UF UNIVERSITY of FLORIDA
IFAS Extension

Trees and Me

4H FOM12

Florida 4-H Project Book
Forest Resources
Series Book 2

Note to the Project Helper

This project book is designed to help youth explore the amazing world of trees. It can be used with a 4-H club, classroom, family outings, or at camp. The project book can be completed in a week as a concentrated unit, or over many months of sporadic activity. You might use this material with an entire club or class, or sponsor an individual. The ideas are here to help guide the exploration and should not limit the journey. There are other resources you might tap including experts in your community who will have other ideas of interesting projects.

This book is the second in a series of three. A Leader Guide for this series provides background information and suggestions for assisting youth with the activities in each book. Youth can continue in the Forest Resources Series with *Florida's Fabulous Forests.* Groups can conduct a community service project with Give Forests a Hand.

Sunshine State Standards

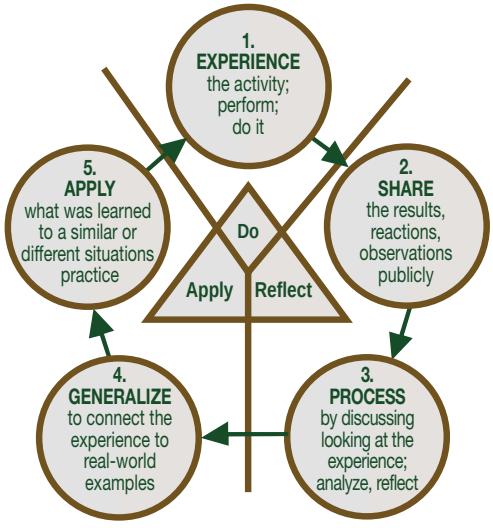
Teachers may wish to use these activities to enhance their work on the following Sunshine State Standards:
SC.G.1 – understands the competitive, interdependent, cyclic nature of living things in the environment.
SC.D.2 – understands the need for protection of the natural systems on Earth.

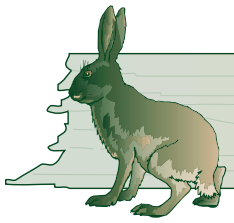
Additional activities to teach your students about trees and forests are in the national curriculum resource Project Learning Tree (PLT). A list of PLT activities for most of the exercises in this project book can be found in the Forest Resources Series Leader Guide. Contact your County Extention Office or the Florida Forestry Association (850-222-5646) for the next PLT workshop near you.

Experiential Learning

The activities in this book were designed to include the three basic steps of the Experiential Learning Model. 4-H members should 1) do an activity, 2) reflect on this experience by discussing it with you and by answering questions, and 3) apply this experience to a new situation.

An Experiential Model for Effective Teaching and Learning Experiences





What's Inside

Chapter 1 – Tree Basics

Chapter 2 – Getting to Know Florida Trees

Chapter 3 – Gifts From Trees

Welcome to Trees and Me

Close your eyes for a moment and imagine a world without trees. What do you think you'd miss first – shade, a green horizon, paper, or oranges? Thankfully, we don't have to live in a world without trees. Many communities protect urban trees and encourage people to plant more. Florida has protected thousands of acres of forest in state parks and conservation areas, so we can enjoy the many benefits of trees. Even more forest land is owned and carefully tended by numerous Florida families. Our forest industry also works hard to harvest and replant trees efficiently so we always have a multitude of wood products.

In this project book, you will learn more about trees – how they grow and how you benefit from them. Since the process of getting to know someone usually begins with learning their name, you'll have an opportunity to learn the names of several trees, too.

Florida is rather unusual when it comes to trees because our climate encourages so many different things to grow. There are eight distinctly different forest ecosystems across Florida, and that means that different sets of plants and animals prefer to live in each one. Of course, since animals move and plants spread their seeds, you can find some of these animals and plants in other forests as well.

Trees are very special plants. Come learn more about them!

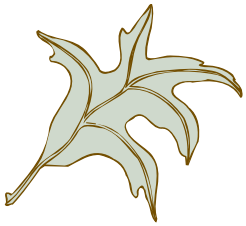


Chart Your Progress

Use this chart to keep track of your project. With your Project Helper, decide which 8 activities and 4 or more challenges you want to do. As you complete each activity and challenge, ask your Project Helper to sign that you have finished it.

Activity	Completion Date	Signature
1.1 What's a Tree?		
1.2 Food Factories		
1.3 How Wood You Like That?		
2.1 Tree Traits		
2.2 The Key to Trees		
2.3 A Tree's Favorite Place		
2.4 City Trees		
2.5 Guide the Way		
3.1 Wood is Good		
3.2 Incredible Edibles		
3.3 Tree Surprises		
3.4 Paper Pieces		
3.5 A Natural View		
Challenge #____		
Challenge #____		
Challenge #____		
Challenge #____		

Chapter 1: Tree Basics

There's a lot to learn about trees and a good place to start is with basic, essential information about what a tree is and how it grows. The next three activities give a general overview of trees but be sure to consult other sources if you have more questions or if something catches your interest!

Activity 1.1: What's a Tree?

Life Skill: Learning to learn
Project Skill: Defining the word 'tree'
What to Do: Compare a definition that you create with other definitions.

Sometimes very simple questions are very hard to answer. What do you think? What is a tree?

Do the Activity

1. Go outside and carefully examine at least 5 different plants that you think are trees. Write down at least 3 characteristics that all 5 plants have in common:

   a.

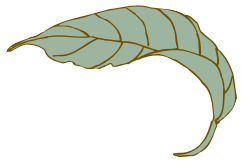
   b.

   c.

2. Using these common characteristics, write a definition that would help someone who just landed from outer space know what a tree is – and what a tree is not.

3. Now test out your definition on some plants that could be tricky to define. Look at the pictures on page 7 and read the descriptions. Circle the plants that you think should be called trees, and make sure your definition would categorize them as trees.
4. Now look up the definition of a tree in several different books (a dictionary, a science book, and a tree identification book). How close is your definition?

Talk it Over



Share with your helper

- Describe the trees you observed.
- Explain your definition of a tree.

Tell what's important

1. What are the most important characteristics of a tree?_____

_____

_____

Explore what you learned

1. How did your definition of a tree change as a result of this activity?_____

_____

_____

2. How do you think most people define a tree? _____

_____

_____

Imagine what's next

1. When you think about trees, what would you like to know more about? _____

_____

_____

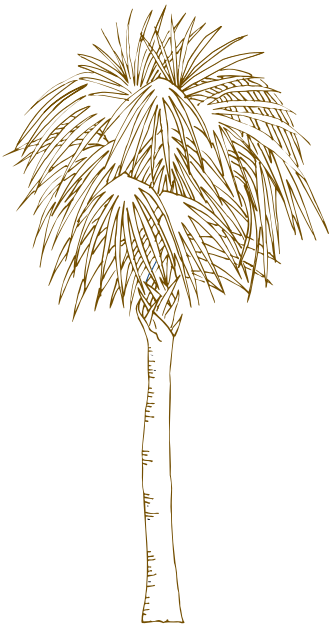
More Challenges

1. Have you ever noticed sayings that refer to trees? *Barking up the wrong tree. Can't see the forest for the trees. He's all spruced up.* What do these phrases mean? What other phrases have you heard about trees? Can you make up some phrases that refer to characteristics of trees?
2. Talk to other people about their definitions of a tree. Ask friends, family members, teachers, and neighbors. Contact tree experts such as a park ranger or someone who works for a lumber company. Ask them for their definition of a tree. How are these definitions the same? How are they different?

Strangler fig often starts its life in the branches of another tree, acting like a vine. It grows quickly and as it matures, sends down its own roots to support itself. Eventually a strangler fig will stand on its own, independent of the original host tree. Strangler fig grows to a height of 50-60 feet and is mainly found in South Florida.

The 700 species of bamboo in the world are all members of the grass family. Dwarf varieties of bamboo may grow only one foot high; whereas giant varieties can be over 100 feet. Bamboo stems are hollow, usually round, and jointed. Switchcane is a bamboo with a woody, hollow trunk and long, slender leaves that is native to Florida. It can grow to be 25 feet high.

Gallberry, a common plant in pine flatwoods and savannas, is a member of the holly family. It is evergreen with black, berry-like fruits and small, shiny leaves. Gallberry grows to be seven to nine feet tall and is found throughout Florida. Rather than one central stem it has many branching stems.



Palm trees grow up from a single **terminal bud** in the central part of the trunk. The cabbage palm is Florida's state tree and can grow to be 50-80 feet tall. Its leaves, called **fronds,** are five to eight feet long and also grow from that same terminal bud.

Activity 1.2: Food Factories

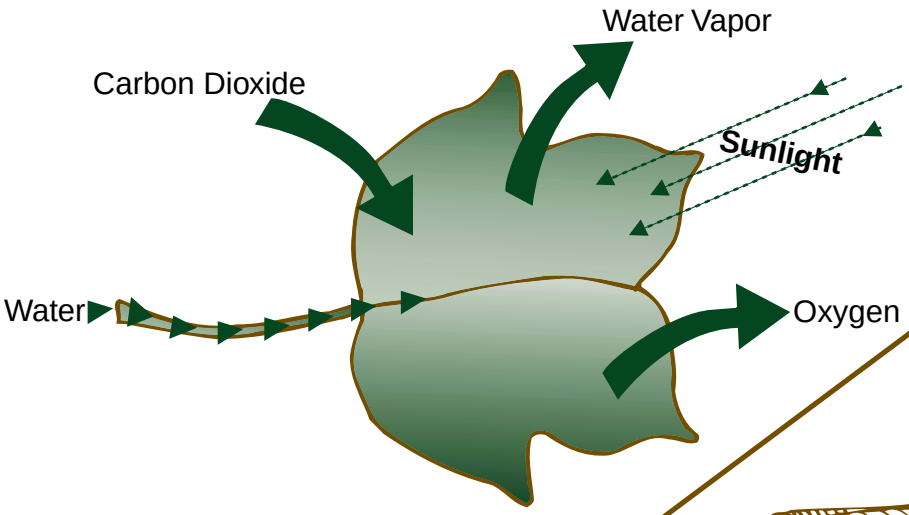
Life Skill: Applying science process skills
Project Skill: Conducting an experiment
What to Do: Experiment with photosynthesis

The words in bold are defined in the Glossary

Leaves are food factories for plants. The food they produce is sugar. It is not as sweet as refined table sugar, but like table sugar, it is a carbohydrate that stores energy. Trees do a very good job of getting their factories all the ingredients they need to produce food:

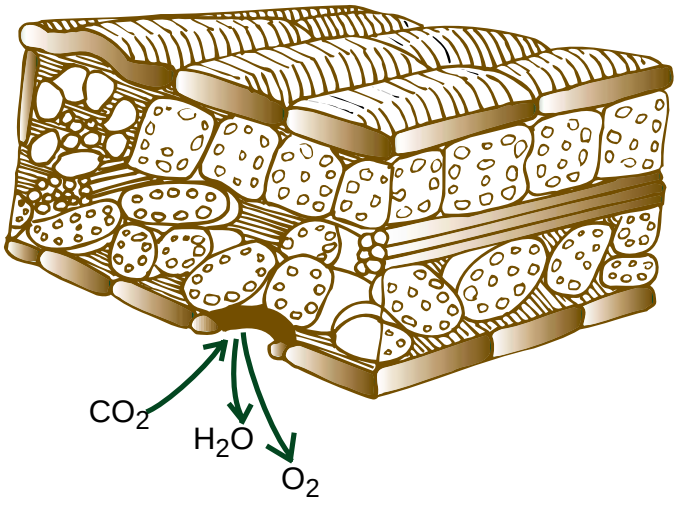
- Leaves are turned toward the sun and positioned in a way that helps capture sunlight.
- Roots absorb water and nutrients from the spaces in the soil.
- Sapwood carries the water and nutrients up the trunk to the leaves.
- Tiny holes on the bottom of the leaves, called **stomata,** allow carbon dioxide gas and oxygen gas to move in and out of the leaves and cells that make food.
- Phloem carries the sugar throughout the tree so the stem and roots can grow.

The process that converts water and carbon dioxide in the presence of sunlight into food and oxygen is called **photosynthesis.** All green plants photosynthesize. The ability to make food energy is something that green plants have and animals do not have.



Sugar is produced from carbon dioxide and water in the presence of light.

Cross section of a leaf showing movement through a stoma



Do the Activity
Experiment 1: Drinking Plants

Materials:

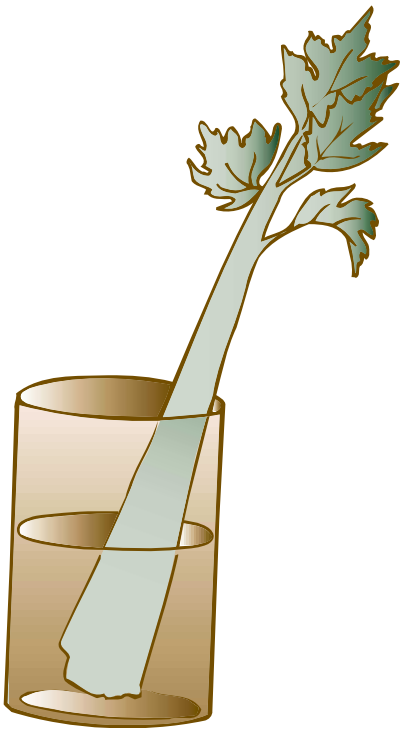
1. 4 stalks of celery, the same size, with leaves
2. 4 glasses
3. Blue food coloring
4. Measuring cup
5. Paper towels
6. Vegetable peeler
7. Ruler

Method:

Lay the four pieces of celery in a row so that the joint where the leaves meet the stalk lines up. Cut the four stalks so they extend 6 inches from this joint.

Place 1/2 cup of water in each glass and mix 10 drops of blue food coloring into each glass. Put a celery stalk into each glass.

Every 15 minutes from the time you started, take one stalk out of the water and examine it closely. Can you see any color appearing in the leaves? Use the vegetable peeler to shave the stalk to see how far up the stalk the colored water traveled. Record the distance below:



Time	Distance Traveled
0 hours	0 inches
15 minutes	
30 minutes	
45 minutes	
1 hour	

How fast does water move to the top of a celery stalk under these conditions?

Experiment 2: It's a Cover-Up

Materials:

1. Tree or shrub in your yard with large, flat leaves you can reach
2. Ruler
3. Scissors
4. Cardboard
5. Paper clips

Method:

Measure the length and width of the leaves of your selected tree or shrub. Cut out several pieces from the cardboard that are as long as the leaves and twice as wide. Fold the cardboard pieces in half. Paper clip them to several leaves so that both the top and bottom of one half of each leaf is covered.

Mark the leaves with a string so you can watch them over the next four days. What do you think will happen? What will the parts of the leaves covered by cardboard look like? Why?

After four days take the clips off the leaves and examine the results. What happened? Why?

Talk it Over

Share with your helper

- Describe how you measured water movement in the celery stalks.
- Describe what you saw when you removed the cardboard pieces from your leaves.

Tell what's important

1. If a tree were 35 feet tall, how quickly could a water droplet travel from the surface of the ground to the highest leaf, if water moved through trees at the same rate it moved through celery? _____

_____

_____

2. In Experiment 2, which photosynthesis ingredient was not available to the cells of the leaf under the cardboard? _____

_____

_____

Explore what you learned

1. Some animals eat animals; some animals eat plants. Animals that eat animals eventually eat animals that eat plants. Why are plants at the "bottom" of every food chain? _____

_____

_____

2. The tiny stomata in leaves are needed to let carbon dioxide and oxygen get in and out of the leaf. They also enable water vapor to escape into the air. If a tree does not have enough water, those little holes could allow the tree to become dehydrated. What design features could prevent leaves from "leaking" precious water during a dry spell? __

_____

_____

Imagine what's next

1. Why do you think forests are called the Lungs of the Earth?_____

_____

_____

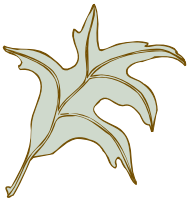
2. Draw a picture of a make-believe plant that is really good at moving water from the roots to the leaves and at keeping its leaves in the sun. Explain how the plant accomplishes these tasks. _____

_____

_____

More Challenges

3. Make a poster of a leaf showing the stomata and explain how photosynthesis occurs.
4. Visit a greenhouse to observe how they raise trees and how they provide each ingredient needed for photosynthesis.
5. If the amount of carbon dioxide gas in the atmosphere increases as a part of global warming, how might this increase affect trees? What might become a limiting factor for tree growth?



Activity 1.3: How Wood You Like That?

Life Skill: Problem solving
Project Skill: Applying given information
What to Do: Answer questions and label pictures about tree trunks

Have you ever thought much about wood? Wood is the main source of energy for heating and cooking in more than 50% of the homes in the world. Here in Florida, some homes are heated with wood stoves, but most of our wood is used for lumber, furniture, tools, and paper. Several activities in this project book explore the different things we make from trees, but for now, let's look at wood.

Most of our wood comes from softwood or hardwood trees: trees with needles and trees with leaves. Other woody plants like palms, vines, shrubs, and bamboo are not used for commercial wood production in Florida. So when we talk about wood, we are referring to the woody trunks of trees like pines and oaks.

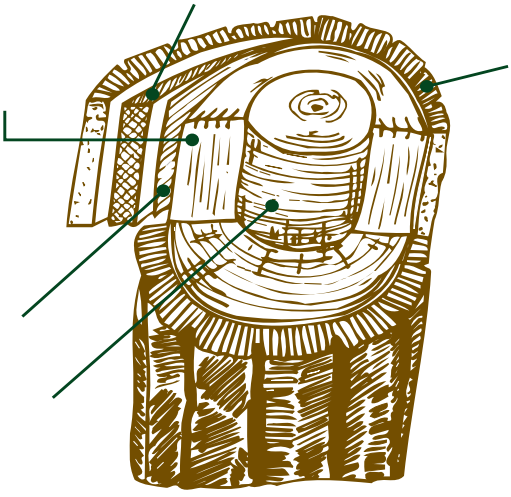
Do the Activity

Most of the woody material in a tree trunk is **xylem** – columns of hollow cells arranged end to end. Living xylem tissue is called **sapwood;** it carries water from the roots to the leaves. Every year, new sapwood is produced in a period of slow growth and fast growth – together they make an **annual ring.** Really old sapwood in the center of the tree may become **heartwood** that stores various wastes and chemicals produced by the tree. In some trees, this heartwood becomes rot resistant or colorful and is highly prized for its durability and quality.

Cells in the **cambium** layer produce new sapwood. These cells are located in a thin layer between the **phloem** and sapwood. The cambium layer produces two types of cells, sapwood on the inside of the cambium layer and phloem cells on the outside. Phloem is made of columns of tube-like cells that carry food made in the leaves to the stems, trunk, and roots.

Dead **outer bark** protects the tree from insects, fire, lawnmowers and other injuries.

Label the picture with these terms: sapwood, phloem, heartwood, cambium, and outer bark.

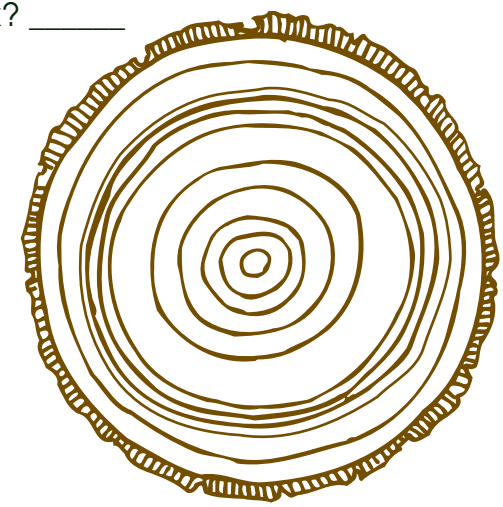


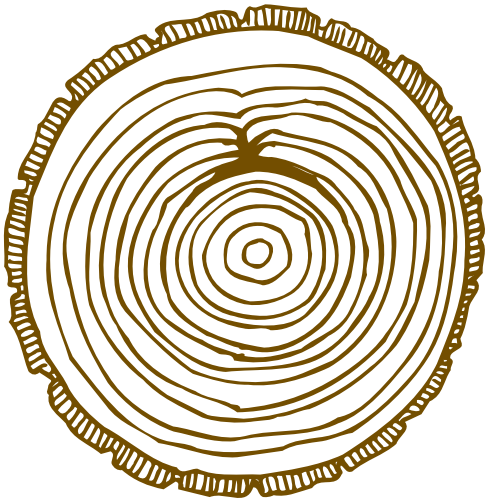
A horizontal cross section of a tree shows the tree's annual rings. These rings can tell a story about how the tree grew. Each ring has a light and dark band; together they usually represents a year of growth. When a tree grows quickly, it forms a wide ring. Annual rings also record information about the health of tree.

a. In the drawing below on the left, count how many years the young tree grew very quickly. _____

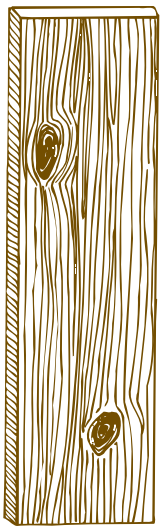
b. Then something happened to reduce the tree's growth – perhaps there was a drought, or perhaps insects attacked the tree and made it difficult to grow by eating the leaves and preventing the tree from producing food. How many years did it take to get over this stress? _____

c. In the drawing on the right, how old was the tree when a fire burned one side of the trunk? _____

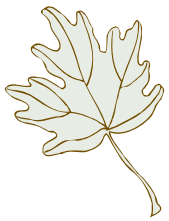




Branches are a part of trees, and it is interesting to see how tree trunks include them. In the picture below on the left, trace the annual rings of sapwood as they carry water to the branch every year. In wood, you can see the evidence of a branch in a knot. A knot is formed where a branch comes out of the tree trunk. The drawing on the right shows typical knots on a tree.



Talk it Over



Share with your helper

- Identify the parts of a tree trunk and describe the function of each.
- Point to the youngest part of a tree and the oldest part(s) of a tree trunk.

Tell what's important

1. What characteristics of a tree might increase the value of its lumber? _____

_____

_____

Explore what you learned

1. Which will certainly kill a tree – shaving a 3 foot long and 3 inch wide patch on one side until you reach the sapwood, or cutting a 3 inch wide band completely around the tree deep enough to reach the sapwood? Why? _____

_____

_____

2. Which tree will have harder, denser, stronger wood – a tree that grows very quickly with wide annual rings, or a tree that grows more slowly and has narrow annual rings? Who could you ask to find out? _____

_____

_____

Imagine what's next

1. The rings of very old trees can be used to interpret the history of an area. Some trees have confirmed that the early settlers in Jamestown Virginia experienced one of the worst droughts in the history of that area. What would those tree rings look like? What other mysteries might living and fossil trees reveal? _____

_____

_____

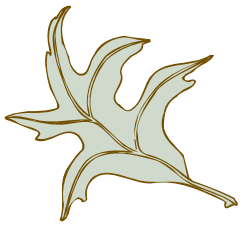
More Challenges

6. Visit a sawmill and see how trees become lumber.
7. In this activity you explored how trees get wider. Now, find out how trees grow taller. Be sure to learn about terminal and lateral buds.

Chapter 2: Getting to Know Florida Tree

Knowing how to identify trees is an important skill for anyone interested in trees and forestry – plus it's fun to be able to walk into the woods and know the names of the surrounding trees. Because Florida has such varying climates, there are many types of interesting trees. This chapter will help you begin to learn to identify some of the important trees in Florida.

Activity 2.1: Tree Traits



Life Skill: Learning to learn
Project Skill: Observing characteristics of trees
What to Do: Go on a scavenger hunt

There are lots of different trees in Florida. Each one has some characteristic that makes it unique. These characteristics may be the shape of the leaf, the furrows in the bark, or the type of flower. Some characteristics are not good for identification, because they are not consistent or stable between the same trees – like the exact size of leaf. You can find small leaves and large leaves on the same tree. However, these characteristics are helpful if they are used in combination with other distinct tree characteristics.

In this activity you will learn about the characteristics that are used to identify trees.

Do the Activity

Have you ever been on a scavenger hunt? A scavenger hunt is where you become a hunter, looking for the items on a list. You go wherever necessary to find the items. The next page has a list of tree characteristics for you to find. Look in your neighborhood and local parks. Travel to a nearby forest to search and explore. Find as many of these characteristics as you can. Take along a few friends or club members and see who can find the most tree characteristics. Information, explanations, and examples of the tree characteristics can be found here and on the 4-H Florida Forest Ecology website. Happy hunting!

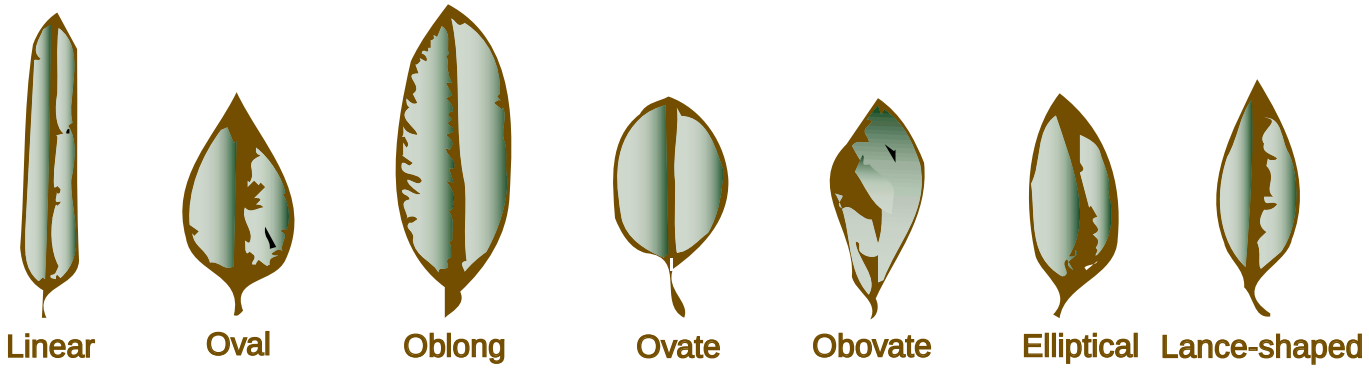
Scavenger Hunt Tree Characteristics

Alternate leaves
Opposite leaves
Simple leaves
Compound leaves

Entire margins
Serrate margins
Wavy margins
Lobed margins

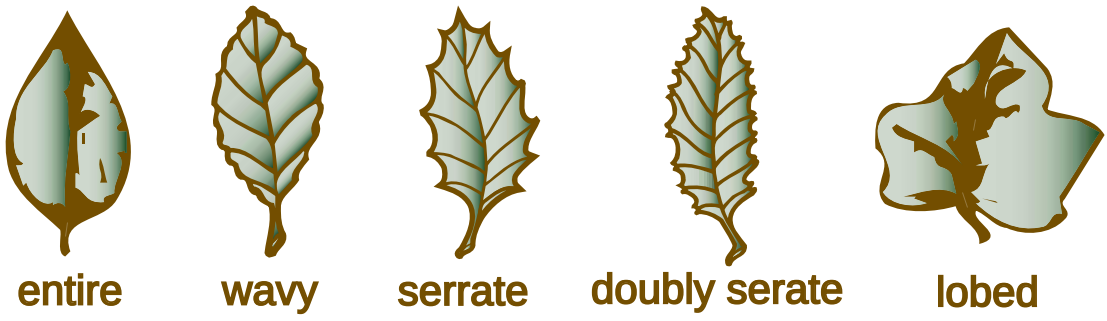
Single needles
Bundled needles
Elliptical leaves
Oval leaves

Leaf Shapes



Leaf Arrangements On A Twig

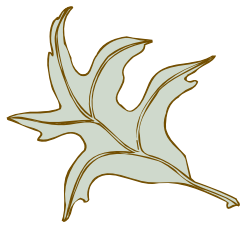
Leaf Margins



Talk It Over

Share with your helper

- Name several tree characteristics that could be used to identify trees.
- Discuss where you went on a scavenger hunt and tell what you found.
- Tell which tree characteristics were difficult to find and why.



Tell what's important

1. What is meant by the term "deciduous tree"? _____

_____

_____

2. Why should you know other characteristics of a tree besides its leaf size or shape? _____

_____

_____

Explore what you learned

1. In terms of leaf shape, how different were most of the trees you saw? _____

_____

_____

2. What characteristics were the most common? _____

_____

_____

Imagine what's next

1. In what situations would it be helpful to know the types of trees in an area? _____

_____

_____

2. Now that you know a few tree characteristics, where do you think you could find information to match these characteristics with tree names? (If you don't know, we'll help you out in the next activity!) _____

_____

_____

More Challenges

8. Identify areas in your community where you could label trees and provide the public with an opportunity to learn to recognize trees in their area. Design a way to inform the public about the identity of certain trees.

Activity 2.2: The Key to Trees

Life Skill: Making decisions
Project Skill: Learning to use a key
What to Do: Find as many of the trees on the Tree ID cards as possible

A key is a tool to identify things. It works by asking pairs of yes/no questions. When you work your way through a key, answering yes or no to each question, you'll end up being able to identify something. The pairs of questions are written so you should answer yes for one of them and no for the other. There are keys for plants, fish, and trees. If you'd like, you could write your own key for the houses on your street or the shoes in your closet. The trick is making sure that the thing you wish to identify is included in the key. In this activity you will key out the trees on the cards on pages 23-28.

Do the Activity

Make double-sided copies of pages 23-28 exactly like they are in this book. Cut out the tree cards. The back of each card explains the characteristics of the leaves or fruits, and the picture on the front shows the identifying characteristics described in the key – leaf shape and branch arrangement.

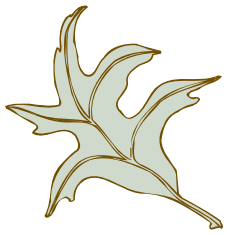
First review the vocabulary of leaves and trees by finding the tree cards that show pictures of each of these characteristics.

Serrate margin
Entire margin
Lobed margin
Compound leaves
Simple leaves

Bundled needles
Single needles
Opposite leaves
Alternate leaves
Leaves or needles longer than 5 inches

Now shuffle the cards and pick one. Use the picture and the description on the card to answer the following questions on this tree key. Then key out the rest of your cards. When you are sure you have keyed all the cards correctly, write the name of each tree on each card.

Key for Tree ID Cards



1. Does this tree have needles? If yes, go to 2.
1. Does this tree have leaves? If yes, go to 5.
2. Are the needles bundled? If yes, go to 3.
2. Are the needles single? If yes, this is Baldcypress.
3. Are the needles only 2 to 3 inches long? If yes, this is Sand Pine.
3. Are the needles at least 4 inches or longer? If yes, go to 4.
4. Are the needles in bundles of 3; and the needles 8-17 inches long? If yes, this is Longleaf Pine.
4. Are the needles in bundles of both 2 and 3; and the needles 4-11 inches long? If yes, this is Slash Pine.
5. Are the leaves opposite? If yes, go to 6.
5. Are the leaves alternate? If yes, go to 9.
6. Are the leaf margins serrate? If yes, this is Red Maple.
6. Are the leaf margins entire? If yes, go to 7.
7. Are the leaves rounded at the base? If yes, this is White Mangrove.
7. Are the leaves tapered, coming to a point, at the base? If yes, go to 8.
8. Does the tree have tall arching roots coming from the trunk and branches? If yes, this is Red Mangrove.
8. Does the tree have pencil-like breathing tubes growing up around the tree? If yes, this is Black Mangrove.
9. Are the leaves compound? If yes, go to 10.
9. Are the leaves simple? If yes, go to 11.
10. Are the leaf margins serrate? If yes, this is Pignut Hickory.
10. Are the leaf margins entire? If yes, this is Gumbo Limbo.
11. Do the leaves have deep lobes? If yes, go to 12.
11. Do the leaves have shallow or no lobes? If yes, go to 13.
12. Are the leaves star-shaped with 5-7 points? If yes, this is Sweetgum.
12. Are the leaves deeply divided into 3-5 lobes? if yes, this is Turkey Oak.
13. Does the tree produce acorns? If yes, go to 14.
13. Does the tree produce a fruit other than acorns? If yes, go to 16.
14. Are the leaves spatula-shaped, narrow at the base and widely rounded at the tip? If yes, this is Water Oak.
14. Are the leaves the same elliptical shape, wide in middle but narrower at the base and tip? If yes, go to 15.
15. Do the leaf margins curl under slightly and are the acorns 1/2 -1 inch long? If yes, this is Live Oak.
15. Do the leaf margins remain flat and are the acorns less than 1/2 inch long? If yes, this is Laurel Oak.
16. Are the leaves 4-8 inches long? If yes, this is Southern Magnolia.
16. Are the leaves 2-4 inches long? If yes, go to 17.
17. Are the leaves rounded at the tip? If yes, this is Pigeon Plum.
17. Are the leaves pointed at the tip? If yes, this is Swamp Tupelo.

Using a tree identification book or the 4-H Florida Forest Ecology website www.sfrc.ufl.edu/4h for additional information, try to find some of the trees on the tree ID cards around your house. Explore your neighborhood, local parks, and nearby forests. You will not be able to find them all, because these trees do not grow in the same part of Florida. How many can you find?

Try your own card games. For example, make two sets of tree ID cards with information on only one side. Play Concentration or Memory and match the pairs of identical leaves. Make four sets of one-sided tree ID cards. Color each set green, blue, red, and yellow. Play Hearts, Go Fish, or Gin Rummy.

Talk it Over

Share with your helper

- Explain how a key works.
- Tell how many trees from the ID cards you found.

Tell what's important

1. Why do you think it is helpful for people to give trees a name, and for everyone to call the same trees by the same names? _____

_____

_____

2. Explain how a key could be used to identify the houses on your street or the shoes in your closet. How could a key help you in solving problems? _____

_____

_____

Explore what you learned

1. Using the information on the cards, why do you think you might not be able to find all the trees on the tree ID cards near where you live? _____

_____

_____

2. Why are characteristics like leaf shape and leaf arrangement usually used to identify trees rather than flowers or bark? _____

_____

_____

Imagine what's next

1. How can you use your Tree ID cards to help others learn the names of the trees? _____

_____

_____

2. Using real trees or field guides, color the Tree ID cards. Does knowing the colors of the leaves and fruit help you learn the trees? _____

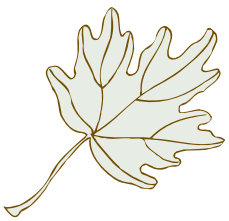
_____

_____

More Challenges

9. Make more tree ID cards to represent trees that grow in your community. Draw their leaves on one side of the card and find out information about them to write on the other side.

10. Give a demonstration on how to identify trees or how to use a key for identification.



Field Guides

You can find many good tree identification guides at your local library, bookstore, and on the web. These guides will provide descriptions of trees and many include drawings and photographs. Sometimes, tree identification guides will also have keys to help you identify trees. There are tree identification guides that were made just for trees in Florida and maybe just for your local area. Other tree guides cover the Southeastern United States and some even cover the whole country or all of North America. The following book titles can provide you with more information on tree identification:

- *Eastern Trees* (Peterson Field Guides), by George A. Petrides, Janet Wehr, and Roger Tory Peterson, revised in 1998
- *Familiar Trees of North America: Eastern Region* (The Audubon Society Pocket Guides), by Jane Friedman and Jerry F. Franklin, 1987
- *Forest Trees of Florida,* by the Florida Division of Forestry, 1997 (This small pocket guide is available free from your local Florida Division of Forestry office.)
- *Forest Trees of the United States and Canada and How to Identify Them,* by Elbert L. Little, 1980
- *Golden Field Guide to Trees of North America,* by C. Frank Brockman, 1968
- *The National Audubon Society Field Guide to North American Trees: Eastern Region* (Eastern), by Elbert L. Little, 1980
- *Peterson First Guides: Trees,* by George A. Petrides, Olivia Petrides, Janet Wehr, 1998
- *Tree Finder: A Manual for the Identification of Trees by Their Leaves* (Nature Study Guide Series), by May T. Watts, 1991

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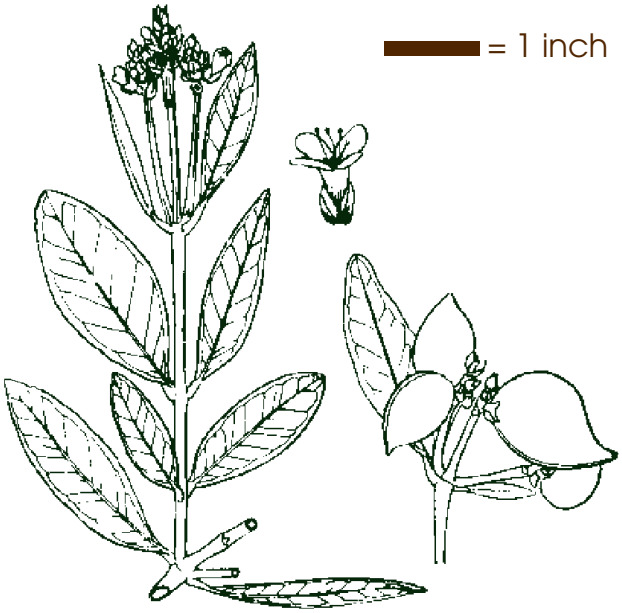

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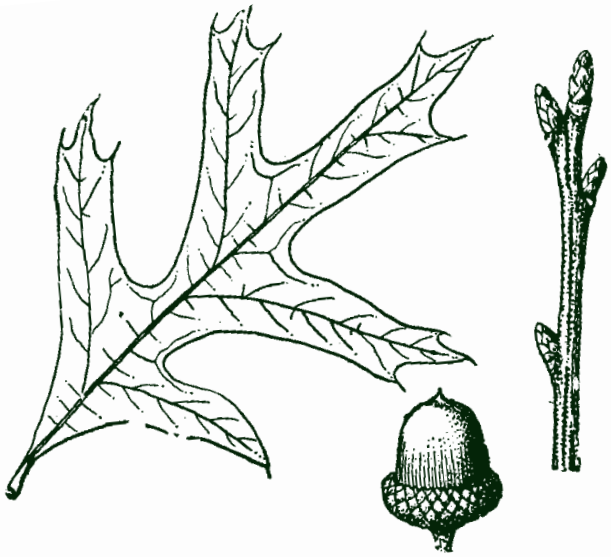

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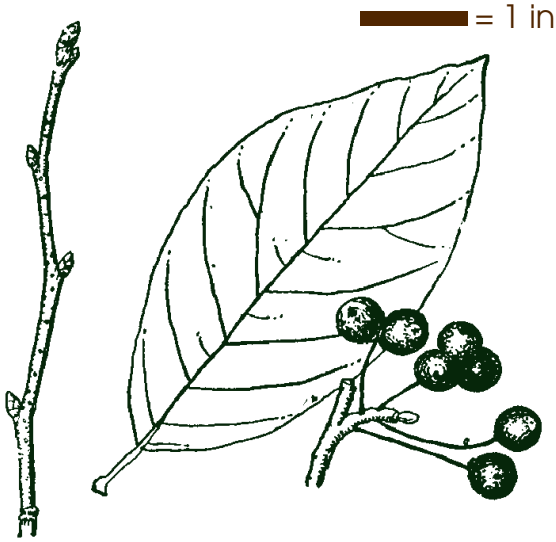

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I am one of the largest and most common trees in South Florida. My alternate, compound leaves are pear-shaped and can be used to make tea. My sap has been used as a liniment and varnish.

My name is _____

I can grow in many different areas throughout Florida. My leaves vary in shapes and sizes, but in general, the outlines are shaped like a spatula, narrow at the base and widening at the tip. I have small, 1/2 inch acorns.

My name is _____

I like to grow around pine trees in sandy soil. I have very pointed leaves with 3-5 deep lobes. My bright yellow-green leaves are thick, rigid, and heavily veined. My acorns measure 3/4-1 inch long.

My name is _____

I grow in salt water close to shore. My opposite leaves come to a point at the base. I have many pencil-like breathing tubes that grow up from the mud to provide air for my underground roots. Beekeepers set up their hives near me when my flowers bloom to make a high quality honey.

My name is _____

I am a tree of the muddy tidal shores of bays and lagoons in Florida. My opposite leaves are rounded with a rounded base and tip. My seeds can float allowing them to move by water to new growing sites.

My name is _____

My leaves are simple, shiny, and dark green with a pointed tip. In the fall my leaves turn bright red. I have a dark blue, berry-like fruit that grows in clusters of two or three.

My name is _____

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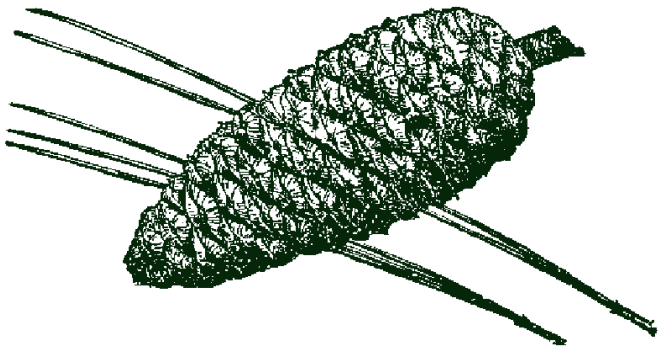

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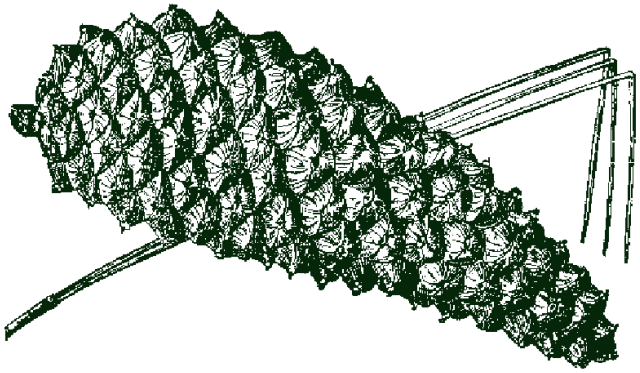

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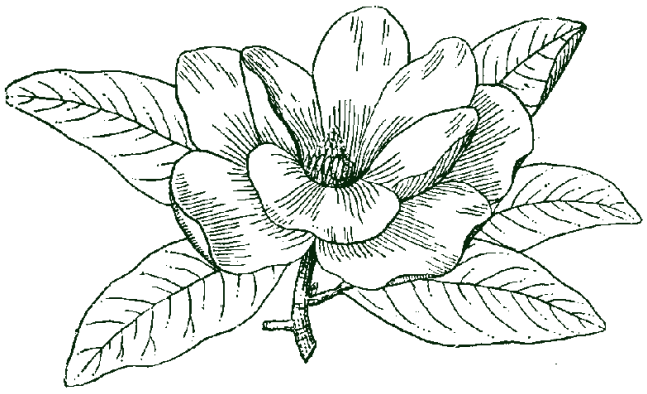

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I have big leaves that are shaped like a star with 5-7 pointed lobes. In the fall my leaves turn brilliant colors such as gold, red, and purple. My fruit is a round spiny ball.

My name is _____

I get my name because I do not lose my leaves in the winter. It looks like I am alive when other trees have dropped their leaves. The margin of each of my leaves curls slightly under and I produce black 1/2-1 inch acorns.

My name is _____

I used to exist all throughout Florida. Though my range is smaller now, I am making a comeback. I survive best with occasional forest fires. My needles are 8-17 inches long.

My name is _____

I am probably the most common tree in Florida. You can find me in natural forests and in pine plantations where I grow fast to make paper. My needles are 4-11 inches long.

My name is _____

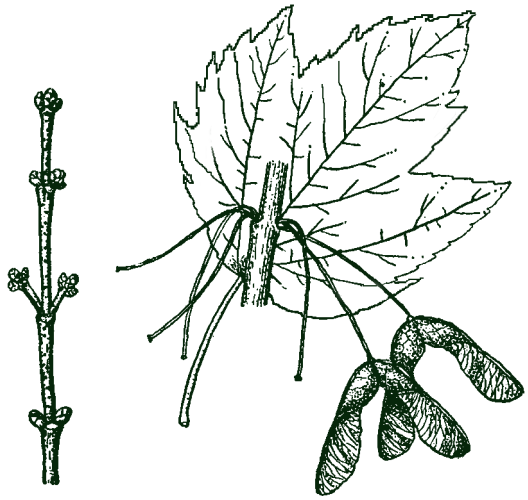
I have compound leaves and alternate branches. I produce a hard nut that squirrels like to eat. My leaves have 5-7 leaflets that turn yellow in the fall.

My name is _____

My shiny, dark green leaves are thick and leathery and often reddish on the lower surface. They are 4-8 inches long. My flowers are large and white with a pleasant smell, but can only be seen in the spring.

My name is _____

= 1 inch



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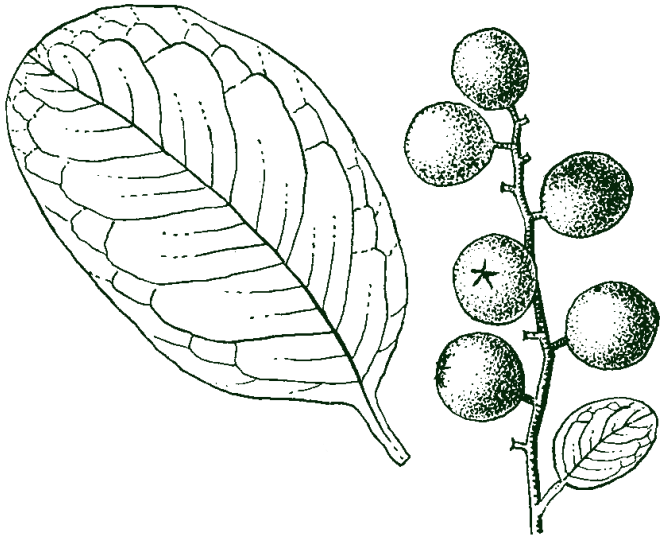

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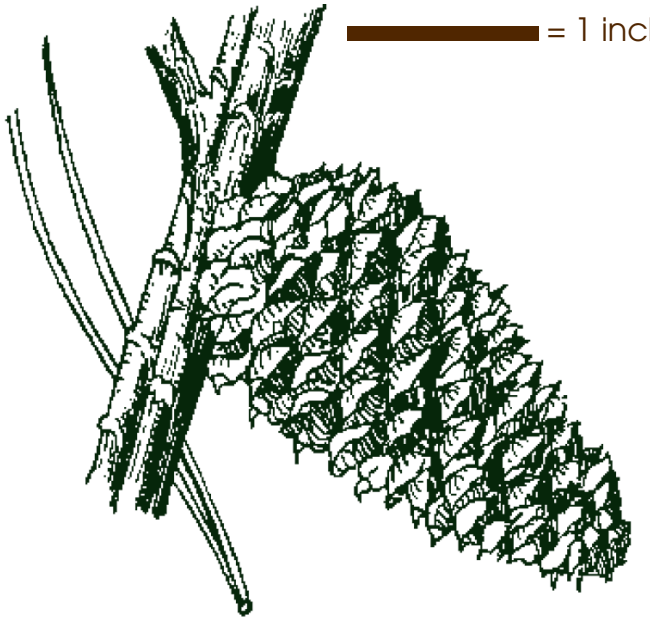

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I can grow to be 100 feet tall, even though I got my start from an acorn less than 1/2 inch long. My bark is smooth and light gray. My leaves tend to be light green and narrow with flat, entire margins.

My name is _____

I live in many different kinds of forests, but like the damp ones best. My opposite leaves have 3-5 lobes with serrate edges. My flowers, buds, and seeds are red.

My name is _____

I am one of the largest and most abundant seacoast trees in Florida, found mostly in the hammocks of the Keys. My leaves are oval, and rounded at the ends. Juice from my fruit is used to make jelly.

My name is _____

I live in swamps and near rivers all over Florida. My needles are individually attached to the branch, and fall off in the winter. I can grow to over 150 feet tall.

My name is _____

I grow in salt water along the shores, inland rivers, and creeks of Florida. I am usually surrounded by water at high tides. My opposite leaves come to a point at the base. I have tall, arching roots that grow out from my trunk and branches to gather air when the underground parts of my roots are underwater.

My name is _____

I grow in very sandy soil across Central and Northern Florida. My trunk and branches are often twisted and gnarled. My needles are 2-3 inches long.

My name is _____

Activity 2.3: A Tree's Favorite Place

Life Skill: Making decisions
Project Skill: Applying information
What to Do: Match the trees with their favorite ecosystem

You have become familiar with tree and leaf vocabulary and have even been introduced to a few trees. Now it's time to really start learning these trees so you will be able to identify them, without the cards, when you are in the forest. You could just memorize all the selected trees in any random order but a system of organization will help you to remember the trees. This activity provides information on Florida's main forest types and the dominant trees that live in each one. As you learn about each forest type, take the time to learn the dominant trees that are provided on your tree ID cards. By associating the trees with a forest type, you will be better able to store this new information in your head.

Florida has a diverse landscape and a varied climate, which means Florida's ecosystems are all very different. An **ecosystem** is an interconnected, interactive community of living things and their physical environment. An ecosystem has certain characteristics that make it distinct. Because of these characteristics, specific plants and animals are best suited to live in a particular ecosystem. For example, an alligator prefers a wet, moist ecosystem such as a marsh or shallow lake. The black bear likes regions of dense cover such as pine flatwoods or cypress swamps. The trees on your tree ID cards grow best in a certain ecosystem; you could say that's their favorite ecosystem. Because these trees are often the biggest and most numerous in their favorite ecosystems, they are known as the dominant trees. Some animals and plants, such as the Longleaf Pine, have more than one favorite ecosystem and can be found in many areas of Florida.

Do the Activity

Use the clues to match the trees with the places they prefer to grow — their favorite forest ecosystem. Information on eight forest ecosystems in Florida is provided. Once you have figured out the trees' favorite ecosystems, fill in the blanks in the boxes. Forests in Florida are suited to the soil, water, and climate of each part of the state. Some people identify over 20 different ecosystems. We have grouped those into eight basic forest ecosystems, and those come in three broad categories:

1. Mostly Dry Sandy Pine Forests

Flatwoods: The flatwood forest covers the flat, sandy areas of southern, central, and northern Florida. Much of this area is now used for pine plantations or grazing. Although the soil is sandy, there may be clay below the surface that holds water in ponds that support cypress trees. This is the most extensive forest ecosystem in Florida.

Scrub: The scrub ecosystem is usually dominated by shrubby trees and pines. It is found on well-drained, nutrient-poor, sandy soils. This community is adapted to and maintained by huge, infrequent fires. Because they do not flood, these areas are often converted to citrus groves, golf courses, and housing developments.

Sandhills: The sandhill system is a forest ecosystem with dry, sandy soils. These soils are well-drained, unlike the flatwoods. When this forest experiences fire very frequently (1-15 years), grasses may cover the ground. This forest once extended from Virginia to Florida and Texas.

2. Mostly Wet Forests

Swamps: Swamps are forested wetlands. They may border a river with moving water, or occupy a pond with still water. They may even be dry in some parts of the year. The plants that live in swamps have special adaptations that enable them to live in high water. Approximately 10% of the land area in Florida is covered by forested wetlands.

Mangrove Swamps: Along Florida's south coast and halfway up the peninsula, mangrove swamps hug the shoreline. These dense forests grow at the high tide line and help stabilize the shoreline, filter pollution, and provide nesting and nursery areas for many aquatic organisms. They are threatened by shoreline development and pollution. This ecosystem now has legal protection.

3. Mostly Dry Broad-leaved Forests

Upland Hardwoods: This forest is one of the most diverse in the state, because it covers a variety of climates, soils, and moisture conditions. The forest will vary in tree species from north to south Florida, eventually blending into the tropical hammock forest. These forests are usually found in patches; the soils have more clay and soil nutrients than other forests, and therefore retain more soil moisture.

Bottomland Hardwoods: This forest is an extension of the upland hardwood forest into the river floodplains and wetlands. The plants in this ecosystem cannot tolerate long periods of flooding (as in a swamp) but they do get flooded periodically when the rivers rise.

Tropical Hammocks: Hardwood forests with broad-leaved evergreens are called hammocks. The tropical hammock ecosystem is only in South Florida, below the frost line, and contains plants and animals that live no other place in the United States. Many hammocks have been converted into housing developments and cities.

We are the Live Oak, Red Maple, and Water Oak. We like to live near rivers and wet areas but we cannot tolerate long periods of flooding. We live in the _____.

I am the Sand Pine. I like to live around shrubby trees on sandy soils. I cannot live in areas that flood or hold water. Periodic fires help maintain my forests and allow me to start growing all over again. I live in the _____.

We are the Longleaf Pine and Slash Pine. We like flat, sandy areas where sometimes the water table is high and our roots get wet. We can grow quite well in nutrient-poor soils and can be found all over much of Florida. We live in the _____.

We are the Baldcypress and Swamp Tupelo. We like to grow near or in freshwater and can even survive long periods of flooding. Pondcypress is also a dominant tree in our favorite ecosystem but you do not have a tree ID card for it. We live in _____.

We are the Red Mangrove, Black Mangrove, and White Mangrove. We like to live in saltwater along the coast. We do not live everywhere we once did, because development and pollution are changing our favorite ecosystem. We live in the _____.

We are Longleaf Pine and Turkey Oak. We like well-drained, dry, sandy soils. The plants around us are mostly grasses because of frequent fire. We live in the _____.

We are Sweetgum, Southern Magnolia, Pignut Hickory, and Laurel Oak. There are so many of us because no one tree dominates our favorite ecosystem. We like soils with lots of clay and nutrients. We grow across much of the eastern United States. We live in the _____.

We are Gumbo Limbo and Pigeon Plum. We cannot live where the temperature drops below freezing. We like well-drained soils. We live in the _____.

Talk it Over

Share with your helper

- Explain what an ecosystem is.
- Name and describe the eight types of forest ecosystems in Florida.
- Go through your Tree ID cards and tell to which ecosystem each tree belongs.

Tell what's important

1. What makes each ecosystem unique? _____

_____

_____

2. What are some of the major threats to Florida's forest ecosystems? _____

_____

_____

3. Which of Florida's forest ecosystems are in danger of vanishing? _____

_____

_____

Explore what you learned

1. What is the dominant ecosystem in your area?_____

_____

_____

2. How did you determine the dominant ecosystem in your area? _____

_____

_____

3. What is your favorite ecosystem type? Why? _____

_____

_____

Imagine what's next

1. If you haven't already, make sure you know and can identify all the trees on your Tree ID cards. Which trees are hard for you to learn? Why? With which trees were you already familiar? _____

_____

_____

2. Was it easier to learn trees in your area? Why? _____

_____

_____

More Challenges

11. Make an 'Ecosystems of Florida' booklet. Have one page for each ecosystem that provides a brief description of the ecosystem. Provide drawings or photographs of the dominant trees in each area.
12. Make a poster or display about the ecosystem type most common where you live. Provide information about the ecosystem type. Create illustrations or take pictures of the different plants and animals found in that ecosystem.

Find it in Florida!

Many state and federal lands in Florida showcase a specific ecosystem. Here's a list of a few parks and forests where you can see each type of an ecosystem. Visit the parks either in person or via the internet.

Swamps: Big Cypress National Preserve, Blue Cypress Water Management Area

Scrub: Jonathan Dickinson State Park (coastal), Ocala National Forest (inland)

Sandhills: Blackwater River State Forest, Ocala National Forest

Bottomland Hardwoods: Ichetucknee Springs State Park, Myakka River State Park

Upland Hardwoods: Faver-Dykes State Park, Wakulla Springs State Park

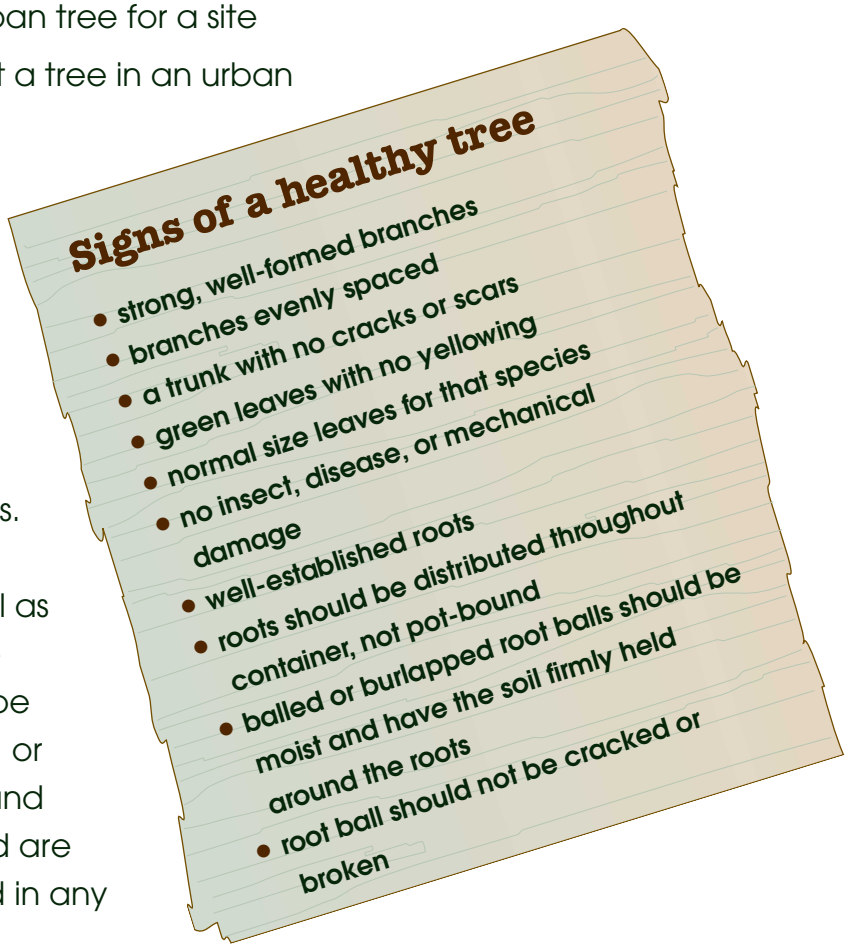
Tropical Hammocks: Collier-Seminole State Park, Lignumvitae Key Botanical Site

Mangroves: Everglades National Park, John Pennekamp Coral Reef State Park

Flatwoods: Apalachicola National Forest, Fakahatchee Strand State Preserve (pine rockland)

Activity 24: City Trees

Life Skill: Making decisions
Project Skill: Choosing an urban tree for a site
What to Do: Select and plant a tree in an urban area



Look around any urban area and you will see many shrubs and trees that you are not likely to find in nearby natural forests. The trees you see are part of the **urban forest,** the community of trees and related organisms occurring in cities and towns. It includes trees from distant Florida forests (like baldcypress) as well as trees from other parts of the world (like gingko). The urban forest is another type of ecosystem like the scrub, flatwoods, or tropical hammocks. Animals, plants, and people call the urban forest home and are part of the complex interactions found in any ecosystem.

Life is not easy for urban trees. Concrete, pavement, buildings, roads, and most other structures make it difficult for urban trees to survive or to naturally reseed themselves. Most urban trees are planted and maintained by people. Since they get to plant their trees, many people choose ornamental trees that are pretty and easy to maintain. Urban trees are also subject to different and often more severe stresses than are non-urban trees. Trees in the city must fight pollution, space limitations, poor soils, and damage from human activity. All these factors mean that urban trees are often different species than what you would find in nearby forests. In this activity, you will become familiar with the urban trees in your area and select a tree to plant and care for. Much of the information provided comes from IFAS Circular 858, Selecting and Planting Trees and Shrubs, available from your County Extension Office.

Do the Activity

Step 1: Choose the Site

Choose an urban area where you would like to plant a tree. It could be your own backyard or a friend's yard. Just be sure you have permission to plant a tree there. Once you have an urban area in mind, become familiar with the urban trees in that area. Explore the surrounding areas, use field guides to identify the trees, and find out more information about these trees. Are they ornamental trees? Are they native to your area? Do they grow well in that area?

Step 2: Choose the Tree

The most important step in planting a tree is matching the right tree to the site. What type of soil does your site have? Does it offer a lot of shade or a lot of sun? Are there space limitations for the roots or branches? Is there good drainage or does the site stay wet and soggy? What type of tree are you interested in growing? Contact your local Cooperative Extension or Division of Forestry office for help in choosing the correct tree for your region and site.

Some Common Urban Trees

North/Central Florida		South Florida	
Baldcypress	Live Oak	Baldcypress	Pigeon Plum
Cabbage Palm	Red Buckeye	Cabbage Palm	Pitch Apple
Dahoon Holly	Soapberry	Dahoon Holly	Royal Palm
East Palatka Holly	Southern Magnolia	Gumbo Limbo	Satin Leaf
Florida Maple	Southern Redcedar	Live Oak	Sea Grape
Hornbeam	Sugarberry	Mahogany	Silver Buttonwood

Step 3: Buy the Tree

Go to a local nursery or garden center and buy the type of tree you selected. Carefully inspect the tree before you buy it. Most trees are sold as bare root, balled-in-burlap, or container. Bare root trees have no soil around the roots. Balled-in-burlap trees have been dug with the soil around its roots and then covered with a protective material. Container plants are just what they sound like, trees in containers!

Step 4: Steps for Planting Trees

1. Keep the roots of the tree moist from the time it is taken out of the package or from the soil until it is planted. Bare root seedlings should be kept in a bucket of water after they are removed from their package and until they are planted.
2. Make a hole that is large enough to allow the roots to naturally spread out in the hole. Do not let the roots curve back up towards the top of the hole.
3. Plant the tree the same depth it grew in the nursery. Be sure to remove container, string, or other packaging.

4. Place moist soil around the roots and pack it down firmly.
5. Water the tree immediately after planting.
6. Use mulch around the tree to keep the soil moist; make sure the mulch does not bury the base of the trunk

Step 5: Maintain your Tree

You can help your tree grow by giving it lots of water and nutrients. Water your tree often after you plant it, particularly if the weather is hot and dry. The exact amount of water will depend on the weather, the soil, and the tree. A young tree in sandy soil should be watered daily for the first week after planting. Water every two days for the next 4-6 weeks and one day a week for the following 7-12 weeks. Water weekly for the next 1 to 2 years in times of drought. If rain is plentiful, you need not water as much.

My Tree Planting Worksheet

Describe the urban site where you planted your tree: _____

_____

_____

_____

_____

What type of tree did you plant? Why?_____

_____

_____

_____

What will you do to maintain your tree ? _____

_____

_____

_____

_____

_____

Talk it Over

Share with your helper

- Define the urban forest.
- Describe the area in which you planted your tree.
- Name the type of tree you chose and explain why you chose it.

Tell what's important

1. What benefits will your tree provide to you, your community, and the surrounding ecosystem? _____

_____

_____

2. Why is it important to know the site? How did you get to know your site? _____

_____

_____

Explore what you learned

1. What are your favorite types of urban trees? Why?_____

_____

_____

2. Where are some of the urban forests in your area? How are these forests used? _____

_____

_____

Imagine what's next

1. How will your tree look in 5 years, 10 years, and 25 years? _____

_____

_____

2. What is your community doing to protect and maintain its urban forests? What more can be done? How can you help? _____

_____

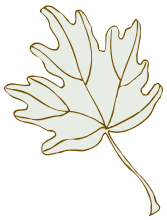
_____

More Challenges

13. Volunteer to help maintain the urban forests in your area. For example, volunteer at an urban park or organize a community tree planting. Make sure volunteers are lined up to continue to care for the newly planted trees.

Planting a Balled-in-Burlap or Container Tree

Activity 2.5: Guide the Way



Life Skill: Communicating with others
Project Skill: Teaching people about a natural area
What to Do: Create a trail guide for a natural area

In the other activities in this chapter you have learned how to identify trees and been introduced to Florida's major forest ecosystems, including the urban forest. Now it's time to put that knowledge to work! You will use what you have learned and will draw on other resources to create a trail guide for a natural area near you.

Do the Activity

Step 1: Choose a natural area that you have access to and that already has an existing trail or foot traffic. It could be a park, a forest, a vacant lot, or a big backyard. Choose an area with a lot of trees and other plants.

Step 2: Answer the following questions about your area to help you learn more and organize information.

1. What is the name of your area? (If it doesn't have one, you can make one up!)
   _____
2. What are the dominant trees and shrubs? What are the other trees, shrubs, and herbs?
   _____
   _____
   _____
3. What animals might live there? _____
   _____
   _____
4. What type of ecosystem is it? _____
5. How do people use the area? _____
   _____
6. What is the history of the area? Who owns the land? _____
   _____
   _____
   _____
7. Describe the overall area and unique features it has. _____
   _____
   _____
   _____
   _____

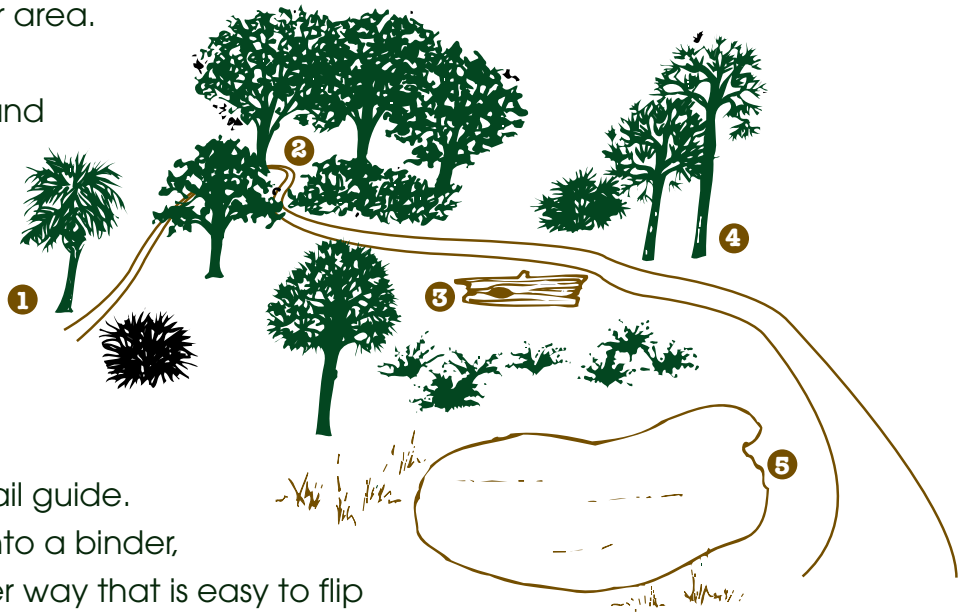
Step 3: Create 5-10 stations along an existing trail. If no trail exists, make a map that identifies interesting areas and connect those areas to create your own trail. A station is a stop along the trail that draws people's attention to a particular feature such as a tree type, animal home, rotting log, or creek. Stations can be marked with posted signs, ribbons, or popsicle sticks — whatever works for your trail.

Suggestions for Writing Good Information for Trail Stations

- Focus immediately on an observable feature of interest
- Explain the feature quickly and interestingly
- Use 60 words or less for each station
- Use short sentences
- Use simple, active verbs
- Do not use technical or unfamiliar language
- Encourage audience to get involved (ask questions or suggest audience does something or looks for something)
- Use visuals to explain and illustrate the message

Step 4: Write information about each station. This information can be a few sentences or a whole paragraph. The length and content will depend on what your station is describing. For a station that identifies a particular type of tree, information could include the tree name, description of the tree, and fun facts about that tree. A station that points out a rotting log could talk about decomposition and microhabitats. Sources of information can include field guides, encyclopedias, nature study guides, the land managers, and neighbors of the area.

Step 5: Collect pictures of your area. You can draw something, take photographs, and make leaf and bark rubbings. Draw a map of your area and its trails. Mark where the stations are on the trail map.



Step 6: Gather all the information and materials you collect and create your trail guide. The guide can be pages put into a binder, stapled, or presented any other way that is easy to flip through and appealing for people to read.

Your guide should include a cover page, introduction, map of the trail, and description of each station.

Talk it Over

Share with your helper

- Describe your area, your trail, and your trail guide.
- With your helper, explore the area using your trail guide.

Tell what's important

1. How did making the guide help you learn about trees and ecosystems? _____

_____

_____

2. How will people use your trail guide? What will they learn from your guide? _____

_____

_____

Explore what you learned

1. How did your feelings toward the natural area change as you got to know it better? ____

_____

_____

2. How can educational efforts about natural areas affect people's attitudes about those lands? _____

_____

_____

Imagine what's next

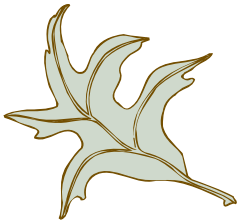
1. How could you continue your education efforts about the area? _____

_____

_____

More Challenges

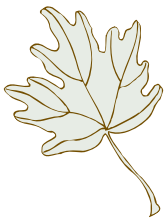
14. Visit a nature trail at a nearby park, nature center, or conservation area. What did they do with their trail that you like? How could they improve the interpretation on the trail for other visitors?



Chapter 3: Gifts From Trees

Trees provide us with all kinds of things – wood products, foods, wildlife habitat, and a great place to climb. This chapter will introduce you to some things you already knew came from trees such as paper and to other things that you may have never guessed!

Activity 3.1: Wood is Good



Life Skill: Learning to learn
Project Skill: Combining experience and knowledge
What to Do: Determine the properties of wood products in your home

Wood, of course, comes from trees and is used to make lots of products including paper and lumber. Certain trees are better than others for making wood products or paper because of the type of fibers in their wood and the specific things we make. Many wood products come from trees grown in **plantations,** a planted forest grown for manufacturing wood products. One acre of trees can produce an average of 2.8 tons of wood per year. That's equal to 7,500,000 toothpicks or 1,200 copies of the National Geographic magazine!

Part 1: Many of the trees harvested from plantations are used to make a variety of wood products.

Plywood is one of the most common wood products used in homes, often used for floors and walls. You might also find it in shelves or cupboards. It is made by gluing together sheets of wood (called a ply) that were peeled off a tree. These sheets may have knots. The more plies in the plywood, the stronger the final product will be (5-ply plywood is stronger than 3-ply plywood.)

Chipboard is made of chips and sawdust from a sawmill, glued together and pressed into sheets. It is used in furniture and cabinets, is often covered with veneer, and is cheaper than plywood or solid wood. Look on the underside of your kitchen counter – is it chipboard?

Oriented strand board (OSB) is like chipboard only the chunks are bigger. It is used in new building construction, particularly in beams where strength is important. It is also used for walls and roofs.

At a lumberyard or home improvement store you will also see lots of solid wood in the form of framing lumber, studs, and all other sorts of boards and lumber.

To see examples of these products visit a lumberyard or home improvement store. As you examine each item, fill in the chart on the next page by describing how each of these products looks. Point out the ways they differ. For example, describe their thickness, if knots are present, and what color they are.

Product	Description
Plywood	
Chipboard	
OSB	
Solid wood	

Part 2: Hunt around your house for ll the wood products you can find and complete the chart below. Us additional sheets of paper if you find more than 10 items.

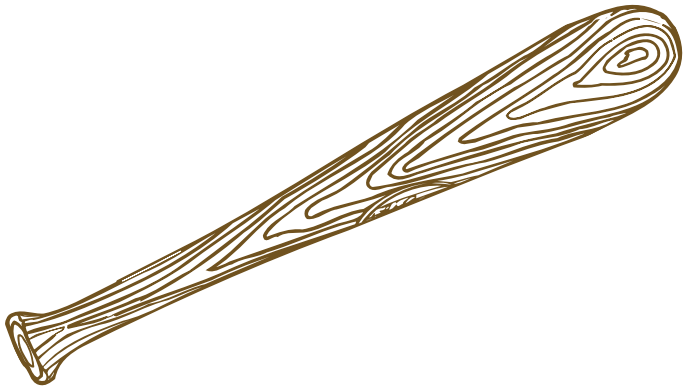
Description of Wood Products	Room Where Found	Type of Wood Product
Example: Cabinet	Pat's bedroom	Plywood

Some of the items you find may not be one of the types of wood products you saw in Part 1. Some wood products in your home may actually have a **veneer** surface. Veneer is a thin sheet of wood (thinner than plywood) that is peeled off a tree to make a very long sheet. High quality veneer from walnut or mahogany may be used as the outside layer of furniture. This saves money since the whole board is not made of expensive wood – just the top layer. You won't see veneer for sale in a lumberyard but you will find it used in a lot of home furnishings.

Which room has more wood? Did you find room that did not have any wood? It may be difficult to tell if a wooden floor is made of solid wood, laminated wood, or is a wood veneer glued to something else. The same is true for furniture, doors, and paneling. But in the end, maybe it doesn't matter. We like the look of wood and we use it often in our home furnishings.

Part 3: By looking at the wooden items in your home, you can learn a lot about trees. Many things, including how the tree grew and how the lumber is cut from the log, affect the appearance of wood.

Examine some of the wooden items you found in Part 2. Can you find annual rings? Be careful that you're not looking at small pieces that trim the edges of other pieces – try to look at the cut edge of a solid piece of wood! A baseball bat is a good example of a solid piece of wood that usually show rings.



Remember how a tree lays down wood around a branch? Can you find evidence of branches and knots in your wood? Because the most valuable wood has no knots, you may not find knots in veneer or some furniture. Try the floor or paneling, since sometimes people like the look of knots there.

Talk it Over

Share with your helper

- Describe the wood items you found in your house.
- Describe the difference between wood veneer, chipboard, and solid wood products.
- Name something in your house from each category: wood veneer, chipboard, and solid wood product.

Tell what's important

1. Take one wood item and describe the annual rings. _____

_____

_____

Explore what you learned

1. Why do you think people like the look of wood so much? _____

_____

_____

Imagine what's next

1. If you could design a tree that had all the properties that people liked in wood, what would your tree look like? _____

_____

_____

More Challenges

8. From the lumberyard or home improvement store, bring home samples or take pictures of wood products. Make a display or presentation about the advantages and disadvantages of each product.

9. Visit a new home that is under construction and look at all the different uses and types of wood products before the walls and ceilings covered them.

10. Enroll in the 4-H Woodworking Project to learn skills involved in making wooden items.

Activity 3.2: Incredible Edibles

Life Skill: Leading Self and Others
Project Skill: Identifying tree products
What to Do: Make the provided recipes and share with your friends and family

Non-woody plants provide many of the foods we eat such as rice, potatoes, wheat, and corn. Trees, however, are an important source of numerous fruits, nuts, and spices.

Do the Activity

Choose one or more of the recipes below and gather the ingredients. The ingredients that are underlined come from trees. Follow the directions and then proudly serve your finished product. Ask the people who eat it to guess which of the ingredients come from trees.

Fruit Tree Salad –

Use fresh, canned, or frozen peaches, oranges, apples, and pears. Mix it all together. Sprinkle coconut on each serving.

Cherry Tree Mousse –

Beat 1 pound ricotta cheese until it is smooth and creamy. Gradually add 2 tablespoons honey and 1/4 teaspoon vanilla. Fold in 2 cups pitted cherries (fresh or frozen and drained). Chill until serving time, then sprinkle 1/2 cup chocolate chips and 1/2 cup slivered almonds on top of the bowl.

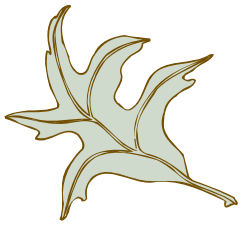
Spice and Fruit Tree Cookies –

Preheat oven to 375F. Mix together 1 stick softened margarine, 1 cup brown sugar, 1/4 cup water, 1 egg, 1/2 teaspoon cinnamon, and 1/2 teaspoon nutmeg. Mix in 1 3/4 cups flour, 1/2 teaspoon baking soda, and 1/2 teaspoon salt, and beat until smooth. Stir in 1 cup of dates or raisins, and 1 cup chopped walnuts or pecans. Drop rounded teaspoonfuls onto greased baking sheets, leaving 2 inches between the cookies. Bake for 8 to 10 minutes until light golden around the edges. Transfer to racks to cool.

Talk it Over

Share with your helper

- Explain what a fruit is and what it does.
- Tell which ingredients you used came from trees.



Tell what's important

1. Which tree fruits are your favorite? How many do you think you eat in one year? _____

_____

_____

2. What other food products and recipes use fruits as an ingredient? _____

_____

_____

Explore what you learned

1. Where do the fruits you use come from? Do they grow in natural forests, plantations, farms, or somewhere else? Are they grown locally or do they travel from far away? _____

_____

_____

2. What tree fruits do you know that are commercially grown in Florida? Why are these fruits grown in Florida? _____

_____

_____

Imagine what's next

1. What conditions, natural and artificial, affect fruit tree production in Florida? How do these conditions help or hurt the fruit industry in Florida? _____

_____

_____

More Challenges

18. Visit a grocery store and search for fruits, nuts, and spices from trees. Keep a list of fruits you are certain come from trees and a separate list of fruits that you are not sure about. When you return home, do research to find out from what type of plants these fruits come.

19. Write a menu for an entire meal that uses a lot of products that come from trees. Prepare the meal for your family.

Precious Cargo

The **fruit** of a tree is a package for that tree's seeds. Flowers on the tree are pollinated and produce a fruit. Inside the fruit are seeds. Some fruits such as oranges and apples contain several seeds. Other fruit such as cherries and peaches hold just one seed inside.

The fruit serves as protection for the seeds and can also be a source of food for the seed when it begins to grow. The fruit can also help spread a tree's seed if the fruit is eaten by an animal who then deposits that seed in a new place when it is eliminated from the animal's system.

Fruits come in many shapes, sizes, and colors. Some fruits are soft and fleshy like lemons and pears. Acorns, walnuts, pecans, and hickory nuts are fruits too! Each of these nuts provides a hard shell to protect the seed inside.

Not all fruits come from trees though. Shrubs, vines, and other small plants produce their own fruit such as grapes, cucumbers, and green beans.

Activity 3.3: Tree Surprises

Life Skill: Communicating with others
Project Skill: Conducting a survey
What to Do: Find 5 people and give them a 'tree product quiz'

Trees surround us even when we are not near forests because trees are used to make many of the items we use everyday. In fact, there are more than 5,000 products that use ingredients from trees. Many people are surprised when they hear what all comes from trees. In this activity you will survey several people to find out what tree products they know and then ask them whether certain items you show them come from trees.

Do the Activity

The list below contains household items that come from trees or have at least one part that comes from trees. Collect as many items from the list below and place them in a box or on a tray.

1. Magazine or newspaper
2. Toothpick
3. Cellophane tape
4. Cellophane window from an envelope or macaroni box
5. Rayon clothing
6. Toothbrush
7. Cork from bottle
8. Cellulose sponge
9. Rubber toy or rubber boot
10. Latex glove

Locate at least 5 people to whom you can give the tree product quiz. First ask them to name as many different products as they can that come from trees. Write down their answers. Next show them each item in your box and ask them to tell you if that item comes from a tree or not. At the end, tell them that all the products come from trees.

Talk it Over

Share with your helper

- Describe the items you collected and explain which ingredient comes from a tree.
- Describe the reactions you got from the people who took your quiz. What were they most surprised about?

Tell what's important

1. If people knew that steering wheels and carpet came from trees, how might they think about forests? _____

_____

_____

Explore what you learned

1. How did your feelings toward trees change as you discovered the tree ingredients in your house? _____

_____

_____

2. What is the tree ingredient that surprised you the most? _____

_____

_____

3. What is the tree ingredient that is most common in your house? _____

_____

_____

Imagine what's next

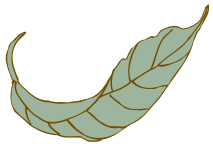
1. What can the forest industry do to let more people know about all the products that come from trees? _____

_____

_____

More Challenges

20. Look through your kitchen for processed foods that have tree ingredients in them. Some very common tree-based ingredients are cellulose, cellulose gum, and cellulose powder. Vanillin and arabic gum are also from trees. You may find other ingredients that come from plants that aren't trees (like carageenan and annetto seed). Research what role these tree-based additives have in food processing.



Tree-based Ingredients

Some of the items in your box are obviously tree products such as the newspaper and toothpick. You may be surprised that some of the other items on the list come from trees. The following information will help you understand how these products come from trees so you can explain it to your friends and family.

Paper is made from dried fibers that once formed the woody mass of a tree. These fibers are part of the xylem tissue that carries water up the tree and forms the structural component of wood. The walls of the cells in the xylem are composed of cellulose filled with **lignin**, a chemical glue that makes the cells stiff and waterproof. **Cellulose,** the molecule that gives flexibility and strength to redwoods and kudzu alike, can be dissolved out of the wood fibers and converted into many products. Some of these are flexible "plastics" like cellophane, sponges, and imitation leather. By adding certain chemicals, cellulose becomes a hard, molded plastic for eyeglass frames, shatterproof glass, toothbrush handles, and steering wheels. Cellulose can also be spun into fibers for carpets and rayon fabric. Lignin, rosin, and other chemicals from trees can be extracted during the pulping process and used to make cosmetics, medicines, inks, adhesives, and emulsifiers.

Certain trees provide unique products. The cork oak tree grows near the Mediterranean Sea; its bark is used to make flooring tiles, bottle corks, bulletin boards, and inner cores of baseballs. The sap from the rubber tree is used to make rubber for boots and other latex items. Scientists have come up with a way to make a **synthetic** rubber that can be made in the factory but they never would have had this idea without rubber from trees.

Activity 3.4: Paper Pieces

Life Skill: Leading self and others
Project Skill: Recycling paper
What to Do: Make paper from scraps

Think about how much paper you use in a day. Obviously in school you use a lot of paper in the form of textbooks, handouts, and art paper. Don't forget cereal boxes, paper plates and cups, newspapers, magazines, and telephone books. Most paper is made from wood fibers from trees. Sometimes these wood fibers come directly from trees but they can also come from recycled paper, which was originally from trees. You will learn about this process as you make paper of your own in this activity. Get your friends to make some, too!

Do the Activity

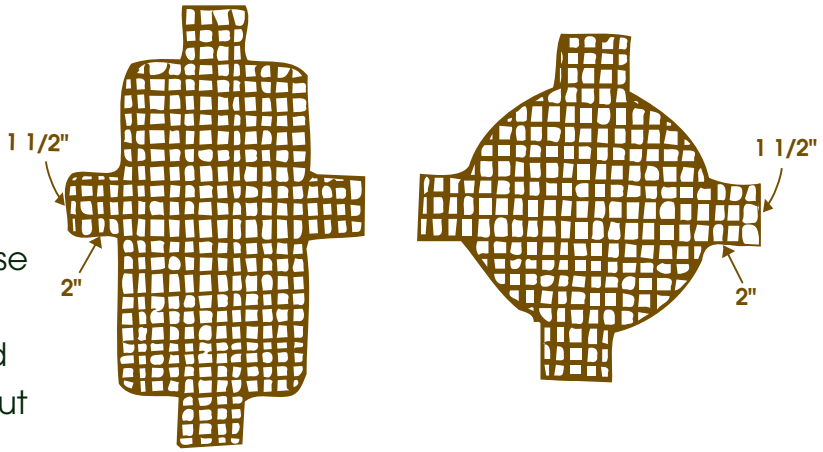
Paper is made from a mixture of 1 percent wood fiber and 99 percent water. Nearly all of this fiber comes from trees, but it can also come from cotton, banana leaves, hemp, kenaf, and other plants. The trees are cut down and shipped to a mill. After the bark is removed, the logs are cut into millions of woodchips. These chips are the size of breakfast cereal flakes. They may be physically mashed or chemically treated to separate the wood fibers into a souplike mix called **pulp**. Some pulp mills don't even make paper, they use the cellulose for other products (see page 50). If recycled paper is used in the mill, it would be mashed into the pulp, too. The pulp is mixed with water and special machines spread the mixture onto a flat screen, roll it between presses, and dry it. You can create a similar process with used paper and a few, simple materials.

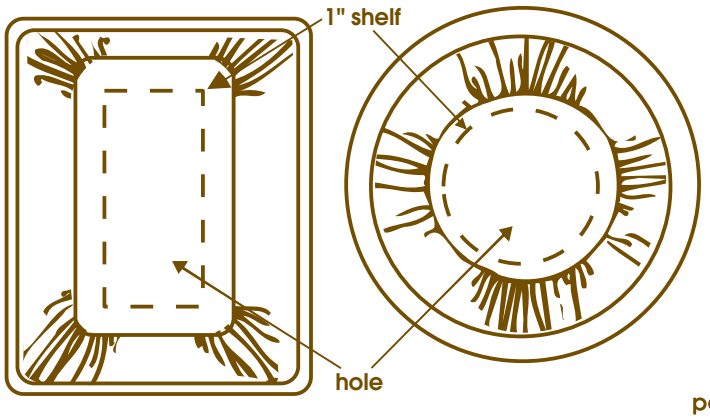
Materials:

1. 2 aluminum pie pans or rectangular roll pans
2. 12" X 12" piece of fine-mesh screen (Fiberglass is best but wire screen will work.)
3. Large container that can hold at least 2 gallons (8 quarts) of water
4. Scraps of old paper such as notebook paper, junk mail, magazines, or newspapers The total amount of paper you need is equal to 6 sheets of newspaper.)
5. 2 tablespoons of liquid laundry starch
6. Paper clips
7. Rolling pin
8. Blender that holds at least one quart
9. Large pile of newspapers
10. Several sponges
11. Crayon
12. Scissors

Make a Deckle

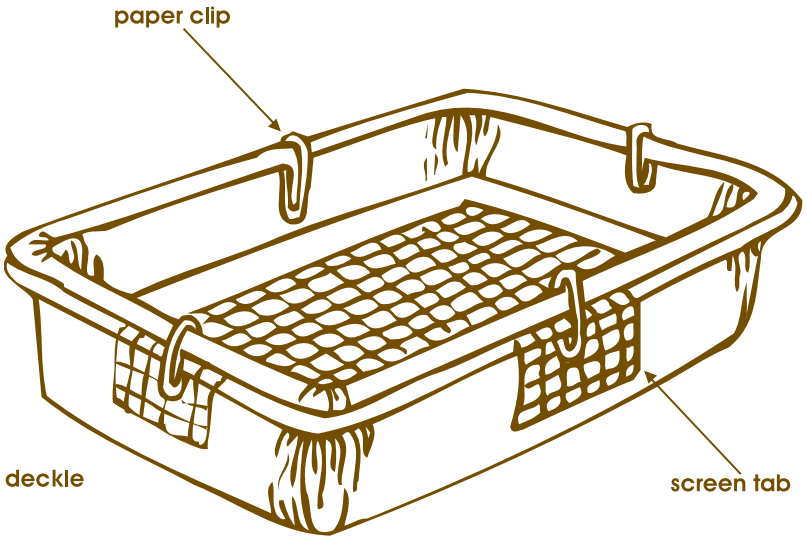
1. First you need to make a **deckle**, a tool used to make paper. Cut a piece of screen that is the same size as the bottom of the aluminum pans, and has four tabs on it. To do this set the pan on the screen and use a crayon to draw a line around the bottom edge. Remove the pan and draw four tabs on the outline. Cut out the shape you have drawn on the screen. Check the picture before you begin.





2. Cut a rectangular hole in the bottom of both rectangular pans or a round hole if you are using pie pans. Leave a one inch wide "shelf" around each hole. The shelf will keep the screen from falling through the hole.

3. Place the screen that you cut into one of the pans. Fold the screen tabs over the outside edge of this pan. Set the other pan on top of the screen. Clip the pans together at the tabs, using a paper clip at each place. Pull the screen edges out from the pans so that the screen is tight and not loose. Now you have a deckle.

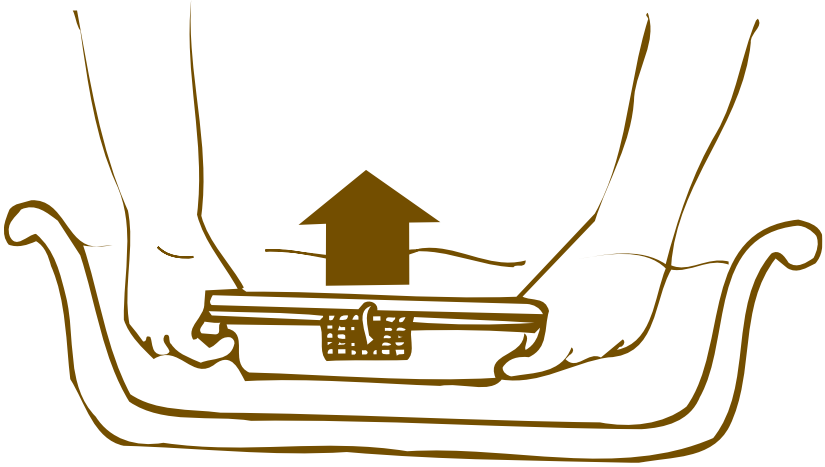


Make the Pulp

1. Tear your paper into pieces about the size of a dime. Divide the torn pieces into six piles. This step can take some time so be sure to get some help.
2. Fill the blender with water to one inch below the 1 quart (32 oz.) line. Add one pile of the torn pieces of paper. Blend at the highest speed until the newspaper pieces have broken down into fibers (about one minute). This mixture is your pulp and will look like cloudy water. Pour the pulp into your large container.

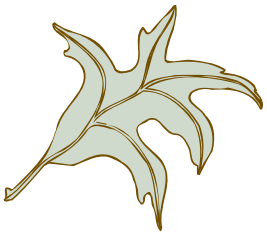
3. Repeat Step #2 with the other piles of paper that you have. Add two quarts of water to the pulp mixture in your container to make two gallons.

Make the Paper

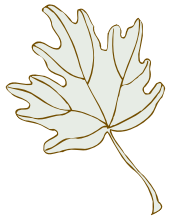


1. Add 2 tablespoons of liquid laundry starch to your pulp mixture and stir with your hands. The starch acts as a binder between the wood fibers in the mixture.
2. Hold the deckle with both hands and slide it gently into the pulp mixture at a slight angle.
3. Hold the deckle as level as you can, near the bottom of the container. When you have a uniform "cloud" of fibers floating over the screen, lift the deckle very slowly and evenly out of the container.
4. Place the deckle on a couple of sheets of newspaper and let it drain. When the newspaper is soaked, place the deckle on fresh newspaper. As it drains, carefully disassemble the deckle by removing the paper clips. Carefully remove the pulp sheet along with the screen or pan and place it on a fresh stack of newspapers.
5. Gently pat the pulp sheet with the sponges to press out any extra water. Do this many times and keep wringing out the sponges. When the pulp sheet is reasonably dry, peel it off the screen or the pan and place it between two sheets of newspaper.
6. Roll a rolling pin over the newspaper sheets containing the pulp sheet. This will remove any remaining water and pack the fibers together. Do this several times with fresh news paper. Dry and save the newspaper, it can be used again!
7. Finally, place the pulp sheet on a fresh sheet of newspaper and allow it to dry overnight.

Don't forget to clean up. Do not pour the pulp mixture into a sink; it will clog the sink. Filter unused pulp mixture through the deckle. Remove the collected fibers from the screen and dispose of them in the trash.



Talk it Over



Share with your helper

- Show the paper you made and explain how you made it.

Tell what's important

1. What would happen if nobody recycled paper? _____

_____

_____

2. What are the advantages of using both sides of a piece of paper? _____

_____

_____

3. Do you use products made from recycled paper? Why should you try to use recycled paper products? _____

_____

_____

Explore what you learned

1. How do your family and school recycle paper? What does your local community do?___

_____

_____

Imagine what's next

1. What can you do to encourage recycling in your community? _____

_____

_____

2. How can you encourage others to use recycled products? _____

_____

_____

3. How does recycling and using recycled products help forests? _____

_____

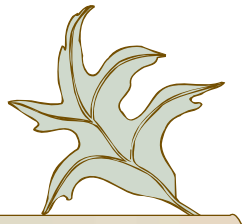
_____

More Challenges

21. Create your own style of paper. You can add color with natural dyes such as tree bark, berries, or fruit juices. You can create different textures by adding dried flowers or grasses, glitter, or thread.

22. Locate the closest paper mill to where you live. Most big cities do not have paper mills. To cut back on the cost of transporting trees, paper mills are usually located near the source of fibers – the forest. Visit a paper mill if one is in your area.

23. In recent years, many cities have created recycling programs for their residents. Visit a recycling plant and find out what is recycled in your community and how it is collected. Learn which products are made from recycled materials and alert citizens to the benefits of buying these items.



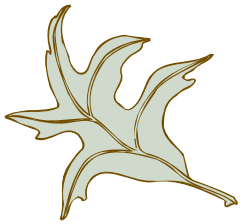
Paper Recycling Facts

- In 1998, 45% of all paper used by Americans was recovered for a total of 45 million tons.
- Recycled paper makes up over 37% of the raw fibers used for making paper in U.S. mills.
- Recycled paper fibers can't make paper forever. The fibers become too short. "Fresh" fiber is usually mixed with recycled fibers to create paper that performs well in printing presses, copiers, and other machines.

Pulp and Paper Mills

- Pulp and paper mills use huge amounts of water. A typical mill uses 28,000-35,000 gallons of water to make one ton of paper. When they are finished using the water, the water is treated to remove valuable chemicals and improve the water quality. Eventually, this water will be returned to nearby rivers, lakes, or oceans.
- Dioxin, an extremely toxic chemical, is a byproduct of bleaching some types of pulp and paper. Modern paper mills have worked hard to reduce the dioxin in their air and water emissions, to the point they are undetectable with current measuring tools.

Activity 3.5: A Natural View



Life Skill: Relating to others
Project Skill: Comparing people's opinions
What to Do: Take pictures and ask people which they like

Many people use forested areas as a place to play and enjoy nature. People who live in cities go to urban, wooded parks to escape the hurried pace of the city life. People plant gardens, hang bird feeders, and bring plants into their homes. Office buildings and malls often have trees and plants inside. The benefits that people receive from this interaction with nature are complex, deep, and not well understood. Forests, trees, plants, streams, and natural areas help people feel better emotionally. Nature provides a place for people to reflect and relax. Research has even shown that people recover from surgery faster if their window view is of a tree rather than a brick wall!

Why do so many people react so positively to natural areas such as forests? The answer to this question is complicated but you can do some research of your own to test your ideas.

Do the Activity

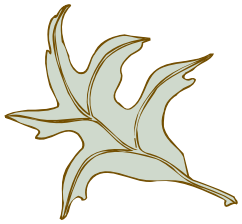
When you think of wooded or natural areas, do you have certain spots that are your favorite places? Do you like the way certain natural areas look? Are there places with trees and plants that make you feel more relaxed just by looking at them? Identify five areas that you like and that you find to be particularly pleasing and relaxing. Think about the best way to represent these places in a picture and take a picture of each area. What do all your favorite areas have in common? What do you like about each area?

Now think about areas that you do not find as relaxing or as pleasant. Maybe they are crowded, noisy, or unsafe. Identify five of these areas and take pictures of each one. What do these areas have in common? What do you not like about each area? Why would you find it hard to relax in these areas?

Gather your ten pictures and randomly number them 1-10. Ask at least five people to sort through the pictures and tell you which scenes they find to be relaxing and pleasing and which scenes they do not. In the chart below, place a ✓ in the box next to the picture number if that person chooses that picture as a relaxing, pleasing scene. Place an **x** in the box next to the picture number if that person finds that scene to be unappealing and hard to relax in. Talk to each person and ask him or her what makes certain areas more appealing than others.

	Your Rating	Person 1	Person 2	Person 3	Person 4	Person 5
Picture 1						
Picture 2						
Picture 3						
Picture 4						
Picture 5						
Picture 6						
Picture 7						
Picture 8						
Picture 9						
Picture 10						

Talk it Over



Share with your helper

- Describe your favorite natural area and explain why you like it.
- Tell which pictures were rated favorably by most people.

Tell what's important

1. What characteristics of the pictures did people focus on when deciding which pictures were their favorites? What characteristics did you use to select your favorite scenes? ___

_____

_____

_____

_____

Explore what you learned

1. How can information about what people like about natural areas help landowners manage their areas? _____

_____

_____

_____

_____

2. What are benefits that people perceive of trees, forests, and natural areas in a city? _____

_____

_____

_____

_____

Imagine what's next

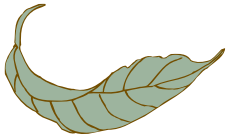
1. How many natural areas does your community have in its downtown area? What do these natural places look like? What do you think these areas mean to the people who live and work there? _____

_____

_____

_____

_____



2. As urban centers expand, what can be done to insure the existence of natural places within the city? Why are such places important? _____

_____

_____

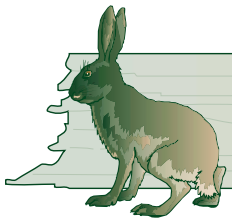
_____

_____

More Challenges

24. Design a park for your city. Draw a layout for the park and describe what features will be included such as picnic tables, playground equipment, hiking trails, or an interpretive center. Build a small model of your planned park.

25. Visit several different areas in your city. Include parks, office developments, parking lots, and vacant lots. Keep a journal of your visits where you record how each place makes you feel and how you react to each place. Reflect on which scenes make you feel most relaxed and why.



Congratulations!

You have completed *Trees and Me*. You have increased your knowledge about tree biology, tree identification, and tree products. You have learned about the parts of a tree, the characteristics of a tree, and the many uses of trees. You have explored the urban forest, natural areas, and ecosystems across Florida.

Florida is an exciting place to learn about trees and forests because it has so much diversity. Many of the trees and forests in northern Florida are different from the trees and forests in southern Florida. Use the website at www.sfrc.ufl.edu/4h to learn more specifics about forest plants and animals. Test your knowledge at the Annual 4-H Forest Ecology Contest. And of course, continue the learning process by checking out *Florida's Fabulous Forests* and *Give Forests a Hand.* Your exploration of trees and forests has just begun!

Certificate of Achievement

I certify that _____ has completed a project using the *Trees and Me* activity guide.

_____ _____

Project Helper's Signature Date

Tree Talk - Glossary

Alternate- describes the leaves and branches of trees that are arranged in a pattern not directly across from each other

Annual ring- layer of new wood produced each year in two periods, one of slow growth and one of fast growth

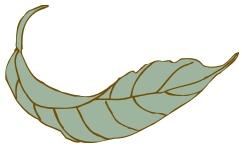
Bundled needles- describes needles of a tree that are clustered in groups of two or more where the bundle is attached to the branch

Cambium- thin layer of cells found between the inner bark and sapwood; produces new sapwood and phloem cells

Cellulose- molecule in the cells of xylem that gives flexibility and strength to woody plants

Chipboard- boards made from big chips and sawdust from a sawmill, glued together and pressed into sheets

Compound- a leaf in which the blade is divided into a number of leaflets and has a bud at the base of the leaf



Deciduous- trees that lose their leaves or needles once a year

Deckle- a tool used to drain pulp to make sheets of paper by hand

Ecosystem- interconnected, interactive community of living things and physical environment

Entire margin- smooth edge of a leaf with no notches

Frond- large compound leaf of a palm or fern

Fruit- develops when a flower is pollinated and serves as a package for the tree's seed

Heartwood- the area of dead cells in the center of the tree trunk that were once sapwood; provides strength and support for the tree and a storage area for various waste products and chemicals produced by the tree

Leaflet- a small leaf-like structure that makes up part of a larger, compound leaf

Lignin- chemical glue found in cellulose that makes the cells in xylem stiff and waterproof

Margin- the border or edge of a leaf

Opposite- describes the leaves and branches of trees that are arranged in a pattern directly across from each other

Oriented strand board- boards made from chips of wood glued together and pressed into sheets; similar to chipboard and particleboard only the chunks are bigger, providing more strength

Outer bark- the outer covering of a tree that protects the tree from injury

Particleboard- boards made from small chips and sawdust from a sawmill, glued together and pressed into sheets

Phloem- columns of tube-like cells that carry food made in the leaves down to feed the stems, trunk, and roots

Photosynthesis- the process in all green plants that converts water and carbon dioxide in the presence of sunlight into carbohydrates and oxygen

Plantation- a planted forest grown for various purposes, like wood and fiber production

Plywood- thin sheets of wood glued together to make one thick sheet of wood; each thin sheet is called a ply and the more plies, the stronger the final plywood

Pulp- ground-up fibers from trees used to make paper and other products

Root ball- refers to the roots of a plant grown in a container or wrapped in burlap

Sapwood- columns of tube-like cells that carry water from the roots to the leaves and store sugars and starch needed for tree growth and development; also called xylem

Serrate margin- notched, toothlike edge of a leaf

Simple- a leaf having only one blade and a bud at the base of the leaf

Single needles- the needles of a tree that are individually attached to the branch

Stomata- tiny holes on the bottom of the leaves that allow water, carbon dioxide gas, and oxygen gas to move in and out of the plant cells that make food (singular = stoma)

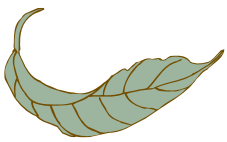
Synthetic- refers to something that is made by people and not by nature

Terminal bud- bud growing at the end of a branch or stem; can contain undeveloped leaves, stems, and sometimes flowers

Urban forest- the community of trees and related organisms occurring in cities and towns

Veneer- a thin sheet of wood that is peeled off a tree to make furniture

Xylem- columns of straw-like cells that carry water from the roots to the leaves and stores sugars and starch needed for tree growth and development; also called sapwood



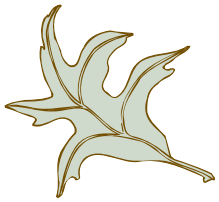
Tree Resources

A variety of resources can be found in your library, at your county extension office, and on the internet to help you explore Florida's Forests.

Field Guides

Field guides are essential to identifying trees. For a list of field guides, see page 22.

Websites



4-H Florida Forest Ecology — http://www.sfrc.ufl.edu/4h

American Forest and Paper Association — http://www.afandpa.org

Florida Division of Forestry — http:/www.fl-dof.com/

Florida Museum of Natural History — http://www.flmnh.ufl.edu/

Florida National Forests — http://www.fs.fed.us/recreation/forest_descr/fl_r8_florida.html

Florida State Forests — http://www.fl-dof.com/Fm/stforest/index.html

Florida State Parks — http:www.dep.state.fl.us/parks/

Florida Trails — http://www.state.fl.us/fwc/ — use Florida Trails button on the left

Forest Resources and Environmental Education — http://www.freenetwork.org/kids/index.cfm

Forest Trees of Florida — http://www.fl-dof.com/Pubs/trees/

Virginia Forestry Outreach Site — http://www.cnr.vt.edu/dendro/forsite/welcome.htm

Books

Here are a few books that include information and stories about trees.
Look for more interesting reading books in your library.

- *The Cay,* by Theodore Taylor, 1969
- *Eli's Song,* by Monte Killingsworth, 1991
- *The Fire Bug Connection,* by Jean Craighead George, 1993
- *A Forest is Reborn,* by James R. Newton, 1992
- *The Foxman,* by Gary Paulsen, 1977
- *Game of Survival,* by Dian Curtis Regan, 1989
- *Lostman's River,* by Cynthia DeFelice, 1994
- *The Moon of the Owls,* by Jean Craighead George, 1993
- *My Side of the Mountain,* by Jean Craighead George, 1959
- *On the Far Side of the Mountain,* by Jean Craighead George, 1990
- *Save my Rainforest,* by Monica Zak, 1992

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Trees and Me

Florida 4-H Project Book
Forest Resources Series Book 1

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