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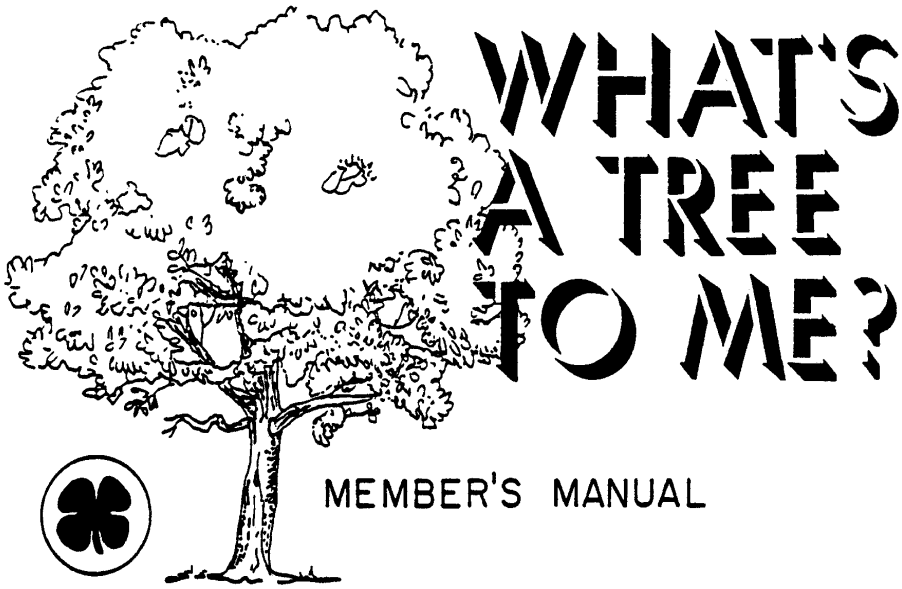
MEMBER'S MANUAL

4H FOM 10

WHAT'S A TREE TO ME?



ACKNOWLEDGMENTS

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Table of Contents

What's a Tree to Me? was developed to teach you more about trees - their importance, value, usefulness, and the pleasure they give. If you live in the city, the suburbs, or the country, trees are an important part of your life. What would your neighborhood be like without trees?

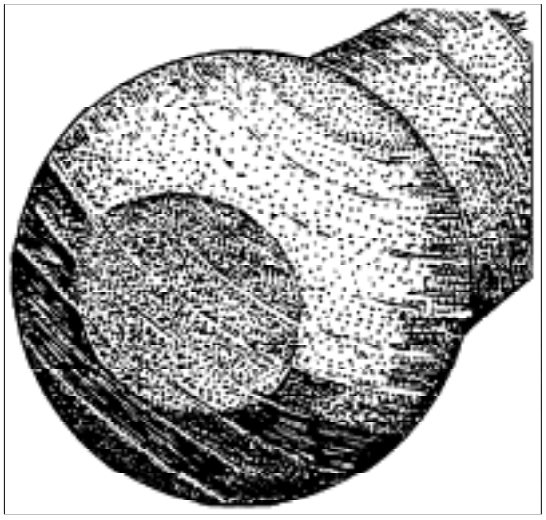
You will learn how trees grow, what trees do for people and the environment, and how you can help trees. There are many exciting activities and opportunities to invite guest speakers to your meetings. You can also learn about careers that deal with trees. The more effort you put into this project, the more benefits you will receive from it. Have a TREEmendous time!

Name:	Age:
County:	4-H Club:
Years in 4-H work:	School:
Leader's Name:	Do you live in the City?

BATTER UP!

Where do baseball bats come from? A store? A room in the school gym? A rack in the dug-out?

Baseball bats come from trees! Ash trees! Every year thousands of trees are cut to make baseball bats. Before they are cut, the trees grow. They produce wood - in layers. The layers show in everything made from wood. Even in baseball bats!



Look at a wooden bat. Look at the end of the handle. Can you see lines there? Do the lines look like those in the picture? Look at the lines closely. The light ones have little pits or pores in them. The pores make the wood soft. The soft wood grew when there was plenty of rain. Then the new growth had big, soft cells - a whole layer of them.

During the dry season there was less water for the tree. The layer of wood that grew had small, hard cells. They were darker. This layer did not have many pits or pores.

By fall the tree slowed its growing almost to a stop. All winter it just stood in the cold. Not dead, but not growing, either. It just stood dormant, without leaves.

The next wet season, it began to grow again. It grew a layer of soft wood with big cells. Then came dry weather and another layer of hard wood with small cells.

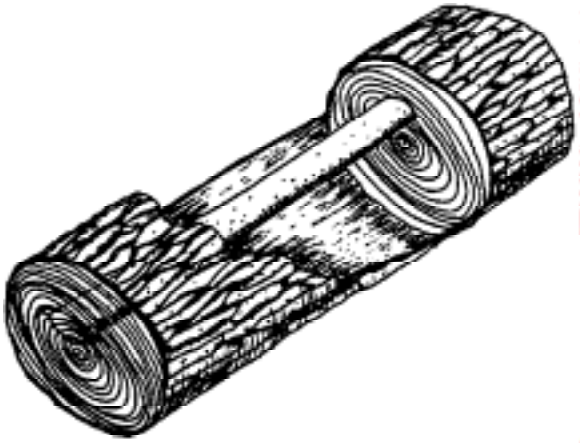
One year: a layer of soft wood, and a layer of hard wood. The year after, that: another layer of soft, and a layer of hard wood.

Year after year... soft, hard soft, hard... soft, hard... Look at the bat again. Can you mark one year of wood?

How many year's growth are there in the handle of the bat? Which took longer to grow - you or the wood in the handle?

Now look at the big end of the bat. How many years did it take to grow that end? How does that compare with your age? How long did it take to grow the whole piece of wood that made the bat? That's a long time! You can't grow a bat in a hurry! A lot of bats takes a lot of trees!

Often the lines (layers of wood) in the bat handles curves. They curve because they were curved in the tree. In the tree, the layers were in cylinders.



Look at your bat. Are the lines or layers curved? How big a cylinder did they come from?

Where do you think the center of the tree would have been? What makes you think so?

If the tree begins to grow at the center, how old would it have been when it grew your bat?

What would the diameter of the tree have been? Could it have been bigger than that? Why do you think so?

Record Section

Project Requirements

I. ANSWER THE FOLLOWING QUESTIONS

1) What kinds of trees are wooden bats made from?

_____

2) When does soft wood grow? What makes it soft?

_____

_____

_____

3) When does hard wood grow? What makes it hard?

_____

_____

_____

4) How old is the wood at the thinnest part of your bat or the demonstration bat?

_____

5) If a fast-growing tree has more hard wood than a slow-growing tree, is slow-grown wood or fast-grown best for bats?

_____

6) When the bat was growing, which end was up?

_____

7) What other sports equipment is made from wood?

_____

II. CHOOSE ONE OF THE FOLLOWING PROJECTS TO DO

1) Visit a wood products factory or store (furniture, sporting goods, sawmill, etc.). Look for annual rings in the wood products. Report the experience to your club, or write a report about the trip.

2) Call a local sporting goods representative or baseball player. Ask him or her to come talk with your club about wooden sports equipment.

III. WRITE A STORY ABOUT THIS PROJECT

Include what you learned, problems you had, and what was the most fun.

_____

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** ATTACH ADDITIONAL PAGES, IF NEEDED **

ON PINES AND NEEDLES

Suppose you drew a leaf of a tree. What would it look like?

This?  Or this?  Or this? 

Would you think to draw one that looks like this? 

It is a tree leaf too. It is the leaf of a ***pine tree***.

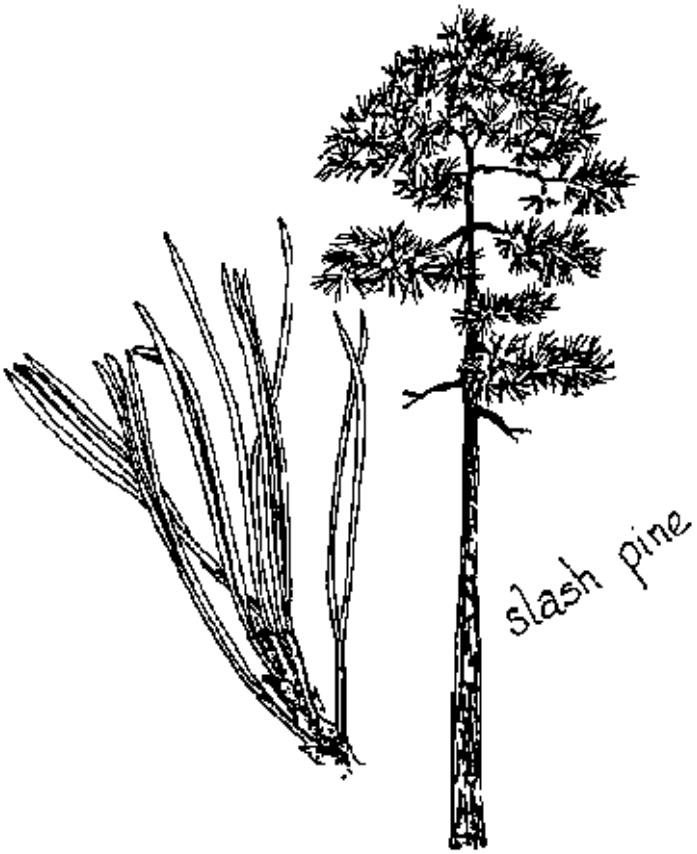
Pine trees have leaves, just as maple trees do. But their leaves are long and slender. They are called ***needles***.

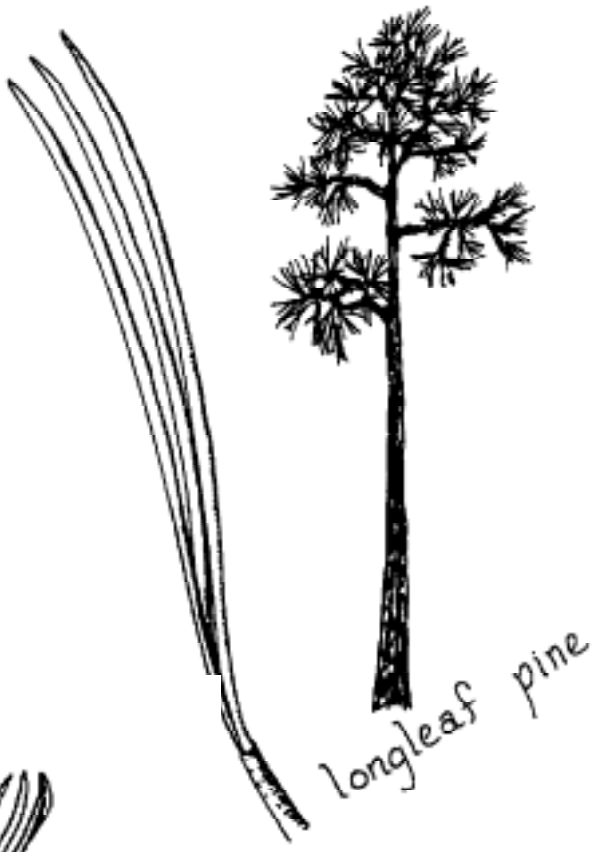
The needles of pine trees are always wrapped in bundles, or ***fascicles***. Look at the needles of a pine branch - closely. Can you see that each fascicle is wrapped at the base? Pick off one fascicle and count the needles in it. How many are there? Are there the same number in all the fascicles on that tree?

Some people call pines ***evergreens***. That is because they never seem to lose all their leaves (needles). They never get bare in winter as deciduous trees do.

EVERGREEN

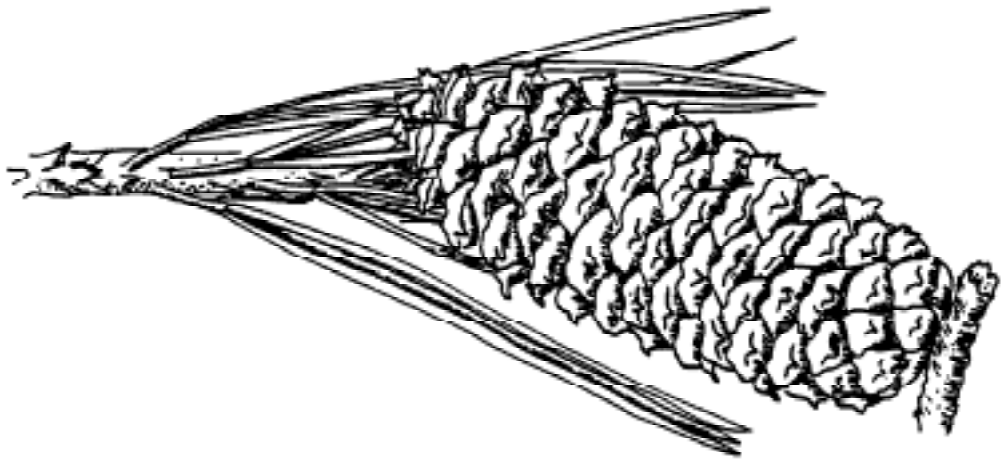
DECIDUOUS


slash pine


longleaf pine


loblolly pine

But there are always needles under a pine tree. Why? The secret is in the twigs. Look closely at the twigs of a pine tree...



Can you see that there are needles on the first or outermost part of the twig? (That is the part that grew this past year.) And can you see needles on the next section (that grew before)? But are there needles on the third section (that grew three years ago)?

Needles stay on pine twigs for two years, and then drop off. So a pine tree has last year's needles while it is growing this year's needles. That makes it look as if it never loses any. But the ground beneath a pine tree shows you that it does!

What do you think a deciduous tree would look like if its leaves stayed on for two years?

Not all trees that have needles are pines. Some trees with needles are not pines. But if they aren't pines, then their needles aren't in bundles, either; they grow *singly*. And the trees that aren't pines usually have shorter needles than pines. So it's wrong to call any tree with needles a "pine."

It might be

BALD CYPRESS

ATLANTIC WHITE CEDAR

SOUTHERN RED CEDAR

Or it might even be another kind. But there is something that almost all trees with needles have - cones.

BALD CYPRESS

LONGLEAF PINE

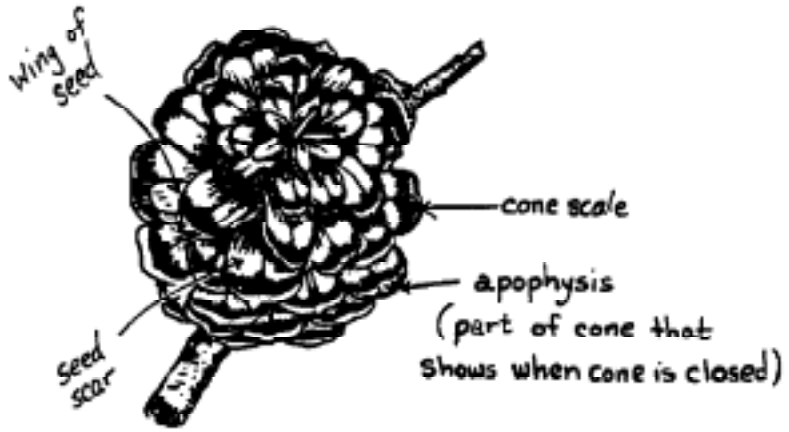
SPRUCE PINE

SAND PINE

Different kinds of trees have different cones. But on one tree, the cones are pretty much alike. Because most trees that have needles also have cones, they are called ***conifers***. That means "cone-bearing."

The seeds of conifers are formed between the scales of the cone. If you look down on the top of a scale, you may see where the seeds lie if they haven't dropped out. If they have fallen out, you will see a lighter area on the cone scale, which is the seed scar.

Conifers usually have a bud at the tip of the twig, with several more clustered around it. Each of these buds can become a branch. There is a new cluster of buds each year. So each year, on some conifers, there is a new ring of branches to mark where the buds were. You can often tell the approximate age of conifers by counting these **whorls** or rings of branches.



At Christmas time, look at some of the trees for sale. Can you pick out the pines (needles in fascicles)? The spruces (needles short, single, and prickly)? The firs (needles flat, not prickly, and just a spot where the needles drop off)?

Conifers include some of our most valuable trees -- for lumber, for paper, for wind breaks, for animal food and shelter, for beauty in forests, parks, and around homes. Try to find out the names of some conifers in your neighborhood.

The key on the next page will help. Start with number one. Read the first description on the left side of the page. If this description fits the tree you are looking at, read the directions on the same line on the rlght.slde of the page. Follow the directions. If the description does not fit the tree you are looking at, drop down to the next line in number one. In time, the key will give you a name instead of a number. But remember: the key works only for the trees listed on it. It won't work for other trees.

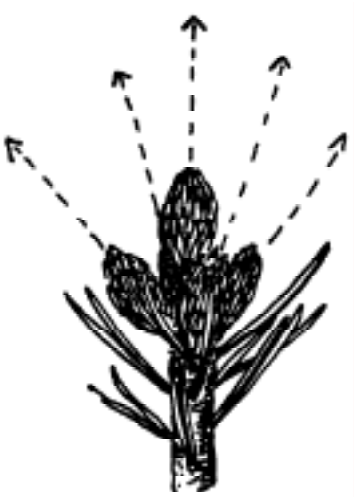


Table 1. Key to Some Common Florida Conifers

1	Leaves over 1.5" long, needle-like	go to step 2
	Leaves less than 1" long, linear or scale-like	go to step 8
2	Needles in clusters of 2, or in clusters of 2 and 3 on the same tree	go to step 3
	Needles in clusters of 3 or occasionally 3 and 4	go to step 6
3	Needles in clusters of 2	go to step 4
	Needles in clusters of 2 and 3	go to step 5
4	Cones 1" to 2" long; needles twisted; soil moist	spruce pine
	Cones 2" to 3.5" long; needles not twisted; soil dry	sand pine
5	Needles 3" to 5" long	shortleaf pine
	Needles 7" to 12" long	slash pine
6	Buds silvery white; needles 8" to 18" long	longleaf pine
	Buds reddish-brown; needles 4" to 10" long	go to step 8
7	Cones 2" to 3" long, nearly globular	pond pine
	Cones 3" to 6" long, conical	loblolly pine
8	Leaves deciduous, 3/8" or more long; cones 1" in diameter	go to step 9
	Leaves evergreen, less than 3/4" long; cones less than 1/2" in diameter	go to step 10
9	Leaves linear, spreading on twigs	bald cypress
	Leaves nearly scale-like, flat against the twigs	pond cypress
10	Cones woody, brown; foliage in flattened, fan-like sprays	Atlantic white-cedar
11	Cones berry-like, blue; foliage in rounded cord-like sprays	Southern red-cedar

* linear: several times longer than it is wide, usually with parallel sides

Key constructed by Larry Rabinowitz

Record Section

Project Requirements

I. ANSWER THE FOLLOWING QUESTIONS

1) What are the needles of a pine tree wrapped in?

_____

2) What is the difference between an evergreen tree and a deciduous tree?

_____

_____

_____

3) Define conifer.

_____

4) How long do needles stay on pine trees before they drop off?

_____

5) Where are the seeds of a conifer formed?

_____

_____

6) How do people use conifers?

_____

_____

_____

II. CHOOSE AT LEAST ONE OF THE FOLLOWING PROJECTS TO DO

1) Identify ***at least three*** different kinds of conifers in your town or city, using the key at the end of the chapter. Record where you found them and any distinguishing characteristics they have.

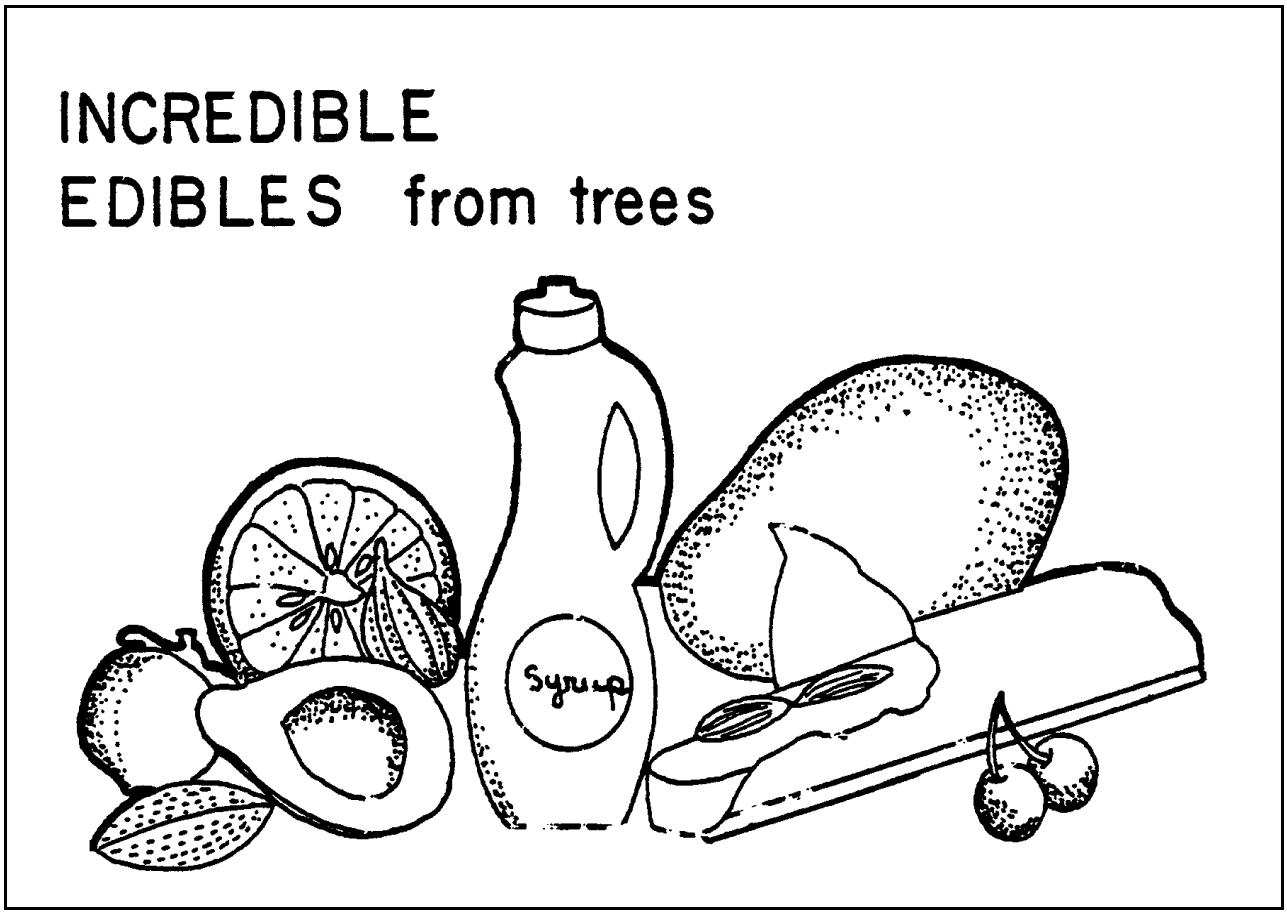
2) Collect cones from as many different conifers as you can find. Identify each tree you get a cone from. Arrange the cones in a bowl to be used as a centerpiece.

3) Make a conifer seed collection. Place the seeds in a small plastic bag, and staple the bag to a display board. Above each bag place a label with your name, the type of tree from which the seed was taken, where it was found, and the date it was found.

III. WRITE A STORY ABOUT YOUR PROJECT

Include what you learned, problems you had, and what was the most fun.

** ATTACH ADDITIONAL PAGES, IF NEEDED **



INCREDIBLE EDIBLES FROM TREES

Trees in a supermarket? Yes! Supermarkets are full of tree products. Boxes, bags, toothpicks, napkins, and paper towels are all wood or wood products. How many can you find?

And when you're hungry, it's nice to know that you can get food from trees too. Lots of incredible edibles come from trees!

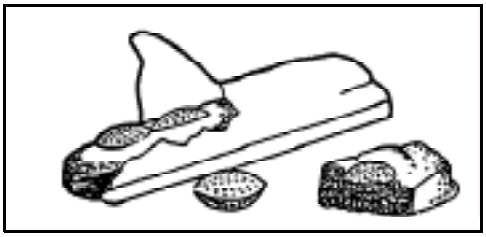
Sawdust soup? Tree-leaf salad? Bark brownies? What part of a tree do you eat most often?

Apples, oranges, mangoes, and many other fruits come from trees. You are eating part of a tree when you eat a tree-grown fruit. Many nuts come from trees. A nut is a type of fruit. Like all fruits, it comes from a flower. But most of us think a nut is so different from an apple that we don't think of it as a fruit.

Most fruit and nuts are easily recognized as tree parts because we eat them just as they are found. But the twigs, sap, leaves, flowers, bark and roots used to make incredible edibles are harder to spot. You probably eat lots of them, but not as they come from a tree. Instead, they are processed or changed in some way before you eat them.

Look at the picture of the candy bar. Or, better yet, get one like it, and examine it. Two kinds of fruit are used to make it - coconuts and almonds. Which is unprocessed? The processed nut is first shredded and then mixed with sugar and other things.

Coconuts and almonds aren't the only tree parts in the candy bar; there's another. Chocolate! Chocolate is processed from the seeds of the cacao tree.



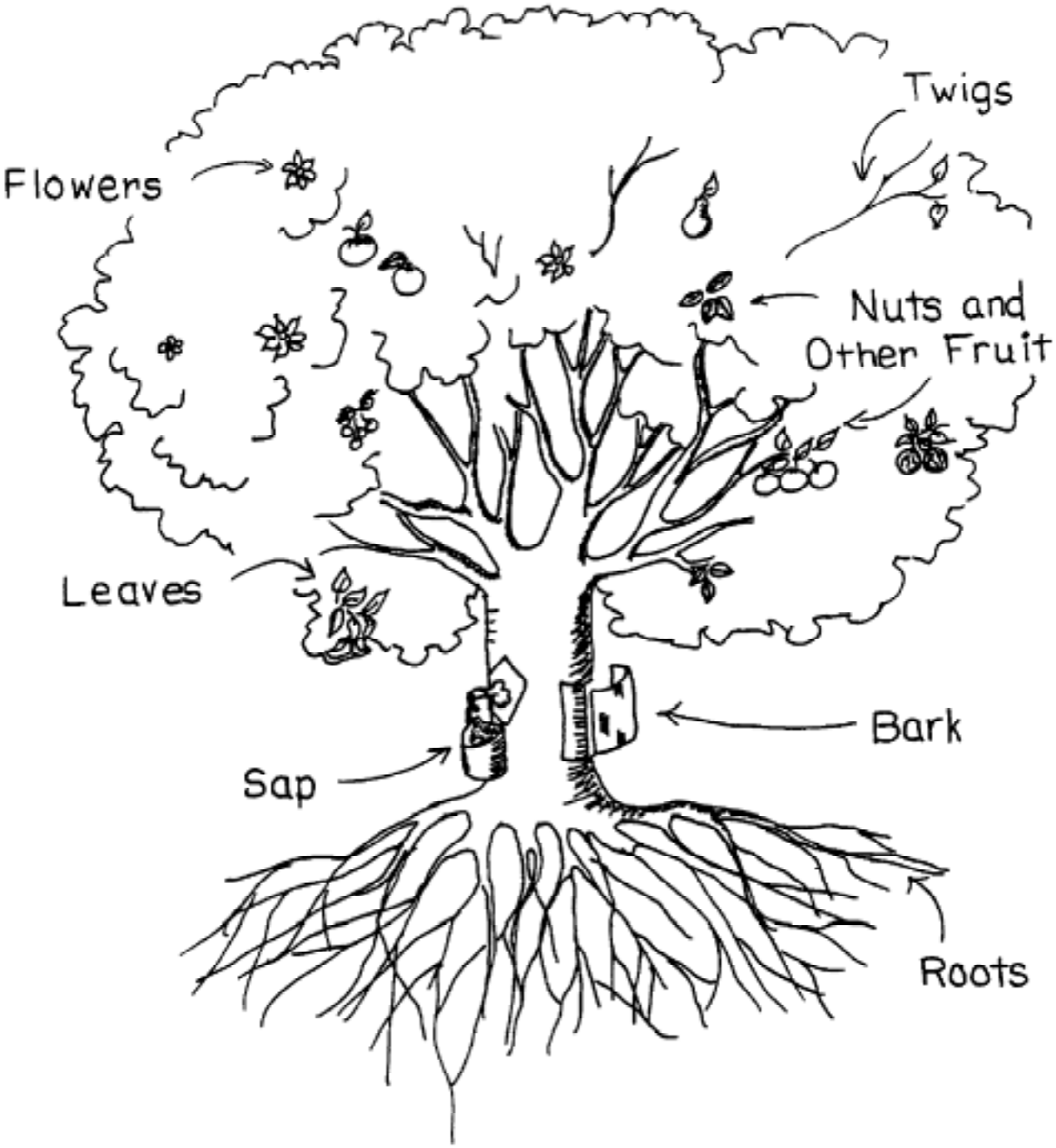
But remember - never eat a tree-fruit (or anything else) if you don't know it is edible!

Incredible edibles - list some others. A search through your kitchen cabinets, a trip to the supermarket, or a walk through the park or your backyard may give you some ideas. Here are four riddles that may help you:

A puzzler:

People obtain many benefits when they eat tree-fruit. Many tree-fruits are good to eat, and good for you. But ... do trees benefit because people eat their fruits? Have any good things happened to apple trees because people like apples? The life story of John Chapman may help you to answer this question. Who was John Chapman? His nickname was "Johnny Appleseed!"

The Incredible Edibles Tree



Record Section

Project Requirements

I. ANSWER THE FOLLOWING QUESTIONS

1) What are the edible parts of a tree? List them, and give an example of each.

I.	II.
III.	IV.
V.	VI.
VII.	VIII.

2) What is a nut?

_____

_____

3) Do some nuts come from trees? Give some examples.

_____

_____

4) What does the word "processed" mean?

_____

_____

II. CHOOSE TWO OF THE FOLLOWING PROJECTS TO DO

1) Make a large poster of the Incredible Edibles Tree. Present it to your club, and give some interesting examples.

2) Mount or draw a map of the world on poster board or thin plywood. Attach to the map lables or samples (in plastic) of products from trees. Be sure to show clearly which county each incredible edible comes from.

3) Make your own dried fruit! You'll need a wooden frame with screening nailed across the top. Slice some fruit (apples, pears, bananas, etc.) very thinly, sprinkle it lightly with sulfur, and place it on your drying frame. Allow the fruit to dry for two days. Bring some to your next club meeting.

4) List all of the incredible edibles from trees you have in your kitchen. Identify each item as a fruit, nut, twig, flower, leaf, sap, bark, or root.

5) Plant a fruit or nut tree in your yard. Ask someone at a local nursery which trees would be suitable for your area. Take slides of the different steps involved in planting a tree, and show them to your group.

6) Take a field trip to a local supermarket. See how many incredible edibles from trees you can find.

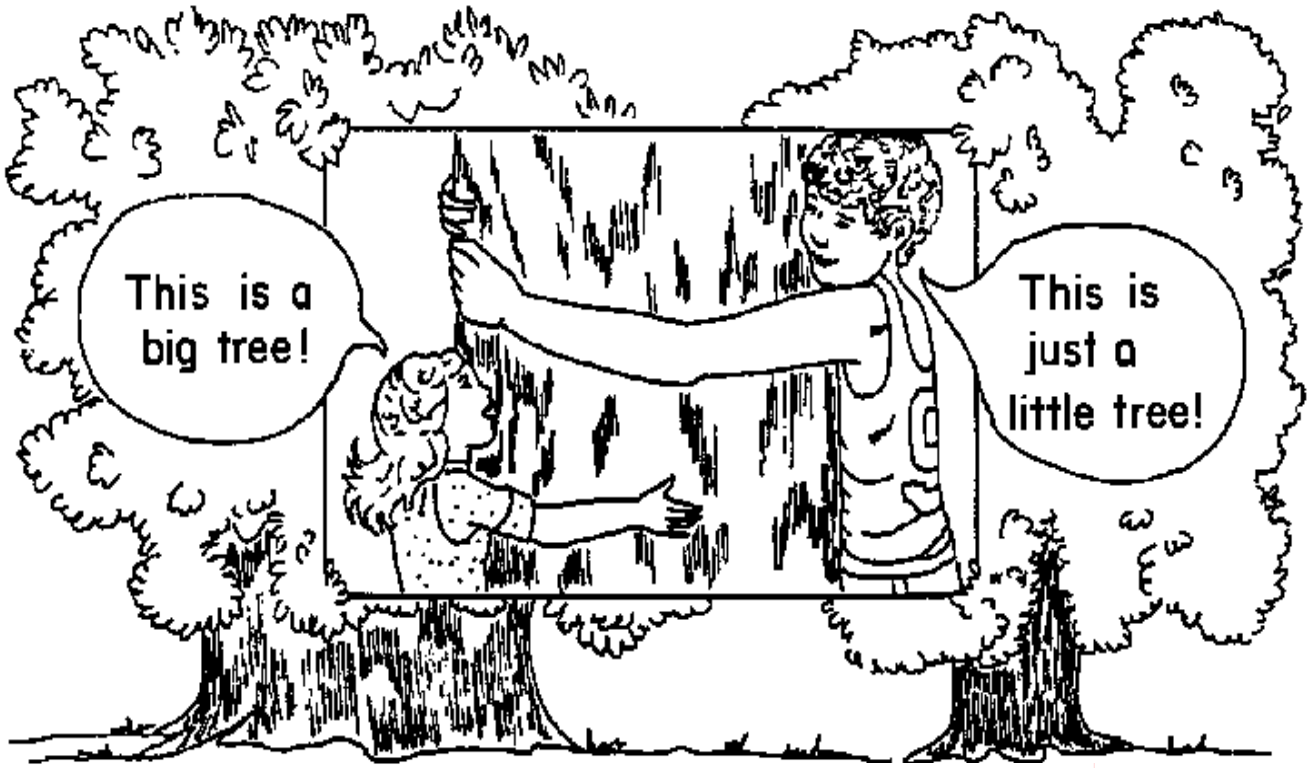
III. WRITE A STORY ABOUT YOUR PROJECTS

** ATTACH ADDITIONAL PAGES, IF NEEDED **

TREE MATHEMATICS

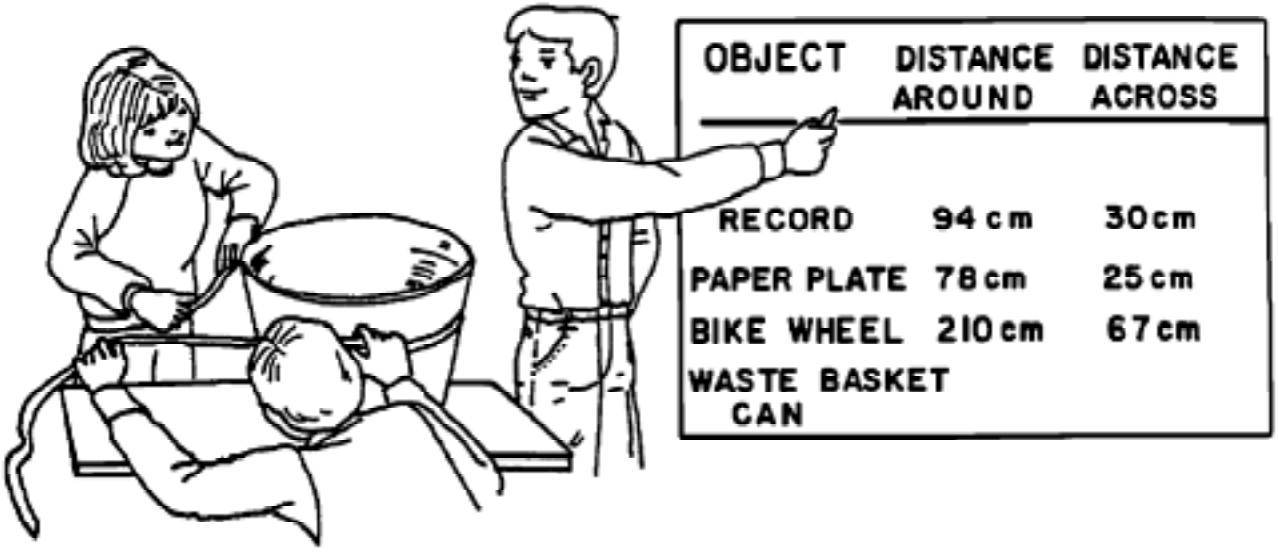
Have you ever seen the bumper sticker that says, "Have you hugged a tree today?" Suppose you did hug a tree. What could you find out from that? If your fingers just touched on the other side, how big around would the tree be? Try making as big a circle as you can by touching your fingers out in front of you. Have a partner measure how far it is around the inside of this circle. How does it compare with what you thought?

Some trees are too big to reach around. Some are small enough to reach around with one hand. But are hands a good way to measure? Why?



A ruler is much better for measuring. But only for certain things. It is not easy to measure round things with a ruler. It is better to use a tape.

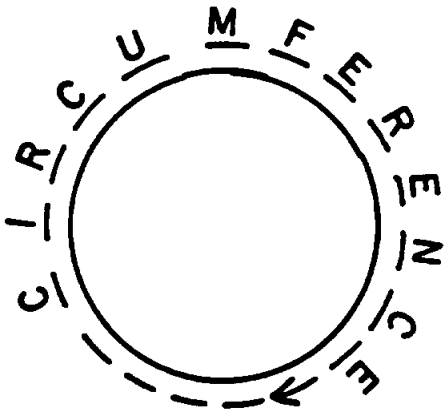
Look for some round things to measure. Try a record, a can, a wastebasket, a bicycle wheel, a paper plate, or a Frisbee. Use a tape to find out how far it is around each one. Then use a ruler or a tape to find out how far it is across each one. Keep a record. Try as many round things as you can.

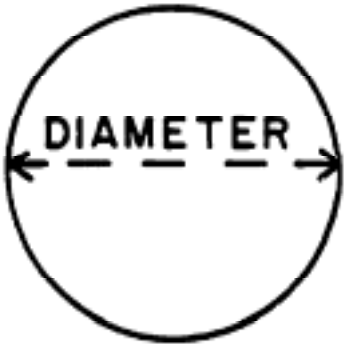


OBJECT	DISTANCE AROUND	DISTANCE ACROSS
RECORD	94 cm	30 cm
PAPER PLATE	78 cm	25 cm
BIKE WHEEL	210 cm	67 cm
WASTE BASKET CAN		

The distance around something is called ***circumference***. What is the circumference of a record? Do all records have the same circumference? Do all Frisbees have the same circumference? How about all trees?

The distance across a round object is called ***diameter***. What is the diameter of a coffee can? What is the diameter of a paper plate?

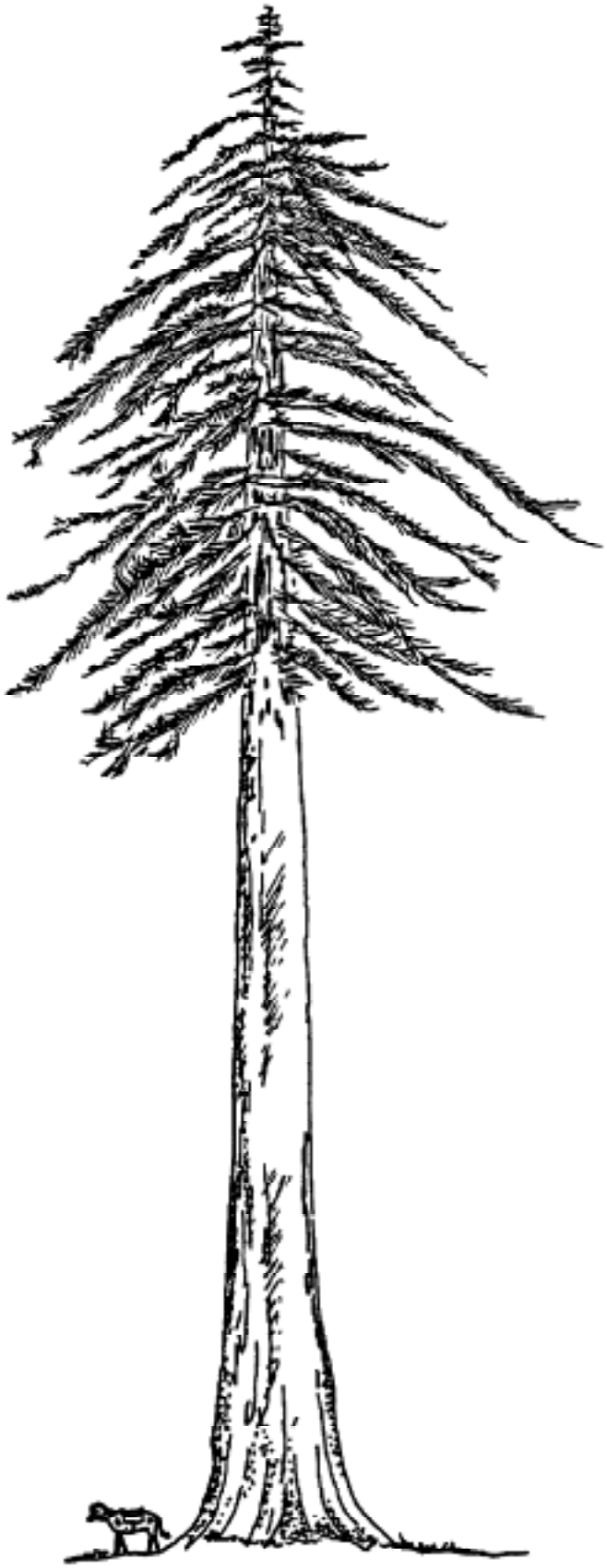




Now look at your record of circumference and diameter for different objects. In each case, about how many diameters would equal the circumference? How many times bigger is the circumference than the diameter? Or, what is the ratio of the circumference to the diameter? This ratio (3.14 or about 3) is called pi (pronounced "pie"). It is the same for all round objects. The symbol for this ratio is π, the greek letter. When you see this letter in a math fomula it always means 3.14.

Now suppose you wanted to measure the diameter of a tree. Could you tell what it was if you measured the circumference? Sure!

Try finding the diameter of some nearby trees. First, use a tape to find the circumference. Then, from your record of the ratio of circumference to diameter (or π), figure out the diameter of each tree. What is the diameter of the largest tree near you? What do you think is the diameter of the largest tree in the United States?



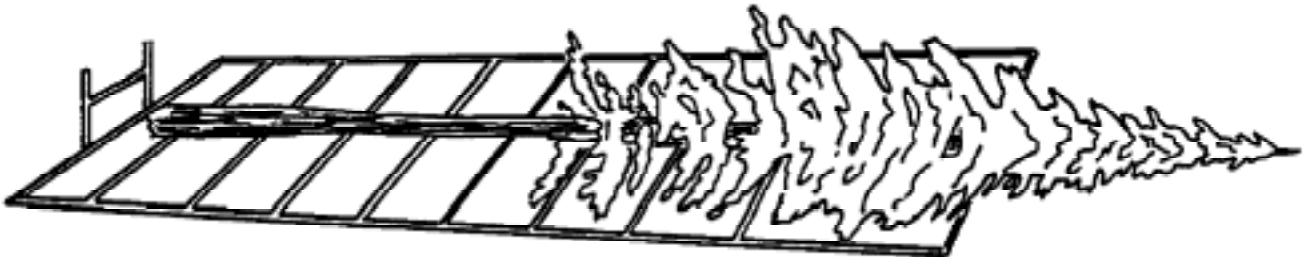
The giant sequoia is one of the largest trees in the United States. Its diameter is almost 10 meters (about 30 feet). From that diameter, what would its circumference be? How does that compare to the length of a classroom in your school?

How does the largest tree near you compare with the huge trees in the table below?

KIND OF TREE & LOCATION	DIAMETER
White oak near Philadelphia, 1675	2.5 meters (8 feet)
White pine New Hampshire, 1674	1.7 meters (5 feet)
Tuliptree Maryland, 1970	2 meters (6.5 feet)
American elm Connecticutt, 1950	4 meters (13.5 feet)
Eastern cottonwood New York, 1945	2 meters (6.5 feet)
Sugar pine California, 1955	3.1 meters (10.2 feet)
Douglas fir Washington, 1825	4.4 meters (14.5 feet)

Many of these large trees were cut years ago. Why do you suppose that near-record trees are seldom found today? Since the largest trees may take hundreds, or even a thousand years, to get that big, what chance would a tree have to live that long in a park, along a street, or in your yard?

The tallest tree ever measured in the United States was a Douglas Fir from Washington that was 124 meters high (385 feet)! That's longer than a football field!



Record Section

PROJECT REQUIREMENTS

I. ANSWER THE FOLLOWING QUESTIONS

1) What do the words "diameter" and "circumference" mean?

_____

_____

_____

_____

2) What is the ratio of the circumference of a circle to its diameter?

_____

3) List three of the largest types of trees found in the United States. Where are they found?

_____

_____

_____

4) How many feet equal a meter?

_____

II. CHOOSE ONE OF THE FOLLOWING PROJECTS TO DO

1) Find out what each instrument listed below measures on a tree and how to use it. Ask your city or county forester if he or she would be willing to help.

a) increment borer
b) calipers
c) DBH tape
d) relaskop
e) biltmore stick
f) clinometer

2) Demonstrate to your club the use of at least two of the instruments mentioned above.

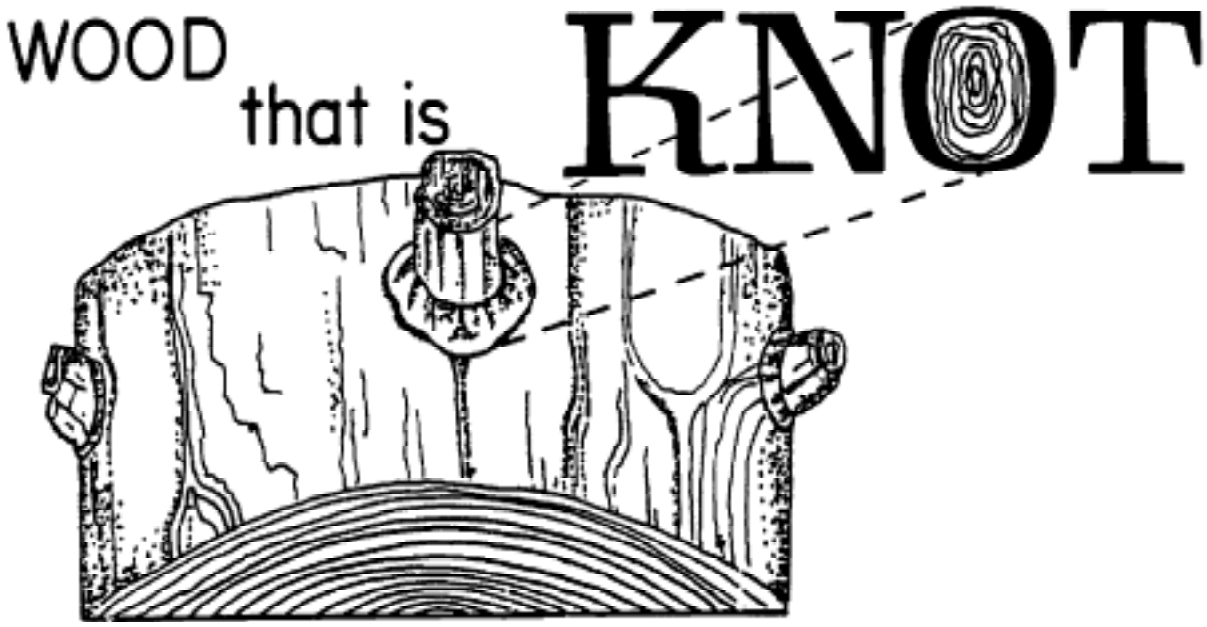
3) Take a core from a pine tree using an increment borer. Glue the core onto a piece of wood, and label each year's growth. Label your specimen with your name, the type of tree it was taken from,where the tree was found, and the age of the tree.

III. WRITE A STORY ABOUT YOUR PROJECT

Include what you learned, problems you had, and what was the most fun.

** ATTACH ADDITIONAL PAGES, IF NEEDED **

WOOD THAT IS KNOT



What makes a knot? Why are some knots tight and others loose? Why do some boards have knots and others not? Are knots good or bad to have in wood?

Long ago, there were many huge trees. Most were cut down for lumber. The board with a knot was not a good board. Some of the widest, cleanest boards were used for tables, floors, cupboards, boats, and even the sides of houses. Knot-free boards were easy to get. They were not expensive.

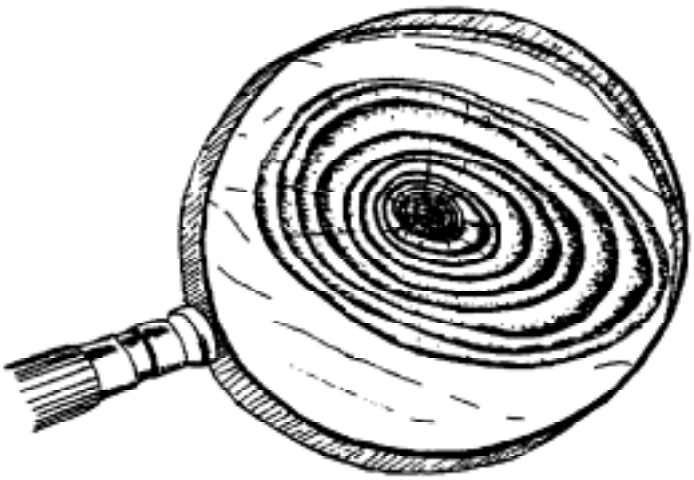
In time, most of the biggest trees were cut. Only smaller trees were left. The trunks were not so tall as on the giant trees. Often, the trunks had branches. When the trunks were sawed into lumber, the lumber had knots. Why?

When a tree with a branch is cut lengthwise, it looks like this:

Where the branch grows out, the "grain" (the direction of the layers) of the wood turns to one side. It continues out into the branch. The grain of the trunk is the grain of the branch, too. Whenever there is a branch on a tree, the grain of the trunk continues right out into the branch.

Boards cut from a tree that has branches often have knots. The knot is a cross-section (a cut across) of the branch. In a cross-section, the grain looks different from that in the main trunk.

When lumber is cut from a tree trunk where there is a living branch, there is a tight knot. Its wood is connected to the rest of the wood in the board. It is not easy to loosen this knot.



Look at a piece of wood that has a tight knot. Use a magnifier. Can you see that there are rings in the knot, something like the rings in a stump, or the rings in a baseball bat? These are the rings in a branch of the tree. The picture on the last page of this chapter shows how they were formed.

Imagine a very simple tree with one branch. The branch starts out as a single little shoot at the side. Each year another layer of wood grows around that of the previous year. Each year another layer. And another. But as the tree grows larger in diameter, it grows over and around the branch. That makes it harder and harder for the branch to grow larger too, there is just too much wood around it.

As the tree trunk gets larger in diameter, the new wood of the branch gets crowded. The rings are pushed closer together.

Sometimes, because of crowding and shading by the upper branches, the lower branches may die. But the tree trunk keeps growing out over the dead branch. As long as the dead branch stays on the tree, the trunk grows out around it. Each year, another layer. And another. And another.

When lumber is cut from a tree where the trunk grew around a dead limb, the knot is loose. Its wood is not connected to the rest of the wood in the board. Sometimes, the knot can be pushed out by a finger.

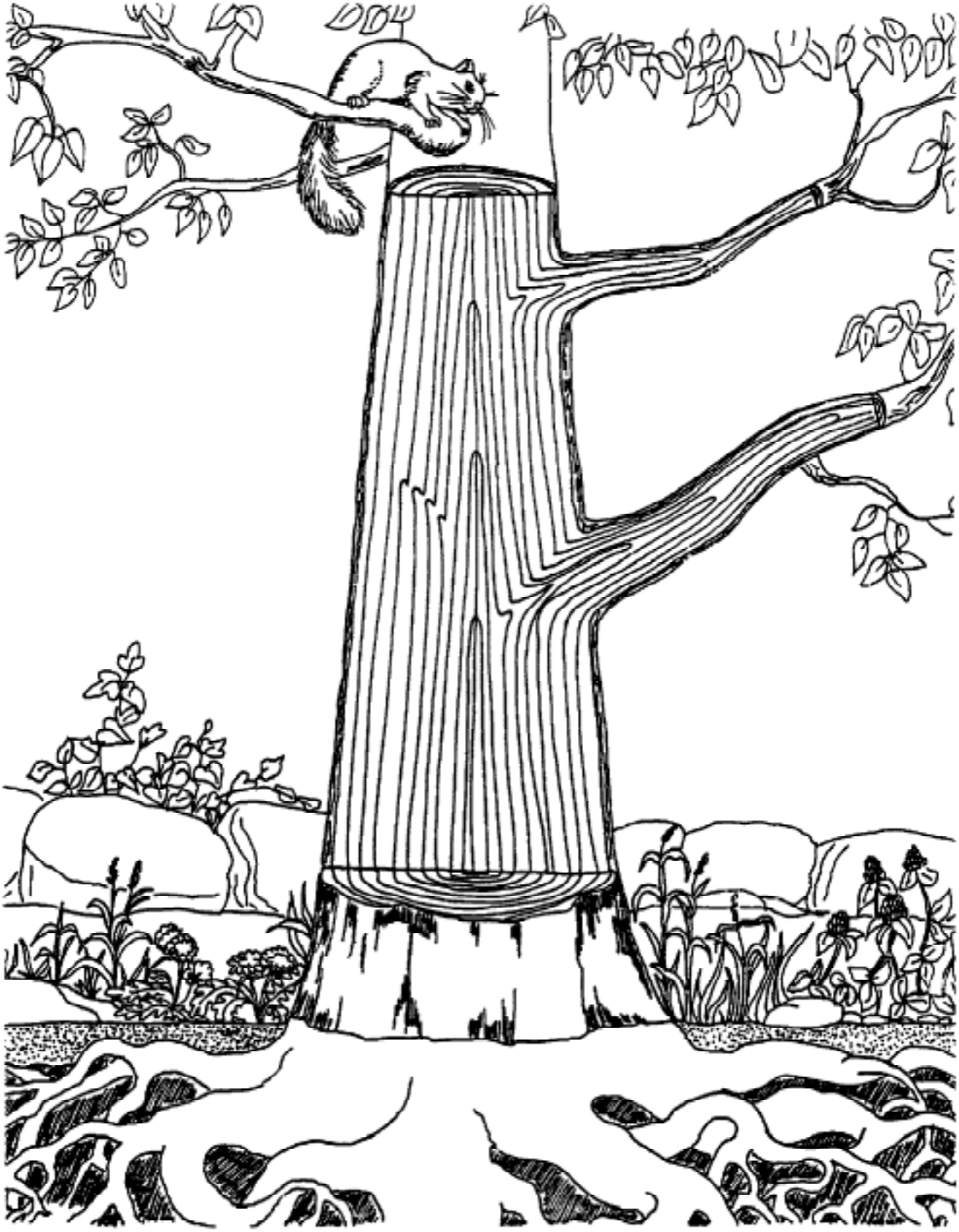
Often, trees grown close together shade the bottom branches, and these branches die. If they fall off soon after dying, they do not leave knots in the wood. But if they remain on the tree as it grows, they leave loose knots.

Because the wood in a knot is crowded by the tree trunk, it is usually very hard. Try to pound a nail into a knot. Then try to pound a nail into clear wood. Which is easier? Some knots are carved to make bowls for pipes. The wood in them is so hard that it lasts a long time, even with tobacco burning in it.

Look at the spacing of the growth rings in the knot and in the clear wood beside it. Where are the rings closer together? What are some other differences that you can see between clear wood and wood that is knot wood?

Once wood that had knots was considered poor quality. But in time, people began to think knots were attractive. Especially in wood used to panel rooms. Now knotty pine is prized wood for walls and furniture.

Something to think about... Swings often hang from tree limbs. As a tree grows, does the limb get higher above the ground? Must a swing be lengthened as the tree grows? Must a fence that is nailed to a tree be loosened and lowered from time to time? Or do limbs stay at the same height as a tree gets bigger and older? What about knots? Do they move up as the tree gets older, or do they stay in the same place?



Record Section

Project Requirements

I. ANSWER THE FOLLOWING QUESTIONS

1) What makes a knot?

_____

2) What is a knot?

_____

_____

3) Explain the difference between a tight knot and a loose knot.

_____

_____

_____

4) Why do the bottom branches of trees grown close together often die?

_____

_____

_____

5) Why is the wood in a knot usually very hard?

_____

_____

_____

6) The growth rings in a knot are closer together than the growth rings in the clear wood beside it.

True or False?

_____

II. CHOOSE ONE OF THE FOLLOWING PROJECTS TO DO

1) Make a poster similar to the drawing on the last page of the chapter. Using your poster, explain to your parents how a knot is made.

2) See how many wooden objects in your house have knots in them. Are they tight or loose knots?

III. WRITE A STORY ABOUT YOUR PROJECT

Include what you learned, problems you had, and what was the most fun.

** ATTACH ADDITIONAL PAGES, IF NEEDED **

E PLURIBUS UNUM

What can tell you the news, keep your cereal fresh, and get you a seat at the Super Bowl? Paper! Where does paper come from? TREES! The woody fibers found in tree trunks are the raw material paper comes from.

Look at the "tails" side of a U.S. coin. See where it says E PLURIBUS UNUM? That's the motto of the United States of America, written in Latin. It means "out of many, one." As individuals, each of us can do a lot of work, but when we work as a team, we can do much more. Many become one when individuals work as a team. If paper had a motto, it might be E PLURIBUS UNUM.

Paper From Fibers

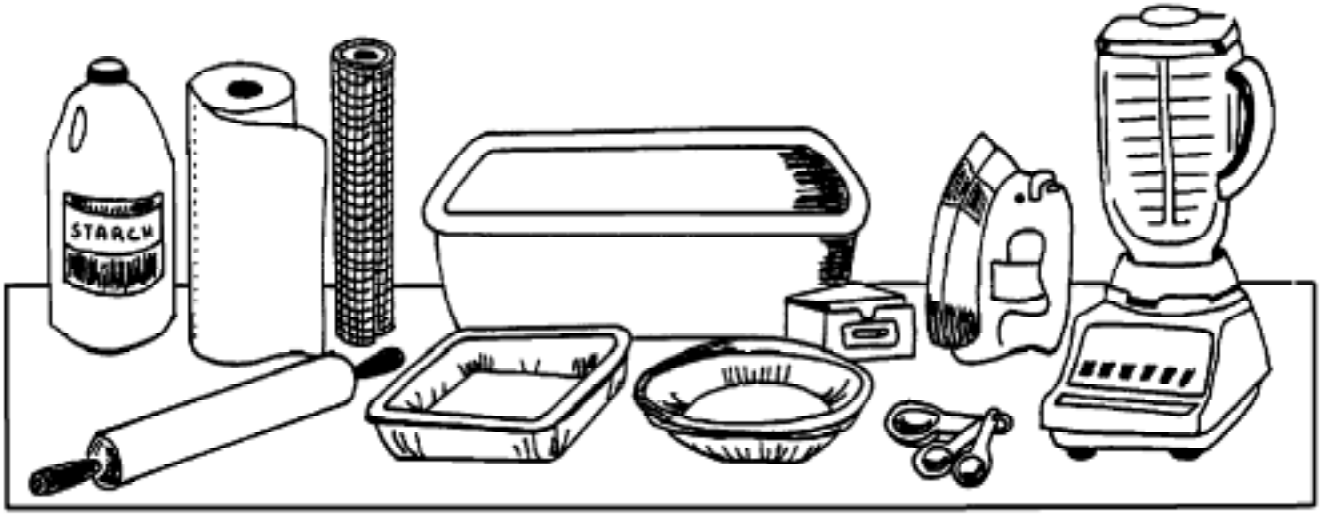
Tear a piece of paper in two. Look at the torn edge. Use a magnifier if you have one. What do you see?

The rough edge on a torn piece of paper Is made up of hair-like pieces called ***fibers***. These fibers were once part of a tree trunk that was chipped into pieces about as big as your thumbnail. These wood chips were mixed with chemicals and water in a large tank called a ***digester***. Here the chips were broken down into individual fibers like the fibers on the torn edge of a piece of paper.

The fibers, chemicals, and water in the digester made a soupy mixture called pulp. To make paper, the pulp was sprayed on a flat surface, pressed, and dried. From the many fibers in the pulp came one - one sheet of paper, E PLURIBUS UNUM.

You don't always have to cut down a tree to make paper. You can recycle or reuse it.

Recycle Your Own Paper!



Equipment and materials you will need:

1) Two aluminum roll or pie pans (aluminum is recyclable too). The small sizes (8" x 5" roll pans, or 10" pie pans) work well.

2) A piece of fine-mesh window screen, 12" x 12". Fiber-glass screen is best because it lies flat and is easy to cut. But wire screen will work.

3) A plastic or metal basin that will hold two gallons (8 quarts) of water.

4) Newspaper.

5) Two tablespoons of liquid laundry starch.

6) One box of paper clips.

7) One rolling pin.

8) One electric iron (treated with care, and cleaned after use).

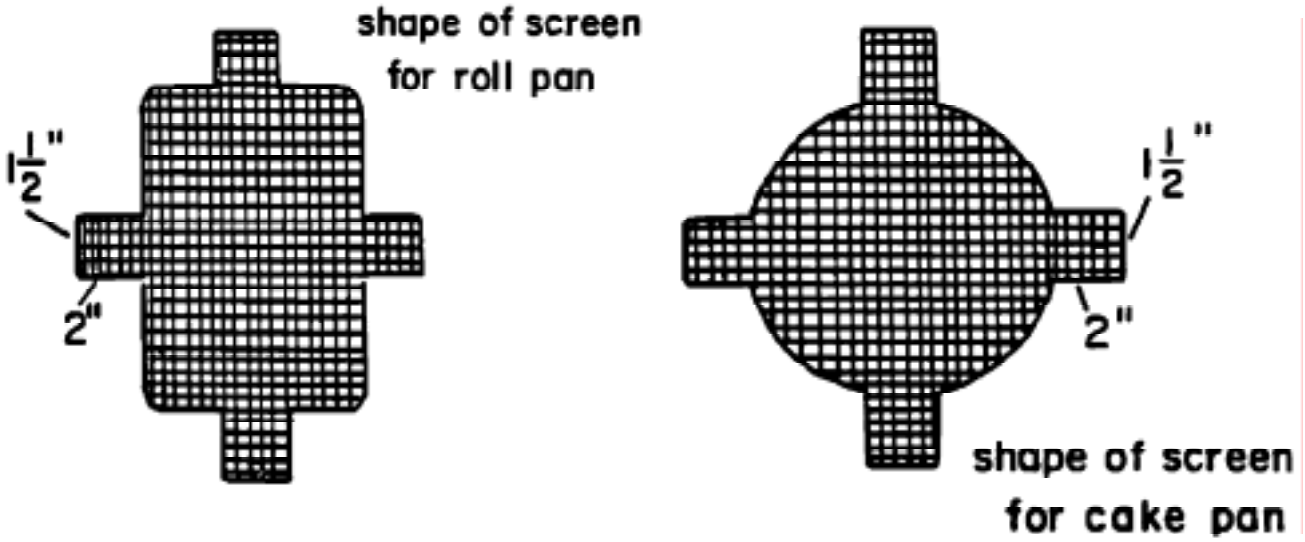
9) One electric blender (treated with care, and cleaned after use).

All set? O.K., follow these directions...

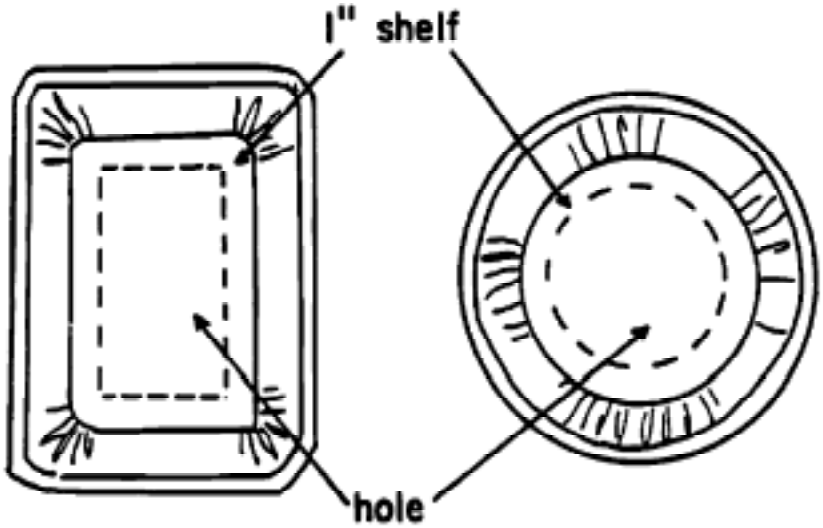
Paper-makers Use a Device Called a Deckle.

You can make a deckle by following these directions:

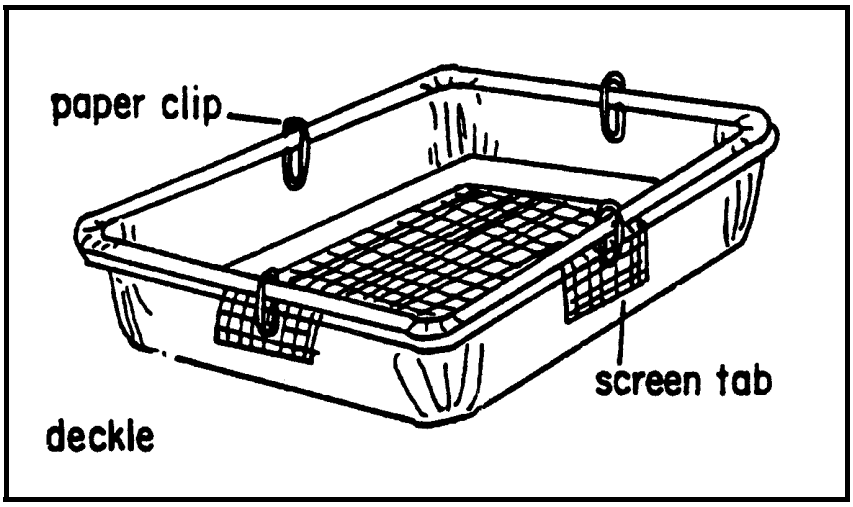
1) Cut a piece of screen which is the same size as the bottom of your pan, and has four tabs on it. To do this set the pan on the screen and draw a crayon line around the bottom edge. Remove the pan and draw four tabs on the outline. Check the pictures before you begin.



2) Cut a rectangular hole in the bottom of each roll pan. (If you are using pie pans, cut a round hole). Leave a "shelf" about one inch wide around the hole. The shelf will keep the screen from falling through the hole. Check the pictures before cutting.



3) Place the screen that you cut into one of the pans. Set the other pan in on top of the screen. Fold the screen tabs over the outside edge of the lower pan. Clip the pans together at the tabs, using a paper clip at each place. Now you have a deckle.



Preparing the Pulp

1) Tear one page of newspaper into pieces about the size of a dime. The newspaper will provide you with fibers. Do this six times so that you have six piles of torn paper. This will take a while, so work as a team. E PLURIBUS UNUM!

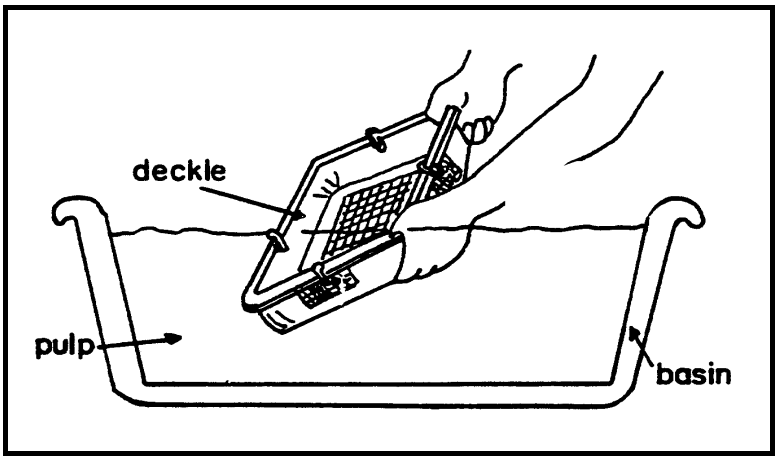
2) Fill the blender with water to one inch from the top. Add one pile of newspaper pieces. Blend at the highest speed until the newspaper pieces have broken down into fibers (about one minute). The mixture will look like cloudy water. Pour the mixture - or pulp - into the basin.

3) Repeat step 2 with the five piles you have left. If your blender holds one quart, you will have one and an half gallon of pulp when all the piles have been blended. Add two quarts of water to the pulp mixture to make two gallons. (If your blender holds less than a quart, add enough water to the pulp in the basin to make two gallons.)

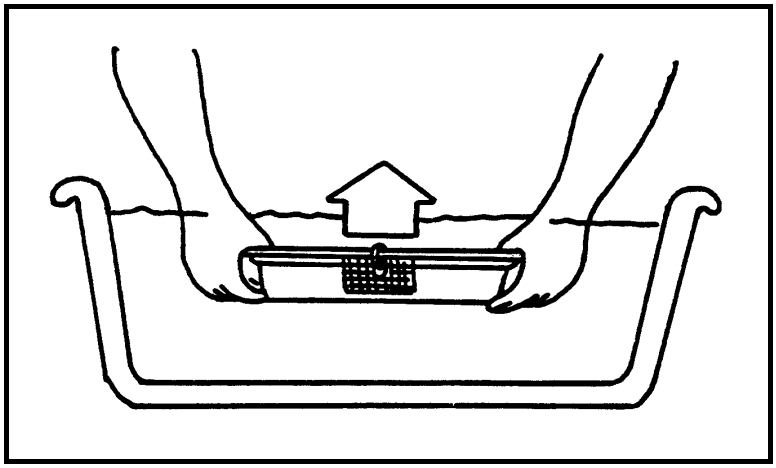
Making a Sheet of Paper

1) Add two tablespoons of liquid laundry starch to your pulp mixture and stir it with your hands. (The starch acts as a binder between the wood fibers suspended in the mixture.) How does it feel?

2) Now you are ready to make paper. 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 basin. When you have a uniform "cloud" of fibers floating over the screen, lift the deckle S-L-O-W-L-Y and evenly out of the basin.



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. (Remove the paper clips carefully to avoid disturbing the pulp sheet). Carefully remove the screen, with the pulp sheet on it, and place it on a fresh stack of newspapers.

5) The layer of pulp should be fairly solid now. Gently pat it dry with extra newspapers. When it is quite dry, peel the pulp sheet off the screen and "sandwich" it between fresh newspaper.

6) Roll a rolling pin over the pulp "sandwich" to remove any remaining water and to pack the fibers together. Do it again with fresh newspaper. (Dry and save the newspaper; it can be recycled).

7) Place the pulp sheet on a flat surface (a piece of wood or desk top) covered with several layers of newspaper. Then iron the sheet dry with an iron set at "rayon." Or, make a fresh "pulp sandwich" and place it between sheets of newspaper. Then leave it overnight.

8) When the pulp sheet is dry, you'll have lots of individual fibers working as a team in one piece of hand-made paper.

E PLURIBUS UNUM!

Clean up

Do not pour mixture into a sink; it will clog the drain. Filter the pulp mixture through a deckle. Remove the collected fibers from the screen and dispose of them In a wastebasket. When you are working with pulp at a sink, always keep the drain-strainer in place. E PLURIBUS UNUM!

Record Section

Project Requirements

I. ANSWER THE FOLLOWING QUESTIONS

1) What does E PLURIBUS UNUM mean?

_____

_____

2) How does E PLURIBUS UNUM relate to paper?

_____

_____

3) What is paper made of?

_____

4) Why is recycling important?

_____

_____

5) What else besides paper can we recycle?

_____

_____

II. CHOOSE ONE OF THE FOLLOWING PROJECTS TO DO

1) Start a newspaper recycling drive at your school or in your neighborhood.

2) Recycle magazines and paperback books by donating them to hospitals and convalescent homes.

3) Start an aluminum can collection club. Find a collection center and return the cans. You can make money this way!

4) Visit a recycling center. Write a report on what you saw.

5) Visit a paper mill. Set up a tour before you go.

III. WRITE A STORY ABOUT YOUR PROJECT

Include what you learned, problems you had, and what was the most fun.

** ATTACH ADDITIONAL PAGES, IF NEEDED **

STUMP DETECTIVE

What does a detective use to solve a mystery? He uses clues. Stump detectives use clues in tree stumps. These clues help them interpret what happened to the tree while it was alive. Be a stump detective! All you need is a stump and your eyes ... and brains!

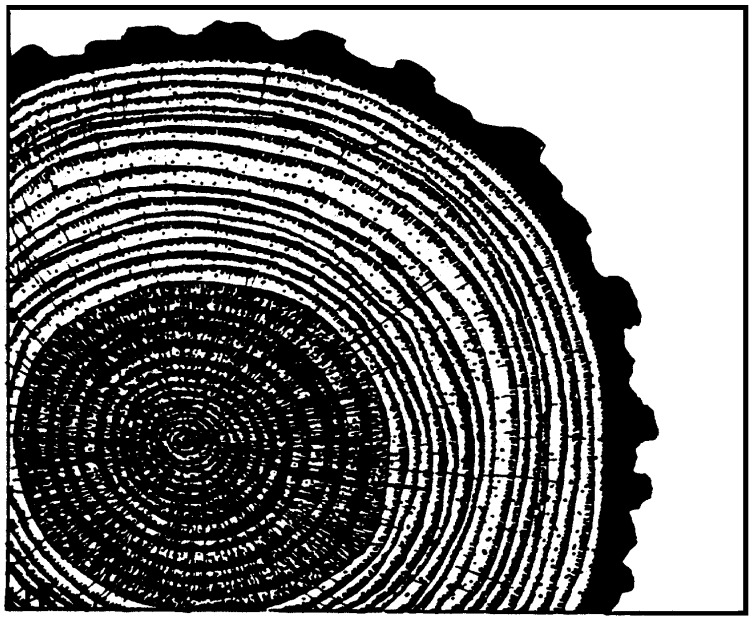
Look at some annual rings in a wooden object. They show how the tree grew. Each year the tree grew a new layer -- lighter in the wet season, darker in the dry season. Almost no growth occurred in the cold season.

How long did it take to grow one annual ring? How many annual rings does the object you're looking at have? How many years did it take to grow this much wood?

A very thin layer of cells that covers the whole tree just under the bark produces the annual growth rings. This thin layer is called the ***cambium***. It is so thin that you probably can't see it. All the wood in the tree grows from the cambium. What do you think would happen to the tree if someone cut through the cambium all the way around the tree?

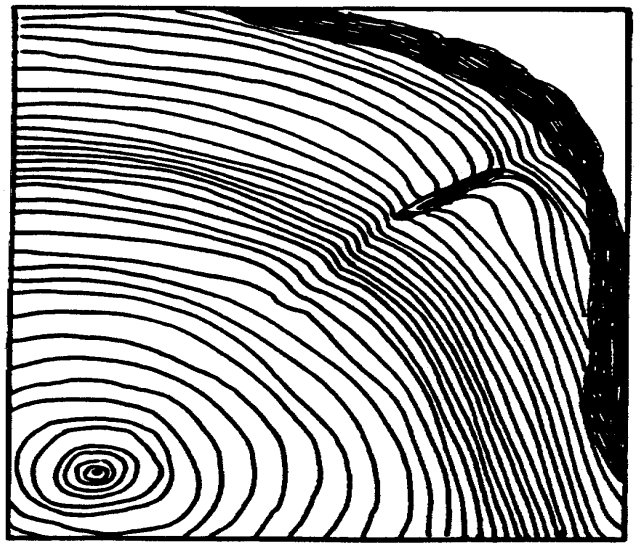
The outer, most recently made, part of a tree trunk is called the ***sapwood***. It is made of many tiny tubes that carry water from the roots to the leaves. As the sapwood gets older, these tubes get clogged. Then it is called ***heartwood***. Often the heartwood is darker in color than the sapwood.

Where are the heartwood and sapwood in this picture? About how old is the oldest part of the sapwood? What do you think would happen to this part of the sapwood if the tree kept growing?



A stump detective can learn a lot more about a tree than its age when it is cut. He or she can even learn what the weather was like when the tree was growing!

In one block of wood, are all the annual rings the same width? A wide ring means a lot of growth that year. A narrow ring means little growth. What might cause a tree to grow faster some years than others? Could it be from plenty of rain that year? Could a narrow ring mean not much rain?

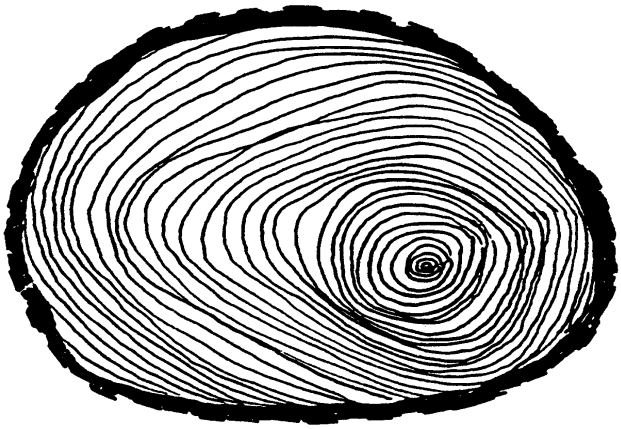


There are other reasons for trees to grow faster or slower, too. Would a tree grow faster or slower if:

- some of its roots are cut for a new sidewalk?
- a nearby tree is cut down?
- insects eat a lot of its leaves?
- people walk on its roots?
- it is dug up and moved to another place?
- a tall building goes up on its sunny side?
- people pull its leaves off as they walk by?

What else could happen to a tree to make it grow faster or slower?

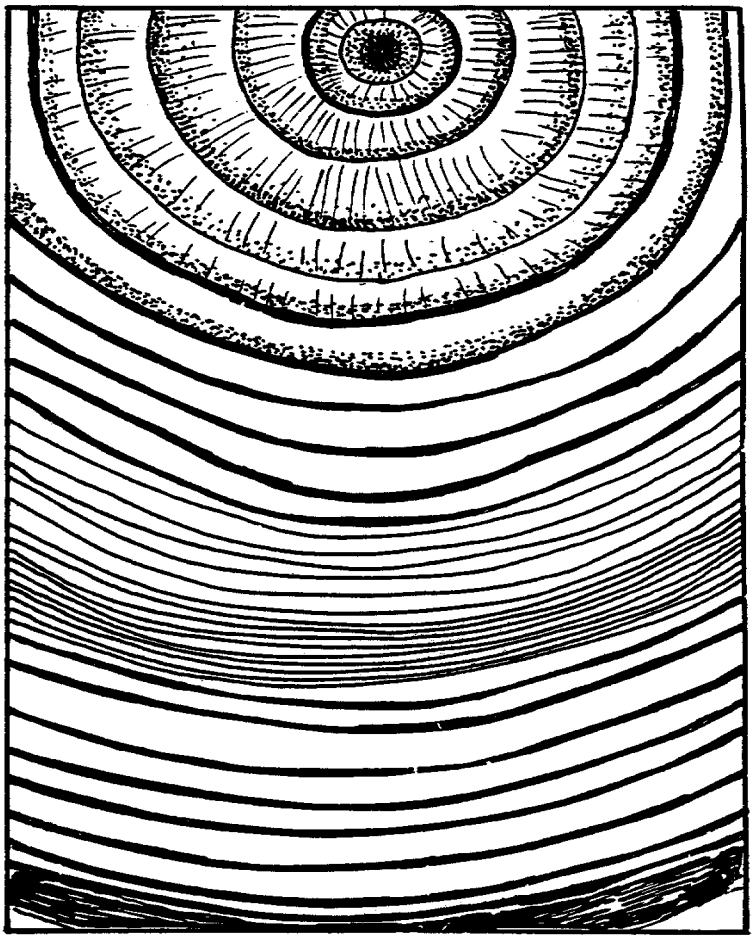
Some trees grow more on one side than the other, like this:



A Myster to Solve...

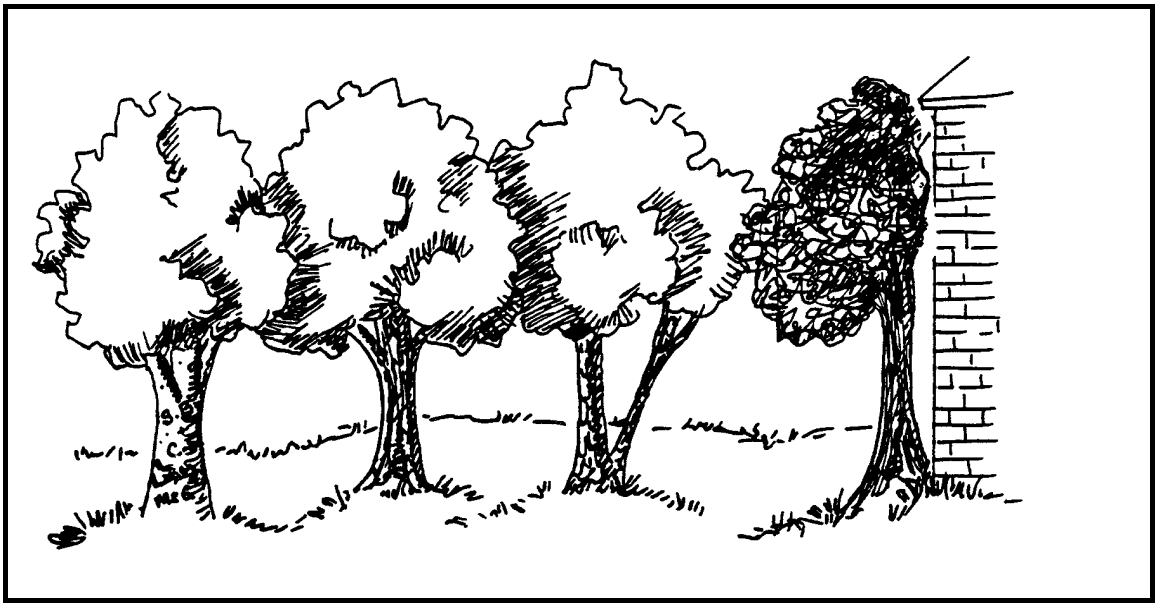
In a park, Maria and Jorge found a tree stump that looked like this:

Year	Rainfall (in centimeters)
1969	55
1970	58
1971	63
1972	65
1973	72
1974	88
1975	128
1976	120
1977	100
1978	127
1979	122
1980	98



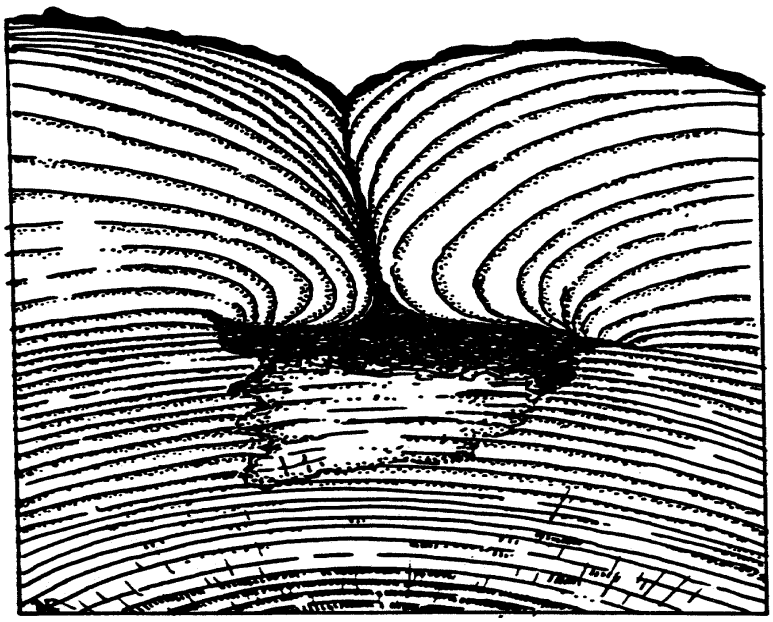
Maria said, "They must have cut this tree when they built the park in 1981." Jorge said, "I'll bet it was cut when they tore down that old building back in 1976." Who is right? How can you tell?

The chart showing the amount of rainfall in their city for the last 12 years should help.



Which of these trees do you think would grow more on one side than the other?

This tree is injured. What might have caused the injury? How old was the tree at the time? How many years did it take for the injury to heal all the way?



Project Requirements

I. ANSWER THE FOLLOWING QUESTIONS.

1) What is the cambium of a tree, and what does it do?

2) What are sapwood and heartwood, and how do they differ?

3) How are a tree's annual rings related to weather?

4) What are some things that could affect a tree's growth?

II. CHOOSE ONE OF THE FOLLOWING PROJECTS TO DO.

1) Be a stump detective. Find a stump, and try to determine where the youngest part of the stump is. Where is the oldest? Where is the heartwood? The sapwood? The cambium? Make a drawing of the stump. Label the heartwood and sapwood. Under your drawing, write the age of the tree when it was cut.

2) Conduct a tree survey in your neighborhood. Look for trees that have been damaged In some way. Record the kind of tree, where it was found, and the kind of damage. Could this damage have been avoided?

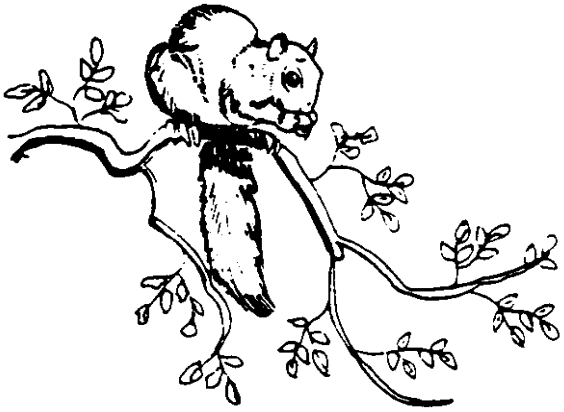
3) Take pictures of damaged trees. Mount the pictures on a piece of posterboard, and label each photo according to the type of damage. Bring your poster to the next club meeting.

III. WRITE A STORY ABOUT YOUR PROJECT.

Include what you learned, the problems you had, and what was the most fun.

*** ATTACH ADDITIONAL PAGES, IF NEEDED ***

WILDLIFE AROUND US



Have you ever seen a raccoon in your neighborhood? What about a mockingbird, a lizard, or a bee? I'm sure you've seen my friends and me somewhere in your city. I'm a squirrel. We are all animals. Some of our friends call us wildlife. Like you, we need food, water, shelter, and living space in order to survive.

You probably get your food from the grocery store, your water from a faucet, your shelter from your house, and your living space from your neighborhood and city. I get my food and shelter from trees. My water comes from puddles of rain, ponds, and birdbaths. And my living space is the city park or that clump of trees in your backyard. The combination of food, water, shelter, and living space is called ***habitat***.

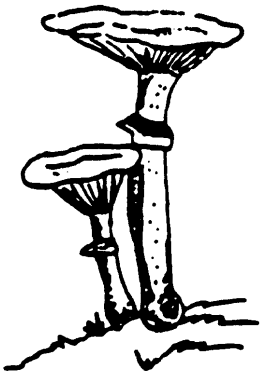
Do you like seeing my friends and me in your neighborhood? You and I are both part of nature. We depend on each other, just as all living things depend on or are related to one another.

How are all living things related to one another? Let's start with the sun. The energy from the sun is transferred to plants by a process called ***photosynthesis***. Plants are called ***producers*** because they can produce their own energy from the sun. This energy may be consumed or eaten by animals called ***herbivores***. They eat only plants. Other animals consume only animals (meat). They are ***carnivores***. Carnivores which hunt and eat living animals are ***predators***. Those which feed on dead animals are ***scavengers***. Some may consume both plants and animals. The animals in this group are called ***omnivores***. All these animals - herbivores, carnivores, and omnivores - are called ***consumers***. They depend on plants and each other to survive.

Another group of organisms, usually bacteria (one-celled microscopic organisms) and fungi, are called ***decomposers***. These organisms break down dead plants and animals into simple substances such as water and matter. These substances are then recycled (reused) by plants and animals.

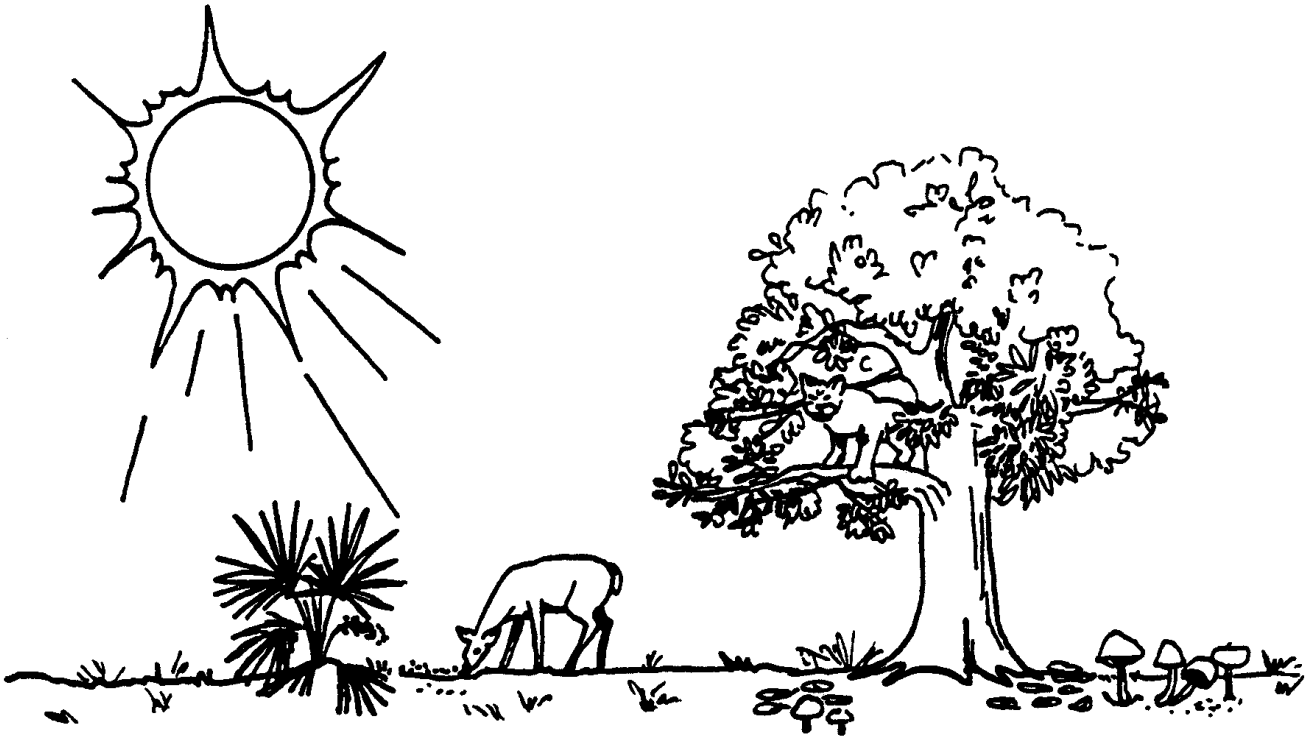
PRODUCER

CONSUMER



DECOMPOSER

The producers, consumers, and decomposers are all connected by a food chain. The first step in the food chain starts with green plants trapping energy from the sun. Herbivores and/or omnivores eat the plants; this is the second step. The third step involves carnivores and/or omnivores eating herbivores. And the fourth step consists of decomposers breaking down dead organic matter from plants and animals. This organic matter provides various nutrients used by green plants. At each step in the food chain, a lot of energy is lost. Energy flows through the chain.

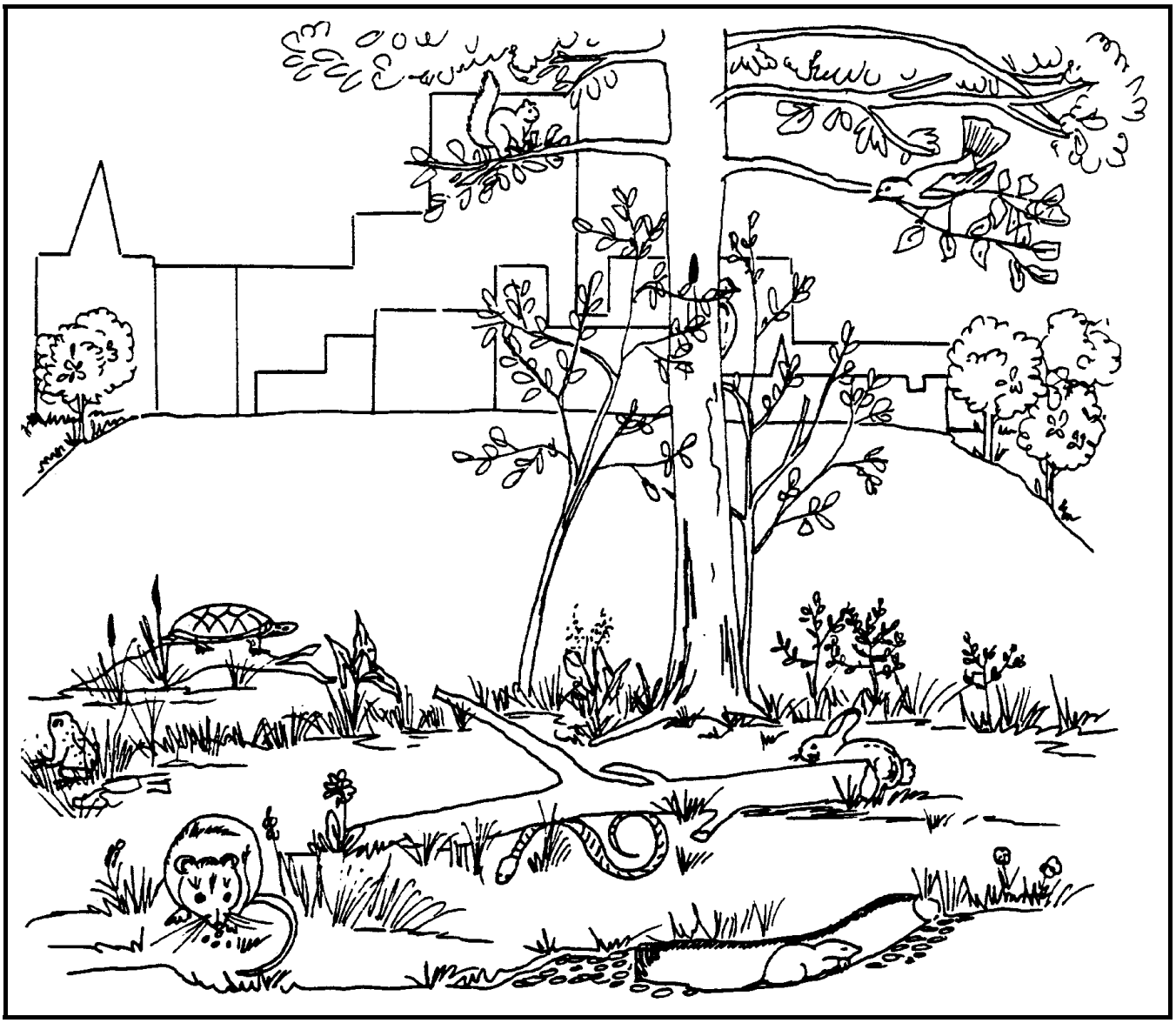


Now you can see how all living things are interconnected. Take me for example, I eat hickory nuts, beechnuts, and acorns which all come from trees (producers). That makes me an herbivore. And I make my den in old trees. So, I depend on trees a lot! In turn, I bury nuts, and those that I forget or can't find begin to grow into trees.

When my friends and I can't find suitable habitat conditions, it causes all sorts of problems for us. If food, water, shelter, and living space are scarce, sometimes we can't survive. Or we may have to move to a better habitat. Or competition among us grows, and we fight for the scarce resources. We my not be able to raise our young, or we may be eaten by a fox. In that case, the decomposers break down the organic matter that the fox did not eat. This provides nutrients for green plants.

Do you think a vacant lot covered with trash and weeds could support many different kinds of wildlife? How about a city park with lots of trees, shrubs, and a pond? I think the park could support more wildlife. ***Carrying capacity*** describes the number of healthy plants and animals that a habitat can support or "carry" at one time. The amount of food, water, shelter, and living space usually determine a habitat's carrying capacity.

You can find many different kinds of animals in the city.

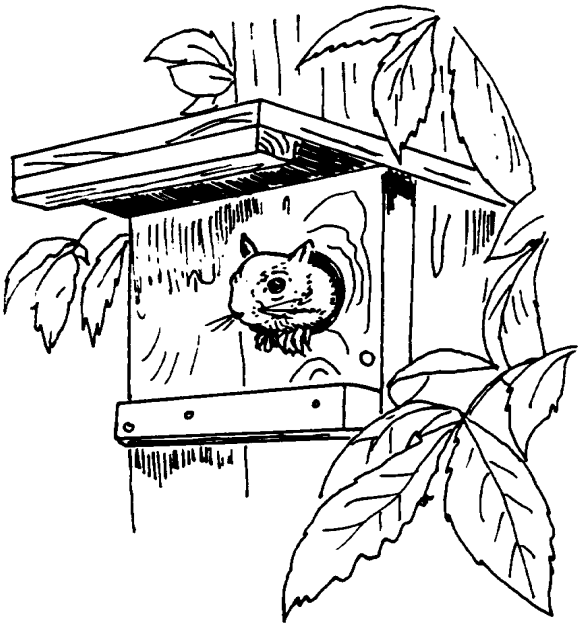


My friends the raccoons, opossums, rabbits, field mice, and I are all mammals. We have backbones and fur and hair and feed our young milk. You are a mammal too, so you can see that many mammals are found in the city. Birds, such as sparrows, doves, woodpeckers, cardinals, bluejays, and mockingbirds also like the city. Did you know that the mockingbird is the state bird of Florida?

You also can find reptiles, such as snakes, lizards, and turtles in the city. Do you think spiders, insects, frogs, and fish are animals too? They are.

Each living thing has a job or role in the community. Your parents have their jobs, and your job is to go to school and help around your home. A plant or animal's role within its community is called its ***niche*** (pronounced "nitch").

All the animals I have mentioned so far have adapted to city and country life. Adapting is the process of changing over time to become better suited to one's surroundings. You can help the animals in your city. Remember animals need food, water, shelter, and living space. What can you do to help provide these necessities?



Project Requirements

I. ANSWER THE FOLLOWING QUESTIONS.

1) What do animals need to survive?

_____

_____

2) Define habitat.

_____

_____

3) By what process is energy from the sun transferred to plants?

_____

4) Why are plants called producers?

_____

_____

5) Define herbivore.

_____

6) What are animals that only consume other animals called?

_____

7) What is an omnivore?

_____

8) What do decomposers do?

_____

_____

9) How are producers, consumers, and decomposers connected?

_____

_____

_____

_____

10) Energy flows and nutrients cycle. How is this demonstrated in an ecosystem?

_____

_____

11) What is carrying capacity?

_____

_____

_____

12) What Is a plant or animal's role in its community called?

_____

_____

II. CHOOSE ONE OF THE FOLLOWING PROJECTS TO DO.

1) Make a poster or model of a food chain, and explain it to your club.

2) Make an all natural bird feeder. All you need is a large pine cone, some string, peanut butter, and bird seed.

Fill the pine cone with peanut butter. Then roll It In bird seed. Hang your bird feeder from a tree with some string. Be sure to keep a "stuffed" pine cone up all winter. The birds are relying on ***you***. When it gets warmer stop your feeding program. The birds will be able to find their own food. But they'll be back next winter!

3) Make a birdbath. You don't need anything fancy. An old trash can lid or an old tire cut in half will do. You also will need some tie wire or nylon rope, wire cutters, a drill, and a hacksaw.

Drill three sets of holes around the lip of your container. At each site drill two holes an inch apart from each other and one-half inch from the container's edge. Find a low branch on a tree. Run the wire or rope through each set of holes and around the tree limb. Twist the wire ends tightly. If you use wire to hang your bird bath, be sure to remove the bath occasionally and loosen the wire to prevent damage to the tree.

Now fill the container with two and one-half inches of water. Maintain the bath by keeping a water supply available and cleaning it inside to prevent algae build up.

4) You can provide food, shelter, and living space by planting some shrubs and trees in your yard or in a vacant lot.

First, you must get permission from the owner of the property. Then, you should find out which plants provide food for wildlife. Elderberries and pokeberries are native species that attract wildlife. Pyracantha is an exotic that many birds feed on. Oak, holly, dogwood, hawthorn, wax myrtle, red-cedar, and redbud trees also are good wildlife food sources.

5) Identify ten birds that you have seen in your neighborhood. Study their feeding habits. Fill in the following table.

Neighborhood Bird/Food Chart
1.
2.
3.
4.
5.
6.
7.

III. WRITE A STORY ABOUT YOUR PROJECT.

Include what you learned, what problems you had, and what was the most fun.

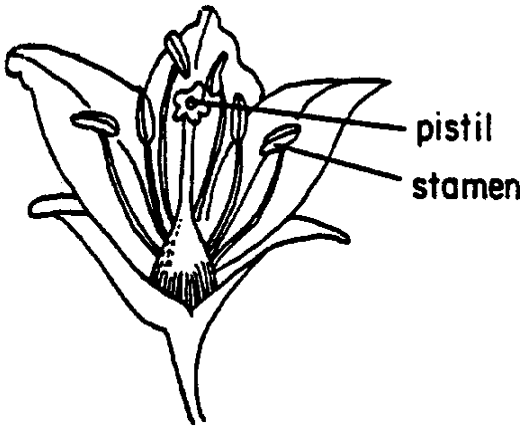
** ATTACH ADDITIONAL PAGES, IF NEEDED **

GREAT OAKS FROM LITTLE ACORNS

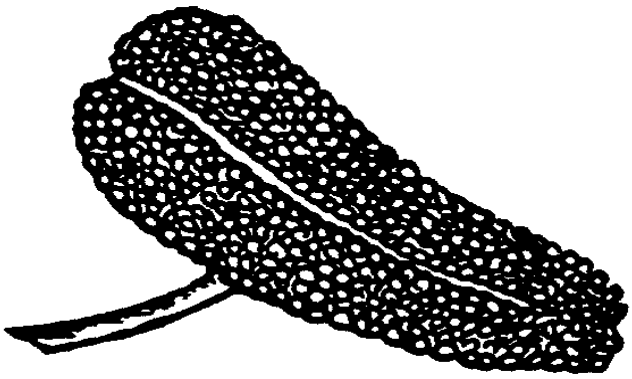
When you see the word "seed" what do you think of? What are some kinds of seeds that you know? Have you ever seen the inside of a seed? How do you think a seed comes to be, anyway?

Seeds begin as flowers. Did you know that Florida means "abounding in flowers"? Look carefully at a flower such as an Easter lily. Inside the petals are both male and female flower parts. Right in the center is a ***pistil***, the female part of the flower. It is inside the pistil that seeds grow. But they cannot form until ***pollen*** from the ***stamens*** gets to the pistil. Can you think of some ways that the pollen can get to the pistil? Look for the stamens that grow around the pistils. They resemble white pins with long heads.

Take apart one of your flowers. First, pick off or cut off all the petal-like parts. Leave only the stamens and the pistil. Now look at the top of a stamen, using a magnifier. What does it look like?

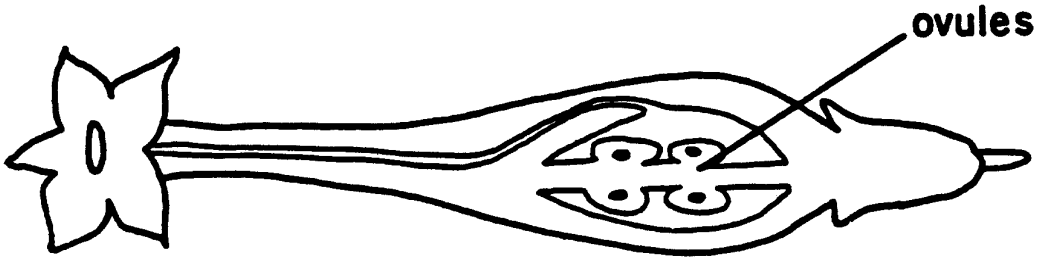


Can you see some tiny yellow"dust" on the stamen? Each piece of dust, called a ***pollen grain***, is half of what is needed to start a seed.

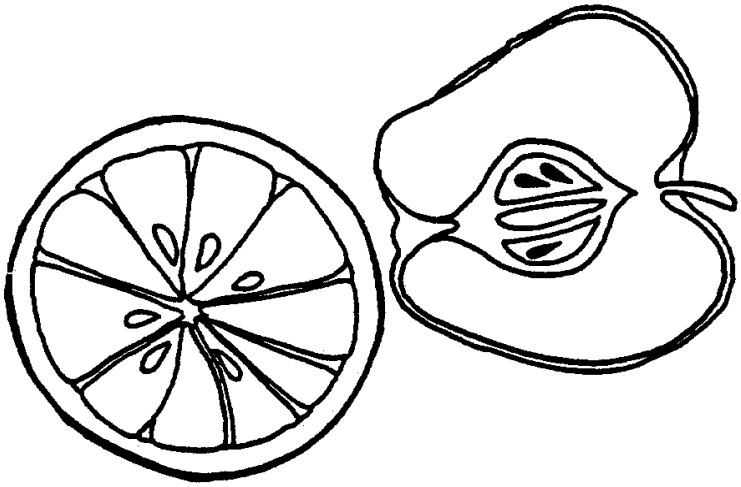


Usually insects or wind help to transfer pollen from the stamen to the pistil. The top of the pistil is a bit sticky. When pollen of the right kind lands on the pistil, each pollen grain sends a microscopic tube down through the pistil to an ***ovule*** Inside the base. In the ovule is the other half of what is needed for a seed.

If you sliced through the ***ovary*** in the base of the pistil in your flower, the inside would look this --



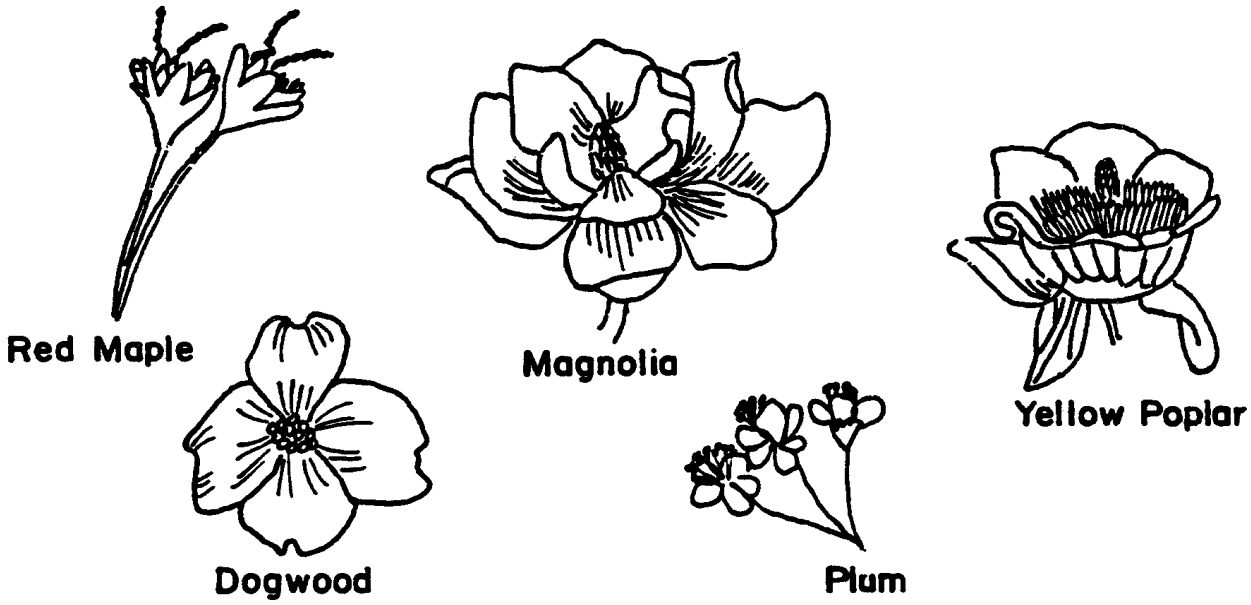
One of the tiny seed-like structures is an ovule. When the microscopic tube from a pollen grain grows down the pistil to an ovule, a sperm given off by the pollen grain joins with the egg in the ovule. It is then that a seed gets started.



The ovules of different plants make seeds that look different. In an apple, the outer covering of each ovule becomes hard and brown. An apple seed is brown. In an orange, the outer covering of each ovule stays white, so an orange seed is white. What color is the seed of a cucumber? A hickory nut? A lima bean?

When the seed begins to grow in the ovary, the ovary changes too. In a cucumber plant, the ovary becomes big and juicy, with a green covering. When you eat a cucumber, you eat the ovary and the ovules (called seeds when they are full grown). To eat an orange, the outer covering of the ovary needs to be peeled. Only the inner part of the ovary is juicy and edible. The seeds are thrown away. Do you throw away the seeds when you eat a cucumber? How about squash? Tomato? Grape? String bean? Black-eyed peas?

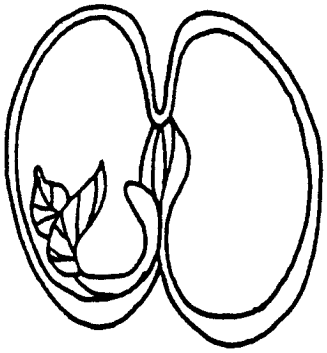
Did you know that trees have flowers too? They produce seeds, much like cucumbers and tomatoes and Easter lilies do. Some common Florida tree flowers look like this:

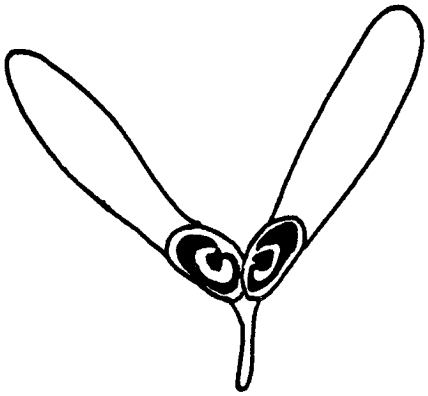


In some trees, such as wax myrtle and most hollies, female and male flowers are on separate trees. Only the female flowers produce berries and seeds. In most trees the male and female parts are close together. What do you think is inside a seed, anyway?

A common, big seed that you can buy in stores, and which is good to eat when cooked will show you.

Put a few lima beans in a dish of water. Soak them overnight. The next day, carefully split one open. You will see a tiny plant curved around one end. This is a new bean plant -- all ready to grow when it is planted.

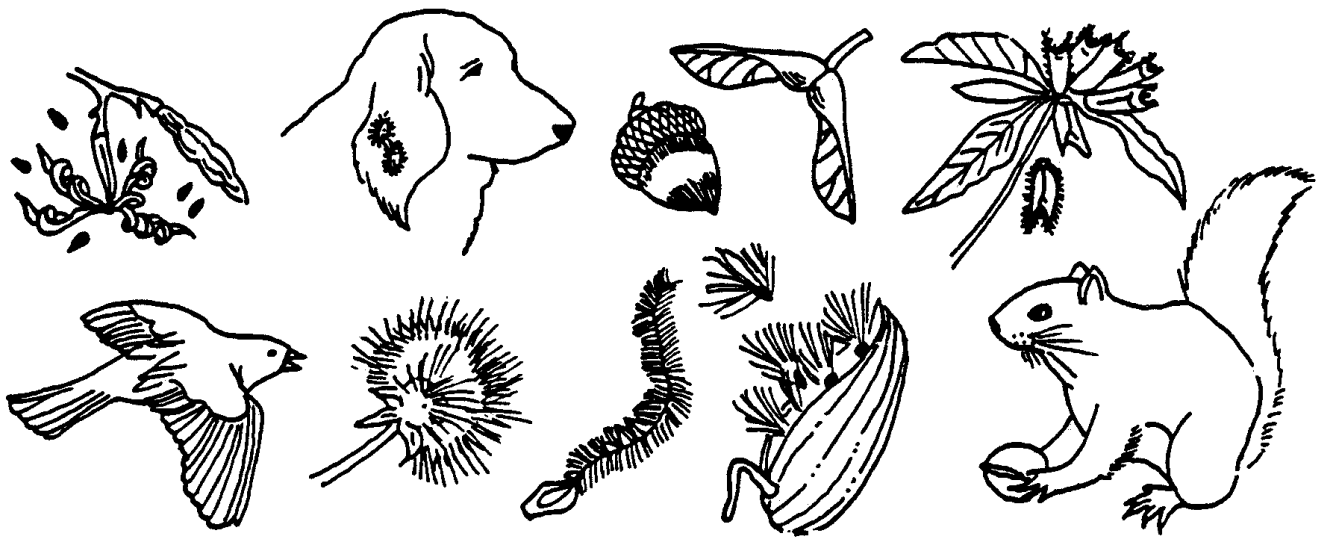




A seed is a tiny plant surrounded by some food and a cover. It began to grow inside the ovule of the flower, and then stopped. The hard cover around it protects it until it is planted. Then the new plant will start growing again when the conditions are right.

Just think -- every seed has in it a completely new plant and some food. Every tree seed has in it a completely new living tree -- alive, but not actively growing -- yet!

What do you think would happen if all the seeds from one tree fell right at the base of the tree? Almost none would grow. They would be ***competing*** with the parent tree for water, light, and room to grow. So it is important for each tree to scatter its seeds as far as possible. Trees have many different ways of scattering seeds. What are some you can think of?



This picture shows some of the ways tree seeds are ***dispersed*** or scattered. Many seeds are dispersed by the wind. Some have wings to spin them or slow them as they fall. Some have fuzz that acts as a parachute.

Some seeds are carried away by animals and buried. Sometimes birds eat fruits such as cherries, but drop the pits or seeds. People may eat a fruit such as grapes, and spit out the seeds. Can you think of other ways seeds might be dispersed? Make a list of all the ways you can think of that tree seeds get scattered. On your way home from school, keep an eye out for seeds along the sidewalk. How do you think they got there?

Seeds are awfully small compared to trees. The greatest oak grew from a tiny acorn. And the giant sequoia, one of the world's biggest trees, grows from a seed no bigger than a grain of rice!

Project Requirements

I. ANSWER THE FOLLOWING QUESTIONS.

1) Why do you think our state was named "Florida"?

2) Where do seeds come from?

3) What is the pistil of a flower?

4) What are the stamens of a flower?

5) Explain how a seed comes to be.

6) What is a seed?

Project Requirements

II. CHOOSE ONE OF THE FOLLOWING PROJECTS TO DO.

1) a) Line a jar or tall glass with paper towels.
b) Fill the jar with moist peat moss, cotton, or sawdust.
c) Pour about an inch of water into the container.
d) Put corn, beans, grass seed, or pine seed between the paper and the glass.
e) Place the glass in a warm place.
f) Write down what you see at the same time every day.

2) Go on a seed scavenger hunt. Write down the different kinds of seeds you found, where you found them, and how you think they got there.

3) a) Remove and wash the seed from an avocado.
b) Peel away the outer cover of the seed and put it in water, so it does not dry out.
c) Hang the seed in a jar of water (pointed side up) by supporting the seed with toothpicks. Just the bottom should touch the water.
d) Place in warm, dimly lit place. In 3 to 8 weeks a shoot and root should emerge. Move the seed to stronger light until the root is 2 to 3 inches long.
e) Plant the seed by burying it halfway into a good, sandy soil mixture. Place the plant in a warm, sunny spot. To keep your plant bushy, pinch off the top inch of soft growth. Keep the plant out of drafts.

III. WRITE A STORY ABOUT YOUR PROJECT.

Include what you learned, the problems you had, and what was the most fun.

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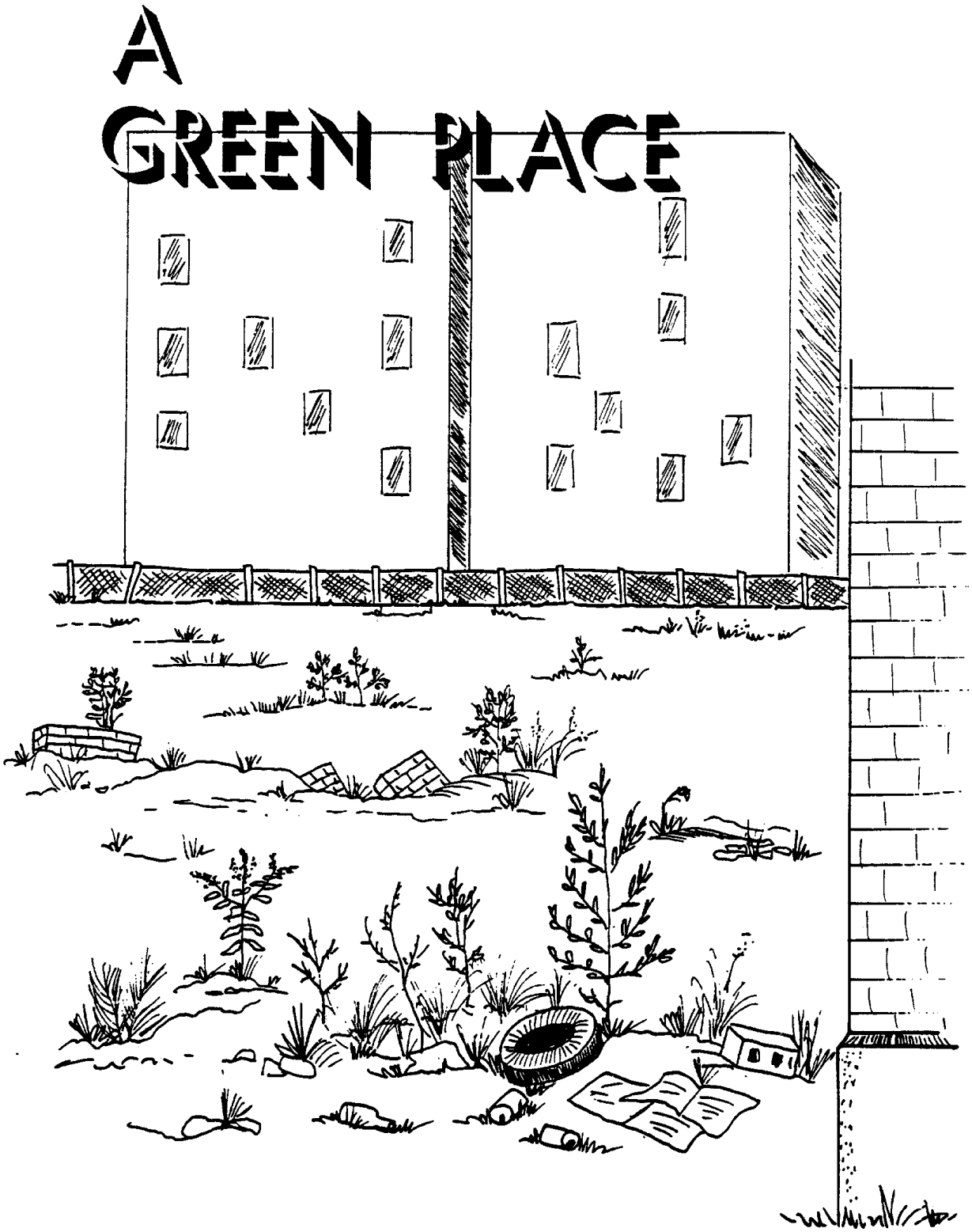
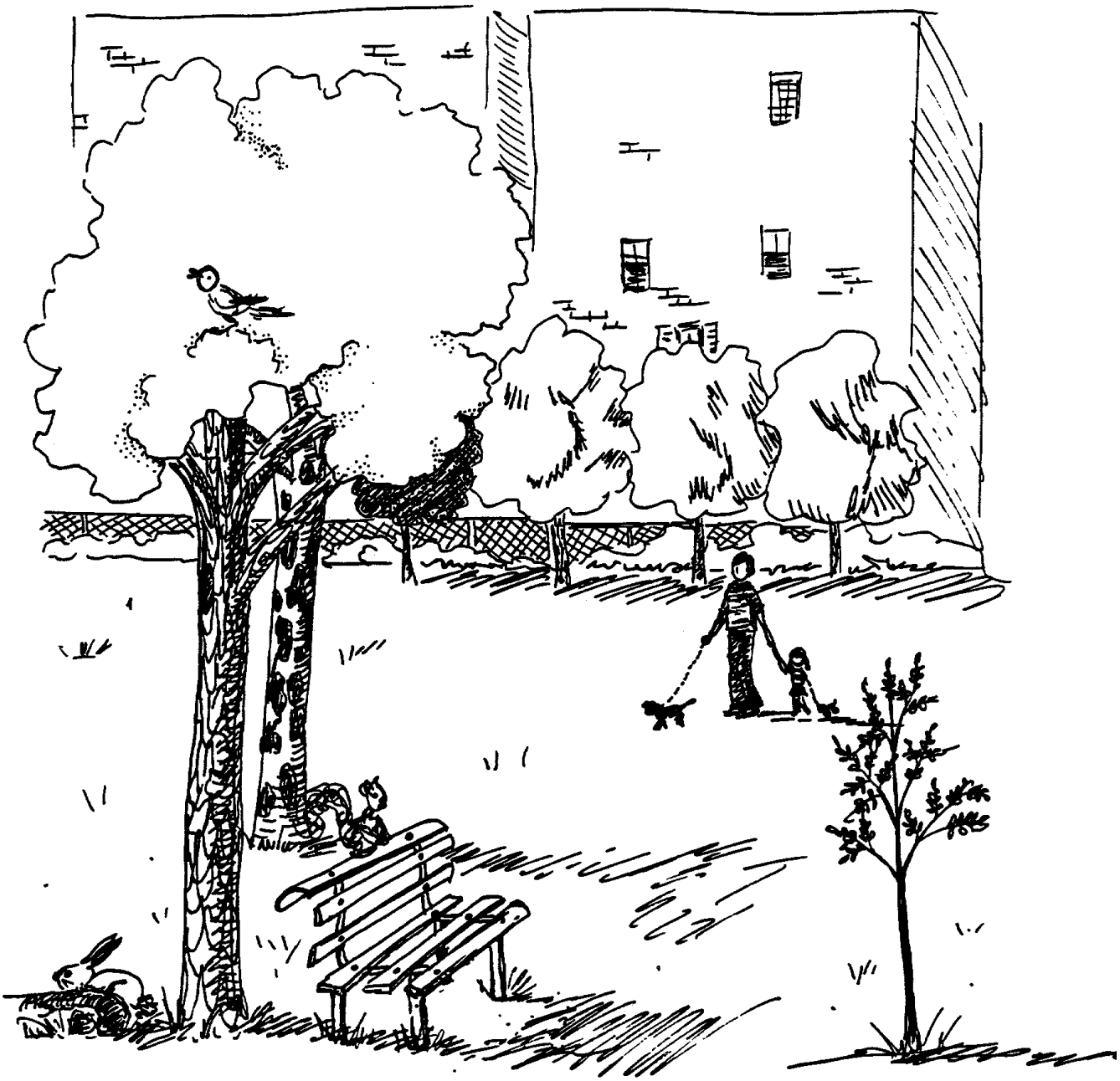
** ATTACH ADDITIONAL PAGES, IF NEEDED **



Are there spaces in your neighborhood where trees could grow, but don't?

Sometimes a space is needed for a building -- or a parking lot -- or a basketball court -- or a playground -- or an outdoor market.

But sometimes a space would be better if it were green -- if it had trees growing on it. Then on hot days people could sit in the shade, read without being bothered by the sun, play games, listen to birds, or just enjoy the green.



Trees in a city space don't just happen. People plan carefully and work hard for them! New trees enter the city as ***saplings***. A sapling is a young tree -- not a baby -- not an adult. If you were a tree, you'd be a sapling.

Who do you think planned and worked for the trees in your city? If trees are on a roadside, a sidewalk, or in a park, they were probably planted by your local government. Most towns and cities hire people to plant and care for trees. You can find out who planted the saplings in your city by asking the people in your city or town government. Look in the telephone directory for the listing of town or city offices. You will find a lot of offices listed -- the mayor, the engineering offices, the police and fire departments, and many others. Look for the office of the ***city forester***. No luck? Try tree warden or buildings and ground maintenance, or park department. If the branches of city or town government have you stumped, ask an adult to help you get to the root of the problem. When you find the correct office, write down the address.

Write a letter to the forester inviting him or her to speak to your group. If your invitation is accepted, prepare your questions for the forester in advance. Here are the kinds of questions you may want to ask your guest:

1) What kinds of trees are there in our city?

2) How much does it cost to plant one?

3) Where do the saplings come from?

4) What other things do city foresters do besides planting trees?

5) How much money does the city spend each year to remove dead trees?

6) How much does the city spend to repair or replace damaged trees?

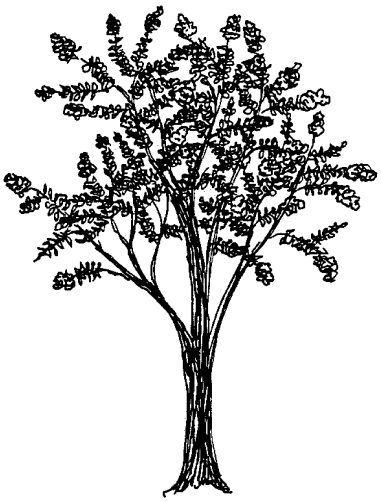
7) Who else works with trees in the city? What do they do?

8) Where is the biggest, oldest, or most famous tree in our city?

Talk about places in your neighborhood that would really make good green spaces. Ask if you may help plant trees there. And take care of them! Remember that trees will give people pleasure and make the neighborhood a nicer place.

It's important to choose the right kind of trees. Usually a tree native to your area is a better choice than an ***exotic*** tree. A native tree is one that occurs naturally where it is found. An exotic tree has been brought from another place and planted where you wouldn't naturally find it.

Before planting a tree, you should be able to answer the following questions:



1) Is the tree native to your area?

2) Is this the kind of tree you want? A shade tree, an accent tree, a street tree, a flowering tree...

3) What kind of soil does the tree need?

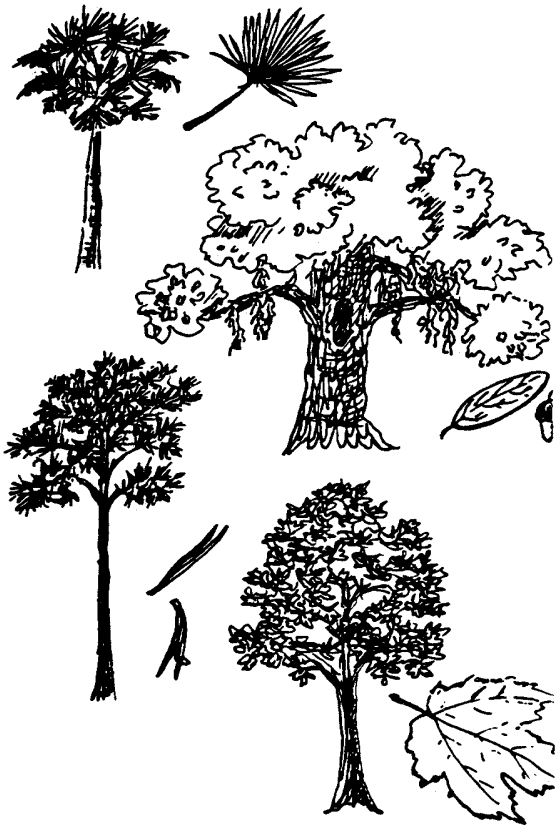
4) Does the tree need mostly shade, mostly sun, or a little of both?

5) If you live near the coast, is the tree salt tolerant?

6) Does the tree have poison fruit, twigs, leaves, or bark?

7) What kind of pests might hurt the tree?

A few trees you may want to choose from are the cabbage palm, the live oak, the slash pine, and the red maple. These trees grow throughout the state.



The cabbage palm is Florida's state tree. This member of the palm family grows up to 80 feet tall. Its name comes from the large leaf-bud or "cabbage" at the top of the trunk. The "cabbage" may be cooked and eaten as a vegetable. But the tree dies as a result. It grows in sandy soils of hammocks.

The live oak is a symbol of the South. Its wide-spreading crown makes it an excellent shade tree. But this tree needs plenty of room to grow.

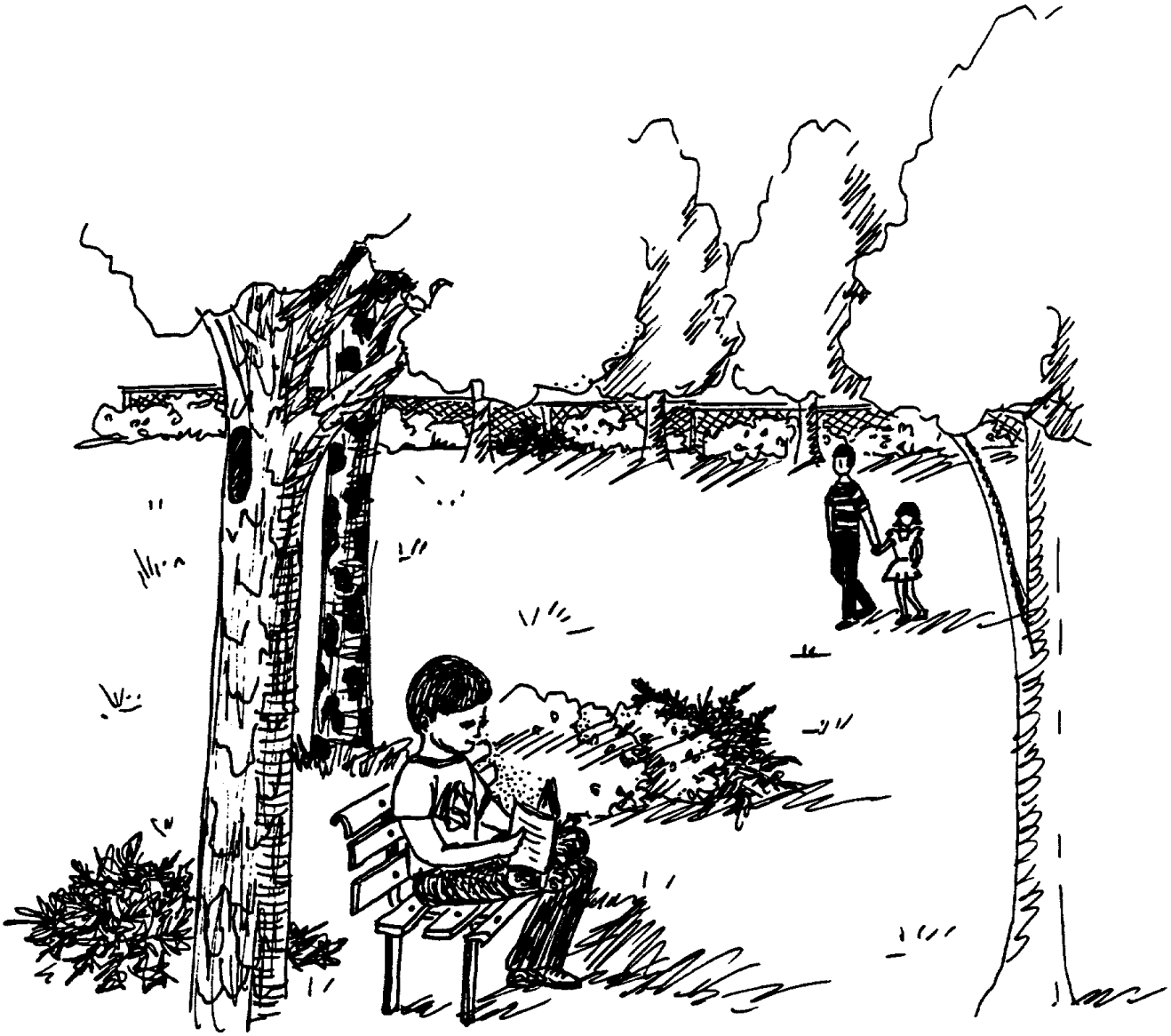
Slash pine is a fast-growing tree common to all parts of Florida. Foresters grow this pine for timber, but it makes a beautiful ornamental tree too.

The red maple is a deciduous tree. Do you remember what that means? This maple is an excellent shade tree during the rest of the seasons. It normally grows on low areas and swamps. Its red flowers appear in February. The flowers are followed by thin, red, papery seeds called samaras.

Remember, city trees face special problems. Cities are usually warmer than the country. And there is less water. People walk on the roots of trees. This compacts the soil, and the roots can't get as much water and air as they normally would. People also pull off the leaves and branches of trees. And they carve into the bark. All these things make it harder for trees to get their food and water. Without food and water, people can't grow -- neither can trees!

You can help trees by taking care of them after they are planted. They need water and lots of it! They also may need fertilizer. By checking on them often, you can find out what they need.

Some day, when you come back to the site, you may be surprised -- and pleased -- to see trees where there was once only a messy, vacant lot. And you will feel good because you helped make space for a green place.



Project Requirements

I. ANSWER THE FOLLOWING QUESTIONS.

1) What is a sapling?

_____

_____

2) What is an exotic tree?

_____

_____

3) What is a native tree?

_____

_____

4) Who is your city or county forester?

_____

II. CHOOSE ONE OF THE FOLLOWING PROJECTS TO DO.

1) Identify ten common tree species in your city. Note whether they are native or exotic. Make a leaf, twig, and/or fruit collection of these trees. Present your findings to your club.

2) Prepare a checklist of potential tree problems you may have in your neighborhood or nearby park. Inspect an area approximately ten blocks long, and list all problems found. Present your findings and propose possible solutions. Consult a specialist if necessary.

3) Select a barren lot or trash lot in your city, and plant some saplings. Call the county or city forester to help your club with this project. Be sure to select appropriate tree species. Maintain the trees the first year. Check trees once a month. This qualifies for a community pride project.

4) Learn your local tree laws. The city or county forester should be able to help you. Tell your club about them.

5) Visit your county forest tower. You should be able to see all the trees in your city.

III. WRITE A STORY ABOUT YOUR PROJECT.

Include what you learned, the problems you had, and what was the most fun.

** ATTACH ADDITIONAL PAGES, IF NEEDED **

ne day a very old man left his house early in the morning and returned several hours later with a sapling. The sapling was half as tall as you are and as thin as a wooden pencil. The old man began planting it at the roadside in front of his house. He worked slowly because he was old and because he enjoyed the work. As he planted, a neighbor came by and looked at the tiny sapling.

"Why you silly old man," the neighbor laughed, "you're wasting your time planting such a small sapling! You'll be gone before it grows large enough to fill this space with beauty and shade."

"You are correct," the old man calmly replied as he continued planting. "But, I am not planting this tree for myself. All my life I have had fine trees to look at and walk under because when I was young, old people planted trees. Now, I plant trees -- for those to come!"

GLOSSARY

A

Accent tree - a tree that draws attention to the building or site where it is planted.

Adapt - to adjust to new or changed circumstances.

Annual ring - any of the concentric rings seen in cross sections of the stems of most trees and shrubs; each ring is a layer of wood that is a year's growth.

B

Biltmore stick - a stick used to measure the diameter of trees.

Branch - any woody extension growing from the trunk or main stem, or from a main limb, of a tree.

Bud - a small swelling or projection on a plant, from which a shoot, cluster of leaves, or flower develops.

C

Circumference - the line bounding a circle, a rounded surface, or an area suggesting a circle or the distance measured by this line.

City forester - a person hired by a city to help plan, evaluate, and educate others on the status of city trees.

Clinometer - an instrument for measuring angles of slope or inclination.

Community - 1) all the people living in a particular district, city, etc.
2) a group of animal and plant species living together and having close interactions especially through food relationships.

Competition - the struggle among individual organisms, in. this case trees, for food, water, space, etc. when the available supply is limited

Conifer - cone-bearing trees and shrubs, mostly evergreen, in the order Coniferales, as the pine, spruce, fir, cedar, yew, etc.

Consume - to eat or drink up; devour

Consumer - in ecosystems, an organism that survives by consuming organic matter (plants and animals).

D

D.B.H. - the diameter of a tree at breast height (4.5 feet above ground).

D.B.H. tape - an instrument (tape) used to measure the D.B.H. of standing trees.

Deciduous - shedding leaves each year; opposed to evergreen.

Deckle - a removable frame used as an edging for the four sides of a sheet mold in making paper by hand.

Decomposer - an organism that obtains energy in the process of, breaking down organic matter to more simple substances; refers to bacteria and fungi, ex. mushroom.

Den - the cave or other lair of a wild animal.

Diameter - a straight line passing through the center of a circle, sphere, etc. from one side to the other.

Disperse - to break up and scatter in all directions; spread about; distribute widely.

Dormant - live, but not actively growing.

E

Edible - anything fit to be eaten; food.

Embryo - the immature plant contained in a seed.

E Pluribus Unum - out of many, one; a motto of the United States.

Evergreen - having green leaves throughout the year; opposed to deciduous.

Exotic - a plant that is not native; foreign.

F

Fascicle - a small tuft or cluster of fibers, leaves, stems, roots, etc.

Fiber - a slender, threadlike structure that combines with others to form (plant) tissue.

Flowering tree - a tree with showy flowers.

Food chain - movement of energy and nutrients from one feeding group of organisms to another in a series that begins with green plants and usually ends with carnivores.

Forester - a person trained in forestry. Foresters may be in charge of a forest or urban trees, or may be involved in many areas of forestry work including: forest hydrology, forest management, forest genetics, forest economics, forestry education, forest-wildlife management or timber purchasing.

G

Gallon - a liquid measure, equal to four quarts (231 cubic inches).

Germinate - to sprout from a spore, seed, or bud: to start developing or growing.

Grain - the arrangement or direction of fibers, layers, or particles of wood, leather, stone, paper, etc.

Growth ring - same as annual ring.

H

Habitat - place where a plant or animal lives, including its source of food and water, shelter and living space.

Hammock - a raised piece of very fertile land with hardwood trees growing on it.

Herbivore - an animal that eats only plants.

I

Increment borer - an instrument used to obtain a core of wood from a living tree. The number and width of annual rings can be determined from the core.

K

Knot - a hard lump on a tree where a branch has grown; a cross section of such a lump, appearing as concentric circles in a board.

L

Limb - a large branch of a tree.

M

Mammal - any of a large class (Mammalia) of warm blooded, usually hairy vertebrates whose offspring are fed with milk secreted by the female mammary glands.

Meter - the basic unit of length in the metric system, equal to 39.37 inches.

N

Native - belonging to a locality, or country by birth, production, or growth; indigenous.

Niche - the particular role of an individual species or organism in its community, including its position in the food cycle, its behavior, etc.

O

Omnivore - an organism that eats both plant and animal material.

Organic - of, having the characteristics of, or derived from living organisms.

Organism - any individual animal or plant usually having diverse organs and parts that function together as a whole to maintain life and its activities.

Ornamental - a plant or shrub grown for its decorative effects.

Ovary - the enlarged hollow part of the pistil containing ovules.

Ovule - a structure in seed plants that develops into a seed after fertilization

P

Persistent - remaining attached permanently or for a more than one growing season, as some leaves.

Photosynthesis - the production of organic substances, mostly sugars, from carbon dioxide and water occurring in green plant cells supplied with enough light.

Pistil - the seed-bearing (female) part of a flowering plant.

Pollen - the yellow, powder-like male cells formed in the stamen of the flower.

Producer - a green plant that produces sugars.

Q

Quart - a liquid measure, equal to 114 gallon (57.75 cu. in.).

R

Ratio - a fixed relation in number between two similar things, ex. a ***ratio*** of two boys to three girls

Recycle - to use again and again.

Relaskop - an instrument used to determine the height and diameter of standing trees.

Root - the part of a plant usually below ground, that holds the plant in position, draws water and nutrients from the soil, and may store food.

S

Samara - a dry, winged fruit, as of the maple.

Sap - the juice that flows through a plant, especially a woody plant, carrying water, food, etc, to the tissues.

Sapling - a young tree.

Sapwood - the living wood which conducts water and nutrients between the roots and crown. It is located between the inner bark of a tree and the heartwood.

Shade tree - a tree planted primarily for the shade it gives.

Shoot - a new growth; sprout or twig.

Stamen - the pollen-bearing (male) part of a flowering plant.

Street tree - trees planted along streets and roadways primarily to provide beauty and shade.

Stump - the lower end of a tree or plant remaining in the ground after most of the stem or trunk has been cut off.

Swamp - a wetland supporting trees, such as cypress or red maple.

Symbol - something that stands for or represents another thing.

T

Tree warden - a person who guards, or has charge of trees; a tree keeper or custodian.

Trunk - the main stem of a tree.

Twig - a small, slender branch or shoot of a tree or shrub.

W

Wildlife - Birds and other wild animals, collectively.

Wind-break - hedge, fence, or row of trees that serves as a protection from wind.

1. This document is 4H FOM 10, which supercedes 4H-480, one of a series of the School of Forest Resources and Conservation for 4-H Youth Development Program, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Date reprinted October 1990. Please visit the FAIRS Website at **http://hammock.ifas.ufl.edu**.

2. Cynthia L. Thomson, Graduate Assistant, School of Forest Resources and Conservation, Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida, Gainesville, 32611.

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