



# UNIT FIVE:

## PEOPLE AND THE WEB—LIVING TOGETHER AND HOW IT WORKS

### UNIT FIVE DISCOVERIES

Students will be introduced to some of the ways people and trees relate to each other. For background see the Introduction and Chapters One, Two, Three, and Four in *Where Are All The Trees? A Minnesota Primer*.

### KEY

- P** Primary Students
- I** Intermediate Students
- A** Advanced Students

We have spent a great deal of time in the previous units learning about one particular member of the web of life: TREES! We've learned that trees, like all living things, exist in an area because it provides all the essentials for their life. When those essentials are no longer provided, their very existence is threatened or destroyed.

People are the only members of the web that can profoundly change the whole environment when it does not or can not provide for us. We can remove soil, water, plants, and animals to meet our needs (to build houses, provide food, farm, collect water, etc.) or we can add soil, water, plants, and animals to provide for our needs (food, windbreaks, shade, landscaping, etc.). This gives us a unique advantage in choosing our living options and an awesome responsibility to do that job wisely. We have, in effect, become stewards of spaceship earth.

The following activities will explore how we do that job and what effects our changes have on the environment around us.

“Man did not weave the web of life;  
he is merely a strand in it.  
Whatever he does to the web  
he does to himself.”

—Chief Seattle

### Activity 1: Points of View

**P I A**

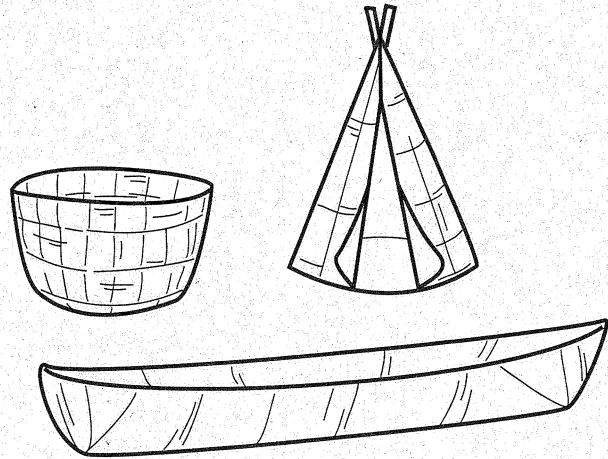
How we look at something and perceive its usefulness dictates how we treat it. For example, an old fallen log would look perfect to a skunk looking for a place to live. It would look like an eyesore to a homeowner cleaning up his or her yard.

Using the following list as a starter, make a list of people and animals that might relate to trees differently.

- |                             |                  |
|-----------------------------|------------------|
| an artist                   | a tree inspector |
| an ecologist                | a homeowner      |
| a landscape architect       | a gray squirrel  |
| a forester                  | a logger         |
| a bird that lives in a tree | a camper         |
| a tree farmer               |                  |

Now ask the students to pick one and draw pictures of how their choice might view or use trees at different times in the tree's life cycle. For example, a woodpecker would love to make its home in a hollow, standing dead tree. A forester might clear the dead tree out to make room for saplings. ❁

*Used with permission from A Teachers' Guide to Arbor Month, Minnesota Arbor Month Partnership, 1990.*



## Activity 2: Home, Sweet Home



Trees find a home and exist in a place that will sustain them. Once there, they go on to provide a home to many creatures—including us! If you could create different kinds of housing units for different species, how would you make a comfortable home for the plants and animals in:

1. A tree farm along the banks of the Mississippi or up along the North Shore
2. A reptile house in Minnesota
3. A home for tropical plants in the Twin Cities (example: Como Conservatory)
4. A nature preserve for wild songbirds
5. An animal wildlife refuge
6. A people house: on the prairie; on the farm; in the woods; on the North Shore; by a lake near Mora.

What trees and plants would grow naturally? What plants would need help to stay alive? What kind of space would the trees and animals need to exist?

American Indians inhabited our Minnesota forests long before European settlers arrived. Their love of nature and attitude of respect for all of it showed how keenly aware they were that everything they needed had to come from the world around them. Pick a part of the state, think about what natural resources might have been present long ago, and draw or construct houses and other items the Indians might have made (for example, a tepee out of buffalo hides and poles, a dugout canoe or a birch-bark canoe, eating appliances, wooden bowls, woven reed baskets). Check out *Steven Caney's Kids' America*, an excellent resource on how to make many of these items. See the bibliography.

In pioneer times, people had to use what they found around them to build their homes—everything from caves to prairie sod houses to log cabins. With the seemingly endless bounty of the land, the necessity of the times, and the lack of awareness of long-range consequences, the settlers logged their way into the new world. Have the students construct a model of a house using materials that would be available to them in a particular area of the state. ❁

## Activity 3: Being Good Neighbors

**P**

Most of our personal relationships with trees take place in our own back yards and neighborhoods. Weather permitting, take the children outside and have them lie down and look up through the leaves. Talk about and make a list of some of the things trees give to us.

Read *The Giving Tree* by Shel Silverstein. Over the years, what did the tree give to the boy?

With the help of Activity Sheet 5A, list some of the things we can do for trees. Start to create lifelong good habits by making some of those things a regular part of your outdoor activities with the children.

**I A**

Take the same awareness inventory (things we can do for trees) as above. Now look at Activity Sheet 5B. As our awareness grows with age, we realize that our relationship with trees goes far beyond the neighborhood. We need to take care of them so that they can be enjoyed by all creatures—including us! Ask students to list the different ways we and other animals benefit from the wise management of this precious resource in the different settings pictured.

Join a local project (park maintenance, nature center volunteer, etc.) or create one of your own for managing and maintaining your yard. Perhaps make a picnic area for you to enjoy nature-watching, or make a feeding station for the animals to enjoy people-watching! ❄

## Activity 4: Is There a Doctor in the Forest?

Trees have many things that can hurt them, both natural and human: disease (Dutch elm, oak wilt), insects, fire, wind, lightning, lack of proper moisture, poor growing conditions, pollution, construction, vehicles, animals, etc.



MN-DNR Photo

Wildfires are one threat faced by trees in a forested area.

**P I A**

Go on a discovery hike and hunt for tree problems. Use Activity Sheet 5C to help students figure out what happened to the tree. What caused the problem? Is the tree still alive? Can it survive the problem?

What can you do to help trees stay healthy? (Ideas: Protect them from forest fires; remove diseased trees so that they can't infect others; water and mulch trees regularly; don't hang on the lower branches.) Have students make a list of the things they can start doing right away to help their adopted trees and any others. ❄

## Activity 5: Build a City, Park, or Forest



Have students think of what it would be like to be given a tract of land that they could develop any way they chose. First have them decide what kind of environment they are going to create.

Go back to the maps in Unit Four and the activities of Units Three and Four for a refresher on the information you've learned about tree needs (soil, water, space, etc.). Use that information to plan what trees students would put in the areas they are creating. For those planning a city, *The Right Tree Handbook* would be helpful (see bibliography). For those planning a park, check out Activity Sheet 5D to see the kinds and numbers of trees people would see if they were to visit it.

How will people relate to the trees and use them in each of the different places?

See Activity Sheets 5E and 5F for how to plant a tree.

Call your local extension office or DNR forestry office and see if there is a planting project you can actually take part in. ❄

## Activity 6: What a Difference it Makes—with and without Trees



Without good stewardship and management, whole environments are permanently altered or destroyed.

Read *The Lorax* by Dr. Seuss. Discuss what happened to all the living things, including the Once-ler. Role-play the story, creating costumes and props.

Editor's note: In Laytonville, California, an attempt was made to ban *The Lorax* from the schools as an anti-logging book. Discuss why the book was perceived as a threat. Discuss what positive messages the book has to give.



There is currently much discussion about what is happening to ecosystems in different parts of the world: the Pacific Northwest old-growth forest, home of the spotted owl; tropical rain forests, etc.

Have students research one of these areas and what is happening there. Discuss what the area might be like five to 10 years from now. What global impacts might these changes have? What suggestions do the students have to manage the situations in a positive way?

Find out about a reforestation project near you. Call your DNR forestry office or your county extension office. (Many times scout groups or 4-H groups get involved.)

Learn what has happened to an area that has been through a natural disaster (the Hinckley fire; the Springbrook Nature Center tornado in Minneapolis) or has been harvested and then replanted. Go to visit the area if you can. Draw a picture of what the area might have looked like before it was disturbed. Then draw a picture of what the area looks like now. If new trees have been planted, find out how long it will take them to grow to maturity. ❄

## Activity 7: Plant, Animal, Rock Game

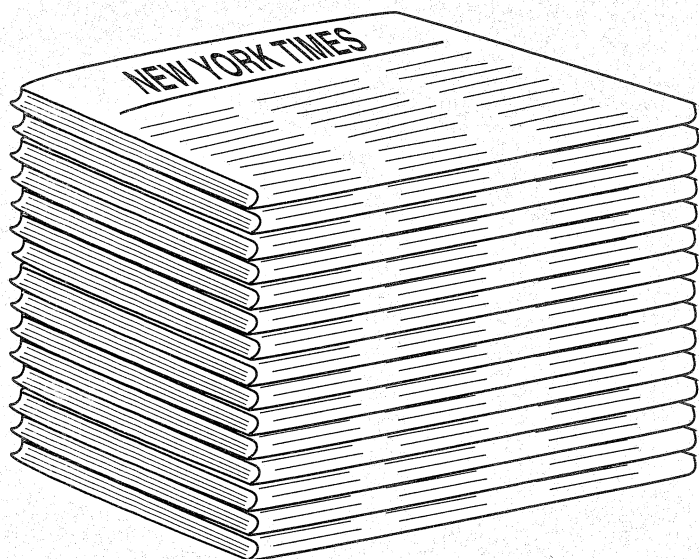


Gather all of the collected items you can from your hikes. Draw three circles on the ground: one for rocks, one for plants, one for animals. Ask the children to sort out their nature items and put them in the appropriate circle. Now bring out a bag of other collected items from your walks (pop cans, bottles, foil candy wrappers, etc.). Which circle can you put these in? Discuss the fact that there is no appropriate “nature” place for these items. This game is a great discussion starter on pollution and recycling. If you have not read *The Lorax* by Dr. Seuss, please do so now. It fits in perfectly.



As a group, join a local effort to clean up a park, river, or roadside area.

Everyone bring newspapers from home for one week. Weigh them at the end of the week to see how much paper was used. Then recycle them! ♻️



## Activity 8: Reduce and Reuse—What’s Garbage and What’s Not

A step vital to the preservation and wise use of our natural resources is the development of a good working system to reduce, recycle, and recover usable natural materials from the waste we have already generated. In other words, it’s time to put that garbage back to work! Share the following facts with the students:

- Each Minnesotan produces an average of 2 1/2 to 4 pounds of garbage every day.
- Up to 3 percent of the state’s garbage (about 100,000 tons a year) could be eliminated by using waste-reducing techniques such as reusing office paper as scratch paper, leaving grass clippings on the lawn, and not buying disposable products.
- The United States is the major exporter of wastepaper in the world.
- By weight, 37 percent of our garbage is made up of paper, 18 percent is glass, 10 percent is metal, 8 percent is food waste, 7 percent is plastic, and 10 percent is other miscellaneous items.

*Source: Minnesota Office of Waste Management.*

**TREE FACT:** Recycling just one Sunday edition of the New York Times newspaper would save 75,000 trees!

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Now, let's concentrate on what can be done with just paper.



For one week ask the students to save all of the different kinds of wastepaper they have left over after their projects. Separate the papers into two stacks each day: one for paper that is completely used up; one for paper that could be used for something else. At the end of the week, compare the two stacks and help the students decide whether they are wasting paper.

Now give everyone some of the reusable paper and something else that is made out of paper (for example, a grocery bag, shoe box, magazine, greeting card, newspaper, lunch sack, milk carton). Ask everyone to think of ways to reuse their item. Decide which ideas would work best for you and make them a part of your group's daily routine.

Maintain a room recycling center. Make gifts, models, table decorations, collages, bookmarks, name tags, and anything else students can suggest out of products for recycling from school and from home. Recycle unused materials through your local recycling center. (Call your county or city offices to find out where to recycle.)

Try this to experience what pioneer children might have done. Give each student a 12-by 12-inch piece of hardboard (painted a slate color) to use instead of paper for writing and drawing. Use chalk and erase the markings with a damp cloth when done.

Use the back sides of paper to do another exercise.

Send for a paper-making kit and use some of your recycled material to make new paper. Write or call:

Minnesota Forest Industries  
1015 Torrey Building  
314 West Superior Street  
Duluth, MN 55802  
Phone: 218-722-5013



~  
"Man is tinkering with his environment,  
and the absolute requirement of intelligent  
tinkering is to save all the parts."  
~

—Aldo Leopold

**T**hese activities are beginning stages of awareness of the stewardship role we need to play as part of the delicate cycle of any environment we live in. With the realization that trees are a necessary part of our lives in many ways, Minnesota is a leader in developing management practices that help maintain a balance and harmony within that inter-relationship. Use the following activities to explore the many ways people can be a part of the stewardship process.

## Activity 9: How Do We Use Trees?

The variety of Minnesota's ecosystems provides an ideal home to many species of trees. Let's look at some of the products our state's trees give to us.

**Paper Birch:** This tree has a white, papery bark that stands out against the dark bark of other forest trees. It's used for firewood and furniture.

**Ash:** Strong, hard wood. Green ash is an athlete's special friend. Used for baseball bats and hockey sticks, as well as handles and firewood.

**Aspen:** Once considered rather useless, the aspen is now the most commercially-used tree species in the state. It's used in panel types of boards and to make paper.

**Basswood:** Light, soft wood. Used for carving, inexpensive furniture, even inner parts of shoes.

**Maple:** A beautifully grained hardwood, popular for furniture and moldings. The sugar maple provides sap for maple syrup and is one of fall's most colorful trees.

**Oak:** Heavy, hard, strong wood. Used for heavy construction, beams and support braces, paneling, furniture.

**Black spruce:** Grows in moist soil and bogs. Used mostly for pulp.

**Tamarack or larch:** Hard, heavy wood. Used for telephone poles, railroad ties, posts.

**White spruce:** Used for paper and for things that must be strong such as furniture and canoe paddles. This is also a popular Christmas tree.

**Red pine:** Coarse-grained, hard wood, good for building and construction. Minnesota's state tree.

**Balsam fir:** Used for paper and Christmas trees.

**White pine:** Wood for lumber, building, and construction.

**White cedar:** Fragrant wood with "outdoors" scent that repels moths. Used for posts, poles, cedar closets.

**Cottonwood:** Soft, light wood. Used for making paper.

**Elm:** Heavy, hard wood. Favorite for furniture and boat building.



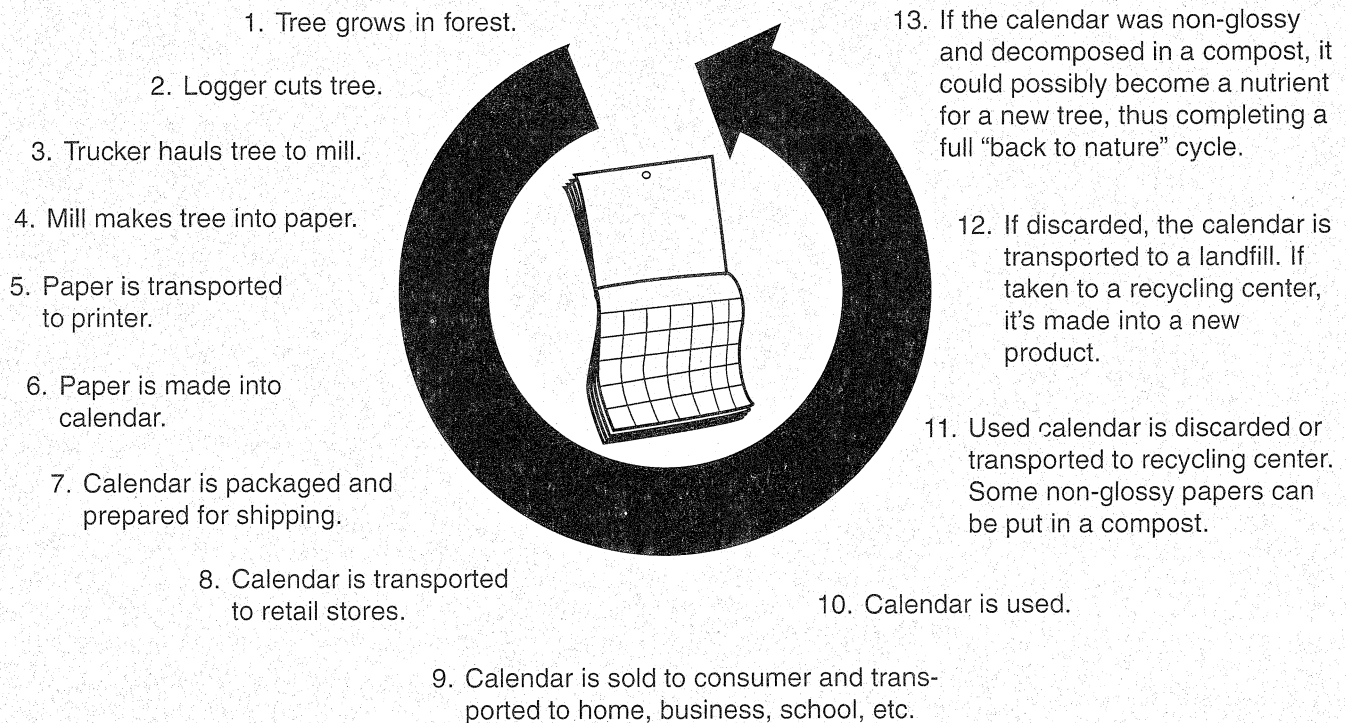
Let's follow some of the steps that it takes to keep Minnesota trees truckin' from the forest to the consumer and finally through the disposal process. The following list shows some of the wood products that are manufactured and transported in Minnesota:

- |                    |                             |
|--------------------|-----------------------------|
| airplane parts     | musical instruments         |
| boats              | oriented strand board (OSB) |
| boxes and crates   | paper                       |
| building materials | parallel strand lumber      |
| cabinets           | picture frames              |
| clocks             | playground equipment        |
| docks              | shingles, shakes            |
| doors              | signs                       |
| fencing            | sporting goods              |
| fishing tackle     | stairs                      |
| furniture          | tools                       |
| ladders            | toys                        |
| lamps              | waferboard                  |
| lumber             | windows (wood-framed)       |
| mobile homes       |                             |

Ask each student to bring three items that are products of the Minnesota forest ecosystem. These could be wood products, or they could be things such as maple syrup or buckskin gloves from deer that lived or grazed in the forest.

Each student chooses one of the items to research, identifying all of the steps necessary to produce the finished product from the raw material. Next, students identify all of the steps necessary to "cycle" the finished product through the disposal process. Finally, they draw and label the points in the product's life cycle on a large sheet of paper or on a chalkboard. For example, a student might draw the poster below to illustrate the steps in the cycle of a calendar. \*

### STEPS IN THE CYCLE OF A CALENDAR



## Activity 10: It Takes All Kinds— Forestry-Related Careers



It takes a partnership of all kinds of people and jobs to help trees get through the growth process to the wood shop or construction site. Make a list of some that you can think of and compare it to the following:

- forest soil specialist
- insect and plant disease specialist
- silviculturist
- timber buyer
- forest hydrologist
- logger
- fishery specialist
- forest products sales representative
- cabinet and furniture maker
- urban forester
- wildlife specialist
- conservation officer
- forest products production manager
- forester
- chemist
- plant geneticist
- professor
- paper process engineer
- computer specialist
- park ranger
- forest firefighter
- wood carver
- paper buyer
- tree service specialist
- heavy machine operator
- geologist
- consultant

Discuss what each of these people have to do with the trees and wood products.

Have the students draw pictures, write stories, or role-play about the jobs.

Create dioramas of different scenes relating to some of the jobs (tree farm; saw mill or logging camp; managed park area for use by people and animals).

Are there places nearby you can visit to learn more about any of the jobs?

- nursery
- state park or forest
- lumberyard
- construction site
- wood shop
- furniture store

Make sure to stress the importance of the renewable part of the process. The lesson of the Once-ler in Dr. Seuss' *The Lorax* is very clear here: What we use, we must replace and use wisely. \*

*Adapted with permission from Project Learning Tree.*

## Activity 11: Who's Minding the Trees?

All those people who manage the growth and processing of our trees do so based on personal reasons and decisions made at all levels of the governmental process. Many facts and needs must be continually assessed in order to assure that we steward our state's precious resources wisely. Read the background information in the *Minnesota Primer*, Chapter Five, about some of the ways our state is doing this. Now let's get a feel for how this partnership works.



Create a forest by passing out the tree cards (cut out the cards on the next page and put on index cards). Have the student "trees" make a mixed stand. Make sure all members of the ecosystem understand the vital role they play as part of the stand.

Select one student to be the forester. Give that student one of the three management cards (also included) and turn him or her loose in the stand to do his or her job, based on the information on the card. As he or she

“harvests” (taps on the shoulder) the necessary trees, move these “trees” to one side.

Now ask for reactions from the harvested trees. Any ideas why you may have been harvested? Any idea as to the forester’s overall goal? Do you consider this a wise management decision?

Then ask the forester to read what the management card directed.

Repeat the process using a different management card and forester.

## TREE CARDS

*One of each on 3" x 5" cards.*

### Dead Tree

Many insects live beneath the bark and inside the wood of dead trees. Birds eat these insects. Birds also peck large holes in the wood to create nests for raising their young. Dead trees do not interfere with the growth of living trees around them.

### Sugar Maple

The wood from sugar maple trees can be sawed into lumber. Maple syrup can be made from the sap. Maple sap can be collected in early spring by drilling a hole in the tree, inserting a hollow tube into the hole, and placing a bucket beneath the tube. Sap then is boiled to evaporate water and concentrate the sweet syrup. Leaves on sugar maple trees turn brilliant red or yellow in the fall. Sugar maple trees can grow in dense shade and can regenerate in small forest openings.

### Aspen

The wood from aspen trees is used for paper, particleboard, and lumber. Leaves on aspen trees turn bright yellow in the fall. White-tailed deer eat twigs on young aspen trees and ruffed grouse feed on aspen leaves, buds, and flowers. When aspen trees are harvested, thousands of root suckers sprout up to regenerate the forest. Aspen trees regenerate best in large forest openings such as clear-cuts.

### White Pine

The wood from white pine trees is used for lumber. White pine trees hold their needles year around providing some green color in the woods even in winter. Young white pines can tolerate some shade and reproduce in small forest openings.

### Animal Den Tree

A tree with a hole in its trunk or in a large branch may provide shelter for squirrels, raccoons, and cavity-nesting birds such as woodpeckers.

### Oak

The wood from oak trees can be used for lumber, veneer, and railroad ties. Acorns are eaten by many animals including deer, grouse, wood ducks, and turkeys. Young oak trees do not grow well in the shade. Oaks reproduce best in large forest openings.

## MANAGEMENT DECISION CARDS

One of each on 3" x 5" cards.

### Forester #1

You are working for a family that wants to produce maple syrup to sell. This syrup is made by collecting sap from sugar maple trees and then boiling it to evaporate the water and concentrate the sweet syrup. Sugar maple trees with big trunks and crowns produce the most sap.

*(back)*

Cut all trees except the sugar maples. This harvest will reduce competition from undesirable trees and allow sugar maple trees to grow larger. Cut dead trees because they could fall at any time and injure one of your family members while they are collecting sap.

### Forester #2

You are working for a landowner who has to pay a large medical bill. He needs all the income he can earn. This woodland has many big trees in it.

*(back)*

You are to cut all the trees in the woods and bring them to the edge of the woods. Remove dead trees too, because they can be sold for firewood.

### Forester #3

You are working for a landowner who needs to earn some periodic income from the woodland, but she also likes wildlife and she wants a variety of trees in her woodland for their beauty.

*(back)*

Cut about one-third of the trees. Leave some trees of each species (sugar maple, oak, aspen, and white pine). Do not cut animal den trees or dead trees. Dead trees provide insects for birds to eat.

*Possible effects of harvest by Forester #1:* It will provide immediate income from selling the harvested trees. Annual income will be earned by producing and selling maple syrup. Wildlife habitat will be greatly reduced. There will be no dead trees, animal den trees, or acorns for wildlife.

*Possible effects of harvest by Forester #2:* The owner will earn income necessary to pay medical bills. The forest will regenerate over-time, but there will be a loss of habitat for wildlife that depend on dead trees, animal den trees, and acorns. Wildlife that prefer young, dense stands of trees will benefit when the forest regenerates. The forest will regenerate mostly aspen because root suckers will sprout by the thousands and occupy most of the growing space.

*Possible effects of harvest by Forester #3:* The owner will earn some periodic income. The forest will regenerate mostly sugar maple and white pine because they grow well in small openings created by harvesting groups of trees. All tree species will be represented in future stands. Animal species that need acorns or that prefer young, dense tree stands that often occur following a clear-cut will not benefit. ❄

## Activity 12: Respect and Responsibility—Global Stewardship



Did you ever think about the fact that what we do with our trees in Minnesota affects what happens to trees in other states or even other parts of the world? If we don't manage our trees to provide for all the things that the forests can give us (products, recreation, wildlife habitat, soil and water quality) we have to go elsewhere to get them. To be good stewards of all the resources we have to work together statewide and globally.

~  
"The earth does not belong to man;  
man belongs to the earth."  
~

—Chief Seattle

Go back to Activity 11 and the *Minnesota Primer* (Chapter Five) to review some of Minnesota's policies. What do Minnesota's forests and the rain forests have in common? (They are both being harvested for human needs.) What don't they have in common? (Minnesota's forests are being replaced at a greater rate than they are being used; the rain forest is not.) James Bowyer, a forest products researcher at the University of Minnesota, emphasizes that we must use our resources here wisely so that we don't have to deplete resources elsewhere on the globe where management practices are not as well developed.

Divide everyone into three groups and assign each group a different part of the state (for example, an oak forest in the southern part of the state, a mixed forest of the central

region of the state, a pine forest of the Arrowhead region). Each group is to form a stewardship committee for its area. Study your area using some of the following questions to get started:

1. What does the area provide (recreation, wildlife habitat, etc.)?
2. What needs to be monitored (water quality, soil erosion, human use, etc.)?
3. What do you want it to provide (five years, 10 years from now)?

Devise a plan of careful management of your area. Possible references for further study:

Forest Inventory and Analysis  
USDA Forest Service  
North Central Forest Experiment Station  
1992 Folwell Avenue  
St. Paul, MN 55108  
Phone: 218-649-5139

Forest Resource Assessment and  
Analysis Program  
Department of Natural Resources  
Division of Forestry  
2002 Airport Road, Suite 204  
Grand Rapids, MN 55744  
Phone: 218-327-4449

Based on their activities and readings, have the students discuss the issues involved to accomplish wise stewardship and draw conclusions about responsible environmentalism.

Have them send their concerns and priorities to Project Learning Tree. It is important to start to stress that people's opinions can't be heard until they are spoken and that they do make a difference.

Project Learning Tree  
Department of Natural Resources  
500 Lafayette Road  
St. Paul, MN 55155-4044

Finally, brainstorm about possible economic solutions for the people and trees in the rain forests (new sources of income, food, etc.). \*

## Activity 13: Swing Dingles and Sweat Pads—Logging in Minnesota

The work was hard, the days long and cold. And if the food was no good, you found yourself a new camp. So were the times and conditions of a lumberjack's day in the late 1800s. Though how it's done and why it's done have changed, logging continues to be an important part of Minnesota's history and economy.



Use the information from the *Minnesota Primer* (Chapter Four) and Activity Sheet 5G to introduce the students to the colorful life of the old-time logging camp.

Divide students into groups of “then” and “now.” Ask each group to prepare a skit about a typical day in the life of a logging camp. Encourage them to use costumes, props, words from this unit’s “loggers’ lingo” list, etc., to bring the story alive.

STEPS IN HARVESTING	THEN	NOW
1. Choosing the area and the trees to harvest.	Forest companies bought timberland and harvested as they wished.	Forest managers and loggers work with landowners to harvest trees in ways that leave the forest healthy.
2. Felling (cutting), limbing (taking off branches), bucking (cutting off at certain lengths).	Loggers used hand tools such as axes, wedges, and crosscut saws.	Loggers use power saws and sometimes hydraulic shears.
3. Skidding or yarding.	Horses or oxen moved logs.	Huge tractors and skidding machines move logs.
4. Loading and unloading.	Horses or oxen loaded logs on sleighs.	Front-end loaders or special cranes load logs on trucks.
5. Transportation to mill.	Logs were floated on rivers.	Trucks and rail cars carry logs.
6. Preparing the land for new trees.	Not done.	Clearing brush, planting seedlings.

**P I A**

Speaking of sweat pads, let's make some! Let's take a swing over to the cook's shanty and whip up some real camp food. Using the following recipes, make the starter and let set three days. Then fire up the stove, pass the axle grease, and chow down!

*Source: Forest History Center, Grand Rapids, Minnesota.*

**SOURDOUGH STARTER**

Mix equal portions of potato water (water left after cooking potatoes) and flour. Put in a crock or glass container. Let stand about three days until it smells "yeasty." When starter is used, replenish with equal portions of flour and water. It is not necessary to use potato water for replenishment—only if it is on hand. Let starter sit about 24 hours before it is used again.

**LOGGING BERRIES**

Simmer dried prunes, covered with water, for 20 minutes. Serve cold.

**SWEAT PADS**

- 1 cup sourdough starter
- 3 Tbsp. melted lard or margarine
- 1/2 cup sugar
- 1 tsp. salt
- 1-1/2 tsp. baking soda

Stir together lightly. Do not beat. Mixture will bubble. Bake on a greased griddle. Turn once and serve with margarine and syrup.

**SHOE PACK PIE—LARRIGAN PIE**

- 1 cup sugar
- 3 Tbsp. cornstarch
- 3 Tbsp. cider vinegar
- 3/4 cup water
- 1/2 tsp. lemon extract

Mix thoroughly and put in unbaked pie shell. Bake in moderately hot oven (350°) for 45 minutes or until mixture sets and pie is browned.

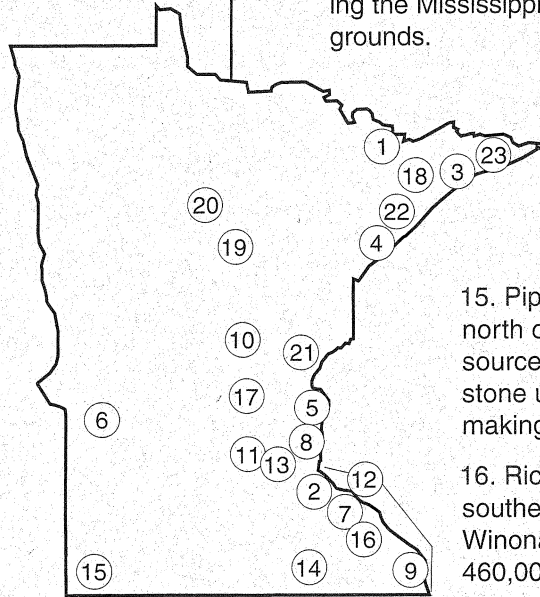
**P I A**

No story about Minnesota forests is complete without the inclusion of Babe, the Blue Ox, and his mighty friend, Paul Bunyan. Paul and his stories are typical tall tales, stretching the truth and full of fun and tomfoolery as they try to explain a situation or solve a problem. These are usually told in the first person and the storyteller claims to personally know Paul.

Read or have the children read some of the stories about Paul and Babe's adventures (see the bibliography). Reenact some of the stories. Then have the students write some of their own tall tales about different interesting features of the Minnesota landscape (see the list of some Minnesota landmarks on the next page). For example, how did Minnehaha Falls get smack dab in the middle of the city? Why aren't there any trees on that prairie? How did Lake Pepin get in the middle of the river?

## SOME MINNESOTA "NATURAL" LANDMARKS:

1. Boundary Waters Canoe Area—In the Arrowhead region of Minnesota. One million acres of lakes, trees, and rivers.
2. Chimney Rock—South of Hastings off Highway 61. Turn west at 220th Street and continue two miles to a T intersection. One-half mile farther north is Chimney Rock, a 34-foot formation surrounded by oak and birch trees. This sandstone rock is capped by a thin layer of limestone that protects it from rain.
3. Devil's Kettle Waterfalls—In Judge C. R. Magney State Park on Highway 61, 42 miles southwest of Grand Portage. A mysterious geological wonder. The Brule River divides, and one side tumbles 50 feet to a pool below. The water from the other side plunges into a huge pothole never to be seen again. That is the mystery of Devil's Kettle.
4. Gooseberry Falls—Gooseberry Falls State Park. On Highway 61, 15 miles northeast of Two Harbors. Visible from the Highway 61 bridge. A spectacular series of waterfalls on the Gooseberry River. The first fall is above the bridge. It drops 30 feet into a pool that flows under the bridge to the 60-foot, two-tiered lower falls, and on to Lake Superior.
5. Interstate State Park—One mile south of Taylor's Falls on Highway 8. Interesting geological rock formation and "potholes" not found anywhere else.
6. Lac Qui Parle Lake—In the Minnesota River just west of Milan.
7. Lake Pepin—In the Mississippi River between Red Wing and Wacouta.
8. Lake St. Croix—In the St. Croix River at Stillwater. *Lac Qui Parle Lake, Lake Pepin, and Lake St. Croix are each within a river. These lakes have been formed by other rivers carrying sediment and depositing it into the three major rivers. The deposits create sandbars that back up the water and form lakes.*
9. Le Crescent—Town in the southeastern corner of the state. Called the apple capital of Minnesota because of all the apple orchards in the area.
10. Mille Lacs Lake—North of the Twin Cities area on U.S. Highway 169. One of the largest lakes in Minnesota—18 miles long, 14 miles wide.



11. Minnehaha Park—Minnehaha Creek is in Minneapolis. Spectacular Minnehaha Falls and walking trails to the Mississippi River.
12. Mississippi River—Forms the eastern boundary of Minnesota from Hastings south.
13. Mounds Park—East side of St. Paul overlooking the Mississippi River. Sacred Indian burial grounds.
14. Mystery Cave—Off Highway 63 near Spring Valley. Minnesota's largest underground caves with fossils, stalactites, a lake, and a river.
15. Pipestone Quarry—Sixteen miles north of Luverne. This quarry is the source of unusual reddish-colored stone used by American Indians for making pipes.
16. Richard J. Dorer State Forest—In southeastern Minnesota, west of Winona. An area of two million acres, 460,000 of which are hardwoods.
17. Sand Dunes State Forest—West of Zimmerman. During the "Dust Bowl" of the '30s, the light soil in this area drifted like snow over roads and front porches. Concerned citizens began to plant trees there.
18. Sawtooth Mountains—In Superior National Forest off Highway 61. Forests of maple, aspen, oak, and pine.
19. Schoolcraft State Park—Located along the banks of the Mississippi River near Deer River. Indian wild-ricing site surrounded by a forest of giant pines.
20. Star Island—In Cass Lake in Chippewa National Forest, north of the Twin Cities off Highway 371 between Bemidji and Grand Rapids. Star Island is the largest island in the lake. It has its own lake!
21. St. Croix Valley—Located along the St. Croix River on the eastern side of the state. A mix of hardwood and pine forests.
22. Tettegouche State Park—Off Highway 61 near Silver Bay. Rugged, semimountainous terrain. Has four wilderness lakes within the park.
23. The Witch Tree—A 300-year-old gnarled and twisted cedar tree grows out of the rocks and is located a few feet above Lake Superior east of Grand Portage.

Let's add some fun to those tall tales. Look at the list of "logger's lingo." Have the students liven up their stories by including some of the terms (for example, "The belly robber loaded the swing dingle with the sweat pads and vegetable fireworks")!

### Loggers' Lingo

axle grease: butter  
belly robber: poor cook  
blackjack: coffee  
cookee: cook's helper  
gazebo: wood worker  
greenhorn: new logger  
logging berries: prunes  
lye: lousy coffee  
nosebag: lunch bucket  
overland trout: bacon  
river pig: man who drove the logs  
downstream to a sawmill  
road monkey: man who kept the logging  
roads in good condition  
sweat pads or liver pads: pancakes  
swing dingle: sleigh taken into the  
woods carrying lunch  
the push or the big push: camp foreman  
vegetable fireworks: beans

## Activity 14: Tree Treasures!



A treasure is something precious that we value and protect. Trees are one of our most precious natural treasures. We have spent a great deal of time learning that even though they are a renewable resource, they need our protection and wise use.

Read about two men who appreciated the outdoors and spent a great deal of their lives working to create awareness and protection for our vast resources. John Muir's love of nature helped persuade President Teddy Roosevelt to set aside 148 million acres of forest reserves. Our very own Minnesotan, Sigurd Olson, helped create the BWCA (Boundary Waters Canoe Area).

Find out about conservation groups. (National Audubon Society, American Forestry Association, Izaak Walton League, Greenpeace, National Wildlife Federation, Sierra Club, The Wilderness Society, The Nature Conservancy to name a few.) Contact one of the groups and have someone come to talk to you. Join a group or start one of your own!

Start to become aware of what you use, how you use it, and how that use affects other living things. That knowledge will lead to an attitude of respect and a change of habits. Those changes will create a strong and healthy web of life for all living things! ❁

~  
"Man can no longer live for himself alone. We must realize that all life is valuable and that we are united to all life. From this knowledge comes our spiritual relationship to the universe."  
~

—Albert Schweitzer



Poetry is the music of the soul. Its simple rhythm and meter touch us like no other type of writing.

Read or listen to the following poems. "Feel" what they have to say. Draw pictures of what they say to you. Create your own poems of what trees mean to you.

### **Trees**

I think that I shall never see  
A poem as lovely as a tree;  
A tree whose hungry mouth is pressed  
Against the earth's sweet flowing breast;  
A tree that looks at God all day  
And lifts her leafy arms to pray;  
A tree that may in summer wear  
A nest of robins in her hair;  
Upon whose bosom snow has lain  
Who intimately lives with rain;  
Poems are made by fools like me,  
But only God can make a tree.

—Joyce Kilmer

### **Arbor Day**

"Tree Planting Day" they called it  
In Nebraska long ago.  
Now we call it Arbor Day, and  
Oh, I love it so!  
I love to plant a growing thing-  
A tree, a shrub, a vine-  
And know it will for years and years  
Keep growing there, a sign  
To children who come after me  
That someone thought of them,  
And left behind a living friend  
More precious than a gem.

—Betty Foust Smith

### **Trees**

Trees are the kindest things I know,  
They do no harm, they simply grow.  
And spread a shade for sleepy cows,  
And gather birds among the boughs.  
They give us fruit in leaves above,  
And wood to make our houses of.  
And leaves to burn on Halloween,  
And in the spring new buds of green.  
They are the first when day's begun,  
To touch the beams of morning sun.  
They are the last to hold the light,  
When evening changes into night.  
And when the moon floats on the sky,  
They hum a drowsy lullaby.  
Of sleepy children long ago  
Trees are the kindest things I know.

—Source unknown

What does he plant who plants a tree  
He plants, in sap and leaf and wood,  
In love of home and loyalty,  
And far-cast thought of civic good  
His blessing on the neighborhood.

—Charles Lathrop Pack

**What Do We Plant  
When We Plant the Tree?**

What do we plant when we plant the tree  
We plant the ship which will cross the sea,  
We plant the mast to carry the sails,  
We plant the planks to withstand the gales-  
The keel, the keelson, the beam and knee-  
We plant the ship when we plant the tree.  
What do we plant when we plant the tree?  
We plant the houses for you and me,  
We plant the rafters, the shingles, the floors,  
We plant the studding, the lath, the doors,  
The beams and siding, all parts that be,  
We plant the house when we plant the tree.  
What do we plant when we plant the tree?  
A thousand things that we daily see.  
We plant the spire that out-towers the crag,  
We plant the staff for our country's flag,  
We plant the shade from the hot sun free:  
We plant all these when we plant the tree.

—Henry Abbey

**Trees of the Fragrant Forest**

*(For six children. As they take their places  
upon the stage, those in seats recite the first  
stanza.)*

Trees of the fragrant forest,  
With leaves of green unfurled,  
Through summer's heat, through  
winter's cold  
What do you do for our world?

First: Our green leaves catch the raindrops  
That fall with soothing sound,  
Then drop them slowly, slowly down;  
It's better for the ground.

Second: When, rushing down the hillside,  
A mighty fresh stream foams,  
Our giant trunks and spreading roots  
Defend your happy homes.

Third: From burning heat in summer  
We offer cool retreat,  
Protect the land in winter's storm  
From cold, and wind, and sleet.

Fourth: Our falling leaves in autumn,  
By breezes turned and tossed,  
Will rake a deep sponge-carpet warm,  
Which saves the ground from frost.

Fifth: We give you pulp for paper,  
Our fuel gives you heat;  
We furnish lumber for your homes,  
And nuts and fruit to eat.

Sixth: With strong and graceful outline,  
With branches green and bare,  
We fill the land through all the year,  
With beauty everywhere.

All: So listen! From the forest  
Each one a message sends  
To children on this Arbor Day:  
"We trees are your best friends!"  
—Source unknown

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# ACTIVITY SHEET 5A

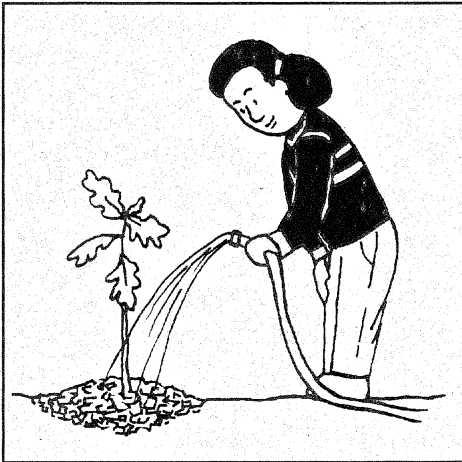
## HELPING HANDS FOR TREES

Trees in our cities and near our homes need special care. Here are some ways you can help.

### DO

Water and fertilize trees.

Trim off dead branches.



Be sure the soil under trees doesn't get too packed down.



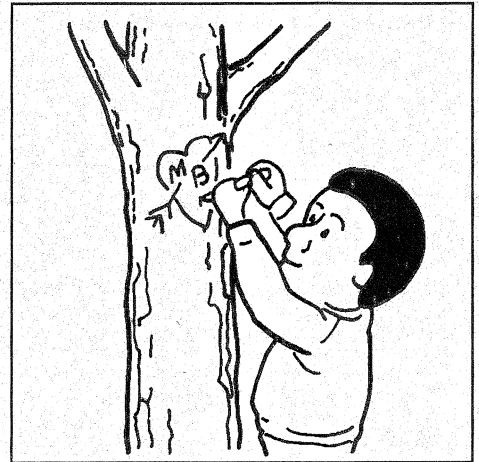
Protect trees from injury.

Call your local forester if you see a tree that seems diseased or badly injured.



### DON'T

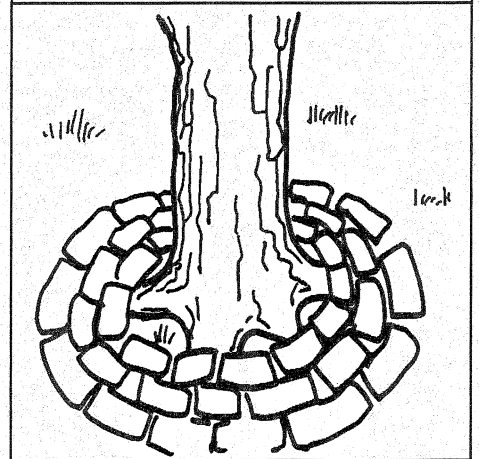
Carve on a tree, break its branches, or peel off its bark.



Climb or pull on small trees.

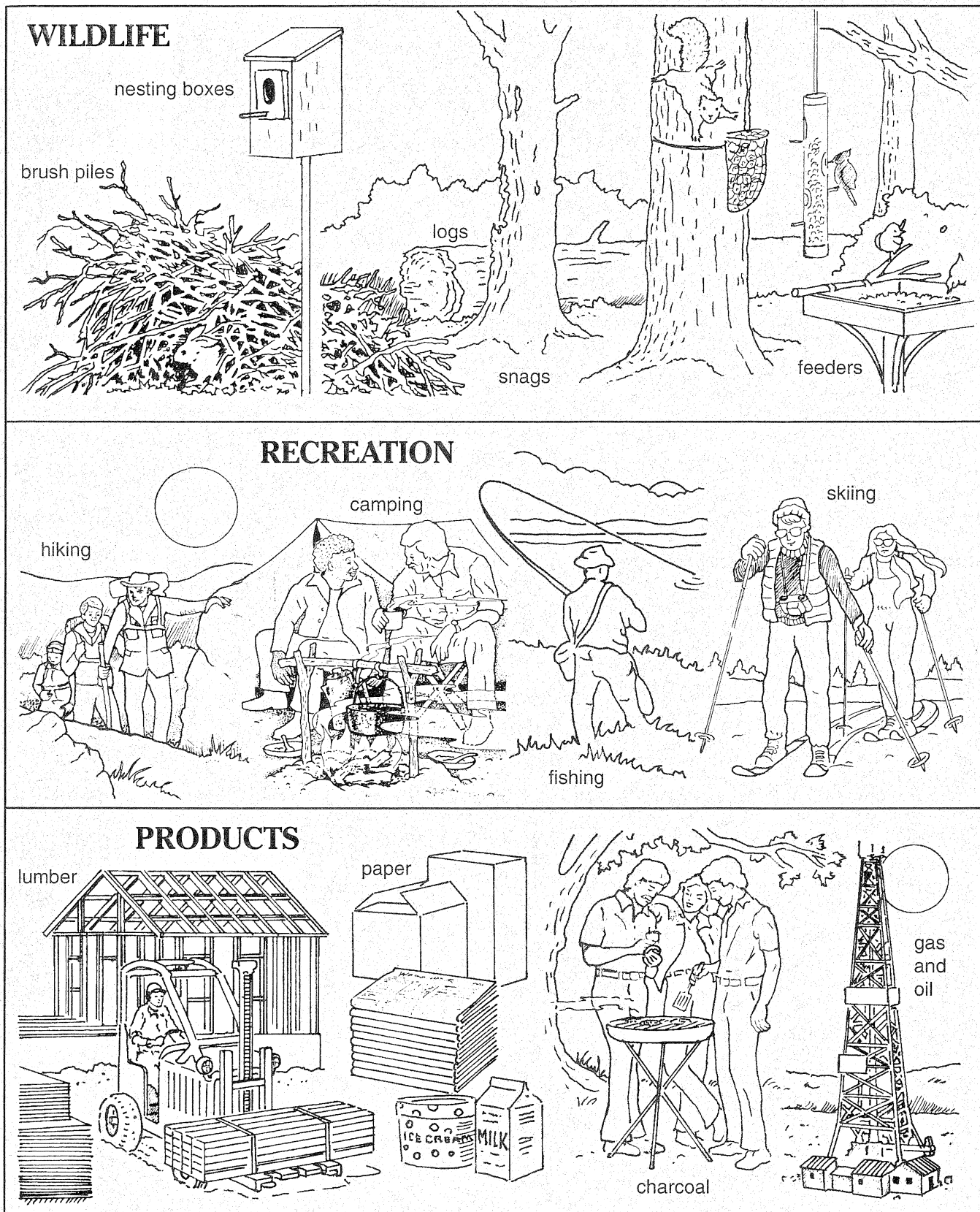


Cover the soil around trees with bricks, patio blocks, cement, asphalt. Roots need water and air!



# ACTIVITY SHEET 5B

## WE ALL NEED FORESTS



Reprinted with permission of National Wildlife Federation from the Trees Are Terrific issue of NatureScope, ©1992.

# ACTIVITY SHEET 5C

## HOW DO PEOPLE WOUND TREES?

What happens to the tree?



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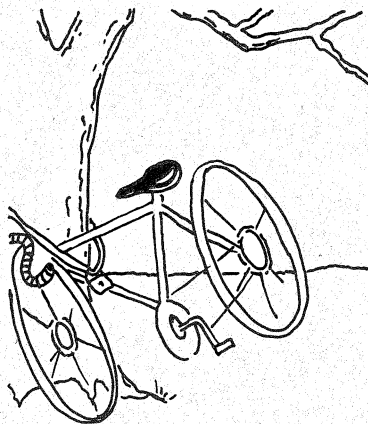
What happens to the tree?



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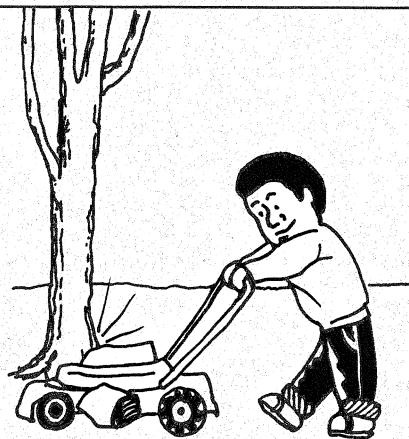
What happens to the tree?



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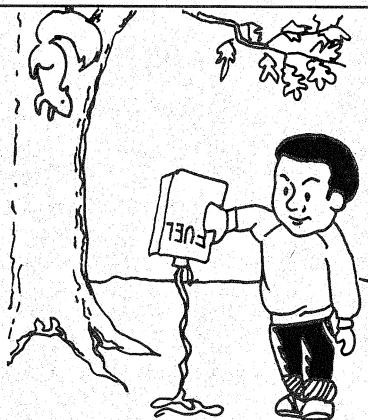
What happens to the tree?



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What happens to the tree?



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What happens to the tree?

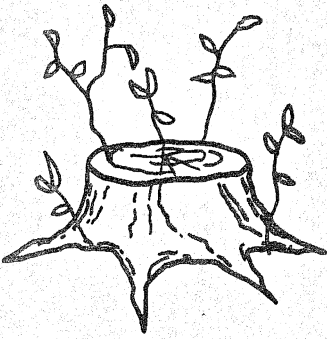

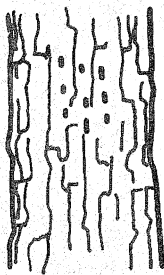
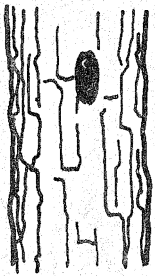
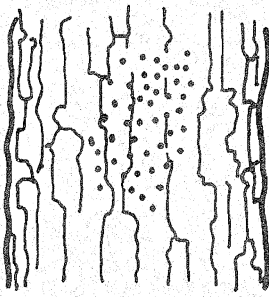
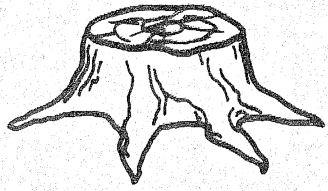
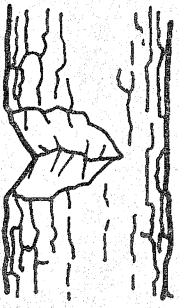
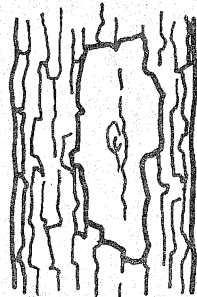
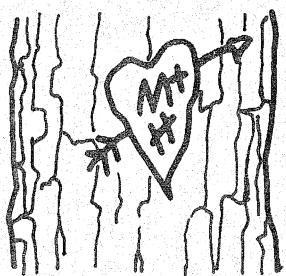
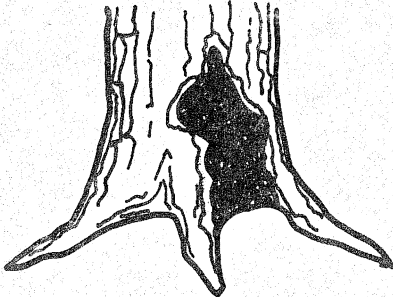
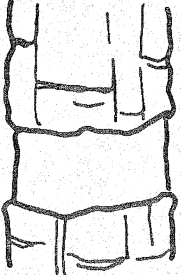
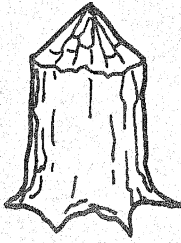


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# ACTIVITY 5C CONTINUED

## HEALTHY AND UNHEALTHY TREES

<p>Stump regeneration</p> 	<p>Broken off</p> 	<p>Sap-sucking bird holes</p> 
<p>Woodpecker holes</p> 	<p>Insect holes</p> 	<p>Stump</p> 
<p>Ax</p> 	<p>Bark scraped or torn away</p> 	<p>Human damage</p> 
<p>Fire scar</p> 	<p>Tree bark removed around entire tree</p> 	<p>Stump left by a beaver</p> 

Used with permission of Mary Beth Blomeke, Camp Courage.

# ACTIVITY SHEET 5D

## A FOREST IN YOUR YARD

If the average-sized yard (75 feet by 150 feet) was planted as a representative cross section of Minnesota's forest land, it would be crowded with 108 trees!



Amy B. Beyer

Used with permission, Forest Resource Assessment and Analysis Program, Minnesota Department of Natural Resources—Division of Forestry.

# ACTIVITY SHEET 5E

## LET'S PLANT A TREE

### Why Plant Trees?

All it takes is to look at a tree, or to sit under one on a hot summer day, to appreciate this unique plant. A tree is a beautiful living thing. Our peace of mind, our emotions, and our spirits are affected by what our eyes see. The pleasing look of trees makes them one of the most important, beautiful things in our environment.

But we receive many benefits from trees other than those we see. Trees make important contributions to the ecology and economy of wilderness, rural, and urban areas.

Forests protect the water supply by preventing runoff and erosion. They also purify the air, provide habitat for wildlife, and occupy places where we can go to "get away from it all" by camping, hiking, and skiing.

Commercial forests in our state provide the nation with hundreds of tree products, including paper, film, turpentine, plastics, and many chemicals. Minnesota's forest industries make an important contribution to the state's economy.

Where proper ground cover is lacking, rural areas in the United States lose over \$1 billion worth of precious topsoil every year. The planting of field windbreaks and farmstead shelterbelts helps prevent this kind of costly erosion in our state. Windbreaks and shelterbelts also reduce the effects of summer and winter winds on humans and animals; cut down on heating costs in homes; protect feedlots, gardens, orchards, and crops; and beautify homes and farmsteads.

Trees make commercial and residential areas in Minnesota's cities and towns more beautiful and valuable. But they do much more than make our urban areas pleasant places to live. Trees are one of nature's most efficient dust traps. Their leafy surfaces keep a steady flow of dust and dirt from saturating

the air we breathe. They relieve sound pollution by breaking up and reducing sound waves; tests have shown that proper landscaping can reduce traffic noise, too. Trees keep cooling costs down in summer, and so conserve precious energy resources. They absorb carbon dioxide from the atmosphere and give off oxygen.

In a single day, each full-grown adult inhales 35 pounds of oxygen—and we get it all from green plants on land and in the sea. Planting trees is not only a matter of comfort, beauty, and economy. They help us survive!

### How to Plant a Tree

Scope out a site in your yard. Check with an adult first. (If you are unable to plant in your yard, contact your city offices about planting on the boulevard or at a local park. Other possibilities might be your church, school, or parents' office. In any case, be sure to get approval from the person in charge.) Call the Gopher State utility hotline and get help from an expert to locate buried electric, gas, or other utility lines.

Twin Cities: 454-0002

Greater Minnesota: 800-252-1166

While waiting for the utility locator, select a tree that will grow well on the site you've selected. Consider the soil type. Is it sandy and well drained? Or heavy clay, and so perhaps wet and possibly compacted? Be sure to choose a tree that will grow in the soils of your site. For help, check with your local nursery or garden center, city forester or tree inspector, DNR Private Forest Management forester, county extension agent, or Soil and Water Conservation District technician.

## LET'S PLANT A TREE *continued*

### Planting Your Trees

When choosing and planting a tree, remember there are a number of different growing regions in Minnesota (see Unit 4, Activity Sheet 4B). Some species of trees do better in one region than another. Before choosing a tree, find out what kinds of trees do well in your part of the state, and also at your chosen planting site.

The root systems of both seedlings and saplings must be protected before the trees are planted.

The roots of some saplings are already protected in containers or large clumps of dirt surrounded by burlap. Some saplings are purchased bareroot, however. If seedlings are bareroot, they must be kept in water, and not exposed to wind and warm temperatures for more than 3 to 5 minutes before they are planted, or the roots will be damaged. All young trees, especially the bareroot trees, must be protected from extreme hot and cold. Their roots must not be allowed to dry out.

It's important to plant your trees properly. See Activity Sheet 5F.

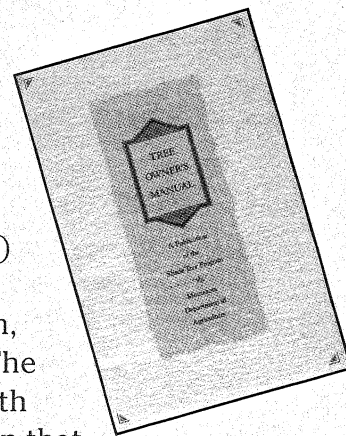
Trees are living things that need your care and protection. They need to be mulched and watered regularly after planting, too.

### Resource

"*Tree Owner's Manual*" by the Minnesota Department of Agriculture, Shade Tree Program, (1990) is a 24-page guide to proper tree selection, planting, and care. The manual is packed with the latest information that any prospective tree owner will want to have as a reference. To get your copy send \$1.20 (plus tax) to:

Minnesota Extension Distribution Center  
Room 20 Coffey Hall  
1420 Eckles Avenue  
St. Paul, Minnesota 55108

Ask for "*Tree Owner's Manual*," bulletin number AG-MI-3898.



# ACTIVITY SHEET 5F

## HOW TO PLANT A TREE

<p>1. Choose a proper location for your tree. Don't forget its ADULT size.</p> 	<p>2. Keep your roots moist at all times. Dry roots die.</p> 	<p>3. Dig a hole large enough to spread the roots apart.</p> 
<p>4. Place the tree in the hole at the proper depth. (See "How Deep" illustration.) Gently add loose soil.</p> 	<p>5. Add more soil and firm with foot.</p> 	<p>6. Mulch with wood chips.</p> 
<p>7. Water regularly.* Wait for shade!</p> 	<p><b>HOW DEEP?</b></p> <p>Too shallow.      Just right.</p> <p>Too deep.</p> 	

\* Consider what care besides watering your tree will need in the months and years to come: protection from people, animals, machines such as lawn mowers, wind, disease, smothering by grass and ground cover, etc. How will the tree get this protection?

Adapted with permission from A Teachers' Guide to Arbor Month, Minnesota Arbor Month Partnership, 1990.

# ACTIVITY SHEET 5G

## LOGGING IN MINNESOTA

Minnesota's lumber industry played a big part in the development of the state. The first major harvesting of timber is thought to have been by army troops at Fort Snelling where the area's first sawmill was built in 1821. By the 1830s logging had spread along the St. Croix River Valley; the state's first commercial sawmill was built at Marine-on-St. Croix in 1839. For many years, sawmill operations in the Twin Cities were the largest in the United States. Sawmills were built near rivers because logs were floated to the mills. Logging in Minnesota was heaviest between about 1890 and 1930.

White pine was the most popular timber tree, and Minnesota had plenty of those. Some were so big around, it would take five people to circle them. A few reached as high as a 10-story office building.

Most of Minnesota's first loggers or lumberjacks came from the eastern United States or Canada. They were much like migrant workers, following the timber harvest as it moved from settlements in the east through the forest wildernesses to the west. The forests were harvested for two main reasons: to provide wood and timber to meet the building and other needs of a growing United States population, and to clear land for fields to grow agricultural crops. Loggers didn't think about conservation. There seemed an endless supply of timber, and fields were thought to be more important to a growing country than forests.

As more land was cleared, settlers began arriving in Minnesota from the European countries, especially Scandinavia. These immigrants often headed for logging camps to find work.

Between 60 and 90 men usually lived in a camp. There were no women in these early camps, but later, some had women cooks.

Logging took place in winter. Logs were skidded to the river by horse-drawn sleighs over the ice. Then in the springtime when the rivers thawed, logs were floated downstream. You may have seen pictures of logjams showing what happened when logs became tangled. Sometimes dynamite was needed to break up the jams.



Logs were pulled by horse-drawn sleighs to the river.

MIN-DNR Photo

A lumberjack's day started at sunrise and ended at sundown. It was hard, strenuous work. After working all day in the cold woods, the jacks headed for the cook shanty for a hot meal. Then it was on to the bunkhouse where they hung up their wet clothes to dry and settled down to relax a little while before going to bed. Bedtime was early, and the men slept two or even three to a bunk on straw-filled mattresses.

Most of the lumberjacks stayed at the camp all winter. The weeks were long and boring, and the jacks became experts at entertaining themselves. Fast-moving card games, dances (some wore flour sacks around their waists to take the ladies' parts), and tall tales were favorite activities.

## LOGGING IN MINNESOTA *continued*

Mealtime was an important part of each day. Other than the foreman who was in charge of everything, the cook was the most important person in the camp. Because the camps were far from supply stores and had no way of preserving food, the cook usually wasn't able to make many different kinds of food. But what he did make had to be good or the men would move to another camp or have him fired. In most cook shanties no talking was allowed except to ask that food be passed.

Life in a logging camp wasn't easy. There was no electricity, running water, indoor bathrooms, power tools, or machines.

About 5,000 people still work as loggers in Minnesota today. They no longer live in logging camps; most live at home and drive to work in the forest each day. (If a logging site is a long way from home, some rent rooms in a nearby town until a particular job is finished to save time during their busy workdays.) Most loggers pack their lunches and eat in the woods.

The jobs loggers do today are the same things loggers did at the turn of the century to harvest wood, but the tools and ways of doing it have greatly changed.