

# A4 - Why Trees Are Important

This unit is about the reasons trees are important to people. When you have finished it, you will agree that the world would be a different place without trees. In your notebook or recordbook, keep a record of everything you do in this lesson. Include the date you started and the date you finished each thing you did. Give a clear description of what you did and the results you obtained.

## Meeting 9 Trees Provide Beauty And Comfort

"Why are trees important?" Trees increase the everyday satisfactions we obtain from living. Trees are pleasing to our sense of beauty. This is because of their shapes, foliage colors, foliage patterns, flowers and seasonal differences. Trees add beauty. We like trees on home grounds, in parks and along streets and roadsides. Trees help us enjoy living. Trees are used to screen or hide unsightly areas from view. They also reduce the amount of dust and other pollutants in the air. Trees take in carbon dioxide and give off oxygen. Therefore, trees are a part of nature's process of air purification.

Trees improve our comfort through effects they have upon sun and wind. Perhaps you have felt the pleasant coolness of tree shade in contrast to the heat of the summer sun. When trees are planted in a correct arrangement, they break up strong winds. By doing this, they reduce the chill factor of cold days. They may decrease the drying effects of hot winds in summer. Crops do better in fields that are protected by shelterbelts or windbreaks. People like living in areas where trees offer shade and beauty. When planted in a proper arrangement and location, trees help reduce noise or unpleasant sounds. Also, the same trees may help reduce heating and airconditioning costs.

Trees provide added enjoyment because they attract birds and beneficial insects, such as honeybees. Many kinds of trees and shrubs have sweet smelling flowers. We enjoy their fragrance. Trees also provide many different kinds of edible fruits. These are pomes, drupes, nuts or berries. Some people have developed businesses of making and selling jams and jellies. These are made from wild tree fruits such as plum, crabapple, and wild cherry. Where they grow, rural people may gather quantities of black

walnut, butternut, hickory nuts, beechnuts, and hazel nuts. These nuts are eaten and some are sold. The sugar maple grows in good stands, particularly in New York, Vermont, and New Hampshire. There, people take sap from the maple trees. Then they boil it down into a delicious syrup.

### Things To Do

1. For your community, make a list of all the natural and planned uses you can observe of living trees.

2. Survey your community and make a list of the main tree species or at least 10 you find. Record what uses are being made of each. Put your final list in alphabetical order according to accepted common names of the trees, or according to scientific names.

3. Make a list of trees that you recommend for planting in your community. Give reasons for your choices, such as shade, beauty, windbreaks, wildlife habitat, and view or sound screens. Which one is best for each purpose?

4. On a hot day, take temperature readings at three levels: ground level, at 1 foot (30.48 centimeters) above ground level, and at about 3 feet 3 in. (1 meter) above ground level. Take the readings under heavy tree shade and in an open area under direct sunlight. Make the two readings at the same time if you can. You read the temperature in one location while someone working with you reads the temperature in the other location. Take three readings for each level, spaced a few minutes apart. (*NOTE:* Be sure to synchronize your thermometers). That means read both of them at the same time in the same location. If they vary, then take one as standard and correct the reading of the other. (For example, the first thermometer reads 95.7°F (35.38°C) while the second reads 95.2°F (35.27°C) at the same location. You can take the first as standard and add 0.50 to all the readings of the second thermometer. This will equalize later readings between the two locations). Do your readings show that tree shade effects air temperature on a hot day?

5. On a cold, windy day in winter take temperature readings. One should be at 3 feet (about 1 meter) above ground and another at ground surface out in the open where the wind is blowing unchecked. At or close to the same time, have someone take like readings on the protected or down-wind side of a dense windbreak. These readings may be 50 yards (46 meters) from the border inside a fairly dense woodland tract or forest. Compare the readings to see if the trees have any moderating effect on air temperature during a cold day. (*NOTE:* Before you start your official readings,

synchronize the thermometers as described in No. 4 above.)

6. On a windy day compare the wind velocity. Check the wind on the protected side of a windbreak or in a forest and compare the wind velocity in the open. You may be able to borrow anemometers or wind gauges from the Soil Conservation Service, the Forest Service, a college or school. A homemade wind gauge could show the differences. You should have at least two similar ways to measure so the two recordings can be done in the open and in the protected area about the same time. Record the wind velocity at one yard or one meter above the ground surface. Compare the anemometer records to see how much trees increase or decrease wind velocity.

7. If you can obtain the use of an audiometer, check the effect of trees on sound. Pick an area where you can go one direction in the open from a sound source and the other direction in a forest. Use a drum, a car horn or other suitable sound-maker. Then take readings on the loudness at given distances from the sound source in the open and in the forest. Compare the readings to see if the trees make any difference.

8. Tour a forested area with a wildlife manager or a forester. Look for examples of evidence that trees and shrubs are beneficial to many kinds of animals and birds.

9. Gather enough berries or other suitable fruits to make six small jars of jam, jelly or syrup. Make the product and evaluate it for flavor, consistency and color.

10. In a woodland or forest, identify and gather some edible nuts, such as hazel nuts, hickory nuts, black walnuts, and butternuts. Pinyon pine seed also will count. Gather two pounds or about 1 kilogram of a small nut, such as hazel nut. Gather four pounds or 2 kilograms of a large nut, such as a black walnut. Compare number of nuts in each group.

11. Make a study of some special product that is obtained from trees. Maple syrup, naval stores, and cascara sagrada are examples. Use your findings to give a talk before your club or your science class at school. Or, you may prepare a written report for your record book.

## **Land Use Values**

Trees have other values. Special plantings reduce or prevent soil erosion by wind and water. Sometimes, tree and shrub plantings are made to control snow drifting. They may provide shade for livestock. Other plantings improve habitat for wildlife species, providing them with a better food supply, improved protection or both. Trees protect and improve the soil and shade

streams, making the streams better homes for fish.

Trees improve the quality of water that comes from forested hills, mountains and valleys. Under a forest, great masses of tree roots help hold the soil in place. The mat of leaves, twigs, and other decaying materials that builds up on the ground under trees improves the soil quality. This absorbing mat also prevents rainfall from running off over the surface of the ground. Trees help the water soak into the ground. When the water comes to the surface later in springs, stream beds and lakes, it is clear and pure.

## **Things To Do**

12. While it is raining or very soon after a hard rain, observe the soil surface in an open area. Look at the soil with little or no vegetative cover. Compare this soil with what you see on a protected soil surface under trees in a park or forest. Observe and write in your record book all the differences you can see.

13. Visit a land area where maintenance of good wildlife habitat is a major management objective. Find out how trees and shrubs help wildlife species.

14. Visit a land area that has watershed as its primary value. Learn how trees influence watersheds.

15. Give a demonstration or an illustrated talk. Explain why tree cover on a watershed usually means water of good quality.

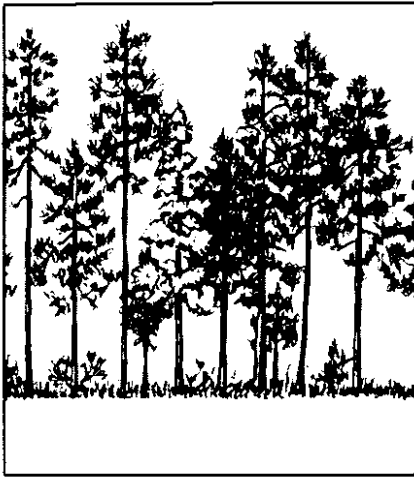
16. Prepare an exhibit or a demonstration. Show why water easily soaks into a soil that is protected by trees while it can easily run off an area where the soil has little or no cover.

## **Meeting 10 Trees Provide a Miracle Material - Wood**

Wood is a quality material. It is used for many purposes. Wood is light in weight for its strength. It can be hewn, sawed, carved or fitted. And wood is very durable if kept dry. It can be treated to make it durable even under poor conditions that favor decay. Wood will burn, but it does not warp, twist, or crumble when exposed to heat. Wood can be treated to make it fireproof.

Wood is a good material for building homes. It has a high heat and electrical insulation values. Wood inside houses gives most people a warm, friendly and comfortable feeling. Wood also can provide fuel for fires in a home or in a camp.

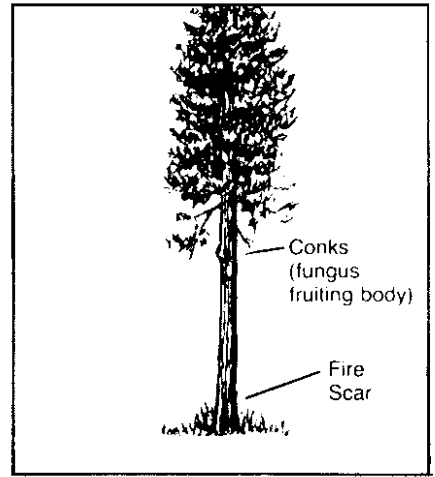
Bug-Kill. Red brown foliage stands out.



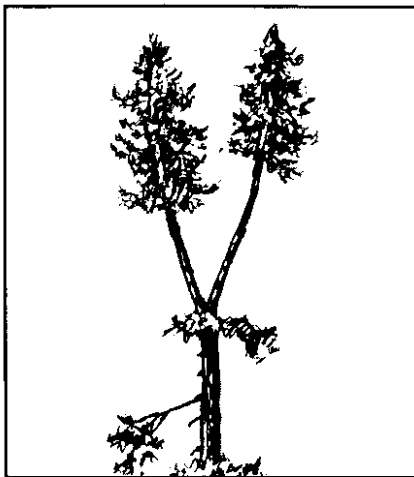
Crop trees. Vigorous well-formed trees spaced widely enough for good growth.



Cull tree. Conks and fire scar indicate extensive decay.



Schoolmarm



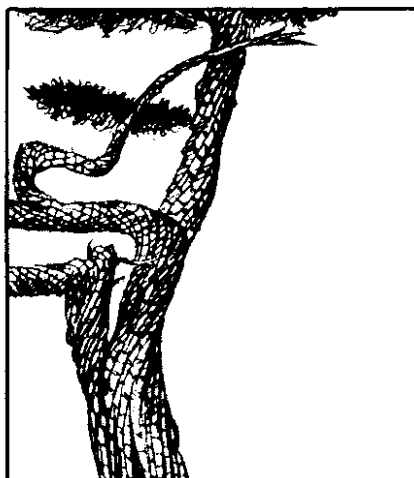
Seed trees left to provide seed for an area that has been logged.



Spike top



Spiral Grain



Widow-maker



Wolf Tree

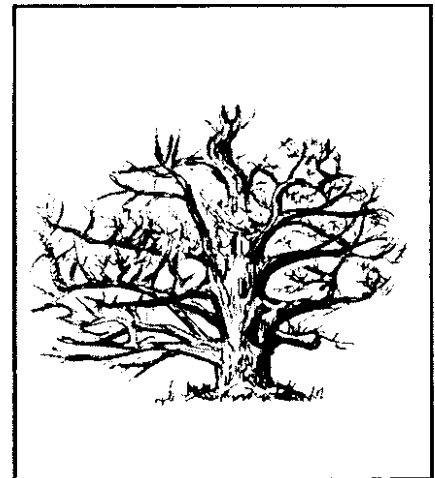


Fig. 19 Illustration of trees to which wood terms are applied.

Wood is the raw material for things that increase our living comfort. It is used for decorative items, papers, fabrics, plastics and medicinal products. In processing wood, many by-products are reclaimed. These include oils, acids, gums and tars, plus wood waste in many forms. Waste products may become fuel, particle board, insulation, soil additive or a special "mud" used in the drilling process for oil. Wood is a renewable resource. It doesn't require large amounts of work or energy to make it useful to people.

## Things To Do

17. Starting in your home and branching out to cover your community, make a list of the different uses being made of wood.

18. In your community, determine how important wood is as a home building material. If your community is large enough, count one or more groups of 100 houses each. Keep a record of how many wooden houses there are in each group of 100 houses. If your community is small, take a smaller group or count all the houses.

19. Compare the heat insulating value of the wood with that of aluminum, concrete or steel. Obtain a piece of metal or concrete and a piece of solid wood or plywood of equal thickness. With your leader's help, arrange the metal or concrete so it can have a candle, or other constant heat source under it. Place a thermometer on top of the material above the flame. Note how long it takes for the thermometer to show an increase of 10 degrees in temperature. Do the same with a piece of wood of the same thickness.

20. Visit a wood processing plant (sawmill, pulmill, furniture factory, particle board plant, post and pole plant or other). Find out what kind(s) of wood the plant uses, how it processes the wood, and what products it makes. Determine the economic impact of the plant upon the community.

21. Make a collection of wood samples from at least 10 different kinds of trees in your area. A good size for samples is 1 1/2 inch diameter by 6 inches long (about 5 centimeters by 15 centimeters). Cut away one face of each sample so that a longitudinal section is shown for half its length. Mount samples on a display board and name them. Show important uses of the wood of each species in the collection.

## Meeting 11 Trees Provide Employment

Trees are important because they provide jobs for many people. There are nursery workers

who grow trees for home and community use and for reforestation. There are landscape architects who design tree plantings to accomplish certain purposes. Or, they plan how existing stands of trees can be treated to protect or enhance certain values. (These include plans for forest clearcut areas that may reduce the natural beauty). Landscape gardeners fertilize, water, trim and take care of trees. Tree surgeons repair damaged trees, perform severe trimming or pruning jobs when needed and remove dead or dying trees. Foresters have the responsibility of meeting, in the best ways possible, the silvicultural and environmental needs of trees in cities, parks and forests. There are timber cruisers, loggers, mill workers, lumber brokers, and employees of manufacturing plants such as workers in a furniture factory. There are lumber yard employees, clerks in retail stores that sell furniture and other wood products, and Christmas tree growers. And, there are administrators, supervisors, service people and equipment suppliers that keep the thousands of tree and woodrelated workers on the jobs.

## Things To Do

22. Find out approximately how many people in your community or county depend upon trees for their jobs. Examples may be in production, construction, or retail businesses. Offices of the U.S. Forest Service, the state forestry, conservation or natural resources department, the Soil Conservation Service, Cooperative Extension Service, forest industry and chamber of commerce are possible sources of information. Make a report to your club on your findings.

23. Talk to several people whose work is dependent upon or closely related to trees—nursery workers, landscape architects, foresters, loggers, and mill workers. Find out what they really do. From your present understanding of your ambitions and talents, do you feel you would like employment that is dependent upon or otherwise closely related to trees? List the main things that make you feel either fitted or unfitted for such work.

24. As accurately as possible, determine the economic value of trees to your community or county. How does your answer compare with values of agricultural crops, livestock, mining, recreation, manufacturing or other industries?

25. Take one type of tree related employment, such as forester, logger, mill worker or tree surgeon. Collect or draw pictures to make an illustrated story of the work a person with such a job does. You may wish to write a play, a news article or a radio program on your findings.

## Other Things To Do

Here are some other interesting things to do that are related to this lesson. Try some of them.

26. Design an exhibit showing the effects of trees on the environment. These may include air temperatures, wind velocity, surface water runoff, soil erosion, water quality and wildlife protection.

27. Survey the needs for additional trees to be planted in your community.

28. Plant one or more trees at your home. Or, participate in a group tree planting project for community benefit.

29. If you live in a town, visit your mayor, city council or park department to learn what guidance is given to people who want to plant trees in the community. If there is no guidance offered, help establish a Community Tree Committee that would inform the community about:

- \*tree pests and other problems with growing trees in the community

- \*how to care for existing trees and shrubs

- \*needs for additional trees in the community

- \*recommended tree and shrub species to plant for different purposes

- \*how to establish young trees and care for them

## Glossary of Terms

### Anemometer

An instrument for measuring the speed or force of wind

### Annual ring growth

A layer of wood-including springwood and summerwood -grown in a single year

### Artificial reproduction

Means of reproducing trees through the use of cuttings or budding and grafting

### Awl-shaped leaves

Long, narrow leaves which taper to a fine point

### Axis

Main line of growth

### Bole

Trunk of a tree

### Bracts

A leaf from the axis of which a flower or floral axis arises; portion of Douglas-fir cone also

### Broadleaf

Trees having broad leaves instead of needles, often called hardwoods

### Bud scale scars

Scar left where terminal bud scale formed, often visible for several years

### Cambium layer

One cell thickness of tissue between the bark and wood that repeatedly divides to form new wood and bark cells

### Conifer

Trees and shrubs, mostly evergreens, including forms (as pines) with true cones and others (as yews) with arillate fruit

### Crown

The head of foliage of a tree or shrub-part of a tree bearing limbs or branches, including twigs, leaves, flowers and fruit

### Cuttings

A short piece of vigorous branch or stem of the past season's growth used in artificial reproduction of trees

### Deciduous

Trees that lose their leaves in the fall

### Determinate growth

Has terminal and lateral buds, forms buds for next year before the growing season is over

### Drupe

A one-seeded fruit which remains closed at maturity (cherry, for example)

### Evergreen

Trees which retain their leaves during the winter

### Foliage

The mass of leaves of a plant

### Genus

Closely related species form a genus

### Genera

Plural of genus; all genera make up a family

### Germinate

To begin to grow

### Graft

A method of reproducing a tree by joining the scion from one plant to the root-stock of a like plant called the host tree

### Habitat

A place or type of site where a plant naturally or normally lives and grows

### Host

The root-stock to which the scion is grafted

### Hybrid

The offspring of two different species or genera. Often has greater vigor than the parent stock

### Increment bore

A tool to help rate growth or tree age

### Indeterminate growth

Develops only lateral buds and never a terminal bud. Keeps on growing until cold or drought stops growth

- Lateral roots**  
Roots of nearly equal size growing from the bottom of the trunk at ground level or just below
- Leader**  
The primary or terminal shoot above the topmost whorl. Shows growth during most recent growing season
- Legume**  
Trees with bean-like seed pods such as black locust
- Lenticles**  
A pore in the stem of woody plants that is the path of exchange of gasses between the atmosphere and stem tissues
- Natural reproduction**  
The reproduction or growing of trees from seed
- Naval stores**  
Products such as tar, pitch, turpentine, pine oil and rosin obtained from pines and other coniferous trees
- Over winter**  
Period of time required for some seed coats to reach a point where moisture can penetrate to start growth
- Phloem**  
Inner bark. The principal or main tissue which carries food or sugar made in the leaves
- Photosynthesis**  
Process through which the leaves, with the aid of heat and light, make food from water, soil nutrients and carbon dioxide
- Pith**  
Small core of soft, spongy tissue at the growth center of the stem
- Pole**  
A young tree with a diameter of three to six inches (7-15 cm) in the small pole stage and a diameter of six to 12 inches (15-30 cm) in the large pole stage
- Pome**  
A fleshy fruit consisting of a central core with usually five seeds enclosed in a capsule and an outer fleshy layer
- Radial**  
Wood growth rings developing around a central axis
- Resin blisters**  
Lumps or blisters of a yellowish to brown natural organic substance formed by plant secretions
- Samara**  
One-seeded, winged fruit-ash, elm, maple
- Sapling**  
A young tree's period of growth from the time it reaches one inch (2.5 cm) in diameter and six feet (2 m) in height until it is three inches (about 7 cm) in diameter and 15 to 30 feet (4.5-9 m) in height
- Scion**  
A vigorous twig or cutting used in grafting to artificially reproduce trees
- Seedling**  
Stage in a tree's growth from germination to the point where it is no more than six feet (2 m) high and one inch (2.5 cm) in diameter
- Sheath**  
Annual layering of wood over the entire tree added by growth activity of the cambium. Top of each sheath shows height of the tree at the end of a given growing season
- Silviculture**  
The development and care of forests
- Species**  
Trees having similar characteristics and showing close relationship to each other
- Springwood**  
The part of the annual growth ring formed during the early part of the season's growth
- Sprout**  
New stems starting from stumps-or roots
- Stomata**  
Small openings through which the leaf takes in air
- Stratify**  
To store seeds in layers, alternating with moisture holding materials such as earth or peat
- Sucker**  
New growth as from buds hidden in the bark and previously shaded by other growth. May occur as a result of severe trimming of the crown
- Summerwood**  
The portion of the annual growth ring formed after springwood formation has stopped. Often called latewood
- Tap Root**  
A deep central or primary root growing vertically downward
- Terminal Bud**  
Growing at the end of a branch or stem. Buds below or behind are lateral buds
- Whorl**  
The layering or grouping of branches at the beginning of each year's growth
- Xylem**  
The water conduction, strengthening and storage tissues of branches, stems and roots