

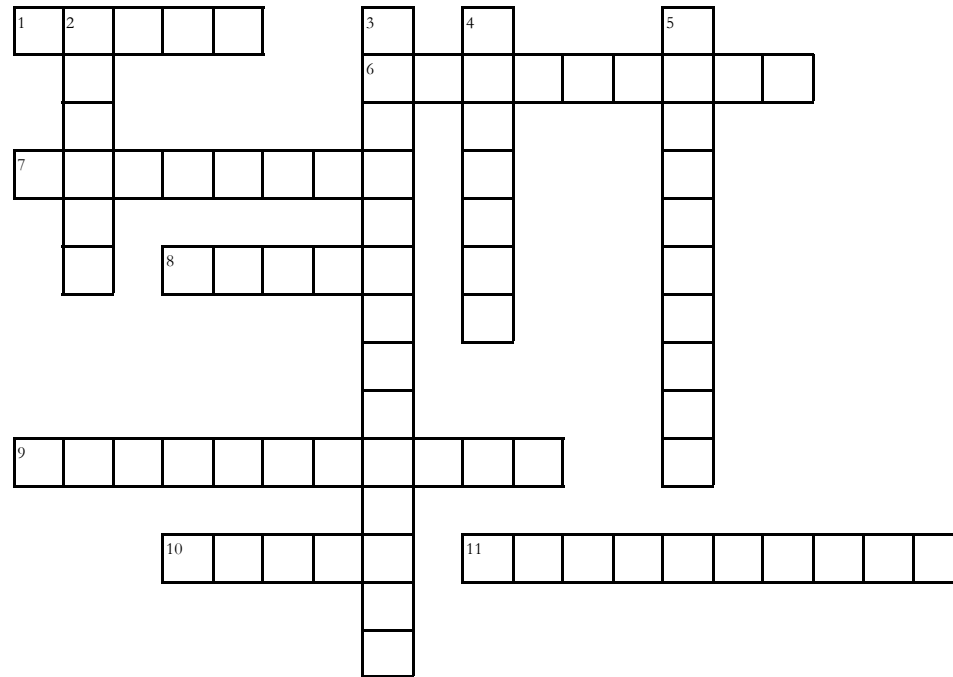
# All about Trees!

**ACROSS:**

1. Makes up 80-90% of a tree's bulk
6. The accumulation of older wood
7. \_\_\_\_\_ adapt to lower light
8. Forest litter helps form this
9. Makes leaves green
10. Absorbs water and nutrients
11. A type of cut with skimmed bark

**DOWN:**

2. A transverse cut is \_\_\_\_\_ the trunk
3. Process that takes in nutrients (sugar) and carbon dioxide and release oxygen and water
4. Growing layer between the bark and wood
5. Has waxy, small, and narrow needles



Answers: 1. Water 2. Across 3. Photosynthesis 4. Cambium 5. Coniferous 6. Heartwood 7. Tolerant 8. Humus 9. Chlorophyll 10. Roots 11. Tangential

## ONTARIO FORESTRY ASSOCIATION

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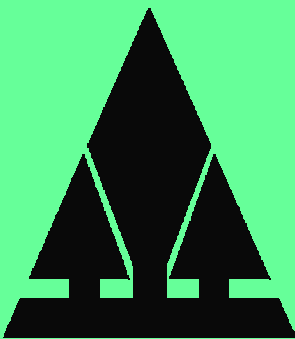


The Focus on Forests Program is a useful tool for teachers and resource educators in any stream of the Ontario education system. It is a guide devised to provide educators with comprehensive lesson plans to incorporate forests and environmental education in the classroom.

To obtain copies of these lessons is EASY, SIMPLE, and FREE!!! Each lesson is found online, grouped by grade level for easy searching. Simply register online with the Ontario Forestry Association – Focus on Forests, and there is unlimited access to these environmental resources.

[www.focusonforests.on.ca](http://www.focusonforests.on.ca)

(Source: Focus on Forest, 1991)



**ONTARIO FORESTRY ASSOCIATION**

**Inside this issue:**

Parts of a Tree	2
Deciduous or Coniferous?	2
Weird Wood Products	2
Lets look at Wood	3
All About Trees!	4

**DID YOU KNOW ...**

- The oldest living tree is 4,600 years old!
- Ontario has over 90 native tree species
- In a year, a tree can absorb the same amount of carbon dioxide produced by a car driving 26,000 miles
- Trees covering buildings can make the temperature up to 20 degrees cooler in the summer
- Roughly 187,000 Ontarians have forestry related jobs



## How do Trees grow in Forests?

As trees grow, their trunks increase in height and diameter, their branches grow larger and they carry more foliage. Root systems also increase in size. This means greater needs for nutrients and water.

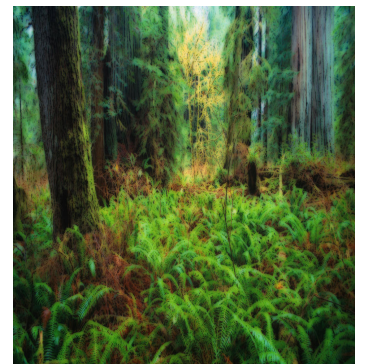
Taller trees with more access to sunlight have an advantage over shorter trees. Larger trees can absorb more water and nutrients and gain more access to sunlight.

Many smaller trees die because they cannot acquire

enough energy and raw materials. This interaction between individual trees is called competition.

Tolerant species are trees that have adapted to lower light. Intolerant species are those requiring full light.

Competition between trees of the same species, as well as between species, happens continuously in a forest. This competition exists among all trees in the forest, from the youngest to the oldest. They compete not only for light, but also for water and nutri-



## A Tree's Needs

Tree growth is affected by the quality, intensity, and duration of **light**. A tree's need for light varies depending on the species. They can be classified into two main groups: the **intolerants** (requiring full sunlight) and the **tolerantes** (which do not require full sunlight). For example jack pines require full sunlight in

order to grow while sugar maples can tolerate shade.

Trees also require nutrients from the **soil**. Again, different species require different types of soils. They also play a role in making part of the soil. Their scattered leaves on the forest floor will decay

along with other forest litter to form humus.

**Water** forms 80-90% of the tree's bulk. It is essential for transporting minerals and nutrients from the roots to the leaves. It is also an important raw material used in photosynthesis.

# Parts of a Tree

Trees are composed of many components which play a vital role in their growth and survival.

## Roots

Roots are a network found underground which helps to anchor the tree. In addition, roots help in absorbing water and nutrients from the soil. The tree uses these to manufacture food and grow.

## Trunk

The trunk is the main stem of the tree and has two primary functions: to support the crown of branches, twigs, and leaves and to transport food and water throughout the tree. Cutting through the outer bark will expose many different layers. The outer bark of the truck protects the inside part of the tree from injury as well as acts as an insulator against cold and heat. The phloem is soft and serves to distribute food made in the leaves to every living cell in the tree. The xylem or sapwood distributes water up the trunk to the leaves, where the food is manufactured. Cambium is the thin growing layer that is found between the xylem and

the phloem. The heartwood is the accumulation of older wood that ceases to carry sap.

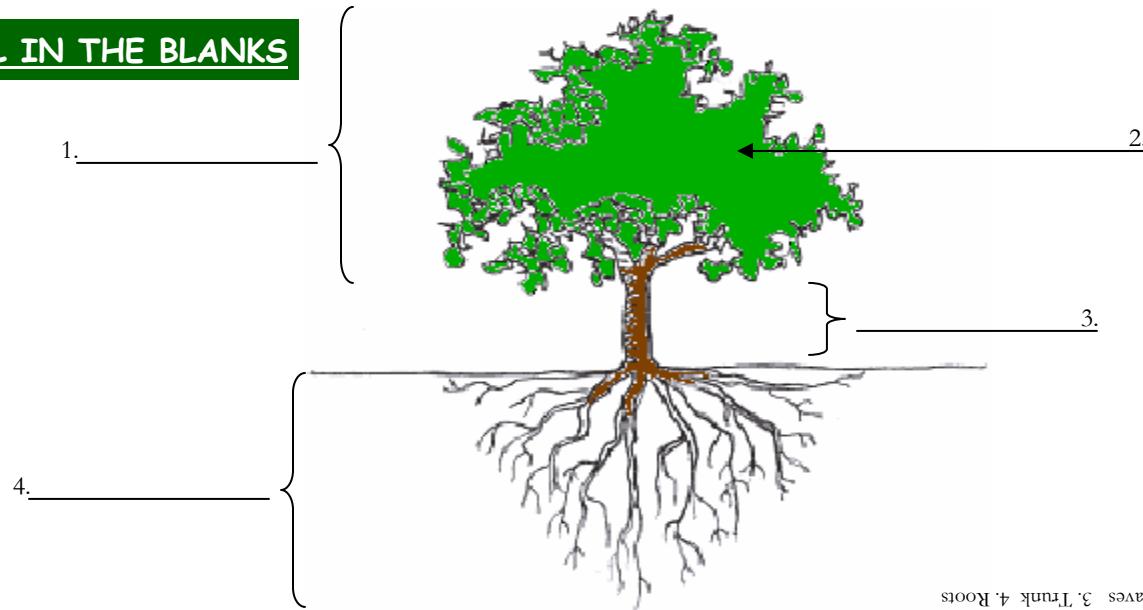
## Crown

The crown of a tree is composed of the branches, twigs, and leaves. The role of the branches and twigs are to hold the leaves up in order to receive sunlight which is vital to food production. In addition, they also support the flowers and fruit of the tree.

## Leaves

Leaves are the manufactures of food for trees. It is done through the process of photosynthesis; powered by sunlight, the green substance in leaves called chlorophyll uses carbon dioxide and water to produce carbohydrates. Also through the process oxygen is released through tiny pores called stomata and water is released through the process of transpiration. Trees in a way act like a giant air conditioner, cooling the air with water vapour and expelling oxygen, which we need to breathe.

### FILL IN THE BLANKS



Answers: 1. Crown 2. Leaves 3. Trunk 4. Roots

# Deciduous or Coniferous?

There are two types of trees that are present in Ontario forests; deciduous and coniferous. Deciduous trees, also know as broadleaves or hardwoods, drop their leaves every winter. Such trees include maples, oaks, birches, elms, etc. Coniferous, also known as evergreens, softwoods or conifers, are cone-bearing trees. Their small,

waxy, and narrow needles stay on the tree all year round. Some example are pines, spruces, cedars, etc.



Deciduous:

Maple tree

Coniferous:

Pine tee

# Weird Wood Products

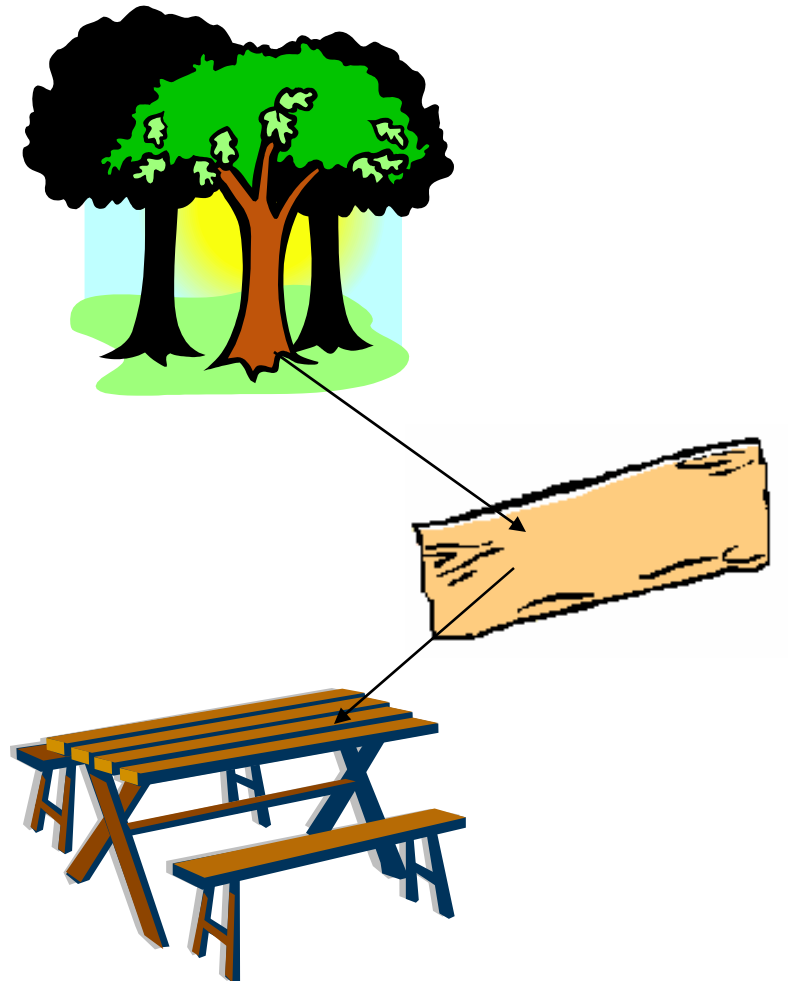
Sometimes the weirdest things can be made from things we least expect. When we look at trees, we don't really think about what it makes. All parts of a tree contribute to making certain products.

## Instructions:

1. Walk around the house and record what items you think come from trees. Write down what part of the tree the object comes from.
2. Put your objects in a list, placing them in categories of where in the tree their material comes from.

## Questions:

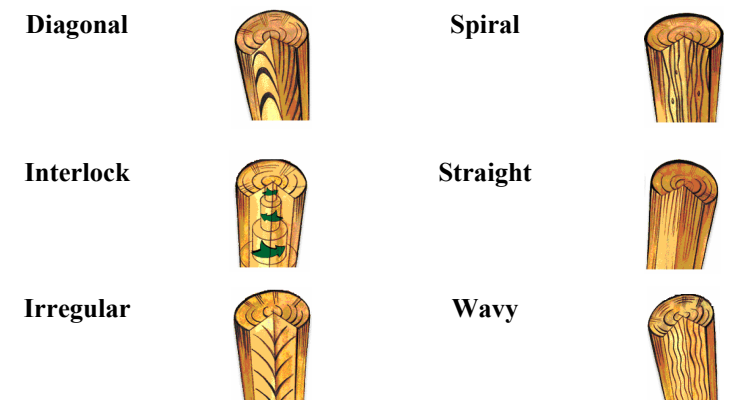
1. What part of the tree did most objects come from?
2. If there were no trees how do you think the product would be made?
3. List 5 products that come from trees that are not wood-based? What part of the tree do you think these products are made?



# Lets look at Wood Grains!

When we look at a piece of wood, we can see lines that give it personality. Although it may look appealing, the grain in the wood serves a purpose. The direction of the grain controls the ridgity and flexibility of the wood.

There are six different types of grains:



Grains can be produced in two ways; the way the tree grows and the way the wood is cut (transverse, radial, and tangential). A transverse cut is across the trunk, a radial cut is down the centre of the trunk while a tangential cut is skimmed of bark.