

# Reading the Rings of a Tree

Just by reading a tree's rings, you can discover some amazing things! Because the layers of wood a tree forms in the spring grow fast and consist of large cells, the rings are lighter. The slower summer growth has denser cells so those rings are darker. You probably already know that by counting the dark rings on a cut tree, you can tell how old it is, but if you examine the shape and pattern of the rings you can piece together the tree's whole history – from sunny days to insect infestation.

These narrow rings show the result of a serious drought.

Here you can see a scarred spot from a forest fire.

The rings are spaced widely, showing five years of good weather.

The rings narrow here, indicating insect infestation.

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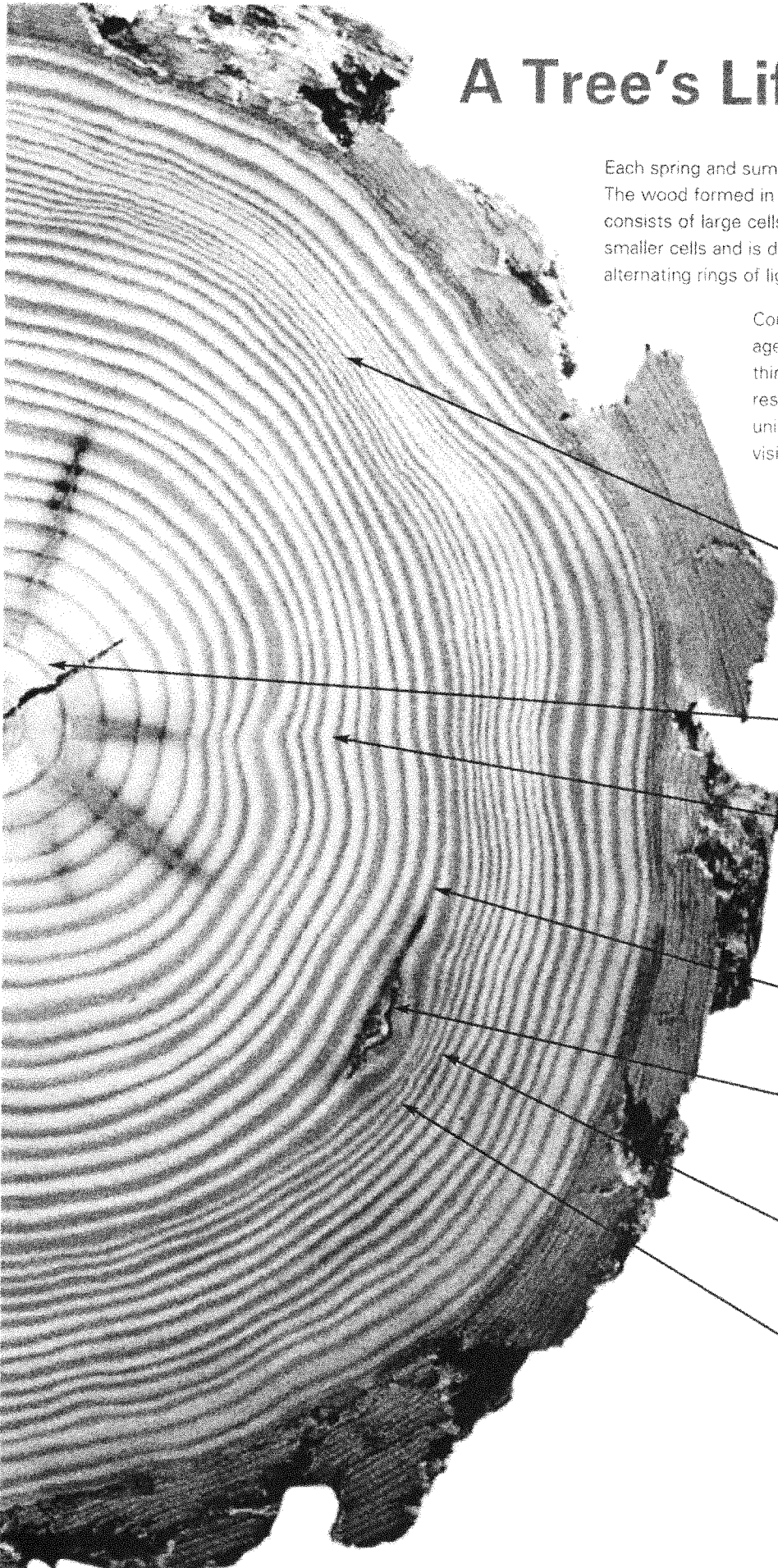
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# A Tree's Life at a Glance

Each spring and summer, a tree adds new layers of wood to its trunk. The wood formed in spring grows fast and is lighter because it consists of large cells. In summer, growth is slower; the wood has smaller cells and is dark. So when the tree is cut, the layers appear as alternating rings of light and dark wood.

Count the dark rings and you'll determine a tree's age. Study them, and you'll learn much more. Many things can affect the way a tree grows and, as a result, will alter the shape, thickness, color and uniformity of the rings. A typical tree's history made visible by its rings might go something like this:

- 
- A** A tree's rings that appear wider on one side than the other may indicate that something pushed against the tree as it was growing. The tree will build "reaction wood" to help support the side that's leaning.
  - B** A tree that's happy, getting lots of sunshine and rain, will show rings that are relatively broad, and evenly spaced.
  - C** If all else looks good but the growth appears to have slowed nonetheless, it's possible that neighboring trees are providing too much shade while their crowns and root system take up the lion's share of water and sunshine.
  - D** Remove the crowding trees, and you'll see wide, evenly spaced rings, indicating that the tree is growing rapidly and straight once more.
  - E** A fire in the forest can be easily seen by scarring on the tree's bark. Year by year, the tree will create more and more wood to cover the scar, but it's there to see in the tree's history.
  - F** Narrowed rings that go on for several seasons can indicate a drought. Few things can slow a tree's healthy growth like lack of water over a long period of time.
  - G** Narrow rings can depict an insect infestation, too. The larva of the sawfly, for example, eats the leaves and leaf buds of many kinds of coniferous trees.

# ACTIVITY SHEET 1A

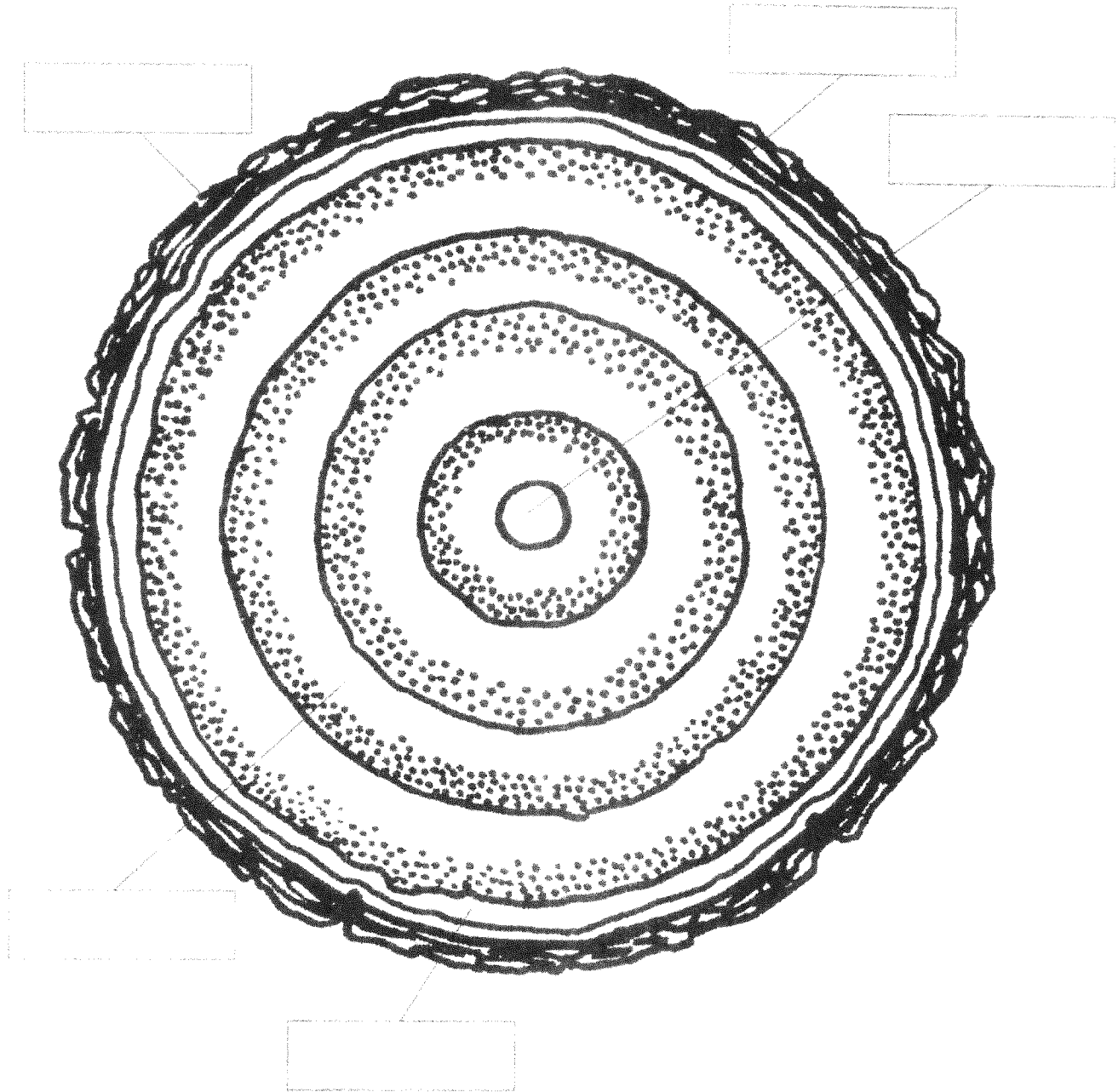
## LEARN THOSE LAYERS

Can you label each layer? The layers you're looking for are:

outer bark  
cambium

heartwood  
sapwood (or xylem)

phloem (or inner bark)



*Used with permission from A Teachers' Guide to Arbor Month, Minnesota Arbor Month Partnership, 1996.*



## Reading a Tree's Rings

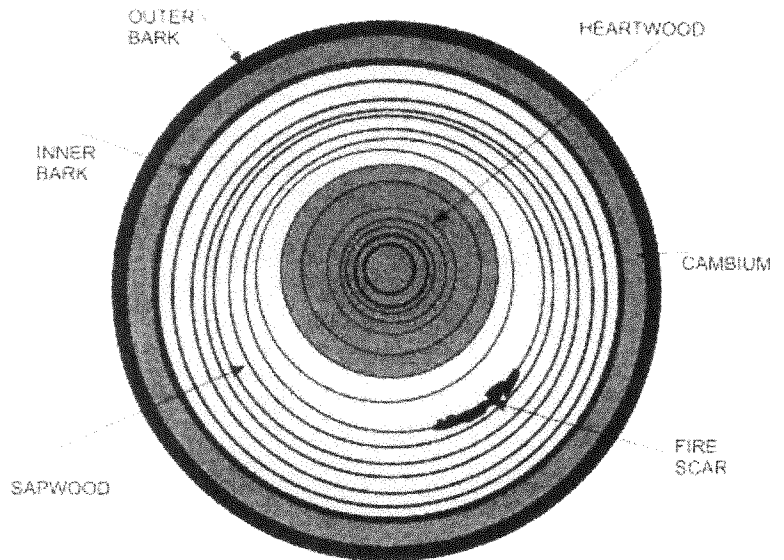
The outer bark is the protective outer layer of the trunk

The inner bark is the layer of the trunk through which the tree's food flows - it is located between the outer bark and the cambium. When this short-lived layer dies, it is called cork.

The cambium a single layer of living cells in the trunk that is located between the sapwood and the inner bark.

The heartwood is the core of the trunk, which contains very strong, dead tissue that supports the tree

The sapwood carries water and minerals between the roots, trunk, and branches. It is usually lighter in color than the heartwood.



Each ring represents one year. Larger gaps between the rings indicate more growth in a year. This could be due to more light due to thinning or better growing conditions (temperature, rain, etc.)

**Draw your own tree ring diagram below:**

# The Living Forest

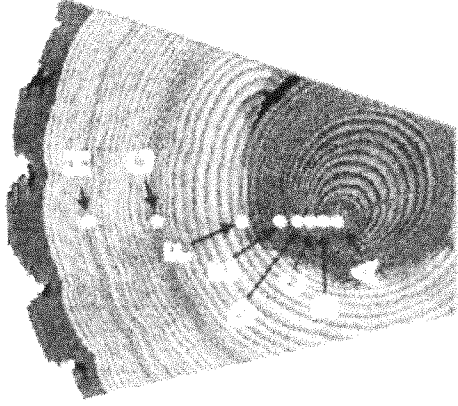


Image courtesy *International Paper*

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## What Tree Rings Tell Us About the Life of a Tree

This tree is 62 years old. It's been through fire and drought, plague and plenty. And all of this is recorded in its rings.

Each spring and summer a tree adds new layers of wood to its trunk. The wood formed in spring grows fast, and is lighter because it consists of large cells.

In summer, growth is slower; the wood has smaller cells and is darker. So when the tree is cut, the layers appear as alternating rings of light and dark wood.

Count the dark rings, and you know the tree's age. Study the rings, and you can learn much more. Many things affect the way the tree grows, and thus alter the shape, thickness, color and uniformity of the rings.

1920



The tree a loblolly pine is born.

(The tiny ring at letter "A" in the tree ring section above shows us how small the seedling was when it started to grow.)

1925



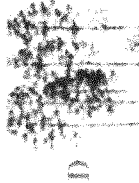
The tree grows rapidly with no disturbance. There is abundant rainfall and sunshine in spring and summer. The rings are relatively broad, and are evenly spaced.

1930



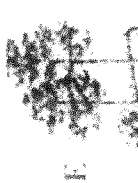
When the tree was 6 years old, something pushed against it, making it lean. The rings are now wider on the lower side as the tree builds "reaction wood" to help support it.

1940



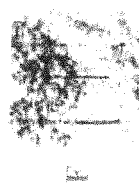
The tree is growing straight again. But its neighbors are growing too, and their crowns and root systems take much of the water and sunshine the tree needs.

1943



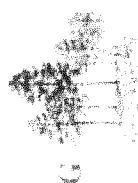
The surrounding trees are harvested. The larger trees are removed and there is once again ample nourishment and sunlight. The tree can now grow rapidly again.

1946



A fire sweeps through the forest. Fortunately, the tree is only scarred, and year by year, more and more of the scar is covered over by newly formed wood. (Locate the black fire scar to the ring that is marked by the letter "F".)

1958



These narrow rings (at letter "G" on the tree ring above) may have been caused by a prolonged dry spell. One or two dry summers would not have dried the ground enough to slow the tree's growth this much.

1973



Another series of narrow rings may have been caused by an insect like the larva of the sawfly. It eats the leaves and leafbuds of many kinds of coniferous trees.