

Winter Tree Study

LET'S GET STARTED

Trees have a skeleton, as you do. The trunk of a tree acts like your spinal column, and the branches and twigs give the tree structure, like bones give your body shape.

A tree is a vascular plant, meaning it has a circulatory system that carries fluid through the tree, like your body carries blood through veins. The fluid flowing inside the tree is water and glucose. Water is pumped up from the roots through tubes to the tips of the twigs, where it's sent into the leaves to make glucose. This happens through photosynthesis.

Glucose is transported from the leaves through tubes, where it flows through the tree and feeds it. The tube that sends water up the tree is called xylem, while the tube through which glucose flows is named phloem. These tubes, which flow up and down a tree, are called vascular bundles.

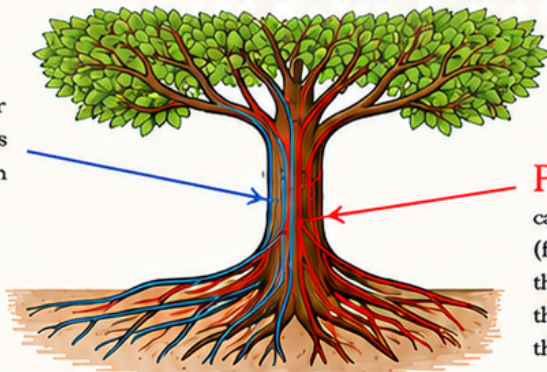
Have you wondered how trees become wider with age? A tree has woody stems that thicken as it gets older. This is because they have cells that make up a vascular cambium. These cells are layered beneath the surface of a stem and develop into xylem and phloem. As the vascular cambium increases xylem and phloem, the stem thickens as more wood is added each year.



THE TREE'S CIRCULATORY SYSTEM

Xylem

carries water and minerals upward from the roots to the leaves.



Phloem

carries glucose (food) from the leaves to the rest of the tree.

- ♦ Xylem carries water upward.
- ♦ Phloem carries glucose (food) throughout the tree.
- ♦ Together they form the tree's vascular system.

Between the xylem and phloem is a layer of cells called the vascular cambium. These cells divide to make new xylem (wood) on the inside and new phloem on the outside. As more wood is added each year, the stem thickens and the tree becomes wider.

If you look inside a tree trunk, you'll see rings in the wood. Each ring shows one year of growth. The lighter part of the ring, made in Spring and early Summer, is called spring wood. It has larger cells and is lighter in colour. The darker part, made later in Summer and Autumn, is called autumn wood. It has smaller cells and is darker.

By measuring these rings, we can tell how much the tree grew in a year.



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HOW TO STUDY A TWIG IN WINTER

Twigs are small branches that help us learn a lot about a tree, especially in Winter when there are no leaves.

At the end of each twig is a terminal bud. It is shaped like a little cone and is covered with bud scales that protect the new leaves inside. Along the sides of the twig you will see smaller buds, called lateral buds.

Scattered over the twig are tiny raised pores called lenticels. These are 'breathing pores' that allow the tree to take in oxygen and release gases.

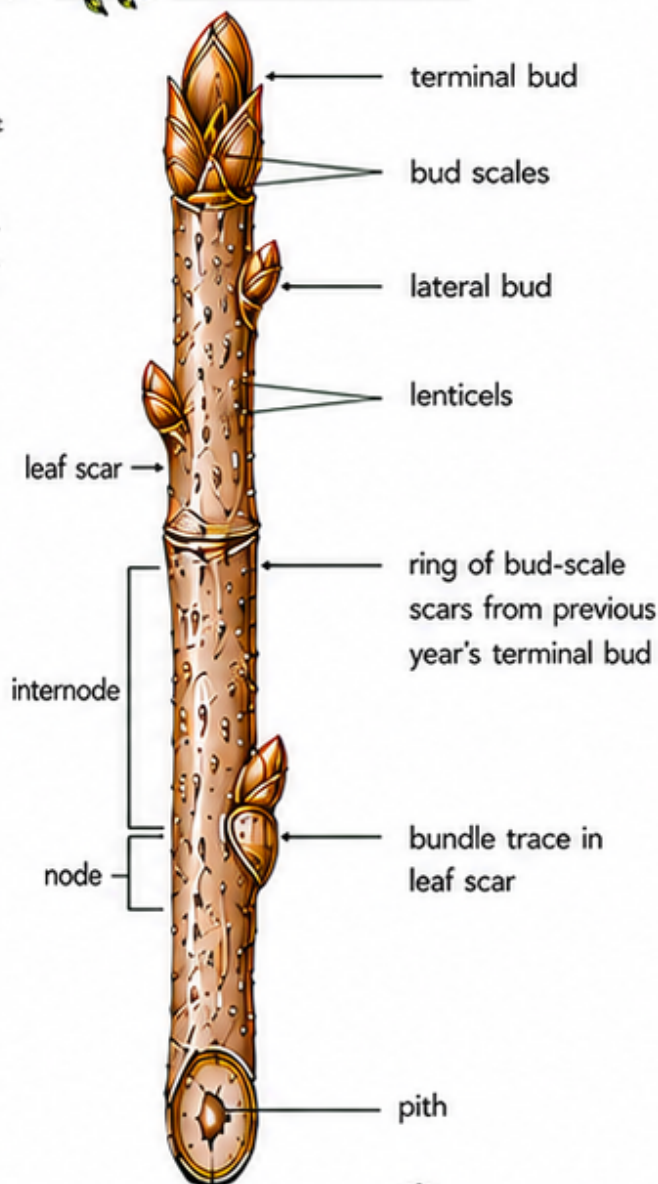
Below each bud there is a leaf scar. This is the mark left where a leaf was attached to the twig last year. Inside the leaf scar is a bundle trace. This is where the food and water tubes once passed into the leaf.

A twig has nodes and internodes. Nodes are the places where buds are located. The spaces between the nodes are called internodes.

If you look closely in the middle of the twig, you can see a ring of bud-scale scars left behind by last year's terminal bud. These rings help us measure how much the twig grew in one year.

The spaces between nodes are called internodes. The length of the internodes can tell us how well the tree grew.

By looking at buds, leaf scars, lenticels and measuring last year's growth, we can learn how a tree is growing, even in Winter!



SUMMARY

Trees grow:



wider

by adding more wood each year through the vascular cambium.



taller

by adding cells to the tops of their branches and stems.



deeper

by growing longer roots in search of water and minerals.



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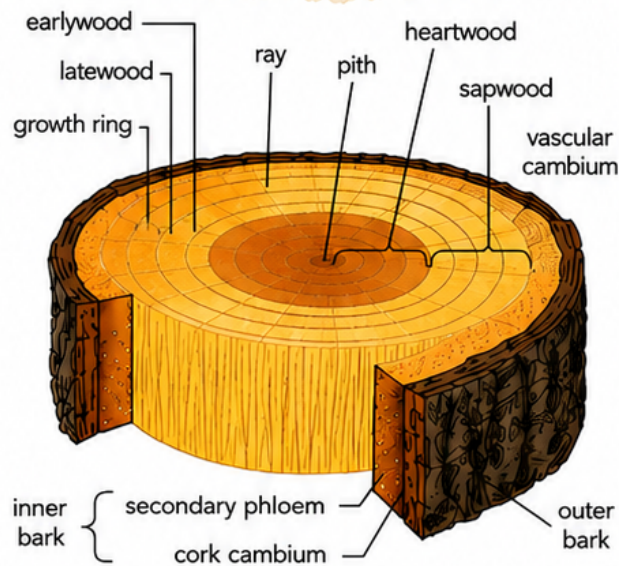
NATURE RAMBLE

Return to your adopted tree and observe it. What changes do you notice in it as a habitat since summer and autumn? Are there any fungi, lichens or mosses attached to the tree? Explore the area directly beneath the tree. What do you see?

Measure the height and diameter of the tree if you haven't done so already. Take note of the bark pattern and compare it with another tree. What differences do you notice? Is the tree shedding its bark?

Take note of how the branches are attached to the tree? Does the trunk divide into branches or does it extend through to the top with branches coming off its sides? Are the twigs at the end of the branches coarse or fine? Do the branches lift or droop? Compare the bark on the twigs to the bark on the branches and trunk. How are they different?

Observe the buds on the twigs. What colours are they? Are they arranged on the twig as opposite or alternate to each other? Can you see previous bud scars? Notice the texture of the buds. Are they shiny, sticky or rough? Measure the distance between the terminal bud and circular scar. Measure the distances between other circular scars. Which year did the tree grow the most, and in which year did it grow the least?



QUOTE

"Don't judge each day by the harvest you reap but by the seeds you plant."

Robert Louis Stevenson



A SCRIPTURE

"For he shall go out with joy and be led forth with peace: the mountains and the hills shall break forth before you into singing, and all the trees of the field shall clap their hands."

Isaiah 55:12

Tree

Watercolour by Margaret Flockton
Natural History Museum, London
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