



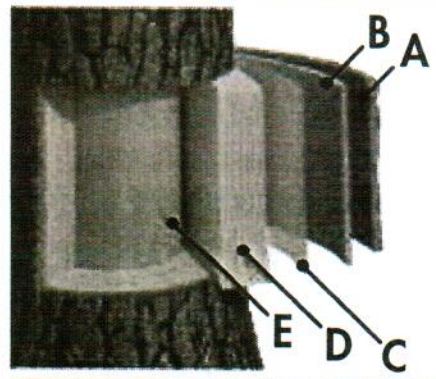
TREE SCHOOL

Before you head out to help identify some of the trees along Cantigny's Hiking Trail, let's take a minute to learn about the different types of trees and how they grow.

Anatomy of a Tree

- A** The **outer bark** is the tree's protection from the outside world. Continually renewed from within, it helps keep out moisture in the rain, and prevents the tree from losing moisture when the air is dry. It insulates against cold and heat and wards off insect enemies.
- B** The **inner bark**, or "phloem", is pipeline through which food is passed to the rest of the tree. It lives for only a short time, then dies and turns to cork to become part of the protective outer bark.
- C** The **cambium cell** layer is the growing part of the trunk. It annually produces new bark and new wood in response to hormones that pass down through the phloem with food from the leaves. These hormones, called "auxins", stimulate growth in cells. Auxins are produced by leaf buds at the ends of branches as soon as they start growing in spring.
- D** **Sapwood** is the tree's pipeline for water moving up to the leaves. Sapwood is new wood. As newer rings of sapwood are laid down, inner cells lose their vitality and turn to heartwood.
- E** **Heartwood** is the central, supporting pillar of the tree. Although dead, it will not decay or lose strength while the outer layers are intact. A composite of hollow, needlelike cellulose fibers bound together by a chemical glue called lignin, it is in many ways as strong as steel. A piece 12" long and 1" by 2" in cross section set vertically can support a weight of twenty tons!

A Cross-Section of the Inside of a Tree Trunk



Leaves Make Food for the Tree

And this tells us much about their shapes. For example, the narrow needles of a Douglasfir can expose as much as three acres of chlorophyll surface to the sun.

The lobes, leaflets and jagged edges of many broad leaves have their uses, too. They help evaporate the water used in food-building, reduce wind resistance — even provide “drip tips” to shed rain that, left standing, could decay the leaf.

Tree Terms

Branches: These arms of the tree hold the leaves or needles up to receive the sun’s energy.

Cambium Cell: Is the growing part of the tree trunk.

Coniferous: Trees that have small waxy leaves, sometimes needles, which are usually kept all year.

Deciduous: Trees which shed their leaves or fruit at seasonal intervals.

Gums: The trees sap contains food made by photosynthesis and other minerals and nutrients. Sticky gums in the sap are used by the tree to protect it from invading insects and wounds that cut through the bark. People use tree gums for many useful products, such as adhesives, drying agents in paint and ink, and ingredients in soap and cough syrup, to name a few.

Leaves or needles: The miracle of photosynthesis takes place here. Air and water come together with energy from the sun. Food is the end product, which the tree uses to grow bigger and reproduce. Oxygen is a welcome by-product of the process. Leaves or needles also help filter pollutants, shelter wildlife and shade the homes of fish and people.

Palmate(ly): Leaves resembling fingers on a hand.

Pinnate(ly): Leaves that resemble feathers.

Roots: Serving as both anchor and sponge, the roots help to stabilize the tree and to soak up water and nutrients for the tree to use in photosynthesis. Roots also serve as a storage area for sugars made through photosynthesis, and help hold precious forest soils in place.

Trunk: The woody trunk is what makes a plant a tree. It holds the branches and leaves up to the sun. Wood in the trunk is used for countless wood and paper products that people use every day. Tree trunks also provide homes for animals.

Whorl(ed): Three or more leaves originating from the same point.

