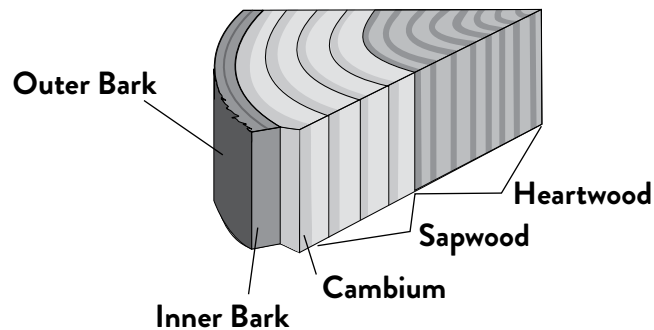


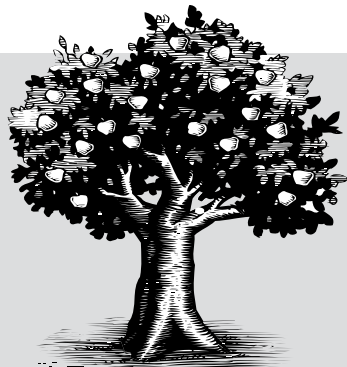
Read the Rings

How do trees keep growing new wood every year? It's a fascinating story. Most trees in North America add new wood to their girth each year in a regular, predictable way. The new tissue is added right inside the bark by a thin layer of cells called the cambium. With the warmth of spring, cambium cells begin to divide. The cambium cells on the outside become part of the tree's phloem, a band of inner bark through which the tree's food supply moves. The cambium cells on the inside become the xylem, a system of tiny tubelike cells that carry the tree's water supply. These xylem layers give us the annual rings.



Fun Fact

Trees require enormous quantities of water. A large apple tree in full leaf may absorb as much as 95 gallons of water from the soil every day. Most of the water goes to the leaves. On a sunny summer day, some trees move water up through their trunks at the rate of 3 feet per minute. A tree's wood is about half water.



As spring begins, new cells are added quickly, and the tree increases in diameter. In a cross section of a stump, this growth appears as a wide, light-colored band called earlywood or spring wood. But as the season moves on into summer and fall and the soil is less moist, the cells are added more slowly. The rings—latewood or summer wood—are narrower and darker. Finally, the cold dry days of fall halt growth altogether.

One light band and one dark band together make up a single year's growth and show as one annual ring. A new annual ring is added under the bark each year.

School children everywhere are intrigued by figuring the age of a tree through counting its rings. (Start at the outer, newest ring just inside the bark and count in toward the center to know the age of the tree.) But scientists find many other fascinating bits of information tucked into the annual rings. Best known is the relationship between weather, growing conditions, and the width of the rings. Wide, light rings mean spring weather was good: warm days, lots of rain, good growing conditions. Narrower rings mean spring was probably cold or dry, and/or growing conditions were stressed. Perhaps the tree was crowded by others, shaded, or stressed by insect pests. Tree growth was limited.

