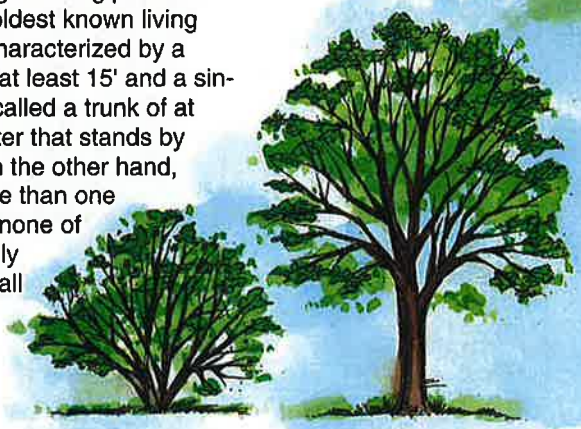
An Up-Close Look at a Tree

Sure, you know what a tree is. Or do you? There's a lot to know. First of all, depending on where they grow, some of the 865 or so tree species native to North America north of Mexico may appear to be shrubs, which aren't trees. And some shrubs can be treelike. Really, then, what is a tree?

Is it a shrub or a tree?

Trees are the largest living plants. In fact, they're the oldest known living things. They're characterized by a mature height of at least 15' and a single woody stem called a trunk of at least 3" in diameter that stands by itself. Shrubs, on the other hand, usually have more than one woody stem and none of the stems normally grow as thick or tall as a tree.



Two types of trees—broadleaf and needleleaf

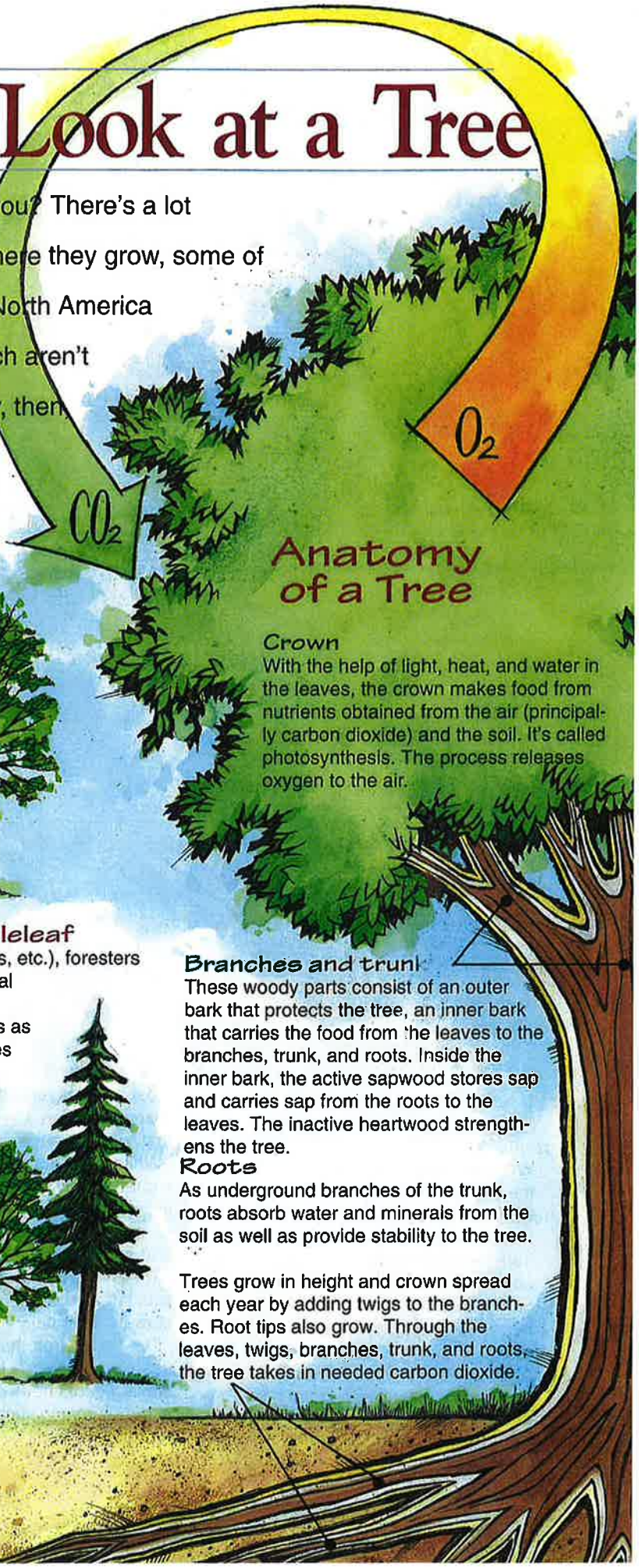
Although there are hundreds of tree species (oaks, pines, palms, etc.), foresters and those in the wood products industry refer to only two general types: *broadleaf* trees and *needleleaf* trees.

Botanists also refer to broadleaf trees of the temperate regions as *deciduous*, meaning that most of them annually drop their leaves and grow new ones. They also call needleleaf trees *conifers* or *evergreens* because with few exceptions they retain their green needles all year.

Leaf of broadleaf tree (northern red oak)

Leaf of needleleaf tree (eastern white pine)

Anatomy of a Tree



Crown

With the help of light, heat, and water in the leaves, the crown makes food from nutrients obtained from the air (principally carbon dioxide) and the soil. It's called photosynthesis. The process releases oxygen to the air.

Branches and trunk

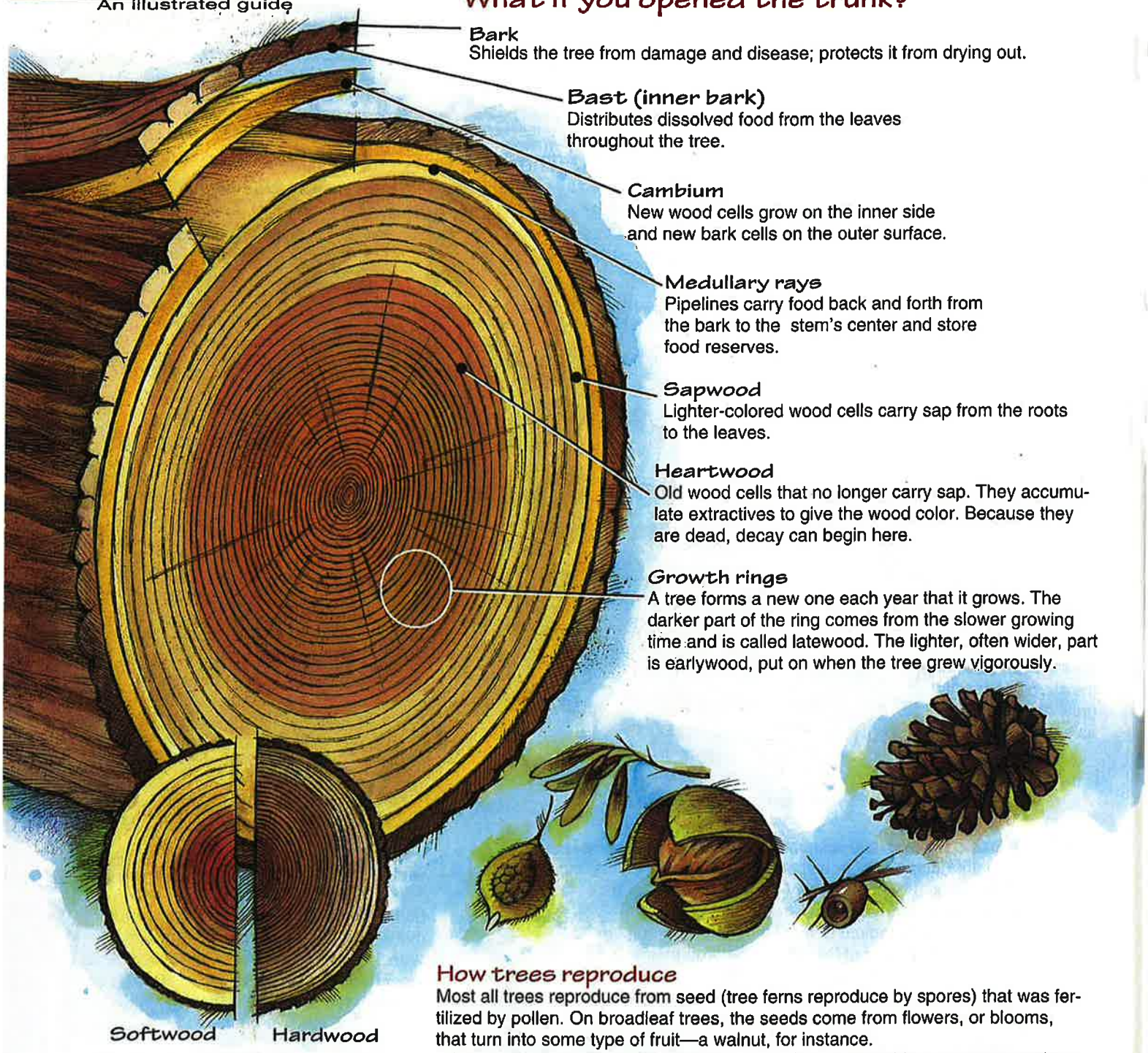
These woody parts consist of an outer bark that protects the tree, an inner bark that carries the food from the leaves to the branches, trunk, and roots. Inside the inner bark, the active sapwood stores sap and carries sap from the roots to the leaves. The inactive heartwood strengthens the tree.

Roots

As underground branches of the trunk, roots absorb water and minerals from the soil as well as provide stability to the tree.

Trees grow in height and crown spread each year by adding twigs to the branches. Root tips also grow. Through the leaves, twigs, branches, trunk, and roots, the tree takes in needed carbon dioxide.

What if you opened the trunk?



Bark
Shields the tree from damage and disease; protects it from drying out.

Bast (inner bark)
Distributes dissolved food from the leaves throughout the tree.

Cambium
New wood cells grow on the inner side and new bark cells on the outer surface.

Medullary rays
Pipelines carry food back and forth from the bark to the stem's center and store food reserves.

Sapwood
Lighter-colored wood cells carry sap from the roots to the leaves.

Heartwood
Old wood cells that no longer carry sap. They accumulate extractives to give the wood color. Because they are dead, decay can begin here.

Growth rings
A tree forms a new one each year that it grows. The darker part of the ring comes from the slower growing time and is called latewood. The lighter, often wider, part is earlywood, put on when the tree grew vigorously.

Softwood Hardwood

Woodworkers refer to the wood from the two types of trees, even the trees themselves, as *hardwood* and *softwood.* Hardwood refers to the wood from broadleaf trees—ash, maple, oak, and so forth—which many times is harder than the wood from needleleaf trees—lodgepole pine, white pine, and others. The trunks of some tree species of both types have sapwood that's more valuable than the heartwood. On others, it's just the opposite.

How trees reproduce

Most all trees reproduce from seed (tree ferns reproduce by spores) that was fertilized by pollen. On broadleaf trees, the seeds come from flowers, or blooms, that turn into some type of fruit—a walnut, for instance.

While the fruits of all broadleaf trees don't always resemble a nut or an apple or a cherry, they're still referred to as fruits. Needleleaf trees produce seeds that lie in cones or similar structures, and are released when the cone opens. Seeds are spread by animals, birds, wind, and water. Eventually they find a home in the soil and sprout when the time is right.

Trees also can successfully reproduce by sending up sprouts from a stump that was left after a tree was cut down or blown down, or from root sprouts. These sprouts eventually grow into trees (black cherry and redwood regularly do this).

The young tree that develops from a seed is called a seedling. Once the seedling reaches a height or 6' or more and its trunk grows to 2" thick, it's called a sapling. Most trees reach adulthood when their diameters develop to 16–18", although many, such as a bur oak, do not become fully mature for 200 years or more. Softwoods become "sawtimber" at 9" diameter, hardwoods at 11".

Illustrations: Brian Jenson