

## Tree Readings

**1.** Look around you and chances are you'll see a lot of things made out of wood. People use wood to build houses and other buildings; to construct doors, floors, fences, and furniture; and to make many other products including bowls, boats, paddles, crates, baskets, and baseball bats.

To make wood products, people first harvest trees and process them into lumber. After the trees have been cut down, the branches are removed and they are cut into logs. Then, the logs are loaded onto trucks and transported to a sawmill. The first machine at the sawmill strips off the bark. The logs are then measured and then cut into lumber. Depending on how the wood will be used (whether for buildings, furniture, baseball bats, etc.), the trees will be cut in different ways.

What products a tree is used for depends on the type of tree it is. For example, hardwood trees such as oak and maple are often used for flooring and high quality furniture, while softwood (coniferous) trees are usually used for papermaking, lower quality furniture, houses, and crates. Plants contain a compound called cellulose to give them rigidity and support. Cellulose is the main component in wood and is also used to make paper.

**3.** It would be hard, if not impossible, to find a part of a tree that people do not use in some way. The bark of many trees, for example, is used for many different products. Most bottle corks are made from the bark of cork oak trees, which grow in Europe and Africa near the Mediterranean Sea. The spongy bark of these trees is made into bulletin boards, the inner cores of baseballs, and many other products. Quinine, the drug used to cure and prevent malaria, comes from Peruvian bark and had been used by Native Americans long before the Europeans arrived. Some tree bark has an abundance of a chemical called tannin. People use tannin to process leather.

Some trees produce saps called gums and resins that are used to make paint thinner, chewing gum, medicines, and many other products. For hundreds of years, South American Indians have extracted the sap or latex from the rubber tree to make products such as rubber-soled shoes and containers. They processed it by heating the rubber and mixing it with sulfur to improve its strength. Maple trees produce a sap that people turn into maple syrup.

Trees provide people with fruits and nuts such as apples, coconut, pecans, lemons, and olives, and spices such as all-spice and nutmeg. Tree leaves, trunks, and other parts also provide ingredients for paints, road building materials, medicines, artificial vanilla, adhesives, inks, and hundreds of other products.

**2.** All land plants contain a compound called cellulose, which provides them with rigidity and support. It's the number-one component in wood. People use cellulose from wood to make a variety of products besides paper. For example, cellulose can be mixed with certain chemicals and squeezed into fibers that are used to make carpets, wigs, and fabrics such as rayon for clothes and furniture.

Cellulose is also used as a key ingredient in cellophane, sausage casings, explosives, shatterproof glass, sponges, shampoo thickeners, imitation leather, and many other products. Processed with certain chemicals, cellulose may also be used to produce molded plastics for eyeglass frames, hairbrush handles, steering wheels, and so on.



**4.** Paper was made by hand for nearly 17 centuries following its invention in China about 100 A.D. In Asia, plant fibers were beaten into a pulp, suspended in water, and formed into sheets by draining the fibers through a screen. As knowledge of papermaking moved westward, paper makers began to use rags rather than plant fibers to furnish pulp.

Papermaking spread to Europe through the Middle East, reaching Spain from North Africa by about 1200. From Spain, the craft eventually was brought to the North and South America. The Spanish established a European-style paper mill in Mexico in about 1580.

Paper mills use cellulose from three sources: recycled paper, wood chips and sawdust leftover from making lumber, and raw logs. When raw logs arrive at the mill, machines strip the bark off and chop the trees into chips. Then the chips (and other sources of cellulose) are "cooked" with chemicals until the mixture becomes a thick pulp. Next, the pulp is "washed." During the washing stage, dirt and other impurities are filtered out, producing clean pulp and, leftover waste and solids called sludge water. The sludge is separated from the water and either landfilled, burned, or applied to the land as fertilizer. The wash water goes into a waste water treatment system. The clean pulp then goes through a series of machines where the fibers get mashed apart so that the pulp will form smooth sheets when dried.