Tree Ring Investigation – Student Reading

PARTS OF A TREE

Leaves: All tree leaves serve the same purpose—to make food for the tree. Leaves use carbon dioxide from the air, water from the roots, and the sun's energy (in the form of sunlight) to make sugar (glucose). This food-making chemical reaction is called photosynthesis. Photosynthesis can take place only in the presence of chlorophyll—the green pigment that is found in all green plants. During photosynthesis, chlorophyll absorbs sunlight and the leaves release oxygen, which becomes part of the air.

Bark: The outer layer of the trunk (and branches) is called the outer bark or just the bark. Although bark looks different from tree to tree, it serves the same purpose—to protect the tree from injury and disease. Some trees have very thick bark that helps prevent damage from fires. Others have bad-tasting chemicals in their bark that discourage hungry insects. And some bark is covered with spines or thorns that keep browsing mammals away.

Trunk: The trunk of a tree is important for two reasons: First, it acts as a support rod, giving the tree its shape and strength. Second, it acts as the central "plumbing system" in a tree, forming a network of tubes that carry water and minerals up from the roots to the leaves, and food (sugar) from the leaves down to the branches, trunk, and roots.

Phloem: The layer next to the outer bark is called the inner bark or phloem (FLOW-um). The phloem acts as a food supply line from the leaves to the rest of the tree. Sap (water containing dissolved sugars and nutrients) travels down (flows) from the leaves through channels in the phloem to the branches, trunk and roots, supplying all the living parts of the tree with food.

Cambium: Next to the phloem is a very thin layer called the cambium. It is often only one or two cells thick, and you need a microscope to see it well. The cambium is a growth layer of the tree that makes new cells during the growing season, which become part of the phloem, part of the xylem (see below) or more cambium. The cambium is what makes the trunk, branches and roots grow thicker.

Sapwood/Xylem: The layer next to the cambium is called the sapwood or xylem. Each year the cambium adds new layers of woody tissue; the sapwood is made up of the youngest layers of wood. The sapwood is a network of thick-walled cells that form a pipeline, carrying water and minerals up the tree from the roots to the leaves and other parts of the tree. After a few years the sapwood in most trees gets filled in with resin-like material and slowly changes into heartwood.

Heartwood: The heartwood is old xylem that no longer transports water and minerals up the tree. The heartwood is often darker in color than the sapwood. The heartwood gives the tree support, but sometimes it rots away leaving a hollow, living tree.

Roots: A tree's roots are long, underground branches that spread out to help anchor the tree and absorb water and nutrients from the soil. Large taproots (growing down) and lateral roots (growing sideways) branch into smaller and smaller roots. An average tree has millions of these small rootlets, each covered with thousands of fine root hairs. The root hairs can easily absorb water and dissolved minerals because they lie very close to the surface where water and nutrients are found.