



4-H VOLUNTEER INFORMATION SERIES

Nebraska 4-H Youth Development

Tree Factory

Project Learning Tree, Page 269



Level: Grades 3-6

Summary for Activity:

1. Take students to an open area where there is plenty of room to “build” a tree.
2. Place the laminated sheets of paper in a sack. There are enough parts for 30 students, so adjust the numbers accordingly, depending on the size of the group.
3. As a reminder, here are the parts of the tree and what they mean:
 - a. **Taproot** – As the taproot, I grow straight down into the ground. Like all roots, I help anchor the tree to the ground. I also help absorb water and nutrients from the soil.
 - b. **Cambium** – I am the very thing growing layer of the tree. I make cells that become the new xylem, phloem and cambium.
 - c. **Heartwood** – As heartwood, I form the central core of the tree. I am made of dense dead wood and provide strength for the tree.
 - d. **Xylem** – As the xylem, I bring water and nutrients from the roots to the leaves of the tree. As my cells become old, they become part of the heartwood.
 - e. **Lateral roots** – As the lateral roots, I spread my roots out from the tree to cover a large area. I also help anchor the tree to the ground and absorb water and nutrients from the soil.
 - f. **Phloem** (also called the Inner Bark) – I carry sap (which is sugar and nutrients dissolved in water) from the leaves to the rest of the tree. At certain time of the year, I may also transport stored sugars from the roots up to the rest of the tree.
 - g. **Leaves** – I am the food factory of the tree. Using energy from the sun, captured by chlorophyll (the stuff that makes leaves green) I change carbon dioxide into oxygen and sugar (food) through a process called photosynthesis (pho-to-syn-the-sys.)
 - h. **Bark** – I protect the tree from injury caused by insects, animals, plants, disease, and fire. Depending on the type of tree, I may be thin, thick, spongy, rough, smooth, or covered in spines.

4. Start to build the tree.
 - a. Ask students what makes up the center of the tree and what gives the tree strength. (**heartwood**)
 - Students portraying heartwood should stand in the center of the open area, tighten their muscles, and chant, "I support, I support."
 - b. Ask students what tree part transports water to all parts of the tree. (**xylem**)
 - Students should join hands to form a small circle around the heartwood. These students should chant, "Gurgle, slurp. Gurgle, slurp. Transport water." Raise joined hands up and down.
 - c. Ask students where the water in the xylem comes from. It is (absorbed by the **roots**.)
 - **Taproot** should sit down with his/her back against the xylem.
 - **Lateral roots** lie down with feet toward the xylem and their arms and fingers spread out to represent root hairs. Roots should make slurping noises.
 - d. Ask students where the water in the xylem travels to. (**leaves**)
 - Have heartwood hold the ends of the four pieces of yarn or string. The other end should go to a student who represents leaves.
 - What do leaves do all day? (Make food through **photosynthesis**.) **Leaves** should flutter hands and say, "We make food. We make food."
 - e. Ask leaves what happens to all the food they make using sunlight, air and water. (It gets transported to the rest of the tree.)
 - f. Ask everyone what part of the tree transports the food from the leaves to the rest of the tree. (**phloem**)
 - Have the phloem students join hands and form a large circle around the tree as they reach above their heads and grab for food. Then they should squat down and release the food. They should chant, "Food to the tree!"
 - g. What layer produces new xylem and phloem to keep the tree growing healthy? (**cambium**)
 - Cambium students should form a circle between phloem and xylem. They should sway from side to side and chant, "New phloem, xylem, and cambium."
 - h. What final component of the tree is missing? (**bark**)
 - Have the bark students lock arms and form a circle that faces out from the center of the tree. They should look tough and march in place chanting, "We are bark. Please keep out."
 - i. when the tree is assembled, students should do everything at the same time.

Wrap Up:

Take a hike through the trees and have students watch for the various live parts they just learned about. Find a fallen tree and see if any of the parts can be identified. Use cut logs and identify parts. Have students discuss the function of each part.