

Into The Woods

Cub Scout Program – Webelos (4th-5th graders) (1 hr. 30 min)
(Year Round)

1) Forest Layers

10 minutes

Forests are made up of many layers. Begin walking into a forested area and introduce the five forest layers by explaining the characteristics of each layer. Complete the “Find Your Neighbors (Forest Layers)” activity. (See attached)

2) Forest Tree Identification

30 minutes

a). Discussion: Look around the forest. What primarily makes up a forest? *Trees of all different sizes, shapes, colors, textures, etc!* Do animals use trees? What for? *Homes, food, shelter, etc.* Do we use trees? What for? *Homes, food, shelter, etc.*

- i) Activity:** While hiking along the trails, use Tree ID Guide Books and Tree Key ID’s to identify *six* forest trees common to our area (e.g., beech, maples, oaks, hickory, tulip tree, cherry, pines, hemlocks, sweetgum, sycamores, etc.). ***Provide clipboard, paper and pencil for Scout leader, so they can keep track of the trees identified.*** After identifying the tree by leaf, bark, bud, etc., ask the scouts how they think wildlife (homes and food) and/or humans use these trees. See below for some examples...

Examples: Sugar Maple.....Maple Syrup for humans, sap/food for animals
American Beech.....Wood for humans (furniture), nuts for animals
White Oak.....Hardwood flooring for humans, acorns for squirrels
Pines.....sticky adhesives (bandaids) for humans, food for animals
Hickory...wood-burning stoves & tool handles for humans, nuts for animals
Tulip Tree...musical organs for humans, nectar source for animals

3) Forest Plant Identification

25 minutes

a). Discussion: There are many other plants in a forest besides large trees. Can you think of any? Scope out the layers below the canopy and understory (shrubs, herb, ground). What do you see? Depending on the season, you may see different types of shrubs with berries on them, flowering plants, etc.

- i) Activity:** Using the Wildflower Guide Books, identify *six* different forest plants (other than trees) that are useful to wildlife. ***Provide clipboard, paper and pencil for Scout leader, so they can keep track of the plants identified.*** After identifying the plant, ask the scouts how they think wildlife uses these plants and for what purposes.

(1) Helpful Hints: you can try and find the following plants, unless there are others that are easily accessible, you have knowledge of, etc.

(a) Mayapples – mini-shelter and food (apples) for animals

(b) Spicebush – birds eat the berries, and Spicebush Swallowtail butterflies lay their eggs on this shrub

- (c) Christmas Fern – leaves eaten by herbivores
- (d) Poison Ivy – berries eaten by animals...Be careful, don't touch!
 - (i) Note: Seeds are spread mainly by animals, and are viable after passing through the digestive tract of birds
- (e) Trillium – ants use this plant.
 - (i) Note: They carry the seeds away when they fall from the plant because the ants enjoy the sticky covering each seed case has when it falls to the ground.)
- (f) Jack-in-the-Pulpit – food source for slugs, birds, mammals

4) Build a Tree

15 minutes

- a) **Discussion:** Now that we have identified many trees in our forest, what makes up a tree? *Roots, leaves, bark, branches, etc.* But there are many other parts of the tree that you can't see from the outside that are so important in the every day function and structure of the tree (e.g., sapwood, heartwood, cambium, phloem) (see "Parts of a Tree" worksheet for descriptions of each - attached). These parts help provide the tree with what it needs to survive. What do living things need to survive? (*sun, air, water, food, space, etc.*)
- i) **Activity:** Build a Tree! - take the students to an area with lots of space to build a tree. Complete the "Build a Tree" activity (see attached).

5) Age of a Tree

10 minutes

- a) **Discussion:** How can you tell how old a tree is? *By counting the rings!* You can also gather a lot of other information about a tree, besides how old it is, by looking at Tree Cookies. You can tell how old the tree was, how healthy it was, whether or not there was a draught, storm, etc., whether or not the tree was shaded, etc.
- i) **Activity:** Pass out a tree cookie to each scout. Have them count the number of rings. Compare and contrast the tree cookies. Are they all the same size? If they are, do they all have the same number of rings? Why or why not? Then, have the scouts examine other characteristics of the cookie. What other information can they gather?

FIND YOUR NEIGHBORS (Forest Layers)

Objective:

This activity illustrates the five forest layers and the animals that live in each layer

Materials:

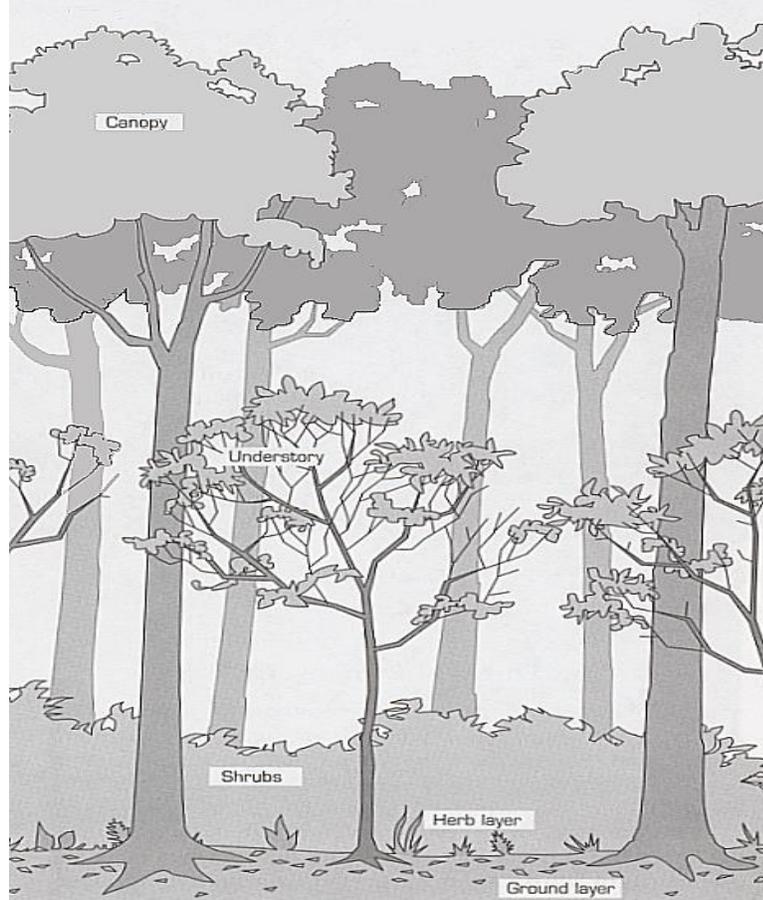
Forest organism cards
Five layer cards

Procedure:

- Introduce the five forest layers (canopy, understory, shrub, herb, and ground) by explaining the characteristics of each layer. Use the layer cards to help illustrate the difference in the layers.
- Explain to the students that it may be difficult to identify all the layers in a real forest.
- Have the students physically try to find the layers in the forest.
- After they find the layers explain to them that although plants mainly define the layer, there are animals that may spend most of their time in one layer. Tell them they are going to do an activity that will help them figure out which plants and animal belong to which layer.
- Spread the layer cards on the ground just far enough apart so everyone can still hear a discussion.
- Explain to the students that they will each receive a plant or animal card. On each card there will be a clue as to which layer the animal or plant spends most of its time. Tell the students when they receive their card they are to read the clue to themselves. When you say, "Find your neighbors!" they are to go to the layer card where they think their plant or animal spends most of its time. There they will find their neighbors!
- Pass one card to each student. Allow them enough time to read the clue and look at the picture on the back. Be sure to account for the students' reading level.
- Shout "Find your neighbors!"
- Call on someone from each layer. Have them explain who they are, who their neighbors are, and if they like or dislike their neighbors. (For example on the ground layer there is a snake, a toad, and moss. If the snake is called, the student may say he or she likes the neighbors because it can hide in the moss and eat the toad. The toad will not like the neighbors because the snake eats toads!)
- Wrap up the activity by having the students recite the 5 layers.

SIMPLE EXPLANATIONS OF THE FIVE LAYERS

- Canopy** The highest layer. The tallest trees reach up to the sunlight shading everything below.
- Understory** Young saplings compete for a place in the canopy; smaller trees such as flowering dogwood, red bud, and sassafras stay as permanent members of the understory.
- Shrub** Usually a thick layer, a maximum of 6 feet above the ground, formed by woody plants with several stems/ trunks.
- Herb** A layer that grows close to the ground. Most plants have a soft green stem that is not woody.
- Ground** Plants that hug the soil including mosses, lichens, and liverworts.



BUILD A TREE

Objective

Students will describe the general structure of a tree and explain how different parts of a tree help the tree function.

Materials Required:

Build a tree cards

- Heartwood (1)
- Sapwood (3)
- Taproot (1)
- Lateral Roots (2)
- Cambium (2)
- Phloem (2)
- Bark (2)
- Leaves (2)

Total 15 (The activity can be done with fewer students. Reduce the number of sapwood, lateral roots, etc.)

Procedure:

Take students to an area with lots of space to build the tree. Tell students that they are going to create a tree by acting out the tree parts. Have each student pick one build a tree card. This is the part of the tree they will portray. Ask students what makes up the center of the tree and gives the tree strength (heartwood). The student portraying heartwood should stand in the center of an open area, tighten their muscles, and chant, "I support; I support."

Ask students what part of the tree transports water to all parts of the tree (sapwood). Have the sapwood students join hands to form a small circle around the heartwood. Have these students chant, "Gurgle, slurp. Gurgle, slurp. Transport water," as they raise their joined hands up and down.

Ask students where the water in the sapwood comes from. (The roots absorb it.) Have the taproot sit down with his or her back against the sapwood, and have the lateral roots lie down on the ground with their feet toward the sapwood and their arms and fingers spread out to represent root hairs. Have the roots make sucking noises.

**NOTE: Be sure to warn other students not to step on the roots!*

Ask students where the water in the sapwood travels (to the leaves). Have the heartwood hold out his or her arms. Have the leaves hold hands with the heartwood to portray leaves at the end of a branch. Ask the leaves what they do all day (make food through photosynthesis). Have the

leaves flutter their hands and chant, “We make food, we make food.”

Ask the leaves what happens to all the food they make using sunlight, air, and water. (It gets transported to the rest of the tree.) 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. Have them emulate the role of the phloem by reaching above their heads and grabbing (for food), and then squatting and opening their hands (releasing food) while chanting, “Food to the tree!”

Ask students if they have left out an important part of the tree. What layer produces new sapwood and phloem to keep the tree growing and healthy? (cambium) Have the cambium students form a circle between the phloem and the sapwood. Tell them to sway from side to side and chant, “New phloem, sapwood, and cambium. New phloem, sapwood, and cambium.”

Ask students what final component of their tree is missing—it is something that protects the tree (bark). Have the bark students lock arms and form a circle that faces out from the center of the tree. Ask them to look tough. Have them march in place chanting, “We are bark. Please keep out.”

When the tree is completely assembled, have all students act out and chant their parts simultaneously. If you want you can end the session by telling the students their tree is old and falls over. Let everyone carefully fall down.

VARIATION FOR YOUNGER STUDENTS

Ask students to name things that living things need to survive, (sun, air, water, food, space, and so on).

Take students outside and have them gather around a tree. Ask how trees get the water they need.

Where does the water come from? (rain, snowmelt, groundwater)

How does it get into the tree? (The roots absorb it.)

How does it get around to all parts of the tree? (Tiny “pipes” in the sapwood carry water to the trunk, branches, and leaves.)

As the students discuss each question, have them act out the answers. For example, they can simulate rain falling by patting their hands on their legs or the ground; they can simulate roots by lying on their backs with their arms and legs spread out as they make slurping sounds; they can simulate sapwood chanting, “Gurgle, gurgle, gurgle. Water to the tree.”

Next, ask students where trees get the food they need to survive. Do they chase after animals? Grab things with their branches? (No! They make food in their leaves by using energy from the sun.) Have the students imitate how the leaves make food. Have them hold their arms up and

alternately curl and straighten their fingers (leaves) while chanting, “Making food, making food.” Afterward, explain that the leaves also “breathe” by taking in gases from the air and releasing other gases through tiny holes in their under-sides (stomata).

Have students stand up and wrap their arms around the trunk of the tree. What does the trunk do for the tree? (It provides strength, supports the branches and leaves, and contains all the “pipes” that transport water and food around the tree.) Have the students act out the trunk of the tree by standing straight and tall and by looking strong.

Have students feel the bark of a tree and describe what it feels and looks like. Ask them how bark might be useful to a tree (protects it from pests and disease). Have students act out the role of bark by holding hands and forming a circle with all students facing out from the center. While still holding hands, have them chant, “We’re the bark. Insects- keep out!”

Have students look for seeds, fruits, nuts, or cones on the tree. Ask them what these parts of the trees do (produce new trees). Have them act out a seed growing into a tree by scrunching down into a ball (the seed) and then slowly straightening up until their arms are raised over their heads.

Ask students what keeps the tree from blowing over (roots). Divide the group into two parts. Have all students lie down with their arms and legs spread out, and have one group make slurping sounds (to simulate the roots absorbing water) while the other group chants, “Stay in place. Stay in place,” to express how roots anchor the tree.

Finally, call students together to build a model tree. Divide the students into three groups. One group, the roots, should stand close together with their arms entwined and chant, “Gurgle, gurgle, gurgle. Water to the tree.” The next group, the bark, should make a circle around the roots; join hands, and chant, “We’re the bark! Insects- keep out!” Members of the last group, the leaves, should stand at various distances around the bark and chant, “Making food, making food,” while flexing their fingers.

PARTS OF A TREE

BACKGROUND

From a tree's tiny root hairs buried in the ground to the highest leaves in its *crown*, each part of a tree plays a role in helping it to function. Following is a summary of the various parts of a tree and what each one does.

LEAVES

Leaves are the food factories of a tree. Using energy from the sun, which they capture with a pigment called "*chlorophyll*," leaves convert carbon dioxide and water into oxygen and sugar (food!) through the process of *photosynthesis*. The gases needed for and generated by photosynthesis enter and exit through tiny holes called "*stomata*" found on the under surface of the leaves. Water vapor also exits through the stomata in the process of transpiration.

TRUNK AND BRANCHES

The trunk provides support for the branches, which in turn support the tree's leaves. The trunk and branches contain the tree's "pipes" — the tubes that transport water and nutrients to the leaves, and sugar from the leaves to the rest of the tree. They also contain the growing layer of the tree that makes the trunk, branches, and roots of the tree thicker each year. Following is a look at a tree trunk from the inside to the outside and a description of what each layer does: (see diagram below)

Heartwood forms the central core of the tree and is made up of dense, dead wood. It provides strength for the tree.

Sapwood, also called the xylem (ZEYE-luhm), brings water and nutrients up from the roots to the leaves. Older xylem cells become part of the heartwood.

Cambium (KAM-bee-uhm) is a very thin layer of growing tissue that makes cells that become new xylem, phloem, or cambium.

Phloem (FLOW-uhm) is also called the inner bark. It carries sap (sugar and nutrients dissolved in water) from the leaves to the rest of the tree. At certain times of the year, phloem may also transport stored sugars from the roots to the rest of the tree. (In the springtime, for example, the sap of Sugar Maples rises from the roots and is tapped to make maple syrup.)

Outer Bark protects the tree from injury caused by insects, animals, other plants, disease, and fire. Bark characteristics vary from species to species. It may be thin or thick, spongy, rough or smooth, covered with spines, and so on depending on the type of tree.

ROOTS

A tree's roots help anchor the tree in the ground. They also absorb water and nutrients from the soil. Trees have lateral roots that spread out from the tree and cover a broad area. Many trees also have a taproot that grows straight into the ground. As a tree's taproot and lateral roots grow away from the tree, they branch into finer and finer roots called rootlets. The rootlets themselves are, in turn, covered by even finer root hairs. These root hairs absorb approximately 95 percent of the water and nutrients used by the tree.

