

Forest Layers!

Developed by: Heather Canapary

Time: 50-60 minutes in class or at headquarters

Overview

This activity introduces participants to the layers of the forest. By having them analyze and classify plants based on their needs. This activity also can display the process of succession by removing one of the larger trees and showing what new species fill in first.

Learning Objectives

By the end of this activity, participants will be able to:

1. Identify canopy, understory, shrubs, herbaceous plants, and litter as layers of the forest
2. Name at least 2 species that reside in each layer
3. describe the successional process

Materials Needed

- Cut-outs of trees and shrubs w/ labels on the back (determine the quantity of sets of plants needed based on how the activity is run)
- Larger poster board or sheet of paper w/layers drawn out, or a chalk board divided into 5 layers
- tape

Background Material

One characteristic of an old-growth forest is that it varies compositionally in layers. Five layers are commonly identified: the canopy that consists of the tallest trees that receive most of the sunlight; the understory, less tall, more shade tolerant trees that occupy the area underneath the canopy; the shrub layer, woody plants that are underneath the understory; herbaceous plants, non-woody flowers and herbs; and the ground cover/ litter layer that covers the forest floor.

At the Andrews Experimental Forest Douglas-fir and western hemlock are the two main canopy species. Vine maple and ___ can be found in the understory. Oregon grape, sword fern and salal are common shrubs. Trillium and Oregon iris can be found in the herbaceous plants layer and a variety of moss, lichen, and leaf litter occupies the ground. However, depending on the stage of the forest, these layers can vary. Right after a large disturbance, like a high intensity fire, there might not be any canopy and mostly herbaceous plants, like fire weed. Also, if a forest isn't disturbed for a long enough time, the slower growing hemlocks that can live in the shade of the Doug-firs, can grow taller and shade out the mature Douglas-firs.

Activity Description

Step 1. Getting Started: Introductions and discussion of what plants need to survive(10 minutes)

Have the class brainstorm ideas of what they think a tree needs to survive. The answers should include light, air, water and soil (LAWS). Each of these factors affects what tree occupies which place in the forest.

Step 2. Research plants (optional) (1 hr in library)

- Give students list of plants to be categorized in the forest. Students will research what each plant's needs are and where they might fit in the forest layers. Students may also find pictures of their plants and print them to place on the layer board during the activity.

Step 3 Filling in the Forest

- Explain to the students that all the plants they have fit somewhere into the layer structure of the forest. Each plant has specific needs, like sunlight, that determine which layer it will grow in. Have them arrange the species into the layers.

- Do all the plants fit into a space where their needs are met? The answers you receive will vary. Depending on how students arrange their forest, some of the smaller sun-loving shrubs and herbaceous plants may receive enough light, but that is probably because the student placed all of their large trees off to one side. If the larger trees are distributed across the forest, there will be plants that didn't fit into the layout. Also be on the lookout for trees that are just squeezed in to fill a space. An older Doug-fir will not be under a western hemlock because the Doug-fir is not tolerant of the shade.
- All these plants are part of the forest, but some of you experienced that they didn't all fit on the forest layout at one time; is there another way that all of these species could fit in the forest? Yes, the other way is that the species composition varies over time. This concept is referred to as succession.
- Knowing that species composition changes over time, assign small groups and have each small group fill in the forest layers that exist during different stages of succession.
- Have each group present their forest and talk about what species are there in their stage of succession and which aren't.

Step 4. Gauging Understanding (10-15 minutes on trail or using virtual tour)

While walking down the Lookout Creek Trail, ask students to identify plants from the lesson. Are they found where we expected them to be? What stages of succession are parts of this forest in?