

Timber Resource Leader Guide

See the student datasheet answer key that is with this guide.

Objectives

Students will:

- A. List the resources that trees need to grow.
- B. Explain how environmental conditions affect tree growth and the forest over time.
- C. Use forestry tools to sample a population of trees to calculate tree volume per acre.
- D. Consider how trees can be used for humans while maintaining the forest for other uses.

General Directions

You will have between 45-55 minutes to complete this station with student groups (between 6-10 students each). Please familiarize yourself with the student data sheet attached, so that you can facilitate students completing the worksheets.

The students should have studied vocabulary terms (DBH, succession, tolerance, etc.) and discussed the sampling process as part of their classroom preparation for Forest Field Days (this does not always happen, though, although we encourage it). REMEMBER: the data you help students collect at the station will be used in the classroom to develop their management plans.

Sample Lesson (for 50 min. station)

Give Students an Introduction to the Forest (5-10 mins)

Ask students what species of trees dominate the canopy. What about the smaller understory trees?

- Most of the big trees are Douglas-fir, which need plenty of sunshine to grow well. Trees in the understory are likely hemlock and others that can tolerate the shade. If there are suppressed Douglas-fir seedlings near your plot, point out the poor growth.
- Different trees, like different animals, tolerate different environmental conditions.
- If the students choose to harvest trees for their management plan, they will have to replant- it is the law.

Ask students what trees need to grow. *Answer: water, sunlight, nutrients, carbon dioxide*

Ask the students what they think this place might have looked like 70 years ago when Grandma Petersen was their age.

- The Bauman property was purchased by the family in the 1940's. The stand students are measuring was once a hay field, but now contains trees over 30 years old.
- Point out that forests are always changing. Ecologists call this change succession. Because the forest is always changing, so are the types of animals that live in the forest.
- If trees are harvested, landowner must replant within two years. This ensures the forest is ready for harvest in the future (highlight this to the students regarding their own management plans).

Teach Students how to Sample (15-20 mins)

Have the students measure a few trees in the sample plot to understand the use of the diameter tape. The sample plot is a 1/10 acre circular plot (37.2 feet radius). For the Bauman property, students do not need to measure every tree (3-4 perhaps). The data, which you can relay to students, is below:

- When sampling, students should record DBH to the nearest whole inch on their datasheet (page 8, #2a). If you have time and/or a good math student with a calculator in the group, have them calculate the average diameter of the trees on the plot. This can also be done back at school. Be sure they record the number of trees on the student datasheet, page 9.

Measurement data: 16, 11, 13, 15, 14, 19, 12, 13, 12, 16, 12, 13, 14, 16, 15, 13, 15, 16, 15, 18, 18 (data from 2019 measurements)

Teach Students how to Measure a Tree's Height (5-10 mins)

Help the students select an "average looking" tree as one-tree sample of height.

- Measure a 100 feet horizontal distance and show the students how to use a clinometer to measure tree height (Many students will have a hard time looking through this tool. They aren't used to keeping both of their eyes open). Record the tree height on the datasheet, Page 8.

Help the students through the calculations for bf per plot and values per acre (5-10 mins)

Teach Students how to age a Tree (5-10 mins)

Show the students the increment borer and demonstrate how it is used. Count the rings and record the age on the datasheet. Landowners request that trees are not bored- use a chunk for your "boring" demonstration. Show how the number of rings tells the tree's age; the size of the rings tells about the environment in which it grew and is growing. Show students how rings start in the middle and that the current year's ring is next to the cambium just inside the bark. Light rings= spring growth; darker rings = summer growth

- If available, show two tree "cookies" of the same age, but different sizes. Ask what may have caused what they see (competition for water, light, nutrients, climate, insects, or fire.)
- Relate age and size back to what trees need to grow. The same age trees can be different sizes. Introduce the idea that trees compete with one another for resources and that the bigger ones get more "goodies" and dominate the area. The little trees die — this is nature's way of thinning. Foresters often thin trees out to keep the remaining trees healthy and growing well. Point out self-thinning if it is occurring on the site.

Conclude by asking them the questions in "Thinking about Management" section of their datasheets.

Get them thinking about how they will use this information for their management plans, which they will devise back in the classroom.