



TREE STUDY OUTDOOR LAB TEACHER'S GUIDE

Learning Goal: Students will learn the interrelationship and value of shoreline trees/plants. Establish the contribution of trees and other vegetation to a healthy shoreline.

Objectives:

- Determine the height of a tree using a clinometer and apply basic math skills to tree studies.
- Determine the age of a tree using a bore sample.
- Recognize characteristics of trees to identify local deciduous (broadleaf) and coniferous (cone bearing) trees.
- Describe the economic, aesthetic, and environmental value of trees.

Notes:

- **When setting up for this lab**, make sure you have enough safety glasses and calculators for students who will be rotating through the clinometer section. The student groups in this session should be divided in half for mini-rotations. Half of the students will be in the Tree ID session, which will walk around the surrounding area looking for various tree species. The other half of students will be divided once again, with one pair of students starting in the clinometer activity and the other pair of students starting in the tree boring activity. See the example timeline for a breakdown of session rotations.
- **When wrapping up this lab**, instructors should total the points for all three sections and initial next to the total. Move the score to the cover page.

Clinometer:

Note: before the session, review the clinometer lab instruction found on page 10 of the student lab book.

- Have students put on safety goggles and demonstrate how a clinometer works.
- Students should select a tree, identify the species, and record this information in their lab book.
- Have students calculate and record the height of a selected tree with the clinometer (see specific directions on page 10 of the lab book).
- As time allows, ask students why it is useful for foresters to know the height of trees.
 - For example, when completing a forest survey, tree height can be used to understand the age of the forest. While tree boring gives you an exact answer, foresters don't drill into every tree. Getting heights for several trees can give a bigger picture.

- Also, tree height is important to describe the structure of a forest. Sometimes there is more or less canopy or understory levels. This information can give insight into what animals and other organisms would do best in that area.

Tree boring:

- Demonstrate how a tree boring instrument works.
- Review aging from indoor session: Use a sample bore to show the rings and explain that you can age a tree by counting these rings. Each ring represents a summer growth period and a winter period (little/no growth). Ask students which end of the sample would be the oldest ring (closest to the center) and which ring would be the youngest ring (closest to the bark).
- Have students select a tree they want to sample. They should measure the girth of the tree at chest height and record this in their lab book. If available in supply bin, use wax to fill the holes after students complete the lab.
- Have students take a bore sample, count the rings to determine the age, and record their estimate in the lab book. Note: instructor should initial the lab books (#2 under the tree boring section) when students have completed this task.
- As time allows, ask students what information can be obtained by looking at the thickness of the rings. Not all the rings will be the same thickness. When there are good environmental conditions, trees will have thicker growth rings. When there is a drought or temperatures were outside of the tree's preference, they will typically have smaller growth rings.

Tree ID:

- Instructor will take half of the students from the tree study group on an exploratory walk.
- During this time, discuss attributes of trees that aid in their identification. Show students how to examine differences in bark/buds/leaves/cones/needles/branching structure.
- Review with Q/A what trees are native to our area.
- When students correctly identify a tree type listed in the lab, initial on the associated line.
- Discuss the benefits of trees to lakes/rivers/wetlands– make sure to cover the important environmental, economic, and aesthetic roles that trees play.