TREE STUDY OUTDOOR LAB
LESSON PLAN

Subject area: Value of trees to shores, lakes, rivers, and wetlands
Grade level: Middle School
Seasonal timing: Fall or spring when leaves and cones are available
Instruction time: 45 minutes

A. **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.

B. **Objectives:** Learners will be able to:
- 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.

C. **State Standards:**
- SCI.SEP3.m – Planning and conducting investigations.
- SCI.SEP5.m – Using mathematics and computational data.
- SCI.LS1.C.m – Plants use the energy from light to make sugars through photosynthesis. Within individual organisms, food is broken down through a series of chemical reactions that rearrange molecules and release energy.
- SCI.LS2.A.m – Organisms and populations are dependent on their environmental interactions both with other living things and with nonliving factors, any of which can limit their growth. Competitive, predatory, and mutually beneficial interactions vary across ecosystems but the patterns are shared.
- SCI.LS2.D.m – Changes in biodiversity can influence humans' resources, such as food, energy, and medicines, as well as ecosystem services that humans rely on — for example, water purification and recycling.

D. **Setting:** Forested area.

E. **Materials and Resources:**
- Tree study outdoor lab manuals, writing utensils, and clipboard.
- Tape measure (50').
- Clinometer for each student team.
- Boring tool.
- Basic tree identification key.

- Safety glasses
- Cameras

F. General delivery, see teacher guide for detailed implementation suggestions
- Review what trees are in our area and what students identified in the class.
- Discuss how trees benefit lakes, rivers, and wetlands.
- Demonstrate how a clinometer and tree boring instruments works.
- Review safety considerations.

  Small Group: Have students work in their teams and instructor checks:
- Students identify trees during a nature walk using leaves, cones, and needled branches.
- Have students calculate the height of a selected tree with the clinometer.
- Have students take a bore sample of the same tree and determine age.

G. Assessment:
Students write a short paragraph on how trees are important at their home.