



## TREE STUDY INDOOR LAB TEACHER'S GUIDE

### Objectives:

- establish the contribution of trees to a healthy shoreline
- recognize characteristics of trees for identification
- determine the age of a tree using a bore sample
- determine the height of a tree using a clinometer

1. Introduce the guests in the room.
2. List tasks for today
  - a) discuss value of trees on shoreline, for water and aquatic life forms
  - b) identify several varieties of trees
  - c) demonstrate the use of a borer to age a tree
  - d) review use of a clinometer to measure height of a tree (if time permits)+
3. What benefits do trees and other vegetation offer lakes, streams, fish and other organisms?
  - a) shade (creates cooler water temperatures, supporting higher oxygen levels)
  - b) food
  - c) shelter (provides habitat in water)
  - d) slower runoff speed, less erosion
  - e) roots absorb excess nutrients and pollutants
4. **Lab activity:** Identifying several varieties of trees using samples and a set of keys  
How does one identify a particular type of tree?
  - a) leaves (examples)
    - i) white pine has five needles in a cluster (remember 'white' has five letters)
    - ii) red pine has two needles in each cluster
    - iii) spruce looks like a bottle brush
    - iv) balsam has flat needles arranged flatly and smell like Christmas
  - b) cones (examples) – jack pine cones release seeds in a fire
  - c) bark (examples)
    - i) red pine has reddish scales
    - ii) white pine has dark bark and is furrowed
  - d) flowers
  - e) fruit/nuts/seeds
    - i) oak varieties produce acorns
    - ii) maple varieties produce "helicopters"

5. **Lab activity:** Aging a tree using a bore sample and a tree "cookie" (samples stored in lesson box)

How does one determine the age of a tree?

- a) Explain Cambial layer
  - i) is located inside the bark
  - ii) produces xylem and phloem (cells that transport 'sap' up and down the tree) each year the cambial layer becomes an "annual ring"
- b) Collect a bore sample with a boring tool - demonstrate use of boring tool
- c) Count the annual rings
  - i) light ring = spring wood; dark ring = summer wood; together = one year
  - ii) the width of ring indicates growing conditions for the year

6. **Lab activity:** Using a clinometer to determine height (review activity from class)

How can one measure the height of a tree?

- a) Create a right isosceles triangle using a clinometer (see spring LEEP curriculum)

NOTE: Due to time constraints, this activity has been taught by the science teacher during a follow-up day in our program.

7. Review of main ideas from class activities.