Measure Tree Height on a Slope: Two-Triangle with Eyes Lower than Tree Base

Field Guide

Task

Measure heights of shrubs and/or trees to help determine the MUC class of your Land Cover Sample Sites.

What You Need

- ❏ 50 m measuring tape
- ❏ Flexible measuring tape
- ❏ Small bean bag
- ❏ *Measure Tree Height on a Slope: Two-Triangle with Eyes Lower than Tree Base Data Sheet*
- ❏ *Table of Cosines*

- ❏ Pen or pencil
- ❏ Permanent tree markers (optional)
- ❏ Clinometer
- ❏ Species ID keys and/or other local species guides
- ❏ Blindfold

In the Field

1. Work in a team of two. You and your partner move away from the base of the tree until you can see the top of the tree through the drinking straw of the clinometer. **Note:** For the best results, adjust your distance so that the clinometer is as close to 30 degrees as possible and you are further from the tree than it is tall.
2. Site the top of the tree using the clinometer. Have your partner read and record the clinometer angle. This is the 1st Clinometer Reading.
3. Using the *Table of Tangents*, record the TAN of the angle on the *Measure Tree Height on a Slope: Two-Triangle with Eyes Lower than Tree Base Data Sheet*.
4. Site the base of the tree using the clinometer. Have your partner read and record this clinometer angle. This is the 2nd Clinometer Reading.
5. Using the *Table of Tangents*, record the TAN of the angle on the *Measure Tree Height on a Slope: Two-Triangle with Eyes Lower than Tree Base Data Sheet.*
6. Using the *Table of Cosines*, record the COS of the 2nd Clinometer Reading on the *Measure Tree Height on a Slope: Two-Triangle with Eyes Lower than Tree Base Data Sheet.*
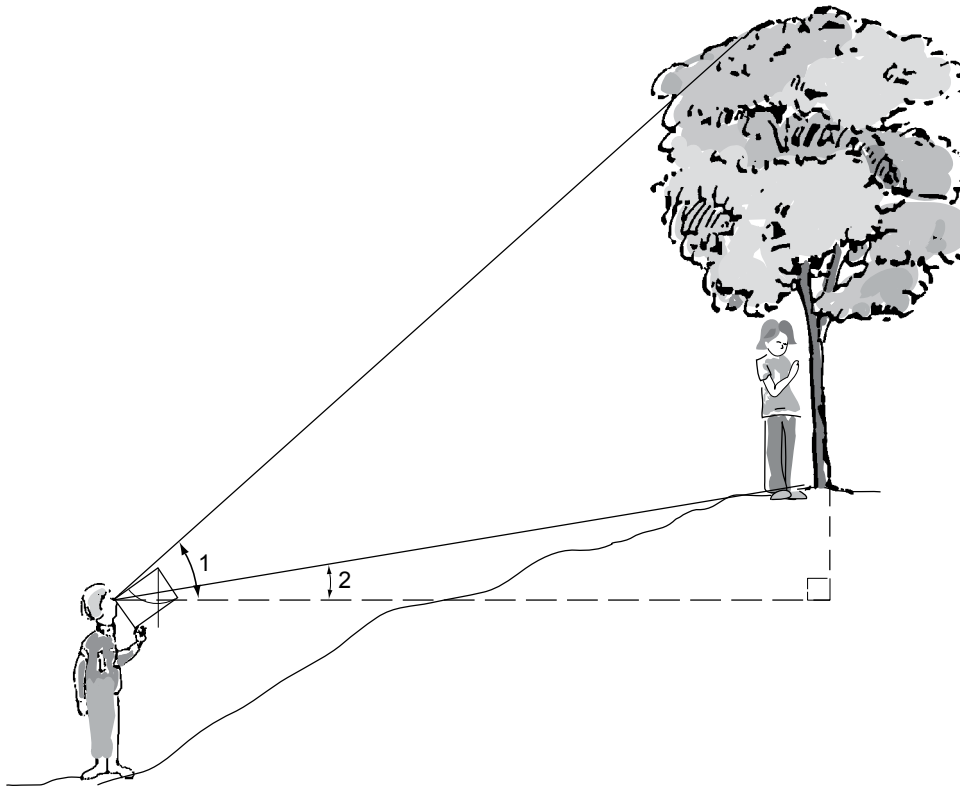
7. Measure the horizontal distance from your eyes to the base of the tree. Have your partner help you using the 50 m tape. Record this in the *Measure Tree Height on a Slope: Two-Triangle with Eyes Lower than Tree Base Data Sheet*.

8. Calculate the Baseline using the following formula:

   (Distance to the Tree) x COS (2nd Clinometer Reading)

9. Calculate the tree height using the following formula:
   TAN (1st Angle of the Clinometer) x (Baseline) – TAN (2nd Angle of the Clinometer) x (Baseline)

10. Record the tree height in the *Measure Tree Height on a Slope: Two-Triangle with Eyes Lower than Tree Base Data Sheet*.

11. Repeat steps 1-11 two more times for each tree and report the average value.