

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

Field Guide

Task

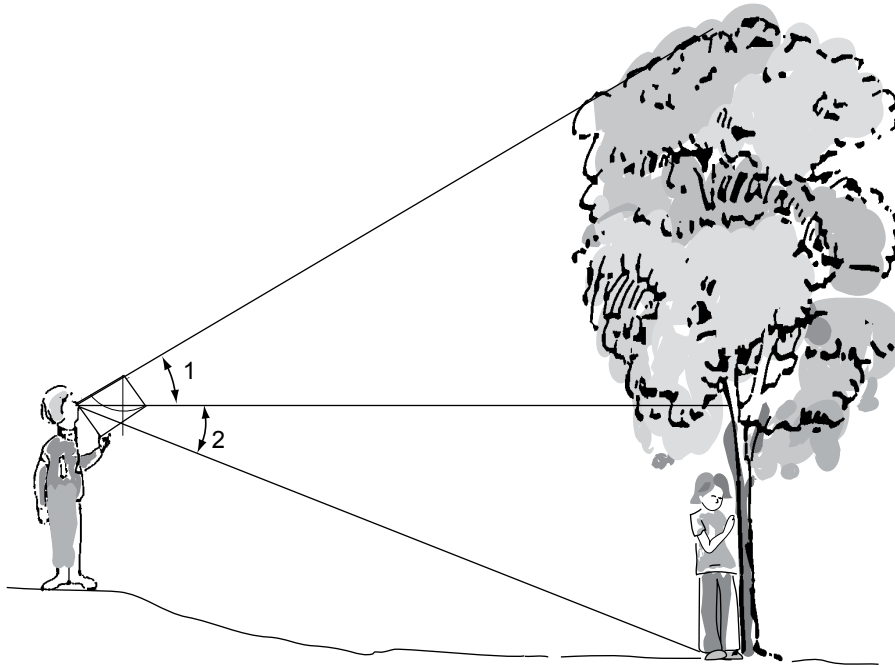
Measure heights of shrubs and/or trees to help determine the MUC class of your Land Cover Sample Sites.

What You Need

- 50 m measuring tape
- Flexible measuring tape
- Small bean bag
- [Measure Tree Height on a Slope: Two-Triangle with Eyes Higher than Tree Base Technique 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 Higher than Tree Base Technique Data Sheet](#).
4. Turn the clinometer around and look through the straw through the opposite end. Site the base of the tree. 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 Higher than Tree Base Technique 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 Higher than Tree Base Technique 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 Higher than Tree Base Technique Data Sheet](#).
8. Calculate the Baseline using the following formula:
 $(\text{Distance to the Tree}) \times \text{COS} (2^{\text{nd}} \text{ Clinometer reading})$
9. Calculate the tree height using the following formula:
 $\text{TAN} (1^{\text{st}} \text{ Angle of Clinometer}) \times (\text{Baseline}) + \text{TAN} (2^{\text{nd}} \text{ Angle of Clinometer}) \times (\text{Baseline})$
10. Record the tree height in the [Measure Tree Height on a Slope: Two-Triangle with Eyes Higher than Tree Base Technique Data Sheet](#).
12. Repeat steps 1-11 two more times for each tree and report the average value.