Tools of the Trade: Methods for Measuring Trees

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Sample Data Collection Sheet

Date: _____ Time: _____

Tree Number: _____ Species Name: _____

Location Description: _____

_____

Bole Circumference (inches): _____

Use a tape measure or string to measure the distance around the outside of the tree, 4.5 feet from the ground – or at the height your class decided.

Crown Spread (feet): _____

1. Look up and find the outermost edge of the crown above. Foresters sometimes call this edge the drip line, where water first drips off of a tree and onto the ground when it rains. Stand at the drip line, directly across the tree from a partner, with the tree trunk blocking your view of your partner. The length between you and your partner is the crown spread.

2. *Incorporating Averages:* Find the narrowest part of the crown and measure the distance between you and your partner, in feet. Record this number. Then find the widest part of the crown and measure that distance, in feet. Add the two measurements together. Then divide the total by 2. This average measurement is the tree's crown spread.

Narrowest (feet): _____ Widest (feet): _____

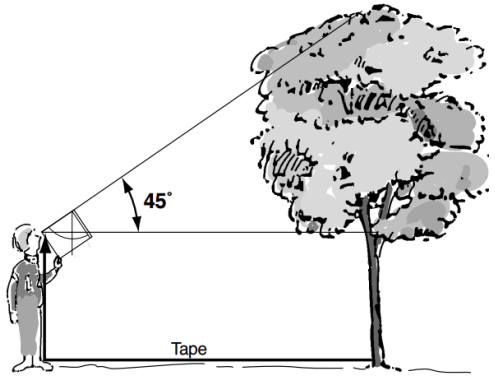
Average Crown Spread (feet): _____

Tree Height (feet or inches): _____

Method 1: Clinometer at 45 degree angle (from GLOBE)

1. Move away from the base of the tree until the clinometer reads 45 degrees when you see the top of the tree through the straw.

2. Have your partner(s) stretch the measuring tape from the base of the tree to your toes. Your partner should then step on the tape at the ground and then run it up to your eye level. This is the height of the tree.



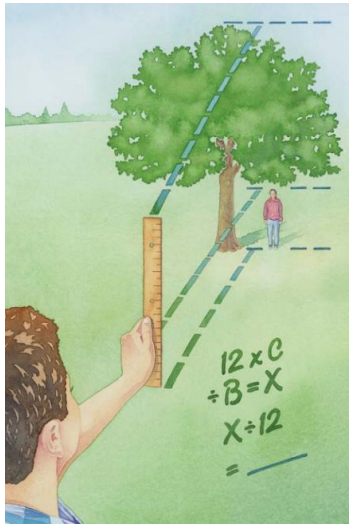
Tree Height (feet or inches): _____

Method 2: Ruler & Partner (from Minnesota Conservation Volunteer)

1. Measure your partner's actual height, in inches (A):_____

2. Have your partner stand at the base of a tree. Hold a 12-inch ruler or other measuring stick straight out in front of you and walk backward. Stop when the top and bottom of the ruler line up exactly with the top and bottom of the tree. Record where the top of your partner's head appears on the ruler, or their apparent height, in inches (B): _____

3. Record the length of your ruler or measuring stick, in inches (C): _____



4. Plug your three numbers (A, B, and C) into this equation and calculate the tree's height tree, in inches (H):

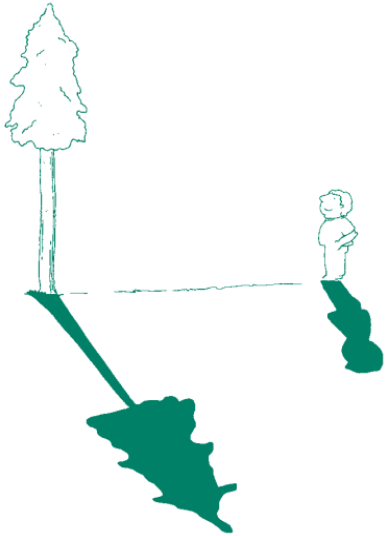
$$H = A \text{ x } C \div B$$

Tree Height (inches): _____

Incorporating Algebra: Higher grades can use a ratio equation and solve for the height of the tree.

$$\frac{A\ (actual\ height\ of\ partner)}{B\ \begin{pmatrix} height\ your\ partner \\ appeared\ on\ the\ ruler \end{pmatrix}} = \frac{H\ (height\ of\ tree)}{C\ (length\ of\ ruler)}$$

Method 3: Shadow & Partner (from Project Learning Tree)



1. Measure your partner's actual height, in inches (A): _____

2. Have your partner stand next to a tree. Measure your partner's shadow from the bottom of their feet to the top of their shadow's head, in inches (B): _____

3. Quickly measure the shadow of the tree, from the bottom of the tree trunk to the top of the tree's shadow, in inches (C): _____

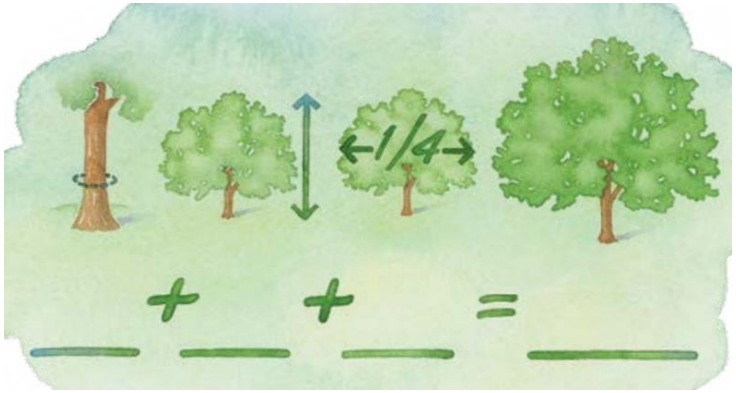
4. Use one of the equations from Method 2 and calculate the tree's height, in inches (H).

Tree Height (inches): _____

Incorporating Precision: You can test the precision of one or all of these methods by measuring a single tree multiple times. For example, use the Shadow & Partner Method at different times of day for a single tree and compare the tree heights you calculate. Think about why you may calculate different heights for the same tree.

Calculating Tree Size Score:

Bole Circumference (inches) + Tree Height (feet) + ¼ Crown Spread (feet)



Conversion Note: You may need to convert tree height measurements from inches to feet.

Space for Calculations, Conversions and Other Notes: