Appendix 6: Using a Biltmore Stick

The Biltmore Stick is used to measure the diameter of a tree in inches (DBH) and the height of a tree in number of 16 foot logs. The DBH and height can be used to estimate the volume of wood in the tree.

Instructions for making your Biltmore stick

To construct a Biltmore stick, you will need a stick of wood 3 feet long, about 1 inch wide and about 1/4 inch thick (such as a yardstick), and copies of pages 3 and 4 of Appendix 6.

Merritt Hypsometer side. First, assemble the Merritt Hypsometer by cutting out pieces #A-D on page 3. Assemble the pieces in the order given by taping them together along the dotted lines, making sure the numbers are in sequence. You may wish to have the paper copy laminated or covered with clear contact paper to make it waterproof and more durable. Attach the paper copy of the hypsometer to your yardstick with glue or tape.

Diameter stick side. Next, assemble the Diameter stick by cutting out pieces #A-D on page 4. Tape the pieces together in the order given and attach them to the other side of the yardstick, as described above.

How to use the diameter stick to measure tree diameter (DBH)

Hold the diameter stick horizontally against the tree 4.5 feet from the ground ("breast height") and approximately 25 inches from your eyes. Look directly at the center of the tree. Without moving your head, look to the left and line up the zero end of the stick with the left edge of the tree. Now look at the other edge of the tree and read the diameter to the closest inch (again without moving your head). Take two measurements at right angles to each other and take the average.

How to use the Merritt Hypsometer to measure tree height

Stand 1 chain (66 feet) from the tree. Hold the Merritt Hypsometer vertically facing the tree, 25 inches from your eyes. Line up the zero end of the hypsometer 1 foot above the ground ("stump height"). Move your eyes up and look at the point where the trunk diameter becomes too small or large branching occurs ("merchantable height"). Read the height measurement from the Merritt Hypsometer to the nearest half log.

**Merchantable height will vary depending on the desired product. For example, sawlogs are
usually at least 10\" in diameter at the smallest end, while some pulpwood buyers will buy pulpwood as small as 4\" in diameter. See Unit 6: Lesson 26 for product specifications or contact your local forester for commonly used dimensions in your region.

**For more information** see "The Woodland Steward" by J.R. Fazio, pages 22-25. Biltmore sticks and tree scale sticks (which measure only diameter, not height) may be ordered from Forestry Suppliers (1-800-647-5368), Ben Meadows Company (1-800-241-6401), or other similar companies.

**Activity:**
Make a Biltmore stick and record the diameters, heights, and number of logs of the trees you identified in Lesson 9.