

# Using a Biltmore Stick

David Brigham, Lansing School District, Michigan

The Biltmore stick is a forester's tool to measure trees quickly. Using the board feet calculator (not on this rudimentary Biltmore Stick), one can rapidly determine the amount of lumber that is in a tree.

**Diameter** is measured by placing the stick on the tree at 4.5 feet (DBH or diameter at breast height). Using one eye, line up one end of the stick with the edge of the tree and then read, peripherally with the same eye, the diameter from the stick.

**Length** is measured in units called 'logs'. These are 16 foot sections and a  $\frac{1}{2}$  log is 8 feet. The forester starts at the base of the tree and walks off 66 feet (one chain) to measure the tree. Once they are 66 feet away from the tree, they use the side of the Biltmore Stick. By holding the stick at arm's length, they align the bottom of the stick with the base of the tree. Then they look up the trunk until an imperfection or major branching occurs and read the number of 'logs' that are represented.

This is a quick approximation of the trees and wood available in an area. Sampling technique lessons could be incorporated in advanced settings. It is also interesting to note the odd measurement units (chains, rods, DBH, logs) that are used. These are forestry standards even today. They have an interesting historical aspect especially in Michigan's place in the Northwest Ordinance.

**1 chain = 66 feet or 22 yards or 20 meters or 4 rods**

80 chains = 1 mile  
40 chains =  $\frac{1}{2}$  mile  
20 chains =  $\frac{1}{4}$  mile

1 section = 80 chains<sup>2</sup> (640 acres)  
 $\frac{1}{4}$  section = 40 chains<sup>2</sup> (160 acres)  
 $\frac{1}{4} \frac{1}{4}$  section = 20 chains<sup>2</sup> (40 acres)

## Materials needed to make a Biltmore Stick

- 30 inch blank wood sticks
- Fine-tipped Sharpie to mark the stick
- Measuring tape (with decimal or fraction increments)
- Biltmore Stick measurement sheet

## Biltmore Stick Measurements (30" stick)

**DBH (diameter at breast height), 16' Logs**     Start measurements on the left end of the stick

Write on stick	Measure Fraction	Measure Decimal	Write on stick	Measure on stick
6"	5 <sup>7</sup> / <sub>16</sub>	5.4"	1	6.1"
8"	7	7"	2	12.1"
10"	8 <sup>7</sup> / <sub>16</sub>	8.45"	3	18.2"
12"	9 <sup>7</sup> / <sub>8</sub>	9.9"	4	24.2"
14"	11 <sup>3</sup> / <sub>16</sub>	11.2"		
16"	12 <sup>1</sup> / <sub>2</sub>	12.5"	You may want to	mark <sup>1</sup> / <sub>2</sub> logs as well
18"	13 <sup>11</sup> / <sub>16</sub>	13.7"		
20"	14 <sup>7</sup> / <sub>8</sub>	14.9"		
22"	16	16"		
24"	17 <sup>1</sup> / <sub>16</sub>	17.1"		
26"	18 <sup>3</sup> / <sub>8</sub>	18.2"		
28"	19 <sup>1</sup> / <sub>4</sub>	19.25"		
30"	20 <sup>3</sup> / <sub>16</sub>	20.25"		
32"	21 <sup>1</sup> / <sub>8</sub>	21.2"		
34"	22 <sup>1</sup> / <sub>8</sub>	22.2"		
36"	23	23"		
38"	23 <sup>7</sup> / <sub>8</sub>	23.9"		
40"	24 <sup>3</sup> / <sub>4</sub>	24.8"		