



National Wildlife Federation's Eco-Schools USA-Learning About Forests Forest Study Site Measurement Guide

CREATING A FIXED PLOT SAMPLE

If you have a larger forested area on your school grounds or in your community, you may want to sample different areas of the site versus the whole site. Students can work in teams and have their own plot sample or have one plot with students measuring different aspects within that plot.

A fixed area plot has a known area. You will want to try to choose a plot size that gives you an average of 5-10 trees per plot. We suggest you try a 1/10 (one tenth) of an acre and see if this provides you with enough trees. In a forested area the easiest shape for a plot sample is circular.

For a **circular plot** have students denote the center of the plot with a flagged stick or flag marker. Have the radius of the circle be 37.2 feet or 11.3 meters for your 1/10 acre plot. Using a 50-foot measuring tape, have each team measure 37.2 feet from the plot sample center and continue to circle the center with tape flagging the perimeter. It is within this perimeter that your students will collect their data. This video is useful in showing you how to create a circular plot sample, <https://www.youtube.com/watch?v=lfU5BIbn9Y>.

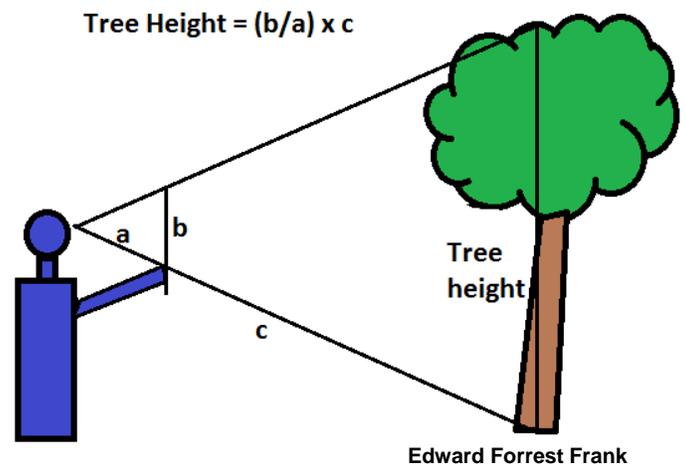
DETERMINING TREE HEIGHT

<https://www.youtube.com/watch?v=5H8s2zNRRv8>

The height of a tree is measured from the ground to the top and is approximated to the nearest foot. Most foresters use a clinometer to determine tree height but it is an expensive piece of equipment. You can [create your own clinometer](#) or you can use the procedure below to measure tree height.

Have students work in teams. Have a couple students stay on level ground as they follow the directions. For younger students, parents or teachers should help with this measurement.

1. Have one student hold their arm out in front of them so that their fist is at eye level. (Their arm should not be bent at all). Have another student measure the distance from your fist to your eye – see line A on diagram.
2. Face the tree you want to measure and hold a yardstick so that the distance from your hand to the top of the stick is the same as the distance you measured in Step 1 (see line B on diagram). Make sure they hold the stick straight up and down and not at an angle.
3. Walk backward away from the tree until you can see the base (bottom) of the tree by looking over your fist, and the top of the tree by looking over the top of the yardstick (remind them not to move anything but their eyes!)
4. When they see the tree completely by sighting over the top of the yardstick and the top of the fist, have the other team member's measure the distance between you and the tree. This distance is the approximate height of the tree.





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DETERMINING DIAMETER AT BREAST HEIGHT (DBH)

<https://www.youtube.com/watch?v=JLc4UjOpC0s>

DBH is a common tree measurement. To determine DBH, measure your tree at 4.5 feet above ground and have one student hold one end of the measuring tape against the tree. Have another student wrap the tape around the trunk. If the students are not tall enough to measure the circumference at 4.5 feet, or if there are branches at that height, have them measure at the best point below the mark (or get an adult to help). To get DBH, take this circumference measurement and divide it by 3.14. DBH measurements are used to estimate volume, biomass, board feet and carbon storage.

Biomass – Biomass is organic matter derived from living, or recently living organisms. Biomass can be used as a source of energy and it most often refers to plants or plant-based materials that are not used for food or feed, and are specifically called lignocellulosic biomass.

Board feet – A unit of volume for timber equal to 144 cubic inches, notionally twelve inches by twelve inches by one inch.

Carbon storage – **Carbon** capture and **storage** (CCS) (or **carbon** capture and sequestration) is the process of capturing waste **carbon** dioxide (CO₂) from large point sources, such as fossil fuel power plants, transporting it to a **storage** site, and depositing it where it will not enter the atmosphere, normally an underground geological formation.

