



# What Can a Tree Do For You?

## Student Activity Sheet

### Part 1: How Much Carbon Is In My Tree?

**DIRECTIONS** ▶ Use the steps below to estimate the amount of carbon that is stored in a tree.

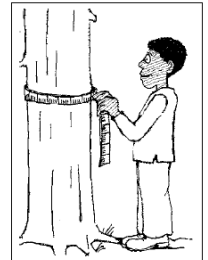
Supplies you will need:

- Meter stick (or piece of string 4 feet and 5 inches long)
- Fabric measuring tape (or piece of string long enough to go around your tree trunk)
- Tablet or smartphone with the [GLOBE Observer](#) app installed
- Tree Data resource sheet

1. **Identify a tree that you can measure.** The tree should be at least 15 feet high (about three times as tall as you are). If possible, choose a tree on a relatively flat ground (not one on a hill). Choose a tree that you can walk up to, all the way to the trunk (a tree behind a fence won't work). If possible, identify what species your tree is.
  - *Record some observations about your tree, including: location of your tree, species (if known), tree type (evergreen or deciduous), leaf type (leaves or needles), and any other interesting characteristics that you notice.*

2. **Measure the Diameter of your tree.**

- While standing at the tree, use a meter stick or measuring tape to find the standard measuring point: 4 feet and 5 inches (or 1 meter and 35 cm) above the ground.
- Have one person in your group keep their hand on the tree trunk to mark the measuring point.
- Use your measuring tape to find the circumference of the tree trunk at the measuring point. Be sure that the measuring tape isn't twisted and that it is at an even height all the way around the trunk (make sure the measuring tape isn't lower or higher than the measuring point as it wraps around the tree).



Tree circumference (in) = \_\_\_\_\_

To find the diameter of your tree, divide the circumference by  $\pi$  (3.14).

$$\text{Diameter (in)} = \frac{\text{circumference}}{3.14} = \boxed{\text{Diameter}}$$

3. **Measure the height of your tree using the GLOBE Observer app.**

- Login to the GLOBE Observer app using the login/password that your teacher provides.
- Select Trees from the menu and go through the tutorial
- Choose one person from your group to enter their height. This person will need to be the one to use the device to take measurements.
- Choose "New Tree Observation" and follow the steps to make your tree height measurement and record it below. Note: use English units so that tree height will be measured in feet.

Tree height (ft) =

4. **Determine how much carbon is in your tree.**

- Use your Diameter and Tree Height measurements to figure out how much carbon is in your tree using Table 1 on the Tree Data resource sheet.

Carbon in my tree (lbs) =



## Part 2: Not All Forests Are the Same

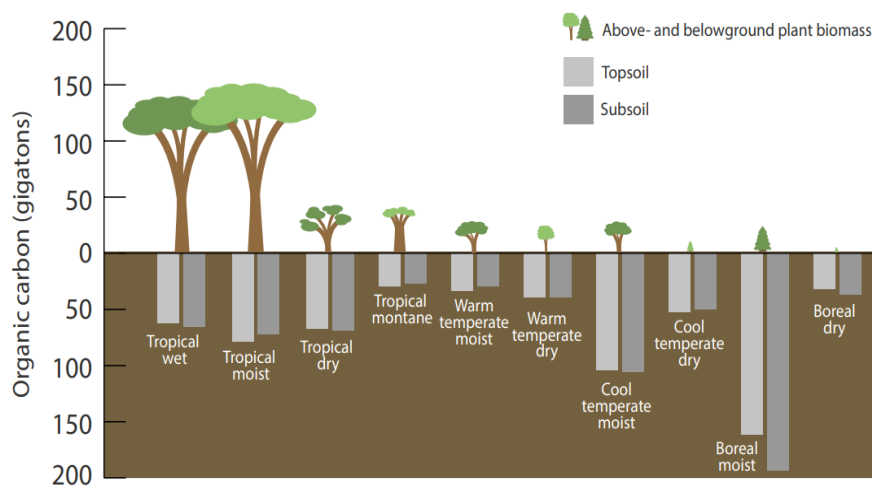
**DIRECTIONS** ▶ Use the graph below to analyze how different forest types store carbon.

The graph at the right shows the three main types of forest:

- Tropical, Temperate, and Boreal

Forests store carbon in three different ways:

1. Plant biomass: above ground in trunk, branches, and leaves.
2. Topsoil: soil that is close to the surface.
3. Subsoil: soil that is deeper below the ground (often permafrost).



Credit: [US Forest Service](https://www.fs.fed.us/)

1. **Each forest type also has different sub-types with different amounts of humidity - wet, moist, and dry.** What is the relationship between humidity and how a forest stores carbon? Explain.
2. **The deep subsoils of Boreal forests store carbon in frozen layers called permafrost.** As global temperatures continue to rise, how might the carbon-storing ability of Boreal forests change?
3. **Compare Table 2 on the Tree Data resource sheet to the graph above.** Which of the three main forest types has the largest impact on carbon storage? Explain.
4. **Rank the top four carbon-storing ecosystems in Table 2.** Which ecosystems listed in Table 2 store the most carbon?
5. **Compare the size (area) of different forest types with the amount of carbon stored in each type.** Where would planting trees have the biggest impact as a climate solution?

