



CLIMATE, CLASSROOMS AND TREES

Materials included in your kit:

- One SPI Digital Caliper
- One pair of snips
- One single hole punch
- One measuring tape in millimeters
- Twelve aluminum nails
- Twelve numbered aluminum tree tags
- Twelve stainless steel springs
- Twelve stainless steel dendrometer bands
- Twelve stainless steel “clips”
- One black marker
- One instructional CD

Other materials that you will need, but are not supplied

- Hammer
- Needle nose pliers
- Pen or pencil

How to prepare and install your dendrometer

1. Select your tree. When selecting a tree make sure that you choose one that is alive, relatively straight, doesn't have a split or double- trunk and free from vines and other growth. This will make measuring much easier and more uniform from tree to tree. You will also want to think about the trees that you select; you will need ten trees of varying species and height. Don't select a palm tree, a bamboo or a cactus as these grow differently than most trees and the dendrometer won't work. *You may want to also create other -experiments on your trees. For example you may want to compare the rate at which different species of tree grow or how different amounts of available light affect growth. Think about these other opportunities when you select your trees*



2. Once you have selected a tree, measure the circumference of the tree at 1.3 meters from the ground, considered a standard height which trees are measured (BH). This height is used to calculate the diameter at breast height (DBH). If the tree is on a slope, measure while standing on the uphill side.
3. Using the black marker, place a mark on the tree at BH, as this is where you will place the dendrometer band, once it is prepared.
4. Using a hammer (not provided) and one of the aluminum nails provided, nail one of the numbered aluminum tags into the tree slightly (about 5-10 cm) above the 1.3 meter mark. Only drive the nail into the tree about 2 centimeters (or about $\frac{1}{2}$ an inch), this will NOT hurt the tree. Make sure that the numbered side of the tag is facing out.
5. Record on your data sheet: the tree number, the location (school name and town), the latitude and longitude, the diameter (you will need to calculate this from your circumference measurement and it can be added later), the date of your initial measurement (this will also tell you what day you installed the band), the scientific name of the tree (we can help you if you can't figure it out), and crown position (this is how much light the top of the tree get relative to other trees. You will choose: totally lighted, partially lighted and shaded.) See [Figures 1-3](#) below:



Figure 1: totally lighted

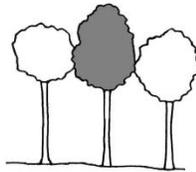


Figure 2: partially lighted

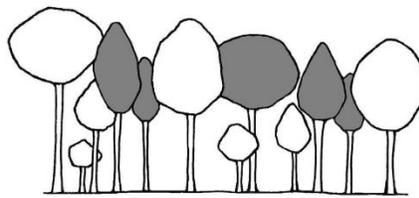


Figure 3: shaded

6. Once you have recorded all of the initial information on to your data sheet, the next step is to install the dendrometer band. To do this see that your band has a head end, the folded end with a hole punched in it, and a tail end; the end with nothing on it. (see Figure 4)

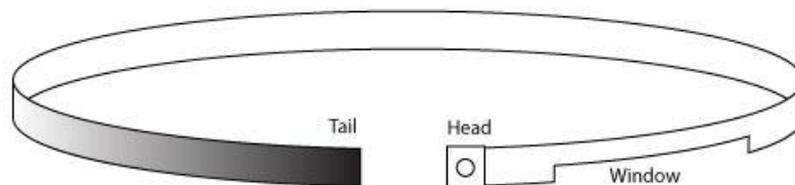


Figure 4: dendrometer orientation

7. Take the band and wrap it around the tree. You will need to slide the tail end through the small opening on the head end. (see Figure 5) Wrap the band so that the band window is facing down.

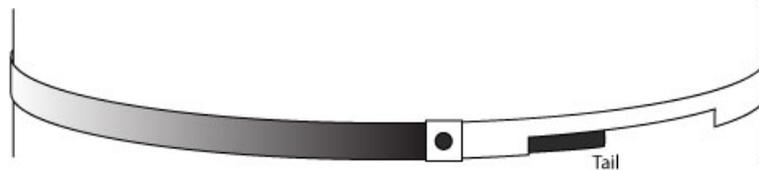


Figure 5: How the tail end fits into the head end

8. The tail end should slide past the window that is cut in the band. You will then need to trim the tail end of band so that there is a one centimeter opening remaining in the window. You can do this by measuring one centimeter back from the edge of window. Mark this spot with the black permanent marker. Slide the tail end of the band back out and using the snips trim the end, where you made the mark. Make sure to cut this end as squarely and cleanly as you can.
9. Slide the tail end back through the head. The next step is to punch a second hole in the band for the stainless steel spring to attach onto the dendrometer band. This spring keeps the band securely on the tree, without sliding up or down. You will need to measure from the center of the existing hole on the head end of the band 8.5 cm away from the window. Mark this spot. Use the single-hole punch to punch a hole at this mark. (see Figure 6)
10. If the band has loosened, re-tighten it and put one end of the spring in the hole that was pre-punched in the head end of the band and one end of the spring in the hole that you just punched. You may need a pair of needle-nose pliers to attach the spring to the second hole. (The spring may fly off if you let it go, so be careful and use proper eye protection).
11. Make sure that the band is perpendicular to the trunk, as tight as possible.
12. Loosely wrap one of the stainless steel “clips” around the band where the tail end overlaps the window. This will keep the tail end from sliding up or down the tree. (The “clip” is the light grey band in Figure 6 below)

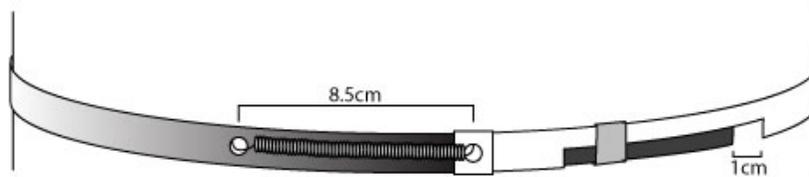


Figure 6: Completed dendrometer band

13. Congratulations, you have installed your dendrometer band.
14. You may take an initial measurement with your digital calipers (refer to “*What to do with your Data*” sheet for direction on how to use calipers)
15. Repeat the procedure on at least nine more trees.

PLEASE NOTE:

You will need to wait about 4 weeks from installation for your first data collection however! The band needs to adjust to the tree so that the measurement is accurate.