1. What is your tree's name?

2. What is the location of your tree?

3. Type the tree. Is the tree deciduous or coniferous? How do you know?

4. What does the barks look like?

5. What does the bark feel like?

6. Draw a leaf sketch.

7. Measure your tree (using a measuring tape) at chest height. What is its circumference?

8. Where does your tree get its primary source of water?

9. Is your tree similar to or different than it's brothers and sisters around it? How is it similar or different?

10. Do you think this tree is natural or a transplant? Why do you think that way?

11. Use the "measuring tree height" guide and estimate the height of your tree.

12. To the best of your ability, make a scale drawing of your tree (on the back of this paper).

Measuring Tree Height Reading

Measuring tree height is an important part of a site analysis. Trees affect the plants around them, the animals that will inhabit the area, water availability, the microclimate, sunlight, and soil type. There are many ways to estimate tree height. Below are five methods, starting with the simplest and least accurate. All of these methods involve working with a partner.

Rough Estimate Measure the height of one person and record. That person then stands straight against the tree. The second person stands at a distance and estimates how many "heights" of that person make up the tree height. Walk farther back and repeat. Do until you are getting a consistent estimate.

Logger's Estimate One person stands at a distance from the tree and extends his or her arm to full arm's length. Bracket the tree height between the thumb and forefinger. If the tree is too big, walk farther away from the tree. Without changing the distance between the fingers, rotate the hand so the distance runs along the ground from the base of the tree outward. The second student should locate the spot on the ground identified by the first student's forefinger. (Note: It is important that the first student keep his or her arm fully extended throughout this exercise.) The distance on the ground equals the height of the tree.

Shadows Measure the height of one person and the measure of his or her shadow. Record. Measure the shadow length of the tree and record. The following proportion can be used to calculate the tree height:

$$\frac{\text{height of tree}}{\text{length of tree's shadow}} = \frac{\text{height of person}}{\text{length of person's shadow}}$$

Sighting Stick Using the sighting stick, move a distance from the tree such that, when held at arm's length, the base of the stick is at the base of the tree and the stick just covers the height of the tree. In this position, sight through the hole to the tree. The second person should mark the spot on the tree that is visible through the hole. Because the stick is ten inches long and the hole is drilled at one inch, tree height can be calculated using the following proportion: $\dfrac{1"}{10"} = \dfrac{\text{height of the marked spot on the tree}}{\text{height of tree}}$

Trigonometry Pick a spot at some distance from the tree. Measure the distance from the base of the tree to the spot. Record. Measure the angle necessary to sight to the top of the tree from the spot. Be sure to sight from the ground. Tree height can be calculated using the following equation: $\tan \text{ of angle} = \dfrac{\text{length of leg opposite angle}}{} = \dfrac{\text{tree height}}{}$

Distance to tree_____
Angle_____
Tan of angle_____
Height of tree_____

Name(s)_____ **Tree Height Data Sheet**

Do the following estimates based on your teacher's instructions.

Rough Estimate
height of person _____
tree height = height of person times number of "heights" (use average)
number of " person heights" needed to determine tree height
average of trials _____
height of tree_____

Logger's Estimate
height of tree _____

Shadows
height of tree =   height of person
length of tree's shadow   length of person's shadow
Therefore,height of tree = height of person times length of tree's shadow
length of person's shadow_____
height of person_____
length of tree's shadow _____
length of person's shadow _____
height of tree _____

Sighting Stick
1"   =   height of the marked spot on the tree
10"   height of tree
Therefore, height of tree = 10 times height of the marked spot on the tree
height of tree _____

Trigonometry

tan of angle = length of leg opposite angle = tree height
length of leg adjacent angle distance to tree
Therefore,
tree height = tan of angle times distance to tree
      distance to tree _____
      angle _____
      tan of angle _____
      height of tree _____

Tree Base Example

Each outside line will be a total of 6-feet across. The individual sections will be 3 feet. Because the base of each tree is different, have the students use their skills of estimation to plot their dowels and then check for proper footage with a tape measure. The measurements can be easily adjusted as space allows.

Each segment will be 3 ft x 3ft
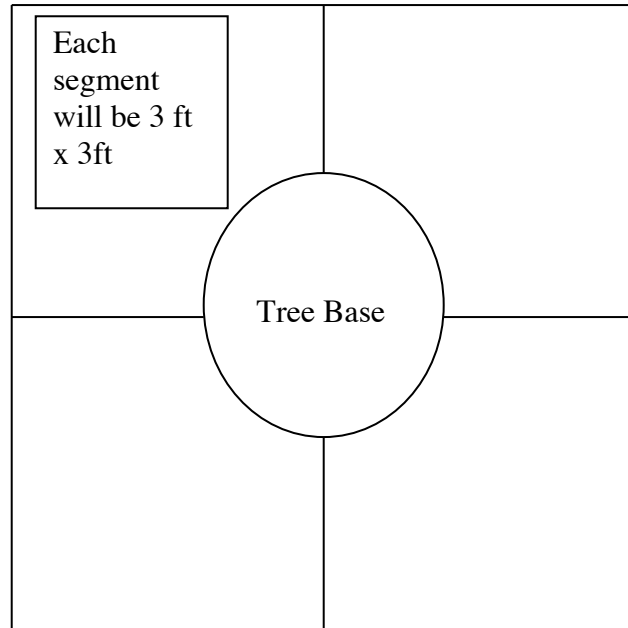
Tree Base

Name(s) _____   **Tree Base Worksheet**

Divide the ground around the base of the tree into four quadrants, examine the ground, by quadrant, and report what you find there. On this sheet, draw your four quadrants and list what you find in each quadrant.

Look for the following: the types of plants that are growing there, nearby insect and animal life, and dead materials in each quadrant.

Writing Prompt

First Observation
Document the date. Imagine you are your adopted tree. Write a journal entry, using your five senses, and describe what you notice about your surroundings. What do you see, what is your world like, how do students use/abuse you, and what is your role in the school? Be sure to develop a sequential story line and use figurative language as well as descriptive words.

Second Observation
Document the date. Imagine you are your adopted tree. Write a journal entry and describe how things have changed over the time in your region. What has changed, what remains the same, and what do you think will happen to you in the future?

Third Observation
Document the date. Imagine you are your adopted tree again. Write a journal entry with a description about how you and your region have changed and developed over the school year.

Now take all of your observations and turn them into a narrative by
- Introducing your topic
- Developing your topic
- Using appropriate transitions (since, when, although, etc.)
- Using vocabulary appropriate to describing change over time
- Providing a conclusion