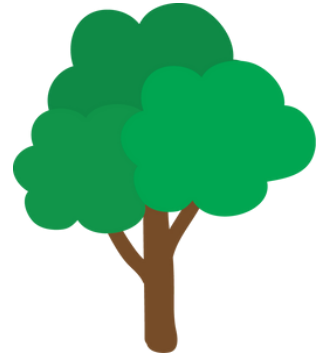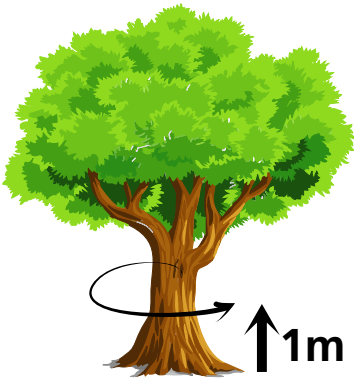# Tree Maths

For these tasks you will need to be in an area with trees. This can be a park, woodland or garden. Try using the A-Z tree ID resource to work out what species of tree you are looking at.

Estimating the age of a tree

Measure the distance in cm around the trunk of the tree at about 1m up from the ground.
This measurement is known as the girth.
You can work out the age of the tree by multiplying the girth by 2 and then dividing by 5.

1m

Estimating the height of a tree

To do this you will need to make a piece of equipment called a clinometer. A clinometer is a tool that is used to measure the angle of elevation, or angle from the ground, in a right - angled triangle. It is used to measure the height of tall things that you can't reach to the top of such as a building, flag pole or tree.
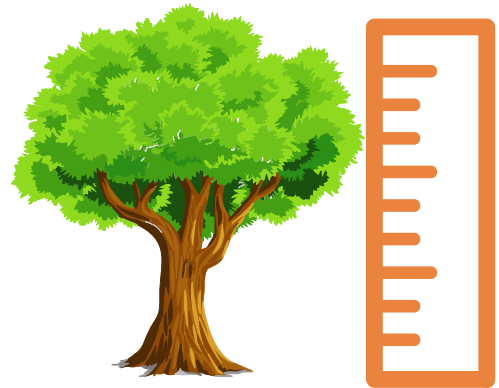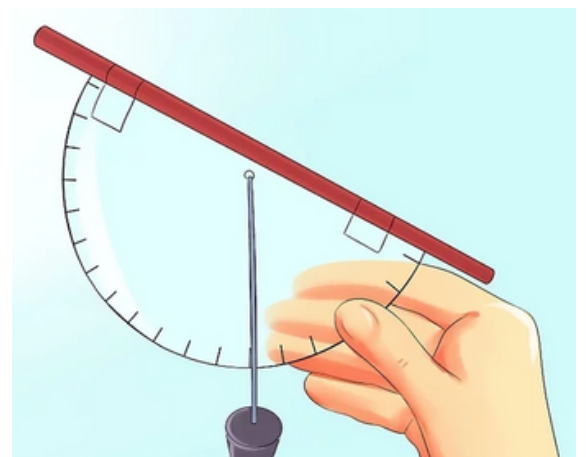
You will need:

- A protractor with a small hole on the centre spot
- 20 cm of string
- A weight - such as a metal nut, paper clips or a small piece of clay
- A straw
- Clear Tape

To make the clinometer:

- Tape the straw to the straight edge of the protractor.
- Push the string through the hole in the protractor and tie a knot so it won't pull through.
- Tie your weight to the other end of the string.

To measure the height of the tree:

You will two people for this as well as your clinometer, a tape measure and a pen and paper.

1. Find the tree that you want to measure.

2. Walk backwards, pointing the straw up towards the top of the tree and looking through the straw until you can see the top of the tree.

3. Ask your friend to read the angle being recorded on the clinometer. This is read where the string or cotton is touching the protractor.

4. Keep moving back (or forward if you've gone too far) until you have the clinometer angle measuring 45 degrees. With a 45 degree angle your job will be much easier as the distance from you to the tree will be equal to the distance from the ground to the top of the tree.

5. Measure the distance between where you are standing and the base of the tree.

6. Measure the distance from your eyes to the ground

7. Add these two distances together - because to be most accurate the triangle has to finish at your feet not your eyes.

8. You now have a very close approximation of the height of the tree.
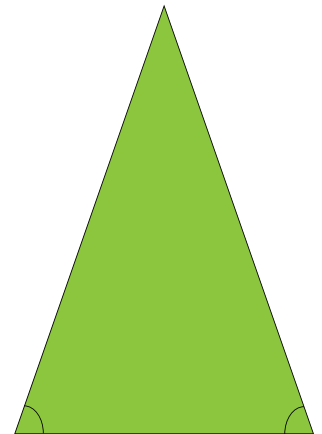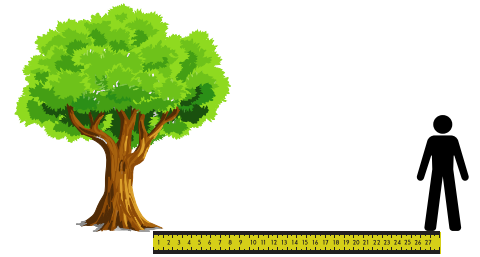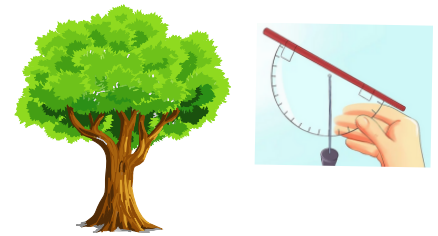
You, the base of the tree and the top of the tree, form an isosceles triangle meaning the distance from you to the base of the tree is equal to the height of the tree (from the viewer's eyes to the top).

Extension

Look at the trees and their surroundings to see if you can find evidence of human influence. Were the trees planted or did they grow there naturally? How do you know?

If you have been able to identify what species they are using the A-Z tree ID guide, can you find out if these are native species or ones that have been introduced to Britain?