

How big is your tree?



'Champion' trees are the biggest of their species. We have a few in the Gardens, one is the *Zelkova carpinifolia*, or Caucasian Elm, which is in front of the Herbarium.

Use maths in the Gardens to figure out the measurements of your adopted tree!

Tree Height

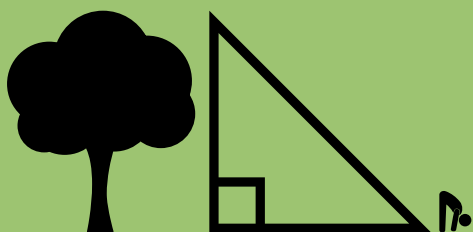
STEP 1: Divide into pairs. Student 1, stand with your legs apart and your back to the tree. Keeping your legs straight, bend over and look at the tree between your legs. Move back and forth until you can just see the top of the tree between your legs.

STEP 2: Student 2, measure the distance between the feet of student 1 and the base of the tree. One of your largest steps is approx. 1m. Count your steps between Student 1 and the tree. The height of the tree is the same as the distance between student 1 and the base of the tree. Record on your measurement sheet.

Further Exploration



- This method works because the angle of sight from between the legs (when you can only just see the top of the tree) to the top of the tree is approximately 45 degrees. The angle of the tree with the ground is 90 degrees (a right angle). An approximate isosceles triangle is then formed. This means that the distance between your feet and the tree trunk is approximately the same as the height of the tree.
- Compare the results of the class. Are they the same? Think about ways the measurement could be more accurate.



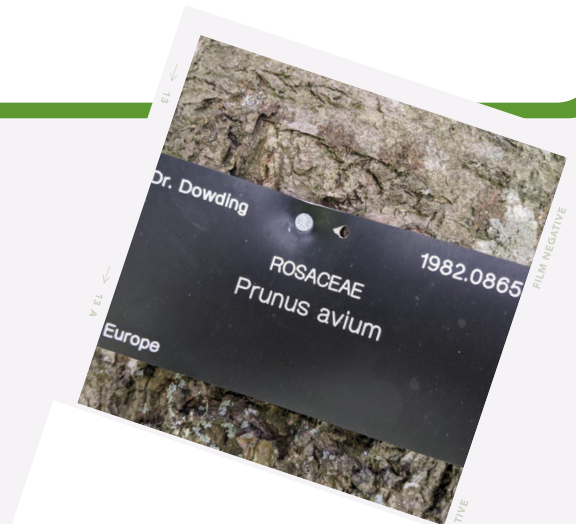
Tree Age

Note: You will need a measuring tape for this activity

STEP 1: Student 1 use the measuring tape to measure the distance from the ground to the height of 150 cm above the ground. Student 2 hold your finger at that height on the tree trunk.

STEP 2: Student 1 measure the girth (circumference) of the tree trunk using the measuring tape at the level where the student 2 is holding their finger.

STEP 3: Record your measurement on your recording sheet. On average a tree grows out approximately 2.5cm per year. Take the measurement of the tree girth in centimetres and divide by 2.5 to calculate the approximate age of your tree.



Further Exploration



All the plants in Botanic Gardens have a label recording their scientific name, and the accession number (in the top right corner). This gives the year it was introduced into the Gardens and then the identifying number e.g. if the plant's accession number is 1982:0865, it is the 865th plant introduced into the Garden in 1982. If the accession number starts with XXXX, this means we have no record of when it was brought in. Can you find the label for your tree? Can you calculate what age it is? Does it correspond to your age calculations? What are the problems with these techniques (hint: the accession number says when a plant was brought into the Gardens, not when its seed was sown).



Tree Measurement Recording



Tree Height:

Distance from student 1 to
base of tree = _____
metres.

Tree height = _____
metres.

Tree Age

Tree circumference = _____
cm ÷ 2.5 = _____
= approximate age of tree



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