

Plants

Samples

D

Students are shown modern examples of plants which are found as fossils e.g. a frond of Dawn Redwood, (*metasequoia glyptostroboides*, common in gardens), a Horsetail, common in damp places and photos of modern tree ferns from New Zealand.

Carbonisation

D

Surround a leaf with clay and heat it in the oven. Break it open.

Trunk diameter

I 5 min

Because Carboniferous trees were hollow they are often squashed flat. Students measure the width (w) of a squashed fossil trunk and calculate what its original diameter (d) was. $d = 2xw/\pi$

Bamboo

D

Carboniferous trees were rather like bamboo, hollow inside. However bamboo is a grass.

Strength of trees

Pa I 15 min

Compare the strength of *Lepidodendron* which was hollow inside and that of

Oak which is solid. Resistance to bending is proportional to

$$\frac{\text{Young's modulus for wood} \times \text{second moment of area}}{\text{length}}$$

If the properties of the wood are the same and the length (tree height) is constant then the only variable is the second moment of area. This is $\pi/4 \times r^4$ for a solid tree and $\pi/4 \times (r^1 - r^2)^4$ for the hollow tree, where r = radius, r^1 = outside radius and r^2 = inside radius.

After the Ice Age

Pa I 5 min

Students are given a diagram showing the abundance of each type of tree pollen found in clays deposited since the Ice Age. They must work and explain out the order of arrival of the different types of tree.