Cambridge University
Botanic Garden

How big?

Measuring the largest trees in the Garden

Notes and map to assist your visit to the Garden

Cambridge University Botanic Garden

LESSON PLAN: How Big? Measuring the largest trees in the Garden
DURATION: Typically 30 minutes

Learning Objectives

Compare and contrast two huge trees.

Find out that trees make the biggest living structures (visible above ground) on earth.

Examine some information about the most massive tree in the world (the General Sherman).

Overview

Using tape measures and/or non-standard measures (holding hands around the trunk) compare the two biggest trees in the Botanic Garden, by measuring their trunk circumference. The Giant Redwood and the Cedar of Lebanon are both magnificent trees, with very different growth forms.

Introduction

Use the map to locate two of the biggest trees in the Garden. Talk about measuring the tree circumference and how best to do this. The pupils are going to measure both trees and compare them, the size, the feel of the bark, what the leaves/needles are like, what the cones are like, how the branches are arranged, the overall shape of the tree.

Main Task

Take an overall look at the trees. Get the pupils to discuss measuring before beginning the task. Suggest the pupils (age depending) look at the names of the trees and record these. Once the measurements and observations have been made about the two trees in the Garden, look at the pictures of the Redwoods from California. Using the pictures and information chart contrast the size of the General Sherman with the Giant Redwood growing in the Garden. Take a large tape measure (100m) and walk with it to undo it until you reach the 84m mark. (Head from the tree along the main walk.) This is the height of the General Sherman tree. See how this compares with the 30m tree in the Garden. Alternatively use the large tape measure to create a circle showing the circumference of the General Sherman tree. This will relate with your measurements of the circumference of the trees in the Garden.

Plenary

Discuss trees and their growth and size and age.

Resources

You will need the map showing the location of the biggest trees in the Garden. Paper and pencils for recording tree circumferences. Small measuring tape (10m), large measuring tape (100m).

Vocabulary

Tree, bark, trunk, smooth, rough, fissured, grooves. Redwood: soft red bark, flattened leaves, compact redwood cone, columnar growth form and spiral arrangement of branches. Cedar tree: Hard fissured bark, blue green needles, large triangular pieces of cone, egg shaped cones. Spreading growth form. Cut surfaces where branches have been lopped.

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Activities to support your visit

1. Watch this short video on how conservation scientists from the University of Cambridge discovered a tree the height of 20 London double-decker buses: https://www.youtube.com/watch?v=_MlcDLi2xCY
2. Investigate the sizes of other trees in the Garden or back at school
3. Find information about trees and their growth using the internet. Why do trees produce tree rings? What trees do not make tree rings and why not?
4. Explore the Woodland Trust website and find information about Ancient trees in this country: http://www.woodlandtrust.org.uk/naturedetectives/activities/2018/10/ancient-tree-spotter-sheet/
5. Find out which are the oldest and tallest trees on Earth

Comparing the trees

Giant Redwood	Cedar of Lebanon
Circumference:	Circumference:
Number of people holding hands:	Number of people holding hands:
Circumference of General Sherman Tree is 32.12 m	

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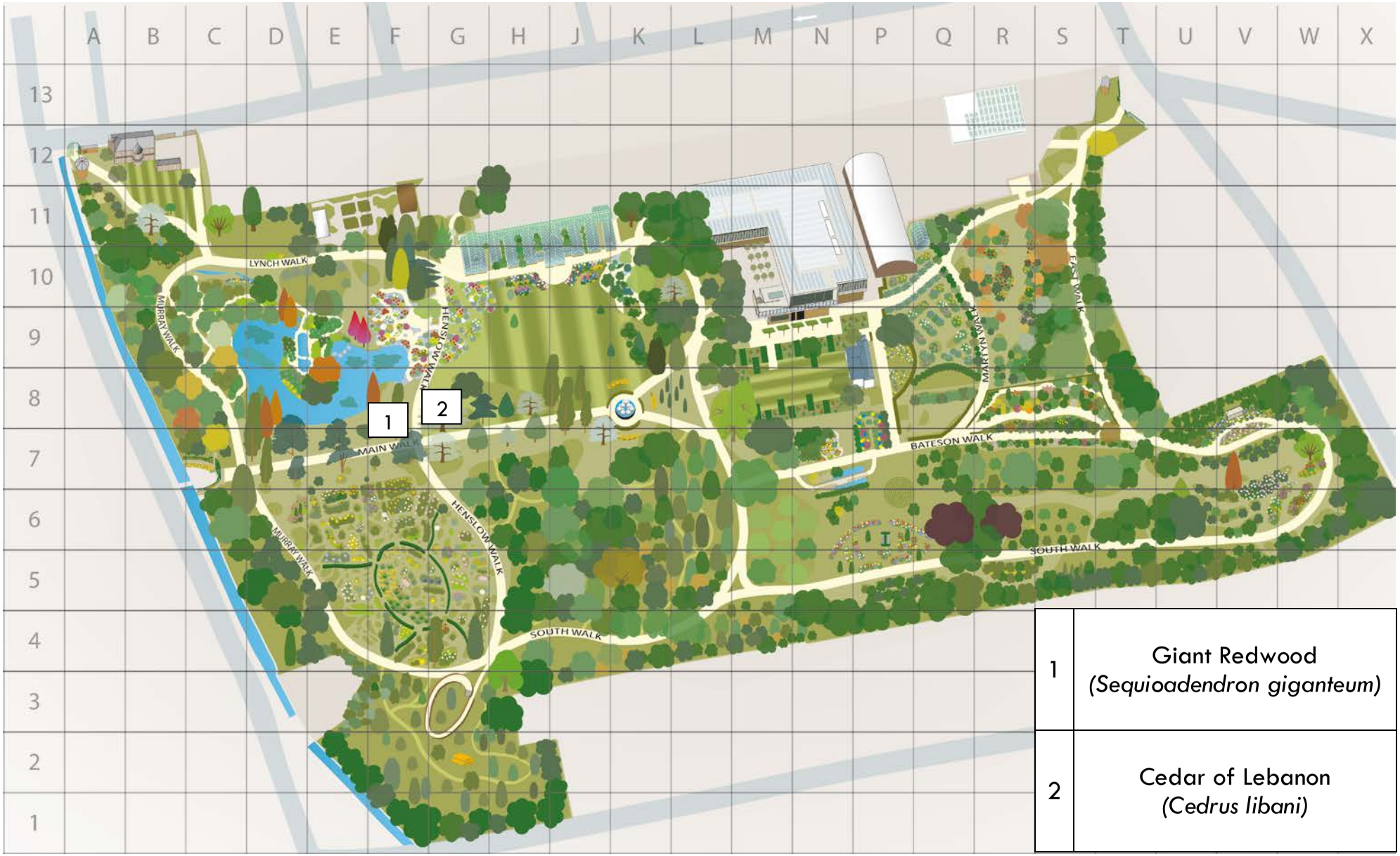
Map for How Big? Tree Measuring

Cambridge University Botanic Garden



1	Giant Redwood *(Sequioadendron giganteum)*
2	Cedar of Lebanon *(Cedrus libani)*

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General Sherman Tree

General Sherman is the name of a Giant Redwood tree. Giant Redwoods are also known as Giant Sequoias. The General Sherman is one of the tallest Giant Sequoias in the world with a height of about 84.8 metres. The General Sherman is not the tallest or the widest tree in the world but the overall volume of its trunk makes it the biggest tree on Earth. In 2002, the volume of its trunk measured about 1487 cubic meters. Trees make the biggest living structures (visible above ground) on the planet.

The General Sherman grows in the Giant Forest of Sequoia National Park in California in the United States. The tree is believed to be between 2,300 and 2,700 years old. The Giant Redwood growing in the Botanic Garden was planted in 1846 making it 173 years old in 2019.

General Sherman tree was named after General William Tecumseh Sherman an American Civil War leader, by naturalist James Wolverton in 1879.

General Sherman Measurements

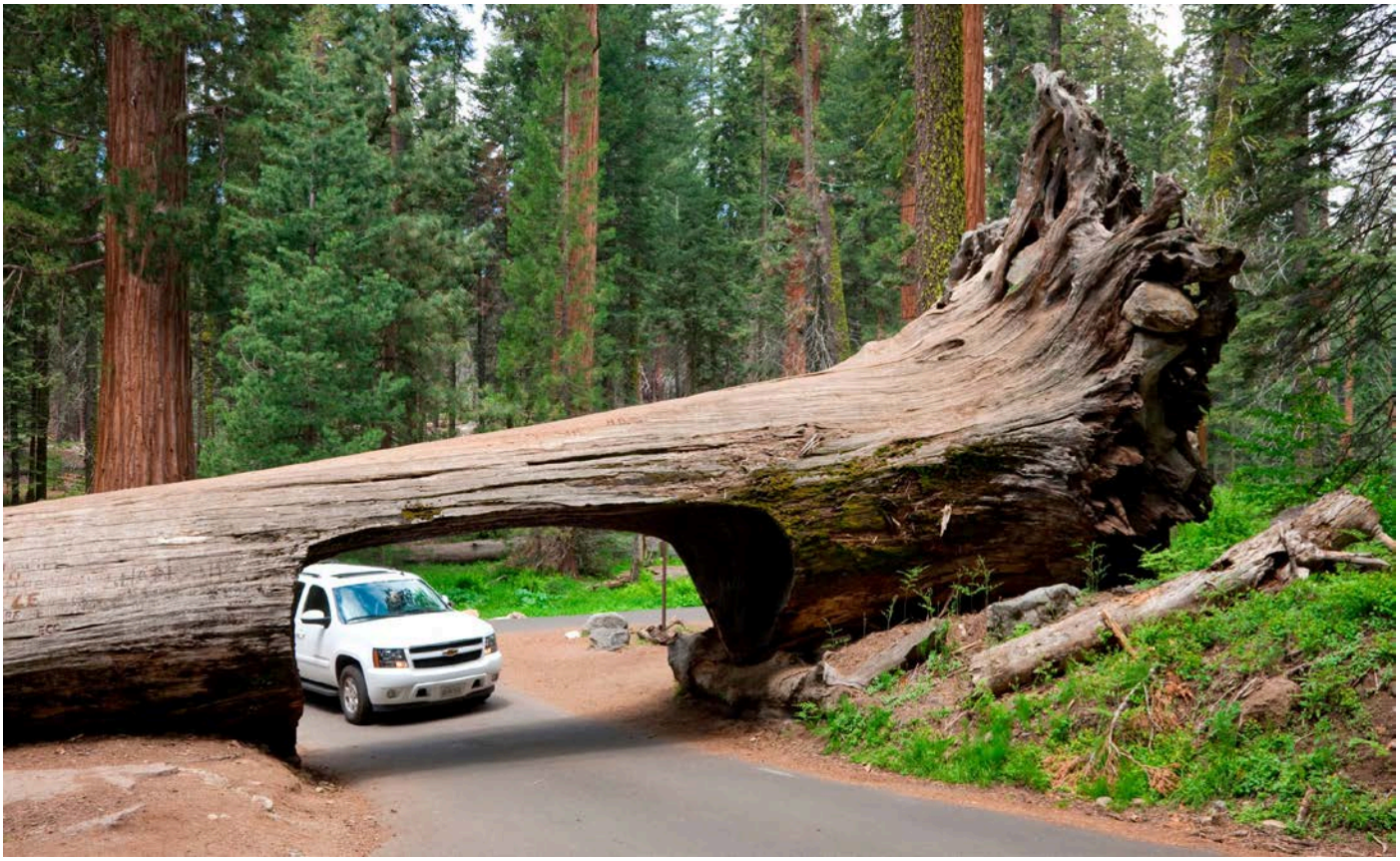
	Metres	Feet
Height above base	84.8	277.9
Circumference at ground	32.12	105.6
Maximum diameter at base	12.1	39.5

Thick squishy bark

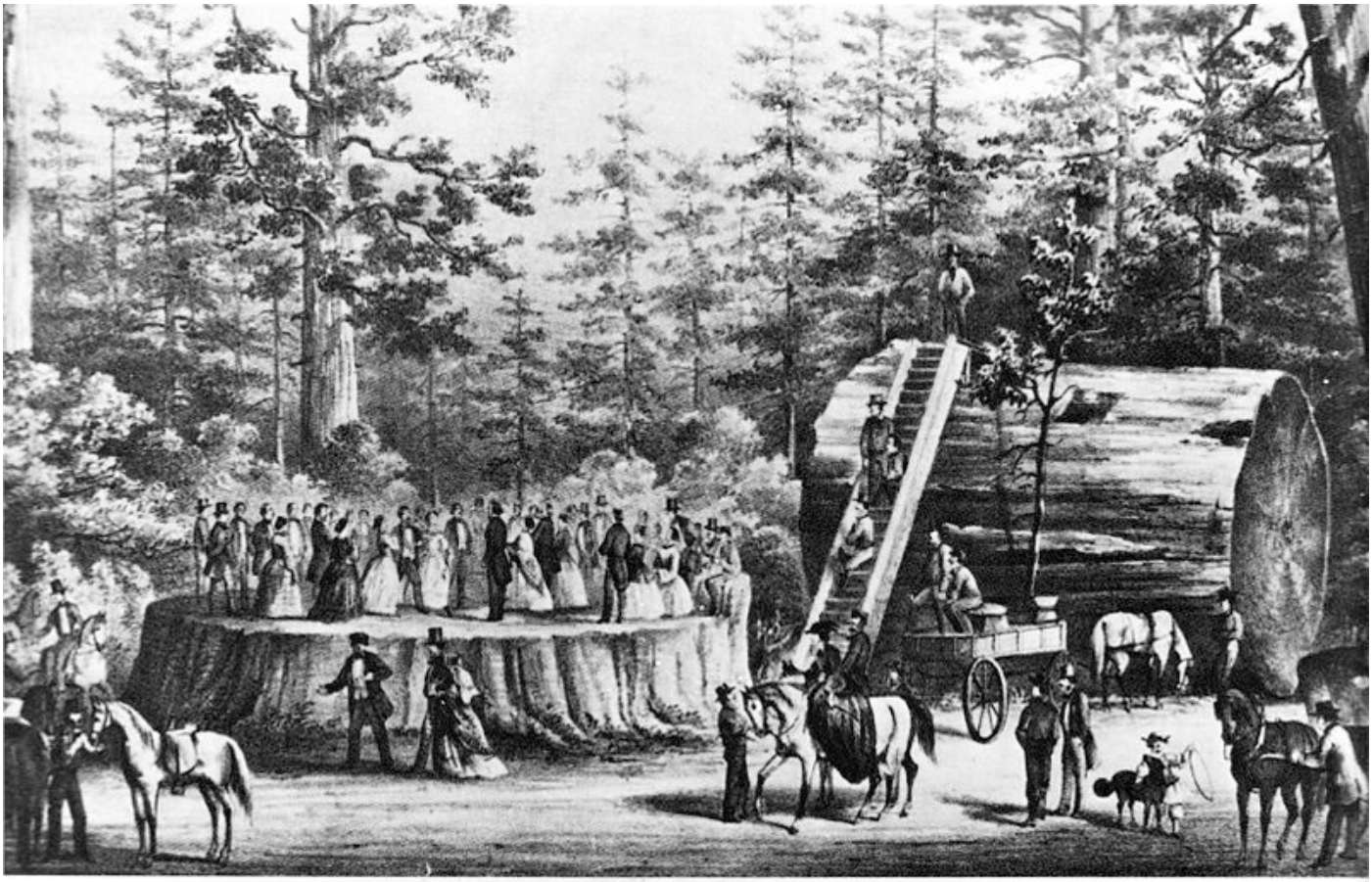
Giant Redwoods are incredibly hardy and have soft, thick bark which is fire resistant and helps protect the tree from forest fires as well as drought and insect damage.

Cones containing seeds

Giant Redwoods only reproduce by seeds. Forest fires help open the cones and release the seeds which then grow in the burnt, bare soil. Can you find any cones underneath the tree and spot the tiny seeds inside?




WAWONA
DIAMETER 26 FEET
HEIGHT 227 FEET



THE STUMP AND TRUNK OF THE MAMMOTH TREE OF CALAVERAS.

Showing a Cotillion Party of Thirty-two Persons Dancing on the Stump at one time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