

Gymnosperms

(Seeds not enclosed in an ovary)

Seeds usually produced in female cones, wind pollinated from the smaller male cones which are usually at ends of branches.

Conifers – Pines, Cypress, Cedar, etc. etc. Called Softwoods (but some can be relatively hard)

Growth habit typically apical dominant – 1 vertical growth cell at tip of tree. If damaged then no further vertical trunk growth.

Foliage often but not always needle type. Trees are usually evergreen with needle foliage more suited to winter extremes of the Northern Hemisphere.

Australian has relatively few coniferous species – Huon Pine and King Billy Pine in Tasmania, Cypress pine in Northern Australia, Araucaria species (Hoop Pine, Bunya Bunya and Monkey Puzzle) in Queensland.

Angiosperms

(Seeds enclosed in an ovary)

Flowering plants, seed usually pollinated by insects or birds, but some such as Oaks are wind pollinated.

Hardwood – Oaks, Elms, Eucalypts, Acacias etc etc
However fast grown species such as Balsa, in the tropics, can be much softer than the softwoods.

Growth habit not apically dominant, many growth tips giving the typical rounded crown shape and relatively unaffected by insect or minor storm damage.

Foliage usually broad leaf and trees are often deciduous, esp. European species. Eucalypts and Acacias in Australia are evergreen as our climate not so extreme.

Characteristics of Tree Growth

2 types of cells involved in tree growth:

Apical cells for vertical growth of the tree, located at tips of branches. These cells divide longitudinally to extend the branch or tip of the tree.

Cambial cells for growth in girth. These are a band of cells which run continuously from the base to the tip of the tree. They are located inside the bark. These cells divide transversely, the outer cells forming the inner bark called phloem, whilst the inner cells form the true wood or xylem. The phloem conducts food from the leaves back to the roots whilst the xylem conducts water from the roots to the leaves.

As the tree ages, the phloem also ages to eventually die. This can be shed from some species such as Eucalypts whilst it might be retained indefinitely as in Oaks. The Cork Oak has particularly thick bark which is retained on the tree and can be stripped for use as cork with no damage to the tree. Other species such as Sequoia sempervirens, Californian Red Wood, have very thick spongy bark giving the tree good resistance to fire.

In Spring, the wood cells develop faster and are usually thin walled (called earlywood). As growth tapers off towards the end of the growing season the walls of cells developed at this stage have thicker walls. These are referred to as latewood. The difference in appearance between these two cell types in cross section gives rise in most species to annual rings by which the ages of a tree can be determined.