

Temperate Trees

Temperate trees are found in mid-latitude parts of the globe between the polar regions and the tropics. In these regions, summers are warm and wet and winters cold and dry. The trees that grow here have to be able to withstand different kinds of climate and periods of rapid change.

One of the most significant seasonal changes in temperate regions is the number of hours of sunlight. There is less sunlight in autumn and winter, and therefore less opportunity for trees to photosynthesise. Many temperate trees react by shedding their leaves. These are known as deciduous trees, and the process is called leaf abscission. Trees will also shed their leaves if conditions become unusually dry, because most water loss from a plant is through its leaves. Shedding its leaves saves the tree water. It also accounts for the colours of temperate woodlands in autumn. Because the leaves are no longer required to photosynthesise, they lose their chlorophyll, the green pigment used for photosynthesis. This means that other colours in the leaf become apparent, producing the glorious displays of reds, browns and golds seen in the vast forests of New England in the United States, Hokkaido in Japan and in similar temperate regions all over the world.

Shedding leaves has another advantage, too. Most temperate trees have large, flat leaves (very different to the needle-like leaves seen on conifers) attached to the branches by a small stem called a petiole. This makes them excellent for capturing energy when the sun is shining, but it also makes the tree vulnerable to damage when it snows, because the leaves tend to trap the snow, making the branch heavy and likely to break.

Temperate trees shed their leaves by growing a layer of cells between the leaf stalk and the branch, which separates stalk from branch and causes the leaf to fall to the ground. A hormone called auxin controls this process. The vast majority of temperate trees (including all those on this page) are angiosperms (flowering plants) that evolved late – between 150–80 million years ago. This is almost 150 million years later than the conifers.

Key to plate

1: Sycamore

Acer pseudoplatanus
Height: up to 35m
a) bud b) seed

This tree is native in the mountains of central Europe and perhaps also Scotland; elsewhere it has been introduced.

2: White mulberry tree

Morus alba
Height: Over 20m
a) leaves b) fruit
This species is native to China and is the main food source for silk worms.

3: English oak

Quercus robur
Height: 36m

a) leaf b) acorn
These trees occur almost all over Europe.

4: English elm

Ulmus procera
Height: 36m
a) seed b) flower

5: Common beech

Fagus sylvatica
Height: 40m
a) seed pod b) leaf

6: Sweet chestnut

Castanea sativa
Height: 35m
a) leaf b) seed

7: Scarlet oak

Quercus coccinea
Height: 21m
a) leaf b) acorns

8: Silver birch

Betula pendula
Height: 30m
a) male catkin b) scale from female catkin c) female flower d) male flower

9: Broadleaf maple

Acer macrophyllum
Height: 15–30m
Leaf

10: Japanese maple

Acer palmatum
Height: 8m
Leaf

