

What are trees ?

Trees are tall woody plants that can live for many years. With their trunks, roots, branches and leaves, they are the largest and longest living organisms on earth.

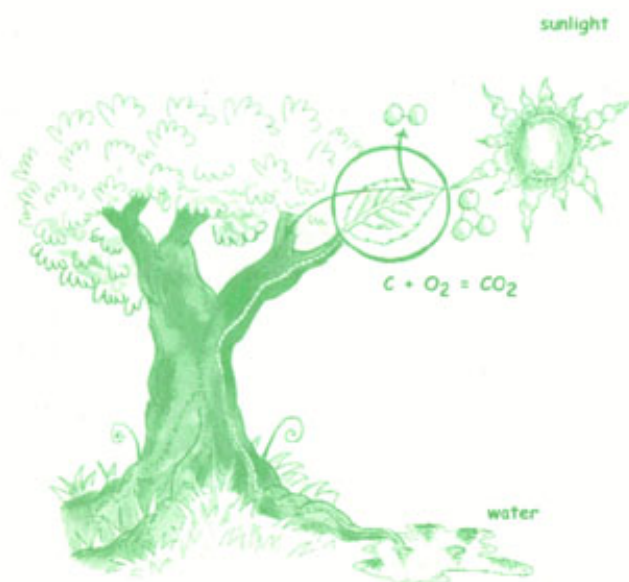
How do trees work ?

Trees need light, air, water and nutrients in order to live. They need sunlight to make food and oxygen. Each leaf on the tree acts as a mini food factory with energy from sunlight providing the power. The process through which food is made and oxygen is given off is called photosynthesis and it takes place in the green pigment which gives the leaf its colour, the chlorophyll.

The leaves of a tree act like solar panels to capture the sun's energy. This sunlight combines with carbon dioxide, which is taken in through small pores in the underside of the leaf, and water, which is absorbed by the fine roots in the soil.



This process of photosynthesis enables the leaves to make sugars and nutrients to provide the building blocks to help the tree grow. In autumn, any sugars left over are stored in the roots and rise as sap in spring to help the first leaves of the year to grow. Oxygen is given off as a waste product and is used by people and animals to provide fresh air for breathing.



The structure of a tree

Leaves - The flat shape of the leaves helps to capture sunlight. There is more chlorophyll in the upper surface of the leaf giving it a darker green colour. The underside of the leaf has thousands of small pores through which the gases in the air enter and escape and water taken up by the roots evaporates. Veins are extremely fine tubes which carry the water, nutrients and sugars.

Branches

The branching pattern of a tree is the most effective way of spreading leaves over a large area and capturing the most sunlight.

Tree Trunk

The tree trunk has four main components:

Heartwood: This consists of old, dead cells and gives the tree strength to stand tall and strong so that the leaves can capture more sunlight.

Sapwood: This consists of very fine tubes which carry water and nutrients up to the leaves.

Inner Bark: This has fine tubes which carry the sugars made by the leaves to other parts of the tree or down to the roots to be stored as sap.

Bark - This is the tough outer skin which protects the tree from damage.

Roots

There are two types of roots in a tree:

Woody Roots - These are the big roots which store sugars (sap) over the winter and anchor the tree to the ground.

Fibrous Roots - These are very fine roots covered with fine root hairs which grow between the soil particles to absorb water and nutrients.



Why are trees so important?

The emergence of human civilisation has been mainly based on trees as they provided food, fuel and shelter. Their importance can be seen below:

- ✓ Trees filter and cleanse the air by removing pollutants, including carbon monoxide, dust and sulphur dioxide. For example, every year an average mature tree absorbs up to 26 pounds of carbon dioxide from the air and releases 13 pounds of oxygen - enough for a family of four for a day!
- ✓ Trees provide insulation and reduce energy bills by blocking cold winds in winter and providing cool shade in summer.
- ✓ In urban areas, trees act as sound buffers which can reduce noise levels by up to half.
- ✓ Trees reduce flooding by dispersing rainfall and absorbing and storing run-off.
- ✓ Trees anchor the soil and prevent erosion.
- ✓ Trees provide food and shelter for birds, insects and other animals.
- ✓ Trees lend maturity and beauty to the streetscape and rural countryside.
- ✓ Trees help people to develop a sense of beauty and aesthetic awareness.
- ✓ Trees promote a stronger sense of community among people.



- ✓ Trees provide timber for buildings and wood to make paper. All the books you read and even this sheet of paper started life as a tree.
- ✓ 30% of medicines are based on plant products and new ones are being discovered all the time.

What's so important about native trees?

A native species to Ireland is one which arrived here before the end of the last ice age. Irish wildlife depend on native trees to maintain foodwebs and biological networks. Birds feed on trees, find cover, nesting sites and song posts. Buds, seeds and fruits also serve as food to other animals.

Native broad-leaved trees such as oak, hazel and holly are best suited to environmental conditions in Ireland yet only 1.5% of Ireland's land area is

covered by native broadleaves. These species alone fully support other native plant and animal species. Although non-native species might look nice, their value to Irish wildlife is minimal. One in every two Irish insect species is dependent on native woodlands. The oak tree, for instance, one of Ireland's most beneficial trees to native wildlife, supports 284 insect species.