Plant Nutrition and Reproduction

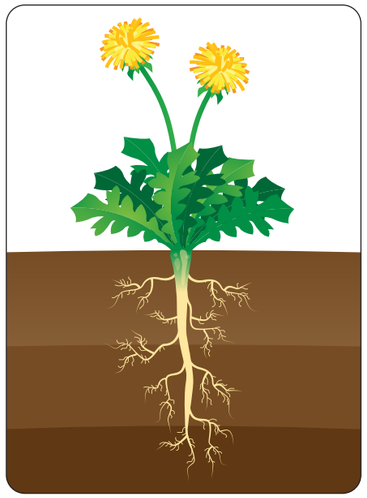
Plant parts

Plant parts have different functions. The flowers, stems, leaves and roots each have an important role.

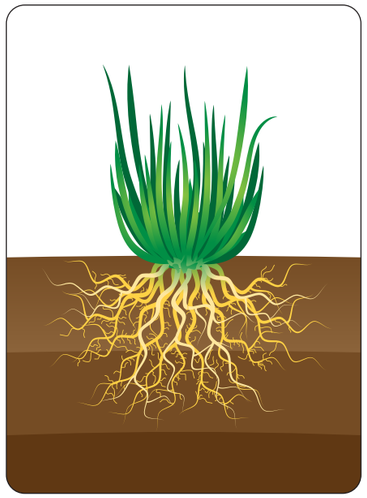
Roots

Roots have two main functions. They anchor the plant securely in the ground and take in water and nutrients from the growing medium, such as soil.

There are two main types of root systems: taproots and fibrous roots.



taproot



fibrous roots

A taproot system has a large primary root that grows deep into the soil to anchor the plant. Smaller lateral roots grow out from the taproot. Lateral roots are covered with small root hairs, which take in water and nutrients. Some taproots are edible, such as carrots and beetroots.

A fibrous root system has many thin roots that grow out from the stem and anchor the plant just under the soil's surface. Fibrous roots spread far from the plant to reach water and nutrients.

Stems



Stems have two main functions.

They transport water, nutrients and food around the plant and they support the leaves and flowers.

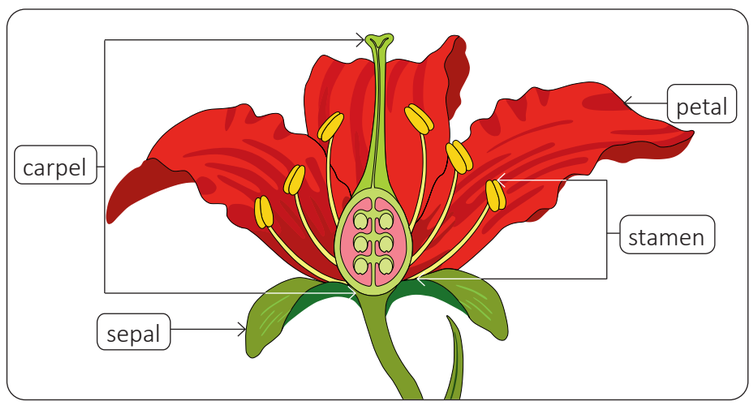
Stems transport water, nutrients and food around the plant through vessels called xylem and phloem. Xylem transport water and nutrients from the roots to the leaves. Phloem transport food made in the leaves to the rest of the plant.

A stem also supports the flowers to attract pollinators and the leaves so they can capture sunlight.

Flowers

Flowers have one main function. Following reproduction, they make seeds that can grow into new plants.

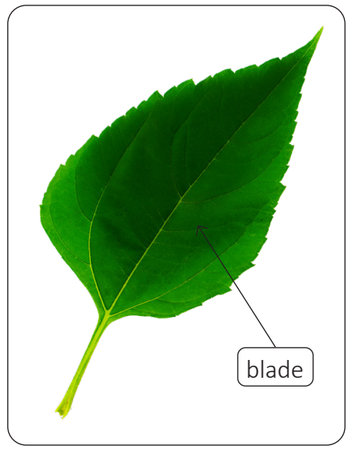
Different parts of a flower have different functions. Sepals protect the flower bud as it grows, bending back when the flower opens. Petals attract pollinators with their bright colours, scent, and a sweet liquid called nectar. The stamen is the male part of the plant. Male pollen grains are produced at the top of the stamen in the anther. The carpel is the female part of the plant. Pollen travels into the carpel to make seeds. The carpel of some plants can swell into a fruit.

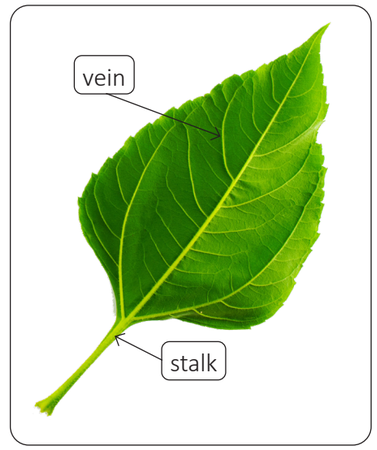


Leaves

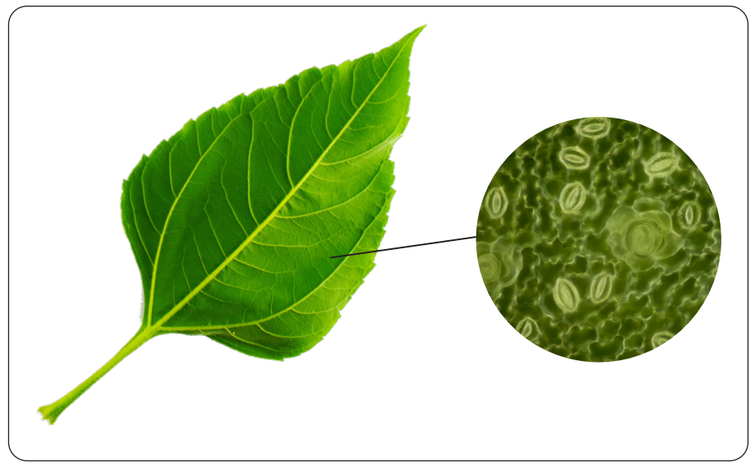
Leaves have two main functions. They make food for the plant through a process called photosynthesis. They also lose water from their underside in a process called transpiration.

The structure of leaves allows them to carry out these functions. The blade captures sunlight, and the stalk and veins transport water into and out of the leaf.





Holes called pores are on the underside of leaves. They help gases from the air to enter and leave the leaf. This is also where water leaves the leaf during transpiration.



pores on the underside of a leaf

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Life cycle of a plant

There are four stages in the life cycle of a plant.

Seed

A seed contains a tiny new plant and a food store in a protective seed coat. Germination is the process of a plant beginning to grow from a seed.

Seedling

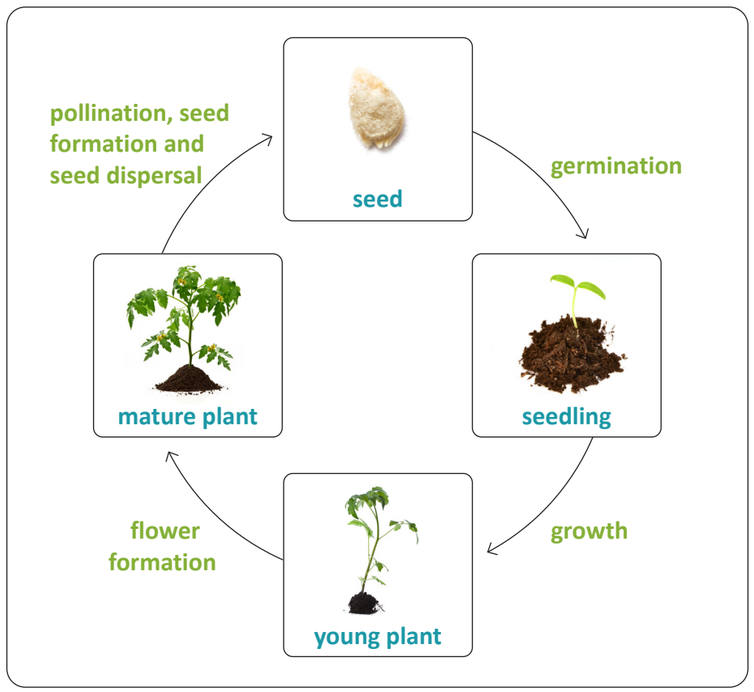
If a seedling has sunlight, nutrients, warmth, water and is protected from strong winds and heavy rain, it goes through a process of growth to form a young plant.

Young plant

As a young plant grows and matures, it begins the process of flower formation and buds form.

Mature plant

When a flowering plant has matured, pollen is moved from the stamens of one flower to the carpel of another during pollination. Seed formation then occurs in the carpel. Seeds are moved away from the parent plant during a process called seed dispersal.



Pollination



Pollination is the process where pollen is transferred from the male anther at the top of the stamen to the female carpel of another flower.

Flowering plants can be pollinated by insects, such as bees. The pollen sticks to an insect as it drinks nectar from a flower. The pollen on the insect then lands on the stigma at the top of the carpel of another flower. It travels down into the carpel to make seeds. Wind can also disperse the pollen of some flowering plants.

Seed dispersal

Seeds are moved away from the parent plant so that new plants do not have to compete for sunlight and water. This process is called seed dispersal. Seeds are dispersed in different ways.

Wind

Seeds dispersed by the wind are usually small and light so they can be carried in the air.



Animals

Seeds formed in fruits are eaten by animals, which are dispersed through their droppings. Some seeds hook onto animals when they brush past a plant. Others are buried by animals.



Explosion

Some seeds are dispersed by explosion. The seeds develop inside a seed pod, which bursts open and fires the seeds into the air.



Water

Seeds dispersed by water can be small and light or contain air so that they float.



Varying needs of plants

Most plants take in water and nutrients from soil. However, **orchids** live high up on rainforest plants. Their roots don't reach the soil, so they take in water and nutrients from the moist, tropical air.



Most plants need a regular supply of water, but **cacti** thrive in dry places with little rainfall. Their stems swell and store water when it is available to use in times of drought.



Many plants need sunny conditions to survive but the **hart's tongue fern** thrives in the shade. Its leaves are broad and thin to capture as much sunlight as possible.



Glossary

anther	A male part of a flower where pollen grains are made.
pollinator	An animal that transfers pollen for the process of pollination.
stamen	A flower's male reproductive organ consisting of an anther and filament.
stigma	A female part of a flower .
vessel	A tube that transports liquids.

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