

Plants

Scientific Focus

Biology

WHAT SHOULD I ALREADY KNOW (links to previous learning)

- Which things are living and which are not.
- A variety of common wild and garden plants, including deciduous and evergreen trees and how to identify them.
- The structure of common flowering plants, including trees (including leaves, flowers, fruits, roots, bulbs, seeds, stem, trunks and branches)
- Seeds and bulbs grow into mature plants
- Plants need water, light and a suitable temperature to grow and stay healthy.
- Different vegetation belts and climate zones around the world
- Plants and animals depend on each other to survive.

KEY QUESTIONS? ENQUIRIES

How can we identify and describe the function of different parts of flowering plants: roots, stem, leaves and flowers.

How can we explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant.

How can we investigate the way in which water is transported within plants.

How can we explore the role of flowers in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.

Working Scientifically

Asking relevant questions and using different types of scientific enquiries to answer them

- The children consider their prior knowledge when asking questions. They independently use a range of question stems. Where appropriate, they answer these questions.
- The children answer questions posed by the teacher.
- Given a range of resources, the children decide for themselves how to gather evidence to answer the question. They recognise when secondary sources can be used to answer questions that cannot be answered through practical work. They identify the type of enquiry that they have chosen to answer their question.

Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers

- The children make systematic and careful observations.
- They use a range of equipment for measuring length, time, temperature and capacity. They use standard units for their measurements.

Setting up simple practical enquiries, comparative and fair tests

- The children select from a range of practical resources to gather evidence to answer questions generated by themselves or the teacher.
- They follow their plan to carry out: observations and tests to classify; comparative and simple fair tests; observations over time; and pattern seeking.

Explanatory note

A comparative test is performed by changing a variable that is qualitative e.g. the type of material, shape of the parachute. This leads to a ranked outcome.

A fair test is performed by changing a variable that is quantitative e.g. the thickness of the material or the area of the canopy. This leads to establishing a causative relationship.

Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions

Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables

- The children sometimes decide how to record and present evidence. They record their observation e.g. using photographs, videos, pictures, labelled diagrams or writing. They record their measurements e.g. using tables, tally charts and bar charts (given templates, if required, to which they can add headings). They record classifications e.g. using tables, Venn diagrams, Carroll diagrams.
- Children are supported to present the same data in different ways in order to help with answering the question.

Using straightforward scientific evidence to answer questions or to support their findings

- Children answer their own and others' questions based on observations they have made, measurements they have taken or information they have gained from secondary sources. The answers are consistent with the evidence.

Identifying differences, similarities or changes related to simple scientific ideas and processes

- Children interpret their data to generate simple comparative statements based on their evidence. They begin to identify naturally occurring patterns and causal relationships.

Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions

- They draw conclusions based on their evidence and current subject knowledge.
- They identify ways in which they adapted their method as they progressed or how they would do it differently if they repeated the enquiry.
- Children use their evidence to suggest values for different items tested using the same method e.g. the distance travelled by a car on an additional surface.
- Following a scientific experience, the children ask further questions which can be answered by extending the same enquiry.

Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions

- They communicate their findings to an audience both orally and in writing, using appropriate scientific vocabulary.

STICKY KNOWLEDGE

(What we will know by the end of the topic)

The functions of the different parts of flowering plants.

flower

seed

leaf

stem

roots



- The **petals** on a **flower** are usually bright - this is to attract bees and other insects so that they can collect **pollen** to make **seeds**.
- The **seeds** are then able to grow to make new **plants**. This is called **germination**.
- **Leaves** use **carbon dioxide** and sunlight to make food for the **plant**.
- The **stem** carries water and other **nutrients** from the **roots** to the rest of the **plant**. **Leaves** use this water to make food.
- The **stem** also helps to keep the **plant** upright so that the sunlight can reach it easier.
- The **roots** help to 'anchor' the **plant** in the **soil**. They also **absorb** water and **nutrients** from the **soil** for the **stem** to carry to the rest of the **plant**.

What do different plants need to grow?

- air
- water
- sunlight
- **nutrients** from the **soil**
- room to grow
- suitable **temperature**



The amount of each of these may vary depending on the type of **plant**. For example, cacti need less water than other **plants**.

How is water transported within plants?

- Water is **absorbed** from the **soil** by the **roots**.
- It is then **transported** from the **roots** to the **stem** and then to the rest of the **plant**.

How do flowers help in the life cycle of flowering plants?

- The **flower's** job is to create **seeds** so that new **plants** can grow.
- **Pollination** occurs when **pollen** from the **anther** is transferred to the **stigma** by bees and other insects.
- The **pollen** then travels down and meets the **ovule**. When this happens, **seeds** are formed - this is called **fertilisation**.
- **Seeds** are then **dispersed** so that **germination** can begin again.

STICKY VOCABULARY

word

meaning

Roots

These anchor the plant into the ground and absorb water and nutrients from the soil.

Stem

This holds the plant up and carries water and nutrients from the soil to the leaves. A trunk is the stem of a tree.

leaves

These make food for the plant using sunlight and carbon dioxide from the air.

Flowers

These make seeds to grow into new plants. Their petals attract pollinators to the plant.

Nutrients

These substances are needed by living things to grow and survive. Plants get nutrients from the soil and also make their own food in their leaves.

Evaporation

When a liquid turns into a gas.

Fertilisation

When the male and female parts of the flower have mixed in order to make seeds for new plants.

Petal

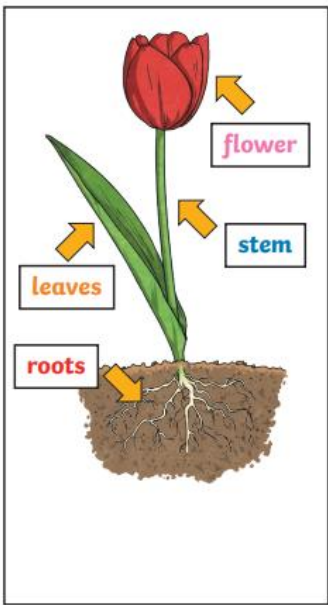
The brightly coloured part of the flower that attracts insects to pollinate the plant.

Stamen

The male parts of the flower. The stamen is made up of the anther and the filament. The filament's job is to hold up the anther. The job of the anther is to make the pollen.

Carpel

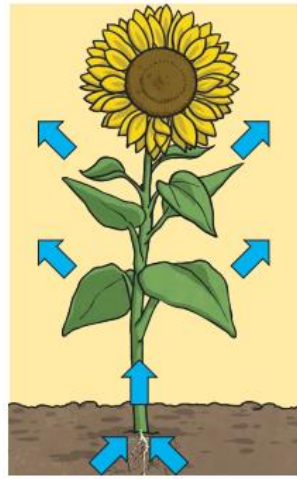
The female parts of the flower. Made up of the stigma, style and ovary. The job of the style is to hold up the stigma. The stigma collects the pollen when a pollinator brushes by it. The ovary contains the ovules, which are the part of the flower that gets fertilised and eventually becomes the new seed.



How Water Moves through a Plant

1. The **roots** absorb water from the soil.
2. The **stem** transports water to the **leaves**.
3. Water **evaporates** from the **leaves**.
4. This **evaporation** causes more water to be sucked up the **stem**.

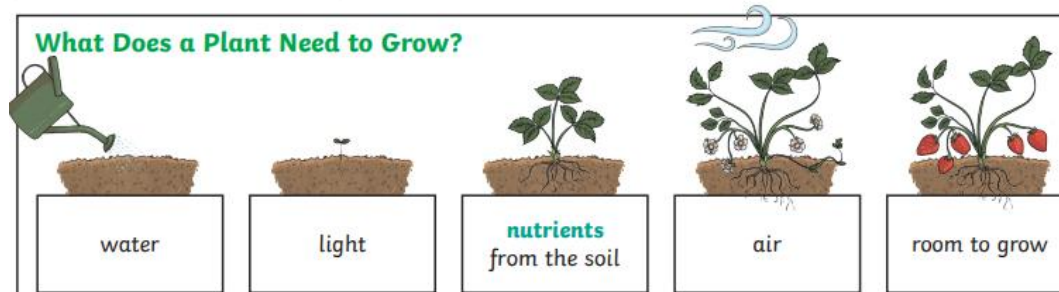
The water is sucked up the **stem** like water being sucked up through a straw.



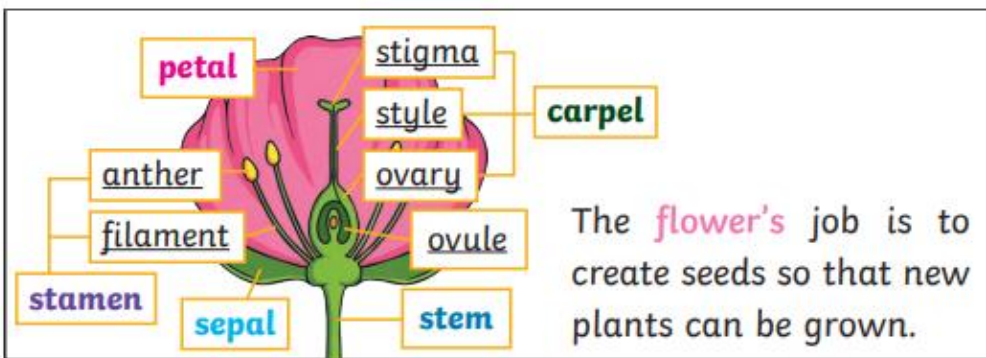
STICKY VOCABULARY

word	meaning
Sepal	Leaf-like structures that protect the flower and petals before they open out.
Pollination	When pollen (a fine powdery substance produced by a flowering plant) is moved from the male anther of a flower to the female stigma.
Pollinator	Animals or insects which carry pollen between plants. Examples include birds, bees and bats.
Germination	When a seed starts to grow.
Seed dispersal	A method of moving the seeds away from the parent plant so that the seeds have the best chance of survival.

What Does a Plant Need to Grow?



Different plants vary in how much of these things they need. For example, cacti can survive in areas with little water, whereas water lilies need to live in water.



The **flower's** job is to create seeds so that new plants can be grown.

Links to British Values

Democracy.

