

Science – Plants

St Bartholomew's CE
Multi Academy Trust



Year: 3

Term: Summer

Prior knowledge

Observe and describe how seeds and bulbs grow into mature plants. (Y2 - Plants)
Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. (Y2 - Plants)

Key Knowledge

Functions of a plant

The different parts of a plant have different functions. The roots of a plant take up water and nutrients from the soil. The roots also keep the plant steady and upright in the soil. The stem carries water and nutrients to different parts of the plant. The leaves use light from the sun, along with carbon dioxide from the air and water to make food for the plant. This process is called photosynthesis. Some plants have flowers. These are involved in reproduction and produce seeds from which new plants grow.

Plant growth

Plants need air, light, warmth, water and nutrients to be healthy. If they are healthy, they can continue making their own food through photosynthesis. Most healthy plants are upright with green leaves. Plants are able to reproduce in two different ways - sexual reproduction and asexual reproduction. Sexual reproduction involves pollen from one flower fertilising the egg of another to produce a seed. Only one parent is needed in asexual reproduction and the offspring are exact copies.

The cycle

Sexual reproduction in plants happens in a cycle-like pattern. Flowers come from seeds, and they create seeds too. All flowering plants go through the following life cycle. Germination is the process by which a plant begins to grow from a seed. Roots form under the soil. The stem, leaves and flower emerge above the soil. Pollen produced by a flower is carried by insects or blown by the wind to another flower. This process is called pollination. When the pollen reaches another flower, it travels to the ovary where it fertilises the egg cells to make seeds. This process is called fertilisation. These seeds are scattered by animals or the wind. This process is called dispersal. Some of the seeds will grow into new plants. Not all plants produce flowers. These are called non-flowering plants. Ferns and mosses are examples of plants which do not produce flowers. They grow from spores instead of seeds.

Asexual reproduction

Some plants can also reproduce without an egg cell being fertilised to produce a seed. Instead, these plants produce an identical copy of themselves. This type of reproduction is known as asexual reproduction.

Plants can reproduce asexually in a number of different ways. Some plants produce bulbs, like daffodils and snowdrops. Others, like potatoes produce tubers. These sit under the soil and develop into new plants the next year.

Seed dispersal

Plants disperse their seeds in lots of different ways. Some seeds are transported **by** the wind and are shaped to float, glide or spin through the air.

Plants growing near a river may use the flowing water to transport their seeds.

Some seed pods are designed to explode and throw the seeds a good distance from the parent plant.

Many plants also use animals to carry their seeds. This type of seed may have handy hooks which attach to an animal's fur. Alternatively, the plants might make tasty fruit to enclose the seeds, which attract animals to eat them.

Bees and flowers

Lots of plants rely on insects like bees to reproduce. To make a seed, a flower needs to be pollinated. Pollen from one flower needs to travel to another. Bees are very important for carrying the pollen between flowers.

To encourage bees to visit them, flowers have colourful petals and an attractive scent. Some flowers give the bees a sugary reward called nectar too.

It's not just plants that need bees; we need them too. Without them we'd have very little food. Lots of our fruit and vegetables come from plants that are pollinated by bees.

Water movement in plants

Roots absorb water from the soil where the plant is planted. Then, the water travels **through the plant to the stem**. Water is sucked up through the stem (just like the way you suck up a drink through a straw!) and then the stem passes water on to the leaves.

Requirements for growth

A healthy plant is usually upright with green leaves. Plants need air, light, warmth, water and nutrients to be healthy. If a plant doesn't have one of these requirements it could affect its growth or even die. For example, a plant that is kept in a dark place will grow tall and spindly in search of light and then become weak and die. A plant that is not watered will have a weak stem and dried-up leaves and will eventually die. A seed will not produce a plant at all if it is kept too cold. The seed needs warmth to germinate (develop from a seed into a plant) and start to grow into a healthy plant.

Key skills

- a. I use my results to draw a conclusion and make predictions for answering a different question.
- b. I can identify some simple differences or similarities when making comparisons.
- c. I support my answers by pointing out the scientific evidence.
- d. I can report my conclusion from the results of my experiment.
- e. I can gather the data I need to answer a scientific question and then present them in a table, grid or graph.
- f. I can record my findings in simple labelled diagrams, keys, bar charts or tables.
- g. I can set up a simple fair test experiment to answer a scientific question.
- h. I can make observations and record measurements (for example in mm or g).
- i. I can ask relevant scientific questions.

Future Learning

Describe the life process of reproduction in some plants and animals. (Y5 - Living things and their habitats)
 Reproduction in plants, including flower structure, wind and insect pollination, fertilisation, seed and fruit formation and dispersal, including quantitative investigation of some dispersal mechanisms. (KS3)

Key Vocabulary

Prior vocabulary – Plants, leaves, flower, seeds, grow, vegetables, fruit, roots, stem, petals, trunk, habitat, growth, deciduous, evergreen, tree, structure, survive, life cycle, scattered, germination, reproduction, nutrients, bulb, temperature
 Working scientifically key vocabulary – properties, observe, test, object, record, equipment, prediction, measurement, enquiry, dependent variable, independent variable, fair test, similar, theory, hypothesis

<p>Functions - work or operate in a proper or particular way.</p>	<p>Seed formation – The formation of the seed completes the process of reproduction in plants (started with the development of flowers and pollination), with the embryo developed from the zygote and the seed coat from the integuments of the ovule.</p>
<p>Flowering plants - a plant that produces flowers.</p>	<p>Seed dispersal - Seed dispersal is the movement, spread or transport of seeds away from the parent plant. Plants have very limited mobility and consequently rely upon a variety of dispersal methods such as the wind and living (biotic) vectors like birds.</p>
<p>Asexual reproduction – A plant that can reproduce without an egg cell being fertilised to produce a seed.</p>	<p>Species - a group of living organisms (animals and plants and other life forms).</p>

<p>Flowers - the seed-bearing part of a plant, consisting of reproductive organs (stamens and carpels) that are typically surrounded by a brightly coloured corolla (petals).</p>	<p>Fertilise - cause (an egg, female animal, or plant) to develop a new individual by introducing male reproductive material.</p>
<p>Pollination - the transfer of pollen to a stigma, ovule, flower, or plant to allow fertilization.</p>	<p>Pollen - a fine powdery substance, typically yellow, consisting of microscopic grains discharged from the male part of a flower or from a male cone.</p>
<p>Additional vocabulary to discuss across the unit – flowering plants, air, light, fertilise, soil, transport, pollen, component, energy, decay, nectar, anther, ovary, ovule, stigma, style, stamen, exchange, fertilisation, structure</p>	
<p>Deepening and broadening the knowledge and understanding for GDS learners:</p> <ul style="list-style-type: none"> • names and knows the functions of other parts of a plant, e.g. pips, seeds, stones, stamens, petals, stigma • knows that plants can reproduce in different ways, e.g. sexual and asexual • recognises the different needs of plants according to the habitat where they grow, e.g. plants in the desert, plants in the rain forest • knows that xylem transports water and nutrients from the roots to the leaves • knows that phloem transports food from leaves to the rest of the plant • explains why a plant withers • explains why a plants leaves start to go brown or the leaves/roots rot • names and knows the functions of other parts of a plant, e.g. stones, stamens, stigma • knows that plants can reproduce in different ways, e.g. sexual and asexual • knows that seeds dispersed into the right conditions for growth stand a better chance of survival, e.g. not too many seeds in the same place • describes a greater variety of ways in which seeds are dispersed • describes more unusual methods of seed dispersal, e.g. some native plants of Australia and South Africa have seedpods that open as a result of the heat from bush fires 	<p>Key Outcomes</p> <p>1. What do different parts of flowering plants and trees do? <i>Children identify, draw and label parts of flowering plants and explain the function of these parts (roots, stem/trunk, leaves, flowers).</i></p> <p>2. Do all plants need the same conditions for life and growth? <i>Children set up a simple fair test, predict and investigate plants needs, e.g. air, light, water, room to grow etc. and make careful and accurate observations and conclusions.</i></p> <p>3. How are nutrients transported in plants? <i>Children will make predictions and set up fair tests to investigate the movement of water through plants (e.g. dyeing water and observing it travel through stems into flowers over time). Children will measure, depict and explain their findings using their knowledge of plant parts and functions.</i></p> <p>4. Why do some plants have flowers? <i>Children will investigate the processes of the life cycle of a flowering plant and the important role of insects (bees, butterflies) within it for pollination and reproduction of seeds. They will report and explain their conclusions using scientific language and diagrams to answer the key question.</i></p> <p>5. What is seed dispersal? <i>Children will explore different types of seed dispersal and be able to match plants to the type of seed dispersal they use.</i></p> <p>6. Why do we need to save the bees? <i>Children will understand the importance of bees for pollination and building on their understanding about human impact on the environment from their last unit, research using secondary sources and suggest ways in which people can help conserve them e.g. through 'rewilding'.</i></p>