

# Plants

## Year 1 - Plants

### National Curriculum Objectives:

- Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.
- Identify and describe the basic structure of a variety of common flowering plants. □ Identify and name the roots, trunk, branches and leaves of a tree.

Pupils should use the local environment throughout the year to explore and answer questions about plants growing in their habitat. Where possible, they should observe the growth of flowers and vegetables that they have planted.

They should become familiar with common names of flowers, examples of deciduous and evergreen trees, and plant structures (including leaves, flowers (blossom), petals, fruit, roots, bulb, seed, trunk, branches, stem).

Pupils might work scientifically by: observing closely, perhaps using magnifying glasses, and comparing and contrasting familiar plants; describing how they were able to identify and group them, and drawing diagrams showing the parts of different plants including trees.

Pupils might keep records of how plants have changed over time, for example the leaves falling off trees and buds opening; and compare and contrast what they have found out about different plants.

### Key Ideas

- Plants usually grow from seeds and bulbs.
- Plants need warmth, light and water to grow and survive.
- Flowering plants make seeds to reproduce and make more plants. Some plants die after producing seeds and others live for many generations. **Duplicated in Year 2.**

Prior Learning	How do Plants Grow?			Vocabulary
<p><b>In Early Years:</b></p> <ul style="list-style-type: none"> <li>Develop an understanding of growth.</li> <li>Shows care and concern for living things and the environment.</li> <li>Make observations of plants and explain why some things occur, and talk about changes.</li> <li>Can talk about some of the things they have observed, such as plants.</li> </ul>	<p><b>Chapter 1: Where plants come from.</b> Most plants start growing from a seed or bulb.</p> <ul style="list-style-type: none"> <li>Provide a range of seeds, bulbs and objects that look like these. Children predict what they think might be real seeds and bulbs and then plan how they could check.</li> <li>Go on a seed hunt trying to identify any seeds from a key (you will need to construct one for the kinds of seeds they may find). Plant the seeds they have found and tried to identify and see if they grow into the plants they predicted.</li> <li>Plant a seed in a jar so it is possible to see it germinate. As it germinates children observe and describe and predict what they think each bit emerging from the seed is for. Continue observing and describing over a few weeks and refine their ideas.</li> </ul>	<p><b>Chapter 2: Plant survival.</b> All plants need water, light and warmth to grow and survive.</p> <ul style="list-style-type: none"> <li>Using quick growing plants like mustard, cress, fast growing grass and beans to test if light, water and warmth are needed. (Do the test on already growing plants as seeds need often different conditions to germinate and we don't need to confuse children)</li> <li>How does the amount of light or warmth affect how well my plant grows?</li> <li>What are the perfect conditions for my cress to grow?</li> </ul>	<p><b>Chapter 3: How plants get what they need to survive.</b> A seed produces roots to allow water to get into the plant and shoots to produce leaves to collect the sunlight.</p> <ul style="list-style-type: none"> <li>Which direction do shoots and roots grow after germination?</li> <li>If a seed is planted upside down will the roots pop out of the soil?</li> <li>How long does a stem need to be before it produces leaves and is it the same for all plants?</li> <li>If plants need water could we grow cress in water but no soil? (Let them grow cress in water and on wet cotton wool and examine the differences)</li> <li>Do all plants have roots, how could we find out?</li> <li>Do all plants have leaves, how could we find out?</li> <li>If plants need water to grow, then surely the more the better. How does the amount of water affect how well a plant grows?</li> </ul>	<p>Leaves, blossom, petals, roots, buds, bulb, trunk, branches, stem, evergreen, garden plants, deciduous, wild plants, seeds, wild plants, garden plants.</p>
<p><b>In Year 2:</b></p> <ul style="list-style-type: none"> <li>Observe and describe how seeds and bulbs grow into mature plants.</li> <li>Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</li> </ul>				

## year 2 - Plants

### National Curriculum Objectives:

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

Pupils should use the local environment throughout the year to observe how different plants grow. Pupils should be introduced to the requirements of plants for germination, growth and survival, as well as to the processes of reproduction and growth in plants.

Note: Seeds and bulbs need water to grow but most do not need light; seeds and bulbs have a store of food inside them.

Pupils might work scientifically by: observing and recording, with some accuracy, the growth of a variety of plants as they change over time from a seed or bulb, or observing similar plants at different stages of growth; setting up a comparative test to show that plants need light and water to stay healthy.

### Key Ideas

- Plants usually grow from seeds and bulbs.
- Plants need warmth, light and water to grow and survive.
- Flowering plants make seeds to reproduce and make more plants. Some plants die after producing seeds and others live for many generations. **Duplicated in Year 1.**

Prior Learning	Making New Plants		Vocabulary
<p><b>In Year 1:</b></p> <ul style="list-style-type: none"> <li>• Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.</li> <li>• Identify and describe the basic structure of a variety of common flowering plants.</li> <li>• Identify and name the roots, trunk, branches and leaves of a tree.</li> </ul>	<p><b>Chapter 1: What are flowers for?</b> All flowering plants make seeds that can grow into new plants</p>	<p><b>Chapter 2: What happens after a plant has produced seeds?</b> Sometimes the plant dies after it has produced its seed and sometimes the plant lives for many generations producing seeds each year</p>	<p>Observation, growth, compare, record, seeds, bulbs, temperature, roots, stem, predict, leaf, flower, measure, diagram, measure, comparative tests, life cycle, life process, germinate, grain.</p>
	<ul style="list-style-type: none"> <li>• Grow some flowers, let them pollinate and show children where the seed grows. They then go on a walk looking for plants and flowers, taking pictures and deciding if a seed could form from the plant and if it has yet formed.</li> <li>• Does cress produce seeds, how could we find out?</li> <li>• Do all plants produce flowers and seeds? Pupils choose a few plants in the school grounds and keep simple diaries of how they change over the year in order to answer the question (see next chapter for extension of this problem)</li> </ul>	<ul style="list-style-type: none"> <li>• Do all plants produce flowers and seeds and what happens to them after they have flowered? Pupils choose a few plants in the school grounds and keep simple diaries of how they change over the year in order to answer the question.</li> <li>• From this information pupils group plants into those that die after flowering and those that carry on living, are there any patterns?</li> <li>• What happens to a daffodil (or other such flower) if it is left outside to form a seed and how is this different if it is cut and placed in water inside?</li> </ul>	

### In Year 3:

- Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers.
- Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.
- Explain the requirements of plants for life and growth (air, light, water, nutrients from soil, room to grow) and how they vary from plant to plant. □ Know the way in which water is transported within plants.

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- Know the way in which water is transported within plants.

Pupils should be introduced to the relationship between structure and function: the idea that every part has a job to do. They should explore questions that focus on the role of the roots and stem in nutrition and support, leaves for nutrition and flowers for reproduction.

Note: Pupils can be introduced to the idea that plants can make their own food, but at this stage they do not need to understand how this happens.

Pupils might work scientifically by: comparing the effect of different factors on plant growth, for example, the amount of light, the amount of fertiliser; discovering how seeds are formed by observing the different stages of plant life cycles over a period of time; looking for patterns in the structure of fruits that relate to how the seeds are dispersed. They might observe how water is transported in plants, for example, by putting cut, white carnations into coloured water and observing how water travels up the stem to the flowers.

### Key Ideas

- Plants make their own food in their leaves to provide them with energy, growth, repair and reproduce.
- Leaves absorb sunlight and carbon dioxide.
- Plants have roots to provide support and to draw moisture from the soil, through stems to take water to the rest of the plant.
- The plant makes its food from water and carbon dioxide, using sunlight as energy, in the green parts of plants (mainly leaves).
- Flowering plants have evolved specific parts to carry out pollination, fertilization and seed growth.
- Seed dispersal improves chances of enough seeds germinating and growing to mature.
- Seeds and bulbs need the right conditions to germinate. They contain a food store for the first stages of growth (ie until the plant is able to produce its own food).

Prior Learning	How plants reproduce.				How Plants make food.	Vocabulary
<b>In Year 2:</b> <ul style="list-style-type: none"> <li>Observe and describe how seeds and bulbs grow into mature plants.</li> <li>Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</li> </ul>	<b>Chapter 1: Reproductive parts of a flowering plant</b> Flowering plants have evolved specific parts to carry out pollination, fertilisation and seed growth. Coloured and scented petals and attract insects Stamen hold pollen Stigma collect pollen Ovaries contain eggs that grow into seeds when pollen from the male moves down the stigma.	<b>Chapter 2: All flowers are similar but different</b> All flowering plants reproduce by pollen from the male reaching the stigma of the female. However all plants look slightly different because they pollinate in different ways. Most plants use insects to pollinate and so have colourful petals and strong scents, a few plants use the wind, these often have less colourful petals and little scent.	<b>Chapter 3: Seed dispersal</b> Plants have evolved many different ways to disperse their seeds. Seed dispersal increase the chances of the seeds germinating and growing into mature plants	<b>Chapter 4: What does a seed do?</b> Seeds and bulbs need the right conditions to germinate. They contain a food store for the first stages of growth (i.e. until the plant is able to produce its own food through its leaves)	<b>Chapter 1: Plants don't eat.</b> Plants don't eat and so have to make their own food to provide them with energy and material to grow. <b>The model of how plants grow</b> Plants turn water from the ground and carbon dioxide from the air into sugar, which is used for energy and making new material to grow.	Air, Light, Water, Nutrients, Soil, Reproduction, Transportation, Dispersal, Pollination, Flower.  Photosynthesis Energy Growth Carbon dioxide Oxygen Sugar material
	Teach children how pollination and fertilisation occur, let them dissect a flower (lilies and daffodils are good) and identify the parts of the flower. Use a microscope to observe the pollen. Children then chose a flower from the school and try and identify the reproductive organs.	Bring in as many different flowers as possible, including grasses and trees. Children try and work out of they are wind or insect pollinated. They could check their predictions using the internet.	<ul style="list-style-type: none"> <li>Leave a tub of compost outside and let weeds develop. Where did they come from? Were the seeds already in the compost or have they come from elsewhere? Plan and carry out an investigation to find out.</li> <li>Collect as many different 'helicopter' seeds as possible and ask which ones would be able to go further (will need to explain that the longer it takes to fall the further the wind could blow them). Draw out questions like 'how does the wing length affect how long it takes to fall. This could be investigated with real seeds or modelling it with paper helicopters.</li> <li>How does the space between seeds affect how well they grow?</li> </ul>	<ul style="list-style-type: none"> <li>Plants grow best when they are damp, warm and in light. Is this true for seed germination?</li> <li>What can you predict about a plant and how it grows from the size of its seed? Plan and carry out investigations to test your ideas.</li> </ul>	<ul style="list-style-type: none"> <li>Provide children with small pots of already growing grass and cress. Cut back each plant to about 1/2 inch, predict and monitor how they both respond.</li> <li>How does the amount of light affect how well a plant grows?</li> <li>Do plants take in water through their roots alone, their leaves or both leaves and roots? How could you find out?</li> <li>Does the carbon dioxide enter at the top of the leaf or the underside of the leaf? How could you find out?</li> <li>How are soils that retain water well different from those that don't? Do all plants prefer the same type of soil?</li> <li>How is the growth of a plant affected by removing different amounts of leaves?</li> <li>If we stop gases from getting in an out of leaves what will happen? How can we find out?</li> <li>If you set up a sealed glass dome containing damp soil, normal air and some small flowering plants, what would you predict to happen over a long period of time?</li> </ul>	

### In UKS2:

- Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago □ Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents
- Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.

