

Year Group:	3	Strand: 2	What functions do the parts of a flower have?
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BIOLOGY

Key NC Reference and Objectives	<ul style="list-style-type: none"> Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. 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 Investigate the way in which water is transported within plants Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.
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Enquiry Approaches and Skills in Science	<div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <p align="center">ENQUIRY APPROACHES</p> <ul style="list-style-type: none"> Comparative / fair testing Changing one variable to see its effect on another, whilst keeping all others the same. Research Using secondary sources of information to answer scientific questions. Observation over time Observing changes that occur over a period of time ranging from minutes to months. Pattern-seeking Identifying patterns and looking for relationships in enquiries where variables are difficult to control. Identifying, grouping and classifying Making observations to name, sort and organise items. Problem-solving Applying prior scientific knowledge to find answers to problems. </div> <div style="width: 48%;"> <p align="center">ENQUIRY SKILLS</p> <ul style="list-style-type: none"> Asking questions Asking questions that can be answered using a scientific enquiry. Making predictions Using prior knowledge to suggest what will happen in an enquiry. Setting up tests Deciding on the method and equipment to use to carry out an enquiry. Observing and measuring Using senses and measuring equipment to make observations about the enquiry. Recording data Using tables, drawings and other means to note observations and measurements. Interpreting and communicating results Using information from the data to say what you found out. Evaluating Reflecting on the success of the enquiry approach and identifying further questions for enquiry. </div> </div>
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Key Investigation	<ul style="list-style-type: none"> Investigate how different conditions can affect the growth of a tomato plant. Enquiry Approach: Comparative/Fair Testing and Observation over time Enquiry Skills: Asking Questions, making predictions, setting up tests, observing and measuring, recoding data, interpreting and communicating results, evaluating. Guidance: Recap children’s previous knowledge of conditions that affect plants from Y2, recap the experiment completed on water, light and temperature and recap what those experiments told us about growth of a plant. Discuss what other factors may affect the growth of a plant – lead discussion to nutrients from the soil and space available for the plant to grow. Children think about how we could set up an experiment to test these two elements. Set up two experiments, one linked to the space a plant has to grow (for example, a tray with only a few seeds in, compared to a try with lots of seeds in) and the second one linked to nutrients from the soil (one tomato plant to be give a fertiliser to help it grow and the other no fertiliser). Discuss with children how to keep the rest of the experiment a fair test so we can measure the affect our change has had. Children can make predictions about what will happen and then observe over time the growth of the plants. Children can record diagram at different points, making sure all observations are dated. Note: This experiment will have to span the whole unit to allow growth to be seen, it could be set up at the start but plenary and conclusion not done until last lesson or at a further point in the term. It would be great for children to look at the growth all the way through to the production of fruit, linked to the lessons to pollination and growth and dispersal of seeds.
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Other suggestions for investigations and activities	<ul style="list-style-type: none"> Identifying, classifying and group parts of a plant. Enquiry Approach: Identifying, Classifying and Grouping Enquiry Skills: Making systematic and careful observations, recording findings using a Venn diagram. Guidance: Children could participate in a scavenger hunt around the school grounds, or be given a collection of seeds, berries, leaves ect to sort into groups using a Venn diagram. Pupils choose how they sort the items and explain the reasoning behind their choices. The same activity could be completed by using a variety of leaves from different trees, or pictures of flowers.
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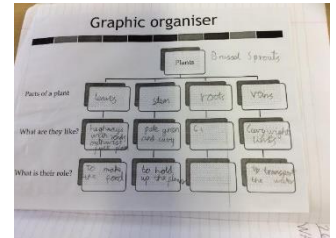


- Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers.

Enquiry Approach: Identifying, Classifying and Grouping, Observing
Enquiry Skills: Making systematic and careful observations, recording findings using a graphic organiser

Guidance:

Children are given a plant to examine. Children make observations of the key parts and explain the purpose of each part. Children can use magnifying glasses to help them investigate each part of the plant. At this stage of learning, children need to know that plants make their own food using their leaves but they do not need to understand how this happens. They could present their work in a graphic organiser.



Extension for greater depth:

Children could examine a wide range of plants, comparing similarities and difference, including cacti. Children could examine plants with different root types, for example, tap root or fibrous root and draw and explain the differences.

- Investigate how water passes up the stem of a flower

Enquiry Approach: Observing over time

Enquiry Skills: Making predictions, observing gathering and recording data to help in answering questions, interpreting and communicating results, evaluating

Guidance:

Before this investigation explore the main parts and purpose of the flower (roots, stem/trunk, leaves and flowers). Discuss what would happen if we took away different parts of the flower, for example, what would happen if we took away the flowers roots?



Discuss with the children how we may show water travelling up the stem of a flower. Introduce a white carnation and a beaker of coloured water. Discuss the investigation. Introduce the term reliable and discuss how results could be made more reliable. Conduct the experiment on more than one flower. Extension: Evaluate the experiment and ask the children to think about would this be the same for all white flowers/all flowers? Discuss with the children and try other white flowers out or even celery. Stems of flowers could be split in half and placed in two different coloured beakers.

- Explore the male and female parts of a flower that are involved in pollination, seed formation and how insects help the process.

Enquiry Approach: Identifying, Classifying and Grouping

Enquiry Skills: Making systematic and careful observations, recording findings using a labelled diagram.

Guidance:

Children should learn that the plants have male and female parts. The male part is called the stamen and this produces pollen. The female part is called the pistil and this is where the pollen needs to reach to make a seed for the plants lifecycle to continue. Children can dissect a variety of flowers to identifying the male and female parts. Children can create a labelled diagram labelling these parts. *(At this point, the children do not need to know all the smaller named parts of the male and female flower parts, this will be covered in year 5)* Children need to understand that when insects take the pollen to the female part of the flower, this then starts a process to make a seed – children could draw a simple diagram of this process.

- Investigate how different seeds are dispersed.

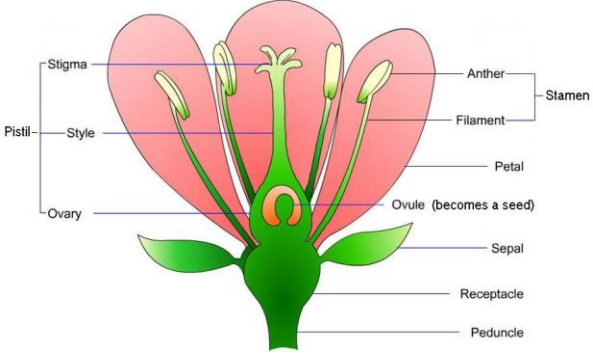
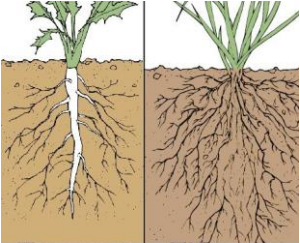
Enquiry Approach: Identifying, Classifying and Grouping, Observing

Enquiry Skills: Making systematic and careful observations, recording findings using a labelled diagram.

Guidance:

Children need to understand that after the pollination process has occurred, the flower then makes a seed to continue its life cycle – once this seed is made the process is complete. The next part of the flowers job is to get the seed away from

	<p>the parent plant so that the new plant can grow out of the seed. The children need to understand that the seed contains the new plant and store of food for when it germinates. Children need to understand that the process of getting the seed from its parent plant is called dispersal and that this can happen in a variety of ways dependent on the plant. Children need to investigate dispersal by animals (through eating the fruit a plant produces such as a tomato plant or berries), hooked fruits such as goose grass, burdock and agrimony by dispersals sticks to fur or feathers, winged fruit such as sycamore or ash and parachute such as dandelion or willow herb. Children could investigate dispersal in a number of practical demonstrations to show each method. Children could examine examples of each fruit by using magnifying glasses and creating labelled diagrams or tables of observations.</p>	
Plants to be grown	Tomato Plants	
Previously Taught Vocabulary	Leaf, flower, petals, Moss, Fern, Conifer, Evergreen, Deciduous, Root, Stem, Blossom, Fruit, Seed, Bulb, Trunk, Branches, Plant, Bud, Germination, Greenhouse, Temperature, Thermometer, Probe	
New Key Vocabulary	<p>Dispersal: act of spreading seeds around. Fertiliser: a material/substance you add to soil to increase the nutrients and help plants grow. Fruit: a structure made by the ovary which helps disperse the seeds. Nectar: a sugary liquid that insects drink to give them energy to fly. Nutrients: taken from the soil through the roots that plants need to make energy, grow, develop, and reproduce. Pollen: tiny grains made by the stamen which are needed by ovules in ovaries to make seeds. Pistil: the female reproductive part of a flower. Pollination: the act of transferring pollen grains from the male anther of a flower to the female stigma. Pollinator: an animal or insect that causes plants to make fruit or seeds. Reproduction: biological process by which new individual organisms – "offspring" – are produced from their "parents". Stamen: a part of the flower which produces pollen at its tip, the male reproductive part of the plant. Sepal: green leaf like structures at the top of the stalk.</p>	<p>Previously taught but now have more advanced definitions: Flower: the part of the plant which is concerned with reproduction.</p>
Core Substantive Knowledge and background knowledge for teachers:	<p>Each major part of the plant has one or more functions. The roots collect water and minerals from the soil and hold the plant firmly in the ground. The stem holds up the leaves so they can gather light to make food and holds up the flowers so they can receive pollen and disperse their fruits. It also conducts water and minerals to the roots to all parts of the plants and food made by leaves to all the other parts of the plant. The trunk of a tree is a stem in which the plant makes wood to give it extra support so it can greatly increase in size. The leaves make food by trapping light and using its energy to construct carbohydrates such as sugar and starch from water and from carbon dioxide taken in from the air. The function of the flower is reproduction. In this process, flowers of the same kind of plant exchange pollen. This leads to fertilisation and a structure called an ovule in the ovary becoming a seed. The ovary then becomes a fruit which helps the seed leave the plant in a process called dispersal.</p>	

	<p>Parts of a flower: Note: Children at Y3 level need to know the vocabulary for stamen (male), pistil (female), petal and sepal.</p>  <p>Root Types for Greater Depth Extension:</p>  <p>Taproot Fibrous</p> <p>Tap Root: A main root that grows down. Fibrous Root: A root system that consists of many small roots growing down.</p>
<p>Prior Knowledge</p>	<p>2.2 Year 2 Plants – Main parts of a plant, germination of a seed, plants require to grow water, light and heat to grow.</p>
<p>Assessment</p>	<p>Thorough assessment of outcomes in books and folders, quizzes and written scientific investigations, also supported by observations and questioning in lessons, assessing the following:</p> <p>Knowledge:</p> <ul style="list-style-type: none"> - Pupils can identify and describe the different parts of flowering plants (root, stem/trunk, leaves and flowers) - Pupils understand what plants need to live and grow (air, light water, with key investigations into the areas of nutrients from soil and room to grow) - Pupils understand the way in which water is transported within plants. - Pupils understanding the part that flower play in the life cycle of flowering plants, including pollinations, seed formation and seed dispersal at a basic level. <p>Skills:</p> <ul style="list-style-type: none"> - Pupils have identified and classified different plants and function parts of a flowering plant. - Pupils have made predictions based on their current understanding. - Pupils have investigated the concept of a fair test and comparative tests. - Pupils have made observations and recorded results in diagrams, drawings and charts. - Pupils have interpreted results and drawn simple conclusions from these. - Pupils have evaluated investigations, suggesting changes that could be made and generated questions about what to investigate next or further.
<p>Useful Planning Resources and Links</p>	<p>Colour changing carnation experiment https://www.youtube.com/watch?v=AMvEVnAFCNA What is a plant? https://www.bbc.co.uk/bitesize/topics/zy66fg8/articles/zcjp39 BBC Bite Size: https://www.bbc.co.uk/bitesize/topics/zy66fg8 Pollination: https://www.youtube.com/watch?v=CUPzbTujJgc Fertiliser: https://www.bbc.co.uk/bitesize/topics/zy66fg8/articles/z86ktv4</p>

