

Biology

Strand: Plants

Working Scientifically Drives All of the Knowledge & Understanding

Year 1			
NC Objectives	Key Scientific Knowledge	Key Vocabulary	Working Scientifically
To identify and name a variety of common wild and garden plants, including deciduous and evergreen trees	<p>To be able to identify & name plants/ wildflowers: poppy, buttercup, blue-bell, dandelion, daisy, cow-parsley, nettle, clover</p> <p>To be able to identify & name garden plants/ flowers: rose, tulip, daffodil, snow-drop, honey-suckle, sun-flower, ivy, forget-me-not</p> <p>To be able to name and identify (i) oak (i), silver birch (i), beech, cherry (i), sycamore (maple), ash, pine, willow (i)</p> <p><i>(Make links to our School class names which are all native trees; where possible, observe and identify some of these species in school-grounds).</i></p> <p>To be able to explain in simple terms what evergreen and deciduous trees are and how this links to seasons.</p>	<p>Plant, flower, vegetable, tree</p> <p>Deciduous/ evergreen</p> <p>leaf, root, stem, branch,</p>	<p>Revise: 2 kingdoms e.g. plants/ animals.</p> <p>Teacher asks a range of questions: what trees do we know? What different shapes of leaves are there? Can trees be grouped? Chn name/ identify trees from pics/ field..</p> <p>Q: How many different types of wildflower do we have on the school field? Chn explore and make observations on school premises.</p> <p>Observe closely using equipment e.g. magnifying glasses</p> <p>Identify & classify e.g. put plants into groups/ hula-hoops/ sorting; compare and contrast plants</p> <p>Gather and record data (to answer questions) e.g. tally, drawing plants, inputting into a given table; noting changes over time based on observations.</p>
To identify and describe the basic structure of a variety of	To be able to name and describe the basic structure of common flowering	Leaf, root, stem, trunk, branch, blossom,	Gather and record data (to answer questions e.g. tree diary, teacher models labelling of diagrams

common flowering plants, including trees	plants, including trees (see examples above)		Suggestion: use vegetable garden/ pots for growing / observations.
Year 2			
To observe and describe how seeds and bulbs grow into mature plants	<i>Revise Yr 1 plant names and vocabulary.</i> To know that seeds need warmth and water to germinate.	Seed, germinate, temperature, bulb, mature	Observe closely e.g. put seeds in bag/ paper-towel to watch germination (Observing over time)
To find out and describe how plants need water, light and suitable temperature to grow and stay healthy	To describe how plants needs water, light and suitable temperature to grow well.	Mature, healthy, condition, temperature,	Perform simple tests e.g. What do plants need to grow? Do plants grow better in dark/ light places? What happens if we don't water a healthy plant? How quickly does x grow in a cold/ warm/ hot place? Measure height with rulers and record data. Use observations & ideas to suggest answers to questions e.g. when we did not water the plant, it died. Plants must need water to grow healthily. Use data/evidence/ picture sources with clues e.g droopy leaves, to consider why a plant might not be healthy. Present and explain findings orally to class; then write a simple conclusion
Year 3			
	<i>Revise Yr 1/2 plant knowledge and vocabulary. Which trees can we</i>		

<p>To identify and describe the functions of different parts of flowering plants: roots, stem/ trunk, leaves and flowers.</p>	<p><i>identify and name? What do plants need to grow well?</i></p> <p>To begin to understand the relationship between structure and function (every part has a job to do); e.g. roots are thin and spread out; stem is round and strong; flowers can be colourful (pollination)</p> <p>To be able to explain the role/ function of e.g. stem/ roots/ leaves/ flowers (stem= transport & support; flowers = make seeds for reproduction; leaves take in sun's energy)</p>	<p>Root, anchor, absorb, stem/ trunk, transport, support, leaf/ leaves, sunlight, energy, nutrition, function, structure, reproduction, flowers, seed</p>	<p>Ask relevant questions and using different types of scientific enquiries to answer them e.g. Investigative testing- What happens to the flower when I put dye in the water I give it? What does this tell me about where water is taken in to the plant?</p> <p>Make systematic and careful observations, using a range of equipment e.g. rulers for measuring plant height/ root length; leaf size (when put in different contexts/ linked to healthy growth)</p> <p>Record findings e.g. labelled diagrams</p>
<p>To 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</p>	<p>To explain that plants need (* Yr 2 learning) water, light, suitable temperature to grow AND that healthy growth can be <u>improved</u> through additional nutrients (fertiliser/ compost) and <u>spacing</u> to avoid competition (for water/ light) with sibling/ parent plants.</p>	<p>Growth, healthy, mature, soil, nutrient, fertiliser, temperature,</p>	<ul style="list-style-type: none"> <i>Ensure that the investigative work is developed from Yr 2 by using the following examples:</i> <p>Ask relevant questions and using different types of scientific enquiries to answer them:</p> <p>Comparative testing ^{*1}: Put 3 different plants in light/ dark rooms (6 plants altogether e.g. plants needing more/ less light to grow well).</p> <p>Fair Testing (controlling continuous variables): how does the <u>amount</u> of water affect plant growth?</p>

			<p>Pattern-seeking: Does more light equate to faster growth? Does more fertiliser <u>always</u> mean that the plant is bigger/ healthier/ taller? (Either pattern-seeking enquiry lines could be done by giving children a data set to analyse).</p> <p>Gather information ... in range of ways to help answer questions (<i>Research</i>: Are some plants better at coping with less nutrients/ water/ space? (e.g. cactus/succulents/ grass). Children present findings orally.</p>
To investigate the way in which water is transported within plants	To be able to describe how water is absorbed through the roots and travels up the stem/ trunk to the leaves.	Stem, trunk, absorb, leaf, transport	<p>Ask relevant questions and use different types of scientific enquiries to answer them e.g. Investigative testing/ observation: What happens to the flower when I put dye in the water I give it? What does this tell me about <u>where</u> water is taken in to the plant?</p>
To explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.	<p>To be able to identify male/ female parts of the flower and describe the process of pollination (NB: There is no statutory requirement for children to know and remember the names of the flower parts (e.g. stigma/ style/ ovary/ stamen etc) but this can be introduced in order for children to begin to understand and marvel at the complexity of plant reproduction and the importance of pollinators)</p> <p>To understand that plants can reproduce without flowers (e.g. non-</p>	Male, female, pollinator, pollen, nectar, reproduce, growth, seed, petal, transfer (pollen), bee, insect,	<p>Gather/ record/ classify/and present data in a variety of ways to help in answering questions: e.g. how many seeds do different fruits have? How does seed design link to seed dispersal methods? Draw different examples of seeds associated with the varying methods of dispersal</p> <p>Write an explanation of the life cycle of a flowering plant using key scientific language (English)</p>

	<p>flowering plants) which do NOT need pollinators e.g. ferns/ mosses)</p> <p>To understand that flowers are colourful to attract pollinators</p> <p>To consider the importance of pollinators and the mutually beneficial relationship between plant/ pollinator</p> <p>To be able to identify the purpose of the fruit as the seed carrier for plant reproduction (to be tasty to animals!)</p> <p>To describe the life cycle of a flowering plant (e.g. pollination, seed formation in fruit, seed dispersal) e.g. with diagrams</p> <p>To describe different methods of seed dispersal and the links between seed design and dispersal method</p>	<p>Seed dispersal, fruit,</p>	<p>Identify differences, similarities (or changes) related to simple scientific ideas and processes (e.g. Compare flower designs/ shapes/ structures; how might this influence pollination/ pollinators?)</p> <p>-Research different pollinators</p> <p>-Consider what might happen (implications) if e.g. bees, became extinct</p> <p>Show the life cycle on a flowering plant in diagrams, using scientific language and appropriate labelling techniques.</p> <p>Investigate seed design (using specimens from nature); use knowledge about seed dispersal to design a seed / e.g.'helicopter' / pod creation</p>
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*1 See link detailing Comparative vs fair testing <https://www.stem.org.uk/community/groups/37033/comparative-tests-vs-fair-tests/41293>

And ASE book It's Not Fair (in Science Resources)