Hampshire Services
HIAS SCHOOL IMPROVEMENT

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Hampshire Science Team
Progression of Substantive Knowledge in Biology- Plants

Year 1-6

HIAS Science Team
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Hampshire County Council

www.hants.gov.uk

Overview

This document contains…

A progressive list of the substantive knowledge within the Hampshire Science Learning Journeys with reference to the related National Curriculum statutory requirements.

Points to consider when using this resource

The Learning Journeys provide schools with clearly sequenced substantive knowledge across chemistry, biology and physics. Where possible, the links to the National Curriculum statutory and/or non- statutory requirements have been identified.

Suggested sequence of learning

Year	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
1	Describing materials		Animal survival	Habitats	Seasons	Plants
2	Animal life cycles		Changing materials		Pushes and pulls	Making New Plants
3	Magnets	Animals, Skeletons and Movement	Solids, Liquids and Gases	Plants and their food production	Light	Rocks and soils
4	Mixtures and separating them	Digestion	Plant Reproduction		Making electrical circuits work	Living things
5	Fossils, geological time and classification	Space and gravity	Making new substances		Forces that oppose motion	Circulation
6	How light behaves	Classification and Evolution	Controlling electrical circuits		Sound	

BIOLOGY | CHEMISTRY | PHYSICS

BIOLOGY
Plants

	Substantive Knowledge from Learning Journeys	*National Curriculum Statutory Requirement*
Year 1	**Plants** **Knowledge Block 1- Where do plants come from** ● A **seed** contains a miniature plant that can develop into a fully grown plant. ● A **bulb** has underground vertical shoots which already has modified **leaves** ● Seeds and bulbs need water to grow but most do not need light (**germination**) ● Seeds and bulbs have food stores inside them to help the plant start to grow. **Knowledge Block 2- Plant survival** ● To survive plants, need to get water, light, and avoid being eaten **Knowledge Block 3- How plants get what they need to survive** ● A seed produces **roots** to allow water to get into the plant. ● A seed produces **shoots** to produce leaves to collect the sunlight. ● A basic plant structure can include leaves, flowers (blossom), petals, fruit, roots, bulb, seed, trunk, branches, stem	***Year 1 Plants*** ***Notes and guidance (non-statutory)*** *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).* ***From Year 2*** *Note: Seeds and bulbs need water to grow but most do not need light; seeds and bulbs have a store of food inside them.*
Year 2	**New Plants** **Knowledge Block 1- What flowers are for** ● All **flowering plants** make seeds (**reproduction**) that can grow (**germinate**) into new plants ● Plants need water, light and a suitable temperature to grow and stay healthy **Knowledge Block 2- What happens after a plant has produced seeds** ● Some plants die after it has produced its seed and sometimes the plant lives for many **generations** producing seeds each year	***Year 2 Plants*** ***Pupils should be taught to:*** ● *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.* ***Notes and guidance (non-statutory)*** *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.*

	Substantive Knowledge from Learning Journeys	*National Curriculum Statutory Requirement*

Year 3	**Plants and their food production**
	
	Knowledge Block 1- Plants don't go to McDonalds
	• Plants do not eat food so have to make their own.
	• This food provides then with energy, and materials to grow
	• To make the food (sugar) plants need water from the ground, **carbon dioxide** from the air and light from the sun.
	  ○ The water is taken up through the **roots** from the **soil**
	  ○ The carbon dioxide is taken in through the **leaves**
	• As well as food, plants also make **oxygen** which is given out back into the air through the leaves
		Year 3 Plants
		
		Pupils should be taught to:
		• *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*

Year 4	**Plant reproduction** **Knowledge Block 1- The reproductive parts of a flowering plant** • Flowering plants **reproduce** by the process of **pollination** • Pollination leads to the formation of a **seed** which can grow into a new plant • Flowering plants have evolved specific parts to carry out pollination and seed growth • Those parts are **stamen** where pollen is produced, **stigma** where pollen is collected, and the **ovaries** which contains the eggs that become a seed when the pollen travels down the stigma and meets the egg • Flowers have **petals** also are a range of colours, patterns, and smells to attract insects **Knowledge Block 2- All flowers are similar but different** • Plants and flowers look different because they pollinate in different ways. • There are two types of pollination Insect and wind • Insect pollinated flowers are usually bright coloured and strong scents • Wind pollinated flowers have less colourful petals and much less scent **Knowledge Block 3- Seed dispersal** • Plants have evolved many different ways to **disperse** their seeds • Seed dispersal increases the chances of seeds **germinating** and growing into a mature plant **Knowledge Block 4- What a seed does** • A seed contains a miniature, undeveloped version of the plant • They contain a food store for the first stage of growth (until the plant can make its own food) • They are surrounded with a protective coat.	***Year 3 Plants*** ***Pupils should be taught to:*** • *explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.*

Year 5		
Year 6		

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