

**Curriculum INTENT:**

At Chawton CE Primary School we believe that an engaging Science curriculum will develop children’s love of discovery of the world around them. We aim to inspire an appreciation of the biological, physical and chemical elements of our surroundings. We recognise the importance of nurturing a culture where children take pride in the results of their enquiries, and how they have recorded their findings. We believe that children need to develop a secure grasp of skills and knowledge in Science; following a clear pathway of progression as they advance through the primary curriculum.

**Progression of Skills and Understanding**

**Vocabulary**

Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	<p><b>Animals Including Humans:</b> Birds, fish, amphibians, reptiles, mammals and invertebrates Feathers, scales, gills, fins, hair, land, water, backbone, skeleton Carnivores, herbivores, omnivores Meat, plants</p> <p><b>Materials:</b> Wood, plastic, glass, metal, water, rock, brick, fabric, sand, paper, flour, butter, milk, soil</p>	<p><b>Animals Including Humans:</b> As Reception plus Classification, Egg, larva, pupa, adult Ladybirds, butterflies, dragonflies, smooth newt, common frog, toad Baby, toddler, child, teenager, adult Growth, nutrition (feeding), respiration (breathing is part of this) Hygiene, clean, wash, germs</p>	<p><b>Animals Including Humans:</b> Nutrition, diet, vitamins, minerals, fats, proteins and carbohydrates Skeletons, protect, support and aid movement.</p> <p><b>Forces and Magnets:</b> Magnets, bar and horseshoe, attract, repel North and south poles Magnetic, magnetic field.</p> <p><b>Light:</b> dark, dull, bright, very bright</p>	<p><b>Animals Including Humans:</b> Digestive system, oesophagus, stomach, acid, small intestine Protein, vitamin, mineral, carbohydrate, fats, energy, growth, repair. Saliva, teeth, incisors, canines, premolars, molars, function Food chain, producer, consumer, predator, prey.</p> <p><b>Electricity:</b></p>	<p><b>Animals Including Humans:</b> Gestation, foetus, fertilisation, species, baby, toddler, adolescent, adult, elderly person Puberty, hormones, pituitary gland, testosterone, oestrogen</p> <p><b>Earth and Space:</b> Day and night, Earth, axis, rotate Solar system, star, Sun, Planets, Mercury, Venus, Earth, Mars, Jupiter,</p>	<p><b>Animals Including Humans:</b> Circulatory system, heart, blood, veins, arteries, pulse, clotting Diet, balanced, vitamins, minerals, proteins, carbohydrates, sugars, fats Drugs, caffeine, nicotine, alcohol, cannabis, cocaine etc. Lifestyle, healthy</p> <p><b>Electricity:</b> As Year 4 plus: Volts Series circuit</p>

	<p>Hard/soft, stretchy/not stretchy, shiny/dull, rough/smooth, bendy/not bendy, sticky/not sticky, bend, stretch, twist Touch, see, hear, smell and taste <b>Plants:</b> Deciduous, evergreen, ash, birch, beech, etc. Cleavers, coltsfoot, daisy, dandelion, garlic mustard, mallow, etc. Crocus, daffodil, bluebells, etc. Roots, branch, trunk, stalk, leaf, flower, petal, seeds, bulbs and twigs <b>Seasonal Change:</b> Spring, summer, autumn, winter Year, months, days Hot, warm, mild, cold, sunny, cloudy, rain, sleet, snow, hail, thunder, lightning, rainbow, wet, damp, dry, windy, breezy, gusty, temperature, degrees Celsius, thermometer, weather vane.</p>	<p>Healthy, grow, strong, energy. <b>Living Things and their Habitats:</b> As Reception plus Habitat, micro habitat Pond, meadow, log pile, woodland, river, lake, beach, cliff Organism, plant, animal Invertebrates, snail, slug, woodlouse, spider, beetle, fly, etc. Pond animals, pond skater, water slater, ramshorn snail, pond snail, leech, etc. <b>Materials:</b> Crumble, squash, twist, transparent / not transparent <b>Plants:</b> Need of plants, water, light, heat, temperature wood, plastic, glass, metal, water, rock, brick, fabric, sand, paper, flour, butter, milk, soil</p>	<p>Shadow, block, absence of light Reflect, bounce, mirror, reflection Light source, sun. <b>Plants:</b> As Year 2 plus: petal, stamen, carpel Processes, pollination, fertilisation, germination. <b>Rocks:</b> Chalk, limestone, granite, basalt, sandstone, flint, slate, shale, marble Sedimentary, metamorphic, igneous Calcite, feldspar, topaz, diamond, talc, corundum Hard/soft, permeable/impermeable Heat, pressure, erosion, transportation, deposition, melt, solidify Grain, pebbles Crystals, layers Early areas of land – Gondwana, Pangea Land formations – Plates, volcanoes, mountains, valleys.</p>	<p>Appliances, fridge, freezer, TV, computer, iron, kettle, etc. Series circuit Components, battery, bulb (lamp), bulb (lamp) holder, buzzer, crocodile clip, leads, wires, switch, open, close Brighter, duller, slow, fast, quiet, loud Conductor, insulator Light, sound, movement, heat. <b>Living Things and their Habitats:</b> As Year 2 plus: Classification, key Build of types of trees and plants native to Britain. <b>Sound:</b> Bang, blow, shake, and pluck Loudness, quiet, quieter, quietest, loud, louder and loudest Pitch, low, lower, lowest, high, higher, and highest Vibrations, source <b>States of Matter:</b> Solid, liquid and gas Oxygen, hydrogen, helium, carbon dioxide, methane Water, milk, juice, petrol, oil Wood, rocks, metal, plastic, glass, wool, leather, etc. Melting, condensation, evaporation, solidifying, freezing, water cycle, water vapour, steam, heating, cooling.</p>	<p>Saturn, Uranus, Neptune (Pluto) Phases of the Moon, full moon, gibbous moon, half moon, crescent moon, new moon, waxing, waning Moon's orbit: 29.5 days, lunar month, orbit, planets, revolve, sphere. <b>Forces:</b> Gravity, friction, air resistance, upthrust, weight Newton meter, Newtons (N) Particles, surface area, push, pull, balance Mass, grams and kilograms Mechanical devices, gears, levers, pulleys, springs. <b>Living Things and their Habitats:</b> As Year 4 plus: Animal development, egg, larva, pupa, nymph, adult, metamorphosis Parts of a flower – petal, stamen (anther + filament), carpel (stigma + style + ovary + ovule) <b>Materials:</b> thermal conductor, thermal insulator Electrical conductivity, electrical conductor, electrical insulator Dissolving, solvent, solution, solute, soluble, insoluble, solid, liquid, particles, suspensions Separating, sieve, filter, evaporate, condense.</p>	<p>Resistance <b>Evolution and Inheritance:</b> Evolution, evolve, natural selection, survival, reproduction, offspring, parents, siblings, environment, variation, fossils; ammonites, belemnites, micrasters, etc. <b>Light:</b> As Year 3 plus: Opaque, translucent, transparent Sunset, sunrise, position. <b>Living Things and their Habitats:</b> As Year 5 plus: Kingdoms, animal, plant, 'micro-organism' Classes, amphibian, reptile, bird, mammal, Scales, feathers Flowering plant, non-flowering plant.</p>
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<b>Year R Overview</b>		
<p>Science in the EYFS Framework falls predominantly under the Understanding the World area of learning. In addition, aspects within Communication and Language are important to the teaching and learning of Science. The Characteristics of Effective Teaching and Learning are threaded through all aspects of learning and are the fundamental ways in which children within EYFS learn. During the Early Years, children should be developing knowledge, skills and understanding which will prepare them for the Year 1 curriculum.</p>		
<p>In preparation for the following practical knowledge in <b>Year 1:</b> Plants, Animals including Humans, Everyday Materials, Seasonal Changes</p>	<p><b>Early Years Curriculum: Understanding the World</b></p> <p>Understanding the world involves guiding children to make sense of their physical world and their community. The frequency and range of children’s personal experiences increases their knowledge and sense of the world around them – from visiting parks, libraries and museums to meeting important members of society such as police officers, nurses and firefighters.</p> <p>In addition, listening to a broad selection of stories, non-fiction, rhymes and poems will foster their understanding of our culturally, socially, technologically and ecologically diverse world. As well as building important knowledge, this extends their familiarity with words that support understanding across domains. Enriching and widening children’s vocabulary will support later reading comprehension.</p>	<p><b>Suggested EYFS Key Skills, Knowledge and Understanding (Curriculum)</b></p> <p>Make simple predictions about what they think might happen                      Carry out simple investigations in a small group                      Explain why something happened and use this to predict what might happen next/change                      Identify, compare, classify and group a variety of places, objects, materials and living things                      Talk about changes, including the seasons                      Talk about their immediate environment and compare it to other environments</p>

Science Knowledge and Skills (Practical Knowledge)

In preparation for the following Year 1 Key Skills, Knowledge and Understanding

**Working Scientifically:**

- Ask simple questions and recognising that they can be answered in different ways
- Observe closely, using simple equipment  
Perform simple tests
- Identify and classify
- Use their observations and ideas to suggest answers to questions
- Gather and record data to help in answering questions

**Linked Early Learning Goals (Assessment)**

**The Natural World**

- Explore the natural world around them, making observations and drawing pictures of animals and plants.
- Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class.
- Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.

**Listening, Attention and Understanding**

- Listen attentively and respond to what they hear with relevant questions, comments and actions when being read to and during whole class discussions and small group interactions.
- Make comments about what they have heard and ask questions to clarify their understanding.

*The ELGs should not be used in any way to limit the wide variety of rich experiences that are crucial to a broad and balanced curriculum.*

**KEY STAGE ONE:**

**National Curriculum Statements**

The principal focus of science teaching in key stage 1 is to enable pupils to experience and observe phenomena, looking more closely at the natural and humanly-constructed world around them. They should be encouraged to be curious and ask questions about what they notice. They should be helped to develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests, and finding things out using secondary sources of information. They should begin to use simple scientific language to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways. Most of the learning about science should be done through the use of first-hand practical experiences, but there should also be some use of appropriate secondary sources, such as books, photographs and videos.

'Working scientifically' is described separately in the programme of study, but must always be taught through and clearly related to the teaching of substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content.

Pupils should read and spell scientific vocabulary at a level consistent with their increasing word reading and spelling knowledge at key stage 1.

**Year 1/2: CYCLE A**

	ASKING QUESTIONS	MEASURING AND RECORDING	CONCLUDING
	Pupils should be taught to: <ul style="list-style-type: none"> <li>• ask simple questions and recognise that they can be answered in different ways</li> </ul>	Pupils should be taught to: <ul style="list-style-type: none"> <li>• observe closely, using simple equipment</li> <li>• perform simple tests</li> <li>• gather and record data to help in answering questions</li> </ul>	Pupils should be taught to: <ul style="list-style-type: none"> <li>• identify and classify</li> <li>• use their observations and ideas to suggest answers to questions</li> </ul>
<b>Seasonal Change</b>	Pupils should be taught to: <ul style="list-style-type: none"> <li>• observe changes across the four seasons</li> </ul>		
<b>ON-GOING</b>	<ul style="list-style-type: none"> <li>• observe and describe weather associated with the seasons and how day length varies</li> </ul>		

Science Knowledge and Skills (Practical Knowledge)

<p><b>Why is London Burning?</b></p> <p><i>Everyday materials (Y1 unit)</i></p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>distinguish between an object and the material from which it is made</li> <li>identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock</li> <li>describe the simple physical properties of a variety of everyday materials</li> <li>compare and group together a variety of everyday materials on the basis of their simple physical properties</li> </ul> <p><b>Opportunities for Working Scientifically:</b></p> <ul style="list-style-type: none"> <li>Perform simple tests to explore questions, for example: 'What is the best material for an umbrella? ...for lining a dog basket? ...for curtains? ...for a bookshelf? ...for a gymnast's leotard?</li> <li>Compare the uses of everyday materials in and around the school with materials found in other places</li> <li>Observe closely, identifying and classifying the uses of different materials, and recording their observations</li> </ul>
<p><b>How do you travel around the world on a sleigh?</b></p>	
<p><b>Can animals dance?</b></p> <p><i>Animals, including humans (Y2 unit)</i></p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>notice that animals, including humans, have offspring which grow into adults</li> <li>find out about and describe the basic needs of animals, including humans, for survival (water, food and air)</li> </ul> <p><b>Opportunities for Working Scientifically:</b></p> <ul style="list-style-type: none"> <li>Observe, through video or first-hand observation and measurement, how different animals, including humans, grow</li> <li>Ask questions about what things animals need for survival and what humans need to stay healthy</li> <li>Suggest ways to find answers to their questions</li> </ul>
<p><b>What makes me me?</b></p> <p><i>Living things and their habitats (Y2 unit)</i></p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>explore and compare the difference between things that are living, dead, and things that have never been alive</li> <li>identify that most living things live in habitats to which they are suited and describe how different habitats provide the basic needs of different kinds of animals and plants, and how they depend on each other</li> <li>identify and name a variety of plants and animals in their habitats, including micro-habitats</li> <li>describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food</li> </ul> <p><b>Opportunities for Working Scientifically:</b></p> <ul style="list-style-type: none"> <li>Sort and classify things according to whether they are living, dead or were never alive</li> <li>Record their findings using charts</li> <li>Describe how they decided where to place things</li> <li>Talk about ways of answering their questions</li> <li>Construct a simple food chain that includes humans (e.g. Grass, cow, humans)</li> <li>Describe the conditions in different habitats and micro-habitats</li> <li>Find out how the conditions affect the number and type of</li> <li>Plants and animals that live there</li> </ul>
<p><b>Does chocolate grow on trees?</b></p> <p><i>Plants (Y1 unit)</i></p>	<p>Pupils should be taught to:</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, including trees</li> </ul> <p><b>Opportunities for Working Scientifically:</b></p> <ul style="list-style-type: none"> <li>Describe how they were able to identify and group plants</li> </ul>

Science Knowledge and Skills (Practical Knowledge)

	<ul style="list-style-type: none"> <li>• Draw diagrams showing the parts of different plants including trees</li> <li>• Keep records of how plants have changed over time</li> <li>• Observe and record, with some accuracy</li> </ul>		
<p><b>What was life like at the Seaside?</b></p> <p><i>Animals, including humans (Y2 unit)</i></p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene</li> </ul> <p><b>Opportunities for Working Scientifically:</b></p> <ul style="list-style-type: none"> <li>• Ask questions about what things animals need for survival and what humans need to stay healthy</li> <li>• Suggest ways to find answers to their questions</li> </ul>		
<b>Year 1/2: CYCLE B</b>			
	<b>ASKING QUESTIONS</b>	<b>MEASURING AND RECORDING</b>	<b>CONCLUDING</b>
	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• ask simple questions and recognise that they can be answered in different ways</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• observe closely, using simple equipment</li> <li>• perform simple tests</li> <li>• gather and record data to help in answering questions</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• identify and classify</li> <li>• use their observations and ideas to suggest answers to questions</li> </ul>
<p><b>Seasonal Change ON-GOING</b></p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• observe changes across the four seasons</li> <li>• observe and describe weather associated with the seasons and how day length varies</li> </ul> <p><b>Opportunities for Working Scientifically:</b></p> <ul style="list-style-type: none"> <li>• Make tables and charts about the weather</li> <li>• Make displays of what happens in the world around them, including day length, as the seasons change</li> </ul>		
<p><b>What was it like to live in a castle?</b></p> <p><i>Use of everyday materials (Y2 unit)</i></p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses</li> <li>• find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching</li> </ul> <p><b>Opportunities for Working Scientifically:</b></p> <ul style="list-style-type: none"> <li>• Perform simple tests to explore questions, for example: 'What is the best material for an umbrella? ...for lining a dog basket? ...for curtains? ...for a bookshelf? ...for a gymnast's leotard?'</li> <li>• Compare the uses of everyday materials in and around the school with materials found in other places</li> <li>• Observe closely, identifying and classifying the uses of different materials, and recording their observations</li> </ul>		
<b>What's so great about Great Britain?</b>			
<p><b>Will we ever land on the moon again?</b></p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• observe changes across the four seasons</li> <li>• observe and describe weather associated with the seasons and how day length varies</li> </ul> <p><b>Opportunities for Working Scientifically:</b></p> <ul style="list-style-type: none"> <li>• Make tables and charts about the weather</li> </ul>		

Science Knowledge and Skills (Practical Knowledge)

<p><i>Seasonal Changes: Wild Weather</i></p>	<ul style="list-style-type: none"> <li>• Make displays of what happens in the world around them, including day length, as the seasons change</li> </ul>
<p><b>Will my bulb still grow if I plant it Upside Down?</b></p> <p><i>Living Things and their habitats (Y2 unit): Gardens and Allotments</i></p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• explore and compare the difference between things that are living, dead, and things that have never been alive</li> <li>• identify that most living things live in habitats to which they are suited and describe how different habitats provide the basic needs of different kinds of animals and plants, and how they depend on each other</li> <li>• identify and name a variety of plants and animals in their habitats, including micro-habitats</li> <li>• describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify</li> </ul> <p><b>Opportunities for Working Scientifically:</b></p> <ul style="list-style-type: none"> <li>• Observe closely comparing and contrasting familiar plants.</li> <li>• Describe how they were able to identify and group plants</li> <li>• Draw diagrams showing the parts of different plants including trees</li> <li>• Keep records of how plants have changed over time</li> </ul>
<p><b>What is Life like as a bug?</b></p> <p><i>Animals, including humans (Y1 unit)</i></p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals</li> <li>• identify and name a variety of common animals that are carnivores, herbivores and omnivores</li> <li>• describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)</li> <li>• identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense</li> </ul> <p><b>Opportunities for Working Scientifically:</b></p> <ul style="list-style-type: none"> <li>• Use their observations to compare and contrast animals at first hand or through videos and photograph</li> <li>• Describe how they identify and group them</li> <li>• Group animals according to what they eat</li> <li>• Use their senses to compare different textures, sounds and smells</li> </ul>
<p><b>What's so special about Chawton?</b></p> <p><i>Plants (Y2 unit)</i></p>	<p>Pupils should be taught to:</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> <p><b>Opportunities for Working Scientifically:</b></p> <ul style="list-style-type: none"> <li>• Observe closely comparing and contrasting familiar plants.</li> <li>• Observe and record, with some accuracy</li> <li>• Setup a comparative test to show that plants need light and water to stay healthy</li> </ul>
<p><b>Assessment notes for the Y3/4 teacher:</b></p>	

**Lower KEY STAGE TWO:**

**National Curriculum Statements**

The principal focus of science teaching in lower key stage 2 is to enable pupils to broaden their scientific view of the world around them. They should do this through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments, and by beginning to develop their ideas about functions, relationships and interactions. They should ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information. They should draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out.

'Working scientifically' is described separately at the beginning of the programme of study, but must always be taught through and clearly related to substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content.

Pupils should read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge.

**Year 3/4: CYCLE A**

	<b>ASKING QUESTIONS</b>	<b>MEASURING AND RECORDING</b>	<b>CONCLUDING</b>	<b>EVALUATING</b>
	Pupils should be taught to: <ul style="list-style-type: none"> <li>ask relevant questions and use different types of scientific enquiries to answer them</li> <li>set up simple practical enquiries, comparative and fair tests</li> </ul>	Pupils should be taught to: <ul style="list-style-type: none"> <li>make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers</li> <li>record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables</li> <li>gather, record, classify and present data in a variety of ways to help in answering questions</li> </ul>	Pupils should be taught to: <ul style="list-style-type: none"> <li>identify differences, similarities or changes related to simple scientific ideas and processes</li> <li>report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</li> <li>use straightforward scientific evidence to answer questions or to support their findings</li> </ul>	Pupils should be taught to: <ul style="list-style-type: none"> <li>use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions</li> </ul>

**How can we walk like an Egyptian?**

*Forces and Magnets (Y3 unit)*

Pupils should be taught to:

- compare how things move on different surfaces (friction/push/pull)
- notice that some forces need contact between two objects, but magnetic forces can act at a distance
- observe how magnets attract or repel each other and attract some materials and not others
- compare and group together a variety of everyday materials on the basis on whether they are attracted to a magnet, and identify some magnetic materials
- describe magnets as having two poles
- predict whether two magnets will attract or repel each other, depending on which poles are facing

**Opportunities for Working Scientifically:**

Science Knowledge and Skills (Practical Knowledge)

	<ul style="list-style-type: none"> <li>• Compare how different things move and grouping them</li> <li>• Raise questions and carrying out tests to find out how far things move on different surfaces and gathering and recording data to find answers their questions</li> <li>• Explore the strengths of different magnets and finding a fair way to compare them</li> <li>• Sort materials into those that are magnetic and those that are not</li> <li>• Look for patterns in the way that magnets behave in relation to each other and what might affect this, for example, the strength of the magnet or which pole faces another</li> <li>• Identify how these properties make magnets useful in everyday items and suggesting uses for different magnets.</li> </ul>
<p><b>How can we look after our world?</b>  <i>Animals, including humans (Y3 unit)</i></p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat</li> <li>• identify that humans and some other animals have skeletons and muscles for support, protection and movement</li> </ul> <p><b>Opportunities for Working Scientifically:</b></p> <ul style="list-style-type: none"> <li>• Raise and answer questions based on their observations of animals and what they have found out about other animals that they have researched</li> <li>• Identify and group animals with and without skeletons and observing and comparing their movement</li> <li>• Explore ideas about what would happen if humans did not have skeletons</li> <li>• Compare and contrast the diets of different animals (including their pets) and decide ways of grouping them according to what they eat</li> <li>• Research different food groups and how they keep us healthy and design meals based on what they find out</li> </ul>
<p><b>Where have we come from?</b>  <i>Rocks (Y3 unit)</i></p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• compare and group together different kinds of rocks on the basis of their appearance and simple physical properties</li> <li>• describe in simple terms how fossils are formed when things that have lived are trapped within rock</li> <li>• recognise that soils are made from rocks and organic matter</li> </ul> <p><b>Opportunities for Working Scientifically:</b></p> <ul style="list-style-type: none"> <li>• Observe rocks, including those used in buildings and gravestones, and explore how and why they might have changed over time</li> <li>• Use a hand lens or microscope to help them to identify and classify rocks according to whether they have grains or crystals, and whether they have fossils in them</li> <li>• Research and discuss the different kinds of living things whose fossils are found in sedimentary rock and explore how fossils are formed</li> <li>• Explore different soils and identifying similarities and differences between them</li> <li>• Investigate what happens when rocks are rubbed together or what changes occur when they are in water</li> <li>• Raise and answer questions about the way soils are formed</li> </ul>
<p><b>Where are the seven wonders of the world?</b>  <i>Plants (Y3 unit)</i></p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers</li> <li>• 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</li> <li>• investigate the way in which water is transported within plants</li> <li>• explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal</li> </ul> <p><b>Opportunities for Working Scientifically:</b></p> <ul style="list-style-type: none"> <li>• Compare the effect of different factors on plant growth</li> <li>• Discover how seeds are formed by observing</li> <li>• Look for patterns in the structure of fruits that relate to how the seeds are dispersed</li> <li>• Observe how water is transported in plants</li> </ul>

Science Knowledge and Skills (Practical Knowledge)

<p><b>How does it go round and round?</b></p> <p><i>States of Matter (Y4 unit)</i></p>	<ul style="list-style-type: none"> <li>• Use and make simple guides or keys to explore and identify local plants and animals</li> </ul> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• compare and group materials together, according to whether they are solids, liquids or gases</li> <li>• observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C)</li> <li>• identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature</li> </ul> <p><b>Opportunities for Working Scientifically:</b></p> <ul style="list-style-type: none"> <li>• Group and classify a variety of different materials</li> <li>• Explore the effect of temperature on substances such as chocolate, butter and cream</li> <li>• Research the temperature at which materials change state, for example, when iron melts or when oxygen condenses into a liquid</li> <li>• Observe and record evaporation over a period of time, for example, a puddle in the playground or</li> <li>• Washing on a line, and investigate the effect of temperature on washing drying or snowmen melting</li> </ul>
<p><b>What was life like in Chawton in the Regency period?</b></p> <p><i>Light (Y3 unit)</i></p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• recognise that they need light in order to see things and that the dark is the absence of light</li> <li>• notice that light is reflected from surfaces</li> <li>• recognise that light from the sun can be dangerous and that there are ways to protect their eyes</li> <li>• recognise that shadows are formed when the light from a light source is blocked by a solid object</li> <li>• find patterns in the way that the size of shadows changes</li> </ul> <p><b>Opportunities for Working Scientifically:</b></p> <ul style="list-style-type: none"> <li>• Look for patterns in what happens to shadows when the light source moves or the distance between the light source and the object changes</li> </ul>

**Year 3/4: CYCLE B**

	<b>ASKING QUESTIONS</b>	<b>MEASURING AND RECORDING</b>	<b>CONCLUDING</b>	<b>EVALUATING</b>
	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• ask relevant questions and use different types of scientific enquiries to answer them</li> <li>• set up simple practical enquiries, comparative and fair tests</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers</li> <li>• record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables</li> <li>• gather, record, classify and present data in a variety of ways to help in answering questions</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• identify differences, similarities or changes related to simple scientific ideas and processes</li> <li>• report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</li> <li>• use straightforward scientific evidence to answer questions or to support their findings</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions</li> </ul>

Science Knowledge and Skills (Practical Knowledge)

<p><b>Were the Vikings raiders or traders?</b></p> <p><i>Electricity (Y4 unit)</i></p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• identify common appliances that run on electricity</li> <li>• construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers</li> <li>• identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery</li> <li>• recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit</li> <li>• recognise some common conductors and insulators, and associate metals with being good conductors</li> </ul> <p><b>Opportunities for Working Scientifically:</b></p> <ul style="list-style-type: none"> <li>• Observe patterns, for example, that bulbs get brighter if more cells are added, that metals tend to be conductors of electricity, and that some materials can and some cannot be used to connect across a gap in a circuit</li> </ul>
<p><b>Where does the bang come from?</b></p> <p><i>Sound (Y4 unit)</i></p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• identify how sounds are made, associating some of them with something vibrating</li> <li>• recognise that vibrations from sounds travel through a medium to the ear</li> <li>• find patterns between the pitch of a sound and features of the object that produced it</li> <li>• find patterns between the volume of a sound and the strength of the vibrations that produced it</li> <li>• recognise that sounds get fainter as the distance from the sound source increases</li> </ul> <p><b>Opportunities for Working Scientifically:</b></p> <ul style="list-style-type: none"> <li>• Find patterns in the sounds that are made by different objects such as saucepan lids of different sizes or elastic bands of different thicknesses</li> <li>• Make earmuffs from a variety of different materials to investigate which provides the best insulation against sound</li> <li>• Make and play their own instruments by using what they have found out about pitch and volume</li> </ul>
<p><b>Why is the Earth so angry?</b></p> <p><i>Light touch/repetition Forces and Magnets (link to tectonic plates – Y3 forces)</i></p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• compare how things move on different surfaces</li> <li>• notice that some forces need contact between two objects, but magnetic forces can act at a distance</li> <li>• observe how magnets attract or repel each other and attract some materials and not others</li> <li>• compare and group together a variety of everyday materials on the basis on whether they are attracted to a magnet, and identify some magnetic materials</li> <li>• describe magnets as having two poles</li> <li>• predict whether two magnets will attract or repel each other, depending on which poles are facing</li> </ul> <p><b>Opportunities for Working Scientifically:</b></p> <ul style="list-style-type: none"> <li>• Compare how different things move and grouping them</li> <li>• Raise questions and carrying out tests to find out how far things move on different surfaces and gathering and recording data to find answers their questions</li> </ul>
<p><b>Where does my food go?</b></p> <p><i>Animals, including humans (Y4 unit)</i></p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• describe the simple functions of the basic parts of the digestive system in humans</li> <li>• identify the different types of teeth in humans and their simple functions</li> <li>• construct and interpret a variety of food chains, identifying producers, predators and prey</li> </ul> <p><b>Opportunities for Working Scientifically:</b></p> <ul style="list-style-type: none"> <li>• Compare the teeth of carnivores and herbivores, and suggesting reasons for differences</li> <li>• Find out what damages teeth and how to look after them</li> <li>• Draw and discuss their ideas about the digestive system and comparing them with models or images</li> </ul>
<p><b>Why is our world changing?</b></p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• recognise that living things can be grouped in a variety of ways</li> </ul>

Science Knowledge and Skills (Practical Knowledge)

<p><i>Living things and their habitats</i> (Y4 unit)</p>	<ul style="list-style-type: none"> <li>• explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment</li> <li>• recognise that environments can change and that this can sometimes pose dangers to living things</li> </ul> <p><b>Opportunities for Working Scientifically:</b></p> <ul style="list-style-type: none"> <li>• Use and make simple guides or keys to explore and identify local plants and animals</li> <li>• Make a guide to local living things</li> <li>• Raise and answer questions based on their observations of animals and what they have found out about other animals that they have researched</li> </ul>
<p><b>Assessment notes for the Y5/6 teacher:</b></p>	

**Upper KEY STAGE TWO:**

**National Curriculum Statements**

The principal focus of science teaching in upper key stage 2 is to enable pupils to develop a deeper understanding of a wide range of scientific ideas. They should do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically. At upper key stage 2, they should encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They should also begin to recognise that scientific ideas change and develop over time. They should select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests and finding things out using a wide range of secondary sources of information. Pupils should draw conclusions based on their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings.

'Working and thinking scientifically' is described separately at the beginning of the programme of study, but must always be taught through and clearly related to substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content.

Pupils should read, spell and pronounce scientific vocabulary correctly.

Science Knowledge and Skills (Practical Knowledge)

Year 5/6: CYCLE A				
	ASKING QUESTIONS	MEASURING AND RECORDING	CONCLUDING	EVALUATING
	Pupils should be taught to: <ul style="list-style-type: none"> <li>plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary</li> </ul>	Pupils should be taught to: <ul style="list-style-type: none"> <li>take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate</li> <li>record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs</li> </ul>	Pupils should be taught to: <ul style="list-style-type: none"> <li>identify scientific evidence that has been used to support or refute ideas or arguments</li> <li>report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations</li> </ul>	Pupils should be taught to: <ul style="list-style-type: none"> <li>use test results to make predictions to set up further comparative and fair tests</li> </ul>
<b>What have we learnt from the ancient civilisations?</b>				
<b>Are we at the centre of our universe?</b>  <i>Earth and Space (Y5 unit)</i>	Pupils should be taught to: <ul style="list-style-type: none"> <li>describe the movement of the Earth, and other planets, relative to the Sun</li> <li>describe the movement of the Moon relative to the Earth</li> <li>describe the Sun, Earth and Moon as approximately spherical bodies</li> <li>use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky</li> </ul> <b>Opportunities for Working Scientifically:</b> <ul style="list-style-type: none"> <li>Compare the time of day at different places on the Earth through internet links and direct communication</li> <li>Create simple models of the solar system</li> <li>Find out why some people think that structures such as Stonehenge might have been used as astronomical clocks</li> <li>Construct simple shadow clocks and sundials, calibrated to show midday and the start and end of the school day</li> </ul>			
<b>Does the punishment fit?</b>  <i>Light (Y6 unit)</i>	Pupils should be taught to: <ul style="list-style-type: none"> <li>recognise that light appears to travel in straight lines</li> <li>use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye</li> <li>explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes</li> <li>use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them</li> </ul> <b>Opportunities for Working Scientifically:</b> <ul style="list-style-type: none"> <li>Decide where to place rear-view mirrors on cars</li> <li>Design and make a periscope and using the idea that light appears to travel in straight lines to explain how it works</li> <li>Investigate the relationship between light sources, objects and shadows by using shadow puppets</li> <li>Extend their experience of light by looking at a range of phenomena, e.g. Rainbows, colours on soap bubbles, objects looking bent in water, etc.</li> </ul>			
<b>How can we not lose words?</b>	Pupils should be taught to: <ul style="list-style-type: none"> <li>describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird</li> <li>describe the life process of reproduction in some plants and animals</li> </ul>			

<p><i>Living Things and their Habitats (Y5 unit)</i></p>	<p><b>Opportunities for Working Scientifically:</b></p> <ul style="list-style-type: none"> <li>• Observe and compare the life cycles of plants and animals in their local environment with other plants and animals around the world</li> <li>• Ask pertinent questions and suggesting reasons for similarities and differences</li> <li>• Observe changes in an animal over a period of time for example, by hatching and rearing chicks</li> <li>• Compare how different animals reproduce and grow</li> </ul>			
<p><b>How close did the Civil War get to Chawton?</b></p>				
<p><b>Do you have the skills? Chawton Bake Off!</b></p> <p><i>Properties and Changes of Materials (Y5 unit)</i></p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets</li> <li>• know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution</li> <li>• use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating</li> <li>• give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic</li> <li>• demonstrate that dissolving, mixing and changes of state are reversible changes</li> <li>• explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda</li> </ul> <p><b>Opportunities for Working Scientifically:</b></p> <ul style="list-style-type: none"> <li>• Carry out tests to answer questions, for example, 'Which materials would be the most effective for making a warm jacket, for wrapping ice cream to stop it melting, or for making blackout curtains?'</li> <li>• Observe and compare the changes that take place, for example, when burning different materials or baking bread or cakes</li> <li>• Research and discuss how chemical changes have an impact on our lives, for example, cooking, and discuss the creative use of new materials such as polymers, super- sticky and super- thin materials</li> </ul>			
<p><b>Year 5/6: CYCLE B</b></p>				
	<p><b>ASKING QUESTIONS</b></p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary</li> </ul>	<p><b>MEASURING AND RECORDING</b></p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate</li> <li>• record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs</li> </ul>	<p><b>CONCLUDING</b></p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• identify scientific evidence that has been used to support or refute ideas or arguments</li> <li>• report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations</li> </ul>	<p><b>EVALUATING</b></p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• use test results to make predictions to set up further comparative and fair tests</li> </ul>
<p><b>What would you like to invent?</b></p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit</li> </ul>			

Science Knowledge and Skills (Practical Knowledge)

<p><i>Electricity</i> (Y6 unit)</p>	<ul style="list-style-type: none"> <li>compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches</li> <li>use recognised symbols when representing a simple circuit in a diagram</li> </ul> <p><b>Opportunities for Working Scientifically:</b></p> <ul style="list-style-type: none"> <li>Compare materials in order to make a switch in a circuit</li> <li>Identify systematically the effect of changing one component at a time in a circuit</li> <li>Design and make a set of traffic lights, a burglar alarm or some other useful circuit</li> </ul>
<p><b>What was it like to be an evacuee?</b></p>	
<p><b>How can we be Guardians of our World?</b>  <i>Living Things and their Habitats</i> (Y6 unit)</p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals</li> <li>give reasons for classifying plants and animals based on specific characteristics</li> </ul> <p><b>Opportunities for Working Scientifically:</b></p> <ul style="list-style-type: none"> <li>Use classification systems and keys to identify some animals and plants in the immediate environment</li> <li>Research unfamiliar animals and plants from a broad range of other habitats and decide where they belong in the classification system</li> </ul>
<p><b>What does the rainforest do for us?</b>  <i>Evolution and Inheritance</i> (Y6 unit)</p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago</li> <li>recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents</li> <li>identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution</li> </ul> <p><b>Opportunities for Working Scientifically:</b></p> <ul style="list-style-type: none"> <li>Explore the work of scientists and scientific research about the relationship between diet, exercise, drugs, lifestyle and health</li> <li>Observe and raise questions about local animals and how they are adapted to their environment</li> <li>Compare how some living things are adapted to survive in extreme conditions</li> <li>Analyse the advantages and disadvantages of specific adaptations</li> </ul>
<p><b>Who Lives in a House like this?</b>  <i>Forces</i> (Y6 unit)</p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object</li> <li>identify the effects of air resistance, water resistance and friction, that act between moving surfaces</li> <li>recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect</li> </ul> <p><b>Opportunities for Working Scientifically:</b></p> <ul style="list-style-type: none"> <li>Explore falling paper cones or cupcake cases, and designing and making a variety of parachutes and carrying out fair tests to determine which designs are the most effective</li> <li>Explore resistance in water by making and testing boats of different shapes</li> <li>Design and make products that use levers, pulleys, gears and/or springs and explore their effects</li> </ul>
<p><b>What do I need to keep healthy?</b>  <i>Animals, including humans</i> (Y5 unit)</p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>describe the changes as humans develop to old age</li> <li>identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood</li> <li>recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function</li> <li>describe the ways in which nutrients and water are transported within animals, including humans</li> </ul> <p><b>Opportunities for Working Scientifically:</b></p>

Science Knowledge and Skills (Practical Knowledge)

- Research the gestation periods of other animals and comparing them with humans
- Find out and recording the length and mass of a baby as it grows

**Assessment  
notes for the  
Year 7 transition  
teacher:**