

# St Bartholomew's C of E Primary School Science Curriculum Overview



# YEAR 1

Module name	Introduction	Key vocabulary	Key skills
Looking at animals	<p>During this module children learn about a variety of familiar and less familiar animals, including fish, amphibians, reptiles, birds and mammals. The module links with OCW: Animal Antics and is built upon in Year 2, where children learn more about the basic needs of animals. In this module they will identify and name, look closely at and compare and contrast many different animals. They name their body parts, describe their physical features and mimic how they move. They are reminded that animals need to eat in order to be healthy and that they eat lots of different types of foods. Children are also introduced to the terms ‘carnivore’, ‘herbivore’ and ‘omnivore’. Four enrichment lessons are provided to reinforce children’s learning. Children apply their ideas about animals, as they think about pets that may live with them and how these might be looked after if they need to visit a vet for treatment. They also use familiar songs and stories as a starting point; in this module, Old MacDonald and Three Billy Goats Gruff.</p> <p>This module focuses on animals that have backbones (vertebrates). It is likely that some children will give examples of animals without backbones (invertebrates), such as worms, insects and spiders. It is important to reinforce the idea that they are all animals too and that they can be put into different groups using particular characteristics. Examples of invertebrates are in OCW: Animal Antics.</p> <p>In common with other modules the emphasis in this module must be on first-hand experience; children should be exploring and investigating real animals wherever possible, that is, visiting pets or classroom-based animals that they can observe first-hand, such as looking closely at fresh dead fish. Paper-based secondary resources, photos and video are provided as an option during certain lessons, but they are offered as something of a last resort – direct, hands-on interaction with the natural world is essential, particularly for very young children.</p> <p>The main enquiry types in this module are grouping and classifying, and using secondary sources of information to answer questions. Children work scientifically by making careful observations, gathering and recording data to help them to answer questions. They communicate outcomes of their enquiries in different ways, including orally, through physical movement and role play, by creating clay models, producing drawings and simple sentence writing.</p> <p>All lessons are differentiated to help teachers plan for children’s learning. Children should be grouped according to their capacity as scientists, rather than according to their reading or writing attainment. Teachers and other adults should provide support that enables children to access all challenges, as appropriate. Writing frames and other structures are provided to scaffold the learning process for teachers, other adults and for children, and are not necessarily for children to complete independently. All lessons provide opportunities for children to communicate their knowledge, skills and</p>	<p>fish, amphibian, reptile, bird, mammal, goldfish, tropical fish, budgerigar, parrot, rabbit, gerbil, hamster, mouse, chinchilla, lizard, snake, dog, cat, tail, paws, legs, feet, nose, ears, eyes, feather, fur, scales, fins, fish, tail, gills, scales, eyes, mouth, bill, beak, head, eye, legs, claws, wings, feather, down quill, webbed feet, legs, smooth skin, big eyes and mouth, nose, scaly skin, claws on feet, long tongue, big teeth, mackerel, trout, hake, sea bass, whitebait, fl at fish, plaice, robin, blackbird, blue tit, hawk, peacock, seagull, magpie, eagle, jump, hop, leap, climb, clamber, swing, pad, pace, prowl, pounce, spring, fl ap, fl y, fl utter, fl op, splash, splosh, dive, swim, slither, slide, hedgehog, fox, bat, badger, night, nocturnal, senses, sight, smell, sonar, food, feeding, roost, sett, burrow, tunnel, nest, hospital, surgery, nurse, vet, patient, care, look after, treat, accident, injury, injured, illness, sick, medicine, bandage, stethoscope, gloves, face mask, overalls, cow, sheep, pig, horse, pony, goat, duck, chicken, cockerel, goose, harvest mouse, barn owl, rabbit, cat, dog, moo, baa, oink, neigh, bleat, quack, cluck, cock-a-doodle-do, honk, squeak, purr, miaow, woof, eat, healthy, meat, insects, fish, vegetables, plants, trees, grass, seeds, nuts, carnivore, herbivore, omnivore, goat, beard, hoof, hooves, horns, troll, ugly, big eyes, big pointed ears, big nose, big mouth with sharp teeth, small, medium, big, smallest, biggest, dinner, meal, meat, lamb, beef, ham, chicken, vegetables, plants, trees,</p>	<p>Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals</p> <p>Identify and name a variety of common animals that are carnivores, herbivores and omnivores</p> <p><b><i>Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)</i></b></p>

	<p>understanding in a variety of ways, other than in writing, and the use of voice recording tools, photographs and video can help greatly in supporting this.</p>	<p>bushes, grass, menu, hamper, appetite</p>	
<p>Plant Detectives</p>	<p>In this module children are introduced to a wide variety of plants, including trees, which are to be found within their immediate environment. For some schools this might mean plants that are growing already on the school field, in flower borders, on the vegetable patch or in the wildlife area, while for others it might mean teachers providing planting in large pots, tubs, grow bags or window boxes, or developing areas of the grounds or playground that are under-used in preparation for this and other modules. Local resources should also be exploited. Community gardens and allotments, trees and borders or verges in public areas, local parks and gardens should all be located and used where possible, and especially if the school grounds themselves provide limited opportunities for children.</p> <p>The emphasis within this module must be on first-hand experience; children exploring and investigating what is familiar and that they see every day around them, such as garden plants, wild plants and trees in school grounds or close by that they can observe first-hand themselves. Paper-based secondary resources, photographs and videos are provided as an option during certain lessons, but they are offered as something of a last resort – direct, hands-on interaction with the natural world is essential, particularly for very young children.</p> <p>All lessons are differentiated to help teachers plan for children’s learning. Children should be grouped according to their capacity as scientists, rather than according to their reading or writing attainment. Teachers and other adults should provide support that enables children to access all challenges, as appropriate. Writing frames and other structures are provided to scaffold the learning process for teachers, other adults and for children, and are not necessarily for children to complete independently. All lessons provide opportunities for children to communicate their knowledge, skills and understanding in a variety of ways, other than in writing, and the use of talk tools, photographs and video can help greatly in supporting this.</p> <p>This module builds on earlier learning during Foundation Stage, where children will have had a variety of plant-related experiences: using their senses, looking at, smelling and tasting, planting and growing things, and becoming aware of obvious differences between things, for example, between different leaves and different flowers. It links to Year 1, OCW: Plants, where children plant, caring for and grow different plants themselves, and to Year 2, Module 2, The Apprentice Gardener, where children develop their understanding of plants and growing still further.</p> <p>During this module children look closely at familiar garden plants and wild plants growing in and close to their school, and become increasingly aware of the enormous variety that there is. They are introduced to the names of some common varieties of wild and garden plants, including trees, and begin to make simple comparisons. They learn the simple names of parts of a plant that most plants have in common, and observe and describe a variety of very different examples, such as flowers of contrasting size and shape and roots of different types and structures. Children discover that there are many different kinds of trees and that some are deciduous and some evergreen. This particular understanding is developed further in OCW: Plants.</p>	<p>pansy, geranium, busy Lizzie, petunia, begonia, daisy, snapdragon, fuchsia, lily, daffodil, tulip, buddleia, weed, buttercup, thistle, nettle, foxglove, poppy, dandelion, daisy, cornflower, periwinkle, bluebell, leaf, stem, flower, bud, root, root system, tap root, fibrous roots, tree, trunk, branch, twig, tall, short, taller, shorter, tallest, shortest, similar, different, compare, group, measure</p>	<p>Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees</p> <p>Identify and describe the basic structure of a variety of common flowering plants, including trees</p>

	<p>The lessons within this module are ideally positioned during the main growing season, when a considerable number of flowering plants are in bloom, in late spring (April and May) or summer (June and July). Where direct links are made with learning that is a focus for an OCW lesson, this is taken into account (for further details refer to the introduction of OCW: Plants).</p> <p>The main enquiry type in this module is grouping and classifying. Children also notice patterns and use secondary sources of evidence to answer their science questions.</p> <p>When working scientifically there is a strong emphasis on children observing closely, identifying and classifying, and comparing and contrasting. Children use simple vocabulary to describe their observations and to identify similarities and differences, and group the evidence they collect in different ways, sometimes using criteria provided by their teacher and sometimes developing their own criteria, with support and where appropriate.</p>		
Using our senses	<p>In this module children develop their knowledge and understanding of the human body, building on their early experiences during Foundation Stage. They identify and name simple parts of the body, as they draw and label a life size version of themselves or a class mate. The children are introduced to the concept of five senses that help them to find out about the world around them and link those senses to particular parts of their body. Each sense is explored by children as they answer a variety of science questions. Children apply their knowledge of senses in two story-based enrichment lessons centred on the tales of The Princess and the Pea and The Crowded House. This module links to Year 2, Module 6, Growing Up, where children learn more about humans; that they grow from tiny babies into adults, need exercise and the right types and amounts of food to help them to be healthy.</p> <p>The emphasis within this module, in common with other modules in Year 1, is on first-hand experience. Some paper-based, secondary resources are provided as an option during certain lessons, but they are offered as something of a last resort – children’s direct, hands-on interaction with the world around them is essential, particularly for very young children.</p> <p>When working scientifically in this module children will carry out a variety of comparative tests and identifying and classifying enquiries. They will communicate their learning in different ways, including orally, and using talk tools to help them to record their responses. They will organise any data that they collect using tables and tally charts as appropriate, and look for simple patterns, for example, about their likes and dislikes.</p> <p>All of the lessons are differentiated to help teachers plan for children’s learning. Children should be grouped according to their capacity as scientists, rather than according to their reading or writing attainment. Teachers and other adults should provide support that enables children to access all challenges, as appropriate. Writing frames and other structures are provided to scaffold the learning process for teachers, other adults and for children. These resources are not necessarily for children to complete independently. All of the lessons provide opportunities for children to communicate their knowledge, skills and understanding in a variety of ways, other than in writing, and the use of talk tools, photographs and video can help greatly in supporting this.</p>	<p>body, head, neck, arms, elbows, hands, fingers, legs, knees, feet, face, skin, ears, eyes, nose, nostrils, hair, mouth, teeth, tall, taller, short, shorter, big, bigger, small, smaller, louder, softer, loud, quiet, high, low, senses, taste, hearing, touch, smell, sight, bitter, sweet, sour, sharp, tingly, fizzy, milky, creamy, buzzer, doorbell, radio, tocker timer, bird song, wind blowing, car horn, traffic noise, loud/er, quiet/er, peaceful, silent, silence, noise, noisy, bang, crash, whistle, buzz, ring, squeak, creak, rattle, bang, knock, tick, chime, feel, touching, sensitive, sense, sensory, rub, pinch, prod, rough, smooth, bumpy, wrinkled, grooved, shiny, smooth, soft, hard, crunchy, slippery, slimy, fragrance, scent, pong, flowery, fruity, sour, bitter, sharp, strong, gentle, smelly, delicate, sensitive, fabric, material, layers, thick, thin, thicker, thinner, soft, hard, clock, window, door, floorboards, kettle, fire, chicken, sheep, cow, cluck, baa, moo</p>	<p>Identify, name, draw and label basic parts of the human body and say which part of the body is associated with each sense</p>

<p>Everyday materials</p>	<p>This module introduces children to a range of basic materials and their properties. In lessons 1–6 they learn to name and identify wood, plastic, metal, glass, rock, brick, water and other materials, many of which will be familiar to them. They understand that these materials can be made into many different objects, from spoons made of plastic, wood or metal or any combination of the three, to more complex objects. They learn to distinguish between an object and the material from which it is made, and to define an object as, for example, a wooden spoon or plastic cup, by the material from which it is made. They recognise that the same material can be made into different objects, for example, a metal can, a metal spoon and a metal car. In the second half of the module use touch and sight to identify a number of simple properties of materials, and test materials such as paper and fabric to compare their properties. In the extension lessons children choose materials to decorate a picture frame based on their different observable properties, and compare the properties of liquid water with frozen ice.</p> <p>When working scientifically there is a strong emphasis throughout the module on children using their senses to observe closely. In the first six lessons, when children are identifying, naming and sorting materials, they learn how to group and classify them using separate and overlapping sorting rings, simple tables and Carroll diagrams. Children find ways to compare the properties of different materials. They design and carry out simple tests to make fair comparisons. They record their findings in a variety of ways and use the evidence from the tests to classify and sort materials according to their properties. They use comparative adjectives to describe their findings, for example, shinier, harder, softer.</p> <p>This module is further developed in Year 2 when the suitability of a range of materials for particular uses are evaluated and children begin to learn how materials can be changed.</p> <p>A large number of resources are required for this module, including off cuts of wood, metal and plastic, pieces of brick, glass and different fabrics and paper. Materials kits can be purchased from education suppliers. Objects made from these materials are also needed. In many of the lessons it is useful to have extra adults to support children and help them to carry out the tasks, and prompt their observations.</p>	<p>materials, wood, wooden, plastic, metal, glass, water, rock, brick, paper, writing, wrapping, shiny, drawing, display, greaseproof, kitchen towel, handkerchief, wallpaper, sand paper, fabric, wool, nylon, silk, fleece fibre, properties, hard, soft, fluffy, rough, smooth, shiny, dull, light, heavy, transparent (see-through), opaque (can't see-through), translucent (see something through), harder, lighter, rougher, stretch, stretchy, elastic, stiff, bend, bendy, not bendy, press, squash, twist, shape, waterproof, absorb, absorbent, soak up, mop up; frozen, freeze, melt, salt, tissue paper, button, glass bead, marble, pebble, pasta</p>	<p><b><i>Distinguish between an objects and the material from which it is made</i></b></p> <p>Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock</p> <p>Describe the simple physical properties of everyday materials</p> <p><b><i>Compare and group together a variety of everyday materials on the basis of their simple physical properties</i></b></p>
<p>Our changing world: seasons</p>	<p>In this module children will experience 'our changing world', as they observe the effects that changing seasons and weather have on them and on the world around them. They will use their senses as they consider what clothing they should wear in different weather conditions and during different seasons of the year. They will carry out seasonal 'scavenger hunts' to collect evidence of the changing seasons and use that evidence to answer science questions. They will share what they have discovered by creating a 'season window' wall display that they add to across the seasons of the year. Children will keep their own weather records and look for patterns in the data that they have collected. This module links to Module 1, Plant Detectives and to the two OCW modules, Plants and Animal Antics.</p> <p>The emphasis within this module must be on first-hand experience; children exploring and using all of their senses to investigate what is familiar and happens every day around them, for example, changes to plants, trees and animals in the school grounds, changes to weather on different days and at different times of the year. Paper-based, secondary resources are provided as an option during certain lessons, but they are offered as something of a last resort – direct, hands-on interaction with the natural world is essential, particularly for very young children.</p>	<p>seasons, autumn, winter, spring, summer, evidence, similar, different, group, compare, change, names of the months of the year, temperature, hot, warm, cold, cool, freezing, frosty, wet, dry, sunny, cloudy, showery, stormy, windy, breeze, gale, rainy, sunny, snow, shower, drizzle, puddle, breeze, gale, thunder, lightning, sleet, fog, mist, hat, gloves, mittens, scarf, muffler, ear muffs, boots, coat, umbrella, wellies, kite, windmill, sunglasses, thick, thin, woolly, furry, warm, waterproof</p>	<p>Observe changes across the four seasons</p> <p><b><i>Observe and describe weather associated with the seasons and how the day length varies</i></b></p>

	<p>The main enquiry types in this module are observing changes over time and noticing patterns. Children will work scientifically by making careful observations, asking and answering questions and gathering and interpreting data, with help and support from their teacher. In Lesson 4 children will be introduced to bar charts as a method of presenting data. They will communicate outcomes in a variety of different ways, for example, by adding evidence that they collect to a 'season window' wall display, and recording their findings in an Our Changing World diary or in a 'Weather big book'.</p> <p>All of the lessons are differentiated to help teachers plan for children's learning. Children should be grouped according to their capacity as scientists, rather than according to their reading or writing attainment. Teachers and other adults should provide support that enables children to access all challenges, as appropriate. Writing frames and other structures are provided to scaffold the learning process for teachers, other adults and for children. These resources are not necessarily for children to complete independently. All of the lessons provide opportunities for children to communicate their knowledge, skills and understanding in a variety of ways, other than in writing, and the use of talk tools, photographs and video can help greatly in supporting this.</p>		

Year 1 working scientifically skills
Asking simple questions and recognising that they can be answered in different ways
Observing closely, using simple equipment
Identifying and classifying
Gathering and recording data to help in answering questions.
Using their observations and ideas to suggest answers to questions
Performing simple tests

# YEAR 2

Module name	Introduction	Key vocabulary	Key skills
Growing up	<p>In this module children consider the basic needs of humans for survival (food, water, air), the need for warmth and shelter, and additional needs for health and wellbeing (covered in more detail for humans in Module 5 and for other animals in Module 2). Children identify simple differences between living and non-living things (see also Module 2), and they are introduced to the sequence of the human life cycle, first through considering how they have changed since birth. Children with younger siblings are able to draw on their own experiences and may sometimes take on the role of 'expert'. They then research further changes that happen as a human baby grows and develops into and through adulthood. This complements learning about other animal life cycles in OCW. When comparing different stages of human life children consider growth, changes in physical appearance, movement, feeding and diet, self-care, the move from dependency to independence and parenthood (although briefly). In Year 5 children learn about other stages in the human life cycle, including puberty, and about human reproduction.</p> <p>This module provides opportunities for finding out information from secondary sources, including an interview with a visitor if it can be arranged, observing changes over time, identifying and classifying, and noticing patterns. When looking for patterns in how our bodies change and grow children have opportunities to create simple scatter graphs. Outcomes from enquiries, such as graphs, group answer sheets and photographs can be displayed and children should be encouraged to add comments using sticky notes, to add to the information and consolidate their understanding.</p> <p>This module makes a distinction between the life story of a single human from birth to death (which may or may not include parenthood) and the human life cycle, through which the human species is perpetuated by adults producing a new generation of offspring. Children who are not already familiar with the idea of a life cycle need to understand that it is not the same individual cycling round and that the adults continue their own life story after producing offspring (this is the case for vertebrates but is not the case for all invertebrates).</p>	<p>baby, need, want, living, alive, essential, food, milk, water, drink, eat, air, breathe, shelter, warmth, survival, depend, child, toddler, compare, change, differences, dependent, independent, move, care, learn, appearance, annotate, life cycle, life story, stages, order, pregnancy, birth, teenager, adult, parent, elderly person, grow, measure, compare, table, scatter graph, plot, pattern, evidence, observation, question, record</p>	<p>Notice that animals, including humans, have offspring which grow into adults</p> <p>Find out about and describe the basic needs of animals, including humans, for survival (water, food and air)</p> <p>Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene</p>
Growing up: good choices	<p>In this module children build on learning from Year 1 about different materials and their properties. The children consolidate their understanding that one type of object can be made from different materials and also that one material can be used for a number of different objects. They continue to develop their understanding of the simple physical properties of materials and consider in more detail how these properties make materials useful for particular purposes. During the module the children test a range of different materials for different purposes. They also have an opportunity to think about creative and unusual uses of everyday materials and find out about John Dunlop, who invented rubber pneumatic tyres. These ideas are further developed in Year 5, Module 4, Everyday Materials. When working scientifically the children will be classifying materials, carrying out comparative tests for different properties and using the results of their tests to suggest suitable (good) choices for a particular purpose.</p>	<p>material, wood, property, metal, plastic, glass, rock, brick, paper, cardboard, fabric, smooth, rough, soft, hard, bendy, squashy, stiff, rigid, shiny, dull, see through, cold, warm, breaks, fold, crease, waterproof, absorb, absorbent, wet, sunglasses, lenses, light, block, transparent, opaque, translucent, strength, strong, weak, tear, teabag, tea leaves, chair, legs, arms, seat, backrest, cushion, tent, stretchy, tent cover, frame, flexible, measure, record</p>	<p>Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses</p> <p>Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching</p>

<p>Materials: shaping up</p>	<p>In this module children are introduced to different ways of changing the shapes of objects made from different materials. They identify materials that can be changed by the actions of squashing, bending, twisting and stretching, and link these actions with the properties of the materials that allow them to be changed. They discover that some materials have different properties according to how they are shaped and what they are made into, and choose materials for uses according to their properties. They also learn that pushes and pulls can cause movement or a change in shape. Children apply their knowledge by making clay models and catapults. This module builds on Module 3 in Year 1, which introduces materials and their properties, and links to Module 3 in Year 2, where children link a range of other properties to the uses of materials.</p> <p>When working scientifically children carry out identifying and classifying enquiries and comparative tests. They record using photographs, labelled drawings, Venn diagrams, tables and bar charts. They have opportunities to measure using non-standard or standard measures and to compare their findings with those of other children.</p>	<p>twist, squash, bend, stretch, squashing, bending, twisting, stretching, push, pull, pushing, pulling, roll, pinch, press, smooth, flexible, rigid, stretchy, squashy, elastic, stiff, properties, suitable, stretchiness, weight, catapult, frame, missile, strong, table, column, Venn diagram, set, sort, label, measure, record, bar chart</p>	<p>Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses</p> <p>Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching</p>
<p>The Apprentice gardener</p>	<p>This module builds on Year 1, Module 1, Plant Detectives and Year 1, OCW: Plants, where children identified plants, named their parts, tended a garden and observed seasonal change. Children should already be aware that plants need water and sunlight; this module revisits and extends that understanding. They are also introduced to growing plants from bulbs and from seeds, learning the sequence of germination, and comparing and contrasting the requirements of germinating seeds with those of mature plants to maintain healthy growth. In Year 3 (Module 1 and OCW) children revisit in more detail the requirements of plants for life and growth, and learn about the functions of plant parts and the life cycle of a flowering plant, including seed production. In Year 5 they cover bulbs in more detail, along with tubers and cuttings.</p> <p>This module should be taught early in the year, before the OCW lessons where children grow vegetables to eat. The OCW lessons provide an opportunity for children to apply what they have learned from classroom investigations in a real context, to learn more about plants' need for a suitable temperature and to observe plants growing to maturity. By creating a floor book to track their learning you will provide them with their own reference book that they can add to and use when planning and planting their vegetable garden.</p> <p>A flexible approach to timetabling is recommended. The module starts with children demonstrating their current knowledge and asking questions. There are then several lessons that provide contexts for setting up investigations. These can be adapted to include children's own questions. Some lessons allow for consolidating and extending prior learning and are only taught if needed. Several of the investigations require observations to be made every few days in frequent short lessons. In a subsequent set of lessons children draw conclusions from their observations. The timing and sequence of these is determined by how soon changes to the plants happen. One way to manage the module would be as two intensive blocks of lessons linked by the ongoing data collection.</p> <p>The main enquiry types in this module are observing change over time and comparative tests; there is also identifying and classifying, pattern finding and research using secondary sources (videos). Children record series of observations using labelled drawings and photographs in diaries. They use their existing knowledge and their observations to make predictions at the start and during investigations. Although there</p>	<p>seeds, plant (verb and noun), apprentice, gardener, bulb, grow, observe, observations, describe, identify, expert, question, predict, prediction, water, compare, answer, investigate, bean, soil, surface, test, bury, light, dark, water, germinate, fair, same, plan, suitable, radicle, root, shoot, leaves, change, evidence, height, tallest, shortest, bar chart, scale, pattern, question, connection, measure, seedling, mature plant, wilting, healthy, unhealthy, warmth, care, die, block, agree, disagree, alive, food store, first, next, later, after...days, order, conclusion, because</p>	<p>Observe and describe how seeds and bulbs grow into mature plants</p> <p>Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy</p>



	are some opportunities to collect and present numerical data, the main focus is on making and comparing close observations and interpreting the changes that children see.		
What's in your habitat	<p>In this module children begin to learn about different habitats, how the living things are suited to the habitat and the interactions between the living organisms within a habitat. During the module they explore the habitat by identifying things that are living, once-lived and never-lived. They construct food chains that show how living things depend on each other. This builds on the understanding gained in Year 1, Module 2, Looking at Animals, that animals eat different types of food. Finally they consider how living things are suited to a particular habitat, again building on work in Year 1, Module 2, Looking at Animals. This is further developed in Year 6, Module 4, Everything Changes.</p> <p>The children work scientifically by using their observations and gathering evidence to suggest answers to questions.</p>	<p>habitat, alive, living, once-lived, dead, never-lived, plants, animals, decay, rocks, soil, air, water, food chain, plants, animals, herbivores (eat plants and parts of plants), carnivores (eat other animals), omnivores (eat plants/parts of plants and other animals), direction, source of food, suited, habitat, features, names of habitats, living things and animal body parts</p>	<p><i>Explore and compare the differences between things that are living, dead, and things that have never been alive</i></p> <p><i>Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other</i></p> <p><i>Identify and name a variety of plants and animals in their habitats, including micro-habitats</i></p> <p><i>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</i></p>
Take Care	<p>In this module children begin to learn about different ways to keep themselves healthy. During the module they consider the importance of eating a range of different types of food. This is developed further in Year 3, Module 5, Amazing Bodies, when they consider the nutrition that they gain from different types of food. During the module they also start to learn about the importance of exercise and hygiene. Dental hygiene is revisited in greater detail in Year 4, Module 4, Where Does All That Food Go?. The importance of exercise is developed further in Year 6, Module 3, Body Health.</p> <p>Children work scientifically by identifying and classifying food, using tables, and Venn and Carroll diagrams. They also make observations and collect data while carrying out exercises, and use their observations and ideas to suggest answers to questions.</p>	<p>food, sort, classify, Venn diagram, Carroll diagram, healthy diet, dairy, fruits, vegetables, meat, fish, beans, fat, sugar, bread, potatoes, cereals, exercise, physical activity, hot, sweaty, heart beating, pulse, tired, aching, muscles, clean, hygiene, hygienic, wash, bath, shower, brush, comb, toothbrush, toothpaste, soap, water, shampoo</p>	<p>Find out about and describe the basic needs of animals, including humans, for survival (water, food and air)</p> <p>Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene</p>

Year 2 working scientifically skills

Asking simple questions and recognising that they can be answered in different ways

Observing closely, using simple equipment

Performing simple tests

Identifying and classifying

Using their observations and ideas to suggest answers to questions

Gathering and recording data to help in answering questions.

# YEAR 3

Module name	Introduction	Key vocabulary	Key skills
Power of forces	<p>During this topic children will explore how forces can make objects start to move, speed up, slow down or change direction. They will compare how things move on different surfaces. This idea will be developed further in Year 5 when they will learn about friction. They will learn that some forces need contact between two objects, but that magnetic forces can act at a distance.</p> <p>They will identify that magnets attract some materials and not others and that these are known as magnetic materials. They will learn that some metals, but not all, are magnetic and that all nonmetals are non-magnetic.</p> <p>They will learn that magnets have two poles and that two magnets will attract or repel each other, depending on which poles are facing.</p> <p>When working scientifically children will compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet. They will carry out comparative and fair tests to investigate the strength of magnets and how objects move on different surfaces. They will make predictions as to whether two magnets will attract or repel each other, depending on which poles are facing.</p>	<p>push, pull, twist, force, air, turns, fast, slow, slows down, material, surface, magnet, attracts, magnetic material, magnetism, acts at a distance, non-magnetic material, metal, non-metal, strength, north pole, south pole, repel, question, investigation, fair test, change, measure, predict, prediction, explanation, observations, draw conclusions</p>	<p>Compare how things move on different surfaces</p> <p>Notice that some forces need contact between two objects, but magnetic forces can act at a distance</p> <p>Observe how magnets attract or repel each other and attract some materials and not others</p> <p>Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials</p> <p>Describe magnets as having two poles</p> <p>Predict whether two magnets will attract or repel each other, depending on which poles are facing</p>
Amazing bodies	<p>In this module children will build on their knowledge of the human body developed in Key Stage 1. They will revisit the importance of eating the right amounts of different types of food, but will extend this knowledge to understand that the food we eat provides us with the nutrition that our bodies require to remain healthy. They will learn about the range of nutrients that humans need to consume in the correct amounts and the role that these nutrients play in keeping our bodies healthy. They will also learn that humans and some other animals have skeletons and muscles for support, protection and movement.</p> <p>When working scientifically children will ask and answer their own questions about the human body and diet through classifying, pattern-seeking investigations and by carrying out research using secondary sources. They will have opportunities to gather data and record and present these in a range of ways.</p>	<p>stay alive, survive, food, balanced diet, nutrition, nutrients, fruit and vegetables, carbohydrates, protein, roughage, fibre, sugar, fat, dairy, skeleton, bones, protect, support, move, muscles, joints, ribs, heart, skull, brain, backbone, spine, spinal column, vertebrate, footprint, trail, vitamins, minerals, question, classify, investigation, survey, measure, pattern, evidence, draw conclusions</p>	<p>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</p> <p><i>Identify that humans and some other animals have skeletons and muscles for support, protection and movement</i></p>
How does your garden grow.	<p>In this module children will build on their experiences of identifying and growing plants in Key Stage 1. They will revise the names of the main parts of a plant (root, stem/trunk, leaf and flower) introduced in Year 1, learning their functions and how these relate to their appearance and structure.</p> <p>They will learn about the absorption and transport of water and nutrients and the role of</p>	<p>plant, roots, stem, trunk, leaf/leaves, flower, leaflet, stalk, veins, surface, edge, lobes, tip, food, root hair, nutrients, anchor, support, seed, germination, seedling, growth, mature</p>	<p>Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers</p>

	<p>the leaf in making food for the plant (knowledge of the process of photosynthesis is not required at this stage). They will also learn about the parts of the flower, their roles in plant reproduction and the stages of the life cycle of a flowering plant, building on observations of growth of seeds and bulbs in Year 2. They will learn more about different types of plant reproduction in Year 5. The content of this module will complement the lessons in the Our Changing World module where children study plants in their natural habitats, identifying their parts and observing the stages of their life cycles and the effect of seasonal change. In the Our Changing World module children will also investigate the requirements for healthy growth.</p> <p>When working scientifically children will ask and answer their own questions about plants through classifying, observing over time, conducting fair test investigations and using secondary sources. They will have opportunities to make and record detailed observations using labelled and annotated diagrams.</p>	<p>plant, flowering, pollination, seed formation, bud, petal, sepal, carpel, stamen, pollen, reproduce, nectar, seed, fruit, dispersal, animal, wind, water, self-dispersal, explosion, sprinkling, competition, air, light, stigma, style, ovary, anther, filament, observe, question, investigation, fair test, change, measure, predict, prediction, explanation, observations, draw conclusions</p>	<p>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>Investigate the way in which water is transported within plants</p> <p><i>Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal</i></p>
<p>Rock detectives</p>	<p>In this module children will work as 'Rock Detectives' establishing core knowledge and understanding of rocks, their relationship to soils and how fossils have formed over time. In learning about rocks children will identify and name rocks, describing and comparing their observable properties and sorting them using a key. They will identify ways in which rocks are used in the local environment and suggest why the properties of certain rocks make them suitable for particular purposes. They will consider how rocks are affected by weathering over time and work scientifically to carry out tests to establish the hardness and permeability of different kinds of rocks.</p> <p>In learning about soils children will explore a variety of soils first hand, making the link between soils of different types and the rocks from which they are partly made. They will learn about what happens to cause rocks to break down and become soil particles and about the organic matter that is an essential part of a healthy soil. They will test a variety of soils, including local soils, to discover whether soils of different types let water through at the same rate. They will work scientifically to make comparisons and draw conclusions based on their observations.</p> <p>In learning about fossils children will discover what a fossil is and how they came to be formed from animal and plant remains. They will learn the names of a variety of common fossils, and about the stages of the fossilisation process. They will also find out about where and how fossils can be found and safely collected.</p>	<p>sandstone, granite, chalk, limestone, marble, pumice, rough, smooth, hard, soft, rock, stone, pebble, texture, particle, crystal, granule, properties, soil, clay, sandy, loam, peat, organic material, weather, weathering, frost, beach, cliff, trilobite, starfish, sea urchin, ammonite, fossil, fossilise, remains</p>	<p><i>Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties</i></p> <p><i>Describe in simple terms how fossils are formed when things that lived are trapped within rock</i></p> <p>Recognise that soils are made from rocks and organic matter</p>

**Year 3 working scientifically skills**

Asking relevant questions and using different types of scientific enquiries to answer them

Setting up simple practical enquiries, comparative and fair tests

Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers

Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions

Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables

Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions

Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions

Using straightforward scientific evidence to answer questions or to support their findings.

Identifying differences, similarities or changes related to simple scientific ideas and processes

# YEAR 4

Module name	Introduction	Key vocabulary	Key skills
<p>In a state (States of matter)</p>	<p>This module introduces the concept of states of matter. Children will learn the characteristic properties of solids, liquids and gases, first through physically exploring typical materials and then by classifying examples, such as powders and very viscous liquids, which are harder to classify. Using first-hand experience and secondary sources they will learn about changes of state and begin to understand freezing and boiling points as identifying characteristics of a material. They will learn the names of some common gases. They will have the opportunity to explore the expansion of liquids and gases when they are heated, using this to make a simple thermometer and explain how it works. They will also learn about the water cycle, modelling it in different ways and further developing their understanding of changes of state. This module focuses on reversible changes; reversibility will be covered in more detail in Year 5, along with other types of change.</p> <p>When working scientifically children will make careful observations and explain what they show. They will also observe and measure changes over time, first-hand and using secondary sources. They will classify materials and record their sorting using Venn diagrams. They will plan and carry out fair tests, learning to identify and control variables and drawing up tables to record their data. This will then be presented as bar or bar line graphs. Children will identify patterns in the data and use these to answer their investigation questions and to make further predictions. When investigating changes of state they will use thermometers and data loggers, applying their mathematical knowledge of the measurement of temperature in degrees Celsius and learning to interpret a line graph (data logger trace) of temperature and time.</p>	<p>solid, liquid, hard, soft, pour, flow, pile, pool, surface, horizontal, runny, viscous, sticky, grain, powder, ice, water, temperature, cool, cooling, warm, warming, hot, degree Celsius, melt, melting, freeze, freezing, solidify, solidifying, heating, states of matter, change of state, melting point, freezing point, process, gas, air, carbon dioxide, helium, oxygen, bubbles, empty, particle, weight, compress, squash, shape, volume, dry, evaporate, evaporation, water vapour, boil, boiling, boiling point, steam, thermometer, data logger, sensor, droplets, condense, condensation, water, droplets, cycle, model, snow, expand, scale, calibrate, heat sensitive, sensor, observe, measure, fair test, variable, collect, present, interpret, data, axis, scale, interval, control, keep the same, evidence, annotate, accuracy, describe, explain, evaluate, reliable, repeatable</p>	<ul style="list-style-type: none"> <li>• Recognise that living things can be grouped in a variety of ways</li> <li>• <b>Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment</b></li> <li>• <b>Recognise that environments can change and that this can something pose dangers to living things</b></li> </ul>
<p>Good Vibrations (Sound)</p>	<p>In this module children will build on their understanding of hearing, which was covered in Year 1 (Using our senses) during work around the senses. They will develop their vocabulary for describing sounds and identify different sound sources. They will learn that sounds are made by something vibrating and that these vibrations travel through a medium to the ear so that we hear them. They will learn that sounds get fainter as the distance from the sound source increases. They will explore ways to change the pitch and volume of sounds.</p> <p>When working scientifically children will look for patterns between the volume of a sound and the strength of the vibrations that produced it. They will also explore the pitch of a sound and ways in which it can be changed. They will do this by investigating how to make and change the sounds produced in a range of different ways. They will have the opportunity to set up simple comparative and fair tests, take measurements, including using data loggers, and report on their findings.</p>	<p>sound, loud, quiet, high, low, repeating, continuous, strike, blow, shake, pluck, vibration, vibrate, solid, gas, volume, strength of vibrations, sound source, fainter, distance, pitch, particles, question, investigation, fair test, change, measure, predict, prediction, explanation, observations, draw conclusions</p>	<ul style="list-style-type: none"> <li>• <b>Identify how sounds are made, associating some of them with something vibrating</b></li> <li>• <b>Recognise that vibrations from sounds travel through a medium to the ear</b></li> <li>• <b>Find patterns between the pitch of a sound and features of the object that produced it</b></li> <li>• <b>Find patterns between the volume of a sound and the</b></li> </ul>

			<p><b>strength of the vibrations that produced it</b></p> <ul style="list-style-type: none"> <li>• <b>Recognise that sounds get fainter as the distance from the sound source increases</b></li> </ul>
Switched on (Electricity)	<p>All children will have experience of electricity in their everyday lives and many of them will have built and investigated simple circuits to make things work at home or in the Foundation Stage. So although this module is the first time that electricity will be taught in KS1 and 2 children's prior knowledge and understanding should be elicited and built on. In this module they will identify electrical appliances, distinguishing between those which are powered by mains and battery (including those with integral rechargeable batteries) and recognising that electricity can be used to produce light, sound, heat and movement. They will explore the production of light, sound and movement by making simple series circuits with cells, wires, bulbs, buzzers and motors, learning the names of the components. They will work mostly with single components. In Year 6 they will investigate the effect of adding and changing components. Through detailed observation and role play they will be able to describe the flow of electricity round a circuit and give reasons why some circuits do not work. They will then learn to control their circuits with switches. They will test materials, classify them as electrical conductors or insulators and recognise that metals are good electrical conductors and plastics are good electrical insulators. They will apply this knowledge when making their own switches and electrical quiz boards. Throughout this module they will learn the safe use of electrical components and the dangers of mains electricity.</p> <p>When working scientifically children will make observations and describe how circuits work using scientific language. They will also communicate using labelled and annotated drawings. Drawings are an important way for children to demonstrate their developing understanding. Circuit diagrams with symbols will be introduced in Year 6. They will plan and carry out a classifying enquiry, recording findings using tables, Venn and Carroll diagrams and will recognise that generalizations cannot be made from small amounts of evidence.</p>	<p>electricity, electrical, mains, plugged in, battery, power, rechargeable, solar, wind up, sound, light, heat, movement, cell, wire, bulb, bulb holder, buzzer, motor, component, circuit, complete circuit, short circuit, flow, break, make, metal, connect, disconnect, terminal, positive, negative, switch, press switch, toggle switch, tilt switch, pendulum switch, property, electrical conductor, electrical insulator, electron, filament, sets, Venn diagram, Carroll diagram, table, conclusion, evidence, annotate</p>	<ul style="list-style-type: none"> <li>• Identify common appliances that run on electricity</li> <li>• <b>Construct a simple series circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers</b></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 series circuit</li> <li>• Recognise some common conductors and insulators, and associate metals with being good conductors</li> </ul>
Where does all that food go? (Animals, including humans)	<p>In this module children will build on knowledge of the human body that they developed in Key Stage 1 and also during the Amazing Bodies unit in Year 3. In this module the children will learn about the human digestive system. They will be introduced to the main body parts associated with the digestive system; the mouth, tongue, teeth, oesophagus, stomach, intestines, rectum and anus. They will learn that the role of the digestive system is to break down the food we eat so that the nutrients, energy and other requirements we derive from it can be used in the rest of the body. They will learn about how food can be broken down through mechanical and chemical processes. They will learn in more detail about the roles of the different types of teeth in breaking food down, and how to care for their teeth. They will also learn about milk teeth and permanent teeth. There are also opportunities for children to investigate questions around toothpastes.</p> <p>This module also explores what animals eat and how this information can be used to build food chains. There are opportunities to explore how the teeth of animals are</p>	<p>mouth, oesophagus, stomach, small intestine, large intestine, rectum, anus, digestive system, digestion, carbohydrate, fat, sugar, protein, roughage, dairy, fruit, vegetables, vitamins, minerals, balanced diet, healthy, mechanical process, chemical process, absorb, nutrients, water, saliva, chemicals, enzyme, teeth, canine, incisor, premolar, molar, jaw, cutting, tearing, grinding, dental hygiene, decay, dentist, brushing, toothpaste, floss, mouthwash, food, plants, animals, food</p>	<ul style="list-style-type: none"> <li>• <b>Describe the simple functions of the basic parts of the digestive system in humans</b></li> <li>• identify the different types of teeth in humans and their simple functions</li> <li>• <b>Construct and interpret a variety of food chains, identifying producers, predators and prey</b></li> </ul>

	<p>adapted to the type of food that they eat.</p> <p>When working scientifically children will ask and answer questions about teeth, digestion and food chains by carrying out research using secondary sources. They will group and classify teeth by their function and relate this to diet. They will have opportunities to carry out comparative and fair tests on different types of toothpaste and to record and present data in a range of ways.</p>	<p>chain, food web, producer, consumer, predator, prey, herbivore, omnivore, carnivore</p>	
<p>Human impact (living things and their impact)</p>	<p>In this module children will learn about some of the positive and negative ways that humans change the environment, locally and globally, with a particular focus on how this affects other living things. They will begin to understand that actions can have both positive and negative consequences, that situations are not black and white, and that decisions involve compromises. They will consider how industry, housing and thoughtless behaviour can damage local habitats and also how humans can increase biodiversity by developing environments such as country parks and nature reserves.</p> <p>This will be related to a developing understanding of food chains (building on what children learned in Year 2) and what happens if food chains are broken by habitat disruption or the removal of a species from an ecosystem. In this module children consider both habitats (where something lives) and ecosystems (the inter-relationships between organisms and their interaction with the habitat/environment). As an example of a local issue that they can influence, children will plan and carry out litter surveys and, through considering the effect of litter on animals, will understand that its negative impact goes beyond its appearance. This will support work towards an Eco-Schools award.</p> <p>Children will also be introduced to some global issues by researching the impact of deforestation, ocean pollution (oil spill) and global warming on ecosystems. In the enrichment lessons children will consider and debate positive and negative aspects of keeping animals in zoos.</p> <p>When working scientifically children will plan and carry out a litter survey, using a tally chart to record data. They will group items into categories to make survey data manageable and present their findings by constructing and labelling pictograms and bar charts. They will also present information as oral and written reports, posters and food chains. When working with information from secondary sources they will weigh and present evidence, recognise statements that do and do not support an argument, and participate in a debate.</p>	<p>environment, impact, positive, negative, litter, pollution, waste, biodiversity, habitat, derelict, graffiti, traffic, destroy, create, location, food chain, producer, consumer, human impact, global issue, destruction, deforestation, rainforest, climate, climate change, zoo, endangered, breed, wild, natural, predator, prey, conservation, categories, tally chart, pictogram, bar chart, axes, scale, opinion, point of view, argument, viewpoint, debate</p>	<ul style="list-style-type: none"> <li>• Recognise that living things can be grouped in a variety of ways</li> <li>• <b>Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment</b></li> <li>• <b>Recognise that environments can change and that this can something pose dangers to living things</b></li> </ul>



**Year 4 working scientifically skills**

*Asking relevant questions and using different types of scientific enquiries to answer them*

Setting up simple practical enquiries, comparative and fair tests

*Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers*

*Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions*

*Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables*

*Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions*

*Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions*

*Identifying differences, similarities or changes related to simple scientific ideas and processes*

*Using straightforward scientific evidence to answer questions or to support their findings.*

# YEAR 5

Module name	Introduction	Key vocabulary	Key skills
Reproduction plants and animals	<p>In this module children learn about reproduction in some types of plants and animals, including humans. This module should be taught after Module 1, The Circle of Life, as it builds on the learning about different types of animals and their life cycles begun during that unit. It also links closely with OCW, where children have opportunities to investigate and enquire practically into many aspects of the learning about reproduction in plants and animals that is the focus for this module.</p> <p>As they learn about plant reproduction children will extend their knowledge from Year 3 of the function of the different parts of flowering plants. They will also learn that plants can reproduce in other ways, through asexual reproduction. As they learn about reproduction in animals children will find out more about specific mammals, birds, insects and amphibians and how they reproduce. There are three lessons focusing on humans, one of which is about the complete human life cycle and two of which focus on puberty. These lessons can be taught to mixed or single gender groups, but all children should learn about changes in boys and girls.</p> <p>When working scientifically, children carry out first-hand observation of flowering and other plants, and also use secondary sources of information. They group and classify living things according to similarities in reproduction processes. They also report and present findings from their enquiries in a variety of ways, including posters, fact cards and guides.</p>	reproduction, reproduce, flower, organ, carpel, stamen, pollen, seeds, seed head, berry, fruit, pollinator, pollination, fertilisation, reproduction, reproduce, propagate, stem, leaf and root cuttings, runners, tubers, bulbs, rhizomes, gender, male, female, sex, sexual, asexual, metamorphosis, mate, sperm, pregnant, give birth, young, pup, calf, foal, chick, hatch, fledge, fledgling	Describe the life process of reproduction in some plants and animals
Feel the force	<p>In Year 3 children learned about how contact and non-contact forces make things start and stop moving. This module builds on these ideas and develops an understanding of how forces including gravitational attraction and drag forces – friction, air resistance, water resistance, and upthrust in water – affect movement. Children learn how mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect, and they use this knowledge in different investigations. When working scientifically, children plan and carry out fair test and pattern-seeking investigations, observe carefully, record accurate measurements, and construct different mechanisms. They look at scientific ideas from the past and carry out an activity to find evidence to support or refute famous scientists' ideas. They make predictions as a result of carrying out simple activities and go on to plan new investigations. There are opportunities to develop graphing skills as well as communication and presentation skills.</p>	air resistance, Aristotle, balanced, balanced forces, bevel gears, clockwork, cogs, compress, extend, effort, force arm, forces, force, friction, force arrow, fulcrum, gravity, Galileo, gear ratio, gears, gear trains, lever, lift, machine, mechanisms, movement, Newton, Newton meter, pinion, pivot, pulley, pull, push, rack, resistance, rotary motion, simple machines, speed, time, unbalanced force, upthrust, water resistance, weight arm, wheel	<p>Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object</p> <p>Identify the effects of air resistance, water resistance and friction, that act between moving surfaces</p> <p>Recognise that some mechanisms, including levers, pulleys and gears allow a smaller force to have a greater effect</p>
The Earth and beyond	<p>In this module children develop their knowledge of the Earth's (and other planets') place in the solar system, and their relationships with other bodies in space, in particular with</p>	Aldebaran, Arctic, Antarctic, British Summer Time, Earth, Greenwich	Describe the movement of the Earth, and other planets, relative

	<p>the Sun.</p> <p>The module draws on children's previous use of the calendar to calculate the duration of events (Year 4 Mathematics) and solve problems involving units of time (Year 5 Mathematics). Children also learn how the Earth's orbit determines the length of a year and why we have leap years.</p> <p>Key Stage 1 observations of the Sun's movement across the sky and Year 3 work on shadows provide a sound basis for investigating how the Earth's rotation causes night and day, and is responsible for the apparent movement of the Sun across the sky, and its changing height in the sky. Children also learn how the Earth's rotation and tilt affect the direction and length of shadows, and how to use shadows for telling the time.</p> <p>Children learn about time differences around the world and investigate time differences using resources including the internet. They will find out about how time was standardised around the world, about the need for scientists to choose a starting point in the continuous process of cycles of sunrise and sunset, and investigate longitude. They are introduced to the International Date Line and the Greenwich Meridian.</p> <p>Children extend their awareness of seasonal changes through the year, which they developed during Key Stage 1, to understand that it is the Earth's tilt on its axis that causes the seasons. This draws on their learning about the Sun and shadows to develop an understanding of the role of latitude in day length and seasons.</p> <p>When working scientifically, children use models for exploring and demonstrating ideas, first-hand observation made at night either in their gardens or local area, or from visits to local observatories, secondary sources of information (mainly web-based) to answer scientific questions increasingly independently, and diagrams, charts and graphs for recording data. They report and present findings in different ways, including booklets, oral presentations and annotated diagrams, draw conclusions, identify causal relationships and explain their thinking.</p>	<p>Meridian, International Date Line, Jupiter, Mars, Mercury, Milky Way, Moon, North Pole, Saturn, South Pole, Sun, Neptune, Universe, Uranus, Venus, asteroid, autumn, axis, compass, crescent, dawn, degrees, dusk, equator, equinox, fixed stars, Full Moon, galaxy, gibbous, hemisphere, horizon, illuminate, leap year, longitude, lunar month, meridian, nebula, New Moon, northern, orbit, planet, reflect, rotate, rotation, solar system, solstice, southern, spin, spring, star, summer, sunrise, sunset, telescope, temperature, tilt, time zone, waning, waxing, winter, year, change, compare, draw conclusions, explain, explanation, investigation, line graph, measure, model, observations, plan, predict, prediction, presentation, question, record, review, scientific diagram, table</p>	<p>to the Sun in the solar system</p> <p>Describe the movement of the Moon relative to the Earth</p> <p>Describe the Sun, Earth and Moon as approximately spherical bodies Use the idea of the Earth's rotation to explain day and night and the apparent movement of the Sun across the sky</p>
<p>Marvelous mixtures</p>	<p>In this module children further develop their conceptual knowledge and understanding of how different mixtures of solids and liquids might be separated. They learn that certain solids dissolve while others do not, and how these dissolved solids might be retrieved from a mixture. They explore how the rate at which solids dissolve can vary, investigating variables that might make a difference. They use their knowledge of separating mixtures in solving a number of real worldbased enquiries, which require them to apply their growing subject knowledge to an unusual context. Children use specific scientific and other vocabulary as they describe, explain and communicate their understanding of materials, succinctly and in ways appropriate to a science context.</p> <p>When working scientifically, children plan different types of enquiries to answer questions, recognising and controlling variables where necessary. They will use a range of science equipment with increasing accuracy and precision, and use a variety of ways to report and present their findings to an audience.</p> <p>This module, together with Modules 3, 4 and 6, builds on earlier learning that was begun in Key Stage 1 and then continued in Year 4. There, children compared and grouped materials according to whether they were solids, liquids or gases and learned about changes of state that take place when materials are heated or cooled. This series of modules offers the final Chemistry-related learning for children in Key Stage 2. It provides teachers with ample opportunities to assess children's progress against the</p>	<p>material, compare, contrast, separate, mixture, sieve, filter, evaporate, solid, liquid, gas, powder, particle, dissolve, soluble, solution, contamination, contaminate, contaminated, impurity, pure, purity, suspension, saturated, saturation, reversible, non-reversible, microbes, bacteria, types of oil, liquid, solid, detergent, sticky, filter, mechanical, boom, residue, environment, biological, marine life, purify, drinkable, sterilise</p>	<p>Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution</p> <p>Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating</p> <p>Demonstrate that dissolving, mixing and changes of state are reversible changes</p>

	programmes of study and in readiness for end of key stage assessment.		
Get sorted	<p>In this module children identify, compare and classify a variety of materials according to both their properties and their uses. They explore familiar materials in a wide range of contexts and begin to recognise that a single material name, like 'metal' or 'plastic' can describe a considerable number of different materials that may display very different properties, but which still have features in common. Specific scientific and other vocabulary is used by children as they describe, explain and communicate their understanding of materials, succinctly and in ways appropriate to a science context.</p> <p>Please note that solubility, although included in the wide-reaching NC statement 'Compare and group together everyday materials based on evidence from comparative and fair tests, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets' is not explored in this module, as it is covered in depth in Module 5.</p> <p>When working scientifically, children plan and carry out different enquiry types to answer questions, including their own, about materials and their uses. They sort, compare, group and classify materials, and develop their abilities to plan and carry out comparative and fair tests, controlling variables, as appropriate.</p> <p>This module, together with Modules 4, 5 and 6, builds on earlier learning that began in Key Stage 1 and then continued in Year 4. During those years children compared and grouped materials according to whether they were solids, liquids or gases, and learned about changes of state that take place when materials are heated or cooled. This series of modules offers the final chemistry-related learning for children in Key Stage 2. It provides teachers with ample opportunities to assess children's progress against the programmes of study and in readiness for end of key stage assessment.</p>	<p>properties, material, solid, liquid, gas, compare, contrast, group, organise, criteria, hardness, soluble, insoluble, transparent, transparency, opaque, hardness, strength, rigidity, flexibility, elastic, elasticity, ductile, electrical conductor/insulator, thermal conductor/insulator, magnetic, non-magnetic, attract, repel, viscosity, viscous, thick, thicker, types of plastic – polyester, nylon, polythene, PVC, polystyrene acrylic – recycle, reuse, biodegradable, environmentally friendly</p>	<p>Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic</p> <p>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</p>
Circle of Life	<p>In this module children build on earlier work from Key Stage 1 and from Year 3, where they learned about the life cycles of plants. They extend their understanding of what a life cycle is, and learn about the life cycles of some familiar (and some less familiar) mammals, amphibians, insects and birds. Children compare and contrast different life cycles, identifying common features as well as explaining key differences. They use their knowledge of life cycles to help them as they create a fantastical creature of their own, complete with its own distinct life cycle. They learn about incredible journeys that some animals undertake to complete their life cycles, and about the different ways in which humans are supporting some endangered animals to increase their population numbers.</p> <p>When working scientifically during this module, children frequently use secondary sources of information, as they carry out their own investigations to answer a variety of science questions, with increasing independence. This should involve the use of quality non-fiction books, web-based material, Apps, etc. and might include a visit to a local zoo, wildlife park or animal collection to gather information more directly from recognised experts.</p> <p>Children report and present findings from their enquiries in a variety of ways, both orally and in written forms, drawing conclusions, identifying causal relationships and explaining their thinking. They consider evidence that has been used to support arguments, for example, as they learn about the work that has been done to protect the</p>	<p>life cycle, birth, growth, reproduction, metamorphosis, aging, death, animal, mammal, amphibian, insect, bird, elephant, toad, bumblebee, blue tit, hedgehog, bat, polar bear, mountain gorilla, cubs, pups, hibernate, nocturnal, marsupial, toad, newt, salamander, tree frog, metamorphosis, tadpole, larva, frog, toad, gills, cold blooded, ladybird, butterfly, dragonfly, head, thorax, abdomen, antennae, egg, pupa, cocoon, adult, thrush, peregrine falcon, ostrich, emperor penguin, breeding cycle, clutch, brood, hatch, fledge, prey, predator, reproduce, habitat, environment, humpback whale, blue whale, swift, osprey, wildebeest, caribou, monarch butterfly, migrate, migration, navigate, genetic, endangered, threatened, extinct, extinction, evolution, giant panda, black</p>	<p>Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird</p>

	<p>future of endangered animals.</p> <p>This module links closely to other Year 5 modules, including Module 2: Reproduction in Plants and Animals, and should be taught before Module 2. It also links to OCW. Lessons in OCW provide children with opportunities to investigate and enquire practically into many aspects of the learning that is the focus of this module.</p>	<p>rhino, peregrine falcon, bumblebee, salamander, osprey, koala bear</p>	
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<b>Year 5 working scientifically skills</b>
<p>Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary</p>
<p>Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate</p>
<p>Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs</p>
<p>Using test results to make predictions to set up further comparative and fair tests</p>
<p>Reporting and presenting 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</p>
<p>Identifying scientific evidence that has been used to support or refute ideas or arguments.</p>

# YEAR 6

Module name	Introduction	Key vocabulary	Key skills
<p>Danger low voltage</p>	<p>In this module children develop their understanding of electrical circuits and build on the work in the Year 4 module. They construct circuits with an increasing number of components and contrast the effects this has on the function of the components. They role play the flow of electricity through a basic circuit and one that includes fuse wire, to model the effect that this has on other components.</p> <p>The children learn to use the recognised electrical symbols to record circuits, particularly as the circuits become more complex. They research how electricity is generated both traditionally using coal and gas, and by renewable resources, and investigate how electricity is transmitted across the country, and what sort of electricity generating plant they might site in their locality.</p> <p>In the extension lessons children apply their knowledge to construct circuits for real life contexts, and then report on and present how they did this, as scientists, to the class and to a third party .</p> <p>When working scientifically, children carry out illustrative practicals, describe circuits using scientific language and record them using the recognised symbols. In lessons 5 and 6 children use secondary sources of information to answer questions about how mains electricity is generated.</p> <p>Enrichment Lessons 1 and 2 should be taken as two blocks of time together, as should Enrichment Lessons 3 and 4. Although there are specific things to complete in each lesson, extra time might be needed to complete the challenges in the second of these two pairs lessons. As part of a science display a space should be set aside as a question wall for children to post their questions during the module.</p>	<p>cell, battery, lamp, wire, buzzer, motor, circuit, current, filament, electrical insulator, electrical conductor, mains electricity, terminal, switch, toggle switch, push switch, slide switch, tilt switch, trembler switch, pressure switch, reed switch, series circuit, resistance, resistor, current, circuit diagram, recognised symbols, generate, generator, coal, gas, oil, fossil fuels, nuclear, biomassfired power stations, wind turbine, wave hub, tidal flow, hydro-electric, grid, pylon, transmission, transformer, solar panels</p>	<p>Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in a circuit</p> <p>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</p> <p>Use recognised symbols when representing a simple circuit in a diagram</p>
<p>Body pump and body health</p>	<p><b><u>Body pump</u></b></p> <p>This module builds on learning about the human body from Key Stage 1, when they learned that humans and other animals need water, food and air in order to survive, and also during lower Key Stage 2, when they investigated the muscular, skeletal and digestive systems. In this module children learn about the human circulatory system and how it enables their bodies to function. They find out about the main parts of the circulatory system: the heart, blood vessels (arteries, veins and capillaries) and blood, and how these work together to deliver oxygen and nutrients to every part of the body. They will find out how the heart works, the main components of blood and the function of the different types of blood vessels. They will also learn about how water is transported through the body and develop their understanding of the importance of water to human health.</p> <p>This module links closely with Module 3, Body Health, in which children find out how to keep their bodies healthy and about the impact of diet, exercise, drugs and lifestyle.</p>	<p><b><u>Body Pump</u></b></p> <p>aorta, artery, atrium, blood, blood vessel, body temperature, capillaries, carbon dioxide, cells, chamber, chest cavity, circulation, circulatory system, deoxygenated blood, digestive system, digestive tract, health, heart, heart valves, humans, hydration, lubricant, lungs, muscular system, nutrients, nutrition, oxygen, oxygenated blood, plasma, platelets, pump, red blood cell, skeletal, system, transport, valve, vein, vena cava, ventricle, vessel, waste, waste gases, white blood cells</p>	<p>Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood</p> <p>Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function</p> <p>Describe the ways in which nutrients and water are transported within animals, including humans</p> <p>Associate the brightness of a</p>

	<p>When working scientifically during this module, children will use secondary sources of information with increasing independence in order to find answers to questions about the functions of different parts of the circulatory system that they cannot investigate first hand. This should involve them using quality non-fiction books, web-based material and health education publications. They could also question local medical experts. Children will carry out and illustrate a practical activity in which they make some 'blood soup', and, in a drama activity, they will model the transport of blood and gases around the body. Some teachers may wish to show children the different parts of a sheep's or pig's heart, which can easily be acquired from a butcher. These can be dissected using scissors to make a memorable demonstration lesson</p> <p><b>Body health</b></p> <p>In this module children learn about how to keep their bodies healthy and how their bodies might be damaged. The focus is on lifestyle choices that humans make, including diet, exercise and drug use, and how these are informed by scientific evidence.</p> <p>Children will build on their learning from Year 3 about the types of food that humans and other animals need in order to stay alive. They will develop a deeper understanding of what constitutes a healthy diet, through exploring food groups and how the body uses them. They investigate food packaging to find out what snacks and drinks contain, and use this information to inform their own choices of drinks and snacks. The children also investigate how the results of scientific enquiries have influenced what we eat.</p> <p>In addition, the module draws on children's learning in Year 3 about the functions of the skeleton and muscles. They explore the effects of exercise on the body and develop their understanding of the circulatory and respiratory systems as they investigate the effects of exercise on the pulse and its recovery rate. They then find out about the training regimes of athletes and learn about about special diets and training programmers.</p> <p>Children will have the opportunity to find out about how drugs help us as well as cause us harm. There is a clear link with work in PSHCE, and it is recommended that any school project on health is planned in conjunction with science lessons.</p> <p>Care should be taken to treat this topic with sensitivity throughout. Knowing any dietary and health issues of pupils is vital to ensure that any issues can be addressed carefully. Awareness of cultural, religious or health-based limitations on diet is essential and these should be treated sensitively to ensure that children understand one another's diets without judging them. This should be linked with PSHCE (awareness and understanding of cultural differences).</p> <p>There are links to several lessons in Module 2, Body Pump, which should be taught first.</p>	<p><b>Body health</b></p> <p>alcohol, asthma, athlete, balanced diet, beats per minute (bpm), benefits, breathing, caffeine, calories, cancer, carbohydrates (including sugars), cheating, cigarettes, clinical trial, consequences, dairy, diet, doping, drugs, eat well plate, energy, exercise, fat, fibre, heart, heart rate, intensity, illegal, impact, James Lind, legal, lifestyle, long-term effect, lungs, medicine, mental benefits, mineral, motivation, norm, nutrition, oxygen, passive smoking, peer pressure, performance enhancing, persuade, physical benefits, protein, pulse rate, RDA (recommended daily allowance), recovery rate, resting rate, rickets, roughage, saturated fat, scurvy, short-term effect, smoking, sodium, solvents, steroids, tobacco, training, unsaturated fat, vitamin</p>	<p>lamp or the volume of a buzzer with the number and voltage of cells used in a circuit</p> <p>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</p> <p>Use recognised symbols when representing a simple circuit in a diagram</p>
<p>Light up your world.</p>	<p>In this module children build on the work that they have done in Year 3 where they learned about light sources, how light enables us to see by reflecting from objects and how different objects reflect different amounts of light and shadows. Here they develop a more detailed understanding of mirrors and the reflections that they form, and apply this understanding to make a periscope. They are introduced to ray diagrams that can be used to represent the behaviour of light. They use these diagrams, together with the fact that light travels in straight lines, to explain the formation of shadows and how their size and shape can be affected. They explore refraction in a number of contexts to see how light does not always appear to travel in straight lines. They investigate how white light is made up of many colours of light and how these can be split apart by a prism or</p>	<p>light, dark, shadow, mirror, bright, dim, reflect, eye, opaque, transparent, translucent, ultra violet, ray, beam, refraction, periscope, spectrum, dispersion, inverted, medium, question, investigation, fair test, change, measure, predict, prediction, explanation, observations, draw conclusions</p>	<p>Recognise that light appears to travel in straight lines</p> <p>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</p> <p>Explain that we see things because light travels from light sources to our eyes or from light sources to objects</p>

	<p>in a rainbow, as well as how the colours can be joined together to make white again. In several lessons children engage in illustrative practical activities to explore these phenomena. They also carry out a fair test investigation to measure the size of shadows compared to the relative positions of the light sources, the object making the shadow and the screen.</p> <p>One key idea in this module is the introduction of ray diagrams as a scientific convention that helps describe the behaviour of light and explains the formation of shadows or images in a pinhole camera. Whilst this may seem relatively straightforward, this move from a descriptive model (the shadow gets bigger, the light reflects from an object to our eyes) to a more scientific model (ray lines can show and predict what is or might happen) can present a significant cognitive jump for some children and you should be considerate of the challenges here. The abstract nature of the ideas represented by the ray diagrams can present a challenge in itself but also represents a shift from a view of light that might be categorised as sea of light, where light is all around, to one that draws a single line to represent what the light is doing.</p> <p>When working scientifically, children ask and propose answers to their own questions about shadow formation as well as exploring quantitatively the formation of shadows. They develop the idea of explaining and supporting the points they make with data and evidence, and consider how confident they feel in the conclusions that they draw, relating them back to predictions that they have made earlier. They carry out illustrative practicals to explore phenomena.</p>		<p>and then to our eyes</p> <p>Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them</p>
<p>The Nature Library and Our changing world.</p>	<p><b><u>Natural world</u></b></p> <p>This is a challenging module in which children will build on their knowledge of living things from previous years and deepen their understanding of why and how organisms are classified. They will explore the process of classification in some detail and how it differs from, but relates to, the identification of living things. The structure, function and purpose of classification systems will be explored with specific reference to living things. Children will become aware of the types and characteristics of organisms that belong in each of the five kingdoms of living things (animals, plants, fungi, bacteria and Protista) and the major sub-groups the kingdoms include. Although they will devise their own systems of classification, children will learn about how Linnaeus developed the system for classifying all living things using their observable characteristics. They will be introduced to the idea of how scientists use ‘conventions’ in order to ensure that everyone means the same thing when they refer to, for example, an organism by its scientific name. This module links to the modules in Our Changing World.</p> <p>When working scientifically, children will use observations and secondary source material to help classify living things, record plants and animals in the school environment and use evidence to support or refute ideas. They will use a range of approaches to present and communicate their findings to others including questioning themselves and their peers, evaluating the strength of evidence used to support arguments.</p> <p><b><u>Our changing world</u></b></p>	<p><b><u>The nature library</u></b></p> <p>General terms: identify, identification, classify, classification, division, family, genus, species, reason, common characteristics, distinguishing characteristics, leaves, shape, size, colour, backbone, wings, jointed legs, cased, transparent, antennae, shell, segments, explain, group, small, harmful, beneficial (helpful), colony, colonies, mould, multiply, historically, grouping, Aristotle, Carl Linnaeus, kingdom, Phillip Miller, John Ray, botany, conventions</p> <p>Kingdoms of living things: Animalia, Plantae, Fungi, Protista, and Monera</p> <p>Plant kingdom: flowering plants, conifers, ferns, mosses and algae</p> <p>Animal kingdom: vertebrates, fish, amphibians, mammals, birds, reptiles, invertebrates, molluscs, annelids, arachnids, insects, arthropods</p>	<p><i>Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago</i></p> <p>Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to parents</p> <p>Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution</p>



		<p>Micro-organisms: (3 kingdoms: Fungi, Monera, Protista), micro-organisms (microbes) bacteria</p> <p><b><u>Our changing world</u></b> mammal, amphibian, insect, bird, metamorphosis, tadpole, nymph, pupae, chrysalis, caterpillar, migrate, hibernate, courtship, plumage, habitat, adaptation, behaviour, young, chick, life cycle, egg, pupae, adult, butterfly, nectar, death rate, nest, brood, fledgling, juvenile, diet, migration, resident, invertebrate, mollusc, worm, snail, woodlouse, centipede, millipede, beetle, aphid, adaptation, predator, prey, survival, habitat, question, investigation, fair test, change, measure, predict, prediction, explanation, observations, draw conclusions, justify, analyse</p>	
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**Year 6 working scientifically skills**

planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary

taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate

recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs

using test results to make predictions to set up further comparative and fair tests

identifying scientific evidence that has been used to support or refute ideas or arguments.

reporting and presenting 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