



We have identified these learning values as intrinsic to supporting the needs of children in our school: *Reflectiveness; Risk-Taking; Stick-Ability; Communication;*

Community Values; Inquisitiveness; Independence; Working Collaboratively National Curriculum Coverage

KS1 National Curriculum	KS2 National Curriculum	
<p>The principal focus of science teaching in key stage 1 is to enable pupils to experience and observe phenomena, looking more closely at the natural and humanly constructed world around them. They should be encouraged to be curious and ask questions about what they notice. They should be helped to develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests, and finding things out using secondary sources of information. They should begin to use simple scientific language to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways. Most of the learning about science should be done through the use of first-hand practical experiences, but there should also be some use of appropriate secondary sources, such as books, photographs and videos.</p>	<p style="text-align: center;"><u>Lower Key Stage 2</u></p> <p>The principal focus of science teaching in lower key stage 2 is to enable pupils to broaden their scientific view of the world around them. They should do this through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments, and by beginning to develop their ideas about functions, relationships and interactions. They should ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information. They should draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out.</p>	<p style="text-align: center;"><u>Upper Key Stage 2</u></p> <p>The principal focus of science teaching in upper key stage 2 is to enable pupils to develop a deeper understanding of a wide range of scientific ideas. They should do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically. At upper key stage 2, they should encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They should also begin to recognise that scientific ideas change and develop over time. They should select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests and finding things out using a wide range of secondary sources of information. Pupils should draw conclusions based on their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings.</p>
<p style="text-align: center;">Working scientifically' is described separately at the beginning of the programme of study, but must always be taught through and clearly related to substantive science content in the programme of study.</p>		

Science Curriculum Statement of Intent:

We aim to encourage our children's natural curiosity to explore the world around them. Our teaching aims to equip our children with knowledge and understanding through first hand practical activities. Through our curriculum we aim to broaden their scientific view of the world and understand how the world operates. We strive for our children to understand the uses and implications of science in the wider world, and to inspire them to become scientists of the future.



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		Key Vocabulary		
		Beacon 1	Beacon 2	Beacon 3
o c a b u l a r y k n o w l e d g e	Understand the following key vocabulary:		Understand the following key vocabulary:	Understand the following key vocabulary:
	<p>Plants: EYFS Root, stem, tree, leaf, flower, water, seed, plant Year 1 habitat; variety; common; wild; garden; deciduous; evergreen; flowering; leaves; blossom; petals; roots; fruit; bulb; seed; trunk; branches; stem; germination; nutrition; reproduction Year 2 seedling, bulb, buds, shoot, water, sun light, seeds, nuts, fruit stones, warm, grow, temperature, germinate Animals: EYFS Animal, head, legs, arms, knee, elbow, neck, face, feet, hands, bread, potatoes, apples, cereals, rice, meat, fish, milk, running, jumping, swimming, walking, chicken, hen, kitten, cat, puppy, dog, duckling, duck Year 1 Body parts: eyes, ears, elbows, hair, mouth, nose, teeth, paw, hoof, tail, fin, shell, skin, wings, beak, fur, scales, feathers Fish: goldfish, tuna, salmon Birds: blackbird, magpie, robin, sparrow, crow, swan. Reptiles: snake, lizard, tortoise Mammals: mouse, horse, cow, sheep, hamster, rabbit Amphibians: frog, toad, newt Senses: feel, hear, smell, see, taste, touch Carnivore, omnivore, herbivore Year 2 Baby, toddler, adult, eggs, fruit, vegetables, water, fibre, meat, fish, cheese, beans washing, exercise, diet offspring</p>	<p>Plants: Year 3 Ground, transport, attract bees, catch sunshine, green, air, nutrients, growth, pollen, pollination, seed formation, seed dispersal, nutrition, support, anchor, reproduction Animals: Year 3 Balanced diet, carbohydrates, protein, fats, fibre, fruit and vegetables, bones, muscles, femur, ribs, spine, tibia, shoulder blade, hollow, relax and contract, protect, support, internal skeleton, exoskeleton Year 4 Teeth and eating: incisor, molar, canine, diet, decay, healthy, teeth, acids, sugars, mouth, rip, tear, chew, grind Digestive system: saliva tongue, toilet waste, nutrients energy, stomach, large/small intestine, brain, lungs, movement, acids, urine, faeces, oesophagus Rocks: Year 3 Rock, soil, marble, granite, sand, stone, slate, chalk, clay, texture, absorbed, permeable, pebble, characteristic, surface, organic, impermeable, crystal, grains, crumbly, igneous, sedimentary, metamorphic, fossil Light Year 3 Shadow, light, flames, opaque, block, direction, light, travels, shortest, longest, highest, torch, shape, similar, transparent, translucent, light source, sun, object daytime, night-time, reflect, shine, shiny, absorb, reflective surface, surface, mirror, sundial, block, lamp Living Things: Year 4 Predator, prey, producer, river, ocean, desert, arctic, rainforest, mountain, farmland, wood, dry, wet, vegetation, shelter, vertebrate, invertebrate, classify, characteristic, flowering plant, non- flowering plant (fern, moss) States of Matter: Year 4 Water, air, ice, milk, lemonade, juice, metal, solid, liquid, gas, pour, flow, change shape, squash, heat, cool, grain/granular, temperature, thermometer, freeze, melt, boil, evaporate, condense, steam, smoke, sea water, properties, melting point, degrees Celsius,</p>	<p>Living Things and their Habitats Year 5 Live young, hatch, tadpole, caterpillar, butterfly, ladybird, pupae, larvae, chrysalis, reproduction, asexual, sexual, life cycle, pollination, seed dispersal, pollen, stamen, stigma Year 6 Micro-organism, microbe, fungus, bacteria, virus, classified, classification key, yeast, characteristic, microscope Variety, variation, offspring, species, competition, adapt, adaptation, reproduce, survive, evolve, fossil record, gills, blubber, moulting, long neck, hooves, eyelashes, tails, generation Animals: Year 5 Teeth and eating: incisor, molar, canine, diet, decay, healthy, teeth, acids, sugars, mouth, rip, tear, chew, grind Year 6 Heart, veins, arteries, capillaries, blood, pulse, beats, oxygen, carbon dioxide nutrients, organs, drugs, medicines, minerals, vitamins, lungs, caffeine, medical, legal, illegal Materials: Year 5 Hardness, solubility, transparency, conductivity, thermal, insulation, dissolve, solution, separation, polymers, reversible, irreversible, evaporating, melting, evaporation, filtering, sieving, , dissolving, burning, rusting, vinegar, bicarbonate of soda, magnetism, insulators, conductors, soluble, insoluble Earth and Space: Year 5 Earth; sun; moon; solar system; spherical bodies; rotation; movement; day and light; planets; Mercury; Venus, Earth, Mars, Jupiter; Saturn; Uranus; Neptune; dwarf planet; Neptune; celestial body; orbit Forces: Year 5 force, air resistance, water resistance, magnetic attraction, gravitational attraction, direction, force, motion, weight, upthrust, Newton, forcemeter, stationary, surface area, force applied, pulley, lever, gear Light: Year 6 Reflection, transparent, translucent, opaque, periscope, luminous, non-luminous, absorb, direction</p>	



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		Key Vocabulary		
		Beacon 1	Beacon 2	Beacon 3
V o c a b u l a r y k n o w l e d g e	Understand the following key vocabulary:		Understand the following key vocabulary:	Understand the following key vocabulary:
	Seasonal Change		Sound:	Electricity:
	<u>Year 1</u>		<u>Year 4</u>	<u>Year 6</u>
	Seasons: Autumn, Spring, Summer, Winter, deciduous, evergreen, shoot, fruit, earth, seeds, leaves, flowers, weather types: rain, hail, snow, ice, frost, sun, showers, wind, reproduce, babies/adults, life cycles, birds, insects, cold, warm, hot, sunrise, sunset		Sound, pitch, volume, vibrations, medium, insulation, travel, instrument	Voltage, current, series, component, circuit, conductor, positive/negative terminal, complete circuit, battery, cell
	<u>Year 2</u>		Forces	
	Dead, alive, living, non-living, habitats, keys, breathe, grow, eat, have babies, move, sense, go to the toilet, habitat, microhabitat, food chain		<u>Year 3</u>	
	Materials		Force, push, pull, speed up, slow down, change shape, change direction, movement, direction, friction, magnets, magnetic, surface, magnetism, north pole, south pole, repel, attract,	
	<u>Year 1</u>		Electricity	
	Hard, stiff, rough, not bendy, opaque, strong, soft, shiny, smooth, waterproof, stretchy, material, transparent, dull, bendy, absorbent, wood, plastic, glass, magnetic, elastic, fabric, metal, water, rock,		<u>Year 4</u>	
	<u>Year 2</u>		Battery, cell, wires, switch, crocodile clips, buzzer, bulb, circuit, symbols, insulator, conductor, plastic, metal, appliance, component	
Brick, cardboard, transparent, waterproof, insulate, keep warm, hard, rigid, strong, flexible, squash, stretch, twist, bend				
Forces				
<u>EYFS</u>				
Push, pull, twist, squash, stretch				
Electricity				
<u>EYFS</u>				
Battery, electricity, switch				



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EYFS

Science is covered across all seven areas of learning in our early years. It is introduced through activities that encourage the children to explore, problem solve, observe, make decisions and talk about the world around them. The skills that the children learn and develop during the early years will provide the foundations for them to build upon as they move through the school ensuring they become independent learners. The children will investigate lots of different objects and materials and develop an understanding of properties. They will also begin to describe and identify similarities and differences when using these materials. Our children are taught to use their tools safely and to ask for help when they need it. They enjoy looking for mini-beasts and creating habitats for animals in the local environment. All of our children are encouraged to ask questions about why things happen and how they work. They will be given the opportunity to use the internet and books to find the answers to any questions that they have and develop independence, taking control of their learning. As with other learning in early years, the children learn Science through exploratory play e.g in the water play investigating floating and sinking and enjoying games, developing a love of learning.

Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
<p><u>Animals and their habitats</u></p> <ul style="list-style-type: none"> •Links to key texts <i>'We're going on a bear hunt'</i> and <i>'Funny Bones'</i> •Identify something as an animal •Name some places animals live •Identify and locate parts of their body •Identify and locate parts of animals' bodies •Use their observations to describe humans and other animals 	<p><u>Animals and their habitats</u></p> <ul style="list-style-type: none"> •Links to key texts <i>'Handa's surprise'</i> and <i>'Beautiful bananas'</i> •Name a very limited range of food •Can identify types of exercise 	<p><u>Materials</u></p> <ul style="list-style-type: none"> •Links to key texts <i>'Tyrannosaurus Drip'</i> and <i>'Harry and his Bucketful of Dinosaurs'</i> •Look at fossils •Make observations of common objects •Make very simplistic observations of materials •Arrange materials into groups 	<p><u>Plants</u></p> <ul style="list-style-type: none"> •Links to key texts <i>'From seed to sunflower'</i>, <i>'Growing Things'</i> and <i>'Ten little seeds'</i>. •Plant seeds to grow •Recognise that they need water to grow •Observe the life cycle •Name the leaf, stem and flower 	<p><u>Electricity and Forces</u></p> <ul style="list-style-type: none"> •Observe and describe movements they and objects make •Know electricity can be dangerous •Explore a range of battery powered devices 	<p><u>Light and sound</u></p> <ul style="list-style-type: none"> •Links to key text <i>'What the ladybird heard at the seaside'</i> •Know that it is dangerous to look at the sun (links to key weather) •Relate their sense of sight to their eyes •Relate their sense of hearing to their ears



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Beacon 1 (bold skills are statutory and a key focus)		Year 1
Working Scientifically Skills	Ideas and Questioning	<ul style="list-style-type: none"> • Ask simple questions and recognise that they can be answered in different ways • Recognise scientific and technical developments that can help us
	Planning	<ul style="list-style-type: none"> • Perform simple tests or follows teachers' instructions • Experiences different types of planning enquiry • With guidance, suggests what they will do • With guidance, identifies things to measure or observe that are relevant to the question • Use resources provided or chosen from a limited range • Use simple measurements and equipment to gather data • Suggests why a test is unfair
	Obtaining and Presenting Evidence	<ul style="list-style-type: none"> • Observes closely (including over time), using simple equipment • Makes measurements using non-standard units • Uses simple secondary resources to find answers, e.g. books, videos, photographs or people • Gathers and records simple data to help in answering questions • With support, prepares simple tables to record data
	Considering and Evaluating Evidence	<ul style="list-style-type: none"> • With help, records their findings in a range of ways, e.g. simple tables, diagrams, pictograms, sorting circles, bar charts and templates • Talks about their findings using everyday terms, text scaffolds or simple scientific language • Uses simple observable features to compare objects, materials and living things • Identifies and classifies by deciding how to sort and group objects • With guidance, begins to notice changes, patterns (i.e. cause and effect) and relationships (i.e. how one variable affects another) • Use their observations and ideas to suggest answers to questions • Uses comparative language to describe changes, patterns and relationships • With support, suggests whether or not what happened was what they expected • With support, suggests different ways they could have done things



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Year 1 Plants	
Slightly below ARE	make observations of plants, (daffodil, daisy, sunflower, rose, lavender, tulip, snowdrop, holly, dandelion, oak, beech, chestnut, pine) including flowers and vegetables they have planted identify the leaf, root, stem and flower of a plant identify the trunk, branch, roots and leaves of a tree
Broadly within ARE	know that plants produce seeds identify differences between plants identify and describe the basic structure of a variety of common flowering plants, including trees name some common plants name some plants that live in the garden name some plants that live in the wild name some trees in the local environment recognise that different plants live in the local environment use simple identification guides to name plants in the local environment identify and name a variety of common wild and garden plants, including deciduous and evergreen trees
Above ARE	compare and contrast different plants sequence pictures of how plants changes over time describe how deciduous trees changes throughout the year explain why some plants are only seen at certain times of the year
Year 1 Animals including humans	
Slightly below ARE	identify and name a selection of animals make observations of animals know that animals eat different types of food use their observations to point out differences between humans and other animals and between animals and non-living things identify and locate the sense organs use senses to describe textures, sounds and smells
Broadly within ARE	identify and sort animals into different groups name the different groups of animals identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals recall and use the words: carnivore, herbivore and omnivore identify and name a variety of common animals that are carnivores, herbivores and omnivores identify the food of some common animals describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) compare differences in texture, sounds and smells name and locate the basic parts of the human body

	draw and label a simple body outline
Above ARE	group animals that belong to: carnivores, herbivores and omnivores describe differences between the different animal groups (e.g. birds have feathers but mammals have fur) identify animals which are more likely to be seen in different seasons explain why some animals are only seen at night
Year 1 Seasonal changes	
Slightly Below ARE	name the four seasons recall simple changes associated with each season observe and name types of weather (e.g. rain, sun, wind, clouds)
Broadly within ARE	observe changes across the four seasons identify what to observe use descriptive words, photos and pictures to record changes collect evidence of changes (e.g. leaves, seeds, flowers) observe and describe weather associated with the seasons and how day length varies identify what to measure about the weather use prepared tables and charts to record data
Above ARE	use secondary data to describe weather in another setting explain why animals are easier to spot at different times of year (e.g. migrating birds, hibernating animals)
Year 1 Materials- Everyday Materials	
Slightly below ARE	name some common materials name some common objects around the school and home make observations of common objects and the different materials they are made of communicate these observations using descriptive words (e.g. <i>bendy, rough, hard</i>)
Broadly within ARE	distinguish between an object and the material from which it is made identify some naturally occurring materials: wood, rock, water identify some man-made materials: glass, metal, plastic identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock identify some properties of materials (e.g. see through, waterproof, absorbent) describe the simple physical properties of a variety of everyday materials compare and group together a variety of everyday materials on the basis of their simple physical properties (both visible and non-visible)
Above ARE	make predictions about which materials will float and sink name materials which have lots of different uses (e.g. paper- wrapping paper, tissue paper, writing paper, birthday card) describe objects that are made from lots of different materials names objects that are sometimes made from different materials (e.g.: spoons- plastic, wooden, metal) explain why people started using plastic bags rather than paper bags



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Beacon 1 (bold skills are statutory and a key focus)		Year 2
W o r k i n g S c i e n t i f i c a l l y S k i l l s	Ideas and Questioning	<ul style="list-style-type: none"> Ask simple questions and recognise that they can be answered in different ways Recognise scientific and technical developments that can help us
	Planning	<ul style="list-style-type: none"> Perform simple tests or follows teachers' instructions Experiences different types of planning enquiry With guidance, suggests what they will do With guidance, identifies things to measure or observe that are relevant to the question Use resources provided or chosen from a limited range Use simple measurements and equipment to gather data Suggests why a test is unfair
	Obtaining and Presenting Evidence	<ul style="list-style-type: none"> Observes closely (including over time), using simple equipment Makes measurements using non-standard units Uses simple secondary resources to find answers, e.g. books, videos, photographs or people Gathers and records simple data to help in answering questions With support, prepares simple tables to record data
	Considering and Evaluating Evidence	<ul style="list-style-type: none"> With help, records their findings in a range of ways, e.g. simple tables, diagrams, pictograms, sorting circles, bar charts and templates Talks about their findings using everyday terms, text scaffolds or simple scientific language Uses simple observable features to compare objects, materials and living things Identifies and classifies by deciding how to sort and group objects With guidance, begins to notice changes, patterns (i.e. cause and effect) and relationships (i.e. how one variable affects another) Use their observations and ideas to suggest answers to questions Uses comparative language to describe changes, patterns and relationships With support, suggests whether or not what happened was what they expected With support, suggests different ways they could have done things



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Year 2 Plants	
Slightly below ARE	know that flowering plants produce seeds which grow into new plants know that some plants have bulbs from which they grow make observations of plants over time
Broadly within ARE	explore how plants from seeds and bulbs grow describe what happens to bulbs during the plant cycle as they grow describe what happens to a seed as it grows and develops describe what they observe as new plants grow observe and describe how seeds and bulbs grow into mature plants suggest how to find out about what plants need in order to grow well recognise that plants are living and need water, light and warmth to grow describe differences between plants grown in the light and in the dark find out and describe how plants need water, light and a suitable temperature to grow and stay healthy
Above ARE	explain how to look after a variety of plants compare the plant cycle for a plant from a seed with that from a bulb know that a seed and bulb both contain everything a plant needs to grow explain that seeds and bulbs do not need light to germinate and identify how this is different to the needs of a plant explain how plants in the desert survive with little water and plants in the rainforest survive with little light
Year 2 Animals including humans	
Below ARE	recognise that animals produce young notice that animals, including humans, have offspring which grow into adults recognise changes that take place as animals get older identify the offspring of a selection of different animals recognise that exercise is important name some types of food recognise that an adequate diet and exercise are necessary for them to grow and stay healthy
Broadly within ARE	describe some differences they observe between babies and toddlers explain that adult animals no longer grow make comparisons of the differences they observe between babies and toddlers find out about and describe the basic needs of animals, including humans, for survival (water, food and air) describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene identify some types of food that make up their diet and name some examples of each describe some of the types of food that they eat
Above ARE	explain how to look after a pet describing what it needs to survive use evidence to show that adult animals no longer grow use evidence to show that children of the same age are not all the same size use evidence to show that older children are generally taller than younger children

Year 2 Living things and their habitats	
Slightly Below ARE	use their observations to point out differences between animals, plants and non-living things recognise that plants provide food for humans and other animals within an environment identify some local habitats name a few of the organisms that live in a particular habitat
Broadly within ARE	with help, use keys to identify some animals and plants recognise that different plants live in the local environment describe the simple features of habitats recognise a microhabitat as a small habitat (e.g. leaf litter, woodlice under stones) describe some microhabitats identify and name a variety of plants and animals in their habitats, including micro-habitats recognise similarities and differences between plants and animals explore and compare the differences between things that are living, dead, and things that have never been alive explain differences between living and non-living things in terms of characteristics such as movement and growth construct a simple food chain (e.g. grass, cow, human) 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 suggest reasons why different plants and animals are found in the different environments 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
Above ARE	compare animals found in familiar habitats with unfamiliar habitats compare plants found in familiar habitats with unfamiliar habitats use different factors to compare a range of habitats (e.g. water, light, temperature)
Year 2 Use of Everyday Materials	
Slightly below ARE	identify uses of some common materials give a reason why a material is suitable for its job identify materials that can be easily changed with force identify materials that cannot be easily changed with force describe pushes and pulls needed to change a material as big or small
Broadly within ARE	recognise that some materials will have more than one property which increases its suitability for its purpose (e.g. glass is transparent, rigid and weatherproof) identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses suggest several reasons why a material may or may not be suitable for a particular purpose find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching describe changes in shapes as a result of the action of pushes, pulls and twists
Above ARE	explain why some materials change shape when a force acts (i.e. push, pull, twist, stretch) as a result of their properties



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<p>explain why one material may be more suitable for a purpose than another by discussing properties</p> <p>explain why plastics cause problems in the oceans</p> <p>explain the importance of reusing and recycling plastic</p>
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<p>describe how swimsuits have changed over time and how the fabric is now more suitable</p> <p>describe how scientists have invented new materials (e.g. Macintosh, Dunlop)</p>
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Beacon 2 (bold skills are statutory and a key focus)		Year 3
Working Scientific Enquiries	Ideas and Questioning	<ul style="list-style-type: none"> Ask relevant questions and use different types of scientific enquiry skills to answer them Explain the purposes of a variety of scientific and technological developments
	Planning	<ul style="list-style-type: none"> Set up simple practical enquiries, comparative and fair tests Begins to make their own decisions about the most appropriate type of scientific enquiry to answer questions Begins to make decisions about what observations to make and how long to make them for Begin to choose the type of simple equipment that might be used from a reasonable range Use appropriate equipment and measurements with reasonable accuracy Recognises when a simple fair test is needed With help, decides how to set up a fair test and control variables
	Obtaining and Presenting Evidence	<ul style="list-style-type: none"> Makes systematic and careful observations Makes accurate measurements using standard units, using a range of equipment, e.g. data loggers and thermometers Recognises when and how secondary sources might help answer questions that cannot be answered through practical investigations Gathers and records data in a variety of ways to help in answering questions Prepares own format for recording data Makes decisions about how to record and analyse the data Records and presents findings using drawings, labelled diagrams, keys, tally charts, Carroll diagrams, Venn diagrams, bar charts and tables Reports on findings from enquiries, in simple scientific language, using oral and written explanations, displays or presentations of results and conclusions
	Considering and Evaluating Evidence	<ul style="list-style-type: none"> Uses observable and other criteria to group, sort and classify in different ways (including simple keys and branching databases) Identifies differences, similarities or changes related to simple scientific ideas and processes. With help, looks for changes, patterns and relationships in their data With help, uses results to draw simple conclusions and answer questions using appropriate levels of knowledge and their own experiences Uses straightforward scientific evidence to answer questions or the support their findings Uses relevant scientific language to discuss their ideas and communicate their findings With support, uses results to suggest improvements to what they have done With support, raise further questions (e.g. arising from the data) With support, makes predictions for new values within or beyond the data collected

Featherstone Wood Primary School Creative Curriculum

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Long Term Planning Science



Year 3 Plants	
Slightly below ARE	<ul style="list-style-type: none"> identify parts of flowering plants recognise that plants need light, water and warmth and healthy leaves, roots and stems in order to grow well know that plants make their own food know that water travels from the roots up the stem sequence pictures to show the life cycle of a plant
Broadly within ARE	<ul style="list-style-type: none"> identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers describe why healthy roots and a healthy stem are needed for plants to grow recognise that the leaves of a plant are associated with healthy growth and more specifically nutrition know that fertilisers contain minerals understand that plants absorb minerals from the soil (Teacher Note: plants create their own food using sunlight, water and carbon dioxide, they do not absorb food from the soil) describe how changes to light and fertiliser affect plant growth explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant investigate the way in which water is transported within plants describe how the stem has a role in support and nutrition (transport of water) describe why plants need flowers describe the role of bees and insects in pollination describe how pollen and seeds are dispersed explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal
Above ARE	<ul style="list-style-type: none"> <i>explain why healthy roots and a healthy stem are needed for plants to grow</i> explain that differences in plant growth are due to the amount of light and/or water compare methods of seed dispersal compare the roots of different plants (e.g. desert plants or rainforest tree. Teacher Note: rainforest trees have very shallow roots as the quality of the soil is more and most of the nutrients are near the surface)
Year 3 Animals including humans	
Below ARE	<ul style="list-style-type: none"> identify some foods needed for a healthy and varied diet know they have bones and muscles in their body state that they and other animals have skeletons identify animals that do not have an internal skeleton (invertebrates) group animals with and without an internal skeleton recognise that their skeletons grow as they grow
Broadly within ARE	<ul style="list-style-type: none"> name the components of a healthy and varied diet describe how their diet is balanced 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 describe some observable characteristics of bones describe the main functions of their skeletons state that movement depends on both skeleton and muscles state that when one muscle contracts another relaxes identify that humans and some other animals have skeletons and muscles for support, protection and movement
Above ARE	<ul style="list-style-type: none"> describe an adequate and varied diet for humans, recognising that there are many ways of achieving this describe problems associated with broken bones or bones diseases describe some advantages of having an internal skeleton over no skeleton or an exoskeleton describe the role of different food groups compare and contrast diets of animals including pets
Year 3 Rocks	
Slightly below ARE	<ul style="list-style-type: none"> observe the characteristics of a variety of rocks name and describe the characteristics of several rocks identify fossils in rocks understand that there are rocks under the Earth's surface recognise that soil is a mixture of different materials and living things
Broadly within ARE	<ul style="list-style-type: none"> classify rocks from the evidence of investigations explain that rocks are used for different purposes dependent on their physical properties explain that different types of rock react differently to physical forces (e.g. water, rubbing) compare and group together different kinds of rocks on the basis of their appearance and simple physical properties describe in simple terms how fossils are formed when things that have lived are trapped within rock recognise that soil contains dead plants and animals recognise that there is rock under all surfaces and that soils come from rocks

Above ARE	<ul style="list-style-type: none"> recognise that soils are made from rocks and organic matter relate the simple physical properties of some rocks to their formation explain how a model (e.g. biscuits, chocolate bars) can be used to represent sedimentary, metamorphic and igneous rocks describe how Mary Anning discovered fossils explain why we do not see the soft parts of animals in fossils explain why we might find lots of the same types of rock in one place explain why certain rocks are used for different purposes and why some rocks could be used for these jobs for example: <ul style="list-style-type: none"> Marble- kitchen worktops or statues Slate roof tiles Granite walls
Year 3 Light	
Slightly below ARE	<ul style="list-style-type: none"> name a number of light sources, including the sun recognise that they cannot see in the dark state that reflections can be seen in shiny surfaces makes generalisations about shiny surfaces (e.g. smooth) recognise that light travels from a source recognise that when light is blocked, a shadow is formed make observations of changes in shadows
Broadly within ARE	<ul style="list-style-type: none"> describe and compare some light sources state that light sources are seen when light from them enters the eyes recognise that light from the sun can be dangerous and that there are ways to protect their eyes recognise that they need light in order to see things and that dark is the absence of light explain that places are dark because there is no light and a light source is needed to help us see in such places notice that light is reflected from surfaces demonstrate light travelling using a torch and record light bouncing off a mirror identify suitable reflective clothing for travelling in the dark explain that they cannot see shiny objects in the dark because there are no light sources recognise that shadows are formed when the light from a light source is blocked by a solid object recognise that shadows are similar in shape to the objects forming them explain that shadows are formed when light from a source is blocked state that even transparent objects block some light and form shadows describe the difference in shadows cast by opaque, translucent and transparent materials explore how to make shadows of different shapes and sizes find patterns in the way that the size of shadows change
Above ARE	<ul style="list-style-type: none"> use ideas about shadows to make predictions about the shadows formed by different objects or materials describe how the length of a shadow changes throughout the day as the sun moves across the sky describe how nocturnal animals are adapted to use what little light there is or their other senses in the dark (e.g. cats, aye-aye, lemurs) describe how Percy Shaw invented cat's eyes and explain their importance to road safety
Year 3 Forces and magnets	
Slightly below ARE	<ul style="list-style-type: none"> recognise that pushes and pulls are forces recognise that a force acts in a particular direction observe the movements, shape and direction of objects when forces act on them identify friction as a force observe and explore how friction affects the movement of objects classify materials as magnetic or non-magnetic recall that magnets have a north and a south pole
Broadly within ARE	<ul style="list-style-type: none"> describe how to make a familiar object start moving by pushing or pulling describe how to use pushes and pulls to make familiar objects speed up, slow down, change direction or shape produce annotated drawings showing the direction of force needed to make an object move describe some ways in which friction between solid surfaces can be increased or decreased compare how things move on different surfaces observe how magnets attract or repel each other and attract some materials and not others compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials describe the difference between a magnet and a magnetic material describe what happens when some materials are put near a magnet notice that some forces need contact between two objects, but magnetic forces can act at a distance recall that magnets have a north and a south pole describe magnets as having two poles describe the direction of forces between magnets predict whether two magnets will attract or repel each other, depending on which poles are facing
Above ARE	<ul style="list-style-type: none"> describe some everyday uses of magnets explain that a compass works by lining up with the Earth's magnetic field describe how lodestone was found to be a naturally occurring magnet and was used as the first compass for navigation



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Community Values; Inquisitiveness; Independence; Working Collaboratively National Curriculum Coverage

Beacon 2 (bold skills are statutory and a key focus)		Year 4
Working Scientifically Skills	Ideas and Questioning	<ul style="list-style-type: none"> Ask relevant questions and use different types of scientific enquiry skills to answer them Explain the purposes of a variety of scientific and technological developments
	Planning	<ul style="list-style-type: none"> Set up simple practical enquiries, comparative and fair tests Begins to make their own decisions about the most appropriate type of scientific enquiry to answer questions Begins to make decisions about what observations to make and how long to make them for Begin to choose the type of simple equipment that might be used from a reasonable range Use appropriate equipment and measurements with reasonable accuracy Recognises when a simple fair test is needed With help, decides how to set up a fair test and control variables
	Obtaining and Presenting Evidence	<ul style="list-style-type: none"> Makes systematic and careful observations Makes accurate measurements using standard units, using a range of equipment, e.g. data loggers and thermometers Recognises when and how secondary sources might help answer questions that cannot be answered through practical investigations Gathers and records data in a variety of ways to help in answering questions Prepares own format for recording data Makes decisions about how to record and analyse the data Records and presents findings using drawings, labelled diagrams, keys, tally charts, Carroll diagrams, Venn diagrams, bar charts and tables Reports on findings from enquiries, in simple scientific language, using oral and written explanations, displays or presentations of results and conclusions
	Considering and Evaluating Evidence	<ul style="list-style-type: none"> Uses observable and other criteria to group, sort and classify in different ways (including simple keys and branching databases) Identifies differences, similarities or changes related to simple scientific ideas and processes. With help, looks for changes, patterns and relationships in their data With help, uses results to draw simple conclusions and answer questions using appropriate levels of knowledge and their own experiences Uses straightforward scientific evidence to answer questions or the support their findings Uses relevant scientific language to discuss their ideas and communicate their findings With support, uses results to suggest improvements to what they have done With support, raise further questions (e.g. arising from the data) With support, makes predictions for new values within or beyond the data collected



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Year 4 Animals including humans (NC statement regarding food chains moved to living things and their habitats)	
Below ARE	<ul style="list-style-type: none"> identify a wider range of body parts, including some internal organs (large intestine, small intestine, brain, lungs, heart, stomach, oesophagus) locate and name the different organs in the digestive system recognise they need to take care of their teeth name the different types of teeth
Broadly within ARE	<ul style="list-style-type: none"> describe the role of each organ in the digestive system describe the simple functions of the basic parts of the digestive system in humans describe the role of each type of teeth in digestion identify the different types of teeth in humans and their simple functions explain how they should look after their teeth and recognise why they need to do so state that animals have different diets and may have different kinds of teeth
Above ARE	<ul style="list-style-type: none"> explain why humans do not have a full set of adult teeth at birth explain why food needs to be broken down explain why dentists are concerned about the amount of sugar children have explain how fossilised teeth give us clues about an animals' diet explain why the teeth of certain types of animals need to be different
Year 4 Living things and their habitats Including Food chain POS statement from animals including humans	
Slightly below ARE	<ul style="list-style-type: none"> recognise that animals can be grouped into vertebrates and invertebrates identify that some animals feed on other animals and some on plants explore ways of grouping living things including animals and plants (flowering and non-flowering) represent feeding relationships with simple food chains
Broadly within ARE	<ul style="list-style-type: none"> explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment recognise that living things can be grouped in a variety of ways describe some of the characteristics of the vertebrate (fish, mammals, amphibians, reptiles and birds) groups (e.g. warm-blooded, have fur, lay eggs) group animals into vertebrate (fish, mammals, amphibians, reptiles and birds) and invertebrates groups (snails, slugs, spiders, worms and insects) recognise that green plants are the ultimate source of food for all animals recognise that a food chain must always start with a green plant (a producer) represent feeding relationships within a habitat with food chains beginning with a green plant which 'produces' food for the other organisms use and understand the terms: producer, predator and prey construct and interpret a variety of food chains, identifying producers, predators and prey (Teacher Note: statement moved from NC 'Animals including humans' to improve progression within topics) know the function of some of the more complex features which aid survival in specific habitats (e.g. gills, blubber, camouflage) describe why different animals and plants live in different habitats recognise that environments can change and that this can sometimes pose dangers to living things describe how humans can cause changes to environments explain that different organisms are found in different habitats because of differences in environmental factors
Above ARE	<ul style="list-style-type: none"> use food chains to predict what might happen to the numbers of an organism if there are suddenly more predators or less prey explain why it is necessary to use a reasonably large sample when investigating the preferences of small invertebrates describe how humans have negatively impacted environments (e.g. pollution, deforestation, introduction of invasive species) explain why some animals are hard to classify (e.g. platypus, echidna, bat, flightless birds)
Year 4 Materials- Solids, liquids and gases	
Slightly below ARE	<ul style="list-style-type: none"> name some solids and liquids state that air is a gas state some differences between solids, liquids and gases observe what happens to a variety of materials when they are heated (e.g. chocolate, ice cream, butter, water) describe what happens to water when it is heated and cooled recognise that these processes can be reversed state that ice, water and steam are the same material identify the processes of melting, freezing, evaporation and condensation
Broadly within ARE	<ul style="list-style-type: none"> recognise everyday substances as mixtures of solids, liquids and/or gases recognise that air is a material and that it is one of a range of gases which have important uses recognise that gases flow from place to place know that gases can be easily compressed describe the differences between solids and liquids compare simple solids and liquids (e.g. in terms of ease of squashing or pouring) compare and group materials together, according to whether they are solids, liquids or gases
	<ul style="list-style-type: none"> make clear distinctions between the properties of solids, liquids and gases identify a wide range of contexts in which changes of state take place describe a few examples where these changes occur recognise that for a substance to be detected by smell, some of it must be in the gas state observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius describe how when ice melts it turns to liquid and how when water freezes it becomes ice describe how these processes can be reversed describe how liquids evaporate to form gases and how gases condense to form liquids sequence the changes that happen in the water cycle describe the water cycle in terms of these processes explain the relationship between liquids and solids in terms of melting and freezing explain the relationship between liquids and gases in terms of evaporation and condensation identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature know that temperature can affect the rate of evaporation or condensation describe the effect of temperature on evaporation explain how changing conditions affects processes such as evaporation and condensation identify a range of contexts in which changes take place (e.g. evaporation of puddles in the school playground or from clothes on the washing line, condensation in the bathroom)
Above ARE	<ul style="list-style-type: none"> describe the behaviour and properties of gases make clear distinctions between the properties of solids, liquids and gases explain why granular solids have some of the properties associated with liquids explain why some substances are hard to classify as solids, liquids and gases (e.g. whipped cream, mousse, mayonnaise, muddy water, fizzy drinks, cornflour and water) compare the boiling point of different liquids explore the effect of salt on ice explain why salt is put on the roads in winter
Year 4 Sound	
Slightly below ARE	<ul style="list-style-type: none"> recognise and describe many sounds and sound sources state that they hear sounds through their ears recognise that when sounds are generated by objects, something moves or vibrates describe differences in pitch and volume describe what they observe when they move further away from a source of sound
Broadly within ARE	<ul style="list-style-type: none"> identify how sounds are made, associating some of them with something vibrating identify what is vibrating in a range of musical instruments generalise that sounds are produced when objects vibrate describe how sounds are generated by specific objects suggest ways of producing sounds recognise that vibrations from sounds travel through a medium to the ear find patterns between the pitch of a sound and features of the object that produced it distinguish between pitch and volume (loudness) know that altering vibrations alters the pitch or volume suggest how to change the loudness of the sounds produced by a range of musical instruments explore how to vary the pitch and volume of sounds from a variety of objects or instruments find patterns between the volume of a sound and the strength of the vibrations that produced it recognise that sounds get fainter as the distance from the sound source increases describe what they observe when they move further away from the source of a sound
Above ARE	<ul style="list-style-type: none"> describe ways in which the pitch of a sound made by a particular instrument or vibrating object can be raised or lowered generalise the effects of changes on sound (e.g. the tighter the tension the higher the pitch) group instruments independently by the way sounds are produced recognise that sounds travel through solids, water and air explore how sound travels through a variety of materials identify suitable materials to use for sound insulation recognise that sound can be reflected from a surface which can cause an echo describe how some animals use echo-location
Year 4 Electricity	
Slightly below ARE	<ul style="list-style-type: none"> identify common appliances that run on electricity identify mains operated and battery operated devices describe some of the dangers associated with mains electricity name some components of a simple electrical circuit know that batteries are sources of electricity recognise that for a circuit to work it must be complete construct a working circuit identify materials as conductors or insulators
Broadly within ARE	<ul style="list-style-type: none"> construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers make drawings of simple working circuits (pictorial only circuit symbols covered in year 6) make circuits from drawings provided 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



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Community Values; Inquisitiveness; Independence; Working Collaboratively National Curriculum Coverage

	<ul style="list-style-type: none"> • describe the effect of making and breaking one of the contacts on a circuit • explain why some circuits work and others do not • recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit • describe how switches work • construct a home-made switch • construct simple circuits and use them to test whether materials are electrical conductors or insulators • recognise some common conductors and insulators, and associate metals with being good conductors
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	<ul style="list-style-type: none"> • are methodical in tracing faults in simple circuits • relate knowledge about conductors and insulators to their use in electrical appliances • describe the use of conductors and insulators in components including connecting wires • identify graphite and playdough as non-metal conductors and explain why this is unusual
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W o r k i n g S c i e n t i f i c a l l y S k i l l s	Ideas and Questioning	<ul style="list-style-type: none"> • Uses their scientific experiences to explore ideas and raise different types of questions • Talks about how scientific ideas have developed over time • Recognises the applications of specific scientific ideas
	Planning	<ul style="list-style-type: none"> • Selects and plans different types of scientific enquiries to answer questions • Makes decisions about what observations to make, what measurements to use, how long to make them for and whether to repeat them • Chooses the most appropriate equipment to make measurements • Explains how to use the equipment accurately • Recognises when and how to set up comparative and fair tests • Recognises and controls variables where necessary (e.g. explains which variables need to be controlled and why) • Takes measurements, in standard units, using a range of scientific equipment, with increasing accuracy and precision
	Obtaining and Presenting Evidence	<ul style="list-style-type: none"> • Takes repeat readings where appropriate • Recognises which secondary sources will be most useful to research their ideas • Begins to separate opinion from fact • Records data and results of increasing complexity • Decides how to record data from a choice of familiar approaches • Calculates mean value where appropriate
	Considering and Evaluating Evidence	<ul style="list-style-type: none"> • Records and presents findings using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs • Reports on findings from enquiries, using relevant scientific language and conventions, in oral and written explanations such as displays and other presentations • Uses and develops keys and other information records to identify, classify and describe living things and materials • Identifies conclusions, causal relationships and explanations of results • Identifies patterns that might be found in the natural environment • Draws valid conclusions, explains and interprets the results (including the degree of trust) using scientific knowledge and understanding (e.g. recognises limitations of data) • Identifies scientific evidence that has been used to support or refute ideas or arguments • Uses relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas • Makes practical suggestions about how their working method could be improved (e.g. sample size on reliability) • Uses results to identify when further tests and observations might be needed • Uses test results to make predictions and to set up further comparative and fair tests



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Year 5 Combined topics: Living things and their habitats including statement from Animals including humans to enable progression within a topic and greater coherence between ideas	
Slightly below ARE	<ul style="list-style-type: none"> sequence the life cycles of a variety of plants and animals name the parts of a flower name the parts of the human reproductive system identify ways in which the appearance of humans changes as they get older identify some characteristics that will not change with age recognise stages in growth and development of humans including puberty
Broadly within ARE	<ul style="list-style-type: none"> recognise the similarities in the life cycles of plants, animals and humans describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird describe the functions of some parts of a flower describe the main functions of parts of a plant involved in reproduction describe the processes of sexual and asexual reproduction in plants describe the simple functions of parts of the human reproductive system describe the life process of reproduction in some plants and animals compare methods of seed dispersal know that most animals reproduce by sexual reproduction describe the changes as humans develop to old age (Teacher note: statement taken from year 5 'Animals including humans' programme of study)
Above ARE	<ul style="list-style-type: none"> compare internal and external fertilisation in animals explain that living things need to reproduce if the species is to survive compare gestation periods (pregnancy) of different animals explain what is unusual about the life cycle of a kangaroo or koala
Year 5 Materials-Properties of Materials	
Slightly below ARE	<ul style="list-style-type: none"> observe and explore the properties of materials (e.g. hardness, transparency, magnetism, electrical and thermal conductivity) identify some materials that are good thermal insulators and some everyday uses of these recognise that metals are both good thermal and good electrical conductors recognise that salt or sugar dissolves in water but sand won't recognise that dissolving is a reversible change recognise that changes of state are reversible recognise the hazards of burning materials
Broadly within ARE	<ul style="list-style-type: none"> suggest why particular materials are used for different jobs depending on their properties 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 give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic name some materials that will and some that will not dissolve in water recognise that although it is not possible to see a dissolved solid, it remains in the solution describe melting and dissolving and give everyday examples of each identify and explore factors that affect the rate at which a solid dissolves separate an undissolved solid from a liquid by filtering recognise that an undissolved solid can be separated from liquid by filtering recognise that a solid can be recovered from a solution by evaporation describe the properties of mixtures which can be separated by filtration describe some methods that are used to separate simple mixtures explain that when solids dissolve they break up so small they can pass through the holes in the filter paper know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution use knowledge about how a specific mixture can be separated to suggest ways in which other similar mixtures might be separated use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating recognise that some changes can be reversed and some cannot demonstrate that dissolving, mixing and changes of state are reversible changes observe and explore a variety of chemical changes (e.g. burning) identify whether some changes are reversible or not classify some changes as reversible (e.g. dissolving) and others as irreversible (e.g. burning) recognise that irreversible changes often make new and useful materials describe what happens when acid and bicarbonate of soda are mixed
	<ul style="list-style-type: none"> explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda explain that in some cases the new materials made are gases and identify some evidence for the production of gases (e.g. vigorous bubbling)
Above ARE	<ul style="list-style-type: none"> describe the difference between melting and dissolving recognise that inks and dyes are often mixtures of different colours and these can be separated by chromatography explain why ink or dye moves up the paper in chromatography describe the properties of new materials (e.g. aerogel, silly putty, wrinkle-free cotton) explain why some materials are good thermal insulators
Year 5 Earth and Space	
Slightly below ARE	<ul style="list-style-type: none"> identify and name the components of the solar system (i.e. Sun, Moon, Earth and other planets) locate the Sun, Earth and other planets in the solar system recognise that the Earth and other planets orbit the Sun recall that the Earth takes one year to orbit the Sun recall that the Earth rotates on its axis and this takes one day recognise that the Moon orbits the Earth recall that a shadow from the Sun changes over the course of a day
Broadly within ARE	<ul style="list-style-type: none"> describe the movement of the Earth, and other planets, relative to the Sun in the solar system describe the movement of the Moon relative to the Earth describe the Sun, Earth and Moon as approximately spherical bodies recognise that the Earth, Sun and Moon are spherical and support this with some evidence recognise that it is daylight in the part of the Earth facing the Sun explore and describe how a shadow from the Sun changes over the course of a day explain in terms of the rotation of the Earth why shadows change and the Sun appears to move across the sky during the course of the day use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky explain why it is night time in Australia when it is day time in England
Above ARE	<ul style="list-style-type: none"> explain that gravity is a force of attraction and it is what holds the planets in orbit around the Sun and the Moon in orbit around the Earth explain that the changes in the appearance of the Moon over a period of 28 days arise from the Moon orbiting the Earth once every 28 days use simple physical models to explain effects that are caused by the movement of the Earth explain how ideas about the solar system have changed over time
Year 5 Forces	
Slightly below ARE	<ul style="list-style-type: none"> identify that force is measured in Newtons name simple forces such as gravity, friction and air resistance recognise that more than one force can act on an object recognise that air resistance slows things down recognise that friction can be useful or not useful
Broadly within ARE	<ul style="list-style-type: none"> identify weight as a force draw force diagrams with arrows showing the direction of forces acting on an object observe and explore the effect of several forces on objects identify the effects of air resistance, water resistance and friction, that act between moving surfaces describe some situations in which there is more than once force acting on an object describe and explain the motion of some familiar objects in terms of several forces acting on them identify forces on an object as either balanced or unbalanced use the terms 'balanced' and 'unbalanced' when describing several forces on an object explain that balanced forces on an object cause it to remain stationary or travel at the same speed explain that unbalanced forces on an object cause it to speed up, change shape or slow down explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object understand that air resistance is the frictional force of air on objects moving through it describe some of the factors that increase friction between solid surfaces and increase air and water resistance describe situations in which frictional forces are helpful as well as those in which frictional forces are unhelpful explore the effects of levers, pulleys and gears recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect
Above ARE	<ul style="list-style-type: none"> describe how levers, pulleys and gears are used in everyday life (e.g. having gears can make it easier to pedal a bike, a bottle opener makes it easier to open a bottle lid) explain how introducing gears onto bikes has changed cycling compare the tread on bicycle tyres according to how much friction they need identify streamlined objects and describe why they have been designed in this way (e.g. cycling helmets, formula 1 cars, dolphins)



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Beacon 3 (bold skills are statutory and a key focus)		Year 6
Working Scientific Enquiry Skills	Ideas and Questioning	<ul style="list-style-type: none"> • Uses their scientific experiences to explore ideas and raise different types of questions • Talks about how scientific ideas have developed over time • Recognises the applications of specific scientific ideas
	Planning	<ul style="list-style-type: none"> • Selects and plans different types of scientific enquiries to answer questions • Makes decisions about what observations to make, what measurements to use, how long to make them for and whether to repeat them • Chooses the most appropriate equipment to make measurements • Explains how to use the equipment accurately • Recognises when and how to set up comparative and fair tests • Recognises and controls variables where necessary (e.g. explains which variables need to be controlled and why) • Takes measurements, in standard units, using a range of scientific equipment, with increasing accuracy and precision
	Obtaining and Presenting Evidence	<ul style="list-style-type: none"> • Takes repeat readings where appropriate • Recognises which secondary sources will be most useful to research their ideas • Begins to separate opinion from fact • Records data and results of increasing complexity • Decides how to record data from a choice of familiar approaches • Calculates mean value where appropriate
	Considering and Evaluating Evidence	<ul style="list-style-type: none"> • Records and presents findings using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs • Reports on findings from enquiries, using relevant scientific language and conventions, in oral and written explanations such as displays and other presentations • Uses and develops keys and other information records to identify, classify and describe living things and materials • Identifies conclusions, causal relationships and explanations of results • Identifies patterns that might be found in the natural environment • Draws valid conclusions, explains and interprets the results (including the degree of trust) using scientific knowledge and understanding (e.g. recognises limitations of data) • Identifies scientific evidence that has been used to support or refute ideas or arguments • Uses relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas • Makes practical suggestions about how their working method could be improved (e.g. sample size on reliability) • Uses results to identify when further tests and observations might be needed • Uses test results to make predictions and to set up further comparative and fair tests



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Year 6 Animals including humans	
Below ARE	<ul style="list-style-type: none"> identify and name the parts of the circulatory system know that the heart is made of muscle state how to measure pulse rate recognise that pulse rate is a measure of how fast the heart is beating identify some of the harmful effects of smoking identify food as a fuel for the body
Broadly within ARE	<ul style="list-style-type: none"> describe what the heart and blood vessels do identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood discover that during exercise the heart beats faster to take blood more rapidly to the muscles make careful measurements of pulse rate describe the different functions of the blood (e.g. transporting and protecting) know that the blood comes from the heart in arteries and returns to the heart in veins know that blood carries oxygen and other essential materials around the body recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function describe the ways in which nutrients and water are transported within animals, including humans recognise that care needs to be taken with medicines and that they can be dangerous give several reasons why it is sometimes necessary to take medicines identify some harmful effects of drugs name the major groups into which food is categorised and identify sources for each group describe the main function of organs of the human body
Above ARE	<ul style="list-style-type: none"> explain the effect of diet on particular organs of the body / aspects of health explain the effect of exercise on particular organs of the body/aspects of health explain how ideas about the circulatory system have changed over time explain how ideas about smoking have changed over time explain why advice on diet changes (e.g. butter vs margarine, five a day, tax on sugary drinks)
Year 6 Living things and their habitats	
Slightly below ARE	<ul style="list-style-type: none"> recognise that there is a wide variety of living things identify vertebrates and invertebrates name and describe the five vertebrate groups understand there are living things that are too small to be seen and these can affect our lives recognise that there are many micro-organisms, some which can cause illness or decay
Broadly within ARE	<ul style="list-style-type: none"> understand why classification is important describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals give reasons for classifying plants and animals based on specific characteristics recognise that there are useful micro-organisms which can be used in food production describe how micro-organisms feed, grow and reproduce like other organisms describe evidence, from investigations, that yeast is living explain how micro-organisms can move from one food source to another or from one animal to another
Above ARE	<ul style="list-style-type: none"> devise own keys to classify organisms and objects describe early ideas about classification (e.g. Aristotle) compare the rate of reproduction in microorganisms to other animals describe how the development of the microscope has contributed to our understanding of microorganisms describe how ideas about hygiene have changed over time (e.g. Semmelweis)
Year 6 Evolution and Inheritance	
Slightly below ARE	<ul style="list-style-type: none"> recognise variation in different species (e.g. dogs, horses) describe how animals and plants are adapted to their environments recognise that animals have to compete for food describe how animals avoid predators (e.g. speed, camouflage) recognise that offspring have some of the features of their parents
Broadly within ARE	<ul style="list-style-type: none"> recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution

	<ul style="list-style-type: none"> explain how being well adapted to an environment means an organism is more likely to survive recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago explain why we do not have a complete fossil record
Above ARE	<ul style="list-style-type: none"> explain that animals which are better adapted to an environment are more likely to survive, reproduce and pass on characteristics to their offspring meaning the animal species will gradually change and evolve (Giraffe with the tallest neck could reach more leaves to feed on) describe the story of the peppered moth and how this provides evidence for natural selection explain how antibiotic resistant bacteria provide evidence for natural selection explain why we can see evidence for natural selection in fast reproducing organisms like bacteria (e.g. antibiotic resistant bacteria and pesticide resistant insects) explain how the introduction of a new species to an isolated environment can affect native species (e.g. Dodo, Kakapo or Stephen's Island Wren) compare the ideas of Darwin and Lamarck about evolution
Year 6 Light	
Slightly below ARE	<ul style="list-style-type: none"> describe reflection as light 'bouncing off' objects explore how light travels using torches and periscopes
Broadly within ARE	<ul style="list-style-type: none"> understand that in order to be seen, all non-luminous objects must reflect light recognise that light appears to travel in straight lines diagrammatically represent light from sources and bouncing off reflective surface using arrows explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes draw diagrams to illustrate how light is travelling from the source to the eye 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 describe a variety of ways of changing the size of the shadow produced by an object describe the relationship between the size of a shadow and the distance between the light source and an object diagrammatically represent the formation of shadows using arrow convention use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them
Above ARE	<ul style="list-style-type: none"> know that, when sunlight passes through some objects, coloured light is produced (for example in rainbows, soap bubbles and prisms) describe how curved mirrors distort a reflection
Year 6 Electricity	
Slightly below ARE	<ul style="list-style-type: none"> know that the 'amount' of electricity (voltage) depends on the number of batteries construct some working series circuits with specified components recognise conventional circuit symbols
Broadly within ARE	<ul style="list-style-type: none"> use recognised symbols when representing a simple circuit in a diagram draw circuit diagrams and construct circuits from diagrams using conventional symbols explore how to change the brightness of bulbs and the volume of a buzzer recall what causes the brightness of bulbs or the volume of a buzzer to change compare different circuits (e.g. for brightness of bulb) recall that the amount of electricity is measured in voltage associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit 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
Above ARE	<ul style="list-style-type: none"> explore the effect of thickness of a wire in a circuit describe the differences between wires usually used for circuits and fuse wires describe what would happen if all lights in a home were connected in the same circuit and one broke explain current in circuits using simple models and analogies (e.g. piped water, bicycle chain, children and sweets)

Featherstone Wood Primary School Creative Curriculum

Long Term Planning Science

We have identified these learning values as intrinsic to supporting the needs of children in our school: *Reflectiveness; Risk-Taking; Stick-Ability; Communication;*

Community Values; Inquisitiveness; Independence; Working Collaboratively National Curriculum Coverage

