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	KS1		KS2		
	Hedgehog	**Fox**	**Badger**	**Otter**	**Deer**
Breadth of Study	**Autumn and Winter** **Everyday materials** **Winter and Spring** **Animals including humans** **Plants** **Spring and Summer**	**Everyday Materials** **Animals, including humans** **Habitats** **Living Things** **Plants**	**Animals including humans:** Teeth and Digestion **Living Things** Classification and Environment **Animals including Humans** Food Chains **Sound:** Vibrations and pitch **Electricity** **States of Matter:** Solids, liquids and gases	**Living things: Classification** **Animals including humans:** **Digestion** **Sound** **Animals including humans:** **Food chains** **States of matter:** Condensation and evaporation **Electricity**	**Animals, including humans** **Evolution and inheritance** **Living things** **Light** **Electricity**
Working scientifically	**Years 1 and 2** Children should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content: ● 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.		**Years 3 and 4** Children should be taught to use the following practical scientific methods, processes and 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		

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			● using straightforward scientific evidence to answer questions or to support their findings **Years 5 and 6** Children should be taught to use the following practical scientific methods, processes and 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 ● 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 ● identifying scientific evidence that has been used to support or refute ideas or arguments.	
Knowledge and Understanding	**Plants** Children should use the local environment throughout the year to explore and answer questions about plants growing in their habitat. Where possible, they should observe the growth of flowers and vegetables that they have planted. They should become familiar with common names of flowers, examples of deciduous and evergreen trees, and plant structures (including *leaves*, *flowers* (*blossom*), *petals*, *fruit*, *roots*, *bulb*, *seed*, *trunk*, *branches*, *stem*). Children might work	**Everyday Materials** Children should identify and discuss the uses of different everyday materials so that they become familiar with how some materials are used for more than one thing (metal can be used for coins, cans, cars and table legs; wood can be used for matches, floors, and telegraph poles) or different materials are used for the same thing (spoons can be made from plastic, wood, metal, but not normally from glass). They should think about the properties of materials that make them suitable or unsuitable for particular purposes and they should be encouraged to think about unusual and creative uses for	**Animals including humans:** Children should be introduced to the main body parts associated with the digestive system and explore questions that help them to understand their special functions. Children might work scientifically by: comparing the teeth of carnivores and herbivores, and suggesting reasons for differences; finding out what damages teeth and how to look after them. They might draw and discuss their ideas about the digestive system and compare them with models or images. **Living Things** Children should use the local environment throughout the year to raise and answer questions that help them to identify and study plants and animals in their habitat. They should identify how the habitat changes throughout the year. Children should explore possible ways of grouping a wide selection of living things. Children could begin to put vertebrate animals into groups such as fish, amphibians, reptiles, birds, and mammals; and invertebrates into snails and slugs, worms, spiders, and insects. Children should explore examples of human impact (both positive and negative) on environments, for example, the positive effects of nature reserves, ecologically planned parks, or garden ponds, and the negative effects of population and development, litter or deforestation. Children might work scientifically by: using and making simple guides	**Animals, including humans** Children should build on their learning from Years 3 and 4 about the main body parts and internal organs to explore and answer questions that help them to understand how the circulatory system enables the body to function. Children should learn how to keep their bodies healthy and how their bodies might be damaged. Children might work scientifically by: exploring the work of scientists and scientific research about the relationship between diet, exercise, drugs, lifestyle and health. **Evolution and inheritance** Building on what they learned about fossils in the topic on rocks in Year 3, children should

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	scientifically by: observing closely, perhaps using magnifying glasses, and comparing and contrasting familiar plants; describing how they were able to identify and group them, and drawing diagrams showing the parts of different plants and trees. Children might keep records of how plants have changed over time, for example the leaves falling off trees and buds opening; and compare and contrast what they have found out about different plants. **Animals including humans** Children should use the local environment throughout the year to explore and answer questions about animals in their habitat. They should understand how to take care of animals taken from their local environment and the need to return them safely after study. Children should become familiar with the common names of some fish, amphibians, reptiles, birds and mammals, including those that are kept as pets. Children should have plenty of opportunities to learn	everyday materials. Children might find out about people who have developed useful new materials, for example John Dunlop, Charles Macintosh or John McAdam. Children might work scientifically by: comparing the uses of everyday materials in and around the school with materials found in other places (at home, the journey to school, on visits, and in stories, rhymes and songs); observing closely, identifying and classifying the uses of different materials, and recording their observations. **Animals, including humans** Children should be introduced to the basic needs of animals for survival, as well as the importance of exercise and nutrition for humans. They should also be introduced to the processes of reproduction and growth in animals. The focus at this stage should be on questions that help children to recognise growth; they should not be expected to understand how reproduction occurs. The following examples might be used: egg, chick, chicken; egg, caterpillar, pupa, butterfly; spawn, tadpole, frog; lamb, sheep. Growing into adults can include reference to baby, toddler, child, teenager, adult.	or keys to explore and identify local plants and animals; making a guide to local living things; raising and answering questions based on their observations of animals and what they have found out about other animals that they have researched. **Sound:** Children should explore and identify the way sound is made through vibration in a range of different musical instruments from around the world; and find out how the pitch and volume of sounds can be changed. Children might work scientifically by: finding patterns in the sounds that are made by different objects such as saucepan lids of different sizes or elastic bands of different thicknesses. They might make earmuffs from a variety of different materials to investigate which provides the best insulation against sound. They could make and play their own instruments by using what they have found out about pitch and volume. **Electricity** Children should construct simple series circuits, trying different components, for example, bulbs, buzzers and motors, and including switches, and use their circuits to create simple devices. Children should draw the circuit as a pictorial representation, not necessarily using conventional circuit symbols; these are introduced in Year 6. Children might work scientifically by: observing patterns, for example, that bulbs get brighter if more cells are added, that metals tend to be conductors, and that some materials can be used to connect across a gap in a circuit. **States of Matter:** Children should explore a variety of everyday materials and develop simple descriptions of the states of matter (solids hold their shape; liquids form a pool not a pile; gases escape from an unsealed container). Children should observe water as a solid, a liquid and a gas and should note the changes to water when it is heated or cooled. Children might work scientifically by: grouping and classifying a variety of different materials; exploring the effect of temperature on substances such as chocolate, butter, and cream. They could research the temperature at which materials change state, for example, when iron melts or when oxygen condenses into a liquid. They might observe and record evaporation over a period of time, for example, a puddle in the playground or washing on a line, and investigate the effect of temperature on washing drying or snowmen melting.	find out more about how living things on Earth have changed over time. They should be introduced to the idea that characteristics are passed from parents to their offspring, for instance by considering different breeds of dogs, and what happens when, for example, labradors are crossed with poodles. They should also appreciate that variation in offspring over time can make animals more or less able to survive in particular environments, for example, by exploring how giraffes' necks got longer, or the development of insulating fur on the arctic fox. Children might find out about the work of palaeontologists such as Mary Anning and about how Charles Darwin and Alfred Wallace developed their ideas on evolution. Children might work scientifically by: observing and raising questions about local animals and how they are adapted to their environment; comparing how some living things are adapted to survive in extreme conditions, for example, cactuses, penguins and camels. They might analyse the advantages and disadvantages of specific adaptations, such as being on two feet rather than four, having a long or a short beak, having gills or lungs, tendrils on climbing plants, brightly coloured and scented flowers. **Living things** Children should build on their

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	the names of the main body parts (including *head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth, teeth*) through games, actions, songs and rhymes. Children might work scientifically by: using their observations to compare and contrast animals at first hand or through videos and photographs, describing how they identify and group them; grouping animals according to what they eat; and using their senses to compare different textures, sounds and smells. **Everyday materials** Children should explore, name, discuss and raise and answer questions about everyday materials so that they become familiar with the names of materials and properties such as: *hard/soft; stretchy/stiff; shiny/dull; rough/smooth; bendy/not bendy; waterproof/not waterproof; absorbent/not absorbent; opaque/transparent*.	Children might work scientifically by: observing, through video or first-hand observation and measurement, how different animals, including humans, grow; asking questions about what things animals need for survival and what humans need to stay healthy; and suggesting ways to find answers to their questions. **Habitats** Children should be introduced to the idea that all living things have certain characteristics that are essential for keeping them alive and healthy. They should raise and answer questions that help them to become familiar with the life processes that are common to all living things. Children should be introduced to the terms 'habitat' (a natural environment or home of a variety of plants and animals) and 'micro-habitat' (a very small habitat, for example for woodlice under stones, logs or leaf litter). They should raise and answer questions about the local environment that help them to identify and study a variety of plants and animals within their habitat and observe how living things depend on each other, for example, plants serving as a source of food and shelter for animals. Children should compare animals in		learning about grouping living things in Year 4 by looking at the classification system in more detail. They should be introduced to the idea that broad groupings, such as microorganisms, plants and animals can be subdivided. Through direct observations where possible, they should classify animals into commonly found invertebrates and vertebrates. They should discuss reasons why living things are placed in one group and not another. Children might find out about the significance of the work of scientists such as Carl Linnaeus. Children might work scientifically by: using classification systems and keys to identify some animals and plants in the immediate environment. They could research unfamiliar animals and plants from a broad range of other habitats and decide where they belong in the classification system. **Light** Children should build on the work on light in Year 3, exploring the way that light behaves, including light sources, reflection and shadows. They should talk about what happens and make predictions. Children might work scientifically by: deciding where to place rear-view mirrors on cars; designing and making a periscope and using the idea that light appears to travel in straight lines to explain how it

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	Children should explore and experiment with a wide variety of materials, not only those listed in the programme of study, but including for example: brick, paper, fabrics, elastic, foil. Children might work scientifically by: performing simple tests to explore questions, for example: *What is the best material for an umbrella? … for lining a dog basket? … for curtains? … for a bookshelf? … for a gymnast's leotard?* ***Seasonal changes*** Children should observe and talk about changes in the weather and the season. Children should observe and talk about changes in the weather and the season. Children might work scientifically by: making tables and charts about the weather; and making displays of what happens in the world around them, including day length, as the seasons change.	familiar habitats with animals found in less familiar habitats, for example, on the seashore, in woodland, in the ocean, in the rainforest. Children might work scientifically by: sorting and classifying things according to whether they are living, dead or were never alive, and recording their findings using charts. They should describe how they decided where to place things, exploring questions for example: *Is a flame alive? Is a deciduous tree dead in winter?* and talk about ways of answering their questions. They could construct a simple food chain that includes humans (e.g. grass, cow, human). They could describe the conditions in different habitats and micro-habitats (under log, on stony path, under bushes) and find out how the conditions affect the number and type(s) of plants and animals that live there. **Living Things** Children should be introduced to the idea that all living things have certain characteristics that are essential for keeping them alive and healthy. They should raise and answer questions that help them to become familiar with the life processes that are common to all living things.		works. They might investigate the relationship between light sources, objects and shadows by using shadow puppets. They could extend their experience of light by looking at a range of phenomena including rainbows, colours on soap bubbles, objects looking bent in water and coloured filters (they do not need to explain why these phenomena occur). **Electricity** Building on their work in Year 4, children should construct simple series circuits, to help them to answer questions about what happens when they try different components, for example, switches, bulbs, buzzers and motors. They should learn how to represent a simple circuit in a diagram using recognised symbols. Children might work scientifically by: systematically identifying the effect of changing one component at a time in a circuit; designing and making a set of traffic lights, a burglar alarm or some other useful circuit.

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		Children should be introduced to the terms 'habitat' (a natural environment or home of a variety of plants and animals) and 'micro-habitat' (a very small habitat, for example for woodlice under stones, logs or leaf litter). They should raise and answer questions about the local environment that help them to identify and study a variety of plants and animals within their habitat and observe how living things depend on each other, for example, plants serving as a source of food and shelter for animals. Children should compare animals in familiar habitats with animals found in less familiar habitats, for example, on the seashore, in woodland, in the ocean, in the rainforest. Children might work scientifically by: sorting and classifying things according to whether they are living, dead or were never alive, and recording their findings using charts. They should describe how they decided where to place things, exploring questions for example: *Is a flame alive? Is a deciduous tree dead in winter?* and talk about ways of answering their questions. They could construct a simple food chain that includes humans (e.g. grass, cow, human). They could describe the conditions in		

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		different habitats and microhabitats (under log, on stony paths, under bushes) and find out how the conditions affect the number and type(s) of plants and animals that live there. **Plants** Children should use the local environment throughout the year to observe how different plants grow. Children should be introduced to the requirements of plants for germination, growth and survival, as well as to the processes of reproduction and growth in plants. Children might work scientifically by: observing and recording, with some accuracy, the growth of a variety of plants as they change over time from a seed or bulb, or observing similar plants at different stages of growth; setting up a comparative test to show that plants need light and water to stay healthy.		
Threshold Concepts	Identifying, Classifying and Grouping, Observing over time, Comparative and fair testing ,Pattern Seeking Animals and Humans, Plants and Habitats, Health and Evolution, Electricity and Light, Materials, Rocks and Space, States of Matter, Weather and Water Cycles.			
Conceptual Vocabulary	**Plants** bark, branches, trunk, deciduous, evergreen, root, stem, leaf, flower, seed, root, seedling, stalk,	**Everyday Materials** waterproof, absorbent, materials, brick, stone, concrete, slate, metal, plastic, glass, wood, fabric,	**Animals including humans:** balanced diet, canine, carnivore, herbivore, incisor, molar, enamel, dentine, decay, milk teeth, bitter, salty, sour, sweet, anus, digestive system, intestine, mouth, oesophagus, saliva, tongue, faeces, fibre, rectum, absorb	**Animals, including humans** nutrition, digestion, protein, carbohydrates, vitamins, minerals, molars, incisors, canines, artery, vein,

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	germinate, bud, petal, nectar, insect, scent **Spring and Summer** life cycle, adult frog, frogspawn, tadpole, froglet, gills, tail, nesting, courtship, breeding, brooding, incubating, hatching, sun, shadow, sunlight, direction, length, wind, wind sock, air pressure, anemometer, water vapour, cumulus, stratus, cirrus, nimbus, prism, spectrum, season, autumn, winter, spring, summer, **Animals including humans** temperature, blood, heart, lungs, bone, skeleton, sweet, sour, bitter, salty, volume, loud, quiet, pupil, iris, texture, rough, smooth, soft, hard, spongy, mammal, reptile, amphibian, fish, bird, feather, beak, bill, wing, egg, habitat, amphibian **Autumn and Winter** spring, summer, autumn, winter, season, sun, shadow, sunlight, direction, length, sunrise, dawn, dusk, sunset, dusk, midday, noon, higher, lower, east, west, precipitation, rainfall, rain gauge, thermometer, weather vane, nocturnal, Celsius, insulation,	cotton, wool, linen, polyester, fibres, man-made, temperature, metal, silver, iron, steel, gold, brass, copper, tin, lead, bark, grain, texture, insulate **Animals, including humans** growth, babies, toddlers, adults, carnivore, herbivore, mammal, amphibian, tadpole, frogspawn, froglet, caterpillar, pupa, metamorphosis, feathers, beaks, nests, eggs, fledglings, protein, carbohydrate, fruit, vegetables, teeth, lower jaw, upper jaw, arms, legs, heart, mouth, lungs, heart, lungs, muscle, pulse rate **Habitats** animal, bird, insect, habitat, rainforest, desert, fish, mammal, reptile, crustacean, herbivore, life cycle, pollination, germination, food chain, carnivore, omnivore, predator **Living Things** arms, legs, head, mouth, ankle, knee, elbow, height, weight, breathing, plant, eating, animal, mammal, insect, bird, reptile, reproducing, backbone, plant, reptile, amphibian,	**Living things** Animal, flower, group, plant, leaf, root, skeleton, stem, sepal, stamen, stigma, deciduous, dormant, evergreen, hibernate, migrate, amphibian, backbone, mammal, reptile,vertebrate, invertebrate, classification, habitat **Animals including Humans (Food chains)** Habitat, micro-habitat, organism, moisture, shelter, consumer, producer, predator, prey, carnivore, herbivore, omnivore, camouflage, adaptation, competition, insecticide, pesticide, survival **Sound** Ear, sound, source, material, ripple, wave, vibration, amplify, volume, distance, echo, insulate, soundproof, pitch, tension **Electricity** Force, magnetic, generate, power, battery, current, bulb, circuit, crocodile clip, filament, wire, buzzer, motor, switch, conductor, insulator **States of Matter** fabric, glass, material, metal, particle, plastic, property, hard, liquid, pour, runny, soft, solid, magnify, carbon dioxide, compress, flow, bubble dissolve, foam, freeze, melting point, solidify, Celsius, thermometer, probe, evaporate, condensation, condense, evaporation, water cycle	capillary, blood vessel, pulse rate, heart rate **Evolution and inheritance** variation, species, genes, genetic, adaptations, predator, carnivore, camouflage, prey, defence, variable, Charles Darwin, fossils, evidence, natural selection, survival, competition, primates, homo sapiens **Living things** biodiversity, ecology, classify, habitat, kingdoms, domain, organism, taxonomy, species, microbe, biodegradable, bacteria **Light** source, reflect, transparent, translucent, opaque, luminous, iris, pupil, lens, retina, optic nerve, reflection, scatter, ray, angle of incidence, prism, spectrum, silhouette, refraction **Electricity** conductor, insulator, cell, battery, switch, current, bulb, motor, component, circuit diagram, resistance, resistor, voltage, buzzer

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	heat loss, evaporation, perspiration, migration, climate, northern hemisphere, southern hemisphere **Everyday materials** stretchy, bendy, flexible, rigid, mould, hard, material, rough, smooth, strong, cold, warm, natural, metal, glass, plastic, brick, clay, wood, wax, paper, stone, concrete, tarmac, magnet, magnetic, attracts, attraction, repels, waterproof, investigate, fair test, predict **Winter and Spring** temperature, ice, snow, frost, frozen, slide, speed, deciduous, evergreen, migration, hibernation, wildlife, food, winter, ice, snow, nest, habitat, climate hibernating, body temperature	mammal, insect, bird, stem, root, flower, leaf, seed, germinate, shelter, food, climate,hygiene, exercise, diet, smelling, tasting, hearing, seeing, touching, **Plants** petal, stamen, stigma, pollen, root, stem, flower, seed, leaf, reproduce, pollen, pollinate, germinate, herbivores, carnivores, planting		