Science Knowledge and Skills Progression Map

	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Working Scientifically	Understand 'why' questions, like: "Why do you think the caterpillar got so fat?" Talk about what they see, using a wide vocabulary Explore how things work	Answer simple questions stimulated by observations & exploration of their world e.g. Why a stone lying on the ground does not move? 'Why did that get hot?" Present evidence in templates provided for them and make simple observations e.g. use a simple tally of boy v girls in class. Which is the majority gender? Use evidence to ask questions and recognise that they can be answered in different ways e.g. Q. 'How do you know which one is waterproof?' Draw on their everyday experience to help answer questions e.g. explains that rain makes them wet.. Vocabulary: Questions, answers, equipment gather, measure, record results, sort, group, test explore, observe, compare describe,	Make some suggestions about how to find things out or how to collect data to answer a question. Compare objects, materials and living things e.g. compare the limbs of different animals; texture/hardness of different material. Use and interpret simple tables where appropriate e.g. blocks graphs, pictograms. Use what they see and their own ideas to suggest answers to questions e.g. says that a plant will die without water. Vocabulary: Pictogram, tally chart, block diagram, Venn diagram, table, chart, order, observe changes over time, notice patterns	Use straightforward scientific evidence to answer questions, or to support findings eg "How do you think changing the amount of light will affect the plant"? Suggest answers or solutions to questions/problems given to them. Answer questions such as: "How could we keep it hotter for longer?" Present simple data in a variety of ways, using that data to identify findings. Choose, from a list, at least one variable that needs to be kept the same in an investigation to make it a fair test e.g. same distance when timing cars down a ramp. Identify straightforward Patterns in observations or in data presented in tables, pie and bar charts e.g. Identify which food was the best source of energy from a bar chart. Choose correct equipment from a given list, or content from information provided, to investigate a question/idea e.g. beaker	Recognise scientific evidence that is for or against an argument, or supports a Scientific idea or not e.g. evidence for how sound travels through different materials. Use 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. Draw tables & bar charts to present simple data. Vocabulary: Increase, decrease, appearance	Recognise that scientific ideas change and develop over time sometimes refuting or supporting previous understanding e.g. evidence for or against global warming. Give examples of where science cannot answer all our questions. e.g. Is there life on other planets? Identify the main variables that may affect investigative results and select which ones to change or keep the same e.g. how forces affect elastic materials. Suggest different possible conclusions from the same range of evidence (pri or sec) Come up with alternative conclusions…"What could this show? What else could it show?" Identify the evidence used in making a conclusion e.g. UK diet is the least healthy. Vocabulary: Opinion/fact,	Interpret data from tables, bar & line graphs etc…to draw conclusions consistent with the evidence e.g. Use graphs & charts to describe the effects of diet on health. Evaluate practical investigation methods and suggest improvements. e.g. Describe some strengths and weaknesses of the plan/method. Make a comment on reliability. Use clear sentences and correct scientific words and symbols to describe ideas and observations e.g. Describe heat transfer using correct wording. Make sets of observations or measurements and say what the range and intervals are e.g. record a set of results and state the highest, lowest measurement. Vocabulary: As for all previous year groups.

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		similar/similarities different/differences		to heat water, thermometer to measure temp. Vocabulary: Types of scientific enquiry, changes, comparative tests, fair tests, careful, accurate, observations, present, data/evidence/results, keys, bar charts table, results, conclusions, prediction		variables independent variable dependent variable controlled variable, accuracy precision, degree of trust	
Plants	Plant seeds and care for growing plants Understand the key features of the life cycle of a plant and an animal	Describe the basic structure of a variety of common flowering plants, including trees e.g. a plant has leaves and roots etc… Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. Vocabulary: Leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud	Describe how seeds and bulbs grow into mature plants eg Seeds and bulbs need water to grow but most do not need light. Describe how plants need water, light and a suitable temperature to grow and stay healthy e.g. says that a plant will die without water. Vocabulary: As for year 1 plus - light, shade, sun, warm, cool, water, grow, healthy, germinate	Identify & describe the functions of different parts of flowering plants: roots, stem/trunk, leaves & flowers e.g. leaves are for nutrition & flowers for reproduction. Know the requirements of plants for life and growth e.g. air, light, water, nutrients from soil, and room to grow and how they vary from plant to plant. Describe the way in which water is transported within plants. Understand the part that flowers play in the life cycle of flowering plants eg pollination, seed formation and seed dispersal. Vocabulary: Photosynthesis, pollen, insect/wind pollination,	Plants can be grouped into flowering and non-flowering plants, such as ferns and mosses.	Relate knowledge of plants to studies of all living things.	Relate knowledge of plants to studies of evolution and inheritance.

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				seed formation, seed dispersal – wind dispersal, animal dispersal, water dispersal			
Living things	Begin to understand the need to respect and care for the natural environment and all living things Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experience		Explore and compare the differences between things that are living, dead, and things that have never been alive 'Is a flame alive? Is a deciduous tree dead in winter? Identify that most living things live in habitats to which they are suited eg on the seashore, in woodland, in the ocean, in the rainforest. Describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other. Identify and name a variety of plants and animals in their habitats, including micro-habitats e.g. woodlice under stones, logs or leaf litter. Recognise a variety of ways in which living things can be grouped e.g. vertebrate animals groups such as fish, amphibians, reptiles, birds, and mammals.		Recognise a variety of ways in which living things can be grouped e.g. vertebrate animals groups such as fish, amphibians, reptiles, birds, and mammals. Use classification keys to help group, identify and name a variety of living things. Recognise that environments can change and that this can sometimes pose dangers to living things eg the positive effects of a nature reserve. Vocabulary: Classification, classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate	Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. Describe the life process of reproduction in some plants and animals e.g. sexual reproduction in animas. Vocabulary: Life cycle, reproduce, sexual, sperm, fertilises, egg, live young, metamorphosis, asexual, plantlets, runners, bulbs, cuttings	Describe how living things are classified into broad groups according to common Characteristics based on similarities & diffs, including micro-organisms, plants & animals. Give reasons for classifying plants and animals based on specific characteristics. Vocabulary: Vertebrates, fish, amphibians, reptiles, birds, mammals, invertebrates, insects, spiders, snails, worms, flowering and nonflowering

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			Use classification keys to help group, identify and name a variety of living things. Recognise that environments can change and that this can sometimes pose dangers to living things eg the positive effects of a nature reserve. Vocabulary: Classification, classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. Describe the life process of reproduction in some plants and animals e.g. sexual reproduction in animas. Vocabulary: Life cycle, reproduce, sexual, sperm, fertilises, egg, live young, metamorphosis, asexual, plantlets, runners, bulbs, cuttings Describe how living things are classified into broad groups according to common Characteristics based on similarities & diffs, including microorganisms, plants & animals. Give reasons for classifying plants and animals based on specific characteristics.				

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			Vocabulary: Vertebrates, fish, amphibians, reptiles, birds, mammals, invertebrates, insects, spiders, snails, worms, flowering and non-flowering 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. Vocabulary: Living, dead, never been alive, suited, suitable, basic needs, food, food chain, shelter, move, feed, names of local habitats e.g. pond, woodland etc., names of microhabitats e.g. under logs, in bushes etc				
Animals, including Humans (including Evolution and Inheritance)	Make healthy choices about food, activity and tooth brushing Know and talk about different factors that support their overall health and wellbeing Manage their own basic hygiene and personal needs,	Identify and name a variety of common animals that are birds, fish, amphibians, reptiles and mammals. Identify and name a variety of common animals that are carnivores, herbivores and omnivores. Describe and compare the structure of a variety of common animals e.g. birds, fish, amphibians,	Observe that animals, including humans, have offspring which grow into adults. Describe the basic needs of animals, including humans, for survival e.g. the need for water, food and air. Describe the importance for humans of exercise, eating the right amounts of different types of food,	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. Know the main body parts associated with the skeleton & muscles, understanding how different parts of the body have special functions e.g. muscles for movement.	Describe the simple functions of the basic parts of the digestive system in humans e.g. mouth, tongue, teeth, oesophagus, stomach and small and large intestine. Identify the different types of teeth in humans and their simple functions; finding out what damages teeth and how to look after them e.g. the	Describe the changes as humans develop to old age eg Changes experienced in puberty. Vocabulary: Linked to PSHE puberty topic. See RSE policy.	Identify and name the main parts of the human circulatory system and describe the functions of the heart, blood vessels and blood. 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

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	including dressing and going to the toilet Use all their senses in hands-on exploration of natural materials	reptiles, mammals , including pets. Identify, name and label the basic parts of the human body and identify and label which part of the human body is associated with each sense. Vocabulary: Fish, amphibians, reptiles Birds, mammals carnivore, herbivore, omnivores, wild animals, pets, body, head, neck, arms, elbows, legs, knees, face, ears, eyes, eyebrows, eyelashes, nose, hair, mouth, teeth, tongue, feet, toes, fingers, nails, ankle, calf, thigh, hips, waist, trunk, chest, shoulders, back, hands, wrist, tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves, senses, touch, see, smell, taste, hear, fingers (skin), eyes, nose, ear and tongue	and hygiene. eg for nutritional purposes. Can list/draw the things an animal needs to live/survive and understand that they live in different habitats. Vocabulary: Offspring, reproduction, life cycles, babies, young, grow change, adults, older/younger baby/toddler/child/teenager, basic needs, water, food, air, breathing, survival, exercise, food types, fruit and vegetable, bread, rice, potato, pasta, milk and dairy foods, foods high in fat or sugar, meat, fish, egg, beans hygiene, clean, wash, healthy medicine, drugs	Vocabulary: Nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, balanced diet, skeleton, bones, muscles, support, protect, move, skull, ribs, spine, muscles, joints, sockets, tendons	corrosive effect of plaque. Construct and interpret a variety of food chains, identifying producers, predators and prey. Vocabulary: digestive system, digestion, mouth, teeth, canines, incisor molar, pre-molar, saliva tongue, rip, tear, chew, grind, cut, oesophagus (gullet) stomach, small intestine large intestine, rectum anus, , carnivore, herbivore, omnivore, produce, consumer predator, prey, food chain		within animals, including humans. Understand that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. 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. Vocabulary: circulatory and respiratory system, heart, blood, blood vessels, pulse, rate, pumps, oxygen, carbon dioxide, transported, lungs, water, diet, exercise, drugs, lifestyle, evolution, suited/suitable, environment, suited adapted/adaptation, offspring, characteristics, vary/variation inherit/inheritance, fossils

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Materials	Explore collection of materials with similar and/or different properties Talk about the differences between materials and changes they notice	Recognise the basic features of objects and distinguish it from the material from which it is made e.g. a car has tyres, they are made from rubber. Use everyday terms to describe simple features or actions of objects e.g. describes the way vehicles move; how things fall. Identify and name a variety of everyday simple materials eg wood, plastic, glass, metal, water, brick, fabric and rock. Make accurate observations about the differences in simple physical properties of a variety of every day materials e.g. touching materials to describes whether they're hard or soft. Show understanding of which materials are most suitable to different functions e.g. What is the best material from which to make umbrellas? Compare and group together a variety of everyday materials on	Use observations to group objects, living things, or events e.g. groups different animals based on the number of legs, group solids that dissolve or don't. Understands how some materials are used for more than one thing eg metal can be used for coins, cans, cars. Know that the shapes of solid objects made from some materials can be changed by squashing, bending, twisting & stretching. e.g. Observe which materials stretches more. Describe the effects of heating, cooling, stretching, bending and squashing eg Water will boil safely in a metal kettle. It wouldn't if it was made from plastic. Vocabulary: Names of materials – increased range from year 1 Properties of materials - as for year 1 plus opaque, transparent and translucent, reflective, non - reflective, flexible, rigid, shape, push/pushing, pull/puling, twist/twisting, squash/squashing.			Compare & group everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical & thermal), & response to magnets. Know that some materials will dissolve in liquid to form a solution, & describe how to recover a substance from a solution. Recognise that dissolving, mixing and changes of state are reversible changes. Use knowledge of solids, liquids & gases to decide how mixtures might be separated, Including through filtering, sieving and evaporating. Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, wood and plastic. Explain that some changes result in new	

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		the basis of their simple physical properties eg bendy/not bendy materials. Vocabulary: Object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, card/cardboard, rubber, wool, clay, hard, soft, stretchy, stiff, bendy, floppy, waterproof, absorbent, breaks/tears, rough, smooth, shiny, dull, see through, not see through	Bend/bending, stretch/stretching			materials, and that this kind of change is not normally reversible, including changes associated with burning and the action of acid on bicarbonate. Vocabulary: Thermal/electrical insulator/conductor, change of state, mixture, dissolve, solution, soluble, insoluble, filter, sieve reversible/non - reversible change, burning, rusting, new material	
States of Matter	Understand some important processes and changes in the natural world around them, including states of matter				Compare and group materials together, according to whether they are solids, liquids or gasses, exploring the effect of temperature on substances e.g. chocolate. Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. Vocabulary: Solid, liquid, gas, state change, melting, freezing, melting		

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					point, boiling point, evaporation, temperature, water cycle		
Rocks and Soils				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 soils are made from rocks and organic matter. Vocabulary: Rock, stone, pebble, boulder, soil, fossils, grains, crystals, layers, hard/soft, texture, absorb water (porous), let water through (permeable /impermeable), marble, chalk, granite, sandstone, slate, sandy/chalk/clay soil, peat			
Forces and Magnets	Explore and talk about different forces they can feel			Compare how things move on different surfaces and notice that magnetic forces can act without direct contact, unlike most other forces. Observe how magnets attract or repel each other and compare and group together a variety of everyday materials on the basis of whether they		Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. Identify the effects of air resistance, water resistance and friction, that act between moving surfaces.	

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				are attracted to a magnet, and identify some magnetic materials. Predict whether two magnets will attract or repel each other, depending on, for example, which way the poles are facing. Vocabulary: Force, push, pull, twist, contact force, non contact force, magnetic force, magnet, strength, bar magnet, ring magnet, button magnet, horseshoe magnet, attract, repel, magnetic material, metal, iron, steel, non magnetic material, poles north pole, south pole		Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. Vocabulary: Force, gravity, Earth, air resistance, water resistance, friction, mechanisms, simple machines, levers, pulleys, gears	
Light				Recognise that we need light in order to see things but that light from the sun can be dangerous and that dark is the absence of light. Know that light is reflected from surfaces and that shadows are formed when the light from a light source is blocked by a solid object. Vocabulary: Light, light source names of light sources e.g. torch, dark/darkness, reflect, reflective, mirror, shadow, sunlight, dangerous, block, direct/ direction			Recognise that light appears to travel in straight lines. Use the idea that light appears to travel in straight lines to explain that objects are seen because they give out or reflect light into the eye. 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. Us the idea that light travels in straight lines to

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				transparent, opaque, translucent, shiny, mat surface			explain why shadows have the same shape as the object that cast them. Vocabulary: As for year 3 plus straight lines, light rays.
Electricity					Identify common appliances that run on electricity. Identify and name the basic parts of a simple series electric circuit, including cells, wires, bulbs, switches and buzzers. 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. Recognise that a switch opens and closes a circuit and associate this with whether or not the lamp is part of a complete loop with a battery. Recognise some common conductors and insulators and associate metals with being good conductors.		Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of the 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 on/off position of switches. Use recognised symbols when representing a simple circuit in a diagram. Vocabulary: Circuit, complete circuit, circuit diagram, circuit symbol, cell, battery, bulb, buzzer, motor, switch, voltage - NB Children do not need to understand what voltage is but will use volts and voltage to describe different batteries. The words cells and batteries are now used interchangeably

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					Vocabulary: Electricity, electrical appliance/device, mains, plug, electrical circuit, complete circuit, component, cell, battery, positive, negative, connect/connections, loose connection, short circuit, crocodile clip, bulb, switch, buzzer, motor, conductor, insulator, metal, non-metal, symbol		
Sound					Identify how sounds are made, associating some of them with something vibrating e.g. in different musical instruments. Recognise that vibrations from sounds travel through a medium to the ear and identify patterns in the sounds that are made by different objects eg elastic bands of different thickness. Identify patterns between the volume of a sound and the strength of the vibrations that produced it, recognising that sound gets fainter over distance.		

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					Vocabulary: Sound, source, vibrate, vibration, travel, pitch (high, low), volume, faint, loud, insulation		
Earth and Space						Describe the movement of the Earth, and other planets, relative to the Sun in the solar system and understand that the Earth, Sun and Moon are approximately Spherical. Describe the movement of the Moon relative to the Earth. Use the idea of the Earth's rotation to explain day and night and the apparent movement of the Sun across the sky. Vocabulary: Earth, Sun, Moon, (Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune) spherical, solar system, rotates, star, orbit, planets	
Seasonal Change	Understand the effect of changing seasons on the natural world around them	Observe changes across the four seasons and describe weather associated with the seasons and how day length varies.					

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		Vocabulary: Seasons, spring, summer Autumn, winter, weather hot/warm, cool/cold, sunny, cloudy, windy, rainy, snowy, hailing, sleet, frost, fog/mist, ice/icy, rainbow thunder, lightning storm, light/dark, day/night					