# Science Progression Document

| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
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| Working Scientifically DISCIPLINARY KNOWLEDGE | **Plan** | Ask simple questions when prompted.<br>Suggest ways of answering a question. | Ask simple questions.<br>Recognise that questions can be answered in different ways. | Ask relevant questions when prompted.<br>Use different types of scientific enquiry to answer questions.<br>Set up simple and practical enquiries, comparative and fair tests with some support. | Ask relevant questions.<br>Use different types of scientific enquiries to answer questions.<br>Set up simple and practical enquiries, comparative and fair tests. | Plan different types of scientific enquiries to answer questions.<br>With prompting, recognises and control variable where necessary. | Plan different types of enquiries to answer questions.<br>Recognise and control variables where necessary. |
| | **Do** | Make relevant observations using simple equipment.<br>Conduct simple tests, with support.<br>Identify and classify with guidance. | Observe closely, using simple equipment.<br>Perform simple tests.<br>Identify and classify. | Make systematic and careful observations, using simple equipment.<br>Use standard units when taking measurements. | Make systematic and careful observations using a range of equipment, including thermometers and data loggers.<br>Take accurate measurements using standard units, where appropriate. | Select, with prompting, and use appropriate equipment to take readings.<br>Take precise measurements using standard units.<br>Begin to understand the need for repeat readings | Use a range of scientific equipment to take measurements.<br>Take measurements with increasing accuracy and precision.<br>Take repeat readings, when appropriate. |
| | **Record** | Gather and record data. | Record and communicate their findings in a range of ways and begin to use simple scientific language.<br>Gather and record data to help answer questions. | With modelling and guidance, gather, record, classify and present data in a variety of ways to help to answer questions.<br>With prompting, use various ways of recording, grouping and displaying evidence and suggest how findings may be tabulated | Gather, record, classify and present data in a variety of ways to help to answer questions.<br>Record findings using simple scientific language, drawings and labelled diagrams.<br>Record findings using keys, bar charts and tables. | Take and process repeat readings.<br>Record data and end results.<br>Record data using labelled diagrams, keys, tables and charts.<br>Use line graphs to record data. | Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, bar charts and line graphs. |
| | **Review** | Recognise findings.<br>Use their observations and ideas to suggest answers to simple questions. | Use their observations and ideas to suggest answers to simple questions. | With prompting, suggest conclusions from enquiries.<br>Suggest how findings could be reported.<br>Suggest possible improvements or further questions to investigate. | Report on findings from enquiries, including oral and written explanations, of results and conclusions.<br>Report on findings from enquiries using displays or presentations.<br>Identify differences, similarities or changes related to simple scientific ideas and processes.<br>Use straightforward scientific evidence to answer questions or to support their findings<br>Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. | Report and present findings from enquiries, including conclusions and, with prompting, suggest causal relationships.<br>With support, present findings from enquiries orally and in writing.<br>Suggest further comparative or fair tests. | Report and present findings from enquiries, including conclusions and causal relationships.<br>Report and present findings from enquiries, including explanations of, and degree of, trust in results.<br>Identify scientific evidence that has been used to support or refute ideas or arguments.<br>Use test results to make predictions to set up further comparative and fair tests. |
| **SUBSTANTIVE KNOWLEDGE** | | | | | | | |
| Animals, including humans | | Know there are many different animals with different characteristics.<br>Know animals have senses to help them survive (animals can respond to their senses).<br>Know that animals need food to survive. | Know that animals move in order to survive.<br>Know that different animals move in different ways to help them survive.<br>Know that exercise keeps animals' bodies in good condition and increases survival chances. | Know that animals are adapted to eat different foods.<br>Know that animals cannot make their own food (producers); get nutrition from what they eat; need the right type and amount of nutrition. | Know that animals have teeth to help them eat.<br>Know that different types of teeth do different jobs.<br>Know that food is broken down by the teeth and further in the stomach and intestines where nutrients go into the blood.<br>Know that the blood takes nutrients around the body. | Know that different animals mature at different rates and live to different ages.<br>Know that puberty is something we all go through, a process which prepares our bodies for being adults and reproduction. | Know that the heart pumps blood around the body.<br>Know that oxygen is breathed into the lungs where it is absorbed by the blood.<br>Know that muscles need oxygen to release energy from food to do work.<br>Know that oxygen is taken into the blood in the lungs; |

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| | | Know that animals need a variety of food to help them grow, repair their bodies, be active and stay healthy.<br>Know and name a variety of commons animals (including fish, amphibians, reptiles, birds and mammals).<br>Know and name the structure of common animals.<br>Know and name a variety of animals that are carnivore, herbivore and omnivore.<br>Know which parts of the body are associated with each sense. | Know that all animals eventually die.<br>Know that animals reproduce new animals when they reach maturity.<br>Know that animals grow until maturity and then do not grow any larger. | Know that many animals have skeletons to support their bodies and protect vital organs.<br>Know that muscles are connected to bones and move them when they contract.<br>Know that movable joints connect bones. | Know what a producer, predator and prey is.<br>Know simple food chains.<br>Know that nutrients produced by plants move to primary consumers then to secondary consumers through food chains. | Know that hormones control these changes – which can be physical and/or emotional. | the heart pumps the blood through blood vessels to the muscles; the muscles take oxygen and nutrients from the blood.<br>Know that diet, drugs and exercise have an effect on the way our bodies work. |
| **Living things and their habitats** | | | Know that some things are living, some were once living but are now dead, and some things never lived.<br>Know that there is variation between living things.<br>Know that different animals and plants live in different places (living things are adapted to survive in different habitats).<br>Know that environmental change can affect plants and animals that live there.<br>Know how plants and animals depend on each other (simple food chains).<br>Know the name of plants and animals and their habitat (including micro-habitats). | | Know that living things can be divided into groups based upon their characteristics.<br>Know that environmental change affects different habitats differently.<br>Know that different organisms are affected differently by environmental change.<br>Know that different food chains occur in different habitats.<br>Know that human activity significantly affects the environment.<br>Know the name of a variety of living things in the local and wider environment. | Know that different animals mature at different rates and live to different ages.<br>Know that some organisms reproduce sexually where offspring inherit information from both parents.<br>Know that some organisms reproduce asexually by making a copy of a single parent.<br>Know that environmental change can affect how well an organism is suited to its environment.<br>Know different types of organisms have different lifecycles. | Know that organisms best suited to their environment are more likely to survive long enough to reproduce.<br>Know that competition exists for resources and mates.<br>Know living things can be grouped based on similarities and differences, including: vertebrate/invertebrate; plants; animals; microorganisms.<br>Know reasons why living things are grouped in particular ways. |
| **Plants** | | Know that plants grow from seeds/bulbs. | Know how seeds and bulbs grow into mature plants. | Know the functions of different parts of flowering plants (roots, trunk/stem, leaves, flowers). | | | |

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| | | Know that plants need light and water to grow and survive.<br>Know that plants are important.<br>Know that we can eat lots of plants.<br>Know the name of common wild and garden plants.<br>Know the basic structure of common flowering plants and trees. | Know that plants need light, water and warmth to grow and survive.<br>Know that flowers make seeds to make more plants.<br>Know that plants are important.<br>Know that we need plants to survive (to clean air, to eat).<br>Know that we can eat different parts of the plants (leaves, stems, roots, seeds, fruit). | Know that plants are producers (they make their own food).<br>Know that plants' leaves absorb sunlight and carbon dioxide.<br>Know that plants have roots which provide support and draw water from the soil.<br>Know how water is transported in plants.<br>Know that flowering plants have adaptations to help it carry out pollination, fertilisation and seed production.<br>Know that seed dispersal improves a plants' chances of successful reproduction.<br>Know that seeds and bulbs require the right conditions to germinate and grow (air, light, water, nutrients from soil, room to grow).<br>Know that seeds contain enough food for the plants' initial growth. | | | |
| **Seasonal change** | | Know that weather can change.<br>Know there are lots of different types of weather: rain, sun, cloud, wind, snow etc.<br>Know that days are longer and warmer in the summer.<br>Know that days are shorter and colder in winter.<br>Know there are four seasons: spring, summer, autumn, winter.<br>Know types of weather associated with each season. | | | | | |
| **Materials** | | Know there are many different materials that have different describable and measurable properties. | Know the suitability of a variety of everyday materials (wood, metal, plastic, glass, brick, rock, | | Know that solids, liquids and gases are described by observable properties. | Know how materials can be grouped according to their properties, including: hardness, solubility, | |

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| | | Know materials that have similar properties are grouped into metals, rocks, fabrics, wood, plastic and ceramics (including glass).<br>Know the name of a variety of everyday materials.<br>Know the properties of a material determine whether they are suitable for a purpose.<br>Know the difference between an object and the material it is made from. | paper and cardboard) for a particular use.<br>Know that materials can be changed by physical force (twisting, bending, squashing and stretching). | | Know that materials can be divided into solids, liquids and gases.<br>Know that heating causes solids to melt into liquids and liquids evaporate into gases.<br>Know that cooling causes gases to condense into liquids and liquids to freeze into solids.<br>Know the temperature at which given substances change state are always the same.<br>Know the part played by evaporation and condensation in the water cycle.<br>Know that the rate of evaporation is associated with temperature. | transparency, conductivity, and responses to magnets.<br>Know when two or more substances are mixed and remain present the mixture can be separated.<br>Know some changes can be reversed, and some cannot.<br>Know materials change state by heating and cooling.<br>Know that some materials will dissolve in liquid to form a solution.<br>Know how to recover substances from a solution.<br>Know how mixtures of solids, liquids and gases might be separated through filtering, sieving and evaporating.<br>Know some particular uses of everyday materials.<br>Know that dissolving, mixing and changes of state are reversible changes.<br>Know that some changes result in the formation of new materials and that this kind of change is not usually reversible (changes associated with burning and the action of acid on bicarbonate of soda).<br>Know heating can sometimes cause materials to change permanently (not usually reversible).<br>Know if it is not possible to get the material back easily, it is likely that it is not there anymore and something new has been made (irreversible change).<br>Know that all matter has mass. | |

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| **Rocks** | | | | Know there are different types of rock.<br>Know that rocks can be compared and grouped according to appearance and simple properties.<br>Know there are different types of soil.<br>Know soil changes over time.<br>Know different plants grow in different soils.<br>Know fossils tell us what has happened I the past.<br>Know that fossils are formed when things that have lived are trapped within the rock.<br>Know that fossils provide evidence.<br>Know palaeontologists use fossils to find out about the past.<br>Know fossils provide evidence that living things have changed over time. | | | |
| **Light** | | | | Know there must be light for us to see; without light it is dark.<br>Know that we need to light to see things, even shiny things.<br>Know that transparent materials let light travel through them, and opaque materials don't let light through.<br>Know that beams of light bounce off some materials (reflection).<br>Know that shiny materials reflect light beams better than non-shiny materials.<br>Know that light comes from a source.<br>Know that light from the sun can be dangerous and there are ways to protect our eyes. | | | Know that animals see light sources when light travels from the source into their eyes.<br>Know that animals see objects when light is reflected off that object and enters their eyes.<br>Know that light reflects off all objects (unless they are black); non-shiny surfaces scatter the light, so we do not see the beam.<br>Know that light travels in straight lines.<br>Know that shadows have the same shape as the objects that cast them (because light travels in straight lines). |

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| | | | | Know that shadows are formed when the light from a light source is blocked by a solid object.<br>Know that there are patterns in the way that the size of shadows changes. | | | |
| **Sound** | | | | | Know that sound travels from its source in all directions and we hear it when it travels to our ears.<br>Know that sound travel can be blocked.<br>Know that sound spreads out as it travels.<br>Know that changing the shape, size and material of an object will change the sound it produces.<br>Know that sound is produced when an object vibrates.<br>Know that sound moves through all materials by making them vibrate.<br>Know that changing the way an object vibrates will change its sound.<br>Know that bigger vibrations produce louder sounds and smaller vibrations produce quieter sounds.<br>Know that faster vibrations (higher frequencies) produce higher pitched sounds.<br>Know that vibrations from sounds travel through a medium to the ear. | | |
| **Forces** | | | | Know that magnets exert attractive and repulsive forces on each other.<br>Know that magnets exert non-contact forces, which works through some materials.<br>Know that magnets exert attractive forces on some materials. | | Know that air resistance and water resistance are forces against motion caused by objects having to move air and water out of their way.<br>Know that friction is a force against motion caused by two surfaces rubbing against each other. | |

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| | | | | Know that magnet forces are affected by magnet strength, object mass, distance from object and object material.<br>Know that things move differently on different surfaces.<br>Know some materials that are attracted to a magnet.<br>Know that magnets have two poles.<br>Know which poles will attract and repel. | | Know that some objects require large forces to make them move; gears, pulley and levers can reduce the force needed to make things move.<br>Know that unsupported objects fall towards Earth because of the force of gravity between Earth and the falling object. | |
| **Electricity** | | | | | Know some common appliances that run on electricity.<br>Know that parts of a simple series circuit, including: cells, wires, bulbs, switches and buzzers.<br>Know whether or not a bulb will light in a simple series circuit.<br>Know that a switch opens and closes a circuit.<br>Know that a source of electricity (mains or battery) is needed for electrical devices to work.<br>Know that electricity sources push electricity around the circuit.<br>Know that more batteries will push the electricity around the circuit faster.<br>Know that devices work harder when more electricity goes through them.<br>Know that a complete circuit is needed for electricity to flow and devices to work.<br>Know that some materials allow electricity to flow easily and these are called conductors.<br>Know that materials that do not allow electricity to flow easily are called insulators. | | Know that batteries are a store of energy and voltage measures the 'push' of energy.<br>Know energy pushes electricity around the circuit.<br>Know that the brightness of a bulb or the volume of a buzzer is associated with the number and voltage of cells used in the circuit.<br>Know that the greater the current flowing through a device, the harder it works.<br>Know current is how much electricity is flowing around a circuit.<br>Know when current flows through wires, heat is released – the greater the current, the more heat is released.<br>Know how to represent a simple circuit using symbols in a diagram. |

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| **Earth and Space** | | | | | | Know that stars, planets, and moons have so much mass they attract other things, including each other, due to a force called gravity; gravity works over distance.<br>Know that objects with larges masses exert bigger gravitational forces.<br>Know that objects like planets, moons and stars spin.<br>Know that smaller mass objects, like planets, orbit larger mass objects, like stars.<br>Know that stars produce vast amounts of heat and light.<br>Know that all other objects are lumps of rock, metal or ice and can be seen because they reflect the light of stars.<br>Know how the planets move in relation to the sun.<br>Know how Earth's moon moves in relation to the Earth.<br>Know that the sun. moon and Earth are roughly spherical bodies<br>Know that day and night occur because of the rotation of the Earth.<br>Know that the sun appears to move across the sky because of Earth's rotation. | |
| **Evolution and inheritance** | | | | | | | Know that life cycles have evolved to help organisms survive to adulthood.<br>Know that over time the characteristics that are most suited to the environment become increasingly common. |

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| | | | | | | | Know that organisms best suited to their environment are more likely to survive long enough to reproduce.<br>Know that organisms reproduce and offspring have similar characteristic patterns.<br>Know that variation exists within a population (and between offspring of some plants).<br>Know that competition exists for resources and mates.<br>Know that living things have changed over time and fossils provide information about living things from Earth millions of years ago. |

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## Vocabulary Progression

| | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
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| **Working Scientifically** | Questions<br>Answers<br>Equipment<br>Gather<br>Measure<br>Record<br>Results<br>Sort<br>Group<br>Tet<br>Explore<br>Observe<br>Compare<br>Describe<br>Similar/similarities<br>Different/differences<br>Beaker<br>Pipette<br>Syringe | Previous plus:<br>Observe<br>Changes over time<br>Notice patterns<br>Secondary sources<br>Identify<br>Classify<br>Data | Previous plus:<br>Scientific enquiry<br>Comparative tests<br>Fair tests<br>Careful<br>Accurate<br>Observations<br>Evidence<br>Results<br>Keys<br>Bar chart<br>Table<br>Conclusion<br>Prediction<br>Support<br>Thermometer | Previous plus:<br>Increase<br>Decrease<br>Identify<br>Classify<br>Order<br>Appearance<br>Present results | Previous plus:<br>Relationships<br>Independent variable<br>Dependent variable<br>Controlled variable<br>Accuracy<br>Precision<br>Degree of trust<br>Classification<br>Scatter graph<br>Line graph<br>Causal relationship<br>Support<br>Refute | Previous plus:<br>Opinion/fact<br>Confidently name types of scientific enquiry |
| **Animals, including humans** | 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, senses, hearing, seeing, touching, smelling, tasting, smooth, bright, dim, loud, quiet, high, low, fish, amphibian, reptile, bird, mammal, herbivore, omnivore, carnivore | Offspring, life cycles, grow, change, adults, basic needs, water, food, air, survival, exercise, food types (fruit, vegetables, bread, rice, pasta, milk, dairy, foods high in fat and sugar, meat fish, eggs, beans), hygiene | Nutrition, food types, carbohydrates, protein, vitamins, minerals, fat, sugar, fruits, vegetables, dietary fibre, water, balanced diet, skeleton, muscles, support, protection, movement, names of bones, vertebrate, invertebrate | Digestive system, nutrition, mouth, teeth, canine, incisor, molar, pre-molar, saliva, tongue, rip, tear, chew, grind, cut, oesophagus (gullet), stomach, small intestine, large intestine, rectum, anus, carnivore, herbivore, omnivore, producer, consumer, predator, prey, food chain, apex predator | Womb, foetus, embryo, gestation, baby, toddler, teenager, elderly, growth, development, puberty | Circulatory system, heart, valve, artery, vein, transport, oxygenated, deoxygenated, blood, blood vessels, pumps, oxygen, carbon dioxide, lungs, nutrients, water, diet, exercise, drugs, lifestyle, evolution, suited, suitable, adapted, adaptation, offspring, reproduction, variation, inherit, inheritance, fossils, function |
| **Living things and their habitats** | | Living, dead, names of local habitats, woodland, meadow, hedgerow, pond, names of micro-habitats, suited, basic needs, depend, food chain, shelter | | Classification keys, environment, fish, amphibians, reptiles, birds, mammals, vertebrates (and examples), invertebrates (an examples), human impact, positive, negative | Life cycle, reproduction, sexual, asexual, germination, pollination, seed formation, seed dispersal, pollen, stamen, stigma, plantlets, runners, mammal, amphibian, insect, bird, fish, reptile, eggs, live young | Organism, micro-organism, fungus, mushrooms, classification keys, environment, fish, amphibians, reptiles, birds, mammals, vertebrates, invertebrates, (examples of the above), arachnid, mollusc, insect, crustacean |

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| **Plants** | Names of: wild plants, garden plants, flowering plants, trees, leaf, flower, blossom, petal, fruit, berry, root, blub, seed, trunk, branch, stem, bark, stalk, vegetable, deciduous, evergreen | Seeds, bulbs, water, light, growth, healthy, shoot, seedling, germinate, temperature, reproduce, lifecycle | Leaf, flower, blossom, peal, fruit, root, bulb, seed, trunk, branch, stem, water, light, air, nutrients, soil, fertiliser, grow, healthy, transported, life cycle, pollination, seed formation, seed dispersal, reproduction | | | |
| **Seasonal change** | Season, spring, summer, autumn, winter, weather, hot, warm, cool, cold, sunny, cloudy, windy, rainy, snowing, hailing, sleet, frost, fog, mist, icy, rainbow, thunder, lightning, storm, light, dark, day, night, sun, moon, day, year | | | | | |
| **Materials** | Object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, cardboard, rubber, wool, clay, hard, soft, stretchy, stiff, bendy, waterproof, absorbent, tear, rough, smooth, shiny, dull, see through, not see through | Suitable, unsuitable, use, object, material, property, wood, plastic, glass, metal, water, rock, fabrics, hard, soft, stretchy, flexible, waterproof, absorbent, transparent, translucent, opaque, shape, change, twist, squash, bend, stretch, roll, squeeze | | States of matter, solid, liquid, gar, air, oxygen, powder, granular, grain, crystals, ice, water, steam, water vapour, heating, cooling, temperature, degrees Celsius, melt, boil, boiling point, evaporation, condensation, water cycle, precipitation, transpiration | Rigid, hard, soft, flexible, waterproof, absorbant, electrical/thermal conductivity, melting, dissolve, solution, insoluble, solute, solvent, particle, mixture, residue, reversible, irreversible, new material, burning, rusting | |
| **Rocks** | | | Rock, stone, pebble, boulder, soil, fossils, grains, crystals, texture, absorbent, marble, chalk, granite, sandstone, slate, clay, peat, organic matter, pumice, sedimentary, layer, sediment, igneous, magma, lava, gas bubbles, metamorphic, change, squeeze, pressure | | | |
| **Light** | | | Light, light source, darkness, reflect, reflective, mirror, shadow, block, direction, transparent, opaque, translucent | | | Light, light source, darkness, reflect, reflective, shadow, absorb, transparent, opaque, translucent, refract, spectrum, rainbow |
| **Sound** | | | | Sound, sound source, noise, vibration, travel, solid, liquid, gas, pitch, tune high, low, volume, loud, quiet, fainter, muffle, insulation, instrument, percussion, strings, bass, woodwind, frequency | | |

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| **Forces** | | | Force, push, pull, twist, contact force, non-contact force, magnetic force, magnet, strength, attract, repel, magnetic material, metal, iron, steel, poles, north pole, south pole | | Force, gravity, earth, air resistance, water resistance, friction, mechanisms, simple machines, levers, pulleys, gears | |
| **Electricity** | | | | 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 | | Circuit, complete circuit, circuit diagram, circuit symbol, cell, battery, bulb, buzzer, motor, switch, voltage |
| **Earth and Space** | | | | | Earth, sun, moon, phase, Mercury, Venus, Mars, Uranus, Neptune, spherical, solar system, rotates, star, orbit, planets, constellation, asteroid, elliptical orbit | |
| **Evolution and inheritance** | | | | | | Offspring, sexual reproduction, vary, genetics, DNA, characteristics, suited, adapted, environmental, survival, inherited, species, fossils |