**Science Progression Map**

**Nursery**

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| **Understanding the World - Science**  |
| **Understanding World (Development matters 3 and 4-year-olds)**  **Children will start to:** * Use all their senses in hands-on exploration of natural materials.
* Explore collections of materials with similar and/or different properties.
* Talk about what they see, using a wide vocabulary.
* Explore and talk about different forces they can feel.
* Draw children’s attention to forces. Suggestions: • how the water pushes up when they try to push a plastic boat under it • how they can stretch elastic, snap a twig, but cannot bend a metal rod • magnetic attraction and repulsion
* Plan and introduce new vocabulary related to the exploration and encourage children to use it.
* Talk about the differences between materials and changes they notice
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| ***Term 1 End Point***  **Talk about what they see, using a wide vocabulary.**   ***Key Vocabulary:***   | ***Term 2 End Point***  **To be introduced to, and begin to use, new vocabulary.**    ***Key Vocabulary:***   | ***Term 3 End Point***  ***Explore a range of toys and talk about how they move***  ***Key Vocabulary:***  | ***Term 4 End Point***     ***Key Vocabulary:***  | ***Term 5 End Point***  **Notice forces and explore and talk about how different forces feel.**   ***Key Vocabulary:***   | ***Term 6 End Point***  **Use all their senses in hands-on exploration of natural materials and talk about the differences.**   ***Key Vocabulary-***  |

**Reception**

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| **Understanding the World - Science**  |
| **Understanding the World - The Natural World ELG** Children at the expected level of development will:  * Explore the natural world around them, making observations and drawing pictures of animals and plants;
* Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class;
* Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.
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| ***Term 1 End Point***  ***To explore the natural world around them talk about what they see (Autumn)***  ***To explore the natural world around them, making observations and drawing pictures of animals and plants***  ***To explore places familiar to themselves and talk about what features they can see and know about***  ***Key Vocabulary: Places, Features, Maps, Plans, Animals, Plants, Habitats, Natural features and objects, Autumn themed vocab***   | ***Term 2 End Point***  ***To explore the natural world around them talk about what they see (Autumn into Winter)***  ***To understand and explore sustainable materials***  ***I can talk about why things happen***  ***I will look closely at the changes in nature and see what is similar and different***  ***Key Vocabulary: Materials, Movement, Changes, Observe, Changes, Similar, difference***  | ***Term 3 End Point***  ***To explore the natural world around them talk about what they see (Winter)***  ***To show skill in making toys work by pressing parts and lifting flaps to make sound, movements or new images***  ***To use blocks and ramps of different lengths to explore speed of cars***  ***Key Vocabulary: Forces, Pull, Push, Speed, Fast, Slow, Winter linked vocab, Changes Signs***   | ***Term 4 End Point***  ***To explore the natural world around them talk about what they see (Winter into Spring)***  ***To know some similarities and differences between the natural world around them and contrasting environments in texts***  ***I can make observations of animals and plants, explain why some things occur and talk about changes.***  ***I understand growth, decay and how things change over time***  ***To explore a range of materials (hard, soft, rough, smooth, metal, wood, fabric etc)***  ***To observe the changes from eggs to chicks***  ***To explore seeds, fruits and vegetables and look at how they grow***  ***Key Vocabulary: Similarities, Differences, Winter Spring, Changes, Signs, Growth, Decay, Life cycle, seeds, growing, shoots,***  | ***Term 5 End Point***  ***To explore the natural world around them talk about what they see (Spring)***  ***To notice some similarities and differences between the natural world around them and contrasting***  ***To explore range of materials (hard, soft, rough, smooth, metal, wood, fabric etc)***  ***To explore a selection of toy vehicles and other objects to travel down ramps***  ***To observes the changes from caterpillars to Butterflies***  ***Key Vocabulary: Life cycles, growth, changes, Speed, Materials, Fast, Slow, Natural World, Contrast,***   | ***Term 6 End Point***  ***To explore the natural world around them talk about what they see (Spring into Summer)***  ***To explore the natural world around them talk about what they see***  ***Observe how fruit and vegetables change over time.***  ***Explore fruits, vegetables and other foods***   ***Key Vocabulary- Changes, Signs, Spring, Summer, changes over time, growth,***  |

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| **National Curriculum – Science**  |
| **Purpose of study** A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world’s future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.  |
| **Aims** **The national curriculum for Science aims to ensure that all pupils:** * develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
* develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them
* are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.
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| **National Curriculum Objectives**  |
| **KS1**   | **LKS2**  | **UKS2**  |
| 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.  ‘Working scientifically’ is described separately in the programme of study, but must always be taught through and clearly related to the teaching of substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content.  Pupils should read and spell scientific vocabulary at a level consistent with their increasing word-reading and spelling knowledge at key stage 1.   | 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.  ‘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. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content.  Pupils should read and spell scientific vocabulary correctly and with confidence, using their growing word-reading and spelling knowledge.  | 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.  ‘Working and thinking 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. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content.  Pupils should read, spell and pronounce scientific vocabulary correctly.  |

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| **Knowledge and Skills**  |
|   | **KS1**  | **LKS2**  | **UKS2**  |
|   | The principal focus of science teaching in key stage 1 is to enable children to experience and observe phenomena, looking more closely at the natural and humanly constructed world around them. They should be encouraged to be curious, ask questions about what they notice and develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions.  **Children should be able to use the following practical scientific methods, processes and skills:**  | 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.   **Children should be able to use the following practical scientific methods, processes and skills:**  | 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.     **Children should be able to use the following practical scientific methods, processes and skills:**  |
| **Plan**  | **Ask questions and plan enquiries**  |
| Ask simple questions and recognise that they can be answered in different ways (*types of enquiry including observing changes over time, noticing patterns, grouping and classifying, comparative and fair tests, using secondary sources*).  | Ask relevant questions and use different types (*types of enquiry including observing changes over time, noticing patterns, grouping and classifying, comparative and fair tests, using secondary sources*) of scientific enquiries to answer them.  | Plan different types (*types of enquiry including observing changes over time, noticing patterns, grouping and classifying, comparative and fair tests, using secondary sources*) of scientific enquiries to answer questions, including recognising and controlling variables where necessary.  |
| **Setup enquiries**  |
| Perform simple tests.  | Setting up simple practical enquiries, comparative and fair tests.  | Use test results to make predictions to set up further comparative and fair tests.  |
| **Do**  | **Observe and measure**  |
| Observe closely, using simple equipment.   Identify and classify.  | Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.  | Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.  |
| **Record**  |

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|   | Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate  | Gather, record, classify and present data in a variety of ways to help in answering the questions.   Record findings using simple scientific language, drawings, labelled diagrams, bar charts, and tables.  | Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.  |
| **Review**  | **Interpret and report**  |
| Identify and classify.  | Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.  | Report and present findings from enquiries, including conclusions, causal relationships, in oral.  |
| **Evaluate**  |
| Use their observations and ideas to suggest answers to questions.  | Use straightforward scientific evidence to answer questions or to support their findings.   Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.  | Explain degree of trust in results.   Identify and evaluate scientific evidence (their own and others’) that has been used to support or refute ideas or arguments.  |
| **Vocabulary**  |
|   | **KS1**  | **LKS2**  | **UKS2**  |
|  **Plants**  | ***Year 1:*** ***Leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud***  ***Names of trees in the local area***  ***Names of garden and wild flowering plants in the local area***  ***Year 2:*** ***As for Year 1 plus, light, shade, sun, warm, cool, water, grow, healthy***  | ***Year 3:*** ***Photosynthesis, pollen, insect/wind pollination, seed formation, seed dispersal (wind dispersal, animal dispersal, water dispersal)***    |   |
| **Animals, including humans**  | ***Year 1:*** ***Head, body, eyes, ears, mouth, teeth, leg, tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves Names of animals experienced first-hand from each vertebrate group Parts of the body including those linked to PSHE teaching (see joint document produced by the ASE and PSHE Association) Senses – touch, see, smell, taste, hear, fingers (skin), eyes, nose, ear and tongue***  ***Year 2:*** ***Offspring, reproduction, growth, child, young/old stages (examples - chick/hen, baby/child/adult, caterpillar/butterfly), exercise, heartbeat, breathing, hygiene, germs, disease, food types (examples – meat, fish, vegetables, bread, rice, pasta)***  | ***Year 3:*** ***Nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, skeleton, bones, muscles, joints, support, protect, move, skull, ribs, spine***  ***Year 4:*** ***Digestive system, digestion, mouth, teeth, saliva, oesophagus, stomach, small intestine, nutrients, large intestine, rectum, anus, teeth, incisor, canine, molar, premolars, herbivore, carnivore, omnivore, producer, predator, prey, food chai***  | ***Year 5:*** ***Puberty – the vocabulary to describe sexual characteristics***  ***Year 6:*** ***Heart, pulse, rate, pumps, blood, blood vessels, transported, lungs, oxygen, carbon dioxide, nutrients, water, muscles, cycle, circulatory system, diet, exercise, drugs, lifestyle***  |
| **Materials**  | ***Year 1:*** ***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***  ***Year 2:*** ***Names of materials – wood, metal, plastic, glass, brick, rock, paper, cardboard Properties of materials – as for Year 1 plus opaque, transparent, and translucent, reflective, non-reflective, flexible, rigid Shape, push/pushing, pull/pulling, twist/twisting, squash/squashing, bend/bending, stretch/stretching***  | ***Year 4:*** ***Solid, liquid, gas, state change, melting, freezing, melting point, boiling point, evaporation, temperature, water cycle***  | ***Year 5:*** ***Thermal/electrical insulator/conductor, change of state, mixture, dissolve, solution, soluble, insoluble, filter, sieve, reversible/non-reversible change, burning, rusting, new material***    |
| **Seasonal changes**  | ***Year 1:*** ***Weather (sunny, rainy, windy, snowy etc.) Seasons (winter, summer, spring, autumn) Sun, sunrise, sunset, day length***    |   |   |
| **Living things and their habitats**  | ***Year 2:*** ***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 micro-habitats e.g. under logs, in bushes etc.***  | ***Year 4:*** ***Classification, classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate***  | ***Year 5:*** ***Life cycle, reproduce, sexual, sperm, fertilises, egg, live young, metamorphosis, asexual, plantlets, runners, bulbs, cuttings***  ***Year 6:*** ***Vertebrates, fish, amphibians, reptiles, birds, mammals, invertebrates, insects, spiders, snails, worms, flowering, non-flowering***  |
| **Rocks**  |   | ***Year 3:*** ***Rock, stone, pebble, boulder, grain, crystals, layers, hard, soft, texture, absorb water, soil, fossil, marble, chalk, granite, sandstone, slate, soil, peat, sandy/chalk/clay soil***   |   |
| **Light**  |   | ***Year 3:*** ***Light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous***   | ***Year 6:*** ***As for Year 3, plus straight lines, light rays***  |
| **Forces**  |   | ***Year 3:*** ***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, poles, north pole, south pole***   | ***Year 5:*** ***Force, gravity, Earth, air resistance, water resistance, friction, mechanisms, simple machines, levers, pulleys, gears***   |
| **Electricity**  |   | ***Year 4:*** ***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***  | ***Year 6:*** ***Circuit, complete circuit, circuit diagram, circuit symbol, cell, battery, bulb, buzzer, motor, switch, voltage***  |
| **Earth and space**  |   |   | ***Year 5:*** ***Earth, Sun, Moon, (Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune), spherical, solar system, rotates, star, orbit, planets***   |
| **Evolution and inheritance**  |   |   | ***Year 6:*** ***Offspring, sexual reproduction, vary, characteristics, suited, adapted, environment, inherited, species, fossils***  |