

Progression in Science 17.03.23

Vision: Learn together what it is to be a scientist, grow together in our knowledge and understanding of the natural and physical world.

- A. scientific knowledge & understanding
- B. understanding the nature, processes and methods of science: working scientifically & 5 scientific enquiry skills
- C. understanding the importance of science
- D. reading: half-termly science storybooks
- E. cross curricular links - **FS & yr 1**
- F. key vocabulary - **FS**

A. scientific knowledge & understanding

NC aim 1: develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics

| Threshold Concepts - skills | Reception (DevMatters2020) +KnOrg | Year 1 | Year 2 |
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| plants | Join in with songs, rhymes and poems about the natural world. Hands-on experiences with the outdoors, fostering curiosity. Make focussed observations and drawings of different plants, <i>naming some of their key parts</i> , learning to recognise and name some of them, <i>describing what they need to grow and be healthy</i> . <i>Consider plants that we eat as food.</i> | Identify and name a variety of common and wild and garden plants, including deciduous and evergreen trees. (lots of observations) | Observe and describe how seeds and bulbs grow into mature plants (2 bulbs) |
| | | Identify & describe the basic structure of a variety of common flowering plants, including trees (grow beans & potatoes, look at petals, leaves, branches, trunk etc) | Find out and describe how plants need water, light and suitable temperature to grow and stay healthy; (potatoes +/- soil, seed +/- light; transpiration, cress moves to light, pollination & plant life cycle) |
| living things & their habitats | Share non-fiction texts that offer insight into contrasting environments both locally and nationally. Talk about / share similarities and differences between environments, naming specific features of the natural world, both man-made and natural. <i>Begin to notice how animals are adapted to their habitat.</i> Learn how to care for the natural world. | Brief introduction to habitat in cross-curricular opportunities | Explore & compare the differences between things that are living, dead, & things that have never been alive (sorting sheet) |
| | | | Identify that most living things live in habitats to which they are suited and describe how different habitats / microhabitats - provide for the basic needs of different kinds of animals and plants, and how they depend on each other. (class wildcat; elephants; worms & minibeasts) |
| | | | identify and name a variety of plants and animals in their habitats, including microhabitats |
| | | | describe how animals obtain their food from plants and other animals, using the idea of a simple food chain , & identify and name different sources of food. (class wild cat; elephants, minibeasts) |

| Threshold Concepts - skills | Reception (DevMatters2020) +KnOrg | Year 1 | Year 2 |
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| animals including humans | Join in with songs, rhymes and poems about the natural world. Interact with the outdoors, fostering curiosity. Make focussed observations and drawings of different animals, learning to recognise some of them, naming them, describing and commenting on them. <i>Consider how to care for animals (including humans), consider what they eat and observe how they grow.</i> | Identify & name a variety of common animals including fish, amphibians, reptiles, birds and mammals (topic linked, throughout the year) | to notice that animals, including humans, have offspring which grow into adults (humans, frogs, chicks, butterfly, plants) |
| | | identify and name a variety of common animals that are carnivores, herbivores and omnivores | find out about and describe the basic needs of animals, including humans, for survival (water, food, air) (wildcats, minibeasts, plants) |
| | | describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds, and mammals, including pets) | |
| | | identify, name, draw and label the basic parts of the human body and say which parts of the body is associated with each sense | describe the importance for humans of exercise , eating the right amounts of different types of food - balanced diet , and hygiene (Spring term-incl. mould, food packaging) |
| everyday materials | Observe and interact with natural processes, such as ice melting, sound causing vibration, light travelling through transparent materials, an object casting a shadow, a magnet attracting an object and a boat floating on water. <i>Recognise and name some everyday materials, talk about their textures and their possible uses. Consider their origin.</i> | distinguish between an object & the material from which it is made (spring term) | |
| | | identify & name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock | identify & compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses; (metals, building materials, rot or not) |
| | | describe the simple physical properties of a variety of everyday materials | find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching (Aut term) |
| | | compare and group together a variety of everyday materials on the basis of their simple physical properties | |
| seasonal changes | Note and record weather. Share texts about the changing seasons. Observe the natural world over the seasons, noting how plants and the behaviour of animals (including humans) changes. Children incorporate their understanding of seasons and weather into their play. | to observe changes across the four seasons. | (Continue to observe and describe weather associated with the seasons and how day length varies. Consider how weather and seasons vary throughout the world.) |
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B. understanding of the nature, processes and methods of science

NC 2nd aim: children 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

In FS: children are informally introduced to the processes and methods of science as they explore the natural world, make observations, draw pictures, sort items etc.

In KS1: children are introduced to each of the skills of working scientifically (WS1-5) and they learn about & experience each of the 5 scientific enquiry skills (SE:1- 5)

| a) <u>working scientifically</u> | | | |
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| | Reception (DevMatters2020) | Year 1 | Year 2 |
| WS-1: ask and answer questions | <p>Children have and develop their own ideas, make links between ideas, and develop strategies for doing things.</p> <p>Children’s interests and fascinations are extended by providing stimulating resources for them to play with and through talking about what they are doing, and what they are noticing. Children’s curiosity is fostered through interactions with the outdoors where they have freedom to touch, smell and hear the natural world around them during hands-on experiences. Children have opportunities to discuss how we care for the natural world around us. I am curious & ask questions about: things that change / patterns / similarities and differences / how things behave and that I can test / my environment and that I can find out in secondary sources.</p> | <p>With support, ask simple how and why questions to be answered in different ways.</p> <p>Ask questions about how & why things change / are linked / are similar or different / are related / and about what people do, how things are, and the way they work.</p> | <p>Begin to ask their own simple how and why questions (often a variation of the main teacher-led focus) to be answered in different ways.</p> <p>Ask questions about how & why things change / are linked / are similar or different / are related / and about what people do, how things are, and the way they work.</p> |
| WS-2: plan & carry out investigations | <p>Children investigate and experience things, develop strategies for doing things, and ‘have a go’.</p> <p>They regularly explore and investigate new materials and interesting things.</p> <p>Children touch, smell, and hear the natural world around them during hands-on experiences.</p> <p>They enjoy frequent opportunities for outdoor play and exploration, with chances to take appropriate supported risks.</p> | <p>With support, plan and carry out investigations to answer their own simple questions, working within the 6 types of scientific enquiry.</p> <p>Identify changes to observe & measure and suggest how to do it;</p> <p>decide what patterns to observe and measure and suggest how to do it;</p> <p>decide what to observe so as to identify or sort things;</p> <p>with support, identify simple variables to change and measure and plan simple comparative tests;</p> | <p>Carry out their own investigations (a variation of a supported investigation) to answer their own simple questions, working within the 6 types of scientific enquiry.</p> <p>Identify changes to observe & measure and suggest how to do it;</p> <p>decide what patterns to observe and measure and suggest how to do it;</p> <p>decide what to observe so as to identify or sort things;</p> |

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| | <p>They make close observations of animals and plants and observe how animals behave differently as the seasons change.</p> <p>Children observe and interact with natural processes (e.g. melting ice)</p> <p>-----</p> <p>Talk about ideas for finding out about: how things change / patterns / sorting or matching things / how things behave. Pay careful attention in order to gain information from secondary sources.</p> <p>Look closely, use all the senses and simple equipment to: observe changes / see patterns when observing more than one thing at a time / sort & match things that are the same, different or sort in own way / see how things behave by carrying out simple tests/ learn from secondary sources</p> | <p>use books, electronic media or ask people to find things out.</p> | <p>with help, identify simple variables to change and measure and plan simple comparative tests;</p> <p>use books, electronic media or ask people to find things out.</p> |
| <p>WS-3: gather data and record</p> | <p>After careful observation, children draw pictures of the natural world, including animals and plants.</p> <p>Note and record the weather.</p> <p>----</p> <p>I make simple records of: how things change / what I notice (with help when necessary).</p> | <p>With guidance use simple measurements & equipment (e.g. hand lenses, egg timer) to gather data.</p> <p>Through teaching and scaffolding, begin to use the different ways of recording data that make it clear to understand.</p> <p>Use simple equipment and non-std units to make measurements, record events or gather data. Make comparisons between simple features of objects, materials or living things. Use simple books, electronic media or people to find things out.</p> <p>Record in words or pictures, or in simple prepared formats such as tallies, sorting circles or tables and maps.</p> | <p>With growing confidence, use simple measurements & equipment to gather data. Through teaching and scaffolding, begin to appreciate, choose and use the different ways of recording data that make it clear to understand.</p> <p>Use simple equipment and non-std/ std units and to make measurements, record events or gather data. Make comparisons between simple features of objects, materials or living things. Use simple books, electronic media or people to find things out.</p> <p>Record in words or pictures, or in simple prepared formats such as tallies, sorting circles or tables and maps.</p> |
| <p>WS-4: suggest answers</p> | <p>Children have and develop their own ideas and make links between ideas.</p> <p>Children describe and comment on things they have seen whilst outside, including plants and animals.</p> | <p>With support, use observations, data and ideas to suggest answers to questions.</p> <p>Identify and sequence simple causal changes. Identify & make links between 2 sets of observations. Identify similarities and differences. Use comparative data to rank materials or objects.</p> | <p>With support & growing confidence, use observations, data and ideas to suggest answers to questions.</p> <p>Identify and sequence simple causal changes. Identify & make links between 2 sets of observations. Identify similarities and differences.</p> |

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| | <p>Children come up with their own ideas and explanations. They extend their ideas through imaginative play that goes beyond the here and now and through sustained discussion that goes beyond what they, and you, have noticed. They consider 'how' and 'why' things happen.</p> <p>Discuss how we care for the natural world around us.</p> <p>----</p> <p>Children talk about: what they have done and what they have noticed, how they have sorted or matched things, things they have found out.</p> | <p>Find things out from secondary sources.</p> <p>Use scientific language to describe simple causal relationships, to talk about patterns, things that are similar or different and to talk about changes. Use scientific language to talk about what you have found out.</p> | <p>Use comparative data to rank materials or objects. Find things out from secondary sources.</p> <p>Use scientific language to describe simple causal relationships, to talk about patterns, things that are similar or different and to talk about changes. Use scientific language to talk about what you have found out.</p> |
| <p>WS-5: evaluate results</p> | <p>Children keep on trying if they encounter difficulties, and enjoy achievements.</p> <p>Children begin to correct their mistakes for themselves e.g. instead of using increased force to push a puzzle piece into a slot, they try another piece to see if it will fit in.</p> <p>---</p> <p>Children talk about whether something makes a difference in their investigation.</p> | <p>With support begin to evaluate results.</p> <p>Talk about whether the change / pattern/ relationship was what was expected.</p> <p>Try to use their sorting data to help group or identify other things.</p> <p>Give an opinion about some things that you found out.</p> | <p>With support and growing independence, evaluate results.</p> <p>Talk about whether the change / pattern/ relationship was what was expected.</p> <p>Try to use their sorting data to help group or identify other things.</p> <p>Give an opinion about some things that you found out.</p> |
| <p>WS-6: use scientific language (see chart below for detail of KS1)</p> | <p>Children name and describe some plants and animals they are likely to see.</p> <p>The teacher models vocabulary needed to name specific features of the natural world, both natural and man-made.</p> <p>They are introduced to new scientific language e.g. you could use and explain terms like 'antennae' and 'thorax'.</p> <p>Children communicate their understanding of their own environment and contrasting environments through conversation and in play.</p> | <p>With support communicate ideas using appropriate scientific language from the NC:</p> <p><i>Science process: magnifying glass, compare, contrast, identify, group, diagrams,</i></p> <p><i>Plants: deciduous, evergreen, plants, habitat, leaves, flowers, blossom, petals, fruit, roots, bulb, seed, trunk, branches, stem, environment</i></p> <p><i>Animals: Name a variety of common animals including fish, amphibian, reptiles, birds, mammals and a variety of common animals that are carnivores, herbivores and omnivores</i></p> <p><i>Main body parts: - head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth, teeth</i></p> <p><i>Senses: sight, hearing, touch, smell, taste</i></p> <p><i>Materials: object, wood, plastic, glass, metal, water, rock</i></p> <p><i>The Year: Seasons - Autumn, Spring, Summer, Winter, observe, describe weather, temperature, day length</i></p> | <p>With support & growing confidence, communicate ideas using appropriate scientific language from the NC:</p> <p><i>Science process: explore, compare, differences, identify</i></p> <p><i>Living things & Habitats: living, dead, never been alive, habitats, basic needs, animals, plants, depend, micro habitats, food chain, alive, environment</i></p> <p><i>Plants: seeds, bulbs, mature plants, water, light, suitable temperature</i></p> <p><i>Animals & health: animals, humans, adults, survival, exercise, eating the right amount of different types of food, healthy, hygiene, egg, chick, chicken, egg, caterpillar, pupa, butterfly, spawn, tadpole, frog; lamb, sheep, baby toddler, child, teenager, adult</i></p> <p><i>Materials: wood, plastic, glass, brick, rock, paper and cardboard, squashing, bending, twisting and stretching</i></p> |

b) 5 scientific enquiry skills

| | Reception (DevMatters2020)-explorative | Year 1 | Year 2 |
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| SE-1: observe closely over time | <p>Observe changes in living things in the setting, and around the local environment.</p> <p>Understand the effect of changing seasons on the natural world and how animals behave differently as the seasons change.</p> <p>Plan: Show curiosity about things that change. With help ask questions and talk about ideas for finding out how things change.</p> <p>Do: Look closely and use our senses to observe changes. Make simple records of how things change (with help where necessary). Use simple equipment and make simple records of findings .</p> <p>Review: Talk about what has been done, and what has been noticed.</p> | <p>With support, closely observe changes over time. <i>e.g. growing a bean</i></p> <p>Plan: Ask questions about how and why things change. With help, identify changes to observe and measure and suggest how to do it.</p> <p>Do: Use non-standard / std units and simple equipment to record changes. With support record findings in words or pictures, or in simple prepared formats such as tables and charts.</p> <p>Review: Identify simple changes and talk about them. Sequence the changes. Begin to use scientific language to talk about changes. Talk about whether the change was as expected.</p> | <p>With support and increasing confidence, closely observe changes over time. <i>e.g. rusting expt., growing mould, germination</i></p> <p>Plan: Ask questions about how and why things change. With help, identify changes to observe and measure and suggest how to do it.</p> <p>Do: Use non-standard / std units and simple equipment to record changes. With increasing independence record findings in words or pictures, or in simple prepared formats such as tables and charts.</p> <p>Review: Identify simple changes and talk about them. Sequence the changes. Begin to use scientific language to talk about changes. Talk about whether the change was as expected.</p> |
| SE-2: notice patterns & relationships | <p>e.g. the teacher could ask: 'What's similar about woodlice and other insects?'</p> <p>Plan: Show curiosity about patterns. With help, ask questions about patterns. Talk about ideas for finding out about patterns.</p> <p>Do: Use senses to look closely for patterns. Observe more than one thing at a time. Make simple records of what is noticed (with help where necessary). Use simple equipment to observe and record patterns.</p> <p>Review: Talk about what has been done and the patterns that have been noticed.</p> | <p>Guided, still informally, begin to notice patterns and relationships. <i>e.g. seasons, our body proportions</i></p> <p>Ask questions about why and how things are linked and suggest what patterns to observe and measure.</p> | <p>With guidance, begin to notice & investigate patterns and relationships. <i>e.g. different body proportions</i></p> <p>Plan: Ask questions about why and how things are linked. With help, decide what patterns to observe and measure and suggest how to do it.</p> <p>Do: Use non-standard units and simple equipment to record events that might be related. Record in words or pictures, or in simple prepared formats such as tables, tally charts and maps.</p> <p>Review: Identify simple patterns and talk about them. Make links between two sets of observations. Begin to use scientific language to talk about patterns. Talk about whether the pattern was as expected.</p> |
| SE-3: group & classify | <p>e.g. the teacher could ask: 'What's similar about woodlice and other insects?'</p> | <p>With guidance, group & classify. <i>e.g. materials, leaves, animals</i></p> | <p>With increasing confidence, group & classify (by observation & simple investigation). <i>e.g. food groups; alive, dead, never alive; plastics</i></p> |

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| | <p>Plan: Show curiosity about similarities and differences. With help ask questions about similarities and differences. Talk about ideas for sorting or matching things.</p> <p>Do: Use our senses to sort and match things. Match things that are the same. Find things that are similar or different. Choose which way to sort or group things. Use simple equipment to help sort things (e.g. boxes, hoops)</p> <p>Review: Talk about how things were sorted or matched.</p> | <p>Plan: Ask questions about how and why things are similar or different. Decide what to observe to identify or sort things.</p> <p>Do: Make comparisons between simple features of objects, materials or living things. Record observations in words, pictures or simple tables. Sort objects by observable and behavioural features. Record the sort in sorting circles or tables.</p> <p>Review: Identify similarities and differences and talk about them. Begin to use simple scientific language to talk about how things are similar or different. Try to use these sorting records to help sort or identify other things.</p> | <p>Plan: Ask questions about how and why things are similar or different. Decide what to observe to identify or sort things. e.g. alive, dead, never alive</p> <p>Do: Make comparisons between simple features of objects, materials or living things. Record observations in words, pictures or simple tables. Sort objects by observable and behavioural features. Record the sort in sorting circles or tables.</p> <p>Review: Identify similarities and differences and talk about them. Begin to use simple scientific language to talk about how things are similar or different. Try to use these sorting records to help sort or identify other things.</p> |
| <p>SE-4: comparative testing</p> | <p>Recognise some contrasting environments that are different to our own.</p> <p>Plan: Show curiosity about how things behave. With help, ask questions about things to test. Talk about ideas for testing how things behave.</p> <p>Do: Use our senses to look closely at how things behave. Carry out simple tests. Make simple records of what is noticed (with help where necessary). Use simple equipment to observe and record.</p> <p>Review: Talk about what has been done and what has been noticed.</p> | <p>May demo. /scaffold a simple comparative test <i>e.g. growing cress +/- soil</i></p> <p>Plan: Help to ask how and why questions. Together discuss how something might behave under 2 different conditions, noticing the link between cause and effect. Discuss which simple variable to change and how to measure and perform a comparative test.</p> <p>Do: Use non / standard units and simple equipment to record data. Record in words or pictures, or in simple prepared formats such as tables and tally charts.</p> <p>Review: Talk about collected data using simple scientific language, describe the simple causal relationship. Discuss how the test was fair and if the relationship was as expected.</p> | <p>Understand & begin to perform simple comparative tests. <i>e.g. absorption building materials (demo.), growing +/- soil; choice chambers-minibeasts</i></p> <p>Plan: Ask how and why questions. Make comparisons of how things behave. With help, notice links between cause and effect. With help, identify simple variables to change and measure. Plan simple comparative tests.</p> <p>Do: Use non-standard units and simple equipment to record data. Record in words or pictures, or in simple prepared formats such as tables and tally charts.</p> <p>Review: Talk about collected data. Use comparative data to rank materials or objects. Use simple scientific language to describe simple causal relationships. With help, say if the test was fair. Say if the relationship was as expected.</p> |

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| SE-5: use secondary sources | <p>Children have access to appropriate non-fiction books and links to information online to: i) help them follow their interests; ii) offer an insight into contrasting environments.</p> <p>Plan: Show curiosity about things in the immediate surroundings. With help, ask questions that can be answered using secondary sources.</p> <p>Do: Listen carefully. Know that information in books and electronic media can be used to answer questions. Find pictures of things. Talk to people about what they do and how things work.</p> <p>Review: Talk about things that have been found out.</p> | <p>Demonstrate / with support, find things out using simple secondary sources.</p> <p>Plan: Ask questions about how things are and the way they work. With help, make suggestions about how to find things out.</p> <p>Do: Use simple books and electronic media to find things out. Ask questions to find out what people do and how things work. Record in words and pictures what has been found out.</p> <p>Review: Begin to use scientific language to talk about what you found out. Talk about whether the information source was useful. Give an opinion about some things that have been found out.</p> | <p>Demonstrate / with support / growing independence in finding things out using simple secondary sources. <i>e.g. plastic biodegradability, human life cycle, earthworms</i></p> <p>Plan: Ask questions about how things are and the way they work. With help, make suggestions about how to find things out.</p> <p>Do: Use simple books and electronic media to find things out. Ask questions to find out what people do and how things work. Record in words and pictures what has been found out.</p> <p>Review: Begin to use scientific language to talk about what you found out. Talk about whether the information source was useful. Give an opinion about some things that have been found out.</p> |
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C. The importance of science

What is science? What is a scientist? What is their role in society today and for the future?

NC 3rd aim: children are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.

| | Reception (DevMatters2020) | Year 1 | Year 2 |
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| uses and implications of science | <p>Groundwork: begin to show curiosity about the world around them and to ask questions (J2).</p> <p>Science week: a first introduction to the role of a scientist.</p> | <p>Use of the working wall throughout the year.</p> <p>Science week, children are introduced to ‘what it is to be a scientist’ and their important role in improving society today and in the future.</p> | <p>Using the working wall throughout the year.</p> <p>Science week, growing understanding of what science is, the importance of scientists in improving society today and in the future.</p> |

D. reading: half-termly science storybooks

| Breadth | Reception | Year 1 | Year 2 |
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| | <p>Tree - Britta Teckentrup; Handa’s Surprise - Eileen Browne The Very Hungry Caterpillar - E. Carle; Slowly Sloth - Eric Carle; Tadpole’s Promise_ Jeanne Willis; My Shadow - Robert Lewis Stevenson;</p> | <p>White Owl, Barn Owl - Nicola Davies; Big Blue Whale - Nicola Davies; Emperor’s Egg - Martin Jenkins; The Tiny Seed - Eric Carle; Dandelion Seed - Joseph Anthony; Dem Bones - Bob Barner;</p> | <p>Tiny - Nicola Davies; Plants that Bite Back - Martin Jenkins; Yucky Worms - Vivian French; The Invention - Hubery & Monroe; Insect Detective - Steve & Charlotte Voake; Growing Frogs - Vivian French;</p> |

| Breadth | Reception | Year 1 | Year 2 |
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| | Yucky Worms - Vivian French; Caterpillar Butterfly- V. French; Oliver's Vegetables - V. French; Oliver's Fruit Salad Healthy Eating - Vivian French; | One Tiny Turtle - Nicola Davies; A Bat Loves the Night- Nicola Davies; Dolphin Baby - Nicola Davies; I don't like snakes - Nicola Davies; Ice Bear - Nicola Davies; Where did my clothes come from - Chris Butterworth?? | The Secret of the egg - Nicola Davies (variety); My Butterfly Bouquet - Nicola Davies; A planet full of Plastic - Neal Layton; Clean up! Nathan Byron; Bog Baby - Jeanne Willis |

E. cross curricular links

| Breadth | Reception | Year 1 | Year 2 |
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| plants & habitats | Patio activities: aut1: planting bulbs; Sum: grow cress, potatoes, sunflowers & other planters | Aut 1- fruit / veg cut & draw, where come from Su1&2 - Topic: Growing Plants, potatoes & more Jack & Beanstalk - a bean & diary Sum1 PofR: The Promise - seeds & dispersal, lots of growing compare leaves / flowers/ roots | Aut1: PofR (geography): Pattan's Pumpkin - Chitra Soundar - introduction to alive, dead & never alive, lifecycles, habitats; germination & growth - planting pumpkin seeds-observe over time; Sum 2: 1. PofR: The Curious Garden-Peter Brown: What plants need to grow / alive dead & never alive: pattern seeking: number of petals on daisy 2. Wisley visit: habitats - savanna, desert, rainforest, alpine - |
| animals including humans | Sci Wk: Farm Visit PofR: Croc & Bird - life cycles, characteristics Measuring height - Oct Sum 1: pond- frog spawn Sum 2: butterflies-insects, life cycles, comparative | Au1 - Topic: Under the Sea / fish, mammals; Aut 1:Ourselves & senses; measure our height/arm span Au1 - PofR: Storm Whale - mammals, fish, birds, all vertebrates Aut2: PofR: Princess & White Bear King - mammals Sp1- PofR: One Day on Our Blue Planet - fish, birds, mammals, invertebrates Sp1 - Sci Wk- Topic: Mary Anning-reptiles-dinosaurs | Aut 1: PofR: Robot & Bluebird - David Lucas; dead / alive, never alive, Spr 1: History: Florence Nightingale & Mary Seacole - balanced diet, exercise, health & hygiene Spr 2: 1. PofR: Bog Baby: habitats, adaptation to habitat & life cycles of frogs; 2. Maths - measuring in cm: pattern seeking of body proportions Sum 1: 1. PofR: Caterpillar, Butterfly - Vivian French; lifecycles: observe real caterpillars 2. PofR: Yucky Worms by V. French & Diary of Worm by Cronin - adaptation to habitat 3. Maths - statistics: class survey of ourselves-collecting data, tally, tables & results |

| Breadth | Reception | Year 1 | Year 2 |
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| everyday materials | Patio Activities: water trays-float & sink, ice yacht, apple boats playdough-Oct | Aut 1 - Topic: Grace Darling - floating & sinking Christmas: stain glass windows -properties of glass Spr 1 - PofR: One day on our Blue Planet - float & sink, phases of water Sp2 - PofR: The Princess & the White Bear King - materials | Aut1: 1. PofR: The Robot & the Bluebird by David Lucas - properties of metals, suitability of materials for use -metals ; 2. The Fire of London - suitability of building materials for their use 3. PofR: Planet full of Plastic by Leyton - caring for our planet: sorting plastics; rot or not, responsible use of plastic. |
| seasonal changes | making kites to fly -Oct | date & daily weather reports quarterly focus on the season observe shadows over day & year | Aut, Spr, Sum: PofR: Out and About by Shirley Hughes - revisit 4 seasons throughout the year |
| what is science & its impact on society | working wall | working wall; science week & Mary Anning & other scientists | Aur 1: PofR bk: A Planet Full of Plastic by Leyton - caring for our planet & responsible use of plastic Spr 1: science week: - What is a scientist? What Kind of Scientist am I? Learning about famous scientists over several weeks; |

E. Key Vocabulary

Key: **Bold** = key words that are often not known; (Bracketed) - do not officially need to know this word;

(Bracketed & highlighted) - don't officially need to know this word, but it's a key word that much else hangs on)

| breadth | FS | Year 1 | Year 2 |
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| | Knowledge | | |
| plants | | <u>Plants</u> Tree, roots, stem, trunk, branches, leaves; deciduous, evergreen; Seed, (germinate), root, shoot, bulb, flower, blossom, petals, fruit Identify & name wild and garden plants: e.g. daisy, buttercup, dandelion, clover; daffodil, tulip Identify and name trees: e.g. holly, oak, willow, sycamore, lime, ash | <u>Plants</u> Reproduce, offspring, lifecycle, germination, bulbs, growth, root, shoot, bud, flower, blossom, fruit, seeds, Survival, healthy, light, temperature, water, soil |
| living things & their | | | <u>living things & habitat</u> Alive (know several characteristics), dead, never alive; survival , water, air, food, temperature; Habitat, microhabitat, suited to their needs (adapted), |

| breadth | FS | Year 1 | Year 2 |
|---------------------------------|----|--|--|
| habitats | | | <p>dependent on each other; Food chain, (flow of energy), prey, predator, camouflage, protection; (e.g. woodland, meadow, pond, savanna, desert, tropical rainforest) Lifecycle & examples; e.g. caterpillar, pupa, butterfly; spawn, tadpole, frog; transform; kitten, puppy etc.</p> |
| animals including humans | | <p><u>humans</u> Parts of the body: head, body, backbone (skeleton); eyes, nose, tongue, ear; neck, shoulder, arm, elbow, wrist, hand, back, chest, hip, leg, knee, ankle, foot; (brain, heart, digestive system) Senses; sight, smell, touch, taste, hearing (linked to body part) <u>animals</u> identify, name & give characteristics of the 5 vertebrate (skeleton) groups: fish=tail, fin, scales; e.g. salmon amphibian=frogspawn, tadpole, frog, transform; reptiles=scales, lay eggs with shells; e.g. snake, crocodile bird= feathers, wings, beak, lay eggs with shells; e.g. robin, blackbird mammals=fur, hair, live young, milk; e.g. human, dog herbivore, omnivore, carnivore (examples of each)</p> | <p><u>humans & health</u> Lifecycle, mature, reproduce, offspring, growth; baby, toddler, child, teenager, adult, old age; Diet, balanced diet, healthy; Food groups: dairy, meat, eggs and pulses/beans, fruit & vegetables, grains, fatty & sugary Nutrients: (protein, fat, carbohydrates & sugars, vitamins & minerals, fibre) exercise, good hygiene</p> |
| everyday materials | | <p><u>Everyday materials and their properties</u> Name material; wood, plastic, glass, paper, metal, rock; Differentiate object vs material (Properties): hard, soft, rough, smooth, shiny, dull, bendy, stiff</p> | <p><u>Suitability of materials for their uses</u> wood, plastic, glass, paper, metal, rock, brick, fabric, elastic, foil etc (properties): solid, waterproof, absorbent, opaque, transparent, push, pull, roll, slide, bounce changes shapes: squash, bend, flexible, twist, stretch</p> |

| breadth | FS | Year 1 | Year 2 |
|---|--|--|---|
| | | | Stem sentence: The best material for..... is because it is; is not a good material for because |
| seasonal changes | | <u>Seasonal change</u> season, spring, summer, autumn, winter; day, month, year; night, sun, moon, light, dark, weather, temperature | |
| Understanding the nature, processes and methods of science | | | |
| scientific skills | ask questions, equipment, measure, observe, describe, compare, differences, similarities, patterns; record, diagram, chart, table, results, suggest answers | ask questions, equipment, measure, observe, describe, compare, differences, similarities, patterns; record, diagram, chart, table, results, suggest answers | ask questions, equipment, measure, observe, describe, compare, differences, similarities, patterns; record, diagram, chart, table, results, suggesting answers |
| types of investigation | observing over time; patterns; sort & group; compare; research (using secondary sources) | observing over time; patterns; sort & group; compare; research (using secondary sources) | observing over time; identify, sort & group; comparative testing; (pattern seeking); research (using secondary sources) |

A progressive, balanced curriculum has many strands:

- a. basic → applied → deep (Chris Quigley inset); need to learn basics (skills, vocabulary, knowledge & understanding) before moving on.
- b. demonstrated → supported / scaffolded → independent
- c. familiar experiences → unfamiliar experiences
- d. unstructured exploring, trial & error → structured investigating to answer questions
- e. observe & imaginative representations → measure & gather quantitative data
- f. simple representations (sorting hoops) → increasingly complex graph formations