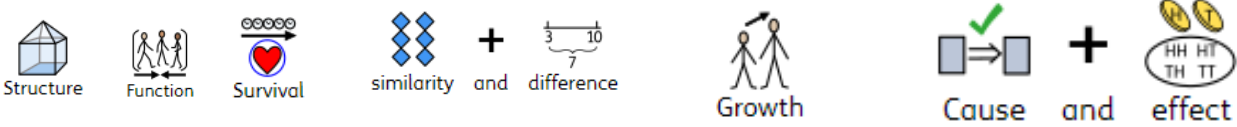


Science

Our Science curriculum will enable children to develop a sense of excitement and curiosity about natural phenomena. They will be encouraged to ask questions about the world around them and work scientifically to further their conceptual understanding and scientific knowledge. Children will be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes. It will provide opportunities for the critical evaluation of evidence and rational explanation of scientific phenomena as well as opportunity to apply their mathematical knowledge to their understanding of science, including collecting, presenting and analysing data. Children will be immersed in key scientific vocabulary, which supports in the acquisition of scientific knowledge and understanding.

Key Concepts



| | | Nursery | Reception | Y1 | Y2 | Y3 | Y4 | Y5 | Y6 |
|--------|-----------------------|-------------------------------------|--|---|--|---|--|----|----|
| Plants | Substantive Knowledge | Plants are living things that grow. | Much of our food comes from plants | Know an oak tree, a sycamore tree and a horse chestnut tree by sight. Know a rose, dandelion, sunflower, daffodil, poppy, marigold by sight. Explain how to plant a seed and help it grow. Seeds need water,soil, and light. Identify deciduous and evergreen trees. Identify stem, leaves, petal,root,trunk, flowers. | The names of different varieties of plants which grow from bulbs and seeds Daffodil,sunflower,tulip,cr ess – and that they require water, light and a suitable temperature to survive and reproduce Identify bulbs, bud,stem,branch,leaves,bl ossom,petal, roots. Know that plants need water, light and a suitable temperature to grow and stay healthy. | Identify and explain the purpose of different structures in flowering plants: stem/trunk,roots, leaves,flowers. Plants make their own food from sunlight. Some plants need different amounts of light, water and soil to grow. Cacti- wavy skin to prevent water loss. Long roots to collect water. The stem carries water up the plant. name the different parts of a flower and explain their role in pollination and fertilisation. recognise that soils are made from rocks and organic matter | No specific national curriculum content- planting is taught through wider outdoor curriculum see DT progression plan for further guidance. | | |
| | Vocabulary | Plant,grow | fruits, vegetables, soil, ground, trees, plants, growing, seeds, healthy | leaves, flowers, petals, roots, , seed, trunk, ,growth,grow,branch es, stem, soil trees (deciduous; evergreen); flowers; vegetables, water, soil, seed,sunlight,enviro nment, oak,rose,marigold,d afofdil,sunflower, sycamore,horse chesnut. | bulb bud germination, sprout,healthy,survive,pro duce,temperature | Nutrition, support, reproduction,seediling, shoot, bud, disperse, wind, soil organic, rock, formation, matter, top soil, sub soil, transformation, translocation, layer | | | |
| | Books | The tiny seed- Eric Carle | Oliver’s vegetables- Vivian French Jasper’s beanstalk- Nick Butterworth | The Night Flower— Lara Hawthorne Bloom—Nicola Skinner | 'Travelling Seeds' and 'Bees Like Flowers' by Rebecca Bielawski 'The Tiny Seed' by Eric Carle | A seed is sleepy- Dianna Hutts Aston | | | |

Explain how plants and animals are adapted to suit their environment. (Evolution and inheritance.)

Cati are adapted to live in a desert– they have a widespread root system to gather water quickly when it rains. Their stem is thick and wavy to prevent water loss.

The arctic poppy has a hairy stem to maintain heat.

Banana flower has thick waxy leaves so they can avoid being torn or removed from the plant.

Dandelion– seeds are spread by the wind.

Oak tree– acorns are eaten by animals and excreted in a different environment.

Poppy explodes it’s seed pod to spread them.

Sycamore– Seeds are spread by the wind.

Marigold– float downstream

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| Animals including humans | Substantive Knowledge | <p>Name domestic animals: cat, dog, rabbit, cow and horse. Identify animals and their sounds.</p> | <p>Name domestic animals: cat, dog, rabbit. Name farm animals: cow, chicken, sheep, horse, pig. Name world animals: lion, shark, owl,</p> | <p>Identify and name a variety of common animals including goldfish, pigeon, seagull, duck, snake, lizard, crocodile, elephant, frog, newt, hedgehog, fox describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) Fish have scales and fins. Birds have feathers and lay eggs. Pets live in homes. Reptiles have scales and legs. Amphibians live in water. Mammals have hair or fur.</p> <p>identify whether they are omnivores, carnivores or herbivores Carnivores eat other animals.</p> <p>Herbivores eat plants.</p> <p>Omnivores eat plants and animals.</p> <p>Names of parts of the human body (head, shoulders, back, stomach, legs, feet, arms, hands, fingers, toes, nose, eyes, ears and mouth). five sense organs are the eyes (for seeing), nose (for smelling), ears (for hearing), tongue (for tasting), and skin (for touching or feeling). Animals have senses to help them survive</p> | <p>Know that animals have offspring that grow into adults. Explain simple lifecycles: Baby-child-teenager-adult Egg-chick-chicken</p> <p>The basic needs of animals, including humans, for survival – water, food, air</p> <p>The importance for humans of exercise and hygiene. Brushing teeth gives healthy teeth, gums and fresh breath. Washing hands is important as it kills germs. Covering your mouth when coughing or sneezing stops germs being spread to others. Exercise keeps bones strong, and muscles toned and healthy. Sleep helps our body repair itself and provides time for the body to grow.</p> <p>the right amounts of different types of foods (carbohydrates, protein, milk & dairy, fruit & vegetables, fats and sugars),</p> | <p>Identify and explain the purpose of the skull, spine, rib cage, muscles.</p> <p>Skeletons are used for movement, support and protection.</p> <p>Identify vertebrates and invertebrates. Explain the terms: exoskeleton, endoskeleton and hydrostatic skeleton.</p> <p>Animals, including humans, need the correct type and amount of nutrition in order to survive. They cannot produce food and therefore must eat to live. (Covered in more detail in DT)</p> | <p>Identify and explain the job of parts of the with the digestive system: mouth, tongue, teeth, oesophagus, stomach, and small and large intestine,</p> <p>Types of teeth and their functions – molars, incisors, canines, premolars</p> <p>Construct and represent food chains. producers, predators & prey</p> <p>(Teeth and hygiene in PSHCE)</p> | <p>Changes through time to the human body – birth, newborn, infant, toddler, childhood, puberty, adolescence, adulthood, elderly, skin elasticity, senses, eyesight, hearing.</p> <p>(Covered in PSHCE through changes)</p> | <p>Name parts of the human circulatory system – heart, cardiovascular, lungs, pulmonary, arteries, veins, coronary, portal vessels, ventricle, atrium, valve systemic and main functions – flow of blood, nutrients through the body.</p> <p>Explain the impact of diet, exercise, drugs, lifestyles. (Covered further in PSHCE.) Exercise: Muscles increase in size, heart rate decreases at rest, increased energy.</p> <p>Diet: Balanced diet ensures the body gets everything it needs. Too much of something can alter the body's ability to work. Could lead to obesity or malnutrition. Rickets is caused by not enough nutrients.</p> <p>Alcohol: Slows down reactions and damages the liver.</p> <p>Caffeine :increases heart rate, increases alertness.</p> <p>Cigarettes: stains teeth, blocks arteries, damages lungs.</p> <p>Prescription drugs- help cure the body from bacterial and viral infections. Could prevent illness developing.</p> <p>Non-prescription drugs: alter brain chemistry, cause reactions to alter, heart rate to change.</p> |
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| | Vocabulary | Animal, farm, pet, | Zoo, | Fish, birds, sight, sound, taste, touch, smell, sort, group, lion, goldfish, shark, pigeon, duck, snake, lizard, crocodile, newt, frog, hedgehog, fox, eye, nose, ears, mouth, knee, elbow, hair, teeth mammals, <u>diagram</u> , senses, amphibians, reptiles, omnivores, carnivores, herbivores | Hygiene, carbohydrates, fats, proteins, milk, dairy, vegetables, sugars, fruits and vegetables, diet, balanced, change, diagram, offspring, child, adult, young, lifecycle, diagram, teenager, old, grow, growth, germs, spread | Support, bone, skeleton, system, endoskeleton, hydrostatic skeleton, exoskeleton, vertebrate, invertebrate, balanced. skuil,rib cage, femur, pelvis, | producers, predators, prey, molars, canines, mouth, tongue, teeth, oesophagus, stomach, and small and large intestine, diet, nutrition, excrete, prehistoric, omnivore, | Puberty, change, grow, decline, improve, stage, lifecycle, gestation, embryo, foetus, development, toddler, pension, responsibility, | function, circulatory system, heart, valve, blood vessel, vein, artery transport, oxygenated, deoxygenated lifestyle, drug,rate,prescription,malnutrition,obesity,fu nction |
| | Books | | | Super Duper You- Sophy Henn It's okay to be different – Todd Parr | | Skulls! Blair Thornburgh Spectacular skeleton- Whizz pop bang | | | |

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| Living Things and their habitats | | Identify and name some minibeasts: bee,ant,spider,ladybird. | Name and identify: slug, spider,insect,snail, worm,ant,beetle, bee Describe that living things change over time- butterflies and chicks. | <i>No specific national curriculum content from EYFS is revisited through work on the local environment in Geography and Life on Earth topic</i> | Identify things that are living, dead or never alive. Explain that all living things move, grow, eat and breathe. (Revisit from animals and humans topic.) Identify habitats and link to survival. Polar bears are adapted to their habitat as they are camouflaged. Their thick fur keeps them warm. Polar bears have small ears to keep them warm. Arctic Hares– change their fur dependent on the season so they are camouflaged. Elephants have big ears to help keep them cool. Elephants don’t have fur to keep them cool. Bees– yellow and black stripes to warn predators that they are dangerous. Orangutans have long arms so they can swing between trees. Identify and describe how animals get their food from plants and other animals. Humans are changing the climate. Polar bears are not designed to live in warm climates. The world is warming up because of pollution. | <i>No specific national curriculum content from previous year groups is linked in with animals including humans.</i> | Sort animals into reptiles, amphibians,mammals, fish and birds. Mammals: live young, fur, warm blooded Reptiles: scales, eggs, cold blooded Amphibians: moist skin, cold blooded, Birds: eggs,warm blooded, feathers,wings,beak Fish: scales,gills,fins,cold blooded Sort plants into flowering and non-flowering including grasses ferns and mosses. Grasses:Look like blades that are soft and bendable. (Bamboo,Wheat and Rye.) Ferns:flowerless and featherless leaves Mosses: seedless, small and found in damp, shady places. Identify and name plants within the school and local environment: oak, elm, birch, moss, fern, dandelion, daisy, poppy, marigold, daffodil, tulip, snowdrop, bluebell. Identify changes that occur with environments and the positive and negative impacts that it has. Polar bears Increased carbon dioxide has caused the Earth’s temperature to rise as a result ice caps have melted, reducing the Polar Bear’s habitat. Elephants are on the ICN red list. Poachers kill them for their tusks. Deforestation and farming have reduced the orangutan’s habitat. Bee populations are declining because the amount of pesticides being used on crops. Their habitats are being destroyed to make room for crop and livestock production. Reducing meat intake has shown to make a person’s carbon footprint lower.Although using some meat alternatives could increase a persons carbon footprint. describe in simple terms how fossils are formed when things that have lived are trapped within rock | Explain the reproduction cycle of plants including sexual and asexual reproduction. Explain the female and male parts of a plant. Look at the lifecycle of a butterfly, kangaroo and frog. | Explain the subclassifications for vertebrates and invertebrates. Vertebrates– Mammals, fish, reptiles, amphibians, birds Invertebrates– arthropod, molluscs, worms, an Arthropod is an invertebrate with a hard, external skeleton and jointed limbs insects are a type of arthropod; their bodies consist of six legs, a head, a thorax and an abdomen; most insects also have a pair of antennae and a pair of wings (e.g. wasp) an arachnid (e.g. spider) is a type of arthropod with eight legs and no antennae or wings Molluscs have a soft, unsegmented body, with damp skin. Worms are divided into segments with a moveable body. Understand the term micro-organisms. Know that there are three types of micro-organism: viruses, fungi and bacteria; of these three, viruses are often not really considered to be alive by many scientists mainly because they don’t have the ‘machinery’ to reproduce inside them Know that germs are disease-causing micro-organisms Yeast is used in the bread making process, it feeds on sugar causing the bread to rise. Understand that fossils provide information about living things from millions of years ago. Living things produce offspring of a similar kind. Explain how plants and animals are adapted to suit their environment. Arctic Hare– Fur changes colour to provide camouflage in Winter or Summer. Elephants– Large ears to cool down Walrus has a thick layer of fat to keep warm. Galapagos Finches: One species of finch arrived on the Galapagos islands from South America. Different food sources on the islands meant that different finches needed different beaks to survive. Over time, finches with beaks suitable for each island were naturally selected. Know that some adaptations lead to evolution. |
| | Substantive Knowledge | | | | | | | | |

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| | Vocabulary | Fly, legs, body, | Insect, minibeast, live, compost, dark, shady, sunlight | | Habitat, micro-habitat, survive, food chain, producer, consumer, | | Amphibian, mammal, fish, bird, scales, eggs, feathers, warm blooded, cold blooded, live young, offspring, weed, flowering, non-flowering, environment, climate change, fossil | pollination , pollinators , fertilization , seed dispersal , germination , stamen , stigma , carpel , pistil , flowering , reproduce , species , adapt , cycle | Key, classification, evolution, survival, advantage, weakness, strength, origin, species, |
| | Books | Do You Love Bugs? Matt Robertson The very hungary caterpillar- Eric Carle Superworm- Julia Donaldson Lost and Found— Oliver Jeffers | | | Evelyn the Adventurous Entomologist- Christine Evans Fantastically Great Women Who Saved the Planet- Kate Pankhurst Tadpole’s Promise— Jeanne Willis & Tony Ross | | Me... Jane= Patrick McDonnell Little People, Big Dreams... Jane Goodall Little People, Big Dreams... David Attenbrough Joan Proctor, Dragon Doctor Patricia Valdez Stone Girl, Bone Girl Laurence Anholt Under Your Feet – Dr Jackie Stroud | Cicada—Shaun Tan | Little People, Big Dreams...– Charles Darwin On the Origin of Species – Sabina Radeva Tiny Creatures: The World of Microbes-Nicola Davies All in a drop= Lou Alexander Moth- Isabel Thomas Beetle Boy— M G Leonard |
| Materials | Substantive Knowledge | Know that things feel differently. Talk about the feeling of different objects. | Describe how things feel, and look. Identify materials/objects that float or sink through observation. Investigate how light shines through some materials but not others. Change materials from one state to another- melting and cooking. (Explored further within the DT curriculum) | Identify and name a variety of everyday materials including wood , glass , metal , water and rock Describe simple properties of materials Distinguish between the object itself and the material from which it is made | Know that materials are used for different purposes due to their specific properties. Identify natural and man-made materials. | compare and group materials together, according to whether they are solids, liquids or gases observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C) identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature | compare and group together different kinds of rocks on the basis of their appearance and simple physical properties | compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating demonstrate that dissolving, mixing and changes of state are reversible changes explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda | <i>No specific national curriculum content- content from previous year groups is recapped through links in other science areas.</i> |
| | Vocabulary | Hard, soft, rough, smooth | | Materials, wood, plastic, fabric, rubber, metal, rocks, glass, water Hard, soft, stretchy, stiff, shiny, dull, rough, smooth, bendy, waterproof, rigid Absorbent, opaque, transparent, predict, properties, purpose | strong, weak, cold, hot ,translucent, fair test, experiment, investigation. | Solid, Liquid, Gas, Evaporation, Condensation, Particles, Temperature, Freezing, Heating, Precipitation | Sandstone, Granite, Marble, Pumice, Crystals, sedimentary, metamorphic, igneous, absorbent/porous, durable, permeable, impermeable | Hardness, Solubility, Transparent, Opaque, Translucent, Magnetic, Filter, Evaporation, Dissolving, Mixing, Thermal conductor, thermal insulator, electrical conductor, electrical insulator | |
| | Books | That’s not my..... | Stick Man | Three Little Pigs- Nicola Baxter | | | Mary Anning and the Sea Dragon Jeannine Atkins A Pebble in My Pocket— Meredith Hooper | | |
| Earth, Light and Sound | Substantive Knowledge- Light and Seasons | There is daytime and night time; it gets darker at night time. We can use lights to help us when it is dark | Name the four seasons and some changes within them. | Describe weather associated with the seasons and how the length of daylight hours changes . Names of months | <i>No science national curriculum content but work on weather is continued through the Year 2 Geography progression map.</i> | Darkness is the absence of light. Shadows are formed when light from a light source is blocked by an opaque object. Light from the sun can be dangerous and we must protect our eyes. Light is reflected from surfaces. Shadows are not always the same size. | <i>No science curriculum content but prior learning is referred to in work on rainforests within Geography.</i> | Day and night occur because of the Earth’s rotation on its axis once every 24hrs. Seasons occur because of the Earth’s tilt on it’s axis and it’s orbit around the sun. | Light can be reflected by mirrors and periscopes use this technique. Light is reflected from objects and then travels into our eyes. Shadows are the same shape as the object that casts them because light travels in a straight line. Rainbows are made when light is bent (refracted.) White light is made up of different colours of light. |

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| | Substantive knowledge- Sound | Different instruments make different sounds. Sounds can be loud or quiet. | <i>No science national curriculum content but exposure to a range of instruments and different methods of producing a sound are taught through the music curriculum.</i> | | | | Sounds are vibrations Vibrations from sounds travel through a medium to the ear The sounds that we hear differ through pitch and volume. Know that volume is how loud or quiet a sound is. Know that pitch is how high or low the sound is. The volume of sound alters depending on the distance from the source of the sound. | <i>No science national curriculum content but exposure to a range of instruments and different methods of producing a sound are taught through the music curriculum. Pitch, Timbre and dynamics are examine. Vibrations are modelled through the violin, samba and ukulele instrumental teaching.</i> | |
| | Substantive knowledge- Earth | Above us we can see the sky. | Identify the Earth, moon and sun. We live on the Earth. The Earth is our world and is made up of land and sea/oceans and sky. Beyond our sky, there is space. | The Earth takes 365 days to go around the sun. | <i>History of transport unit links prior learning about Earth.</i> | <i>No science curriculum content but prior learning is referred to in work on time in Maths.</i> | | The Earth rotates on it’s axis once every 24 hrs. The eight planets in the solar system – Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune The Sun is a star at the centre of our solar system. The moon is a celestial body that orbits a planet. The Earth, Sun and Moon are approximately spherical bodies. The moon is a celestial body that orbits the planet. | <i>No science curriculum content but mathematics curriculum links work on months, years and days.</i> |
| | Vocabulary | Night, day,light,dark,torch, lamp, star,sun, moon,morning, afternoon | Earth,planet,land,ocean, sea,sky, above,below,far away, world, live, month, year, Autumn, Winter, Spring, Summer, | Blizzard, gale, observe, deciduous , evergreen, Dormant, Sunrise, sunset, weather, length, hour, drizzle, seasonal, temperature, measure,hibernation, Season, Spring, Summer, Autumn, Winter, Leaves, fall, Change, rain, snowy, sunny, warm, cold,windy | <i>No science national curriculum content but vocab is included in work on climate and the history of transport.</i> | Dark, light, dim, bright, shadow, blocked, barrier, transparent, opaque, translucent, source, reflected, cast, UV light,reflection | Volume, Vibration, Wave, Pitch, Tone, Speaker, ear, dynamics, loud, soft, quiet | Earth, Sun, Moon, Axis, Rotation, Day, Night, Phases of the Moon, star, constellation, waxing, waning, full, new, year, month, galaxy straight, blocked, cast, | Refraction, |
| | Books | Whatever Next-Jill Murphy The way back home- Oliver Jeffers Bob’s best friend: the man on the moon Polar Bear, Polar Bear, What do you Hear? - Eric Carle | | We’re going on a leaf hunt- Steve Metzger And then it’s spring- Julie Fogliano Percy’s park- A year in Percy’s park- Nick Butterworth | <i>One Giant Leap: A historical account o the first moon landing. - Robert Burleigh The darkest dark- Chris Hadfield Laika: Astronaut Dog- Owen Davey</i> | Ona beam of light- Jennifer Berne The dark- lemony Snicket The game of shadows- Herve tullet | The Sound of Silence-Katrina Goldsaito The deaf musicians- Pete Seeger Moses goes to a concert- Isaac Millman | Hidden Figures – Margot Shetterly Curiosity, the Story of a Mars Rover If: A Mind-Bending Way of Looking at Big Ideas and Numbers (Paperback) David J. Smith | Speed of Starlight: An Exploration of Physics, Sound, Light, and Space- Colin Stuart |

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| Forces | Substantive Knowledge | <i>No science national curriculum content but linked to materials and their use. In EYFS, observations about forces occur through exploring of natural phenomena (See development matters) ,exploring how things work and talking about forces they can feel such as stretching elastic, snapping twigs and floating and sinking.</i> | Know how the shapes of solid objects made from some materials can be changed by <u>squashing</u> , <u>twisting</u> , <u>bending</u> and <u>stretching</u> | Some forces need direct contact between two objects (<u>push/pull</u>), but <u>magnetic forces</u> can act at a <u>distance</u> . <u>Magnets</u> have <u>two poles</u> , and will either <u>attract</u> or <u>repel</u> each other. Friction is caused when one surface rubs against another. | identify common appliances that run on electricity construct a simple series electrical circuit, identifying and naming its basic parts, 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 a lamp lights in a simple series circuit recognise some common conductors and insulators, and associate metals with being good conductors | 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 recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect | associate the brightness of a lamp or the volume of a buzzer with the number and voltage of 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 the on/off position of switches use recognised symbols when representing a simple circuit in a diagram : CELL,BUZZER,WIRE,BULB,SWITCH, MOTOR, |
| | Vocabulary | | Push, pull, change, squash,bend,twist,stretch | Pole, magnet, attract, contact, friction, distance, force | Current, component, electricity, insulator ,conductor ,battery,cell,bulb,wire, circuit, motor,switch, buzzer, bright, dim, open, closed | Air resistance, water resistance, friction, gravity, pivot, pulley, lever, newton, weight, mass | Series,symbol,voltage |
| | Books | | Traction Man- Mini Grey Up and Down—Oliver Jeffers | Act Normal, Don’t Tell Anyone about the Rhinoceros Magnet— Christian Darkin | | | |

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| Scientific Enquiry | Enquiry Types | | <div><div>Comparative / fair testing Changing one variable to see its effect on another, whilst keeping all others the same. </div><div>Research Using secondary sources of information to answer scientific questions. </div></div> | | <div><div>Observation over time Observing changes that occur over a period of time ranging from minutes to months. </div><div>Pattern-seeking Identifying patterns and looking for relationships in enquiries where variables are difficult to control. </div></div> | | <div><div>Identifying, grouping and classifying Making observations to name, sort and organise items. </div><div>Problem-solving Applying prior scientific knowledge to find answers to problems. </div></div> | | |
| | Planning and predicting | Observing over time | Ask questions about things changing. | Ask questions about how and why things change. Identify changes that could be measured with support. | Talk about changes that I see and identify when observations over time can be made. Decide what to observe and how often. Choose equipment to make observations. | | I can identify when observing over time will help answer my questions. I decide how detailed my observations need to be including equipment needed and appropriate measurements. | | |
| | | Research | | Pick books to help answer questions from a range provided by an adult. | Identify when secondary sources might support answering questions. | | Select sources of information that might help answer a question. | | |
| | | Comparative/Fair Testing | | Make comparisons about how things behave. Make links between cause and effect. Identify variables to measure. | Talk about links between cause and effect and with support develop questions for testing. Choose equipment to carry out tests. Decide on variables to collect data on. | | Identify when variables need to be controlled or changed. Create questions to be answered using fair or comparative tests. Choose equipment to carry out tests and when to repeat measurements. | | |
| | | Pattern Seeking | Ask questions about patterns | Ask questions about how things are linked and why. | Talk about where patterns might be found. Decide on what data to collect and what observations to make. | | Recognise when variables cannot be controlled and decide when pattern seeking will help answer a question. Decide on the data to collect and how to measure accurately. | | |
| | | Identifying, grouping and classifying | Ask about similarities and differences. | Identify simple criteria for sorting. | Discuss options for sorting and classifying things. Decide equipment that might be need to classify/group things. | | Make decisions about when classifying might help solve a problem Decide on appropriate secondary sources to support with classifying. | | |
| | | Problem Solving | To help children develop independence in scientific enquiry, pupils should be encouraged to use their own initiative in problem solving. You might challenge your pupils directly with a question or show a particular phenomena and ask them to explain it. Often, posing problems with a real life context will stimulate children's interest and thinking. | | | | | | |
| | Vocabulary | The.....is going to..... I think it will..... What do you think will happen next? What will happen if..... | I think..... I think.....because..... (prior knowledge) | I think.....because..... I predict that.....because..... I think they will be alike because they are both..... | I predict that.....because.....however/meanwhile/therefore/also..... I predict that.....after / as a result of This is probable because.....and.....are different in that.....therefore as a result..... After.....I predict that..... The outcome will be.....because..... What do you think? How did you come to that prediction? | I predict that.....because.....however..... Due to the fact that..... (extension of because) As a result of.....this will happen because..... All events lead on to.....because..... Because.....and.....are similar, I predict that.....will happen. The outcome will be.....due to..... Based on.....I predict that..... After hearing all the evidence, I think that..... will happen | I predict that..... I believe / I think..... might / or..... If..... Then..... X has happened, therefore I think..... | In light of.....I predict..... There is a high / low probability..... The chances of/The likelihood of/Due to the fact that/Upon consideration of the relevant factors | |
| | Collecting and presenting | Data Handling | | Produce pictograms using whole objects to explain findings using a given scale- 1,2,5,10. Create Tally Charts Interpret class produced bar charts. Use a two-way Venn diagram | Produce bar charts using a given scale. Produce bar charts using carefully selected scale. Interpret graphs from data loggers. | | Produce scatter plots and line graphs to explain findings. Explain what pie charts show. Produce simple pie charts to explain findings. Ask questions using graphs created by dataloggers. | | |
| | | Observing over time | Use senses to observe changes Look closely and talk about changes that I observe Draw pictures to show changes. | I can sequence the changes I have seen. Use measurements to the nearest cm to observe changes. Use a thermometer to observe changes to the nearest degree. Measure in ml. | Use measurements to the nearest $\frac{1}{10}$ cm. Use a thermometer to observe changes to the nearest $\frac{1}{10}$ degrees celcius. | | Use measurements appropriately and with careful consideration. | | |

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| | | Research | Listen carefully. Find pictures to help answer questions. Talk to people about what they do and how things work. | Use simple books and websites selected by an adult to find things out. | Use books and websites to find out information. Present findings in different ways. | | | Explain if secondary sources are reliable or if they might show bias. Select sources based on reliability. | |
| | | Comparative/Fair Testing | | Use measurements to the nearest cm to observe changes. Use a thermometer to observe changes to the nearest degree. Use stopwatches/timers to observe changes in seconds/minutes Measure in ml. | Use measurements to the nearest $\frac{1}{10}$ cm. Use a thermometer to observe changes to the nearest $\frac{1}{10}$ degrees celcius. | | | Use measurements appropriately and with careful consideration. | |
| | | Pattern Seeking | Use senses to look for patterns. Observe more than one thing at a time. | Use measurements to the nearest cm | Use measurements to the nearest $\frac{1}{10}$ cm. | | | Use measurements appropriately and with careful consideration. Explain the importance of sample size on reliability. | |
| | | Identifying, grouping and classifying | Use senses to sort and match things. Identify some things that are the same. Identify some things that are different. Use hoops or boxes to sort. Sort and group things based on own criteria. | Make comparisons between simple features of objects, materials and living things. Sort using observable and behavioural features. | Classify using simple tests for behaviour or properties. Use simple keys or branching databases. Make simple keys for things that have clear differences. | | | Use a series of tests to sort and classify materials. Use secondary sources to support classification Make own keys with four or more items. Use several pieces of evidence to identify and classify things. | |
| | | Problem Solving | To help children develop independence in scientific enquiry, pupils should be encouraged to use their own initiative in problem solving. You might challenge your pupils directly with a question or show a particular phenomena and ask them to explain it. Often, posing problems with a real life context will stimulate children's interest and thinking. | | | | | | |
| | | Vocabulary | It is the same because... It looks the same because... It feels the same because... It tastes the same because... It sounds the same because... It is different / They are different because... It is not the same. This is.....and that is..... | They are the same because..... They are different because.....is.....and...is..... They are alike because they are both..... | They are the same because..... They are similar because..... They are different because..... is.....and.....is..... They are alike because they are both..... It feels different because this one..... and that one..... | and.....are both.....and.....are alike in that.....and.....are similar because.....and.....are different in that.....is.....but..... ...is.....is.....but..... ...is.....is.....while...is..... |and.....are similar because.....and.....have the following points in common: One similarity between.....and.....is that..... Another is..... A further..... One difference is..... A further difference..... Year 5 In some ways....and.....are alike. For inst | In some ways....and.....are alike. For instance they both..... Another feature they have in common is that..... Furthermore they are both..... However they also differ in some ways. For example.....while..... Another difference is..... | In some ways.....and.....are alike. For instance they both..... Another feature they have in common is that..... Furthermore they are both..... However they also differ in some ways. For example.....while..... Another difference is that.....whereas..... .. Finally.....but..... The similarities/differences seem more significant that the similarities/differences because..... |
| | Analysing, concluding and evaluating. | Observing over time | Talk about what has been noticed. | Use scientific language outlined above to discuss changes. Talk about if a change was what I expected to happen. | Draw simple conclusions about changes. Use scientific language outlined above to discuss changes. Suggest simple improvements to investigations about changes. | | | Draw accurate conclusions based on data about changes. Evaluate experiments and suggest improvements. | |
| | | Research | Talk about what you have found out. | Use scientific language outlined above to discuss findings. Talk about if an information source was useful. | Use scientific language outlined above to discuss findings. Draw conclusions based on information from different sources. | | | Draw valid conclusions based on research. Understand that some scientific questions have no definitive answer. | |
| | | Comparative/Fair Testing | | Talk about data using scientific language. Use comparative data to rank objects/materials. Develop conclusions with support-EG. I am out of breath because I ran. | Draw simple conclusions about tests and begin to talk about causal relationships using the scientific language outline above. Suggest improvements to tests. | | | Draw valid conclusions based on data. Identify anomalous results. Explain causal relationships using scientific knowledge and understanding. Evaluate effectiveness of tests and recognise when variables are difficult to control. | |

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| | | Pattern Seeking | Talk about patterns | Use scientific language outlined above to discuss patterns. Talk about if a pattern was what I expected to happen. | | Use scientific language outlined above to discuss patterns. Suggest simple improvements for the way a pattern was spotted. Draw simple conclusions about patterns. | | Draw accurate conclusions based on data about patterns. Explain cause and effect patterns using scientific language. | |
| | | Identifying, grouping and classifying | Discuss what I have sorted or matched | Identified similarities and differences and discussed using the vocabulary above. Use records to help sort other items. | | Draw simple conclusions about items that have been sorted. Use scientific language outlined above to discuss classification. Suggest improvements about groupings. | | Evaluate keys/branching databases suggesting improvements. Draw out simple generalisations based on classifications. | |
| | | Problem Solving | To help children develop independence in scientific enquiry, pupils should be encouraged to use their own initiative in problem solving. You might challenge your pupils directly with a question or show a particular phenomena and ask them to explain it. Often, posing problems with a real life context will stimulate children's interest and thinking. | | | | | | |
| | | Vocabulary | Why did.....happen?happened because..... | I think that..... I think thatbecause | I think that.....becaus e..... This happened..... ...because..... | I think that.....because..... This happened.....because..... I conclude that..... On observing I found | I conclude that.....because..... I found that.....because..... As a result of.....I conclude that..... After looking at the data/information/results I conclude that..... On observing I found that.....9 I would say that.....due to the fact that..... My results make me think that.....because..... Having analysed the data, I conclude that.....You could improve this work by.....Maybe you could try..... Next time I / you could / would..... | The fact is..... In effect..... Given that.....then..... I deduce/deduct..... I have worked out..... In conclusion..... I conclude.....This is supported by the fact that..... In my opinion.....furthermore.....However..... Possible improvements may include..... | The facts lead to..... Based on..... Been lead to the conclusion that..... The evidence leads to..... Having considered..... This infers that.....In my opinion..... This is supported by the fact that..... Furthermore.....however..... Possible improvements may include..... Or alternatively..... |
| | | | Famous Scientists | Study the work of: Beatrix Potter | Study the work of: George James Symons Ole Kirk Christiansen Jane Colden Linda Brown Buck | Study the work of: Charles Macintosh Elizabeth Garrett Anderson Jane Goodall Bina Shaheen Siddiqui | Study the work of: Marie Curie Ibn al-Haytham Nikola Tesla Tom Hart Dyke Garett Morgan | Study the work of: David Attenbrough Mary Anning James West and Gerhard M Sessler Lewis Howard Latimer Washington Sheffield | Study the work of: Katherine Johnson Galileo Stephanie Kwolek David Attenbrough Eva Crane |