



## Science Intent and Implementation and Impact Shepherdswell Primary School

### ***Science intent with links to school intent:***

Our intention is to provide a high quality science education, that provides children with the foundations they need, to recognise the importance of Science in every aspect of daily life. Teaching and learning of Science will be taught weekly and given high prominence.

We want our children to take ownership of their learning and become scientists. Building on **prior knowledge**, through high quality and consistent teaching.

It is our duty as teachers to encourage children to engage with science that is all around them, making it relevant as well as creating **connections** from school and home.

Our curriculum will enable children to become **inquisitive and reflective** learners collaborating through researching, investigating, and evaluating experiences. Our science curriculum will be complimented through real life experiences which will foster a respect for living organisms and for the physical environment.

We will ensure there is a science area within their learning environment with, a curiosity cube and an interactive display, CP and relevant seasonal science and scientific vocabulary. Our children will have a curiosity cube relating to their current science strand. These will hook the children's interest, enabling them to develop a sense of excitement and **curiosity** in all strands of science. They will be encouraged to ask questions about the world around them and work scientifically to further their theoretical understanding and practical 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



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	<p>analysing data. Children will be immersed in key scientific vocabulary, which supports in the acquisition of scientific knowledge and understanding.</p> <p>All children will be provided with a broad and balanced science curriculum which reflects the equality and diversity policies and practice in school.</p> <p>Finally, the children will consider how events from the past affect us today. We will discuss this on a local, national or a global level. Our children should be given the opportunity to quench their <b>curiosity</b> by being exposed to immersive and experiential learning.</p>	
<b>Implementation</b>	<p><i>Action points:</i></p> <p style="text-align: center;">We will teach Science as a stand-alone lesson every week. These also can be taught in a cross curricular way when it fits. Making sure it is clear they are learning science specific skills and vocabulary. The Science curriculum links directly to scientific knowledge, skills and understanding to ensure that learning is progressive and continuous.</p>	<p><i>What I will be looking for from teachers and learning:</i></p> <ul style="list-style-type: none"> <li>– Teachers should be looking to take children on at least one educational visit or have a real-life experience related to each strand taught.</li> <li>– Teachers should be promoting the science language from the vocabulary spine.</li> <li>– Teachers should be creating CP for past and current science strands to reinforce learning.</li> <li>– To ensure that learning is progressive and continuous.</li> <li>– There should be a high standard of work in the books which promotes English and Maths skills within being transferred in science.</li> <li>– Children will work collaboratively and practically to investigate and experiment.</li> <li>– Making sure in each strand lessons are both theoretical and practical.</li> </ul>



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We will look to promote out of the box and critical thinkers. Passionate scientists. Through both theoretical and practical lessons.

Create incidental learning opportunities by creating interactive science areas in each class room and using a curiosity cube as a hook. Assessment will take place the first week after each strand has been completed.

Periodic year group assessment tasks, quizzes and informal strategies. Use of concept maps, verbal/written outcomes, reflection, presentations. Repeating experiments independently. EYFS is taught through learning about Knowledge and understanding of the world and incidentally throughout other areas, following

- Teachers should feel comfortable taking risks in order to promote immersive learning experiences.
- Make sure you are supporting SEND, by scaffolding.



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	<p>the children's interests and creating meaningful experiences.</p>
<p><b>Impact</b></p>	<p><i>What should we see from the children at the end of each key stage:</i></p> <p><b>End of EYFS and Key Stage 1</b></p> <p>Our approach to science results in a fun, engaging, high-quality science education, that provides children with the foundations for understanding the world. Our engagement with the local environment ensures that children learn through varied and first-hand experiences of the world around them. So much of science lends itself to outdoor learning and so we provide children with opportunities to experience this, through using our outdoor space and within Forest school. Through various workshops, trips and interactions with experts. The children will have the understanding that science has changed our lives and that it is vital to the world's future prosperity. Pupil voice is used to further develop the Science curriculum, through questioning of pupil's views and attitudes to Science to support the children's enjoyment of science and to motivate learners.</p> <p>EYFS The Early Years Foundation Stage Curriculum supports children's understanding of Science through the planning and teaching of 'Understanding the World.' Children find out about objects, materials and living things using all of their senses looking at similarities, differences, patterns and change. Both the environment and skilled practitioners foster curiosity and encourage explorative play, children are motivated to ask questions about why things happen and how things work. Our children are encouraged to use their natural environment around them to explore. Children enjoy spending time outdoors exploring mini-beasts and their habitats,</p>



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	observing the changing seasons, plants and animals. Children regularly participate in cookery and baking sessions which allows them to experience changes in state as ingredients are mixed, heated and cooled.						
<b>Coverage</b>	<b>Year R</b>	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4</b>	<b>Year 5</b>	<b>Year 6</b>
<b>Science language for vocabulary spine:</b>		Birds, fish, amphibians, reptiles, mammals and invertebrates · Feathers, scales, gills, fins, hair, land, water,	Classification - Birds, fish, amphibians, reptiles, mammals and invertebrates	Nutrition Diet Vitamins, minerals, fats, proteins and carbohydrates Functions of skeletons – protect, support and aid movement Magnets – bar and horseshoe	Digestive system –, oesophagus, stomach, acid, small intestine Protein, vitamin, mineral, carbohydrate, fats, energy, growth, repair. Saliva	Gestation Fetus Fertilisation Species Baby Toddler Adolescent Adult Elderly person Puberty	Circulatory system – heart, blood, veins, arteries, pulse, clotting Diet – balanced, vitamins, minerals, proteins, carbohydrates, sugars, fats



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	backbone, skeleton · Carnivores, herbivores, omnivores · Meat, plants · (Common parts/structures of animals) · (Names of animals that can be found in the school grounds) · (Names of animals that the children keep as pets) Types of materials: wood, plastic, glass, metal, water, rock, brick, fabric,	· Classificati on - Carnivores , herbivores , omnivores · Stages of growth of many insects – egg, larva, pupa, adult · Names of some invertebra tes – ladybirds, butterflies ,	Attract, repel North and south poles Magnetic Magnetic field Simple comparisons: dark, dull, bright, very bright Comparative vocabulary: brighter, duller, and darker Superlative vocabulary: brightest, dullest, and darkest Opaque, translucent, transparent Shadow – block, absence of light Reflect – bounce, mirror, reflection See – light source Sun – sunset, sunrise, position	Teeth – Incisors, canines, premolars, molars Function Foodchain – producer, consumer, predator, prey Electricity Appliances: fridge, freezer, TV, computer, iron, kettle, etc Series circuit Components: battery, bulb (lamp), bulb (lamp) holder, buzzer, crocodile clip, leads, wires, switch Describing words: brighter, duller, slow, fast, quiet, loud	Hormones Pituitary gland Testosterone Estrogen Types of forces: gravity, friction, air resistance, upthrust, weight Measuring forces: Newton meter, Newtons (N) Particles Surface area Push, pull Balance Mass – grams and kilograms Mechanical devices – gears, levers, pulleys, springs Life cycle of animals Animal Life Cycles Most animals including fish, mammals, reptiles	Drugs – caffeine, nicotine, alcohol, cannabis, cocaine, heroin Lifestyle – healthy Electricity, Volts Series circuit Components: battery, bulb (lamp), bulb (lamp) holder, buzzer, crocodile clip, leads, wires, switch Describing words: brighter, duller, slow, fast, quiet, loud Conductor, insulator Resistance Effects of electricity: Light, sound, movement, heat · Evolution, evolve · Natural selection · Survival
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	<p>sand, paper, flour, butter, milk, soil</p> <p>Properties of materials: hard/soft, stretchy/not stretchy, shiny/dull, rough/smooth, bendy/not bendy, transparent/not transparent, sticky/not sticky</p> <p>Verbs associated with materials: crumble, squash, bend, stretch, twist</p> <p>Trees - deciduous,</p>	<p>dragonflies, etc</p> <ul style="list-style-type: none"> <li>· Names of some amphibians – newt, common frog, toad</li> <li>· Stages of life – baby, toddler, child, teenager, adult</li> <li>· Life processes – growth, nutrition (feeding), respiration</li> </ul>	<p>Trees - deciduous, evergreen, ash, birch, beech, rowan, common lime, oak, sweet chestnut, horse chestnut, apple, willow, sycamore, fir, pine, holly, etc</p> <p>Wild flowering plants - cleavers, coltsfoot, daisy, dandelion, garlic mustard, mallow, mugwort, plantain, red clover, self heal, shepherd's purse, sorrel, spear thistle, white campion, white deadnettle and yarrow.</p> <p>Garden plants – crocus, daffodil, bluebells, etc</p>	<p>Conductor, insulator</p> <p>Effects of electricity: Light, sound, movement, heat</p> <p>Switches – open, close</p> <p>Habitat, micro habitat</p> <p>Pond, meadow, log pile, woodland, river, lake, beach, cliff</p> <p>Organism – plant, animal</p> <p>Trees - deciduous, evergreen, ash, birch, beech, rowan, common lime, oak, sweet chestnut, horse chestnut, apple, willow, sycamore, fir, pine, holly, etc</p>	<p>and birds have very simple life cycles: These animals have three stages -- before birth, young and adult. The young are typically similar to the parent, just smaller. The young slowly "grow" to become adults.</p> <p>Amphibians: Amphibians, like frogs and newts, have a slightly more complicated life cycle. They undergo a metamorphosis: they are born (either alive from their mother or hatched from eggs) they spend their childhood under water, breathing with gills</p>	<ul style="list-style-type: none"> <li>· Reproduction</li> <li>· Offspring, parents, siblings</li> <li>· Environment</li> <li>· Variation</li> <li>· Fossils; ammonites, belemnites, micrasters, etc</li> </ul> <p>Simple comparisons: dark, dull, bright, very bright</p> <p>Comparative vocabulary: brighter, duller, and darker</p> <p>Superlative vocabulary: brightest, dullest, and darkest</p> <p>Opaque, translucent, transparent</p> <p>Shadow – block, absence of light</p> <p>Reflect – bounce, mirror, reflection</p>
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	<p>evergreen, ash, birch, beech, rowan, common lime, oak, sweet chestnut, horse chestnut, apple, willow, sycamore, fir, pine, holly, etc</p> <p>Wild flowering plants - cleavers, coltsfoot, daisy, dandelion, garlic mustard, mallow, mugwort, plantain, red clover, self heal, shepherd's purse, sorrel, spear thistle, white campion,</p>	<p>(breathing is part of this)</p> <ul style="list-style-type: none"> <li>· Hygiene – clean, wash, germs</li> <li>· Foods – healthy, grow, strong, energy</li> </ul> <p>Habitat, micro habitat</p> <p>Pond, meadow, log pile, woodland, river, lake, beach, cliff</p>	<p>Parts of plants – roots, branch, trunk, stalk, leaf, flower, petal, seeds, bulbs and twigs</p> <p>Parts of a flower – petal, stamen (anther + filament), carpel (stigma + style + ovary + ovule)</p> <p>Processes – pollination, fertilisation, germination</p> <p>Names of rocks – Chalk, limestone, granite, basalt, sandstone, flint, slate, shale, marble</p> <p>Types of rock – Sedimentary, metamorphic, igneous</p> <p>Types of minerals – Calcite, feldspar,</p>	<p>Wild flowering plants - cleavers, coltsfoot, daisy, dandelion, garlic mustard, mallow, mugwort, plantain, red clover, self heal, shepherd's purse, sorrel, spear thistle, white campion, and yarrow.</p> <p>Garden plants – crocus, daffodil, bluebells, etc</p> <p>Parts of plants – roots, branch, trunk, stalk, leaf, flower, petal, seeds, bulbs and twigs</p> <p>Invertebrates – snail, slug, woodlouse,</p>	<p>they grow into adults and move to the land, breathing with lungs</p> <p>Animals that Undergo a Complete Metamorphosis: Insects</p> <p>These insects have four stages in their life cycle: egg: unborn stage. larva: young stage -- this is when most of the feeding is done. (they usually look like worms) pupa: inactive (no feeding) stage between larva and adult stages. (usually well camouflaged) adult: final, breeding stage. (they usually grow wings)</p>	<p>See – light source</p> <p>Sun – sunset, sunrise, position</p> <p>Classification</p> <p>Vertebrate, invertebrate</p> <p>Kingdoms: animal, plant, 'micro-organism'</p> <p>Classes: amphibian, reptile, bird, mammal, Scales, feathers</p> <p>Flowering plant, non-flowering plant</p>
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	<p>white deadnettle and yarrow. Garden plants – crocus, daffodil, bluebells, etc Parts of plants – roots, branch, trunk, stalk, leaf, flower, petal, seeds, bulbs and twigs Senses: touch, see, hear, smell and taste Seasons; spring, summer, autumn, winter Year, months, days Hot, warm, mild, cold Sunny</p>	<p>Organism – plant, animal Trees - deciduous , evergreen, ash, birch, beech, rowan, common lime, oak, sweet chestnut, horse chestnut, apple, willow, sycamore, fir, pine , holly, etc Wild flowering</p>	<p>topaz, diamond, talc, corundum Properties of rocks – Hard/soft, permeable/impermeable Processes – Heat, pressure, erosion, transportation, deposition, melt, solidify Size of rocks – Grain, pebbles Rock describing words – Crystals, layers Early areas of land – Gondwana, Pangea Land formations – Plates, volcanoes, mountains, valleys</p>	<p>spider, beetle, fly, etc Pond animals – pond skater, water slater, ramshorn snail, pond snail, leech, common frog, smooth newt, etc Ways to create sound – bang, blow, shake, and pluck Loudness – quiet, quieter, quietest, loud, louder and loudest Pitch - low, lower, lowest, high, higher, and highest Vibrations Source States of matter - Solid, liquid and gas</p>	<p>Animals that Undergo an Incomplete Metamorphosis: About 10% of insects go through an incomplete metamorphosis. They do not have a pupal form -- these include dragonflies, grasshoppers and cockroaches. These insects have three stages in their life cycle: egg: unborn stage. nymph: young stage -- this is when most of the feeding is done. adult: final, breeding stage - including wings. Plant reproduction Structure of the flower</p>	
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	<p>Cloudy Rain, sleet, snow, hail, thunder, lightning, rainbow Wet, damp, dry Windy, breezy, gust Temperature Degrees Celsius Thermometer Weather vane Anemometer</p>	<p>plants - cleavers, coltsfoot, daisy, dandelion, garlic mustard, mallow, mugwort, plantain, red clover, self heal, shepherd's purse, sorrel, spear thistle, white campion, white deadnettle and yarrow.</p>		<p>Examples of gases (at room temperature and pressure) – Oxygen, hydrogen, helium, carbon dioxide, methane Examples of liquids (at room temperature and pressure) – Water, milk, juice, petrol, oil Examples of solids (at room temperature and pressure) – Wood, rocks, metal, plastic, glass, wool, leather, etc Processes – Melting, condensation, evaporation, solidifying, freezing</p>	<p>Sepals – (if present) help to protect the flower in bud Petals – attract insects with colour, scent and nectar Stamens – make pollen and hold it in position Stigma – receives pollen during pollination Ovary – contains undeveloped seeds (ovules) which, if fertilised following pollination, develop into seeds Fruit – holds the seeds Reproduction of flowering plants The anther produces the pollen. The filament positions the anther where it can distribute</p>	
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			<p>Garden plants – crocus, daffodil, bluebells, etc</p> <p>Parts of plants – roots, branch, trunk, stalk, leaf, flower, petal, seeds, bulbs and twigs</p> <p>Invertebrates – snail, slug, woodlouse, spider,</p>		<p>Water cycle</p> <p>Water vapour</p> <p>Steam</p> <p>Heating</p> <p>Cooling</p>	<p>the pollen. Together the anther and the filament make up the stamen.</p> <p>The female reproductive organs are at centre of the flower and consists of the stigma, , which is sticky so that pollen remains attached, the style which positions the stigma so that it can receive the pollen, and the ovary, which contains one or more ovules. The best way to see the structure of the ovary is to look at it after fertilisation, when it is called a fruit.</p> <p>Thermal conductivity – thermal conductor, thermal insulator</p>	
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			beetle, fly, etc Pond animals – pond skater, water slater, ramshorn snail, pond snail, leech, common frog, smooth nTrees - deciduous , evergreen, ash, birch, beech, rowan,			Electrical conductivity – electrical conductor, electrical insulator Dissolving – Solvent, solution, solute, soluble, insoluble, solid, liquid, particles, suspensions Separating materials – Sieve, filter, evaporate, condense	
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			common lime, oak, sweet chestnut, horse chestnut, apple, willow, sycamore, fir, pine , holly, etc Wild flowering plants - cleavers, coltsfoot, daisy, dandelion, garlic mustard, mallow, mugwort, plantain,				
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			red clover, self heal, shepherd' s purse, sorrel, spear thistle, white campion, white deadnettl e and yarrow. Garden plants – crocus, daffodil, bluebells, etc Parts of plants – roots, branch,				
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			trunk, stalk, leaf, flower, petal, seeds, bulbs and twigs Need of plants – water, light, heat, temperatu re ewt, etc Types of materials: wood, plastic, glass, metal, water, rock, brick,				
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			fabric, sand, paper, flour, butter, milk, soil Properties of materials: hard/soft, stretchy/n ot stretchy, shiny/dull, rough/sm ooth, bendy/not bendy, transpare nt/not transpare nt,				
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			sticky/not sticky Verbs associated with materials: crumble, squash, bend, stretch, twist Senses: touch, see, hear, smell and taste				
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