

Lord Deramore's Primary School Science Curriculum Progression Plan

**Intent:** Science is a core subject. We believe that Science is vital in inspiring children's interest and curiosity in the world around them. It allows them to widen their knowledge and understanding of phenomena and teaches them that they don't need to just accept how and why things happen but can test and investigate themselves, using different methods of enquiry, to answer their own questions or to satisfy their own fascinations. It teaches them to reason and explain and to evaluate and reassess when things don't go as expected. Science allows children to make apply many of the skills they learn in other areas of the curriculum; note taking, timing, measuring, collecting and presenting findings, and also understanding geographical, historical and social contexts. It allows children to enjoy, and make use of, the natural world and to enjoy moments of awe and wonder when they see, or find out things, that bewilder or surprise them. Science is crucial to the future of many aspects of our daily lives such as health and medical care, design, technology, engineering, travel and exploration. We believe that it is important that children know that Science isn't just about learning more about the things we already know but that it helps us to push boundaries, solve problems, improve situations and create new opportunities. We want our pupils to know how Science affects them and about the many Scientific career paths available regardless of their gender or background.

**Implementation:** Science is taught discretely within year groups, with themes planned on a yearly cycle. A science and an outdoor week are focusses of the year where the opportunities throughout the week revolve around using and applying science skills and knowledge. At Lord Deramore's, we also value outdoor learning as an important part of a child's primary school experience. Extra-curricular and enhancement opportunities, such as STEM club, Hovercraft Day and close working with the university, are included to enhance the children's experience and enjoyment of science.

**Impact:** Children have a learning journal which begins in EYFS and moves through school with them. Each term, an investigation is recorded and deep marked to show progression in scientific knowledge and skills throughout school. Science is assessed by each teacher throughout the year, specifically at the end of a topic. Science levels are reported at the end of the year in the annual report. The Science Lead and SLT monitor the impact of the teaching and learning in science through learning walks, pupil voice, book trawls, staff questionnaires and lesson observations.

| Science                     | Phase 1   |  | Phase 2  |  | Phase 3   |  |  |
|-----------------------------|---|--|--|--|---|--|--|
|                             | EY  | Y1   | Y2   | Y3   | Y4  | Y5   | Y6   |
| <b>Skills and Knowledge</b> | <p><u>Understanding the World: The Natural World ELG</u><br/>Explore the natural world around them, making observations and drawing pictures of animals and plants;<br/>Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class;<br/>Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.</p> <p><u>Scientific skills</u></p> <ul style="list-style-type: none"> <li>Ask simple questions and recognise that they can be answered in different ways.</li> <li>Observe closely, using simple equipment.</li> <li>Perform simple tests.</li> <li>Identify and classify.</li> <li>Use observations and ideas to suggest answers to questions.</li> <li>Gather and record data to help in answering questions.</li> <li>Read and spell scientific vocabulary at a level consistent with their increasing word and spelling knowledge.</li> </ul> <p><u>Scientific knowledge</u><br/><i>See individual year group expectations for detailed breakdown of what children should know and remember for the topics covered</i></p> <ul style="list-style-type: none"> <li>Biology: Plants</li> <li>Biology: Animals, including humans</li> <li>Chemistry: Everyday materials</li> <li>Physics: Seasonal changes</li> </ul> |  | <p><u>Scientific skills</u></p> <ul style="list-style-type: none"> <li>Ask relevant questions and use different types of scientific enquiries to answer them.</li> <li>Use straightforward scientific evidence to answer questions or to support findings.</li> <li>Make systematic and careful observations and where appropriate take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.</li> <li>Set up simple practical enquiries, comparative and fair tests.</li> <li>Identify differences, similarities or changes related to simple scientific ideas and processes.</li> <li>Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.</li> <li>Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables.</li> <li>Gather, record, classify and present data in a variety of ways to help in answering questions.</li> <li>Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.</li> <li>Read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge.</li> </ul> <p><u>Scientific knowledge</u><br/><i>See individual year group expectations for detailed breakdown of what children should know and remember for the topics covered</i></p> <ul style="list-style-type: none"> <li>Biology: Plants</li> <li>Biology: Animals, including humans</li> <li>Biology: Living things and habitats</li> <li>Chemistry: Materials and their uses</li> <li>Chemistry: Rocks</li> <li>Physics: Light</li> <li>Physics: Forces and magnets</li> </ul> |  | <p><u>Scientific skills</u></p> <ul style="list-style-type: none"> <li>Plan different types of scientific enquiries to answers questions, including recognising and controlling variables where necessary.</li> <li>Identify scientific evidence that has been used to support or refute ideas or arguments.</li> <li>Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings where necessary.</li> <li>Use test results to make predictions to set up further comparative and fair tests.</li> <li>Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, and bar and line graphs.</li> <li>Report and present findings from enquiries including conclusions, causal relationships and explanations of and degree of trust in results, in orals and written forms such as displays and other presentations.</li> <li>Read, spell and pronounce scientific vocabulary correctly.</li> </ul> <p><u>Scientific knowledge</u><br/><i>See individual year group expectations for detailed breakdown of what children should know and remember for the topics covered</i></p> <ul style="list-style-type: none"> <li>Biology: Living things and habitats</li> <li>Biology: Animals, including humans</li> <li>Biology: Evolution and inheritance</li> <li>Chemistry: States of matter</li> <li>Chemistry: Properties of changes of materials</li> <li>Physics: Electricity and Sound</li> <li>Physics: Light and Electricity</li> <li>Physics: Forces and magnets</li> <li>Physics: Earth and space</li> </ul> |  |  |
| <b>Expectations</b>         | <p><u>Skills</u><br/>Talk about the things they observe and begin to answer questions about what they have seen.</p> <p>Explore using binoculars and magnifying glasses to look closely at things. Perform simple tests.</p> <p>Begin to use classification terms such as plant, animal</p> <p>Record their observations using pictures and labels</p> <p><u>Biology: Plants</u><br/>Talk about the differences and similarities between common plants. Know that plants and trees</p>  | <p><u>Skills</u><br/>Ask simple questions about what they are interested in and explore the different answers.</p> <p>Use equipment such as binoculars, magnifying glasses, bug collectors and measuring jugs appropriately to observe</p> <p>Experiment and explore to find out what happens to different things</p> <p>Use more exact classification such as evergreen, fish, insect ...</p> <p>Make links between what they see and the answer to questions about what has happened.</p> <p>Make simple measurements such as distance and time.</p> <p>Record what they see and what they have done using pictures and labels</p> | <p><u>Biology: Plants</u><br/>Know how seeds and bulbs grow into plants.<br/>Know what plants need in order to grow and stay healthy.</p> <p><u>Biology: Animals, including humans</u><br/>Know the basic stages in a life cycle for animals, including humans.<br/>Know what animals and humans need to survive.<br/>Know why exercise, a balanced diet and good hygiene are important for humans.</p> <p><u>Chemistry: Materials and their uses</u><br/>Identify and name a range of materials including wood, metal, plastic glass, brick, rock, paper and cardboard.<br/>Know why a material might of might not be used for a specific job.<br/>Know how materials can be changed by squashing, bending, twisting and stretching.</p>  | <p><u>Biology: Plants</u><br/>Know the function of different parts of glowing plants and trees.<br/>Know what different plants need to help them survive.<br/>Know how water is transported within plants.<br/>Know the plant life cycle, especially the importance of flowers.</p> <p><u>Biology: Animals, including humans</u><br/>Know about the importance of a nutritious, balanced diet.<br/>Know how nutrients, water and oxygen are transported within animals and humans.<br/>Know about the skeletal system of a human.<br/>Know about the muscular system of a human.<br/>Know about the purposes of the skeleton in humans and animals.</p> <p><u>Chemistry: Rocks</u><br/>Compare and group rocks based on their appearance and physical properties, giving a reason.</p> | <p><u>Biology: Living things and habitats</u><br/>Group living things in different ways.<br/>Use classification keys to group, identify and name living things.<br/>Create classification keys to group, identify and name living things.<br/>Know how changes to an environment could endanger living things.</p> <p><u>Chemistry: States of Matter</u><br/>Group materials based on their state of matter (solid, liquid, gas).<br/>Know how some materials can change state.<br/>Explore how materials change state.<br/>Measures the temperature at which materials change state.<br/>Know about the water cycle.<br/>Know the part played by evaporation and condensation in the water cycle.</p> <p><u>Physics: Sound</u><br/>Know how sound is made.<br/>Know how sound travels from a source to our ears.</p>   | <p><u>Biology: Living things (inc. humans &amp; sex education)</u><br/>Know the life cycle of different living things e.g. mammal, amphibian, insect, bird.<br/>Know the differences between different life cycles.<br/>Know the process of reproduction in plants.<br/>Know the process of reproduction in animals.<br/>Create a timeline to indicate stages of growth in humans.</p> <p><u>Chemistry: Properties and changes of materials</u><br/>Compare and group materials based on properties (e.g. hardness, solubility, transparency, conductivity).<br/>Know how a material dissolves to form a solution; explaining the process of dissolving.<br/>Know and show how to recover a substance from a solution.</p> | <p><u>Biology: Living things (inc. humans &amp; sex education)</u><br/>Classify living things into broad groups according to observable characteristics and based on similarities and differences.<br/>Know how living things have been classified.<br/>Give reasons for classifying plants and animals in a specific way.<br/>Identify and name the main parts of the human circulatory system.<br/>Know the function of the heart, blood vessels and blood.<br/>Know the impact of diet, exercise, drugs and lifestyle on health.<br/>Know the ways in which nutrients and water are transported in animals.<br/><b>ADD Y6 SEX ED KNOWLEDGE</b></p> <p><u>Biology: Evolution and inheritance</u><br/>Know how the Earth and living things have changed over time.<br/>Know how fossils can be used to find out about the past.</p> |

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|            | <p>have different names and look different.</p> <p><u>Biology: Animals, including humans</u><br/>Talk about the similarities and differences between different types of animals and describe where they live. Name some different animals of different types. Know how to name the parts of the human body that we can see.</p> <p><u>Chemistry: Everyday materials</u><br/>Describe the properties an object is made from and begin to name the material an object is made from. Compare similarities and differences between materials.</p> <p><u>Physics: Seasonal changes</u><br/>Describe the weather through observation. Name the seasons and make observations of the similarities and differences between them.</p> | <p><u>Biology: Plants</u><br/>Know and name a variety of common wild and garden plants. Know and name the petals, stem, leaves and root of a plant. Know and name the roots, trunk, branches and leaves of a tree.</p> <p><u>Biology: Animals, including humans</u><br/>Know and name a variety of animals, including fish, amphibians, reptiles, birds and mammals. Classify and know animals by what they eat (carnivore, herbivore and omnivore). Know how to sort animals into categories. Know how to sort living and non-living things. Know how to link the correct part of the human body to each sense.</p> <p><u>Chemistry: Everyday materials</u><br/>Distinguish between an object and the materials it is made from. Know the materials that an object is made from. Know the difference between wood, plastic, glass, metal, water and rock. Know about the properties of everyday materials. Group objects based on the materials they are made from.</p> <p><u>Physics: Seasonal changes</u><br/>Observe and know and about the changes in the seasons. Name the seasons and know about the types of weather in each season.</p> |  | <p>Know how fossils are formed. Know about and explain the difference between sedimentary, metamorphic and igneous rock.</p> <p><u>Physics: Light</u><br/>Know what dark is (the absence of light)<br/>Know that light is needed in order to see.<br/>Know that light is reflected from a surface.<br/>Know and demonstrate how a shadow is formed.<br/>Explore shadow size and explain the changes.<br/>Know the danger of direct sunlight and describe how to keep protected.</p> <p><u>Physics: Forces and magnets</u><br/>Know about and describe how objects move on different surfaces. Know how some forces require contact and some do not. Know about how objects attract and repel in relation to objects and other magnets. Predict whether objects will be magnetic and carry out an enquiry to test this out. Know how magnets work. Predict whether magnets will attract or repel and give a reason.</p>  | <p>Know how sounds are made, associating some of them with vibrating.<br/>Know the correlation between pitch and the object producing a sound. Know the correlation between the volume of a sound and the strength of the vibrations that produced it. Know what happens to a sound as it travels away from its source.</p> <p><u>Physics: Electricity</u><br/>Identify and name appliances<br/>Construct a series of circuit. Identify and name components in a series circuit (cells, wires, bulbs, switches, buzzers). Know how to draw a circuit. Know the function of a switch in a circuit. Know the difference between a conductor and an insulator, giving examples of each.</p>  | <p>Know how some materials can be separated (filtering, sieving, evaporating). Know and can demonstrate that some changes are reversible and irreversible. Give evidenced reasons why materials should be used for specific purposes.</p> <p><u>Physics: Earth and space</u><br/>Know about and explain the movement of the Earth and other planets relative to the Sun. Know about and explain the movement of the Moon relative to the Earth. Know and demonstrate how night and day are created. Describe the Sun, Earth and Moon (using the term spherical).</p> <p><u>Physics: Forces</u><br/>Know what gravity is and its impact on our lives. Identify and know the effect of air resistance. Identify and know the effect of water resistance. Identify and know the effect of friction. Explain how levers, pulleys and gears allow a smaller force to have a greater effect.</p>  | <p>Know about reproduction and offspring (recognising that offspring normally vary and are not identical to their parents). Know how animals and plants are adapted to suit their environment. Link adaptation over time to evolution. Know about evolution and can explain what it is.</p> <p><u>Physics: Light</u><br/>Know how light travels. Know and demonstrate how we see objects. Know why shadows have the same shape as the object that casts them. Know how simple optical instruments work (periscope, telescope, mirror etc.).</p> <p><u>Physics: Electricity</u><br/>Know how the number and voltage of cells in a circuit links to the brightness of a lamp or buzzer. Compare and give reasons for why components work and do not work in a circuit. Draw circuit diagrams using correct symbols.</p> |
| Vocabulary | Fish, amphibians, reptiles, birds, mammals, pets, human, animal, senses, parts of the body, animal names, animal classes, materials e.g. wood, plastic, glass etc, properties hard, soft, stretchy, stiff, etc, plant, tree, stem, leaf, petal, roots, trunk, branches, fruit, vegetables, bulb, seed, flower, seasons, day, night, weather, wind, rain, snow, etc, hot, cold, warm, question, answer, sort, map, describe, group  | Grow, adult, egg, caterpillar, pupa, butterfly, water, food, air, exercise, hygiene, spawn, tadpole, frog, nutrition, reproduce, egg, chick, chicken, lamb, sheep, baby, toddler, child, teenager, adult, living, dead, never alive, habitats, micro-habitats, food, food chain, sun, grass, cow, human, alive, healthy, shelter, seashore, woodland, ocean, rainforest, hot/cold/warm, dry/damp/wet, bright/shade/dark, deciduous, evergreen, trunk, branches, leaf, root, leaves, bud, flowers, blossom, grow, healthy, petals, root, stem, fruit, vegetables, bulb, seed, water, light, germination, reproduction, wood, metal, plastic, glass, brick, rock, paper, cardboard, rubber, waterproof, squash, bend, stretch, twist, Observe, equipment, identify, classify, diagram, chart, data, compare, contrast, biology, chemistry, physics, record,  | Nutrition, carbohydrates, protein, fat, fibre, water, vitamins, minerals, skeletons, bones, joints, vertebrate, invertebrate, muscles, force, push, pull, open, surface, magnet, magnetic, attract, repel, poles, North, South, light, dark, reflect, surface, natural, star, sun, moon, shadow, solid, artificial, torch, candle, lamp, sunlight, dangerous, common, wild, plant, deciduous, evergreen, trunk, branches, leaf, root, bud, blossom, petals, root, fruit, fruit, vegetables, bulb, seed, common, wild, garden, deciduous, evergreen, water, light, temperature, grow, healthy, germination, reproduction, appearance, physical, hard/soft/shiny/dull, rough/smooth, absorbent/non-absorbent, fossils sedimentary, rock, soils, crystals fair test, observation, accurate, measurement, drawing, bar charts, differences, similarities, changes, | Digestion, mouth, tongue, saliva, oesophagus, stomach, acid, enzymes, small intestine, absorb, vitamins, large intestine, colon, teeth, incisors, canines, molars, sun, producers, prey, predators, carnivore, herbivore, omnivore, appliances, electricity, circuit, cell, wire, bulb, buzzer, danger, insulator, conduct, metal, switch, flow, environment, flowering, non-flowering, plants, animals, vertebrate, environment, invertebrate, insect, fish, amphibians, reptiles, birds, mammals, grasses, ferns, mosses, ecological, population, development, litter, deforestation, vibrate, vibration, ear, hear, sound, volume, pitch, faint, loud, string, percussion, woodwind, brass, insulate, solid, solidify, iron, ice, melt, freeze, liquid, evaporate, condense, gas, state, matter, heat, cool, degrees, Celsius, thermometer, water cycle, evaporation, condensation, temperature, melting, warm/cool, water vapour, scientific enquiry, comparative and fair test, systematic, gather, record, classify, present, labelled diagrams, keys, predictions, evidence, sources | Puberty, life cycle, gestation, growth, reproduce, foetus, baby, fertilisation, toddler, child, teenager, adult, life expectancy, adolescence, earth, sun, moon, planets, stars, solar system, Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune, Pluto, rotate, day, night, Aristotle, Ptolemy, Galileo, Copernicus, Brahe, Alhazen, orbit, axis, spherical, heliocentric, geocentric, hemisphere, season, tilt, gravity, air resistance, water resistance, friction, surface, force, effect, move, accelerate, decelerate, direction, mechanism, pulley, gear, spring, Galileo, Isaac Newton, life cycle, mammal, amphibian, insect, bird, plant, animal, sexual, asexual, properties, hardness, solubility, transparency, conductor, electrical, thermal, magnet, dissolve, solution, separate, solid, liquid, gas, evaporate, reversible, mix, evaporate, filter, sieve, melt, irreversible, burn, rust, conductivity, insulation, chemical Plan, measurements, accuracy, labels, tables, bar graphs, line graphs, predictions, conclusion, explanation, | Evolution, adaptation, inherited, adaptive, traits, natural selection, inheritance, Charles Darwin, Alfred Wallace, DNA, genes, variation, parent, offspring, fossil, environment, habitat, plants, animals, living things, classify, Linnaean, classification, domain, kingdom, phylum, class, order, family, genus, species, characteristics, vertebrates, invertebrates, microorganisms, organism, flowering, non-flowering, internal organs, heart, lungs, liver, kidney, brain, skeletal, skeleton, muscle, muscular, digestion, digestive, circulatory system, heart, blood vessels, blood, impact, diet, exercise, drugs, lifestyle, nutrients, damage, drugs, alcohol, substances, voltage, brightness, volume, switches, danger, series circuit, safety, circuit, diagram, switch, bulb, buzzer, motor, symbol, light, travel, straight, reflect, reflection, light source, object, shadow, mirror, periscope, rainbow, filter Variables, precision, repeat readings, scientific diagrams, classification keys, scatter graphs, further comparative and fair test, conclusion, causal relationship, quantitative |   |

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| Long Term Planning Link       | Autumn term: Materials<br>Spring Term: Animals, including Humans<br>Summer Term: Plants<br>All year: Seasonal Changes | Autumn Term: Plants<br>Spring Term: Materials and their uses<br>Summer Term 1: Animals, including humans<br>Summer Term 2: Habitats | Autumn Term: Forces and Magnets<br>Spring Term 1: Rocks<br>Spring Term 2: Animals, including humans<br>Summer Term 1: Light<br>Summer Term 2: Plants | Autumn Term 1: Electricity<br>Autumn Term 2: Sound<br>Spring Term: States of Matter<br>Summer Term: Living Things, Animals, including humans | Autumn Term 1: Earth and Space<br>Autumn Term 2: Forces<br>Spring Term: Properties and Changes of Materials<br>Summer Term: Living Things, Animals and Sex Education | Autumn Term 1: Light<br>Autumn Term 2: Electricity<br>Spring Term: Evolution<br>Summer Term: Living Things, Animals and Sex Education |
| Enrichment / Cultural Capital |   |   |  |  |  |   |