

## Key Learning in Science: Year 3

**Please Note:** There should be plenty of opportunities throughout the year for children to use the school/local environment to observe plant lifecycles with a particular focus on the different parts of a plant (e.g. comparing fruits and seeds and looking for examples of pollination). This could be done through an ongoing/monthly nature journal to observe, record and review over a period of time.

| Plants – Functions of Parts of a Plant)  | Health - Health/Nutrition)  | Animals - Skeletons and Movement)   |
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| <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>▪ Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers.</li> <li>▪ Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant.</li> <li>▪ Investigate the way in which water is transported within plants.</li> <li>▪ Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</li> <li>▪ Roots grow downwards and anchor the plant.</li> <li>▪ Water, taken in by the roots, goes up the stem to the leaves, flowers and fruit.</li> <li>▪ Nutrients (not food) are taken in through the roots.</li> <li>▪ Stems provide support and enable the plant to grow towards the light.</li> <li>▪ Plants make their own food in the leaves using energy from the sun.</li> <li>▪ Flowers attract insects to aid pollination.</li> <li>▪ Pollination is when pollen is transferred between plants by insects, birds, other animals and the wind.</li> <li>▪ Fertilisation occurs in the ovary of the flower.</li> <li>▪ Seeds are formed as a result of fertilisation.</li> <li>▪ Many flowers produce fruits which protect the seed and/or aid seed dispersal.</li> <li>▪ Seed dispersal, by a variety of methods, helps ensure that new plants survive.</li> <li>▪ Plants need nutrients to grow healthily (either naturally from the soil or from fertiliser added to soil).</li> </ul> <p><b>Notes and Guidance (non-statutory):</b><br/>Pupils should be introduced to the relationship between structure and function: the idea that every part has a job to do. They should explore questions that focus on the role of the roots and stem in nutrition and support, leaves for nutrition and flowers for reproduction.<br/><b>Note:</b> Pupils can be introduced to the idea that plants can make their own food, but at this stage they do not need to understand how this happens.</p> <p><b>Pupils might work scientifically by:</b></p> <ul style="list-style-type: none"> <li>▪ Comparing the effect of different factors on plant growth, for example the amount of light, the amount of fertiliser;</li> <li>▪ Discovering how seeds are formed by</li> <li>▪ Observing the different stages of plant cycles over a period of time;</li> <li>▪ Looking for patterns in the structure of fruits that relate to how the seeds are dispersed.</li> <li>▪ Observing how water is transported in plants, for example, by putting cut, white carnations into coloured water.</li> <li>▪ Observing how water travels up the stem to the flowers.</li> </ul> | <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>▪ Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat.</li> <li>▪ An adequate and varied diet is beneficial to health (along with a good supply of air and clean water).</li> <li>▪ Regular and varied exercise <i>from a variety of different activities</i> is beneficial to health (focus on <i>energy in versus energy out</i>. Include information on making informed choices).</li> </ul> <p><b>Notes and Guidance (non-statutory):</b><br/>Pupils should continue to learn about the importance of nutrition</p> <p><b>Pupils might work scientifically by:</b></p> <ul style="list-style-type: none"> <li>▪ Comparing and contrasting the diets of different animals (including their pets).</li> <li>▪ Decide ways of grouping them according to what they eat.</li> <li>▪ Researching different food groups and how they keep us healthy.</li> <li>▪ Designing meals based on what they find out.</li> </ul> | <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>▪ Identify that humans and some other animals have skeletons and muscles for support, protection and movement.</li> <li>▪ Identify animals (vertebrates) which have a skeleton which supports their body, aids movement &amp; protects vital organs (be able to name some of the vital organs).</li> <li>▪ Identify animals without internal skeletons/backbones (invertebrates) and describe how they have adapted other ways to support themselves, move &amp; protect their vital organs.</li> <li>▪ Know how the skeletons of birds, mammals, fish, amphibians or reptiles are similar (backbone, ribs, skull, bones used for movement) and the differences in their skeletons.</li> <li>▪ Know that muscles, which are attached to the skeleton, help animals move parts of their body.</li> <li>▪ Explore how humans grow bigger as they reach maturity by making comparisons linked to body proportions and skeleton growth – e.g. do people with longer legs have longer arm spans?</li> <li>▪ Recognise that animals are alive; they move, feed, grow, use their senses and reproduce.</li> </ul> <p><b>Notes and Guidance (non-statutory):</b><br/>Pupils should be introduced to the main body parts associated with the skeleton and muscles, finding out how different parts of the body have special functions.</p> <p><b>Pupils might work scientifically by:</b></p> <ul style="list-style-type: none"> <li>▪ Identifying and grouping animals with and without skeletons.</li> <li>▪ Observing and comparing their movement.</li> <li>▪ Exploring ideas about what would happen if humans did not have skeletons.</li> </ul> |

## Key Learning in Science: Year 3

| Material Properties - Rocks)   | Light and Astronomy - Light, reflections and shadows)  | Forces – Non contact forces)   |
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| <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.</li> <li>Describe in simple terms how fossils are formed when things that have lived are trapped within rock.</li> <li>Recognise that soils are made from rocks and organic matter.</li> <li>Rocks and soils can feel and look different.</li> <li>Rocks and soils can be different in different places/environments.</li> </ul> <p><b>Notes and Guidance (non-statutory):</b><br/>Linked with work in geography, pupils should explore different kinds of rocks and soils, including those in the local environment.</p> <p><b>Pupils might work scientifically by:</b></p> <ul style="list-style-type: none"> <li>Observing rocks, including those used in buildings and gravestones.</li> <li>Exploring how and why they might have changed over time.</li> <li>Using a hand lens or microscope to help them.</li> <li>Identify and classify rocks according to whether they have grains or crystals, and whether they have fossils in them.</li> <li>Research and discuss the different kinds of living things whose fossils are found in sedimentary rock.</li> <li>Explore how fossils are formed.</li> <li>Explore different soils.</li> <li>Identify similarities and differences between them.</li> <li>Investigate what happens when rocks are rubbed together or what changes occur when they are in water.</li> <li>Raise and answer questions about the way soils are formed.</li> </ul> | <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>Recognise that they need light in order to see things and that dark is the absence of light.</li> <li>Notice that light is reflected from surfaces.</li> <li>Recognise that light from the sun can be dangerous and that there are ways to protect their eyes.</li> <li>Recognise that shadows are formed when the light from a light source is blocked by a solid object.</li> <li>Find patterns in the way that the size of shadows change.</li> </ul> <p><b>Notes and Guidance (non-statutory):</b><br/>Pupils should explore what happens when light reflects off a mirror or other reflective surfaces, including playing mirror games to help them answer questions about how light behaves. They should think about why it is important to protect their eyes from bright lights. They should look for, and measure shadows and find out how they are formed and what might cause shadows to change.</p> <p><b>Note:</b> Pupils should be warned that it is not safe to look directly at the Sun, even when wearing dark glasses.</p> <p><b>Pupils might work scientifically by:</b></p> <ul style="list-style-type: none"> <li>Looking for patterns in what happens to shadows when the light source moves or the distance between the light source and the object changes.</li> </ul> | <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>Compare how some things move on different surfaces.</li> <li>Notice that some forces need contact between two objects but magnetic forces can act at a distance.</li> <li>Observe how magnets attract or repel each other and attract some materials and not others.</li> <li>Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials.</li> <li>Describe magnets as having two poles.</li> <li>Predict whether two magnets will attract or repel each other, depending on which poles are facing.</li> </ul> <p><b>Notes and Guidance (non-statutory):</b><br/>Pupils should observe that magnetic forces can act without direct contact, unlike most forces, where direct contact is necessary (for example, opening a door, pushing a swing). They should explore the behaviour and everyday uses of different magnets (for example, bar, ring, button, horseshoe).</p> <p><b>Pupils might work scientifically by:</b></p> <ul style="list-style-type: none"> <li>Comparing how different things move and grouping them.</li> <li>Raising questions and carrying out tests to find out how far things move on different surfaces.</li> <li>Gathering and recording data to find answers to their questions.</li> <li>Exploring the strengths of different magnets and finding a fair way to compare them.</li> <li>Sorting materials into those that are magnetic and those that are not.</li> <li>Looking for patterns in the way that magnets behave in relation to each other and what might affect this, for example, the strength of the magnet or which pole faces another.</li> <li>Identifying how these properties make magnets useful in everyday items and suggesting creative uses for different magnets.</li> </ul> |

## Year Group Expectations: Year 3

| Sort / group / compare / classify / identify  | Research<br><i>finding things out using a wide range of secondary sources of information and recognising that scientific ideas change and develop over time</i>  | Modelling  | Recording of 'Explore / Observe'<br><i>developing a deeper understanding of a wide range of scientific ideas encountering more abstract ideas</i>   | Questioning<br><i>asking their own questions about scientific phenomena</i>   | Planning<br><i>using different types of scientific enquiry making decisions about and explaining choices for testing</i>   |
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| <ul style="list-style-type: none"> <li>Compare and contrast functions, diets, teeth, changes over time.</li> <li>Record similarities and differences.</li> <li>Decide ways and give reasons for sorting, grouping, classifying, identifying things/objects, living things, processes or events based on specific characteristics.</li> </ul>  | <ul style="list-style-type: none"> <li>Create/invent design something based on what they have found out applying both research and/or practical experiences (Y3/4).</li> <li>Find out about the work of famous scientists historical and modern day (Y3/4).</li> <li>Finding things out using secondary sources of information (Y3/4).</li> </ul>  | <ul style="list-style-type: none"> <li>Act out something to represent something else about the world around us.</li> </ul>   | <ul style="list-style-type: none"> <li>Observe and record relationships between structure and function (Y3/4).</li> <li>Observe and record changes /stages over time (Y3/4).</li> <li>Explore / observe things in the local environment / real contexts and record observations (Y3/4).</li> <li>Record observations/explorations/ processes using simple scientific language.</li> </ul> | <ul style="list-style-type: none"> <li>Explore their own ideas about 'what if....?' scenarios e.g. humans did not have skeletons.</li> <li>Begin to understand that some questions are testable/ can be tested in the classroom and some cannot.</li> <li>Within a group suggest relevant questions about what they observe and about the world around them.</li> </ul> | <ul style="list-style-type: none"> <li>Help to decide about how to set up a simple fair test and begin to recognise when a test is not fair.</li> <li>As a group, begin to make some decisions about the best way of answering their questions.</li> <li>With support/as a group, set up simple practical enquiries incl. comparative and fair tests e.g. make a choice from a list of at least one variable that needs to be kept the same when conducting a fair test.</li> <li>Find/suggest a way to compare things e.g. materials, magnets.</li> </ul> |
| Equipment and measurement<br><i>increasing complexity with increasing accuracy and precision make their own decisions about the data to collect</i>   | Communicating Recording<br><i>recording data, reporting findings, presenting findings</i>  | Considering the results of an investigation / writing a conclusion   |   |   | Collaborating  |
| <ul style="list-style-type: none"> <li>Collect data from their own observations and measurements, using notes/ simple tables/standard units.</li> <li>Help to make some decisions about what observations to make, how long to make them for and the type of simple equipment that might be used.</li> <li>Make simple accurate measurements using whole number standard units, using a range of equipment.</li> <li>Gathering data in a variety of ways to help in answering questions.</li> <li>Learn how to use new equipment, e.g. data loggers.</li> <li>Explore observe with increased accuracy using a hand lens or microscope.</li> </ul> | <ul style="list-style-type: none"> <li>Record and present findings using simple scientific language and vocabulary, including discussions, oral and written explanations, notes, drawings annotated, pictorial representations, labelled diagrams, simple tables, bar charts [using ranges and intervals (scales) chosen for them] displays or presentations.</li> <li>Record, classify and present data in a variety of ways to help in answering questions.</li> <li>Communicate their findings in ways that are appropriate for different audiences. (Y3/4).</li> </ul> | Describe results<br><i>Looking for patterns analysing functions, relationships and interactions more systematically</i>  | Explain results<br><i>Draw conclusions based on evidence</i>  | Trusting my results   | <ul style="list-style-type: none"> <li>Act out something to represent something else about the world around us.</li> </ul>   |
| <ul style="list-style-type: none"> <li>Describe and compare the effect of different factors on something.</li> <li>With help, look for changes and patterns in their observations and data.</li> <li>Use their results to consider whether they meet predictions.</li> </ul>  | <ul style="list-style-type: none"> <li>Read and spell scientific vocabulary correctly and with confidence (Y3/4).</li> <li>Use their own experience and some evidence or results to draw simple conclusions and answer questions.</li> <li>Talk about and record their findings using simple scientific language.</li> <li>Explain why things have happened.</li> </ul>  | <ul style="list-style-type: none"> <li>Say whether what happened was what they expected and notice any odd results that seem odd.</li> <li>Begin to recognise when a test is not fair and suggest improvements.</li> </ul> |   |   |  |