

## **Science Progression**

### **Purpose of Study (from NC)**

A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.

### **Aims (from NC)**

The national curriculum for science aims to ensure that all pupils:

- ♣ develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
- ♣ develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them
- ♣ are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.

### **Attainment targets (from NC)**

By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study.

Trust, Friendship, Respect, Forgiveness, Courage, Truthfulness

| Lydney C of E Science Progression Document |                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
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| Vision                                     | A caring Christian community where every child achieves a love of life and of learning                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                                            | Rec                                                                                                                                                                                                                                                                                                                                             | Year 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Year 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Year 3                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Year 4                                                                                                                                                                                                                                                                                                                                                                                                                                           | Year 5                                                                                                                                                                                                                                                                                                                                                                                                      | Year 6                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Subject content</b>                     | <p>The Natural World ELG:</p> <p>Children at the expected level of development will:</p> <ul style="list-style-type: none"> <li>- Explore the natural world around them, making observations and drawing pictures of animals and plants;</li> <li>- Know some similarities and differences between the natural world around them and</li> </ul> | <p><u><b>Plants</b></u></p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>♣ identify and name a variety of common wild and garden plants, including deciduous and evergreen trees</li> <li>♣ identify and describe the basic structure of a variety of common flowering plants, including trees.</li> </ul> <p><u><b>Animals, including humans</b></u></p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>♣ identify and name a variety of common animals including</li> </ul> | <p><u><b>Living things and their habitats</b></u></p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>♣ explore and compare the differences between things that are living, dead, and things that have never been alive</li> <li>♣ identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other</li> </ul> | <p><u><b>Plants</b></u></p> <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</li> </ul> | <p><u><b>Living things and their habitats</b></u></p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>♣ recognise that living things can be grouped in a variety of ways</li> <li>♣ explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment</li> <li>♣ recognise that environments can change and that this can sometimes pose</li> </ul> | <p><u><b>Living things and their habitats</b></u></p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>♣ describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird</li> <li>♣ describe the life process of reproduction in some plants and animals.</li> </ul> <p><u><b>Animals, including humans</b></u></p> <p>Pupils should be taught to:</p> | <p><u><b>Animals including humans</b></u></p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>♣ identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood</li> <li>♣ recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function</li> <li>♣ describe the ways in which nutrients and water are transported within</li> </ul> |

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|  | <p>contrasting environments, drawing on their experiences and what has been read in class;</p> <p>- Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter</p> | <p>fish, amphibians, reptiles, birds and mammals</p> <p>♣ identify and name a variety of common animals that are carnivores, herbivores and omnivores Science – key stages 1 and 2 8 Statutory requirements</p> <p>♣ describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)</p> <p>♣ identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.</p> | <p>♣ identify and name a variety of plants and animals in their habitats, including microhabitats</p> <p>♣ describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.</p> <p><b><u>Plants</u></b></p> <p>Pupils should be taught to:</p> <p>♣ observe and describe how seeds and bulbs grow into mature plants ♣ find out and describe how plants need water, light and a suitable temperature</p> | <p>transported within plants</p> <p>♣ explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</p> <p>Animals, including humans</p> <p>Pupils should be taught to:</p> <p>♣ 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</p> | <p>dangers to living things.</p> <p><b><u>Animals, including humans</u></b></p> <p>Pupils should be taught to:</p> <p>♣ describe the simple functions of the basic parts of the digestive system in humans</p> <p>♣ identify the different types of teeth in humans and their simple functions</p> <p>♣ construct and interpret a variety of food chains, identifying producers, predators and prey.</p> <p><b><u>States of matter</u></b></p> | <p>♣ describe the changes as humans develop to old age.</p> <p><b><u>Properties and changes of materials</u></b></p> <p>Pupils should be taught to:</p> <p>♣ 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</p> <p>♣ know that some materials will dissolve in liquid to form a solution, and describe how to</p> | <p>animals, including humans.</p> <p><b><u>Evolution and inheritance</u></b></p> <p>Pupils should be taught to:</p> <p>♣ recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago</p> <p>♣ recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents</p> <p>♣ identify how animals and plants are adapted to suit their environment in</p> |
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|  |  | <p><b><u>Everyday materials</u></b></p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>♣ distinguish between an object and the material from which it is made</li> <li>♣ identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock</li> <li>♣ describe the simple physical properties of a variety of everyday materials</li> <li>♣ compare and group together a variety of everyday materials on the basis of their simple physical properties.</li> </ul> | <p>to grow and stay healthy.</p> <p><b><u>Animals, including humans</u></b></p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>♣ notice that animals, including humans, have offspring which grow into adults</li> <li>♣ find out about and describe the basic needs of animals, including humans, for survival (water, food and air)</li> <li>♣ describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene</li> </ul> | <ul style="list-style-type: none"> <li>♣ identify that humans and some other animals have skeletons and muscles for support, protection and movement.</li> </ul> <p><b><u>Rocks</u></b></p> <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</li> </ul> | <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>♣ compare and group materials together, according to whether they are solids, liquids or gases</li> <li>♣ 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)</li> <li>♣ identify the part played by evaporation and condensation in the water cycle and associate the rate of</li> </ul> | <p>recover a substance from a solution</p> <ul style="list-style-type: none"> <li>♣ use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating</li> <li>♣ give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic</li> <li>♣ demonstrate that dissolving, mixing and changes of state are reversible changes</li> <li>♣ explain that some changes result in the formation of new</li> </ul> | <p>different ways and that adaptation may lead to evolution.</p> <p><b><u>Light</u></b></p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>♣ recognise that light appears to travel in straight lines</li> <li>♣ use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye</li> <li>♣ explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes</li> </ul> |
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|  |  | <p><b><u>Seasonal changes</u></b></p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>♣ observe changes across the four seasons</li> <li>♣ observe and describe weather associated with the seasons and how day length varies.</li> </ul> | <p><b><u>Uses of everyday materials</u></b></p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>♣ identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses</li> <li>♣ find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</li> </ul> | <p>trapped within rock</p> <ul style="list-style-type: none"> <li>♣ recognise that soils are made from rocks and organic matter.</li> </ul> <p><b><u>Light</u></b></p> <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</li> </ul> | <p>evaporation with temperature.</p> <p><b><u>Sound</u></b></p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>♣ identify how sounds are made, associating some of them with something vibrating</li> <li>♣ recognise that vibrations from sounds travel through a medium to the ear</li> <li>♣ find patterns between the pitch of a sound and features of the object that produced it</li> <li>♣ find patterns between the volume of a sound and the strength</li> </ul> | <p>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.</p> <p><b><u>Earth and space</u></b></p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>♣ describe the movement of the Earth, and other planets, relative to the Sun in the solar system</li> <li>♣ describe the movement of the Moon relative to the Earth</li> <li>♣ describe the Sun, Earth and Moon as approximately spherical bodies</li> </ul> | <ul style="list-style-type: none"> <li>♣ use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.</li> </ul> <p><b><u>Electricity</u></b></p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>♣ associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit</li> <li>♣ compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the</li> </ul> |
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|  |  |  |  | <p>ways to protect their eyes</p> <ul style="list-style-type: none"> <li>♣ recognise that shadows are formed when the light from a light source is blocked by an opaque object</li> <li>♣ find patterns in the way that the size of shadows change.</li> </ul> <p><b><u>Forces and magnets</u></b></p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>♣ compare how things move on different surfaces</li> <li>♣ notice that some forces need contact between two objects, but</li> </ul> | <p>of the vibrations that produced it</p> <ul style="list-style-type: none"> <li>♣ recognise that sounds get fainter as the distance from the sound source increases.</li> </ul> <p><b><u>Electricity</u></b></p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>♣ identify common appliances that run on electricity</li> <li>♣ construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers</li> <li>♣ identify whether or not a lamp will light in a</li> </ul> | <ul style="list-style-type: none"> <li>♣ use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.</li> </ul> <p><b><u>Forces</u></b></p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>♣ explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object</li> <li>♣ identify the effects of air resistance, water resistance and friction, that act between moving surfaces</li> </ul> | <p>on/off position of switches</p> <ul style="list-style-type: none"> <li>♣ use recognised symbols when representing a simple circuit in a diagram.</li> </ul> |
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|  |  |  |  | <p>magnetic forces can act at a distance</p> <p>♣ observe how magnets attract or repel each other and attract some materials and not others</p> <p>♣ 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</p> <p>♣ describe magnets as having two poles</p> <p>♣ predict whether two magnets will attract or repel each other, depending on</p> | <p>simple series circuit, based on whether or not the lamp is part of a complete loop with a battery</p> <p>♣ recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit</p> <p>♣ recognise some common conductors and insulators, and associate metals with being good conductors.</p> | <p>♣ recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.</p> |  |
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|                               |     |                                                          |                                                          | which poles are facing.                                                      |                                                                              |                                                                                                                                               |                                                                                                                                               |
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|                               | Rec | Year 1                                                   | Year 2                                                   | Year 3                                                                       | Year 4                                                                       | Year 5                                                                                                                                        | Year 6                                                                                                                                        |
| <b>Working Scientifically</b> |     | I know how to ask simple scientific questions.           | I know how to ask simple scientific questions.           | I know how to ask relevant scientific questions.                             | I know how to ask relevant scientific questions.                             | I know how to plan different types of scientific enquiry.                                                                                     | I know how to plan different types of scientific enquiry.                                                                                     |
|                               |     | I know how to use simple equipment to make observations. | I know how to use simple equipment to make observations. | I know how to use observations and knowledge to answer scientific questions. | I know how to use observations and knowledge to answer scientific questions. | I know how to control variables in an enquiry.                                                                                                | I know how to control variables in an enquiry.                                                                                                |
|                               |     | I know how to carry out simple tests.                    | I know how to carry out simple tests.                    | I know how to set up a simple enquiry to explore a scientific question.      | I know how to set up a simple enquiry to explore a scientific question.      | I measure accurately and precisely using a range of equipment.                                                                                | I measure accurately and precisely using a range of equipment.                                                                                |
|                               |     | I know how to identify and classify things.              | I know how to identify and classify things.              | I know how to set up a test to compare two things.                           | I know how to set up a test to compare two things.                           | I know how to record data and results using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. | I know how to record data and results using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. |
|                               |     | I know how to explain to others what I have found out.   | I know how to explain to others what I have found out.   | I know how to set up a fair test and explain why it is fair.                 | I know how to set up a fair test and explain why it is fair.                 | I use the outcome of test results to make predictions and set up a further comparative and fair tests.                                        | I use the outcome of test results to make predictions and set up a further comparative and fair tests.                                        |
|                               |     | I know how to use simple data to answer questions.       | I know how to use simple data to answer questions.       |                                                                              |                                                                              |                                                                                                                                               |                                                                                                                                               |

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|  |  |  |  | <p>I make careful and accurate observations, including the use of standard units.</p> <p>I know how to use equipment, including thermometers to make measurements.</p> <p>I gather, record, classify and present data in different ways to answer scientific questions.</p> <p>I know how to use diagrams, keys, bar charts and tables; using scientific language.</p> <p>I know how to use findings to report in different ways,</p> | <p>I make careful and accurate observations, including the use of standard units.</p> <p>I know how to use equipment, including thermometers to make measurements.</p> <p>I gather, record, classify and present data in different ways to answer scientific questions.</p> <p>I know how to use diagrams, keys, bar charts and tables; using scientific language.</p> <p>I know how to use findings to report in different ways,</p> | <p>I report findings from enquiries in a range of ways.</p> <p>I know how to explain a conclusion from an enquiry.</p> <p>I know how to relate the outcome from an enquiry to scientific knowledge in order to state whether evidence supports or refutes an argument or theory.</p> <p>I read, spell and pronounce scientific vocabulary accurately.</p> | <p>I report findings from enquiries in a range of ways.</p> <p>I know how to explain a conclusion from an enquiry.</p> <p>I know how to relate the outcome from an enquiry to scientific knowledge in order to state whether evidence supports or refutes an argument or theory.</p> <p>I read, spell and pronounce scientific vocabulary accurately.</p> |
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|                      |                                                                                                                                    |  |  | including oral and written explanations, presentation.<br><br>I know how to draw conclusions and suggest improvements.<br><br>I know how to make a prediction with a reason.<br><br>I know how to identify differences, similarities and changes related to an enquiry. | including oral and written explanations, presentation.<br><br>I know how to draw conclusions and suggest improvements.<br><br>I know how to make a prediction with a reason.<br><br>I know how to identify differences, similarities and changes related to an enquiry. |  |  |
| <b>Spirituality</b>  | <b>Our curriculum provides children with opportunities to explore the big questions in the world.</b>                              |  |  |                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                         |  |  |
| <b>Possibilities</b> | <b>Our curriculum intends to raise children's aspirations and set high expectations for <u>ALL</u> pupils.</b>                     |  |  |                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                         |  |  |
| <b>Well-Being</b>    | <b>Our curriculum intends to raise self-esteem and self-confidence.</b>                                                            |  |  |                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                         |  |  |
| <b>Belonging</b>     | <b>Our curriculum intends to educate children about their place in the world.</b>                                                  |  |  |                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                         |  |  |
| <b>World Aware</b>   | <b>Our curriculum intends to be based on a range of experiential opportunities to help them understand the world they live in.</b> |  |  |                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                         |  |  |

Trust, Friendship, Respect, Forgiveness, Courage, Truthfulness