**St Minver 2014 National Curriculum long term overview**

**Subject: Science**

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| **Aims** | 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. |
| **Subject Content** | **Key Stage 1**  The principal focus of science teaching in Key Stage 1 is to enable pupils to experience and observe phenomena, looking more closely at the natural and humanly-constructed world around them. They should be encouraged to be curious and ask questions about what they notice. They should be helped to develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests and finding things out using secondary sources of information. They should begin to use simple scientific language to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways. Most of the learning about science should be done through the use of first-hand practical experiences, but there should also be some use of appropriate secondary sources, such as books, photographs and videos.  ‘Working scientifically’ is described separately in the programme of study, but must **always** be taught through and clearly related to the teaching of substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content.  Pupils should read and spell scientific vocabulary at a level consistent with their increasing word reading and spelling knowledge at Key Stage 1.  **Lower Key Stage 2 – Years 3-4**  The principal focus of science teaching in lower Key Stage 2 is to enable pupils to broaden their scientific view of the world around them. They should do this through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments, and by beginning to develop their ideas about functions, relationships and interactions. They should ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple fair tests and finding things out using secondary sources of information. They should draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out.  ‘Working scientifically’ is described separately at the beginning of the programme of study, but must **always** be taught through and clearly related to substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content.  Pupils should read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge.  **Upper Key Stage 2 – Years 5-6**  The principal focus of science teaching in upper Key Stage 2 is to enable pupils to develop a deeper understanding of a wide range of scientific ideas. They should do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically. At upper Key Stage 2, they should encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They should also begin to recognise that scientific ideas change and develop over time. They should select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out fair tests and finding things out using a wide range of secondary sources of information. Pupils should draw conclusions based on their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings.  ‘Working and thinking scientifically’ is described separately at the beginning of the programme of study, but must **always** be taught through and clearly related to substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content.  Pupils should read, spell and pronounce scientific vocabulary correctly. |

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| **Year** | **Topic** | **Programme of study (in brief)** |
| **1** | **Plants** | **Name wild and garden plants, flowers** |
| **Animals inc humans** | **Name a variety of animals, carnivores, herbivores and omnivores. Labels basic human parts** |
| **Everyday materials** | **Name everyday materials and describe physical properties. Group materials.** |
| **Seasonal changes** | **Observe changes, describe weather in the seasons.** |
| **2** | **Living things and their habitat** | **Habitats, simple food chains** |
| **Plants** | **Observe how seeds grow. Healthy plant conditions** |
| **Animals inc humans** | **Know animals need water, food and air. Produce offspring. Healthy living** |
| **Uses of everyday materials** | **Explore suitability of materials, how to change shapes of materials** |
| **3** | **Working scientifically** | **(see below)** |
| **Plants** | **Functions of parts flowering plants, growth conditions, water transportation, life cycles of plants** |
| **Animals inc humans** | **Nutrition, Teeth and Eating (Year 4 PoS)** |
| **Rocks** | **Group rocks, fossils, rock formation** |
| **Light** | **Light travels in straight lines, shadows, sunlight dangers, reflection** |
| **Forces and Magnets** | **Attract and repel, magnetic objects, poles** |
| **4** | **Working scientifically** | **(see below)** |
| **Living Things and their habitats** | **Groups, classification keys, environmental changes and its effects** |
| **Animals inc humans** | **Skeletons/muscles and movement.(Year 3 PoS) Digestion, food chains** |
| **States of matter** | **Solids &liquids, change of state when heated or cooled. Separation** |
| **Electricity** | **Simple circuits, components, series circuits, conductors/insulators** |
| **Forces** | **Friction/resistance. (Year 5 PoS)** |
| **5** | **Working scientifically** | **(see below)** |
| **Living things and their habitats** | **Life cycles. Plant reproduction** |
| **Animalsinc humans** | **Human aging. Circulation (Year 6 PoS), Diet and drugs (Year 6 PoS)** |
| **Earth and Space** | **Earth’s movement, Moon’s movement, day and night, solar system** |
| **Sound** | **Vibrations. How sound travels, pitch, volume, sound over distance (Year 4 PoS)** |
| **Forces** | **Levers and Pulleys** |
| **States of matter** | **Gases, evaporation and condensation (Year 4 PoS)** |
| **6** | **Working scientifically** | **(see below)** |
| **Living Things and their habitats** | **Classification inc micro-organisms. Characteristics** |
| **Animalsinc humans** | **Reproduction inc puberty** |
| **Evolution and inheritance** | **Fossils show how life has evolved. Offspring, adaptation and evolution** |
| **Light** | **Light travels in straight lines, how we see, shadows** |
| **Electricity** | **Voltage, brightness of bulbs etc, circuit symbols** |
|  | **Forces** | **Gravity, air and water resistance (year 5 PoS)** |
|  | **Properties and changes of materials** | **Group materials, dissolving, solutions, filtering, sieving, evaporation, reversible and irreversible changes (year 5 PoS)** |

**Working scientifically**

**Statutory requirements**

**Year 1 and 2**

**During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:**

** asking simple questions and recognising that they can be answered in different ways**

** observing closely, using simple equipment**

** performing simple tests**

** identifying and classifying**

** using their observations and ideas to suggest answers to questions**

** gathering and recording data to help in answering questions.**

**Year 3 and 4**

** asking relevant questions and using different types of scientific enquiries to answer them**

** setting up simple practical enquiries, comparative and fair tests**

** making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers**

** gathering, recording, classifying and presenting data in a variety of ways to help in answering questions**

** recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables**

** reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions**

** using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions**

** identifying differences, similarities or changes related to simple scientific ideas and processes**

** using straightforward scientific evidence to answer questions or to support their findings.**

**Year 5 and 6**

** planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary**

** taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate**

** recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs**

** using test results to make predictions to set up further comparative and fair tests**

** reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations**

** identifying scientific evidence that has been used to support or refute ideas or arguments.**