**Science Curriculum – St Cuthbert Mayne Junior School – 2023/2024**

## Our Curriculum Vision – PRAY

| **P**rotecting our Planet – learn and contribute to protecting God's creation – in our community and wider work. Caring about the world we live in; | **R**esilience – be able to face challenges and use them to help us progress. Overcome difficulties that challenge us; | **A**spiration – we are created by God to do amazing things – each one of us. Ambitious / belief in ourselves and in what we can achieve. | **Y**es to equality – we are all equal and important in God's eyes. Everyone is equal and deserves to be valued and respected. |
|---|---|---|---|
| Our science curriculum encourages all pupils to be curious about the environment in which they live and beyond.<br><br>Children value and appreciate nature through the science units of work taught and it increases their knowledge and understanding about the world around them.<br><br>Pupils experience practical and hands on science through close links with Forest School activities. | Children are given opportunities to practise and revisit a range of science skills from Year 3 to Year 6.<br><br>Our curriculum allows opportunities for practical scientific investigations resulting in:<br>- Pupils work as part of team to carry out investigation and work together to analyse results and make conclusions.<br>- Pupils are encouraged to ask relevant questions and to explore topics being taught.<br>- Pupils are encouraged to find alternative ways to find answers to scientific questions and improve ways of working. To understand that many discoveries happened after years of perseverance and by not giving up on finding answers. | Children research a range of STEM ambassadors to inspire their own scientific journey.<br><br>Science work is celebrated around the school and in each unit of work there are clear cross curricular links with other subjects.<br><br>Annually, the whole school takes part in National Science Week to give a focus on science, to develop awe and wonder and to inspire science beyond the curriculum.<br><br>Teachers are encouraged to plan trips and workshops to support pupil' science knowledge in fun, engaging and exciting ways. Previous enrichment activities have included Whipsnade Zoo, StemPoint and Living Eggs. | Every pupil is taught science lessons.<br><br>Pupils look at a range of scientists from different cultures, genders and backgrounds from different periods of time to promote and reflect the diversity of our school and country. |

**Science Curriculum – St Cuthbert Mayne Junior School – 2023/2024**

# Our Subject Philosophy

*"Don't let anyone rob you of your imagination, your creativity, or your curiosity. It's your place in the world; it's your life. Go on and do all you can with it and make it the life you want to live."*
*Mae Jemison, first African American woman astronaut in space*

*"Nothing in life is to be feared, it is only to be understood. Now is the time to understand more, so that we may fear less."*
*Marie Curie*

At St Cuthbert Mayne School, the intent of the science curriculum is to provide the children with an engaging and creative education that increases their understanding and importance of science in every aspect of daily life and the world around them. The curriculum has been designed to allow for the children's knowledge to build across all science subjects from Years 3 to 6 and for the progression of science skills to develop from lower to upper Key Stage 2. Pupils have opportunities to experience practical, hands-on science investigations to encourage children's questioning and curiosity as well as develop a full range of working scientific skills.

## The requirements of the National Curriculum

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

In line with the National Curriculum, our curriculum for science has a clear and logical sequence of learning which builds on knowledge and skills. For each unit of work there is an Overview Planning document that clearly sequences prior and future learning in each subject. We take advantage of a

range of schemes to help plan and deliver lessons, ensuring they match the abilities and needs of our pupils. There are opportunities for working scientifically, for pupils to engage in different type of scientific enquiry, making predictions and conclusions related to their investigation. This progresses to more complex investigations as skills and understanding develop where pupils are encouraged to ask questions, build on prior knowledge and develop as scientific thinkers. Cross curricular links with other subjects are planned within units of work when appropriate, to help pupils transfer skills and see science incorporated in the world around them. To enrich the science curriculum teachers are encouraged to plan trips and workshops to support pupils' science knowledge in fun, engaging and exciting ways. Previous enrichment activities have included Whipsnade Zoo, StemPoint and Living Eggs.

# Science Long term plan:

| Science Curriculum Map 2023-24 | | | | | | |
|---|---|---|---|---|---|---|
| | **Autumn 1** | **Autumn 2** | **Spring 1** | **Spring 2** | **Summer 1** | **Summer 2** |
| **Year 3** | **Rocks and Fossils**<br>Pupils will be taught to compare and group rocks based on physical properties. They will learn how fossils and soils are formed. | **Magnets**<br>Pupils will be taught about force and magnetic attraction. | **Animals including Humans**<br>Pupils will be taught about the nutrients that different foods provide and how they help our bodies. They will explore why humans and animals have skeletons and muscles. | | **Plants**<br>Pupils will be taught how to identify and describe the function of different parts of plants. They will explore the requirements of plants for life and growth. | **Light**<br>Pupils will be taught about light, reflections and shadows. |

## Science Curriculum – St Cuthbert Mayne Junior School – 2023/2024

| | | | | | | |
|---|---|---|---|---|---|---|
| **Year 4** | **Living Things and their Habitats**<br>Pupils will be taught in a variety of ways to identify, sort, group and classify living things. | **Animals including Humans**<br>Pupils will be taught about the digestive systems. They will learn about the type and function of teeth as well as interpreting food chains. | | **Sound**<br>Pupils will be taught how vibrations cause sound, how sound travels and how sound can change pitch and volume. | **Electricity**<br>Pupils will be taught what electricity is, how to construct simple circuits and recognize conductors and insulators. | **Stares of Matter**<br>Pupils will be taught the differences between solid, liquids and gases and how states can change by heating or cooling |
| **Year 5** | **Earth and Space**<br>Pupils will be taught about the movement of the Earth and other planets within the solar system. They will learn how day and night occurs due to the Earth's rotation. | **Forces**<br>Pupils will be taught about different forces including gravity, friction, water and air resistance. | **Properties and Changes of Materials**<br>Pupils will be taught about different materials, their uses and properties. Pupils will investigate dissolving, separating mixtures and irreversible changes. | **Living Things and their Habitats**<br>Pupils will be taught the reproduction in different plants and the life cycles of animals. | **Animals including Humans**<br>Pupils will be taught about the changes, growth and development of humans including puberty. They will investigate the development of babies and compare the gestation period of humans with other animals. | |

## Science Curriculum – St Cuthbert Mayne Junior School – 2023/2024

| | | | | | |
|---|---|---|---|---|---|
| **Year 6** | **Light**<br>Pupils will be taught how light travels from a light source in straight lines and how this affects reflection, shadows and how we see things. | **Electricity**<br>Pupils will be taught how to represent a simple circuit in a diagram and to compare components within a circuit. | **Evolution and Inheritance**<br>Pupils will be taught about variation and adaptation. | **Living Things and their Habitats**<br>Pupils will be taught how living things are classified. | **Animals including Humans**<br>Pupils will be taught about the human circulatory system and how diet, exercise, drugs and lifestyle impact the human body. |

# Working Scientifically Skills Progression at St Cuthbert's Mayne Junior School

At St Cuthbert Mayne school we follow HfL science document to show progression in working scientifically skills.

## HfL Assessment Criteria for Working Scientifically Skills Overview Table

| Skill | | Key stage 1 | Lower key stage 2 | Upper key stage 2 |
|---|---|---|---|---|
| Ideas and questions | | • **asks simple questions and recognises that they can be answered in different ways**<br>• recognises scientific and technical developments that help us | • **asks relevant questions and uses different types of scientific enquiries to answer them**<br>• explains the purposes of a variety of scientific and technological developments | • uses their scientific experiences to explore ideas and raise different types of questions<br>• talks about how scientific ideas have developed over time<br>• recognises the applications of specific scientific ideas |
| Planning | Planning an approach | • **performs simple tests** or follows teachers' instructions<br>• with guidance, suggests what they will do<br>• with guidance, identifies things to measure or observe that are relevant to the question | • **sets up simple practical enquiries, comparative and fair tests**<br>• begins to make decisions about what observations to make and how long to make them for | • selects and **plans different types of scientific enquiries to answer questions**<br>• makes decisions about what observations to make, what measurements to use, how long to make them for and whether to repeat them |
| | Equipment | • uses resources provided or chosen from a limited range<br>• uses simple measurements and equipment to gather data | • begins to choose the type of simple equipment that might be used from a reasonable range<br>• uses appropriate equipment and measurements with reasonable accuracy | • chooses the most appropriate equipment to make measurements<br>• explains how to use the equipment accurately |
| | Variables | • suggests why a test is unfair | • recognises when a simple fair test is needed<br>• with help, decides how to set up a fair test and control variables | • recognises when and how to set up comparative and fair tests<br>• **recognises and controls variables where necessary** (e.g. explains which variables need to be controlled and why) |

| | | | | |
|---|---|---|---|---|
| Obtaining and presenting evidence | Observing and measuring | • **observes closely** (including changes over time), **using simple equipment**<br>• makes measurements using non-standard units | • **makes systematic and careful observations**<br>• **makes accurate measurements using standard units (e.g. cm, m, °C, N, g, Kg, ml), using a range of equipment, e.g. data loggers and thermometers** | • **takes measurements,** in standard units, **using a range of scientific equipment, with increasing accuracy and precision**<br>• **takes repeat readings when appropriate** |
| | Secondary sources | • uses simple secondary sources to find answers, e.g. books, videos, photographs or people | • recognises when and how secondary sources (e.g. books, internet, experts, diagrams) might help answer questions that cannot be answered through practical investigations | • recognises which secondary sources will be most useful to research their ideas<br>• begins to separate opinion from fact |
| | Recording information and data | • **gathers and records simple data to help in answering questions**<br>• with support, prepares simple tables to record data | • **gathers and records data in a variety of ways to help in answering questions**<br>• prepares own format for recording data<br>• makes decisions about how to record and analyse the data | • **records data and results of increasing complexity**<br>• decides how to record data from a choice of familiar approaches<br>• calculates mean value where appropriate |
| | Presenting evidence | • with help, records their findings in a range of ways, e.g. simple tables, diagrams, pictograms, sorting circles, bar charts and templates<br>• talks about their findings using everyday terms, text scaffolds or simple scientific language | • **records and presents findings using drawings, labelled diagrams, keys, tally charts, Carroll diagrams, Venn diagrams, bar charts and tables**<br>• **reports on findings from enquiries, in simple scientific language, using oral and written explanations, displays or presentations of results and conclusions** | • **records and presents findings using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs**<br>• **reports on findings from enquiries,** using relevant scientific language and conventions, **in oral and written explanations such as displays and other presentations** |

| | | | | |
|---|---|---|---|---|
| Considering and evaluating evidence | Looking for patterns | • uses simple observable features to compare objects, materials and living things<br>• **identifies and classifies** (decides how to sort and group objects)<br>• with guidance, begins to notice changes (i.e. cause and effect), patterns and relationships (i.e. how one variable affects another) | • uses observable and other criteria to group, sort and classify in different ways (including simple keys and branching databases)<br>• **identifies differences, similarities or changes related to simple scientific ideas and processes**<br>• with help, looks for changes, patterns, and relationships in their data | • uses and develops keys and other information records to identify, classify and describe living things and materials<br>• **identifies conclusions, causal relationships and patterns** |
| | Explaining results | • talks about what they have found out and how they found it out<br>• **uses their observations and ideas to suggest answers to questions**<br>• uses comparative language to describe changes, patterns and relationships | • with help, **uses results to draw simple conclusions** and answers questions using appropriate level of knowledge<br>• **uses straightforward scientific evidence to answer questions or to support their findings**<br>• uses relevant scientific language to discuss their ideas and communicate their findings | • draws valid conclusions, explains and interprets the results **(including the degree of trust)** using scientific knowledge and understanding (e.g. recognises limitations of data)<br>• **identifies scientific evidence that has been used to support or refute ideas or arguments**<br>• uses relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas |
| | Evaluating | • with support, suggests whether or not what happened was what they expected<br>• with support, suggests different ways they could have done things | • with support, **uses results to suggest improvements** to what they have done<br>• with support, **raise further questions** (e.g. arising from the data)<br>• with support, **makes predictions for new values** within or beyond the data collected | • makes practical suggestions about how their working method could be improved (e.g. the effect of sample size on reliability)<br>• uses results to identify when further tests and observations might be needed<br>• **uses test results to make predictions and to set up further comparative and fair tests** |