

## Science

### Intent:

"Children are naturally curious. Science at primary school should nurture this curiosity and allow them to ask questions and develop the skills they need to answer those questions." Louise Stubberfield

Science teaching aims to give all children a strong understanding of the world around them whilst acquiring specific skills and knowledge to help them to think scientifically, to gain an understanding of scientific processes and also an understanding of the uses and implications of Science, today and for the future.

Scientific enquiry skills are embedded in each topic the children study and these topics are revisited and developed throughout their time at school.

Topics, such as Plants, are taught in Key Stage One and studied again in further detail throughout Key Stage Two. This model allows children to build upon their prior knowledge and increases their enthusiasm for the topics whilst embedding this procedural knowledge into the long-term memory.

All children are encouraged to develop and use a range of skills including observations, planning and investigations, as well as being encouraged to question the world around them and become independent learners in exploring possible answers for their scientific based questions.

Specialist vocabulary for topics is taught and built up, and effective questioning to communicate ideas is encouraged.

Concepts taught should be reinforced by focusing on the key features of scientific enquiry, so that pupils learn to use a variety of approaches to answer relevant scientific questions.

### Implementation:

Teachers plan their curriculum together as a team and plan the following:

- A cycle of lessons for each subject, which carefully plans for progression and depth;
- Challenge questions for pupils to apply their learning in a philosophical/open manner;
- Trips and visits from experts who will enhance the learning experience;

### Impact:

Our Science Curriculum is high quality, well thought out and is planned to demonstrate progression. If children are keeping up with the curriculum, they are deemed to be making good or better progress. In addition, we measure the impact of our curriculum through the following methods:

- A reflection on standards achieved against the planned outcomes;
- A celebration of learning for each term which demonstrates progression across the school;

- Tracking of knowledge in pre and post learning;
- Pupil discussions about their learning;

### **RSE Links**

*The Changing Adolescent Body February 2021 - Statutory RHSE guidance Know key facts about puberty and the changing adolescent body, particularly from age 9 through to 11, including physical and emotional changes.*

- Know about menstrual wellbeing including the key facts about the menstrual cycle.

*Health & Prevention February 2021 - Statutory RHSE guidance*

- Know how to recognise early signs of physical illness, such as weight loss, or unexplained changes to the body.
- Know about safe and unsafe exposure to the sun, and how to reduce the risk of sun damage, including skin cancer.
- Know the importance of sufficient good quality sleep for good health and that lack of sleep can affect weight, mood and ability to learn.
- Know about dental health and the benefits of good oral hygiene and dental flossing, including regular check ups at the dentist.
- Know about personal hygiene and germs including bacteria, viruses, how they are spread and treated, and the importance of handwashing.
- Know the facts and science relating to allergies, immunization and vaccination.

### **SMSC Links**

#### **Spiritual**

- Encourage pupils to reflect on the wonders of the natural world.

#### **Moral**

- Consider that not all developments have been good, and that they may have caused harm to the environment.
- Consider different perspectives and viewpoints and the reasons for these differences.
- Consider moral dilemmas in scientific developments.

#### **Social**

- Researching the work of different scientists, including female scientists.
- Opportunities to work in different pairings and groups.
- Explore the social dimension of scientific advances.
- Show respect for differing opinions i.e. creation.
- Co-operate in practical activities together.

#### **Cultural**

- Visits to different habitats and areas within the local environment.
- Raise awareness that scientific developments are the product of many different cultures.

## **British Values Links**

### **Democracy**

- Take the views and opinions of others into account
- Take turns and instructions from others

### **The Rule of Law**

- Understand the importance of safety rules when working scientifically
- Know that there are consequences in rules are not followed

### **Individual liberty**

- Make choices when planning an investigation
- Others may have different points of view as to where to start

### **Tolerance**

- Scientific discoveries have come from other cultures
- Religious beliefs often compete with scientific understanding

### **Mutual respect**

- Work as a team
- Discuss findings
- Offer support and advice to others

## **EYFS**

### **The Natural World**

Teachers will:

- Ensure that the early years is about exploring and investigating the world, and about having fun and playing.
- Be aware that exploring and investigating are two key elements, which are crucial to establishing a lifelong love of learning.
- Be aware that Science also connects all other areas of learning, from language (describing what's happening in an experiment, learning new vocabulary) to maths and engineering (modelling, construction).
- Provide opportunities for the children to play and explore new concepts, sometimes independently and sometimes with a supporting adult.
- Carefully consider how adults in the setting question children - 'I see...' is the beginning. 'I notice...' adds more detail and encourages children to put their ideas into words and select appropriate vocabulary. 'I wonder...' is the beginning of formulating questions and understanding different enquiry types. Children can then be supported to find out the answer.

- Acknowledge that children are naturally curious and keen to explore the world around them with awe and wonder. We can make the most of their desire to learn in a hands-on way by making sure our provision is accessible and engaging.
- Valuing child-led learning in all areas and encouraging children to plan and take ownership of what they want to discover next, sets them up for success.
- Science areas of provision will be used in the classroom, for example, we might set up a mini science lab in provision where children can make predictions, test out their science ideas and explore independently. These work well both inside and outside and we will get children involved in designing and creating them with us.
- Activities will be changed or enhanced regularly. We will encourage children to see themselves as super scientists both now and in the future.

	<b>KEY STAGE 1</b>	<b>KEY STAGE 2</b>
1	<p><u>Plants (Y1 PoS)</u> Identify &amp; name a variety of common wild &amp; garden plants including deciduous and evergreen trees. Identify and describe the basic structure of a variety of common flowering plants including trees.</p>	<p><u>States of matter (Y4 PoS)</u> compare and group materials together, according to whether they are solids, liquids or gases 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) identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature</p>
2	<p><u>Plants (Y2 PoS)</u> Observe and describe how seeds and bulbs grow into mature plants. Find out and describe how plants need water, light, and a suitable temperature to grow and stay healthy.</p>	<p><u>Materials and their properties (Y5 PoS)</u> 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 know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic demonstrate that dissolving, mixing and changes of state are reversible changes explain that some changes result in the formation of new 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>

3	<p><u>Humans (1,2 PoS)</u></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>Describe the importance of exercise, eating the right amounts of different types of food and hygiene.</p>	<p><u>Working scientifically</u> <u>(Y3/4, 5/6 PoS)</u></p> <p>asking relevant questions and using different types of scientific enquiries to answer them</p> <p>setting up simple practical enquiries, comparative and fair tests</p> <p>making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers</p> <p>gathering, recording, classifying and presenting data in a variety of ways to help in answering questions</p> <p>recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables</p> <p>reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</p> <p>using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions</p> <p>identifying differences, similarities or changes related to simple scientific ideas and processes</p> <p>using straightforward scientific evidence to answer questions or to support their findings.</p>
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<p>4</p>	<p><u>Humans (Growing Up) (Y1,2 Pos)</u>          Notice that animals including humans have offspring that grow into adults.          Use the scientific names introduced to name male and female body parts.          ]Identify some differences between males and females.          Identify the body parts we keep private.          (PANTS rule)          Understand the words no and stop. (Consent)          Understand that people's bodies and feelings can be hurt.          (Link to PSHE)</p>	<p>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 a 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</p>
<p>5</p>	<p><u>Forces (Scientific Enquiry based) (Y1,2 PoS)</u>          Find out about and describe the movement of, familiar things (for example, cars going faster, slowing down, changing direction).          Know that pushes and pulls are examples of forces.          Recognise that when things speed up, slow down or change direction there is a cause (for example a push or a pull)          Explore magnets as a type of force</p>	<p><u>Space (Y5 PoS)</u>          describe the movement of the Earth and other planets relative to the sun in the solar system          describe the movement of the moon relative to the Earth          describe the sun, Earth and moon as approximately spherical bodies          use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky</p>

<p>6</p>	<p><u>Materials (Forest School) (Y1, PoS)</u></p> <p>Distinguish between an object and the material from which it is made</p> <p>Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock</p> <p>Describe the simple physical properties of a variety of everyday materials</p> <p>Compare and group together a variety of everyday materials on the basis of their physical properties</p> <p>Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses</p> <p>Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching_</p>	<p><u>Space (Y5 PoS)</u></p> <p>describe the movement of the Earth and other planets relative to the sun in the solar system</p> <p>describe the movement of the moon relative to the Earth</p> <p>describe the sun, Earth and moon as approximately spherical bodies</p> <p>use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky</p>
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