

SCIENCE

Document 1: Whole School Knowledge Progression

Science intent / rationale:

We believe that the knowledge and skills taught in science lessons is essential for all children to help them become curious about the world around them. We aim to equip children with the scientific knowledge, skills and vocabulary required to understand the uses and implications of science today and in the future.

Science teaching should provide the foundation for a deep interest in investigative and exploratory learning. By the end of their infant school years our children will have developed an enquiring mind and a scientific approach by observing (including over time), identifying, classifying, exploring, researching, asking and answering questions.

Core Principles for the Teaching of Science at Robert Miles Infant School

Pupils at Robert Miles Infant School learn through a science curriculum that will:

- develop excitement and curiosity about the world around them
- develop the core knowledge and skills required to think like scientists;
- develop positive attitudes towards science;
- give children the confidence to ask and answer scientific questions and think of ways to solve problems;
- enable children to evaluate evidence and consider whether tests or comparisons are fair;
- ensure their accurate use and understanding of specific scientific vocabulary;
- inspire and challenge them through the provision of different practical experiences;
- develop creativity, resilience and critical thinking skills through problem solving activities.

EYFS (Reception)		
Reception	Communication (Development Matters)	<ul style="list-style-type: none"> ▪ Learn new vocabulary. ▪ Ask questions to find out more and to check what has been said to them. ▪ Articulate their ideas and thoughts in well-formed sentences. ▪ Describe events in some detail. ▪ Use talk to help work out problems and organise thinking and activities, and to explain how things work and why they might happen. ▪ Use new vocabulary in different contexts.
	Personal, Social and Emotional Development (Development Matters)	<ul style="list-style-type: none"> ▪ Know and talk about the different factors that support their overall health and wellbeing: <ul style="list-style-type: none"> - regular physical activity - healthy eating - toothbrushing - sensible amounts of 'screen time' - having a good sleep routine - being a safe pedestrian
	Understanding the World (Development Matters)	<ul style="list-style-type: none"> ▪ Explore the natural world around them. ▪ Describe what they see, hear and feel while they are outside. ▪ Recognise some environments that are different to the one in which they live. ▪ Understand the effect of changing seasons on the natural world around them.
Early Learning Goal	Communication and Language: Listening, Attention & Understanding	<ul style="list-style-type: none"> ▪ Make comments about what they have heard and ask questions to clarify their understanding.
	Personal, Social and Emotional Development: Managing Self	<ul style="list-style-type: none"> ▪ Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices.
	Understanding the World: The Natural World	<ul style="list-style-type: none"> ▪ Explore the natural world around them, making observations and drawing pictures of animals and plants. ▪ Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. ▪ Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.

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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.

National Curriculum (KS1)

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. 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.

Pupils should read and spell scientific vocabulary at a level consistent with their increasing word-reading and spelling knowledge at key stage 1.

RMI school-wide threads:

- ❖ **Positive Attitudes for Learning (PAL):** We will develop positive learning behaviours and attitudes, focusing on engagement, motivation and critical thinking.
- ❖ **Equality and Diversity:** We aim to provide an equitable start for our children, where communalities and differences are valued and celebrated. Our pupils will develop cultural awareness through a diverse and inclusive curriculum.
- ❖ **Reading at the heart of everything we do:** We will develop confident readers, instil a love of reading and provide purposeful cross-curricular reading opportunities.
- ❖ **Develop an understanding of how to care for our environment:** We will support children to take an interest and responsibility, as global citizens and custodians of our planet.

Concepts of our Science curriculum at RMI:

- ❖ **Curiosity and excitement:** We will encourage children to actively seek new knowledge and understanding, leading them to ask questions and wonder 'what if..'
- ❖ **Hands-on, practical experiences:** We will provide our children with lots of opportunities to experience hands-on science activities and explorations to enable them to see science in action.

Area of study	Reception	Year 1	Year 2	Year 3 (Robert Miles Junior)
Working Scientifically	<p>To build on prior knowledge and:</p> <p>Know how to make observations about what I see and begin to make simple predictions verbally.</p> <p>Know that I can describe things in more than one way.</p> <p>Know some scientific vocabulary to use when describing things.</p> <p>Know that things change with time – e.g., plants / people.</p>	<p>To build on prior knowledge and:</p> <p>Know how to make observations, using equipment.</p> <p>Know how to ask scientific questions.</p> <p>Know that questions may be answered in different ways.</p> <p>Know how to predict and carry out a simple investigation.</p> <p>Know how to make a simple conclusion.</p> <p>Know some scientific vocabulary to use orally and when writing.</p> <p>Know that things can be classified by more than one criterion.</p> <p>Know how to gather data to help answer questions</p>	<p>To build on prior knowledge and:</p> <p>Know how to observe closely making conclusions.</p> <p>Know that questions can be answered in different ways including using the internet and books.</p> <p>Know how to make prediction's based on previous knowledge.</p> <p>Know which equipment to select to carry out a simple investigation.</p> <p>Know the correct scientific vocabulary to use orally and in when writing.</p> <p>Know how to make conclusions and share results.</p> <p>Know results can be presented in different ways.</p> <p>Begin to know what a fair test is.</p>	<p>To build on prior knowledge and:</p> <p>Know questions can be answered through different types of scientific enquiry.</p> <p>Know how to take accurate measurements using standard units of measure.</p> <p>Know how to record, group and classify results and present their findings to share with others.</p> <p>Know that reports can be written using scientific vocabulary.</p>

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Materials and their properties	<p>Know that materials can change depending on how you manipulate them.</p> <p>Know and describe the feeling of different materials.</p>	<p>Know the names of a variety of objects and the material they are made from.</p> <p>Know and describe the physical properties of a variety of everyday materials.</p> <p>Know how to classify materials based on their properties.</p>	<p>Know the names of everyday materials and identify the suitability of them for particular uses.</p> <p>Know how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</p> <p>Know of some significant individuals who contributed to important scientific discoveries.</p>	
Seasonal changes	<p>Know the changing seasons have an effect on the natural world.</p> <p>Know the names of the seasons</p> <p>Know that some environments are different to the ones in which we live.</p>	<p>Know the changing seasons have an effect on the weather.</p> <p>Know the changing seasons effect the length of daylight.</p> <p>Know how the length of daylight impacts the growth of plants.</p> <p>Know that the names of each season and describe them.</p>		
Plants	<p>Know the simple lifecycle of a plant</p> <p>Know the names of some parts of a plant.</p>	<p>Know the names of some common plants.</p> <p>Know what an evergreen is.</p> <p>Know what a deciduous plant is.</p> <p>Know the difference between an evergreen and deciduous tree.</p> <p>Know the basic structure of common flowering plants including trees. (stem, root, flower, leaves, petals, trunk, branches, bulbs, seeds, fruit).</p>	<p>Know the function of the roots, stem/ trunk.</p> <p>Know the lifecycle of a plant from seed or bulb.</p> <p>Know what plants need to grow and stay healthy.</p>	<p>Know the function of a flowering plant.</p> <p>Know how plants transport water.</p> <p>Know the requirements of plants for life and growth (air, light, nutrients from soil and room to grow) and how they vary from plant to plant.</p> <p>Know why the flower is key to a plant's life cycle including bearing fruit.</p> <p>Know that plant pollination and seed dispersal happen in different ways.</p>

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Animals, including humans	<p>Know and name the main outer body parts.</p> <p>Know and name the 5 senses.</p> <p>Know how to use my senses to explore the world around me.</p> <p>Know the different factors that support our overall health and wellbeing, including physical activity, healthy eating, teeth brushing, sensible amounts of screen time. Having a good sleep routine, being a safe pedestrian.</p> <p>Know the names of some animals.</p>	<p>Know further names of body parts.</p> <p>Know the organs associated with each of the senses.</p> <p>Know which animals belong to which animal classification. (reptiles, fish, amphibians, birds, mammals)</p> <p>Know the structure of a variety of common animals (cold blooded, warm blooded, skeleton etc)</p> <p>Identify and name some common herbivores, omnivores and carnivores.</p> <p>Know the difference between carnivores, omnivores and herbivores.</p>	<p>Know that animals including humans have offspring which grow into adults.</p> <p>Know that animals including humans need water, air and food to survive.</p> <p>Know the importance of exercise for humans and explain it.</p> <p>Know the importance of eating the right types and amounts of food.</p> <p>Know how to look after myself including teeth cleaning and hygiene.</p>	<p>Know that skeletons give us structure and our joints define how we move.</p> <p>Know that muscles support the movement of our skeleton.</p> <p>Know that animals including humans need the right types and amounts of nutrition and that they cannot make their own food, they get nutrition from what they eat.</p>
Living things and their Habitats	<p>Know some of the similarities and differences between the natural world around them and contrasting environments, drawing on experiences and what has been read in class.</p> <p>Know the lifecycles of frogs and butterflies.</p>		<p>Know the differences between things that are living, dead and things that have never been alive.</p> <p>know the names of a variety of animals and plants in their habitats including micro habitats.</p> <p>Know which habitat each animal is suited to.</p> <p>Know how different habitats provide the basic needs for different animals and plants.</p> <p>Know how different animals obtain their food from plants and other animals.</p> <p>Know how to create a food chain and identify sources of food.</p>	