

Science Overview



The science topics are well sequenced to provide progression over the year groups and to develop children's scientific knowledge, skills and subject disciplines. High-quality science lessons are taught to provide our children with the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Key working scientifically aspects and concepts such as asking questions, conducting practical enquiries, making systematic and careful observations, gathering, recording and presenting data, using scientific language, reporting on findings, making predictions and using evidence to make conclusion and explaining results are taught, revisited throughout all topics and are developed over time. All science topics give children the opportunity to participate in scientific enquiries, to help them ask questions and develop a sense of excitement and curiosity about the world around them.

Science is taught on a two-year cycle due to mix-year group classes and the choice of the science topic follows guidance set out in the national curriculum. The school follows a published science scheme to base our science topics and lessons on which meet the national curriculum statements. Each lesson is sequenced to provide opportunities to revisit and build on existing knowledge as well as show progression throughout the topic. The lessons also provide a variety of practical enquire or knowledge base activities. In each Key Stage, over a two-year period, each child will have been taught ten Science topics within the three disciplines. This provides children with a rich and diverse subject knowledge of science in each of the scientific disciplines. Alongside this, children are consistently learning new key scientific vocabulary. Where there are opportunities for making meaningful connections with other subjects, science topics are sequenced accordingly. For example, in Lower Key Stage 2 the 'Eating and Digestion' topic, which covers the human digestive system, is taught alongside the DT topic 'Healthy Lunchboxes where children have the opportunity to plan, prepare and make bread.

EYFS

The EYFS framework is structured very differently to the National Curriculum as it is organised across seven areas of learning rather than subject areas. We continuously use our understanding of child development and skill progression, baselines, observations and assessments to identify and review our children's strengths and gaps. This knowledge, along with the Educational Outcomes and Early Learning Goals within the Statutory Framework, drives our provision, learning environment and tailors our curriculum to the children's needs as well as ensuring we provide a broad range of knowledge and skills that are continuously built upon to provide the right foundations for the children in our care to become lifelong learners. All of this is provided through our continuous provision to engage children's curiosity, thinking and learning through play and adult focus tasks.

Key Stage 1

Topics in Key Stage 1 link and build on children's understanding of 'The Natural World' from EYFS. The order in which the topics are taught allows the children to continuously revisit and build on their existing knowledge from EYFS and pervious topic taught in Key Stage 1.

Within cycle 1, children will study 'Everyday Materials' which extends their knowledge of materials from EYFS. Children will distinguish between object and material, identify everyday materials and describe, compare and group materials based on their properties. 'Exploring Everyday Materials' builds on their knowledge of materials and their properties as children discover their different uses and suitability in the world. 'Identifying Plants' enables children to identify wild and garden plants while describing their basic structure. 'Growing Plants' extends their knowledge of plants as they learn about what plant needs to grow and be healthy. In these two topics, children get to grow and look after their own plant. 'Seasonal Changes'

is taught throughout the year so children are able to experience, observe and describe the different seasons, weather and lengths of the day.

Within cycle 2, children will study 'Growth and Survival', which looks at the basic needs of animals and humans for survival and how they have offspring, which grow into adults. Children will learn about the importance for humans to eat right and exercise. 'Identifying Animals' and 'My Body' continues to introduce children to new scientific vocabulary such as mammals and carnivores. They will explore the basic parts of a human body and compare the structure of a variety of common animals. 'Living in Habitats' allows children to explore and compare the differences between things that are dead, alive or never been alive. They will identify and describe how different habitat provide for different animals and plants and understand a simple food chain. 'Super Scientists' allows children to be scientists and work scientifically by conducting a number of investigations.

Lower Key Stage 2

Within cycle 1, children are introduced to three new topics 'Circuits and Conductors', 'Forces and Magnets' and 'Light and Shadow'. In 'Circuits and Conductors' children build circuits, draw the pictorial representation, learn new scientific vocabulary such as conductors and insulators and understand electrical safety. 'Forces and Magnets' enables children to compare how things move on different surfaces and notice that some forces like push and pull need contact between objects while magnets can act from afar. They start to describe the two poles of a magnet and whether they will attract or repel as well as observing and comparing how magnets attract some materials and repel others. 'Light and Shadow' allows children to discover that they need light in order to see and that light is reflected from surfaces. They recognise that the sun is dangerous and the different precautions they can take to protect themselves. Children understand how shadows are formed and how they change in size. Building on their existing knowledge of materials and their properties, children will also, study 'States of Matter' looking more closing at solid, liquids and gases. They will describe, compare and group materials according to whether they are a solid, liquid or gas. Children will also observe that some materials change state when they are heated or cool and begin to understand the water cycle. Especially, the part played by evaporation and condensation. 'Health and Movement' builds on children's knowledge of what humans need to survive by looking in detail at the different types of nutrients we need. They will identify the different parts of the human skeleton and individual muscles.

In cycle 2, children continue to be introduced to new topics such as 'Changing Sound' and 'Rocks, Fossils and Soils'. 'Changing Sound' gives children the opportunity to understand that sound is caused by vibrations. They will recognise that sound vibrations travel through a medium to the ear and that sound gets fainter as the distance from the source increase. Within this topic, children will understand what pitch and volume is and how the features of the object, which produced the sound, and the strength of the vibration affect them. 'Rocks, Fossils and Soils' looks at the different types of rocks and gives children the knowledge to compare and group them based on their physical properties. Children will be able to describe how fossils are formed and recognise that soil is made from rocks and organic matter. 'Eating and Digestion' builds on children's knowledge and understanding of the human body. Children will describe the digestive system in humans; identify the different types of teeth in humans and their simple functions. They will be able to identify producers, predators, prey, and use this knowledge to construct their own food chains. In 'How Plants Grow', children will build on their existing knowledge of the basic structure of a plant by being able to describe the functions of the different parts of flowering plants. From understanding the functions, they will use their scientific enquire skills to investigate how water is transported within plants. Children will explore how air, light, water and nutrients are needed for plant life, how this will vary from plant to plant and the processes of pollination, seed formation and dispersal. 'Living in Environments' will build on children's knowledge from the 'Identifying Animals' topic in Key Stage 1. Their knowledge of

habits will be expanded, as they will understand that habitats can change and sometimes pose a threat to the animals living there. Children will be able to recognise, explore and group animals in a number of ways and use classification keys.

Upper Key Stage 2

Within Cycle 1, children will study 'Properties and Changes of Materials' which extends their knowledge of materials from Key Stage 1 and Lower Key Stage 2. Children will learn new properties of materials such as solubility and transparency and group everyday materials based on these new learnt properties. They will give reasons based on evidence from fair tests for the particular uses of everyday materials, know that some materials will dissolve to form a solution and understand how mixtures might be separated. Children will demonstrate and explain reversible and irreversible changes. 'Seeing the Light' continues children's understanding of light from Lower Key Stage 2. They will recognise that light travels in straight lines and be able to explain that we see objects because they reflect the light into our eyes. From understanding how shadows are formed in Lower Key Stage 1, children will begin to explain why shadows have the same shape as the objects that cast them. They will use their working scientifically skills to decide where to place rear-view mirrors on a car and design and make a periscope. In 'Changing Circuits', children will understand that the number of cells used in a circuit will affect the brightness of a lamp or volume of a buzzer and be able to construct simple circuits. Children will learn how to represent simple circuits using the correct symbols in a diagram. In 'Changes and Reproduction', children will describe the changes of the human body into old age and be able to draw a timeline of the different stages of growth and development. During the summer term, they will also learn about the changes experienced in puberty. 'Forces in Action' teaches the children to identify, explore and explain the effects of gravity, air resistance, water resistance and friction. They will recognise mechanisms including lever, pulleys and gears. They will learn about scientists Galileo Galilei and Isaac Newton.

In cycle 2, children are introduced to two new topics 'Earth and Space' and 'Evolution and Inheritance'. 'Earth and Space' teaches children about the sun and the planets in our solar system. They will describe the sun, moon and Earth and how they move within the solar system. They will look into the Earth's rotation in more detail to understand and explain how we have day and night. 'Evolution and Inheritance' enables children to recognise that living things change over time. They will study how animals and plants are adapted to suit their environment in different ways and how these adaptations can lead to evolution. Children will recognise that living things produce offspring but their offspring will normally not be identical to their parents. They will understand the idea that characteristics are passed from parents to offspring and over time these characteristics can make animals more or less able to survive in their environment. They will study work of palaeontologist Mary Anning and evolutionist Charles Darwin and Alfred Wallace. In this cycle, children will build on their existing knowledge of living things and their habitats in 'Classifying Organisms' and 'Life Cycles'. In 'Classifying Organisms', children will be able to classify living things into broad groups such as micro-organisms, plants and animals and further classify animals into commonly found invertebrates and vertebrates. In 'Life Cycles', children will be able to describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird and the life process of reproduction in some plants and animals. Children will find out about naturalists and animal behaviourists David Attenborough. In 'Healthy Bodies', children will be able to name the main parts of the human circulatory system, understand how the circulatory system enables the body to function and describe the ways in which nutrients and water are transported around the body. Children will find out how to keep the body healthy and about the impact diet, exercise, drugs and lifestyle on the way their body functions.

Children in Key Stage 1 and 2 have opportunities to experience a variety of activities including participating in practical investigations to develop their working scientifically skills.