



Intent & Long-Term Plan

Science

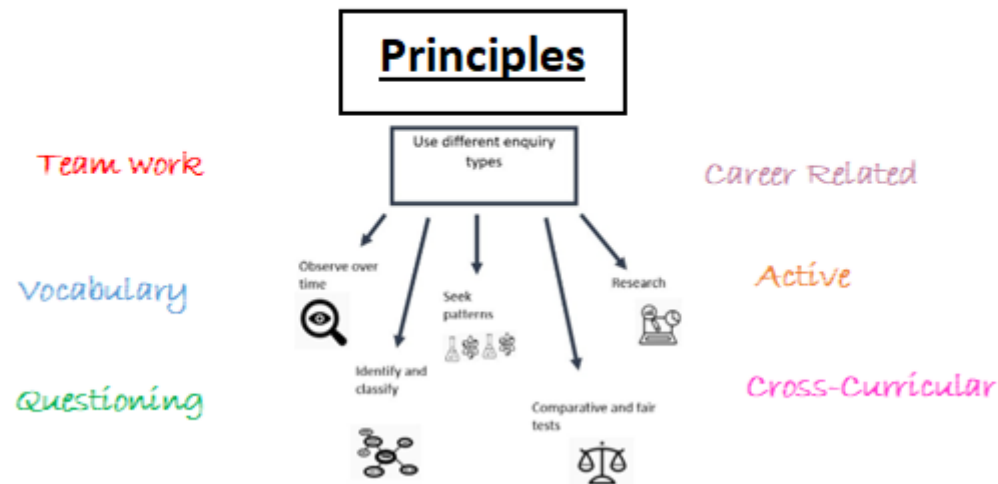


Co-op Academy
Woodslee



Vision

At Co-op Academy Woodslee, we want children to be confident, inquisitive and articulate scientists who are prepared for life in STEM and beyond. Children are given the opportunity to not only learn deeply about the world around them, but to also understand *why* it is important that they do this.



Co-op Academy Woodslee provides an ambitious science curriculum, which covers the full scope of the National Curriculum.

Our science curriculum is designed with the emphasis on pupils building their scientific knowledge sequentially, whilst also developing the skills of scientific enquiry. Our curriculum provides schools with a progression model so that teachers elicit and build on prior knowledge and connect this to what comes next. Key knowledge is revisited within and across units so that pupils can build a secure understanding of increasingly complex scientific concepts. These key concepts are revisited as pupils move through the academy. This, along with opportunities to work practically, contributes to the curriculum design for pupils with SEND.

Our science curriculum provides opportunities for pupils to consolidate and apply their knowledge from other curriculum areas, including mathematics, ICT/Computing, music and English. For example, each unit has two opportunities for pupils to read and comprehend a text related to the scientific concepts they are learning about. A heavy emphasis is placed on pupils' acquisition of language and vocabulary, including scientific words and more advanced high frequency words with multiple meanings. The science curriculum also provides the foundational knowledge needed in other wider curriculum subjects, such as geography and design technology. Our curriculum builds pupils' cultural capital through exposing them to great scientists, past and present, and important discoveries. We promote careers in science, taking every opportunity to discuss and describe less well-known jobs. Our curriculum includes a focus on current, diverse (counter-stereotypical) scientists. This is in keeping with our Co-op Values.

Each unit in our curriculum provides opportunities for pupils to work practically, giving them first-hand experiences of investigating and exploring safely. These experiences are designed to foster pupils' critical thinking as well as their reasoning and explanation skills. Key scientific knowledge is revisited, to support pupils in remembering more and assessments are in place to check they can apply their knowledge.

In line with our inclusive values, we support our pupils with SEND to acquire the core knowledge they need to unlock future learning. To this end, we use knowledge organisers to identify the vital knowledge pupils need to remember. Pupils, including disadvantaged pupils, also benefit from the emphasis on science careers, aimed at broadening pupils' horizons and keeping their aspirations on track. As a trust, we promote a range of enrichment opportunities, including the celebration of British Science week and provision of STEM clubs.

In Year 1 children will continue their EYFS learning. The children begin to identify common wild and garden plants and observe different leaf shapes and identify them using identification charts. Children are introduced to evergreen and deciduous and begin to identify each. Following on from looking at changes in the local environment throughout the year, children in Year 1 observe changes across the four seasons. Children also observe and describe weather associated with the seasons and how day length varies. As part of the everyday

materials topic children learn about the different properties of each type of material and plan and carry out investigations. Finally, children will explore animals including humans and learn to identify the different animal classes.

In Year 2 children continue to develop their working scientifically skills from asking simple questions and recognising that they can be answered in different ways to observing closely, using simple equipment and performing simple tests. In their topic of growth, Year 2 learn the difference between seeds and bulbs and observe growth under different conditions. Children in Year 2 investigate what humans and animals need to survive and begin to look at life cycles including animals and their young. Children explore the difference between habitats and microhabitats and start to learn about how animals are suited to their habitats. In Year 2 children learn about recycling, linking to and developing their design technology skills by planning and creating new items whilst enriching their Year 1 knowledge of materials.

In Autumn term in Year 3 children focus on rocks, learning about different rock types and making fossils. During the light topic in Autumn 2 children are first introduced to reflection and investigate how we see light. In year 3 the topic of humans is built upon from EYFS and KS1. This year children learn about muscles and they make skeletons learning about the different parts of the skeletal system and its importance. Following on from EYFS and KS1 children in Year 3 become plant experts, labelling flowering plants, investigating how water is transported through plants and looking at roots. Children also start to investigate the reproduction of plants through seed dispersal. During the final topic of the year, forces and magnets Children investigate magnets attracting and repelling each other.

During Year 4 children create electrical circuits and investigate what makes the best circuit including creating a switch and exploring Insulators and conductors. Year 4 sees the introduction to sound with the children investigating how we hear sounds, how the pitch of sounds can be changed and how sounds change with distance. Children later explore the digestive system and plan and carry out an investigation to see the effect of coke on egg shells, relating to oral hygiene. Following on from KS1 materials topics, children in year four look at states of matter. They develop their understanding of solids, liquids and gases and then changes in state of matter, looking at viscosity when experimenting to find out Which is the best liquid to use on a water slide? During the Summer term children continue to develop their skills and prior knowledge surrounding living things, this year creating and using classification keys, investigating how organisms adapt to their habitat and starting to look at endangered species and how we can help them.

In Year 5 children develop their ability to evaluate scientific findings. They explore properties and changes of materials including grouping and classifying materials, investigating thermal insulators and conductors and experimenting to find out how does their lunch stay cool? As part of the properties and changes of materials topic, children find out if a material is disappearing or dissolving? and How can we separate solutions when looking at irreversible changes. Children use all of their previous knowledge and experiences to plan their own fair tests. When continuing previous learning of animals including humans Year 5 children focus on life cycles and start to look at gestation and prenatal development and adolescence. This includes finding out what changes occur during the human gestation period and how does the human body change for boys and girls during adolescence? As part of the solar system topic in the summer term, Year 5 children distinguish between heliocentric and geocentric ideas of planetary movement and explain theories of planetary movement in the solar system using evidence.

In Year 6 children begin to understand how adaptation may lead to evolution over time. Children look at inherited and acquired characteristics and relate this to evolution. Children's Year 4 knowledge of electricity is developed and they begin to look at the effects of varying voltage and resistance of materials. In Spring term children move onto light and explore how light appears to travel in straight lines. Year 6 then develop further classification systems within animals including humans, including what a microorganism is and how to classify them based on their characteristics. Summer term sees children in Year 6 understand what a circulatory system is and why it is important. Children look at the components of blood and describe the way in which nutrients and water are transported within animals.

Science Long Term Plan

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Autumn 1	Identify and name common plants and describing basic function.	Grow plants from seeds, observe and describe their need for water, light and	Compare and group rocks and describe the formation of fossils	Look at appliances, simple series circuits, lamps, switches, insulators	Relationships between materials and their uses; looking at reversible	Fossils and the idea that adaptation may lead to evolution over time

		temperature		and conductors	and non-reversible changes	
Autumn 2	Observing changes across the seasons and describing weather patterns	Look at growth, basic needs of water, , exercise, food, air and hygiene for survival / reproduction	Look at light sources, seeing, reflections and shadow formation	Vibrations, volume and pitch		Investigating series circuits; effect of varying voltage, resistance and conductivity of materials
Spring 1	Identify, name, describe, comparing and classifying material properties	Look at habitats, micro-habitats and simple food chains	Role of muscle and skeletal systems in humans and animals and the importance of nutrients	Digestive system in humans and at teeth	Life cycles of mammals, amphibians, plants, insects and birds, Reproduction processes, human growth and changes	Explain how light appears to travel in straight lines and how this affects seeing and shadows
Spring 2			The function of parts of flowering plants, their requirements for growth, water transportation, life cycles and seed dispersal	Solids, liquids and gases; the role of temperature in changing state, evaporation, condensation and the water cycle	Human development to old age	Look at further classification of plants, animals and microorganisms based on characteristics
Summer 1	Identify, observe, and name reptiles, birds, fish, amphibians and mammals Recognise carnivores, herbivores and omnivores	.Look at the practical uses of everyday materials, comparing them and looking at the impact of bending, twisting on solid objects	Contact and distant forces, pole attraction and repulsion, comparing and grouping materials	Identify and name plants and animals; use classification keys	Air and water resistance, gravity and friction Transference of forces in gears, pulleys, levers and springs	Circulatory system; transporting nutrients
Summer 2					Movement of the Earth and the moon; how they relate to day and night	

Science Working Scientifically National Curriculum Coverage

National Curriculum Objectives	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Working scientifically						
Asking simple questions and recognising that they can be answered in different ways	Autumn 1 Autumn 2 Spring Summer	Autumn 2 Spring Summer				
observing closely, using simple equipment	Autumn 1 Autumn 2	Autumn 1 Summer				
performing simple tests	Spring	Autumn 1 Autumn 2 Summer				
identifying and classifying	Autumn 1 Autumn 2 Spring Summer	Autumn 1 Autumn 2 Spring Summer 1				
using their observations and ideas to suggest answers to questions	Autumn 1 Autumn 2 Summer	Autumn 1 Autumn 2 spring				
gathering and recording data to help in answering questions	Autumn 2 Spring	Autumn 1 Autumn 2 Summer				
KS2	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6

Working Scientifically						
asking relevant questions and using different types of scientific enquiries to answer them			Autumn 1 Autumn 2 Spring Summer	Autumn Spring 1 Spring 2 Summer	Autumn 1 Spring 1 Summer	
setting up simple practical enquiries, comparative and fair tests			Autumn 1 Autumn 2 Spring	Spring 1 Spring 2 Summer	Autumn 1 spring	
making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers			Autumn 1 Spring Summer	Autumn Spring 2	Spring 1	
gathering, recording, classifying and presenting data in a variety of ways to help in answering questions			Autumn 1 Spring Summer	Spring 1 Summer	Autumn 1 Spring	
recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables			Autumn 1 Autumn 2	Spring 1 Spring 2 Summer	Autumn 1 Spring	
reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions			Autumn 1	Spring 2 Summer	Autumn 1 Summer	
using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions			Autumn 2 Spring	Autumn Spring 1	Autumn 1 Spring Summer	
identifying differences, similarities or changes related to simple scientific ideas and processes			Spring	Spring 1 Spring 2	Spring Summer	

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

Autumn 2
Spring
Summer

Autumn
Spring 1
Summer

Autumn 1
Spring
Summer