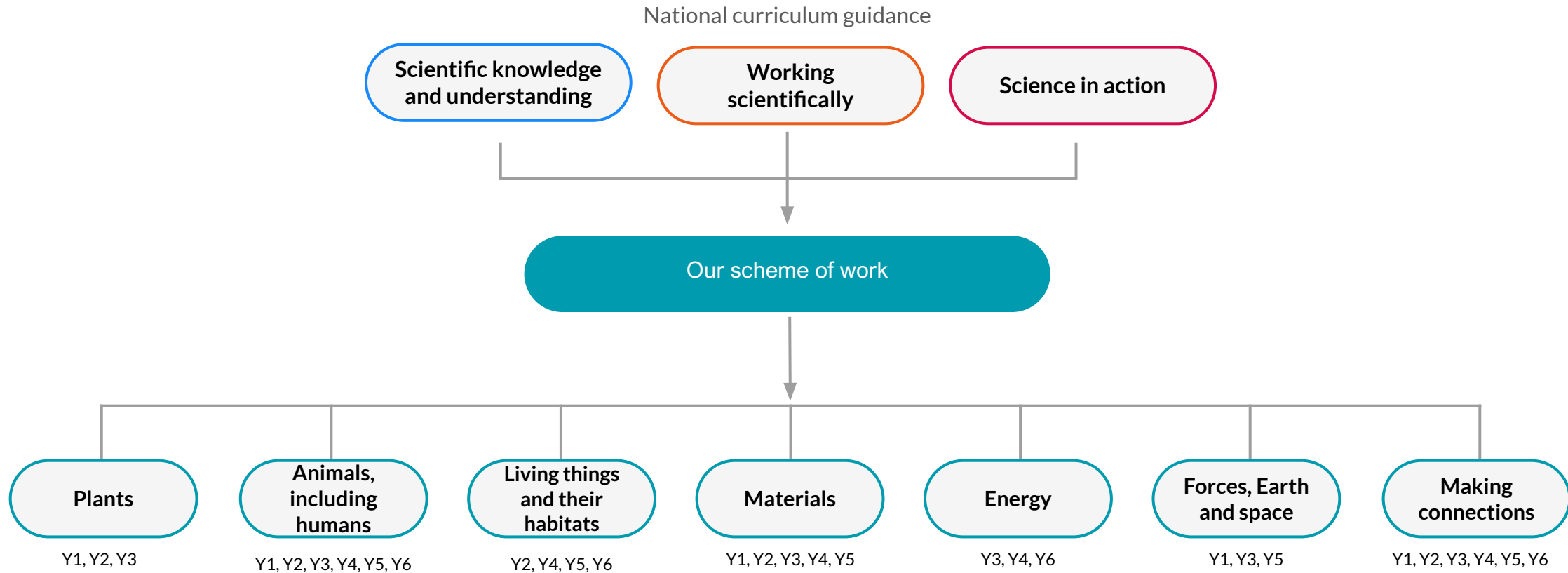


How our Science scheme of work organised?



Key areas in Science

Pupils will develop **Scientific knowledge and understanding** in seven key areas. The learning in each area is summarised below:

Animals, including humans



Identifying animals, their basic structure and their eating habits, as well as their basic needs for survival. Children learn about the life cycles of animals and their place in food chains.

Naming parts of the human body and recognising the function of skeletons, muscles, teeth and the digestive and circulatory systems. Learning about the importance of hygiene and of the right type and amount of nutrition. Children learn about the impact of diet, drugs and exercise on the body and study the life cycles of humans.

This key area covers the Year 1, Year 2, Year 3, Year 4, Year 5 and Year 6 subject content titled 'Animals, including humans' from the National curriculum.

Living things and their habitats



Identifying something as living and how it is grouped based on its characteristics, similarities and differences.

Naming different types of habitats, learning what they provide for life and the impact of habitats changing. Children learn about the life cycles and reproduction of animals and plants, and how this affects the variation of living things around us, past and present.

This key area covers the Year 2, Year 4, Year 5 and Year 6 subject content titled 'Living things and their habitats' and 'Evolution and inheritance' from the National curriculum.

Plants



Identifying different plants and their key structures, growing seeds and plants and understanding their requirements for growth. Recognising the function of different plant structures and understanding how plants reproduce.

This key area covers the Year 1, Year 2 and Year 3 subject content titled 'Plants' from the National curriculum.

Materials



Naming materials, describing their properties and understanding why materials have specific uses. Identifying how materials may change and the factors that may contribute to this, including changes of state within the water cycle. Children learn about different mixtures and how they can be separated based on their properties.

Identifying different types of rocks and their physical properties, and understanding how fossils and soil are formed.

This key area covers the Year 1, Year 2, Year 3, Year 4 and Year 5 subject content titled 'Everyday materials', 'Uses of everyday materials', 'Rocks', 'States of matter' and 'Properties and changes of materials' from the National curriculum.

Energy



Learning about light and its properties, how it enables us to see and how shadows are formed. Identifying the relationship between sounds, volume, pitch and vibrations, and how sound travels to the ear.

Recognising electrical appliances and the components that make up different circuits. Building electrical circuits and identifying factors that affect the output.

This key area covers the Year 3, Year 4 and Year 6 subject content titled 'Light', 'Electricity' and 'Sound' from the National curriculum.

Key areas in Science

Pupils will develop **Scientific knowledge and understanding** in seven key areas. The learning in each area is summarised below:

Forces, Earth and space



Identifying changes across the seasons, and the weather and day length associated with each.

Recognising different types of forces and understanding their effect on objects, including the role of pulleys, levers and gears. Children learn about magnetic materials and that magnets attract and repel.

Learning about the movements of planets and moons within the solar system and how this relates to our day and night.

This key area covers the Year 1, Year 3 and Year 5 subject content titled 'Seasonal changes', 'Forces and magnets', 'Earth and space' and 'Forces' from the National curriculum.

Making connections








































[Finding the optimum: the science subject report](#) (Ofsted, 2023) states that schools should ensure that teachers

'regularly connect new learning to what pupils have already learned. This includes showing pupils how knowledge from different areas of the curriculum connects.'

One of the ways in which we do this is through our Making connections units, which give pupils opportunities, beyond the National curriculum programme of study, to make connections between their science learning.

Long Term Plan

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2	
Year 1	 <u>Seasonal changes</u>	 <u>Everyday materials</u>	 <u>Sensitive bodies</u>	 <u>Comparing animals</u>	 <u>Introduction to plants</u>	 Making connections	
Year 2	 <u>Habitats</u>	 <u>Microhabitats</u>	 <u>Uses of everyday materials</u>	 <u>Life cycles and health</u>	 <u>Plant growth</u>	 Making connections	
Year 3	 <u>Movement and nutrition</u>	 <u>Forces and magnets</u>	 <u>Rocks and soil</u>	 Light and shadows	 Plant reproduction	 Making connections	
Year 4	 <u>Digestion and food</u>	 <u>Electricity and circuits</u>	 <u>States of matter</u>	 Sound and vibrations	 Classification and changing habitats	 Making connections	
Year 5	 <u>Mixtures and separation</u>	 <u>Properties and changes</u>	 <u>Earth and space</u>	 Life cycles and reproduction	 Imbalanced forces	 Human timeline	 Making connections
Year 6	 <u>Classifying big and small</u>	 <u>Light and reflection</u>	 <u>Evolution and inheritance</u>	 Circuits, batteries and switches	 Circulation and exercise	 Making connections	

Long Term Plan

Year 1			
Autumn 1	Forces, Earth and space	Autumn 2	Materials
	<p><u>Seasonal changes</u> (6 lessons) Reflecting on their own experiences, children learn about the four seasons and the weather associated with each. Pupils explore how seasonal changes affect trees, daylight hours and our choices about outfits. They plan and carry out their own weather reports, considering the knowledge required for this job.</p>		<p><u>Everyday materials</u> (6 lessons) Identifying the difference between objects and materials, children explore their surroundings to find examples of each. They work scientifically by planning tests, making observations and recording data. Pupils use results to answer questions and sort and group materials based on their properties.</p>
Spring 1	Animals, including humans	Spring 2	Animals, including humans
	<p><u>Sensitive bodies</u> (6 lessons) Familiarising themselves with the basic parts of the human body, children investigate their senses through stimulating experiences that highlight how we interact with the world around us. They work scientifically, using their senses to make observations, spot patterns and use data to answer questions. They develop an understanding of how science can support those who have lost sensory function and consider how a firefighter uses their senses at work.</p>		<p><u>Comparing animals</u> (6 lessons) Studying both local and global animals, children recognise common features and use this information to make comparisons and begin to classify animals. Pupils collect data by surveying class pets, to then explore ways in which this information can be recorded. They develop their understanding of classification by comparing the dietary habits of different animals and use their knowledge and imaginations to take on the role of a zookeeper.</p>
Summer 1	Plants	Summer 2	Making connections
	<p><u>Introduction to plants</u> (6 lessons) Identifying the key features of a plant, children describe important structures and make comparisons between different plants. Pupils use investigative skills to record the growth of a plant over time and begin to reflect on factors that will affect its development. They begin to explore how plants are used by humans and grow their own herb garden.</p>		<p>Bringing together pupils' learning from multiple Science units, helping them to make connections between the key concepts and skills.</p>

Long Term Plan

Year 2

Living things and their habitats

Autumn 1

Habitats (6 lessons)

Considering the life processes that all living things have in common, pupils classify objects into alive, was once alive or has never been alive. Pupils explore global habitats, naming plants and animals that can be found there. They learn how a range of different living things depend on each other for food or shelter. Pupils explore this further by creating food chains to show the sequence that living things eat each other for energy to grow and stay healthy.

Autumn 2

Microhabitats (6 lessons)

Developing their understanding of scientific enquiry, pupils learn that scientists use a range of skills to answer questions. They discover that microhabitats provide what minibeasts need to survive and carry out a survey to find out where different minibeasts live in the school grounds. They practise asking scientific questions and follow a method to investigate which conditions woodlice prefer. Pupils explore the job role of a botanist by identifying flowering plants.

Materials

Spring 1

Uses of everyday materials (6 lessons)

Building on their knowledge of everyday materials and their properties, pupils recognise that materials are suited to specific purposes and explore how actions such as stretching and bending affect the shape of solid objects. They compare the suitability of materials; gather and record data in tables and block graphs and use their results to answer questions. Children learn about the harmful effects of plastic and explore eco-friendly alternatives.

Spring 2

Animals, including humans

Life cycles and health (6 lessons)

Studying the life cycles of various animals, children learn what animals need to survive and how they change over time. Pupils collect data that allows them to observe changes in their peers, while also developing their ability to take measurements and record data. They consider the role of expert scientific knowledge in careers that inform people to make healthy choices.

Plants

Summer 1

Plant growth (6 lessons)

Using their prior knowledge of important plant structures, children explain what factors are needed for successful growth and compare how those needs vary across different plants. They grow plants from seeds and bulbs to ascertain the needs for initial development and compare this to the survival needs of plants in later growth phases. Pupils take their own measurements and reflect on historical examples to understand how conclusions can be drawn.

Summer 2

Making connections

Bringing together pupils' learning from multiple Science units, helping them to make connections between the key concepts and skills.

Long Term Plan

Year 3

Autumn 1

Animals, including humans

Movement and nutrition (6 lessons)

Studying the human skeleton, children identify key bones and compare them to other animals explaining the role within the body. Pupils explore how changes in muscles result in movement and the implications these discoveries have in the scientific development of prosthetic limbs. They study how energy is used by the body, what constitutes a balanced diet in humans and how research contributes to nutritionist expertise.

Autumn 2

Forces, Earth and space

Forces and magnets (6 lessons)

Investigating the movement of vehicles on different surfaces, children learn about the impact of friction and compare uses and drawbacks. They broaden their experience in writing scientific methods and recording data as they investigate contact and non-contact forces. Pupils explore the properties of different magnets and use this to understand their uses.

Spring 1

Materials

Rocks and soil (6 lessons)

Studying rocks and their properties, children learn how to classify rocks and identify how they were formed. They look at the work of paleontologists to learn about fossil formation and use models to explore how fossils tell us about the past. Pupils investigate the physical properties of rocks and link these to their particular uses. Pupils also explore soil formation, separate soil using a sedimentation jar and test soil drainage.

Spring 2

Energy

Light and shadows (6 lessons)

Identifying examples of light sources, children learn that light is needed to see and how its absence causes darkness. Children investigate reflection and shadow formation, including how different factors change the shadows observed. They explore how shadows can be used to entertain in the arts and create shadow puppets to recount how different people work or experiment with light.

Summer 1

Plants

Plant reproduction (6 lessons)

Building on their prior knowledge of plant structures, children describe the functions of named parts and use evidence to explain their significance in plant development. Pupils investigate further factors that may affect the growth of plants and compete with their peers to disperse seeds in a variety of ways. They explore how seeds vary and define the type of plant they are studying, as well as looking at how seed shapes have inspired modern technologies.

Summer 2

Making connections

Bringing together pupils' learning from multiple Science units, helping them to make connections between the key concepts and skills.

Long Term Plan

Year 4

Autumn 1

Animals, including humans

Digestion and food (6 lessons)

Using models, children describe the function of key organs in the digestive system. Pupils identify the types of human teeth to create their own model and investigate factors that impact our dental health. They compare human teeth to other animals' and consider this in the light of prior knowledge about predators, prey and food chains. Children take on the role of a naturalist investigating animal faeces for clues about diet, digestion and dentition.

Autumn 2

Energy

Electricity and circuits (6 lessons)

Exploring appliances that use electricity in their setting, children learn how to work with electricity safely and build circuits. Pupils investigate electrical conductors and insulators and explore the relationship between the number of bulbs and bulb brightness. Real scenarios and historical discoveries inform children about scientific progression and home safety.

Spring 1

Materials

States of matter (6 lessons)

Investigating the properties of solids, liquids and gases, children learn about the different states of matter. They explore changes of state using relatable examples and use this to explain changes to water through the water cycle. Pupils investigate the relationship between temperature and rate of evaporation while broadening their experience of working scientifically.

Spring 2

Energy

Sound and vibrations (6 lessons)

Exploring different ways of producing sounds, children learn about the relationship between vibrations and what they hear. They use examples of dolphins and whales to develop their understanding of how sound travels between objects and investigate the role of insulation to protect our ears. Pupils explore how pitch and volume can be altered and make their own musical instruments to demonstrate these principles.

Summer 1

Living things and their habitats

Classification and changing habitats (6 lessons)

Identifying different ways living things can be grouped, children make classification keys to explore which grouping methods are most effective. Pupils study ways that habitats may change over time and understand that humans can have both positive and negative effects on their surroundings. They play the role of naturalists and review the impact of conservation programmes.

Summer 2

Making connections

Bringing together pupils' learning from multiple Science units, helping them to make connections between the key concepts and skills.

Long Term Plan

Year 5

Materials

Autumn 1

Mixtures and separation (6 lessons)

Pupils explore different types of mixtures and the different methods that can be used to separate them. They dissolve a range of substances, identify different solutions and investigate how temperature affects the time taken to dissolve. They design and create a water filter, sieve soil and evaporate solutions.

Autumn 2

Properties and changes (6 lessons)

Broadening their experience of the properties of materials, children investigate hardness, transparency and conductivity and consider how these properties influence the uses of materials. They explore reversible changes, including dissolving and changes of state. Children compare these to irreversible changes, including rusting, burning and mixing vinegar and bicarbonate of soda.

Spring 1

Forces, Earth and space

Earth and space (6 lessons)

Exploring some of the key celestial bodies in our Solar System, children learn their names and compare their movements. Pupils discover the relationship between the Earth's rotation and daylight, making models to represent their knowledge. They make their own sundials and consider how and why humans' ideas about the universe have changed over time.

Spring 2

Living things and their habitats

Life cycles and reproduction (6 lessons)

Studying different animals' life cycles, children learn about the significance of reproduction for a species' survival. Pupils calculate the probability of male and female turtles hatching and grow plants to compare asexual and sexual reproduction. Pupils compare fertilisation across different animals and explore the needs of a fetus. Children narrate their own documentary in the style of an inspirational naturalist.

Summer 1

Forces, Earth and space

Imbalanced forces (6 lessons)

Building on their knowledge of contact forces, children explore gravity, air resistance and water resistance in more depth and consider the effect of these forces being imbalanced. They demonstrate key principles in the classroom and plan investigations to further their understanding of the effects of these forces. Pupils test their ideas using models and compete to build the most effective pulley system.

Summer 2

Animals, including humans

Human timeline (3 lessons)

Studying human development and changes, children identify key stages and consider what data may help determine if a child is growing normally. They describe how puberty affects girls and boys and produce graphs to record how gestation periods vary across different animals.

Making connections

Bringing together pupils' learning from multiple Science units, helping them to make connections between the key concepts and skills.

Long Term Plan

Year 6

Year 6			
Autumn 1	Living things and their habitats	Autumn 2	Energy
	<p><u>Classifying big and small</u> (6 lessons) Children broaden their knowledge of how vertebrates, invertebrates, plants and micro-organisms are grouped using shared characteristics. They discover how Carl Linnaeus developed the Linnaean and binomial systems for classifying and naming living things. Pupils use and produce classification keys to sort and identify organisms.</p>		<p><u>Light and reflection</u> (6 lessons) Proving that light travels in a straight line, children use this information to explain observations of reflection and shadows. They explore how our eyes allow us to see and how mirrors can be used in a variety of ways. Pupils investigate factors affecting the size of shadows and the laws of reflection. Children apply what they have learned about light by exploring real-life uses of mirrors.</p>
Spring 1	Living things and their habitats	Spring 2	Energy
	<p><u>Evolution and inheritance</u> (6 lessons) Studying patterns in humans and other species, children learn about characteristics that are inherited from parents and those that are environmental. Through the eyes of Darwin and Wallace, pupils understand how observations lead to theories and explore natural selection. By modelling the variation and natural selection of Darwin's finches, they begin to explain how species evolve over time and the role of fossil evidence that supports this theory.</p>		<p><u>Circuits, batteries and switches</u> (6 lessons) Using their prior knowledge of electrical circuits, children learn to draw conventional circuit diagrams and use models to explain current and voltage. They make their own batteries, relate this to their knowledge of voltage and explore how battery research has impacted other scientific progress. Pupils investigate the use of switches and fuses and apply their electrical knowledge to design and produce their own electrical device.</p>
Summer 1	Animals, including humans	Summer 2	Making connections
	<p><u>Circulation and exercise</u> (6 lessons) Studying the human circulatory system, children learn about the role of the heart, blood and blood vessels and use models to demonstrate their function. They play the role of healthcare professionals to diagnose patients and play games to explore how lifestyle choices affect our health. Pupils devise their own investigation to look at the relationship between exercise and heart and breathing rates, applying their knowledge of variables.</p>		<p>Bringing together pupils' learning from multiple Science units, helping them to make connections between the key concepts and skills.</p>