ST JAMES'
PRIMARY SCHOOL

'In faith we grow and flourish'

Science - Long-term plan

Long-term plan: Science

Overview (All year groups)

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 1	Forces and space: Seasonal changes	Materials: Everyday materials	Animals: Sensitive bodies	Animals: Comparing animals	Plants: Introduction to plants	Making connections: Investigating science through stories
Year 2	Living things: Habitats	Living things: Microhabitats	Materials: Uses of everyday materials	Animals, including humans: Life cycles and health	Plants: Plant growth	Making connections: Plant-based materials
Year 3	Animals: Movement and nutrition	Forces and space: Forces and magnets	Materials: Rocks and soil	Energy: Light and shadows	Plants: Plant reproduction	Making connections: Does hand span affect grip strength?
Year 4	Animals including humans: Digestion and food	Energy: Electricity and circuits	Materials: States of matter	Energy: Sound and vibrations	Living things: Classification and changing habitats	Making connections: How does the flow of liquids compare?
Year 5	Materials: Mixtures and separation	Materials: Properties and changes	Forces and space: Earth and space	Living things: Life cycles and reproduction	Forces and space: Unbalanced forces	**Coming soon!** Animals: Human timeline (3 lessons)/ Making connections: Does the size of an asteroid affect the diameter of its crater? (3 lessons)
Year 6	Living things: Classifying big and small	Energy: Light and reflection	Living things: Evolution and inheritance	Energy: Circuits, batteries and switches	Animals, including humans: Circulation and health	Making connections: Are some sunglasses safer than others?

Year 1

Unit 1	Forces and space: Seasonal changes 6 lessons Reflecting on seasonal changes by exploring the weather and features of autumn, winter, spring and summer. Pupils investigate how the seasons affect trees, daylight hours and daily choices and apply their learning by planning and presenting their own weather reports.	**Unit 2**	Materials: Everyday materials 6 lessons Discovering the difference between objects and materials by exploring and classifying items in the world around them. Pupils develop their scientific enquiry skills by planning tests, making observations, recording data and using evidence to sort materials according to their properties.
Unit 3	Animals: Sensitive bodies 6 lessons Investigating the human body and the five senses by exploring how people experience and interact with the world around them. Pupils develop their scientific enquiry skills by making observations, identifying patterns and using data to answer questions.	**Unit 4**	Animals: Comparing animals 6 lessons Classifying animals by exploring their characteristics, physical features and diets. Pupils compare local and global animals, collect and present data about pets, and develop their understanding of classification through practical investigations and role-play inspired by the work of Jane Goodall.
Unit 5	Plants: Introduction to plants 6 lessons Discovering a variety of wild and garden plants by exploring their features and identifying common flowering plants, trees and plant parts. Pupils observe, sort and measure leaves, investigate what plants need to grow and learn about the different edible parts of plants through practical scientific enquiry.	**Unit 6**	Making connections: Investigating science through stories 5 lessons Investigating plants and animals through outdoor learning and practical enquiry. Pupils collect and analyse data about trees, identify animals from their footprints, explore the features of different animal groups and seek patterns in bird diets and physical characteristics while designing habitats using natural materials.

Year 2

Unit 1	Living things: Habitats 6 lessons Identifying what living things need to survive by exploring the life processes shared by all living things. Pupils classify things as alive, once alive or never alive, investigate plants and animals in habitats around the world and discover how living things depend on one another through food chains and other relationships.	**Unit 2**	Living things: Microhabitats 6 lessons Developing scientific enquiry skills by exploring how scientists investigate and answer questions about the world. Pupils learn about microhabitats and the needs of minibeasts, carry out surveys and investigations in the school grounds and discover the work of a botanist by identifying flowering plants.
Unit 3	Materials: Uses of everyday materials 6 lessons Investigating how the properties of materials make them suitable for different uses. Pupils compare materials, explore how bending, stretching and other actions can change the shape of solid objects and use data from their enquiries to answer questions.	**Unit 4**	Animals, including humans: Life cycles and health 6 lessons Exploring animal life cycles and survival by investigating how animals grow, change and meet their basic needs. Pupils collect and analyse data about changes in humans, develop their measuring and recording skills and consider how scientific knowledge can help people make healthy lifestyle choices.
Unit 5	Plants: Plant growth 6 lessons Examining how plants grow and reproduce by carrying out comparative tests and observing changes over time. Pupils identify the conditions needed for seed germination and healthy plant growth, measure and record stem growth, explore plant life cycles and consider the impact humans can have on plants and their environments.	**Unit 6**	Making connections: Plant-based materials 5 lessons Considering ways to reduce, reuse and recycle by applying knowledge of material properties to solve practical problems. Pupils investigate plant-based materials, learn about paper production and carry out simple tests to identify suitable materials for homemade plant pots, using natural materials to decorate their designs.

Year 3

Unit 1	Animals: Movement and nutrition 6 lessons Investigating the human body by studying the skeleton, muscles and nutrition. Pupils identify key bones and their functions, compare human and animal skeletons, explore how muscles enable movement, learn how the body uses energy and what makes a balanced diet.	**Unit 2**	Forces and space: Forces and magnets 6 lessons Investigating how vehicles move across different surfaces and how friction affects motion. Pupils develop their scientific enquiry skills by planning investigations, writing methods and recording data, while learning about contact and non-contact forces and the properties and uses of magnets.
Unit 3	Materials: Rocks and soil 6 lessons Classifying rocks by exploring their properties, uses and formation. Pupils investigate how fossils are formed and what they can reveal about the past, learn about the work of palaeontologists and explore soil formation through practical enquiries, including sedimentation and drainage tests.	**Unit 4**	Energy: Light and shadows 6 lessons Exploring how light enables us to see and identifying different light sources. Pupils examine reflection and shadow formation, investigate factors that affect shadows and apply their learning creatively through shadow puppetry.
Unit 5	Plants: Plant reproduction 6 lessons Understanding how plants grow and reproduce by exploring the functions of different plant parts and their role in development. Pupils investigate factors that affect plant growth, discover how water is transported through plants and compare different seeds and methods of seed dispersal through practical enquiry and modelling activities.	**Unit 6**	Making connections: Does hand span affect grip strength? 5 lessons Experimenting with friction and grip by carrying out comparative tests, analysing data and drawing conclusions. Pupils investigate the relationship between hand span and grip strength, explore how different materials affect grip and apply their findings to design and evaluate friction gloves.

Year 4

Unit 1	Animals including humans: Digestion and food 6 lessons Exploring the digestive system by using models to understand the function of key organs and how food is processed in the body. Pupils investigate different types of human teeth and factors affecting dental health and compare human and animal dentition.	**Unit 2**	Energy: Electricity and circuits 6 lessons Discovering how electricity is used in everyday life by identifying electrical appliances and learning how to work safely with electricity. Pupils build and test simple circuits, investigate conductors and insulators and explore how changes to a circuit affect bulb brightness.
Unit 3	Materials: States of matter 6 lessons Investigating solids, liquids and gases by exploring the properties of different states of matter and how materials change state. Pupils use everyday examples to understand melting, freezing, evaporation and condensation and apply their knowledge to the water cycle.	**Unit 4**	Energy: Sound and vibrations 6 lessons Discovering how sound is made and travels by exploring the relationship between vibrations and hearing. Pupils investigate how sound moves through different materials, learn how animals such as dolphins and whales communicate, explore ways to protect hearing and experiment with pitch and volume by creating their own musical instruments.
Unit 5	Living things: Classification and changing habitats 6 lessons Classifying living things by exploring different ways organisms can be grouped and evaluating the effectiveness of classification keys. Pupils investigate how habitats change over time and consider the positive and negative impact humans can have on the environment.	**Unit 6**	Making connections: How does the flow of liquids compare? 5 lessons Comparing the properties of liquids by investigating how different substances flow and exploring ways to measure and represent their results. Pupils plan and carry out their own enquiries, draw conclusions from data and consider how the flow of liquids influences the design and use of medicines.

Year 5

Unit 1	Materials: Mixtures and separation 6 lessons Separating mixtures by exploring different methods, including filtering, sieving and evaporation. Pupils investigate how substances dissolve, identify solutions and examine how temperature affects the rate of dissolving, applying their learning by designing water filters and separating soil mixtures.	**Unit 2**	Materials: Properties and changes 6 lessons Examining the properties of materials by investigating hardness, transparency and conductivity and considering how these characteristics affect their uses. Pupils explore reversible changes, such as dissolving and changes of state and compare these with irreversible changes, including rusting, burning and chemical reactions.
Unit 3	Forces and space: Earth and space 6 lessons Investigating how the Solar System works by examining the Sun, Earth, Moon and planets and comparing their movements. Pupils investigate how the Earth's rotation causes day and night, create models and sundials to represent their understanding and consider how scientific ideas about the universe have changed over time.	**Unit 4**	Living things: Life cycles and reproduction 6 lessons Comparing animal and plant life cycles by investigating reproduction, growth and survival. Pupils explore sexual and asexual reproduction in plants, grow cuttings and plot root growth, compare life cycles across animal groups and analyse secondary data to understand how predators and climate change can affect amphibians.
Unit 5	Forces and space: Unbalanced forces 6 lessons Exploring gravity, air resistance and water resistance and the effects of balanced and unbalanced forces. Pupils demonstrate key concepts through practical activities, plan and carry out investigations and test ideas using models.	**Unit 6**	Animals: Human timeline (3 lessons)/ Making connections: Does the size of an asteroid affect the diameter of its crater? (3 lessons)

Year 6

Unit 1	Living things: Classifying big and small 6 lessons Classifying living things by exploring how vertebrates, invertebrates, plants and micro-organisms are grouped according to shared characteristics. Pupils learn about Carl Linnaeus and the development of scientific classification systems and apply their understanding by using and creating classification keys to identify organisms.	**Unit 2**	Energy: Light and reflection 6 lessons Examining how light behaves by investigating reflection, shadows and how light travels in straight lines. Pupils explore how the eyes detect light, examine the laws of reflection, investigate factors that affect shadow size and apply their knowledge by exploring practical uses of mirrors in everyday life.
Unit 3	Living things: Evolution and inheritance 6 lessons Exploring inheritance and evolution by investigating how characteristics can be inherited or influenced by the environment. Pupils learn how Darwin and Wallace used observations to develop theories of evolution, model natural selection using Darwin's finches and examine how fossil evidence supports the idea that species change over time.	**Unit 4**	Energy: Circuits, batteries and switches 6 lessons Understanding electrical circuits by learning how to represent them using conventional circuit diagrams and models. Pupils investigate current, resistance and voltage, compare the effects of different batteries on bulb brightness and apply their knowledge of circuits and switches to design and create practical electrical devices.
Unit 5	Animals, including humans: Circulation and health 6 lessons Learning about the circulatory system by exploring the roles of the heart, blood and blood vessels and using models to demonstrate how they work together. Pupils examine how lifestyle choices can affect health and investigate the relationship between exercise and heart rate.	**Unit 6**	Making connections: Are some sunglasses safer than others? 5 lessons Evaluating sun safety by investigating how different sunglasses protect the eyes from light and UV radiation. Pupils plan and carry out enquiries, use their knowledge of electrical circuits to create a light source for testing, analyse their results and communicate their conclusions through presentations and advertisements.