



St Luke's School Long Term Planning



Science

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Aut 1	Seasons 	Materials 	Rocks 	Sound 	Forces 	Light
Aut 2	Animals (inc. Humans) 	Environment 	Light 	Living Things & Habitats 	Living Things & Habitats 	Electricity
Spring 1	Materials 	Animals (inc. Humans) 	Forces & Magnets 	States of matter 	Earth & Space 	Animals (inc. Humans)
Spring 2	Plants 	Living Things & Habitats 	Animals (inc. Humans) 	Animals (inc. Humans) 	Materials 	Living Things & Habitats
Sum 1	Seasons 	Plants 	Plants 	Electricity 	Animals (inc. Humans) 	Evolution & Inheritance
Sum 2	Scientists & Inventors 	Scientists & Inventors 	Scientists & Inventors 	Scientists & Inventors 	Scientists & Inventors 	Scientists & Inventors

Scientific Enquiry

	Observing over time	Pattern Seeking	Research	Identifying & Classifying	Comparative tests	Fair tests
Year 1						
Seasons 	How does the colour of a UV bead change over the day?	Do trees with bigger leaves lose their leaves first in Autumn?		How would you group these things based on which season you are most likely to see them in?	In which season does it rain the most?	
Animals (inc. Humans) 	How does my height change over the year?	Do you get better at smelling as you get older?		How can we organise all the zoo animals?	Is our sense of smell better when we can't see?	
Materials 	What happens to shaving foam over time?		Which materials can be recycled?	Making an umbrella – which materials are waterproof?	Which materials are the most absorbent?	
Plants 	How does my sunflower change each week?	Is there a pattern in where we find weeds growing in the school grounds?		How can we sort the leaves that we collected on our walk?	Which type of compost grows the tallest sunflower?	

Year 1

Autumn	<p>Seasons: Children learn about the four seasons, with a particular focus on autumn and winter. Children will learn what the word weather means and find out how different types of weather can be measured. Children will use a class weather station to observe measure and record the weather across the seasons. They will also observe changes across the seasons by exploring the signs of autumn and winter through nature and wildlife. A range of activities are used in this unit including observation, discussion and learning outside. Children also work scientifically by collecting, recording and interpreting simple data.</p>	<p>Animals: Children learn about human and animal bodies and consider similarities and differences between them. Children engage in a variety of activities including drawing and labelling the body, using their senses to conduct an investigation, describing animal bodies and sorting animals into groups.</p>
Spring	<p>Materials: Children will learn to identify and name everyday materials and will have the opportunity to explore the properties of these materials. Children also will carry out a simple investigation to help them decide which material would be most suitable to use for an umbrella. At the end of the unit children apply their knowledge of everyday materials to sort objects by their properties. A range of learning activities are used in this unit including, discussions, labelling and matching activities, games, and an investigation to encourage where children have the opportunity to ask and find the answers to questions.</p>	<p>Plants: Children engage in a variety of activities including identifying common plants and trees in the garden and in the wild, sorting deciduous and evergreen leaves, and crafting labelled plant collage pictures. Children will plant their own bean in lesson 1 and observe it closely over the coming weeks by measuring and recording its growth.</p>
Summer	<p>Seasons (2): Children will continue to use a class weather station to observe, measure and record the weather in different seasons and will start to make comparisons between two seasons, as well as across all four seasons. They will also observe changes across the seasons by exploring the signs of spring and summer through nature and wildlife. A range of learning activities are used in this unit, including observation, discussion and learning outside. Children also work scientifically by collecting, recording and interpreting simple data.</p>	<p>Scientists & Inventors: Children will learn about the inventions of Lego and ear muffs, and will explore the materials used to make them. They will investigate other materials that keep us warm, carrying out simple tests. Children will find out about the work of animal scientists, such as vets and zoo keepers. They will group and sort animals to make their own paper zoo, and will act in role as a vet, identifying the body parts of different animals. Children will have the opportunity to collect data when finding out about horticulturists and meteorologists. They will create bar charts of their favourite sensory plants, and make rain gauges to gather data on rainfall. Throughout the unit, children will work in a fun and hands on way to learn about scientists and inventors.</p>

Scientific Enquiry

	Observing over time	Pattern Seeking	Research	Identifying & Classifying	Comparative tests	Fair tests
Year 2						
Materials 	Would a paper boat float forever?		How are plastics made?	Which materials will let electricity go through them, and which will not?	Which material would be best for the roof of the little pig's house?	
Environment 						
Animals (inc. Humans) 	How does a tadpole change over time?	Which age group of children wash their hands the most in a day?		Which offspring belongs to which animal?	Do bananas make us run faster?	
Living Things & Habitats 	What conditions do woodlice prefer to live in?	Which habitat do worms prefer – where can we find the most worms?	How does the habitat of the artic compare to the habitat of the rainforest?	How would you group things to show which are living, dead or have never been alive?		
Plants 	What happens to my bean after I have planted it?	Do bigger seeds grow into bigger plants?	How can we identify the trees that we observed on our tree hunt?		Do cress seeds grow quicker inside or outside?	

Year 2

Autumn	<p>Materials: Children learn about the uses of everyday materials including wood, plastic, metal, glass, brick, paper and cardboard. Children then go on to compare the suitability of different everyday materials for different purposes. They explore how objects made of some everyday materials can change shape and how the recycling process is able to reuse some everyday materials numerous times. It finishes with children learning about new discoveries which have made over time with a specific focus on John McAdam. A range of learning activities are used in this unit including, discussions, debates, sequencing and a local walk where children work scientifically to identify the uses of everyday materials in the local area.</p>	<p>Environment: Children are introduced to the ecological challenges that face the modern world. Children undertake a range of activities that challenge them to engage with environmental issues and to understand the simple changes we can make to live more sustainable lives. Throughout the unit, learning is closely focused on the Working Scientifically strand of objectives, providing a range of opportunities for children to apply practical scientific methods and skills.</p>
Spring	<p>Animals (inc. Humans): Children learn about how humans and other animals are born, grow and change, and what we need to survive and be healthy. Children classify different kinds of animal babies, learn about the basic needs that are shared by humans and animals, and research the differing needs of animals within our care. Focusing their own experiences, children explore the need for humans to eat a varied diet, to keep themselves clean, and to take regular exercise. Throughout the unit, the learning materials encourage children to make positive choices that contribute to a healthy lifestyle.</p>	<p>Living things and their habitats: Children will learn about a variety of habitats and the plants and animals that live there. They learn to tell the difference between things that are living, dead and things that have never been alive, and apply this in a range of contexts. They make observations of a local habitat and the creatures that live there, investigating conditions in local microhabitats and how they affect the minibeasts found within them. This unit allows children to research a range of global habitats and how the living things that live there are suited to their environments, and also provides an introduction to the idea of dependency between plant and animal species.</p>
Summer	<p>Plants: children have the opportunity to closely study plants and trees in the natural environment, taking measurements and making observational drawings. Children plant a seed and a bulb and compare them as they grow. They record changes in their plants in words and pictures, take measurements throughout the unit and finally draw bar charts to show the growth of the two plants. Children set up a comparative experiment to observe what plants need to grow well, and watch the germination process first hand by growing cress. Children begin to learn about plants we eat, and understand that farming involves creating the right conditions for food crops to grow.</p>	<p>Scientists & Inventors: Children will learn about the invention of the waterproof coat, and will explore other waterproof materials by carrying out simple tests. Children will find out about the work of doctors, and will learn about Elizabeth Garrett Anderson, the first woman doctor in Britain. Children will have the opportunity to create their own greenhouse based on the invention of the biomes at the Eden Project, and use their greenhouse to compare the growth of plants. They will learn about how germs are spread, looking at the work of Louis Pasteur and carrying out a fun experiment to prove how far germs can spread in a few minutes. Children will set up a small world to show the effects of water pollution, as discovered by Rachel Carson during her research on ocean habitats. Finally, children will learn about the development of wind turbines and how this invention is used to generate power. Throughout the unit, children will work in a fun and hands-on way to learn about scientists and inventors.</p>

Scientific Enquiry

	Observing over time	Pattern Seeking	Research	Identifying & Classifying	Comparative tests	Fair tests
<u>Year 3</u>						
Rocks 	How does tumbling change a rock over time?		Who was Mary Anning and what did she discover?		Which soil absorbs the most water?	How does adding different amounts of sand to soil affect how quickly water drains through it?
Light 	When is our classroom the darkest? Is the Sun the same brightness all day?	Are you more likely to have bad eyesight and to wear glasses if you are older?	How does the Sun make light?			How does the distance between the shadow puppet and the screen affect the size of the shadow?
Forces & Magnets 	If we magnetise a pin, how long does it stay magnetised for?	Does the size and shape of a magnet affect how strong it is?		Which materials are magnetic?	Which magnet is the strongest?	

Year 3

Autumn

Rocks: Children discover the different types of rocks and how they are formed. Children will compare and group rocks based on appearance and simple properties. They will learn how fossils are formed and learn about the contribution of Mary Anning to the field of palaeontology. Children will understand how soil is formed and then investigate the permeability of different types of soil.

Light: Children will learn about light, reflections and shadows. They will learn about different sources of light, and that we need light to see. The children will work scientifically and collaboratively to investigate reflective materials, in the context of designing a new book bag. They will work in a hands on way to play a range of mirror games, finding out more about reflective surfaces. Furthermore, they will learn that the sun's light can be dangerous, and will create an advert for a pair of sunglasses or a sun hat that they have designed. The children will have chance to test which objects are opaque in an investigation to design the most effective curtains, and will find out how shadows change when the distance between the object and light source changes. They will develop their scientific enquiry skills, making observations, predictions and conclusions.

Spring

Forces & Magnets: Children will learn about forces, friction and magnetic attraction. They will learn about forces in the context of pushing and pulling, and will identify different actions as pushes or pulls. The children will work scientifically and collaboratively to investigate friction, by exploring the movement of a toy car over different surfaces. They will work in a hands on way to identify magnetic materials. Furthermore, they will conduct an investigation into the strength of different types of magnet. The children will have chance to explore the way magnetic poles can attract and repel in an exciting activity, making their own compass and using it to find hidden items. The children will use their understanding of magnetic attraction to design and create their own magnetic game. They will develop their scientific enquiry skills, making observations, predictions and conclusions.

Animals (inc. Humans): Children learn the importance of the right type and amount of nutrition as well as the functions of skeletons and muscles..

Summer

Plants: Children will learn the names of different parts of plants, and the jobs they do. The children will work scientifically and collaboratively to investigate what plants need to grow well, and will present their findings to their classmates. Furthermore, they will have chance to predict what will happen in an exciting investigation into the transportation of water within plants. They will work in a hands-on way to identify the parts of a flower, and will explore the different stages of the life cycle of a flowering plant.

Scientists & Inventors : They will learn about the men and women who risked their lives to find new plants, and will design their own new plant, thinking about its requirements for life. The children will learn about Marie Curie and her work on radiation. They will find out how she developed the medical use of x-rays. Children will consider what plants need to grow well through exploring the life and discoveries of George Washington Carver. They will find out about William Smith and how he learnt that the fossils found inside rocks can be used to tell the age of the rocks as well as the modern-day applications of this. Furthermore, they will learn about Inge Lehmann, the woman who discovered that the Earth's core is solid. The children will have chance to investigate how images change in convex and concave mirrors and will hear about the inventions and devices that use convex and concave mirrors.

Scientific Enquiry

	Observing over time	Pattern Seeking	Research	Identifying & Classifying	Comparative tests	Fair tests
<u>Year 4</u>						
<p style="text-align: center;">Sound</p> 	When is our classroom the quietest?				Which material is best to use for muffling sound in ear defenders?	How does the volume of a drum change as you move further away from it? How does the length of a guitar string/tuning fork affect the pitch of the sound?
<p style="text-align: center;">Living Things & Habitats</p> 		Where in our school is the most polluted?	Can we find other animals to add complexity to our classification key?	Can we use the classification keys to identify all the animals that we caught pond dipping?		Does the amount of light affect how many woodlice move around?
<p style="text-align: center;">States of matter</p> 	How does the level of water in a glass change when left on the windowsill?	Is there a pattern in how long it takes different sized ice lollies to melt?			Do all liquids freeze at the same temperature?	How does the surface area of a container of water affect how long it takes to evaporate?
<p style="text-align: center;">Animals (inc. Humans)</p> 	How does an egg shell change when it is left in cola?		How do dentists fix broken teeth?	What are the names for all the organs involved in the digestive system? How can we organise our teeth into groups?		
<p style="text-align: center;">Electricity</p> 	How long does a battery light a torch for?			How would you group these electrical devices based on where the electricity comes from?	Which material is the best conductor of electricity?	How does the thickness of a conducting material affect how bright the lamp is?

Year 4

Autumn	<p>Sound: Children will learn how vibrations cause sounds and how sounds travel, as well as how sounds can change pitch and loudness. The children will learn about how sounds are made, carrying out demonstrations of vibrations, and completing a sound survey of their school. They will work in groups to create a human model of the way particles pass sound vibrations on, and write and star in their own documentary explaining how sound travels. The children will work in a hands-on way to explore pitch, and will use their understanding of how high and low sounds are made to create their own set of pan pipes. They will have the opportunity to make a string telephone, and will use this to investigate how sounds change over distance and through different materials. The children will work scientifically and collaboratively to investigate the best material for soundproofing, in the context of making a music studio quieter. Finally, they will demonstrate their learning from the whole unit by designing and creating their own musical instrument that will play high, low, loud and quiet sounds.</p>	<p>Living Things: Children explore a variety of ways to identify, sort, group and classify living things. They learn how animals are split into ‘vertebrates’ and ‘invertebrates’ and begin to consider the differences between living things within these classifications. They use and create classification keys to group, identify and name living things from the local habitat and beyond. This unit also introduces children to the idea that environments are subject to man-made and natural changes, and that these changes can have a significant impact on living things. Throughout the unit children work scientifically by gathering, recording and presenting information in different ways.</p>
Spring	<p>States of matter: Children will learn about the differences between solids, liquids and gases, classifying objects and identifying their properties. The children will work scientifically and collaboratively to investigate the weight of a gas. Furthermore, they will have chance to find the ideal temperature to melt chocolate. They will explore in-depth how water changes state, exploring melting, freezing, condensing as well as a particular focus on evaporation. Finally, they will learn about the stages of the water cycle, creating mini water worlds and an interactive water wheel to represent the different stages.</p>	<p>Animals (inc. Humans): Children will focus on the digestive system in humans and animals and the functions of teeth. Children will learn more about herbivores, carnivores and omnivores in the context of teeth, digestion and the food chain. In addition, they will extend their understanding of food chains to more complex chains and food webs.</p>
Summer	<p>Electricity: Children will learn about what electricity is and how it was discovered. They will identify which appliances use electricity in their homes and how to keep themselves safe. Children will construct circuits, start to create pictorial circuits and conduct an investigation into how easily different types of switches can break and reconnect a circuit.</p>	<p>Scientists & Inventors: Children will learn about the dangers posed to living things in Madagascar and Gerald Durrell’s conservation efforts. The children will also learn about Alexander Graham Bell and his invention of the telephone. They will learn about Lord Kelvin, the man who determined the temperature of absolute zero. The children will explore the work of Thomas Edison. The children will also find out about the invention of toothpaste.</p>

Year 5

Autumn	<p>Forces: Children will learn about types of forces such as gravity, friction, water resistance and air resistance. Children will also learn about the use of mechanisms such as levers, gears and pulleys. The children will identify forces and find out about Isaac Newton and his discoveries about gravity, completing a comprehension about his life and his work. The children will look for patterns and links between the mass and weight of objects, using newton meters to measure the force of gravity. They will also work collaboratively to investigate air and water resistance, participating in challenges to design the best parachute and boat. They will have the opportunity to work in a hands-on way to explore friction, developing their own brake pad for a tricycle or scooter. During some of the practical science work, the children will discuss how variables other than the one being tested can be kept the same to help make a fair test. Finally, they will find out about different mechanisms, including levers, gears and pulleys, and will design their own marvellous machine.</p>	<p>Living Things and Their Habitats: Children will learn about the process of reproduction and the life cycles of plants, mammals, amphibians, insects and birds. The children will explore reproduction in different plants, including different methods of pollination and asexual reproduction. They will recap their work in Year 3 by playing a game to name the parts of a flower. The children will have the opportunity to take cuttings from plants, creating clones of the parent plant. They will learn about different types of mammals and their different life cycles, making life cycle wheels to present their learning. Furthermore, the children will find out about Jane Goodall and her work with the now-endangered chimpanzees in Africa. They will explore metamorphosis in insects and amphibians, comparing their life cycles. Finally, the children will explore the life cycles of birds, and will write and star in their own wildlife documentary comparing the life cycles of different living things.</p>
Spring	<p>Earth & Space: This unit is the only Astronomy related science unit in the primary science curriculum. The aim is to give children a basic overview of Earth and its place in our Solar System.</p>	<p>Properties and Changes of Materials: Children will learn about different materials, their uses and their properties, as well as dissolving, separating mixtures and irreversible changes. The children will sort and classify objects according to their properties. They will explore the properties of materials to find the most suitable material for different purposes. The children will work scientifically and collaboratively to investigate the best thermal insulator to make a lunch box, making predictions and forming conclusions. Furthermore, they will have chance to find the best electrical conductor, in the context of making floodlights brighter. They will explore dissolving, identifying the different variables in their own investigations. They will find out about different ways to separate mixtures of materials, using filtering, sieving and evaporating. Finally, they will learn about irreversible changes, and participate in two exciting investigations to create new materials, including casein plastic and carbon dioxide.</p>
Summer	<p>Animals (inc. Humans): Children will learn about the life cycle of a human being. They will investigate the development of babies and compare the gestation period of humans and other animals. They will learn about the changes experienced during puberty and why these occur. The final investigation will be about the changes to the body as humans get older, as well as comparing the life expectancy of different animals.</p>	<p>Scientists & Inventors: Children will learn about the life and work of Sir David Attenborough. They will learn how CSI techniques use scientific techniques to analyse evidence and prove or disprove theories. They will learn about Margaret Hamilton and her invention of the software and computer code that was used to take Apollo 11 to the moon. They will also study Leonardo da Vinci, Eva Crane and finally investigate the scientific theories surrounding Stonehenge.</p>

Scientific Enquiry

	Observing over time	Pattern Seeking	Research	Identifying & Classifying	Comparative tests	Fair tests
<u>Year 6</u>						
<p>Light</p> 		Is there a pattern to how bright it is in school over the day? Is it the same in every classroom?		Can you identify all the colours of light that make white light when mixed together? What colours do you get if you mix different colours of light together?	Which material is most reflective?	How does the angle that a light ray hits a plane mirror affect the angle at which it reflects off the surface?
<p>Electricity</p> 			How has our understanding of electricity changed over time?		Which make of battery lasts the longest? Which type of fruit makes the best fruity battery?	How does the voltage of the batteries in a circuit affect the brightness of the lamp?
<p>Animals (inc. Humans)</p> 	How does my heart rate change over the day?			Which organs of the body make up the circulatory system?	Which types of exercise has the greatest effect on our heart rate?	Can exercising regularly affect your lung capacity?
<p>Living Things & Habitats</p> 	What happens to a piece of bread if you leave it on the windowsill for two weeks?		What do different microorganisms do? Are they always harmful?		Where in the school are the most micro-organisms found?	
<p>Evolution & Inheritance</p> 		Is there a pattern between the size and shape of a bird's beak and the food it will eat?	What happened when Charles Darwin visited the Galapagos islands?	Compare the skeletons of apes, humans and Neanderthals How are certain animals adapted to their environments?		

Year 6

<p>Autumn</p>	<p><u>Light:</u> Children will learn about light, how we see, shadows, reflection and refraction. The children will learn how light travels and how this enables us to see objects. They will demonstrate their knowledge by making and starring in their own television programme. The children will have the opportunity to make a functioning periscope, finding out about mirrors and the angles of reflection and incidence. They will work scientifically and collaboratively to investigate refraction, carrying out some fascinating experiments into the effects of bending light. Furthermore, they will have chance to predict what will happen in an exciting investigation into the visible spectrum. They will work in a hands-on way to explore how light creates the colours we see, designing coded messages. Finally, they will learn about Isaac Newton and his theory of light and colour, performing a shadow puppet play about his discoveries and ideas.</p>	<p><u>Electricity:</u> Building on the learning from Yr4 the children will learn to represent circuits using symbols in a diagram. They will learn about two of the most important scientific inventors in the field of electricity – Thomas Edison and Nikola Tesla. Children will get the opportunity to develop their understanding of what electricity is and how to measure it. As well as conducting their own investigation, they will get the opportunity to create their own torch!</p>
<p>Spring</p>	<p><u>Animals (inc. Humans):</u> Children will build on their knowledge and understanding of different systems within the body. They will research the parts and functions of the circulatory system. They will focus on how nutrients are transported around the human body. Children will explore how a healthy lifestyle supports the body to function and how different types of drugs affect the body.</p>	<p><u>Living things & Habitats:</u> Children will learn about the classification of living things, including micro-organisms. They will build on their work from Yr4 by sorting animals into groups based on their similarities and differences. They will extend their learning to find out about the standard system of classification first developed by Carl Linnaeus, choosing an animal and researching its classification. Children will put their learning into practice by creating a field guide to the living things in our locality, showing how each one is classified.</p>
<p>Summer</p>	<p><u>Evolution and inheritance:</u> Children will learn about variation and adaptation. They will be able to explore how both Charles Darwin and Alfred Wallace separately developed their theories of evolution. They will examine the scientific evidence from plants and animals that has been gathered to support the theory of evolution.</p>	<p>They will learn about the life and work of Stephen Hawking, and carry out an investigation into Hawking’s theories on black holes. The children will learn about Libbie Hyman, a zoologist whose work on invertebrates informs much of what we know about the characteristics and classification of these creatures. Children will find out about the scientists who raced to prove the structure of DNA, and the controversies surrounding this discovery. They will learn about the role of DNA in inheritance, and create their own model of a DNA molecule. Your children will find out about Alexander Fleming and his discovery of penicillin, and will interpret data in a scatter graph to come to a conclusion about the effects of penicillin. They will look at the evidence for human evolution, and will learn about Mary Leakey and her role in finding significant fossil evidence, and what her fossils prove about evolution. Finally, children will find out about the life and work of Steve Jobs, and his development of new electronics and technologies.</p>