



St Luke's C.E. Primary School

Science Policy

Langport Avenue

Longsight

Manchester

M12 4NG

PURPOSE

The Curriculum at St Luke's is created to be vocabulary rich and enquiry-based with a focus on improving; pupils' long and short-term memory and accuracy and fluency of knowledge and skills. Learning is progressional, each topic build upon the learning from previous topics to deepen scientific understanding.

The Science Curriculum meets the needs of the [National Curriculum 2015: Science programmes of study](#).

This is further deepened, enhanced and supported by additional experiences, opportunities and resources in the form of the [Enrichment curriculum](#) and [The Global Citizen and Mental Wellbeing curriculum](#).

INTENT

St Luke's School understands the need for all pupils to develop their scientific ability as an essential component of all subjects and as a subject in its own right. A high-quality science education provides the foundations for understanding the world. It involves a systematic study of the natural and physical world, leading to reflective conclusions. It is important to build upon the natural curiosity, awe and wonder that children have and to encourage them to embrace this, through techniques such as open questioning. Children should be provided with opportunities to develop their existing understanding through a range of experiences, such as practical experimentation and investigation, in order to open their minds to the social and cultural aspects of the world around them.

AIMS

At St Luke's, we believe science is about developing children's ideas and ways of working that enable them to make sense of the world in which they live through investigation, as well as using and applying process skills. We believe that a broad and balanced science education is the entitlement of all children, regardless of ethnic origin, gender, class, aptitude or ability. Through science, in our school we aim to:

- Encourage the development of positive attitudes towards science.
- Foster curiosity: children's enthusiasm and curiosity for science is promoted at every opportunity.
- Prioritise practical: pupil led practical 'hands on' science learning is planned for and maximised, giving a real-life context where possible.
- Have fun: science is engaging and fun.
- Promote talk and deeper thinking: 'Bright Ideas Time' is used as an effective tool to promote questioning and the generation of ideas.
- Research carried out by doing further reading on topic, by using the internet and books to enquire.
- Be scientific: correct (age-appropriate) scientific vocabulary is confidently used and modelled by staff.
- Get outside: the outside area and locality are utilised to provide regular outdoor learning experiences.
- Practise safe working in accordance with the Primary Schools Code of Practice.
- Encourage open-mindedness, self-assessment, perseverance and developing the skills of investigation – including: observing, measuring, predicting, hypothesising, experimenting, communicating, interpreting, explaining and evaluating.
- Make cross-curricular links between science and other subjects and apply their mathematical knowledge to their understanding of science, including collecting, presenting and analysing data.
- Equip pupils with the scientific knowledge required to understand the uses and implications of science, today and for the future.
- Develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics.

TARGETS

Science in EYFS

Science in EYFS Play underpins the delivery of all the EYFS. In playing, children behave in different ways: sometimes within their play, they may describe and discuss what they are doing and sometimes they may be more reflective and quieter as they play. Within a secure and challenging environment with effective support, children can explore, develop and experiment as they play to help them make sense of the world. The EYFS strand 'Understanding the World' leads directly to scientific elements of the curriculum and leads to more formalised science learning in KS1 and then KS2.

Science in Key Stage 1 & 2

Attainment targets by the end of each key stage; pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study. Key Stage 1, the main focus of science teaching in Key Stage 1 is to enable pupils to experience and observe phenomena, looking more closely at the natural and humanly-constructed world around them. They should be encouraged to be curious and ask questions about what they notice. They should be helped to develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests and finding things out using secondary sources of information. They should begin to use simple scientific language to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways. Most of the learning about science should be done through the use of first-hand practical experiences, but there should also be some use of appropriate secondary sources, such as books, photographs and videos. Pupils should read and spell scientific vocabulary at a level consistent with their reading and spelling knowledge at Key Stage 1.

Lower Key Stage 2 – In years 3 and 4 the main focus of science teaching is to enable pupils to broaden their scientific view of the world around them. They should do this through exploring, talking about, testing and developing ideas about everyday phenomena, exploring the relationships between living things and familiar environments and by beginning to develop their ideas about functions, relationships and interactions. They should ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple fair tests and finding things out using secondary sources of information. They should draw simple conclusions and use some scientific language, first, to talk about and later, to write about what they have found out. ‘Working scientifically’ must always be taught through and clearly related to substantive science content in the programme of study. Pupils should read and spell scientific vocabulary correctly and with confidence, using their growing reading and spelling knowledge.

Upper Key Stage 2 – In years 5-6 the main focus of science teaching is to enable pupils to develop a deeper understanding of a wide range of scientific ideas. They should do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically. At Upper Key Stage 2, they should encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They should also begin to recognize that scientific ideas change and develop over time. They should select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out fair tests and finding things out using a wide range of secondary sources of information. Pupils should draw conclusions based on their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings. Pupils should read, spell and pronounce scientific vocabulary correctly. ‘Working and thinking scientifically’ must always be taught through and clearly related to substantive science content in the programme of study.

RATIONALE

Science is a way of finding out about the real world through methodical investigation, systematic observation, questioning and experimentation. Here at St Luke's Primary, pupils are given appropriate learning opportunities to develop the skills needed to be active citizens within an increasingly scientific world. science is a powerful and useful tool through which children's understanding of the world around them is carefully developed. It is our aim to create a challenging environment that raises standards of achievement in science through high quality teaching and learning.

Our topics are organised to facilitate maximum progress. We do this by building pupils' knowledge; step by step, brick by brick, to ensure a secure foundation. In this way, each topic can build on top of the knowledge learned in the previous topic.

We aim to bring in cross curricular links where it is relevant. Pupils build up their scientific skills and knowledge, developing the necessary ability to investigate, question and understand scientific concepts. To ensure that every child in St Luke's has access to quality teaching and learning and that staff maintain their commitment to raising standards in science.

STATEMENT OF PEDAGOGICAL APPROACH

Children are presented with a range of activities which are planned to allow development of key knowledge, concepts and skills and to progress. Activities within classes are completed in mixed ability groups, allowing support and unique insights to a range of ability levels. Opportunities are planned for open investigations that allow for differentiation by outcome.

Mathematics is a key component of scientific analysis and an integral part of the way we teach science at St Luke's. Numeracy skills are explicitly planned into the curriculum and, where possible, cross-curricular links are emphasised and built upon.

INCLUSION

We are committed to ensuring that all pupils are able to access a broad, high quality curriculum and therefore we follow our Accessibility Policy. In order to meet the additional needs of all disadvantaged and SEND pupils at St Luke's, we tailor resources, organise the classroom environment and buy in further resources whenever necessary. Always ensuring that all groups of learners have full access to quality learning.

We teach science to all children, whatever their ability. Science forms part of the school's curriculum to provide a broad and balanced education for all children. Through our science teaching, we provide learning opportunities that enable all pupils to make progress. We do this by setting suitable learning challenges and responding to each child's different needs. Assessment against the National Curriculum allows us to consider each child's attainment and progress against expected levels. Our assessment in science may also consider the targets set in the children's 'Passports for Learning' (Individual Support Plans).

[Click here for our Accessibility Plan](#)

[Click here for our SEND Policy](#)

[Click here for our Equality Policy](#)

[Click here for our Health and Safety Policy](#)

HEALTH AND SAFETY

Children will be informed of any risk or hazard but will also be encouraged to assess and identify risks for themselves, before beginning any scientific investigation. They will be shown how to use scientific equipment safely and advised, when appropriate, how to move around the classroom in a safe manner. Care will be taken to ensure micro-organisms are carefully sealed and stored in a separate location, to prevent risk of contamination.

RESOURCES

There is a wide range of resources available to the school which will be maintained and monitored by the Science Co-ordinator. The resources are a collective responsibility for the whole school, and pupils are encouraged to treat resources carefully and safely. Children are expected to, where appropriate, to choose their own equipment and set such equipment up for practical science. This should be done under adult supervision with health and Safety requirement in mind.

By doing so, they:

- make sensible choices about which equipment to use
- treat the equipment with care
- use the equipment with their own and other's safety in mind
- become independent learners

The school grounds and surrounding areas offer a great resource for staff and pupils.

READING

Reading has the highest priority in our school:

The ability to read and comprehend fluently impacts on pupil's ability to access science and to attain and achieve to their maximum potential.

Poor reading skills are a limiting factor to pupil's future life chances and the ability to deepen and widen their understanding of science.

In science, there is a wealth of new vocabulary for children to practise, learn and develop. In lessons, teachers are conscious that scientific language may be complex for children to understand. Consequently, every effort is made by teachers to embed and secure a deeper understanding of scientific terminology through the use of reading, investigations, research, discussion, etc.

During science lessons children are given opportunities to practice many of the science skills that scientists use such as arguing from evidence, communicating and evaluating information in addition to constructing explanations. Knowledge of scientific vocabulary and science in general, will help our pupils with their reasoning and problem-solving skills. As a result, opportunities are provided for our children to transfer their reading and writing skills in science.

VOCABULARY

Our aim is for pupils to be able to understand, read, spell and pronounce scientific vocabulary correctly.

ENHANCEMENT LEARNING

Weekly the children have an opportunity to do some further science work through the following enhancement activities.

- Gardening club
- Construction
- Cooking
- Photography
- Outdoor Games
- Music
- Young Explorers' Programme

OUT OF SCHOOL LEARNING

Children may receive science homework based on their current topic. Please see class page for topic, homework and apps/links.

Each year we provide all KS2 children with the chance to spend a night in the Peak District with their classmates and teachers. The 'outdoor classroom' provides a meaningful way to engage learners in practical science, giving them experience of collecting and analysing data, and making predictions in the real world, beyond the limitations of the classroom. The wider educational benefits of teaching and learning science through fieldwork in the natural and built environments include teamwork, motivation and its potential to influence positively the choice of science as a future subject of study. There are many other visits organised to link with the science topic been taught throughout the school.

REPORTING

In the children's annual report, a comment is made about their scientific knowledge and understanding and their skills development. Parents are informed of the topics to be covered at the start of each half term.

Implementation

School Science Long Term Plan

	Autumn Term			Spring Term			Summer Term	
	1:1	1:2		2:1	2:2		3:1	3:2
EYFS	Ourselves	Nature and Local Environment		Changes	The World		Growing and Lifecycles	Animals
Year 1	Seasonal Changes	Animals, Including Humans	Christmas	Animals, Including Humans	Plants	Easter	Everyday Materials	Seasonal Changes
Year 2	Animals, Including Humans	Animals, Including Humans	Holidays	Use of Everyday Materials	Plants	Holidays	Living Things and Their Habitats	Scientist Study
Year 3	Forces and Magnets	Light and Dark		Animals, Including Humans	Plants		Rocks	Scientist Study
Year 4	Living Things and Their Habitats	Animals, Including Humans		Electricity	Sound		States of Matter	Scientist Study
Year 5	Forces	Properties and changes of Materials		Earth and Space	Earth and Space		Living Things and Their Habitats	Animals, Including Humans
Year 6	Living Things and Their Habitats	Evolution and Inheritance		Animals, Including Humans	Light		Electricity	Electricity

Key Stage 1 and 2 knowledge and skills progression

Science	
Year 1	
National Curriculum objectives: In this unit, children will be taught to:	
During year 1, pupils are taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content: • asking simple questions and recognising that they can be answered in different ways • observing closely, using simple equipment • performing simple tests • identifying and classifying • using their observations and ideas to suggest answers to questions • gathering and recording data to help in answering questions	<u>Topic 1: Seasonal Changes</u> <u>Big Question - Do all animals enjoy winter?</u> Lesson 1 – What are the four seasons? Lesson 2 – Why do we have different seasons? Lesson 3 – Why is night time longer in winter? Lesson 4 – What do different animals do to survive winter weather? Lesson 5 – Do all animals around the world adapt to winter in the same way? Lesson 6 – How is climate change affecting how animals live? <u>National Curriculum objectives met in this topic:</u> • observe changes across the four seasons • observe and describe weather associated with the seasons and how day length varies. <u>Topic 2: Animals including Humans</u> <u>Big Question – What do animals and humans have in common?</u> Lesson 1 – What are the senses? Lesson 2 – Why do animals and humans have senses? Lesson 3 – Which animals have four legs? Lesson 4 – What do different animals eat? Lesson 5 – What do birds and mammals have in common? Lesson 6 – Are humans animals?

	<u>National Curriculum objectives met in this topic:</u> • identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals • identify and name a variety of common animals that are carnivores, herbivores and omnivores • describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets) • identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense <u>Topic 3: Animals including Humans</u> <u>Big Question - Are all skeletons the same?</u> Lesson 1 – What is an animal? Lesson 2 – What is a skeleton’s job? Lesson 3 – Why is my skeleton important? Lesson 4 – How does a doctor see bones? Lesson 5 – What body part links to your senses? <u>Topic 4: Plants</u> <u>Big Question – How are plants and trees different?</u> Lesson 1 – What are the parts of a plant? Lesson 2 – What is a plant’s job? Lesson 3 – What plants can we see in local gardens? Lesson 4 – What is different about trees and plants? <u>National Curriculum objectives met in this topic:</u> • identify and name a variety of common wild and garden plants, including deciduous and evergreen trees • identify and describe the basic structure of a variety of common flowering plants, including trees
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Topic 5: Everyday Materials

Big Question – Why isn't slime suitable for building houses?

Lesson 1 – What materials do I already know of?

Lesson 2 – What materials are common in school?

Lesson 3 – What physical properties can we see in our classroom?

Lesson 4 – What groups of materials can we find in the Year 1 area?

Lesson 5 – How do materials differ?

National Curriculum objectives met in this topic:

- distinguish between an object and the material from which it is made
- identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock
- describe the simple physical properties of a variety of everyday materials
- compare and group together a variety of everyday materials on the basis of their simple physical properties

Topic 6: Seasonal Changes

Big Question - Why are seasons important?

Lesson 1 – How has the season changed this year?

Lesson 2 – Which clothes do we wear in different seasons?

Lesson 3 – Why wouldn't winter clothes be suitable for summer?

Lesson 4 – How long is a day in Finland compared to England?

Lesson 5 – Why do some countries get more rainfall than others?

National Curriculum objectives met in this topic:

- observe changes across the 4 seasons
- observe and describe weather associated with the seasons and how day length varies

Year 2

During year 2, pupils are taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- asking simple questions and recognising that they can be answered in different ways
- observing closely, using simple equipment
- performing simple tests
- identifying and classifying
- using their observations and ideas to suggest answers to questions
- gathering and recording data to help in answering questions

Topic 1: Animals including Humans

Big Question – Why is health and hygiene so crucial for humans?

Lesson 1 - Why do humans need exercise to stay healthy?

Lesson 2 - What effect does exercise have on our bodies?

Lesson 3 - What are the different food groups?

Lesson 4 - Why is it important to eat a range of food types?

Lesson 5 – Which foods would you include in your own healthy lunchbox?

Lesson 6 – How does good hygiene help us to stay healthy?

Lesson 7 – How can we prevent germs from spreading?

National Curriculum objectives met in this topic:

- find out about and describe the basic needs of animals, including humans, for survival (water, food and air)
- describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene

Topic 2: Animals including Humans

Big Question – How do different species ensure their survival?

Lesson 1 – What are the basic needs of all animals?

Lesson 2 – Which offspring do and do not look like their parents when they are born?

Lesson 3 – How do the lifecycles of different mammals compare?

Lesson 4 – How do mammals' life cycles compare to other animal types?

Lesson 5 – Why do animals have offspring?

National Curriculum objectives met in this topic:

- notice that animals, including humans, have offspring which grow into adults

Topic 3: Use of Everyday Materials

Big Question - Does material choice matter?

	Lesson 1 - What materials can we find in our local environment? Lesson 2 – What does suitability of materials mean? Lesson 3 – How do the properties of different materials vary and affect their suitability? Lesson 4 – Can all materials change their shape and is this change reversible? Lesson 5 – Which materials are the most suitable for an umbrella? Lesson 6 – Which materials are the most suitable for curtains? Lesson 7 – Which materials would keep a fragile object the safest during transit? Lesson 8 – Why is using sustainable materials important? <u>National Curriculum objectives met in this topic:</u> • identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses • find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching <u>Topic 4: Plants</u> <u>Big Question – Why are plants vital to planet?</u> Lesson 1 – Why do we need seeds and bulbs? Lesson 2 – How do seeds differ from one another? Lesson 3 – What environmental conditions do plants need to grow? (Do all plants need the same conditions?) Lesson 4 – How can we care for our own class plant? Lesson 5 – How can we measure and record the growth of a sunflower? Lesson 6 – What will happen if a plant doesn't get water or light? Lesson 7 – How do the lifecycles of plants differ? <u>National Curriculum objectives met in this topic:</u> • observe and describe how seeds and bulbs grow into mature plants
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- find out and describe how plants need water, light and a suitable temperature to grow and stay healthy

Topic 5: Living Things and their Habitats

Big Question - Why do living things choose particular habitats?

Lesson 1 – How do you know if something is living, dead or never alive?

Lesson 2 – What is the importance of a food chain for living things?

Lesson 3 – What habitats do different animals live in?

Lesson 4 – How do different habitats in the UK compare?

Lesson 5 – How do different habitats in the wider world compare to one another?

Lesson 6 – Where could we create a microhabitat in our local environment and what might choose to live in it?

Lesson 7 – Which materials could we use to create a microhabitat in our classroom?

National Curriculum objectives met in this topic:

- explore and compare the differences between things that are living, dead, and things that have never been alive
- identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other
- identify and name a variety of plants and animals in their habitats, including microhabitats
- describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food

Year 3

During year 3, pupils are taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

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

Topic 1: Forces and Magnets

Big Question: In what ways are opposing forces useful?

Lesson 1: What is the difference between a pushing and a pulling force?

Lesson 2: What effect does frictions have?

Lesson 3: How do we sort magnetic and non-magnetic materials?

Lesson 4: How can I investigate the strength of different magnets?

Lesson 5: When do magnets attract and when do they repel?

Lesson 6: What game could I design using magnets?

National Curriculum objectives met in this topic:

- compare how things move on different surfaces
- notice that some forces need contact between 2 objects, but magnetic forces can act at a distance
- observe how magnets attract or repel each other and attract some materials and not others
- compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials
- describe magnets as having 2 poles
- predict whether 2 magnets will attract or repel each other, depending on which poles are facing

Topic 2: Light and Dark

Big Question - What is light?

Lesson 1: What light sources do we see and use every day and how do they help us?

Lesson 2: How will the absence of light affect my predictions?

Lesson 3: Which materials are the most reflective?

Lesson 4: How does a mirror distort an image?

Lesson 5: How is the sun's light harmful?

Lesson 6: Which materials make the best shadows?

Lesson 7: When do shadows change size?

	<u>National Curriculum objectives met in this topic:</u> • recognise that they need light in order to see things and that dark is the absence of light • notice that light is reflected from surfaces • recognise that light from the sun can be dangerous and that there are ways to protect their eyes • recognise that shadows are formed when the light from a light source is blocked by an opaque object • find patterns in the way that the size of shadows change <u>Topic 3: Animals including Humans</u> <u>Big Question - What makes our bodies healthy?</u> Lesson 1: What groups can I sort food into? Lesson 2: What types of nutrients are in my meal? Lesson 3: How do food labels help us to understand nutrient levels? Lesson 4: What are some similarities and differences in animal skeletons? Lesson 5: In what way does the human skeleton support movement? Lesson 6: How do muscles and bones work together? Lesson 7: How can I test the effect the length of my femur has on my ability to jump? <u>National Curriculum objectives met in this topic:</u> • identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat • identify that humans and some other animals have skeletons and muscles for support, protection and movement <u>Topic 4: Plants</u> <u>Big Question - It's alive?! How do we know that plants are living things?</u> Lesson 1: What are the functions of the different parts of a plant?
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	Lesson 2: What do plants need to grow well? Lesson 3: How can I show results in a way that is easy to understand? Lesson 4: How is water transported around the different parts of a flower? Lesson 5: How do the different parts of a flower enable pollination and fertilisation? Lesson 6: What are the stages of a plant's life cycle? <u>National Curriculum objectives met in this topic:</u> • identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers • explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant • investigate the way in which water is transported within plants • explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal <u>Topic 5: Rocks</u> <u>Big Question - How is the earth below our feet formed?</u> Lesson 1 – What different types of rocks are there and how are they formed? Lesson 2 – What properties of rocks allow us to group them? Lesson 3 – How are fossils formed? Lesson 4 – How did Mary Anning contribute to palaeontology? Lesson 5 – How is soil formed? Lesson 6 – Are some soils more permeable than others? <u>National Curriculum objectives met in this topic:</u> • compare and group together different kinds of rocks on the basis of their appearance and simple physical properties • describe in simple terms how fossils are formed when things that have lived are trapped within rock • recognise that soils are made from rocks and organic matter
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Year 4

During year 4, pupils are taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

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

Topic 1: Living things and their Habitats

Big Question - How can living things be grouped?

Lesson 1 – Mrs Gren... Who is she?

Lesson 2 – How can we group living things depending on their shared characteristics?

Lesson 3 – How can we group organisms in different ways?

Lesson 4 – How can organisms be classified?

Lesson 5 – How can I create a classification key?

Lesson 6 – What is the key to survival?

Lesson 7 – How does change in the environment impact upon living things?

National Curriculum objectives met in this topic:

- recognise that living things can be grouped in a variety of ways
- explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment
- recognise that environments can change and that this can sometimes pose dangers to living things

Topic 2: Animals including Humans

Big Question – What happens to our bodies when we eat or drink?

Lesson 1 – What are the main organs of the digestive system?

Lesson 2 – How does the human digestive system work?

Lesson 3 – How can I identify the different types of teeth in the human body and their functions?

Lesson 4 – What is the structure of a tooth?

Lesson 5 – Which drinks will cause more decay to our teeth?

Lesson 6 – What happened in our tooth decay investigation?

National Curriculum objectives met in this topic:

- describe the simple functions of the basic parts of the digestive system in humans

- identify the different types of teeth in humans and their simple functions
- construct and interpret a variety of food chains, identifying producers, predators and prey

Topic 3: Electricity

Big Question - Why are we so reliant on electricity?

Lesson 1 – Which machines need electricity to work?

Lesson 2 – How and why is electricity dangerous?

Lesson 3 – How does a circuit work?

Lesson 4 – How does a circuit work and how can it be fixed?

Lesson 5 – What are the electrical components and their symbols?

Lesson 6 – Which objects are conductors, and which are insulators?

National Curriculum objectives met in this topic:

- identify common appliances that run on electricity
- construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers
- identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery
- recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit
- recognise some common conductors and insulators, and associate metals with being good conductors

Topic 4: Sound

Big Question - How do animals hear differently to humans?

Lesson 1 – How are sounds made and how do we hear things?

Lesson 2 – How well does sound travel through different materials?

Lesson 3 – What is pitch and how can I arrange sounds in order of it?

Lesson 4 – Why do vibration levels change when sound levels go quieter or louder?

Lesson 5 – Does vibration make a difference to sound?

	Lesson 6 – How do animals hear differently to humans? <u>National Curriculum objectives met in this topic:</u> • identify how sounds are made, associating some of them with something vibrating • recognise that vibrations from sounds travel through a medium to the ear • find patterns between the pitch of a sound and features of the object that produced it • find patterns between the volume of a sound and the strength of the vibrations that produced it • recognise that sounds get fainter as the distance from the sound source increases <u>Topic 5: States of Matter</u> <u>Big Question – What is the difference between solids, liquids and gases?</u> Lesson 1 – Is it always easy to decide if something is solid, liquid or gas? Lesson 2 – Is it possible to change between different states of matter? Lesson 3 – How can we group substances according to whether they are solids, liquids or gases? Lesson 4 – How can temperature cause solids to change to liquids and vice versa? Lesson 5 – Do certain particles have more energy? Lesson 6 – What is the science behind making slime? Lesson 7 – Does the temperature affect how fast the towels dry? Lesson 8 – What are the stages of the water cycle? <u>National Curriculum objectives met in this topic:</u> • compare and group materials together, according to whether they are solids, liquids or gases • observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C)
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	identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature
Year 5	
During year 5, pupils are taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content: - planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary - taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate - recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs - using test results to make predictions to set up further comparative and fair tests - reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations - identifying scientific evidence that has been used to support or refute ideas or arguments	<u>Topic 1: Forces</u> <u>Big Question – What ‘on earth’ are forces?</u> Lesson 1 – What are the effects of opposing forces in everyday life? Lesson 2 – What is the relationship between mass and weight? Lesson 3 – Which factors affect the speed at which objects fall? Lesson 4 – How have scientists influenced the way in which we understand forces? Lesson 5 – Why do we need to control certain variables? Lesson 6 – Could a mouse lift an elephant? <u>National Curriculum objectives met in this topic:</u> - explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object - identify the effects of air resistance, water resistance and friction, that act between moving surfaces - recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect <u>Topic 2: Properties of materials</u> <u>Big Question – Oops! Can I get that back? (Reversible and irreversible changes)</u> Lesson 1 – What are common tests for properties of materials? Lesson 2 – What are the everyday uses of conductors and insulators? Lesson 3 – Which materials are soluble in water? Lesson 4 – How can I separate a range of mixtures back into their original components? Lesson 5 – How can we tell if a change is reversible or irreversible? <u>National Curriculum objectives met in this topic:</u>

- compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets
- know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution
- use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating
- give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic
- demonstrate that dissolving, mixing and changes of state are reversible changes
- explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda

Topic 3: Earth and Space

Big Question – How do we know what is ‘out of this world’?

Lesson 1 – What do I already know about space?

Lesson 2 – What is in our solar system?

Lesson 3 – Why don’t we all float off into space?

Lesson 4 – How can a scatter graph help us to identify causal relationships in data?

Lesson 5 – What evidence is there to support the view that the Earth is spherical?

Lesson 6 – How has our understanding of the solar system changed throughout history?

National Curriculum objectives met in this topic:

- describe the movement of the Earth and other planets relative to the sun in the solar system
- describe the movement of the moon relative to the Earth
- describe the sun, Earth and moon as approximately spherical bodies

Topic 4: Earth and Space

Big Question – Could we survive without the sun?

Lesson 1 – How do we get day and night?

Lesson 2 – Why do we have different time zones in the world?

Lesson 3 – Why are the seasons different in the northern and southern hemispheres?

Lesson 4 – Does the moon affect life on Earth?

Lesson 5 – Why is Earth known as a ‘Goldilocks Planet’?

National Curriculum objectives met in this topic:

- describe the movement of the moon relative to the Earth
- use the idea of the Earth’s rotation to explain day and night and the apparent movement of the sun across the sky

Topic 5: Living things and their habitats

Big Question – Why are bees so important?

Lesson 1 – What is the ultimate goal of all living things?

Lesson 2 – How do plants reproduce?

Lesson 3 – What is the most effective way for plants to reproduce?

Lesson 4 – What did Eva Crane find out about the life cycle of bees?

Lesson 5 – What can Eva Crane’s research teach us about the impact of the decline of bee populations?

National Curriculum objectives met in this topic:

- describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird
- describe the life process of reproduction in some plants and animals

Animals including Humans

Big Question – Is the ‘circle of life’ the same for all animals?

Lesson 1 – What are the stages in the mammalian life cycle?

Lesson 2 – What physical changes do humans experience before birth?

	Lesson 3 – How do human bodies change during puberty? Lesson 4 – What similarities and differences are there between human and other animal life cycles? <u>National Curriculum objectives met in this topic:</u> • describe the changes as humans develop to old age
Year 6	
During year 6, pupils are taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content: • planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary • taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate • recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs • using test results to make predictions to set up further comparative and fair tests • reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations • identifying scientific evidence that has been used to support or refute ideas or arguments	<u>Topic 1: Living things and their habitats</u> <u>Big Question - How are living things classified by biologists?</u> Lesson 1 – What is ‘classification’ and why is it important? Lesson 2 – How did scientists arrive at a standard system of classification? Lesson 3 – Is classification always straightforward? Lesson 4 – What are micro-organisms, are they all harmful and how are they classified? <i>Lesson 5 – Which conditions can hinder mould growth?</i> Lesson 6 – Why am I classified in the same domain as earthworms, trees, mushrooms and algae?! <u>National Curriculum objectives met in this topic:</u> • describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals • give reasons for classifying plants and animals based on specific characteristics <u>Topic 2: Evolution and Inheritance</u> <u>Big Question - How has a growing understanding of inheritance and adaptation helped to shape the theory of evolution?</u> Lesson 1 – What is meant by ‘inheritance’ and how does it explain why offspring look like their parents? Lesson 2 – What is ‘adaptation’ and what are some adaptive traits in familiar species?

	Lesson 3 – How do we know about organisms that used to exist on earth but are now extinct? Lesson 4 – How did the theory of evolution, well, evolve? Lesson 5 – How do fossil discoveries support the theory of evolution? Lesson 6 – How is artificial selection different from natural selection? Lesson 7 – What do I think about the theory of evolution? <u>National Curriculum objectives met in this topic:</u> • recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago • recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents • identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution <u>Topic 3: Animals, including Humans</u> <u>Big Question - What are the circulatory and digestive systems and how can we keep them healthy?</u> Lesson 1 – What is the circulatory system and which organs are in it? Lesson 2 – How are nutrients transported around the body? Lesson 3 – Understanding digestion. Why is it that what comes out looks so different from what goes in?! Lesson 4 – What happens to the water we drink? Lesson 5 – How can I tell if my heart is healthy? Lesson 6 – How can I make healthy eating choices? Lesson 7 – How do drugs and alcohol affect the circulatory and digestive systems? <u>National Curriculum objectives met in this topic:</u> • identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood
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- recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function
- describe the ways in which nutrients and water are transported within animals, including humans

Topic 4: Light

Big Question - How does light travel?

Lesson 1 – How do we see?

Lesson 2 – How is light reflected?

Lesson 3 – What is refraction and how does it change the direction in which light travels?

Lesson 4 – How does a prism show the full spectrum of light?

Lesson 5 – How does light enable us to see colour?

Lesson 6 – Why do shadows keep the same shape as the object that casts them?

National Curriculum objectives met in this topic:

- recognise that light appears to travel in straight lines
- use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye
- explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes
- use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them

Topic 5: Electricity

Big Question - How do electrical appliances work?

Lesson 1 – What were some of the key discoveries regarding electricity and how were they significant?

Lesson 2 – Why is it important that we have a standard way to draw circuits?

Lesson 3 – What is the effect of differing voltages in a circuit?

Lesson 4 – Does wire length affect how components work in a circuit?

	Lesson 5 – What could I investigate about electricity? Lesson 6 – How could I improve upon my previous investigation? <u>National Curriculum objectives met in this topic:</u> • associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit • compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches • use recognised symbols when representing a simple circuit in a diagram
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[Click here for National Curriculum link](#)

IMPLEMENTATION AND PLANNING

Science is a core subject in the National Curriculum. Statutory requirements for the teaching and learning of science are laid out in, 'The National Curriculum in England Framework Document for Teaching', September 2014 and the 'Statutory Framework for the Early Years Foundation Stage', September 2014.

KS2, KS1 and Foundation stage (Understanding the world) teachers should be teaching science for a minimum of two hours each week or equivalent pro rata.

Science will be taught as sequenced units of work that develop specific areas of knowledge and understanding throughout KS1 and KS2. 'Working scientifically' will be embedded within the content of biology, chemistry and physics, so that pupils learn to use a variety of approaches to answer scientific questions. These will include observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); and researching using secondary sources. Activities will be planned in such a way as to ensure equal access for all children. Where possible science will be linked to topics but will also be taught through discrete lesson to ensure coverage of the curriculum.

Science pervades every aspect of our lives and we will relate it to all areas of the curriculum. We will also ensure that pupils realise the positive contribution of both men and women to science and the contribution from those of other cultures. We will not only emphasise the positive effects of science on the world but also include problems, which some human activities can produce.

Planning and curriculum coverage will be monitored by the Head, SLT and Science Subject Co-ordinator.

AMBITION FOR ALL

The needs of all learners to check, embed, extend learning will be met through the following:

All curriculum plans - half termly and daily;

a) Identify greater challenge/tasks for the more able learners.

- b) Opportunities for all SEND pupils in class and how their needs will be met to enable access/achievement/attainment/closing the gap.
- c) Identify the needs of disadvantaged pupils - to ensure there are no gaps between their learning and those who are not disadvantaged.
- d) EAL - pupils for whom English is not their first language.

Support will take many forms:

- Interventions including for the most able
- Resources
- Staff deployment
- Task setting
- Questioning

IMPACT

Impact will be measured by:

- Outcomes
- Assessment
- Attendance
- Behaviour
- Monitoring

To ensure school is ambitious for all its pupils.

PURPOSE OF STUDY AND OUTCOMES

A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity. All pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.

ASSESSMENT

Assessment, Recording and Reporting of Attainment:

We use assessment to inform and develop our teaching.

- We assess for learning (AfL). Children are involved in the process of self-improvement, recognising their achievements and acknowledging where they could improve. Activities during, and at the end of, each topic record achievement and celebrate success.
- Gap analysis of summative data (outcomes) to identify strengths, weaknesses, areas for further development and gaps.
- PPM meetings – Half termly with SLT identifying attainment and progress of individuals/cohorts where support/interventions needed for pupils not on track to achieve their targets or where targets need altering to reflect challenge or accelerated progress being made.
- We mark work positively, making it clear verbally, or on paper, where the work is good, and how it could be further improved and by asking questions designed to extend and scaffold further learning.
- By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study. This will be tracked and monitored over time.
- Feedback is given to parents 3 times a year, describing each child's attainment in science through our topic-based approach.

CLASSROOM MANAGEMENT

A range of teaching methodologies will be employed, depending on the age and ability of the children and the nature of the skills and knowledge being taught. At St Luke's we have a flexible timetable to allow all children to learn at their pace and ability. Children will participate in both guided and investigative practical work and activities where secondary sources of information are used. They will work individually, in groups and as a whole class. Scientific vocabulary will be introduced, alongside explanations of meaning and children will be encouraged to articulate scientific concepts clearly and precisely. The classroom organisation and planning will take into consideration the differentiated needs of pupils, including the more able.

MONITORING AND EVALUATION

Monitoring and reviewing this policy, is the responsibility of the Science Subject Co-ordinator, the Head teacher and Governors to monitor the standards of children's work and the quality of teaching in science. The Science Subject Co-ordinator is also responsible for supporting colleagues in the teaching of science, for being informed about current developments in the subject and for providing a strategic lead and direction for the subject in the school. An action plan is written and reviewed annually.

ATTENDANCE AND PUNCTUALITY

Poor attendance and punctuality impact negatively on learning, creating gaps with a possible impact on social and emotional wellbeing (more acute where attendance is significantly below the expected).

BEHAVIOUR

Where behaviour leads to pupil disengagement and/or impacts on the learning and progress of children, the Head and SLT will swiftly intervene.

Document Control	
Title	Policy
Date	February 2024
Review	Review February 2025 and then annually thereafter