Charlton CE Primary School

Transforming lives through God's embrace

Science

Science at Charlton C of E Primary School

Rationale

The Rising Stars Scheme of Work is used, as we feel the plans within the scheme of work provide our children with the Science Learning they need. The plans can be adapted to suit the varying needs of our children and allow us to use the local environment to support learning. They encourage a broad vocabulary base which is key for our children due to the diversity in languages and needs that they experience. They balance questioning and practical experiments. The way the scheme works enables us to teach the science curriculum in a cross curricular, flexible way and to provide opportunities for children that they might not otherwise experience. The scheme is set up to allow for children, particularly in Key Stage 1, to revisit learning objectives throughout the year, therefore ensuring that knowledge and skills are embedded for children. Each year group has six topics covering the primary science programme of study, and more. The first five topics are linked directly to the programme of study. The sixth topic in each year group is a 'Science in Action' topic. This off-curricular topic reinforces key 'working scientifically' skills linked to the curriculum. It is an opportunity for children to apply their science skills in a wider context. The flexibility the scheme offers also means that we may choose to use the sixth topic to extend children knowledge further by engaging in themed weeks. We feel this flexibility is very important for all of our children to have the opportunity to experience current affairs such as environmental issues so that no one is at a disadvantage.

Intent, Implementation and Impact in Science

Intent	Implementation	Impact
We believe that good teaching of Science offers pupils the foundations to them gaining a secure knowledge of the world around them and an understanding of how and why things work like they do. It is our vision to distil a lifelong love of science within our pupils. We will work hard to provide a rich and varied curriculum to challenge and meet the needs of our children. We believe all pupils should be taught essential aspects of the vocabulary, knowledge, methods, processes and uses of science. From EYFS up to KS2 our pupils will build up a body of key foundational knowledge and concepts, pupils are encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. We will provide our children with wider opportunities in science and make links to other subjects. Teachers will plan and challenge pupils based on the progressive curriculum maps, unique to our school and our needs. Teachers will plan experiments and practical activities well which enhances and extends children's learning. We will monitor our school's progress in science regularly in line with our science policy	We maintain a high level of subject knowledge of science in our school by regular training and professional development. Teachers use assessment for learning to tailor lessons around our children and help us plan for next steps. Through effective teaching of science, we develop children's specific topic related vocabulary, knowledge and key skills during each topic. With effective subject management we are a well-equipped and resourced school. Regular monitoring shows that our children understand and apply key scientific principles within their work. Children are provided with regular opportunities to develop strategies for questioning and thinking. In our school we have a rigorous monitoring process which is kept up to date and works towards our school improvement plan. Trips, visits and themed weeks are planned linked to the Science curriculum. Children are encouraged to follow their own line of enquiry, by participating in child initiated experiments. They ask their own questions and select tools and equipment to conduct their experiments. Children are encouraged to research ideas and theories in order to explain results of their experiments or to extend their learning.	Children enjoy and are enthusiastic about science in our school. There is a clear progression of children's work, use of resources and teachers' expectations in our school. Children's work shows a range of topics and evidence of the curriculum coverage for all science topics. Children are inquisitive and independent in science, selecting their own tools and materials, completing pupil lead investigations and choosing their own strategies for recording. Feedback from teachers has impact on our pupils, often with next step questions to push learning on. Standards in science at the end of the key stages are good and issues arising are addressed effectively in school. Our SLT and governors are kept up to date with developments in the way science is run in our school Full use is made of the outside/local area where appropriate Teachers use open ended questions to engage children and extend their thinking. Teachers create memorable Science lessons for the children. Working scientifically principles are embedded into lessons. Teachers and children are confident in using scientific vocabulary.

Spiritual, Moral, Social and Cultural Aspects of the Science Curriculum

Through science children will be able to develop the following:

Spiritual:

The opportunity to explore beliefs, experience and faiths, feelings and values
Enjoy learning about oneself, others and the surrounding world
Support children in understanding their own identity
Use imagination and creativity and reflect on experiences

Moral:

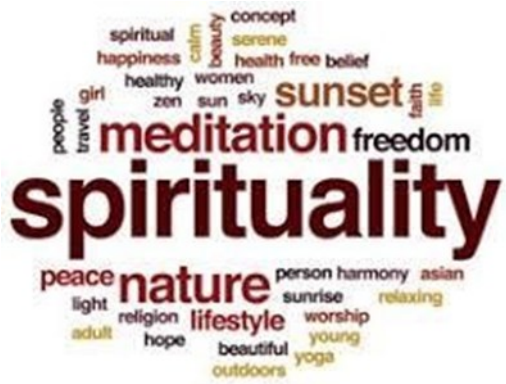
The opportunity to learn what is right and wrong and respect the law
Understand consequences
Investigate moral and ethical issues and offer reasoned views

Social:

The opportunity to use a range of social skills to participate in the local community and beyond
Appreciate diverse viewpoints
Participate and cooperate

Cultural:

The opportunity to explore and appreciate cultural influences
Participate in cultural opportunities
Understand, accept, respect and celebrate diversity



To be most effective, SMSC will be made explicit by staff when delivering the teaching sequence.

Spiritual, Moral, Social and Cultural Aspects of the Science Curriculum

Children are able to reflect on their own beliefs faiths, experiences, feelings and values.

Enjoy learning about their own journey

Understand their own identity

Reflect on their own experiences

To think and reflect in awe about the developments in science and technology and the possibilities for the future.

Respect the law for what is right and what is wrong linked to scientific testing.

Opportunities to look at and appreciate cultural influences outside of their environment.

Opportunities to work with each other on a device.

Opportunities to work alone.

Explore and make links to how technology changes lives.

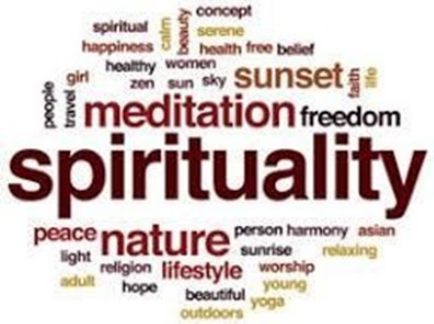
Raise awareness of the legal aspects of using technology.

Treating others as they wish themselves to be treated

Participate in cultural opportunities by being sympathetic within the community. Understand, accept, respect and celebrate diversity.

Encouraging them to reflect on how developments in science have led to changes in every-day life.

Allowing them to engage with cultural opportunities that may otherwise be unavailable to them from the confines of theclassroom.



Pedagogical Approach

Adapted from: Cognitive Load Theory: Research that teachers really need to understand

Cognitive Load Theory — aim = to develop instructional techniques that fit within the characteristics of working memory in order to maximise learning.

Based on two principles:

1. There is a limit to how much **new** information the brain can hold. (**Working memory**—processing new information results in 'cognitive load' which can affect outcomes.)

2. There is no known limit to how much **stored** information that can be processed at one time. (**Long term memory**—stores information as schemas.)

Explicit instruction involves teachers clearly showing children what to do, rather than have them construct or discover it for themselves. To lessen cognitive load on working memory. This can be used for new information and learning. Independent learning also needs to be incorporated but with cognitive load managed through guidance, prior information, scaffolds and assistance if needed.

Long term memory relies on the formation of schemas where information can be processed automatically with minimal conscious effort. Automaticity happens after extensive practice. Thus reducing working memory load. If working memory is overloaded, there is greater risk that the content will not be understood, be confused and not stored into the long term memory. Ultimately, learning will be slowed down. Automation of schemas reduces the burden on working memory because when information can be accessed automatically, the working memory is freed up to process new information.

There are 3 types of Cognitive load—Intrinsic, Extraneous and Germane

I**ntrinsic** —difficulty of subject matter being learnt, it depends on the complexity of the material and the prior learning—i.e. different people will have different levels of cognitive load depending on their experiences and knowledge

Extraneous — how the subject matter is taught—we need to minimise extraneous cognitive load to free up working memory.

Germane—the load imposed on the working memory by the process of learning i.e. by transferring information into long-term memory through schema construction.

Ofsted– Research and Review Series: Science: When solutions to scientific problems are actively withheld from pupils, they must search for solutions themselves. This carries a heavy extraneous cognitive load. This 'load' is further increased if pupils also manipulate apparatus. This explains why participating in 'discovery learning', in the absence of any guidance or sufficient prior knowledge, does not foster progress.

Types of Knowledge

Adapted from Ofsted: Research and Review Series: Science

'Careful curriculum design, where new knowledge is broken down into meaningful components and introduced sequentially, can support all pupils to learn scientific concepts. '

Knowledge in science needs to be built up over time. Expertise is both **productive (**becoming proficient in aspects of science or planning and conducting investigations) and **receptive** (pupils learning about aspects of science).

Directed Discovery — both receptive and productive— introduces pupils to scientific objects and phenomena to help them learn substantive knowledge, such as dissolving or air resistance and enables pupils to learn and practice disciplinary knowledge, such as how to use a thermometer or carry out a specific type of scientific enquiry. When directed discovery learning is used to introduce scientific objects and phenomena to pupils, it must be part of a sequence of teaching that includes the explicit teaching of the substantive knowledge.

Scientific Enquiry — both receptive and productive**—** scientific enquiry should involve pupils using previously learnt substantive and disciplinary knowledge together to answer scientific questions, using the scientific enquiry types set out in the National Curriculum. It can be scaffolded or independent, but pupils must be answering a specific scientific question. Engaging in scientific enquiry not only provides the opportunity for pupils to learn about the scientific enquiry process shown below but also helps them to learn how scientific knowledge becomes established through scientific enquiry. By learning this, pupils appreciate the nature and status of scientific knowledge: for example, knowing it is open to revision in the light of new evidence.

Substantive and Disciplinary Knowledge— To illustrate what this means in practice, let's take a scientific enquiry question and consider the sequence of teaching that would prepare pupils to successfully carry out the enquiry. Let's take the question, "How does the number of cells affect the brightness of a bulb?"

In order to answer this question, pupils need to gather evidence of the amount of light from circuits using different numbers of cells. To do this, pupils need to know the substantive knowledge of how to construct and adapt complete circuits and the disciplinary knowledge of how to measure the amount of light from the bulb. Both these pieces of substantive and disciplinary knowledge can be discretely taught through directed discovery learning. Once pupils have acquired this knowledge, they are then equipped with the required knowledge to successfully engage in gathering evidence to answer the scientific enquiry question

Charlton Science Progression of Scientific Skills

EYFS	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6
• To explore the natural world around them, making observations, drawing pictures of animals and plants. • To know some similarities and differences between the natural world around them and contrasting environments, drawing on their experience and what has been read in class. • To understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.	• To be able to record data - in a table, Venn diagram, chart. • To be able to observe closely, using simple equipment. • To be able to identify and classify. • To be able to ask simple questions and recognise that they can be answered in different ways. • To be able to perform simple tests. • To be able to record simple data in order to answer a question. • To be able to use parts of the plant to identify and classify it. • To able to identify objects.	▪ To be able to use observations to suggest answers to questions; to be able to observe using simple equipment. ▪ To be able to record data - flow diagram, table, tally chart, bar chart. ▪ To be able to perform a simple test. ▪ To be able to ask simple questions and recognise that they can be answered in different ways. ▪ To be able to gather and record data to help answer a question. ▪ To be able to perform a simple test. ▪ To be able to recognise that questions can be answered in a range of ways. ▪ To be able to use simple measurements to gather data.	▪ To be able to record using drawings; to be able to record data in a table; to be able to record findings in a bar chart. ▪ To be able to report on findings from enquiries; to be able to provide an oral explanation of findings. ▪ To be able to set up a comparative test. ▪ To be able to set up a simple practical enquiry. ▪ To be able to set up a simple fair-test. ▪ To be able to identify changes related to scientific ideas. ▪ To be able to use results to draw simple conclusions. ▪ To be able to make systematic and careful observations and measurements. ▪ To be able to make predictions for further values. ▪ To be able to make systematic and careful observations. ▪ To be able to use straightforward scientific evidence to answer questions or to support their findings. ▪ To be able to measure using beakers and syringes. ▪ To be able to present information in a branching key.	▪ To be able to record findings using labelled diagrams. ▪ To be able to use written explanations to report on findings from an enquiry; to be able to report on findings from enquiries, including oral and written explanations. ▪ To be able to identify the correct type of enquiry to answer a question. ▪ To be able to set up a comparative test; to be able to set up simple fair tests. ▪ To be able to set up a simple practical enquiry. ▪ To be able to use results to make predictions. ▪ To be able to gather, record, classify and present data in a variety of ways to help in answering questions. ▪ To be able to use a scientific enquiry to answer a question. ▪ To be able to make systematic and careful measurements with a data logger; to be able to use a thermometer to take accurate measurements. ▪ To be able to identify differences, similarities or changes related to simple scientific ideas. ▪ To be able to use straightforward scientific evidence to answer questions or to support their findings.	▪ To be able to present conclusions; to be able to report a presentation of an explanation; to be able to report and present findings from enquiries, including conclusions, causal relationships and explanations. ▪ To be able to identify scientific evidence that has been used to support or refute ideas or arguments; to be able to use evidence to refute or support an idea. ▪ To be able to record data within tables; to be able to record data using line graphs; to be able to communicate data using a scatter graph. ▪ To be able to plan a scientific enquiry to answer a question. ▪ To be able to explain the degree of trust in results. To be able to plan a fair-test; identifying the control variables. ▪ To be able to use scientific diagrams and labels. To take accurate measurements using a data-logger; to be able to measure accurately using a thermometer; to be able to take repeated accurate measurements using a stopwatch. ▪ To be able to use test results to make predictions to set up further comparative and fair tests. ▪ To be able to evaluate an enquiry in terms of the amount of trust one can have in it.	▪ To be able to plan pattern-seeking enquiry; to be able to plan an enquiry that will answer a question. ▪ To be able to report causal relationships; to be able to present findings from enquiries. ▪ To be able to record results using a line graph; to be able to record data in a table. ▪ To be able to measure with a data logger; to be able to take repeat measurements of data with precision using a data-logger. ▪ To be able to explain the degree of trust can be had in results. ▪ To be able to plan a fair-test by recognising the control variables; to be able to use predictions to set up fair tests. ▪ To be able to identify scientific evidence that has been used to support or refute ideas or arguments. ▪ To be able to recognise which secondary sources will be most useful to research ideas. ▪ To be able to use test results to make predictions to set up further comparative tests. ▪ To be able to make a key to classify plants.

Charlton Science Progression of Knowledge 2023-2024

	EYFS	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6
Biology	**Plants & Animals** Growth & Change: frog life cycle I can show care and concern for living things in the environment I can start to develop an understanding of growth, decay and changes over time I can talk about some of the things I have observed such as plants, animals, natural and found objects. Growth & Change: Looking at pictures and seeing how the children have changed from being a baby to a child. Growth & Change: chick life cycle Environment: care can concern: butterflies. I can tell you what a plant needs to grow (growing the beanstalk) I show care for living things (pets)	**Plants & Animals** Identify a range of local plants Name parts of a range of familiar plants Recognise items that are living, non-living and that have never been alive Name a variety of common animals Identify and group a range of familiar animals. Identify key features of a range of common animals. Relate each of the human senses to organs.	**Plants & Animals** 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 micro-habitats 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 Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy Observe and describe how seeds and bulbs grow into mature plants Notice that animals, including humans, have offspring which grow into adults 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.	**Plants & Animals** 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 Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers 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 Know 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	**Plants & Animals** 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 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	**Plants & Animals** Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird Describe the changes as humans develop to old age Describe the life process of reproduction in some plants and animals	**Plants & Animals** 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 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 How animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood 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

Charlton Science Progression of Knowledge 2023-2024

	EYFS	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6
CHEMISTRY	**Materials** Floating/Sinking – Boat building, metallic/non-metallic objects changing states of matter Di nosaurs and fossils	**Materials** 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	**Materials** Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular use	**Rocks** 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 Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties	**Materials** Compare and group materials together, according to whether they are solids, liquids or gases Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature 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)	**Materials** 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.	

Charlton Science Progression of Knowledge 2023-2024

	EYFS	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6
PHYSICS	Understand some important processes and changes in the natural world around them, including the seasons	**Seasonal Change** Observe changes across the four seasons Observe and describe weather associated with the seasons and how day length varies		**Forces & Magnets** Compare how things move on different surfaces Notice that some forces need contact between two 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 two poles Predict whether two magnets will attract or repel each other, depending on which poles are facing **Light** 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 a solid object Find patterns in the way that the size of shadows changes	**Sound** Identify how sounds are made, associating some of them with something vibrating Recognise that vibrations from sounds travel through a medium to the ear Recognise that sounds get fainter as the distance from the sound source increases 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 Identify common appliances that run on electricity **Electricity** Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers Recognise some common conductors and insulators, and associate metals with being good conductors 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	**Forces** 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 **Space** 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 Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky	**Light** 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 **Electricity** Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in a 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

EYFS	The development of children's scientific curiosity is developed through regular opportunities to engage in exploring and questioning the word around them through their play with a wide range of materials and environments. The quality and variety of what children see, hear and participate in is crucial for developing their understanding, self-expression, vocabulary and ability to communicate scientifically. The frequency, repetition and depth of their experiences are fundamental to their progress in interpreting and understanding what they hear, respond to and observe. Three areas of the EYFS curriculum particularly support this aim: Communication and Language—asking questions to find out more; describing events in some detail; using talk to work out problems and organise thinking; explaining how things work and why they might happen; learning and using new vocabulary in different contexts Physical Development—know and talk about the different factors that support their overall health and wellbeing such as regular physical activity, healthy eating, toothbrushing, sensible amounts of screen time, having a good sleep routine, being a safe pedestrian Understanding the World—explore the natural world around them; describe what they hear, feel and see when they are outside; recognise different environments; understand the effect of changing seasons on the world around them
KS1	The National Curriculum for science in KS1 aims to ensure that all pupils learn by: • 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 • asking simple questions and recognising that they can be answered in different ways This disciplinary knowledge will help them to build their substantive knowledge in the following areas: Year 1—Plants, Animals including Humans, Everyday Materials, Seasonal Changes Year 2—Living Things and Their Habitats, Plants, Animals including Humans, Uses of Everyday Materials

LKS2	The National Curriculum for science in LKS2 aims to ensure that all pupils learn by: • 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 This disciplinary knowledge will help them to build their substantive knowledge in the following areas: Year 3—Plants, Animals including Humans, Rocks, Light, Forces and Magnets Year 4—Living Things and Their Habitats, Animals including Humans, States of Matter, Sound, Electricity
UKS2	The National Curriculum for science in KS1 aims to ensure that all pupils learn by: • 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 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 This disciplinary knowledge will help them to build their substantive knowledge in the following areas: Year 5—Living Things and Their Habitats, Animals including Humans, Properties and Changes of Materials, Earth and Space, Forces Year 6—Living Things and Their Habitats, Animals including Humans, Evolution and Inheritance, Light, Electricity

Science

Long Term Overview

Science Curriculum Map

Year 1 - Programme of Study	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
	Human Body and Senses	Seasonal Change and weather	Materials	Animals	Plants	Plants Seasonal Change and weather
Year 2 - Programme of Study	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
	Living Things and their habitats	Living Things and their habitats	Uses of everyday materials	Uses of everyday materials	Animals including humans	Plants
Year 3 - Programme of Study	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
	Animals including humans	Light	Forces and Magnets	Plants	Rocks	Nappy Challenge
Year 4 - Programme of Study	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
	Sound	Bridges	States of matter	Electricity	Animals including humans	Teeth
Year 5 - Programme of Study	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
	Properties and changes of material	Forces	Earth and Space	Living things and their habitats	Animals including humans	Animals including humans
Year 6 - Programme of Study	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
	Evolution and inheritance	Animals including humans	Electricity	Light	Living things and their habitats	Living things and their habitats

Inclusion in Science

At Charlton Cof E School, we strongly believe in inclusive education to ensure all pupils engage to the best of their ability.

In Science this will look like:

Possible challenges for learning	Recommendations
Remembering instructions Decoding information Organisation Coordination Concentration Working and long -term memory Social communication Wellbeing and self esteem Audio/ oral challenges Sensory challenges Over stimulation Dysregulation Typing difficulties	Dyslexia friendly fonts Widgit communication symbols and Learning through colour. Coloured overlays/paper Simple instructions Chunked information Rosenshine's method of short and frequent inputs/check ins Look to evaluate children's responses and check-ins for wellbeing Colour code actions and sequences Practical opportunities available – moving bodies for instructions for example. Other ways to represent learning though physical objects Ear defenders/ headphones Mainstream core standards Task management board Memory breaks Music technology to allow accessibility for all learners Laptop for recording findings Having word mats available for communication Pre-teach vocab Talking tins to record ideas, results Brain breaks Peer support Praise when seen carrying out the right thing Photos/pictures rather than reading Gloves to help with sensory issues Well ventilated room Prepared and well organised equipment

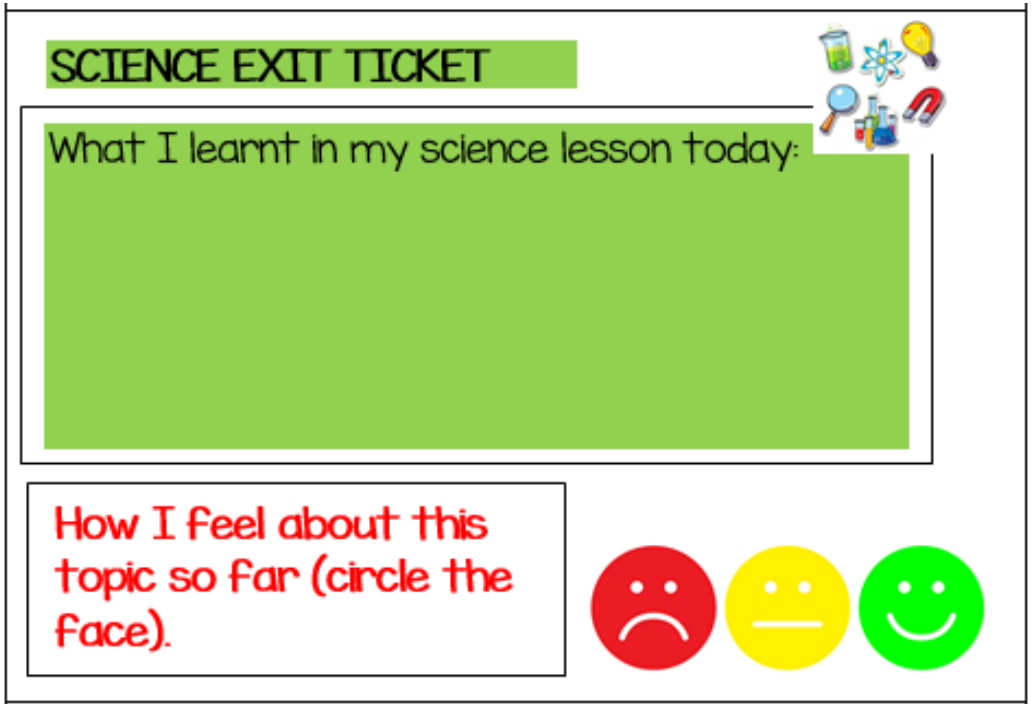
Please speak to the Science Leader for any further help or support.

Assessing in Science

We use exit tickets at the end of each lesson as we feel that this allows children to reflect upon their learning, reinforce their learning from the session and allows teachers to respond and bridge gaps of those learners that need additional support.

We also track children's learning at the end of each half term by using end of unit quizzes and combining this with our knowledge of the children, a decision is made as to whether a child is working towards, expected or working at a greater depth.

We believe teachers are the fundamental way of assessing children via high level of questioning, responding to feedback from children and also pupil voice.



Knowledge Organiser

Science Year 1 Term 1

Who am I?

What I should already know:

- I understand the importance of brushing my teeth.
- I can label basic parts of the body.
- I understand what happens to my body during exercise.
- I can say what changes happen from when I was a baby to now (life cycle).

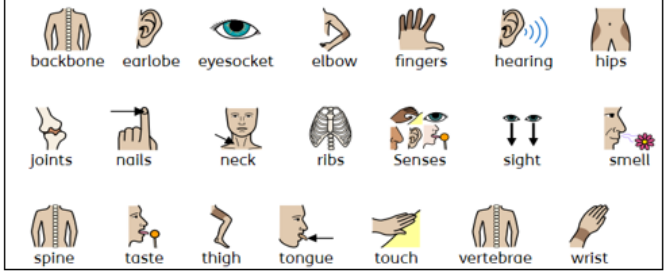
What I should know by the end of this topic:

- To name parts of the body.
- To be able to draw and label parts of the body.
- To know each of the 5 senses.
- Say which part of the body is associated with each sense.

Key skills I will develop are:

- Observe closely, using simple equipment.
- Identify and classify.
- Gather and record data to help in answering questions.

Vocabulary



Knowledge Organiser

Science Year 3 Term 3

Forces and Magnets

What I should already know:

- Magnets are not met in Key Stage 1 at all. However, children may well have come across them at school or home and seen that they can attract some other materials.

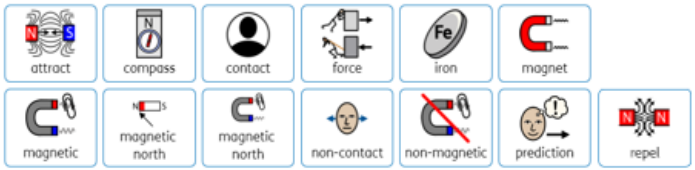
What I should know by the end of this topic:

- Compare how things move on different surfaces.
- Notice that some forces need contact between two 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.
- Identify some magnetic materials.

Key skills I will develop are:

- Ask relevant questions and use different types of scientific enquiries to answer them.
- Set up simple practical enquiries and comparative tests.
- Make systematic and careful observations.
- Record findings using simple scientific language, drawings, labelled diagrams and tables.
- Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.

Vocabulary



An example of our knowledge organisers used to introduce and guide learning through each topic.

SCIENCE ACTION PLAN 2023/2024

SUBJECT LEADER: Rebecca Wharton

KEY PRIORITIES

- **Ensure full coverage of the Science curriculum across the school**
- **Ensure assessment procedures are in place and effective in informing next steps**
- **Science Subject Leader feeds back to staff**

Link to SIP:
To continue to develop the wider curriculum to promote learning engagement from all pupils

To ensure high standards in teaching and learning across the school

Budget for 2023/2024:

Objective *What outcome are we trying to achieve?*	Improve outcomes for Science	**Overall success criteria** *How will we know if we have reached the objective?*	Science has a high profile in school and 85% of children achieve secure for each topic covered	
Specific actions *What will be the specific actions taken to achieve the objective?*	**Success criteria for actions** *How will we know if the actions have been successful?*	**Timeframe and owner** *When will the actions be completed and by whom?*	**Costs** *What are the financial/resource implications?*	**Monitoring** *How will improvements be monitored?*
Long term Science overview plan Progression in Science Knowledge & skills document	A long-term science overview plan progression grid is updated and monitored to ensure a broad and balanced science curriculum is provided for year 1-6 and where appropriate YR.	Ongoing Rebecca Wharton	2-hour Science coordinator time	A long-term plan is in place and evidence that the subjects are covered will be evidenced through monitoring of books, assessments and lessons.
lesson observation/drop in and feedback given	Highly effective lessons are observed where the learning objective is clear and that the lesson is engaging, challenging and one where children make progress.	A year group each term Rebecca Wharton	2 ½ hours Science coordinator time	85% of lessons are graded as good or better.
Pupil Voice	85% of children enjoy science lessons 85% of children know what science is	End of Term 1, 3 & 5 Rebecca Wharton	2 ½ hours Science coordinator time	Pupil data collected and analysed.
Monitoring Displays and Dojo contributions	Photos/Evidence collected that shows the displays to be current, useful to learning and a celebration of high quality science learning and exploration.	Termly Rebecca Wharton	1 hour Science coordinator time – each term	Data collected that indicates the quality and focus of the displays thus in turn indicating breath and balance across the school.
book scrutiny	Books show progress and marking consistent across the school.	End of Term 2 & 6 of each academic year Rebecca Wharton	2 ½ hours Science coordinator time	Evidence gathered and collated that demonstrates the progress and marking across the school.

Science Week	A science week takes place that raises the profile of Science in the school.	By term 6 2024 Rebecca Wharton and all teaching staff	5 hours science coordinator time X2 staff meetings Resources for class teacher £?	Evidence in books, planning, displays etc that demonstrate the learning that occurred in Science week. Floor books reflect the learning, trips and visitors. Parents attend an open afternoon to share the learning.
Update resources and ensure all topics have progressive resources	An audit of current resources will take place at the beginning of each new topic. All topics from Year R to 6 have a full set of working, progressive resources to support the teaching and learning of science.	Ongoing Rebecca Wharton and teaching staff	X6 staff meetings (30 mins each time) £500-1000 Science budget 3 hours science time across the next academic year.	Data collected that indicates the success of the lessons and that a broad and balanced curriculum has been delivered. The Science curriculum will be fully resourced.
Staff training and professional development	New staff and current staff will have access to relevant science training. Subject leader will access relevant training	Ongoing Rebecca Wharton and teaching staff	X3 staff meetings X3 hours SL training X1 day for teaching staff on relevant course (cost unknown)	Teachers and subject leaders will have secure subject knowledge for their area of science. Data collected that indicates the success of the lessons and that a broad and balanced curriculum has been delivered and children are making progress and gaining the relevant skills and knowledge.