



OUR *Science* CURRICULUM

Support • Achieve • Celebrate



The teaching of Science at Cherry Lane Primary School is underpinned by the principles of the Cherry Lane Way.



INTENT

At Cherry Lane, we encourage children to be inquisitive throughout their time at the school and beyond. The Science curriculum fosters a healthy curiosity in children about our universe and promotes respect for the living and non-living. We aim to develop our pupils' curiosity in the subject, whilst also helping them to fulfil their potential. Moreover, we aim to prepare our pupils for life in an increasingly scientific and technological world. We intend learning in science to be through systematic investigations of the physical, chemical and biological aspects of their lives that rely mainly on first hand experiences, leading to them being equipped to answer scientific questions about the world around them. It is our intention that, through investigative science, pupils at Cherry Lane Primary School will continue to deepen their respect for the natural world and all its phenomena, and increase their care and appreciation of it.

We aim to develop pupils' enjoyment and interest in science and appreciation of its contribution to all aspects of everyday life. We use a planned range of investigations and practical activities to give pupils a greater understanding of the concepts and knowledge of science and introduce pupils to the language and vocabulary of science. We extend the learning environment for our pupils via environmental areas and the locality and promote a 'healthy lifestyle' in our pupils.

We believe science encompasses the acquisition of knowledge, concepts, skills and positive attitudes. Throughout the programmes of study, the children will acquire and develop the key knowledge that has been

identified within each unit and across each year group, as well as the application of scientific skills. We ensure that the Working Scientifically skills are built-on and developed throughout children's time at the school so that they can apply their knowledge of science when using equipment, conducting experiments, building arguments and explaining concepts confidently and continue to ask questions and be curious about their surroundings.

Science has changed our lives and is vital to the world's future prosperity, and 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.

Science in our school 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. The staff at Cherry Lane ensure that all children are exposed to high quality teaching and learning experiences, which allow children to explore their outdoor environment and locality, thus developing their scientific enquiry and investigative skills. They are immersed in scientific vocabulary, which aids children's knowledge and understanding not only of the topic they are studying, but of the ever changing world around them and prepares them for life in modern Britain. We intend to provide all children regardless of ethnic origin, gender, class, aptitude or disability, with a broad and balanced science curriculum.

IMPLEMENTATION

In ensuring high standards of teaching and learning in science, we implement a curriculum that is progressive throughout the whole school. Planning for science is a process in which all teachers are involved to ensure that the school gives full coverage of, 'The National Curriculum

programmes of study for Science 2014' and, 'Understanding of the World' in the Early Years Foundation Stage. Science teaching at Cherry Lane Primary School involves adapting and extending the curriculum to match all pupils' needs. KS1 use the Twinkle planning and KS2 follow the Switched on Science schemes of work. Where possible, Science is linked to class topics. Science is taught as discrete units and lessons where needed to ensure coverage. Teachers plan to suit their children's interests, current events, their own teaching style to implement the Switched On Science Scheme, the use of any support staff and the resources available.

We ensure that all children are provided with rich learning experiences that aim to:

- Prepare our children for life in an increasingly scientific and technological world today and in the future.*
- Help our children acquire a growing understanding of the nature, processes and methods of scientific ideas.*
- Help develop and extend our children's scientific concept of their world.*
- Build on our children's natural curiosity and developing a scientific approach to problems.*
- Encouraging open-mindedness, self-assessment, perseverance and developing investigative skills – including: observing, measuring, predicting, hypothesising, experimenting, communicating, interpreting, explaining and evaluating.*
- Develop the use of scientific language, recording and techniques.*
- Develop the use of computing in investigating and recording.*
- Make links between science and other subjects.*

Science is taught consistently, weekly for up to two hours, but is discretely taught in many different contexts throughout all areas of the curriculum. For example, through English, i.e. writing a biography of a famous scientist etc.



We have also hold science week, during the spring term, in which the children enjoy lots of practical science activities addition to their science lessons as well as cross curricular activities studying a life of a famous scientist.



At Cherry Lane, we aspire to promote children's independence and for all children to take responsibility in their own learning, therefore we have implemented pupil assessments, which the children complete at the end of each unit (years 3-6) to track achievements and progress at the end of a topic.


PROGRESSION OVERVIEW


SKILLS

The skills progression outlined in the Switched on Science scheme of learning is aligned with the National Curriculum statements regarding 'Working Scientifically'. These skills are embedded within the content of biology, chemistry and physics, focussing on the key features of scientific enquiry, so that pupils use a variety of approaches to answer relevant scientific questions. These types of enquiry include those outlined by the National Curriculum and shown above. Pupils seek answers to these questions through collecting, analysing and presenting data. Skills for each key stage are broken down into small steps which prepare children for the next stage of their learning.

					results based on patterns.	variables which could affect their investigations.	
Observation and Measurement 	Observe and describe what they see using everyday language. Use equipment such as magnifying glasses and viewers. Take measurements by comparing and notice simple patterns e.g. bigger/smaller.	Can identify and group, compare and contrast using observations, video and photographs. Can observe changes over time and describe changes. Can use magnifying glasses, viewers and digital microscopes. Use simple measurement and equipment such as egg timers and stopwatches. Use non-standard measures.	Observe closely and select the correct equipment. Can identify a range of plants using ID charts. Observe how plants and animals grow and record findings. Notice similarities and differences. Use observations and ideas to suggest answers to questions. Use standard units to estimate and measure. Use rulers, scales, thermometers and measuring vessels with a degree of accuracy.	Make systematic and careful observations. Select your own equipment for observing including digital cameras. Look for naturally occurring patterns. Collect data from your own observations. Can make observations and decide how to record them to answer a question. Take accurate measurements using standard units. Use a range of equipment and begin to read digital measurements from data loggers and stop watches.	Make systematic and careful observations to ask questions and group objects using classification keys. Observe closely and explain processes, identify similarities, differences or changes related to simple scientific ideas or processes. Take and record accurate measurements using standards units to 2dp. Use data loggers to record. Use volt metres and begin to gather repeat readings to increase accuracy.	Observe carefully and make comparisons. Observe changes over a period of time. Make decisions about what to observe to answer questions. Use observation skills and ID kits to identify plants and animals. Take repeat measurements where appropriate. Can find the average of data. Select measuring equipment and use accurately e.g. ruler, tape measure, trundle wheel, force metres.	Can make accurate drawings of plants and animals based on observations. Take measurements using a range of scientific equipment with increasing accuracy and precision, taking repeat readings where appropriate. When collecting measurements decide whether to increase sample size for validity and reliability. Record measurements to 3dp. Use protractors, rulers, force metres, volt metres accurately.
Planning enquiries 	Test out ideas and take risks through trial and error.	Begin to recognise ways they may answer scientific	Can plan and carry out simple tests linked to the different	Can set up practical enquiries using comparative and	Can identify the type of enquiry needed to answer a	Recognise when and how to set up comparative and fair tests	Children choose the type of enquiry needed to carry out their investigation.

Progression of Disciplinary Knowledge - Working Scientifically							
	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Asking Questions 	Question why things happen. Ask questions to find out how things work.	Can ask simple questions. Can ask yes and no questions to sort and classify. Can raise own questions.	Can ask simple questions relevant to the topic. Know their questions can be answered in different ways. Can use a range of question stems.	Can raise questions and can carry out tests with support to find things out. Can write a range of questions relevant to the topic. Can answer questions posed.	Can ask a range of questions to sort and classify. Can write a range of questions using own scientific knowledge. Can answer questions independently using secondary sources.	Use scientific experiences to explore ideas and raise different higher order questions. Can create further questions to investigate. Can raise questions and suggest reasons for similarities and differences	Can raise questions to further prove or disprove a scientific enquiry. Can raise questions about a range of phenomena.
Make predictions 	Can make simple predictions based on comparisons e.g. float or sink.	Can make basic predictions over things they can see or their own ideas. Use some scientific vocabulary.	Draws knowledge from observations to make predictions. Can begin to test predictions and later answer questions.	Draws on knowledge to make predictions. Can add detail to their predictions. Make further predictions based on what's observed or tested.	Predictions are detailed and explain their thinking, they link to tests, data and use scientific language. Raise further predictions from	Use subject knowledge, observations or previous learning to make predictions. Add detail and explanations. Can identify a range of	Use test results to make predictions to set up further comparative tests. Uses evidence to support predictions. Develop predictions based on research and scientific knowledge.]

	Engage in open ended activities. Choose resources they need for their activity from their environment. Find ways to solve problems.	questions. Experience different types of enquiry including practical activities. Use resources provided by the teacher and suggest some resources of their own e.g. pipettes.	types of enquiry. They can carry out a simple comparative test using some of their own ideas. Can suggest their own resources to carry out tests.	fair tests. Use a range of scientific enquiry. Can investigate and answer questions linked to a shared planning frame. Understand some of the variables needed to be controlled with support. Use a range of equipment e.g. thermometers and data loggers.	question. Follow a plan to carry out observations and tests. Use a planning approach with more independence identifying variables and what needs measuring. Children choose their method to carry out their investigation.	and explain which variables need to be controlled and changed. Understand what type of scientific inquiry is needed to answer and prove/disprove scientific questions or phenomena.	Children can pose and answer their own questions, controlling variables where necessary independently. Decide whether sample size needs to be increased for validity. Identify a range of factors which may affect their investigation.
Recording 	Draw pictures or objects in their own environment. Can take photos of things that interest them. Can count results and start to make marks to record results. Can sort in at least 2 groups. Can create a class pictogram using pictures and objects.	Begin to show some accuracy in drawings, observations and use simple labels. Use scientific vocabulary provided by the teacher. Can complete a simple prepared table with some support and scaffolding. Can add marks to a chart to complete data.	Gather and record data to help answer questions. Record observations using photo video, drawings, labelled diagrams or in writing. Count results using tally charts. Use prepared tables to record results more independently. Use simple keys based on yes and no questions. Can sort into 2 groups with their own categories	Record findings using scientific language, drawings and labelled diagrams including detailed labelling and written explanations based on observations. Can complete a table where they can add their own headings and results. Use simple classification keys and Venn diagrams. Can use Carroll diagrams and	Record findings using systematic and careful observational drawings and labelled diagrams using scientific vocabulary. Children present the same data in different ways. Can create own tables with headings. Can record using classification keys. Can use Venn and Carroll diagrams with accuracy. Can use discrete and continuous data	Present results in a variety of ways to help answer questions. Can decide how to record from a range of approaches. Can record ideas using accurate diagrams using scientific language. Create your own results table including cause and effect. Record results systematically and repeat readings. Use	Record data and results with increasing complexity e.g. accuracy of measurements. Use scientific diagrams, models and labels accurately with clarity and using precise scientific language. Calculate mean and range of a set of data. Can use and produce classification keys independently by posing questions. Can independently collect data and produce scatter and line graphs. Can

			and explain the reason for choices. Record using prepared bar charts.	give reasons for criteria. Can produce bar charts adding their own axis labels and headings.	using line/scatter graphs. Can construct bar charts independently.	and develop classification keys. Can classify in a number of ways. Use line or scatter graphs to calculate range in a set of data using different scales. Can produce line graphs with various increments.	create bar charts and pie charts to present data.
Interpreting and concluding 	Offer explanations for why things happen- making use of some recently introduced scientific vocabulary. Develop your own narrative and explain by connecting ideas or events. Develop vocabulary which meets the breadth of their experiences.	Can use evidence from simple tests when answering questions. With help, begin to notice patterns and relationships. Talk about what they have found out and how they found it out. Can make comparisons and recognise biggest/smallest, most effective/least effective from data. Can use simple models to explain processes e.g.	Communicate findings to an audience using relevant scientific language and illustrations. Can identify causal relationships and patterns in results. Can identify which results do not fit the overall pattern and explain findings. Refers to the table of results when describing what has happened. Draws a basic conclusion (with support from the teacher) using	Draws conclusions based on observations. Can compare something using results and the conclusion is consistent with the data. Able to adjust opinion and predictions based on results. Can give reasons for results including any anomalies. Use simple scientific language to discuss ideas and communicate their findings in ways appropriate for different	Draws simple conclusions from results to answer questions and support their ideas. Look for casual relationships in data and identify evidence that refutes/supports ideas. Report on findings to an audience orally and in writing using appropriate scientific vocabulary for a range of audiences. Children use evidence to suggest values	Identify patterns and casual relationships that may be found in the natural environment. Children interpret data to generate simple comparative statements based on evidence. Use results to draw conclusions and can identify external factors that cannot be controlled e.g. temperature inside and outside. Use scientific language and	Look for patterns and relationships using a suitable sample. Use oral and written forms such as displays to report conclusions, casual relationships and give an explanation of the degree of trust in their results. Makes suggestions for ideas that can be explored using pattern seeking. Can spot anomalies and identify results that do not fit the overall pattern. Use data to refute or support ideas or arguments. Focuses on scientific reasons for overall pattern rather than a

		seasonal changes, lifecycles.	own scientific knowledge, observations and comparisons. Uses results of investigations to answer enquiry questions.	audiences orally and written	for different items tested using the same method. Draw conclusions based on straightforward evidence and current subject knowledge to support their findings. Suggest improvements and raise further questions.	illustrations to discuss, communicate and justify scientific ideas. Can use comparative statements to explain results and how things work.	comparison. Uses labelled diagrams to support their explanation. Use ideas from secondary sources to support their ideas, choosing appropriate websites. Create detailed models to explain processes such as circulatory systems and lifecycles.
Evaluating				Apply their knowledge of the topic when evaluating. Explain any amendments and how this impacted the investigation/test.		Evaluate how effectively variables were controlled and what they may do to improve the enquiry.	

KNOWLEDGE

The programmes of study taken from the National Curriculum describe a sequence of knowledge and concepts that develop pupils' scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics. The spiral nature of the Science curriculum ensures that knowledge is revisited during children's learning journey, providing students with multiple opportunities to reinforce their understanding and retention of material, allowing for deeper understanding of topics. Teachers are supported in making these connections and deepening understanding through the use of Switched on Science, which builds on knowledge gained at the previous stage of learning and provides opportunities to revisit and revise learning. Pupils are given opportunities to describe associated processes and key characteristics in common language, and use technical terminology accurately and precisely. They also apply their mathematical knowledge to their understanding of science, including collecting, presenting and analysing data.

Overview of Substantive Knowledge Journey							
	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Animals, including humans							
Plants							
Living things and their habitats							
Evolution and inheritance							
Seasonal changes							
Forces				Forces and magnets			Forces
Light							
Sound							
Earth and space							
Electricity							
Materials		Everyday Materials	Uses of everyday materials	Rocks	States of matter	Properties and changes of materials	

Progression of Substantive Knowledge							
	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Plants (Biology)	<p>Make observations and drawings of plants</p> <p>Know similarities and differences between the natural world and contrasting environments</p> <p>Can plant seeds and care for growing plants.</p> <p>Understand the basic plant life cycle.</p> <p>Know leaf, stem, petals.</p>	<p>Can name common plants and describe the basic parts of flowering plants (deciduous/evergreen)</p> <p>Can describe key features of trees and plants e.g. shapes of leaves, colour of flower, blossom.</p> <p>Can use photos to talk about how plants change.</p> <p>Can talk about plant life cycles.</p> <p>Know basic parts of plants e.g. leaf, stem, petal, flower, stalk, bud, roots, fruit, bark, blossom.</p>	<p>Can describe how plants have grown from seeds and bulbs and how they have developed over time.</p> <p>Know conditions for plant growth.</p> <p>Can spot similarities and differences in bulbs and seeds.</p> <p>Confident in ordering parts of the plant life cycle.</p> <p>Know all parts of the plant and their function.</p> <p>Know the terms: light, shade, sun, warm, grow, healthy, growth, germinate.</p>	<p>Can explain the function of the parts of a flowering plant.</p> <p>Can explain the life cycle of a flowering plant lifecycle including pollination, seed formation, seed dispersal and germination.</p> <p>Know different methods of seed dispersal.</p> <p>Know the requirements of plant growth and how water is transported through the plant. Know how the sun helps plants photosynthesis.</p> <p>Know the terms: photosynthesis, pollen, pollination, absorb, nutrients, reproduce, germination, stamen and style.</p>	<p>Can classify plants in different ways (Living things)</p>	<p>Can explain the life cycles and processes of a range of different plants and trees.</p> <p>Can use ID guides to identify plants. (Living things)</p>	<p>Can classify plants in different ways using observable characteristics/ similarities and differences. Give reasons for classifying plants based on characteristics (Living things)</p>


Animals, including humans (Biology)	<p>Can name a range of animals e.g. farm/jungle.</p> <p>Can group using basic characteristics e.g. land/sea, 4 legs, can fly/can't fly.</p> <p>Can name and point to different body parts e.g. head, body, tummy, knees, legs, arms, toes, eyes, ears, mouth, nose, hair, fingers.</p> <p>Know basic senses e.g. touch, taste, hear, see.</p>	<p>Can name a range of animals which include animals from each of the vertebrate groups.</p> <p>Understand and categorise animals who are herbivore, carnivore and omnivore.</p> <p>Describe and compare animals based on observable characteristics.</p> <p>Know the terms: reptile, amphibian, mammal.</p> <p>Can name, draw and label parts of the human body and say what sense is associated.</p> <p>Can name the 5 senses.</p>	<p>Can describe how animals change as they get older. Know names of animals and their offspring e.g. goat- Kid.</p> <p>Can order the lifecycle of different animals e.g. butterflies.</p> <p>Can explain what humans and animals need to survive e.g. food, sleep, exercise, water, shelter.</p> <p>Know about microorganisms and how to keep hygienic.</p> <p>Understand the term balanced diet and can identify some food groups.</p> <p>Understand the effects of exercise on the body.</p> <p>Know the terms: offspring, nutrition, reproduction, exercise, hygiene, microorganism, germs.</p>	<p>Can name the main bones in the skeletal system such as skull, ribs, humerus, vertebrae, pelvis, ulna, carpals, radius, femur, phalanges, patella, tibia, tarsals, fibula, metatarsals.</p> <p>Know the function of the skeletal system.</p> <p>Can describe how muscles and joints help to move.</p> <p>See similarities and differences in skeletons can classify into endoskeleton, exoskeleton and hydrostatic skeleton.</p> <p>Can name different nutrients found in food.</p> <p>Know the different food groups and why we need to eat a balanced diet.</p>	<p>Can identify and label and draw main parts of the digestive system and explain the process.</p> <p>Know the different types of teeth in their mouth: molars, premolars, canines and incisors and their function.</p> <p>Can identify animals and classify based on their teeth whether they are herbivore, omnivore and carnivore.</p> <p>Can order and draw a range of lifecycles and food chains.</p> <p>Can identify the producer, predators and prey.</p>	<p>Can explain the changes that take place in boys and girls during puberty.</p> <p>Can explain how a baby changes physically as it grows and what it is able to do at each stage.</p> <p>Understand that different animals have different gestation periods.</p> <p>Know the importance of physical and mental health.</p>	<p>Can identify, label and draw parts of the circulatory system e.g. heart, blood vessels, capillaries, arteries, blood.</p> <p>Understand the function of the different parts.</p> <p>Understand how nutrients are transported around the body within animals and humans.</p> <p>Know the impact of a balanced diet, exercise and lifestyle on the way their body's function.</p> <p>Recognise the impact on all body systems learned so far.</p>
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Living things/ Evolution and inheritance (Biology)	<p>Can name some plants and animals.</p> <p>Can explore habitats and know where some animals live.</p> <p>Can compare and describe plants and animals.</p>	<p>Know common plants and trees (plants)</p> <p>Identify and name common animals (animals)</p> <p>Know herbivore, carnivore and omnivore (animals)</p> <p>Describe and compare variety of animals (animals)</p>	<p>Can find a range of items which are dead, living and never been alive.</p> <p>Know what a habitat and microhabitat is and identify animals which live in different habitats.</p> <p>Can talk about features of animals and plants and how they are suited to live in particular habitats.</p> <p>Can construct a simple food chain using terms producer, prey, predator, energy.</p> <p>Can identify different sources of food and understand where food comes from.</p>	<p>Identify and describe functions of different plants. (Plants)</p> <p>Identify and describe different animals and how they are adapted to live in different environments.</p> <p>Understand the term climate (Animals)</p> <p>Can explain how a fossil is formed (Rocks).</p>	<p>Can name living things in a range of habitats, giving key features that helped identify them.</p> <p>Can give examples of how an environment might change both naturally and due to human impact.</p> <p>Explain how changes in the environment can be dangerous to animals and lead to extinction.</p> <p>Know that some animals hibernate.</p>	<p>Describe the life cycles of mammals, amphibians and insects using diagrams.</p> <p>Can describe similarities and differences between them.</p> <p>Understand the term reproduction in plants and animals.</p>	<p>Can give examples in the five vertebrate groups and some in the invertebrate group.</p> <p>Can give key characteristics of these groups.</p> <p>Can give examples of flowering and non-flowering plants.</p> <p>Can identify unknown plants using ID and classification charts.</p> <p>Can explain why animals belong to groups. Know that Carl Linnaeus classifies plants and animals.</p> <p>Can explain the process of evolution and give examples of how plants and animals are suited/adapted to their environment.</p> <p>Give examples of how animals have evolved over time.</p> <p>Understand that</p>
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							fossils give us evidence of the past and know the process of fossilisation.
Seasonal Changes (Biology) Earth and Space (Physics) Light/Sound (physics)	Know the four seasons Can experience different seasons and describe how they feel. Can comment on the environment e.g. leaves on the ground. Can name some clothes they may wear. Know some weather e.g. rain, wind, sun, snow, cloud. Understand the terms night/day	Can name the four seasons and identify in the year when they occur. Can observe and describe the weather in different seasons. Can describe days being longer in summer and shorter in winter. Compare seasons.	Know that the sun rises and sets. Understand that we have night and day. Know why the sun helps plants grow. (plants) Know that it is dangerous to look at the sun (animals)	Light- Can describe how we see objects in light and describe dark as the absence of light. Know it is dangerous to look at the sun. Understand the term ultra violet. Know the terms transparent, translucent and opaque. Can describe how shadows are formed Predict which materials will be more/less visible. Know the term reflective and why reflective materials are useful.	Sound- Can describe different types of objects producing different sounds. Know that sound is caused by vibrations. Can describe how sound travels through different mediums e.g air, water, metal. Can find patterns between pitch and volume and the features of the objects producing it. Know that sounds get fainter as the distance from the sound increases.	Earth and space- Know how the earth and moon move. Know different planets in the solar system. Can understand night and day by explaining the rotation of the earth on its axis. Understand why shadows change using scientific vocabulary and the position of the sun. Can explain how a sundial works. Can explain why we have time zones.	Light- Can describe using diagrams how light travels in straight lines, either from sources or reflected from other objects into our eyes. Can explain how we see things and can label basic parts of the eye and explain their function. Can describe with diagrams how light travels past translucent or opaque objects to form shadows of the same shape. Know how to change the size of shadows by moving objects closer/further from light source.


Materials (Chemistry) Rocks (Chemistry)	Can talk about the similarities and differences between materials. Can describe using basic words. They can group materials based on how they feel or look like.	Can label a picture of an object based on what it is made of. Can describe the properties of materials. Can sort materials using its properties. Know the terms: wood, plastic, glass, metal, water and rock.	Compare the suitability of different materials including wood, metal, plastic, glass, brick, rock, paper, cardboard, water. Know that shapes of solid objects can be changed by squashing, bending, twisting and stretching. Can describe similarities and differences.	Compare and group types of rock and give physical features of each. Explain how a fossil is formed. Explain that soils are made from rocks and also contain living/dead matter. Classify rocks in a variety of ways using scientific vocabulary. Test properties of rocks. Describe materials using transparent, translucent and opaque.	Can name properties of solids, liquids and gases. Can explain the process of melting and freezing. Know the terms evaporation and condensation. Can describe the water cycle. Know the materials have different melting points. Can test a variety of materials to answer questions.	Can explain everyday uses of materials. Can explain what dissolving is. Can name equipment for filtering and sieving. Know how to recover substances from solutions or mixtures by evaporation, filtering or sieving. Can describe reversible and non-reversible changes to materials and give examples.	Recognise that things have changed over time and fossils provide information about living things that inhabited the Earth millions of years ago. (Evolution and Inheritance)
Forces (Physics) Electricity (Physics)	Shows skills in making toys work by pressing parts or lifting flaps to achieve effects such as sound, movement or new images. Understand push and pull.	Understand the terms push and pull. Can move objects by applying a force such as pushing a car.	Know how different materials can be changed by applying a force such as squashing, bending, twisting and stretching.	Compare how things move on different surfaces. Can give examples of forces in everyday life. Name a range of magnets. Know that magnets have a north and south pole. Can show how the poles attract and repel. Can draw	Electricity- can name the components in a circuit. Can make a simple circuit. Can control a circuit using a switch. Can name some conductors and insulators. Can use drawings to represent their circuits. Can describe how a	Can explain the effects of gravity acting on an unsupported object. Can give examples of friction, water resistance and air resistance. Can give examples of the benefits of high/low friction, water resistance and air	Understand different forces and can apply this knowledge across different subjects e.g. geography. Electricity- Understand voltage and amps. Know how to make bulbs brighter, buzzers louder. Can label and name


				diagrams to show the attraction and repulsion between poles of magnets. Can name magnetic and non-magnetic materials.	circuit works. Can name some appliances that run on battery/mains. Know how to make a bulb brighter.	resistance. Can demonstrate how pulleys, levers and gears work. Know that these systems can make lifting heavy objects easier.	components in a circuit. Can draw circuits using symbols. Make circuits to solve particular problems such as a quiet and a loud burglar alarm.
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	KS1	LKS2	UKS2
NC	asking simple questions and recognising that they can be answered in different ways	asking relevant questions and using different types of scientific enquiries to answer them	planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
 Plan	ask some simple scientific questions about the world around them	use their scientific experiences to raise questions about the world around them	explore and talk about their ideas and scientific experiences to raise enquiry questions about scientific phenomena
	begin to recognise ways in which they might answer scientific questions	start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions, e.g. recognising when a fair test is necessary	make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions
		help decide what observations or measurements they might make, how long they will make them for and the equipment they might use	make their own decisions about what observations to make, the most appropriate equipment to use, what measurements to take and for how long, and whether to repeat them
			recognise variables in comparative and fair tests and plan how they will control them
		help decide how to record and analyse data	decide how to record data from a choice of familiar approaches

	use simple secondary sources for researching answers to questions	use secondary sources for researching answers to questions, recognising how this allows them to answer questions that cannot be answered through practical investigations	use a wide range of secondary sources for researching answers to questions, deciding which sources will be most useful and reliable, and understanding the difference between fact and opinion.
	carry out simple comparative tests	set up and carry out simple comparative and fair tests	set up and carry out comparative and fair tests , including controlling variables
	carry out simple pattern seeking enquiries	set up and carry out pattern seeking enquiries	set up and carry out pattern seeking enquiries , choosing a reliable sample size
	identify some living and non-living things and their features (identifying, grouping and classifying)		
	use simple features to compare objects, materials and living things (identifying, grouping and classifying)	talk about criteria for identifying, grouping and classifying	identify, group, classify and describe a wide range of living things and materials, using their scientific knowledge to justify their choices
	decide how to sort and classify things into simple groups with some help (identifying, grouping and classifying)	identify, group and classify things, using simple keys when appropriate	use and develop keys and other information records of increasing complexity to identify, classify, group and describe living things and materials

	KS1	LKS2	UKS2
NC	observing closely, using simple equipment performing simple tests identifying and classifying	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	taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
 Do	observe the natural and humanly-constructed world around them	make systematic and careful observations	make systematic, careful and detailed observations
	use simple measurements (e.g. using comparisons or non-standard units), sometimes using simple equipment	take accurate measurements using standard units	take measurements, using a range of scientific equipment, with increasing accuracy and precision
	make careful observations in enquiries, sometimes using simple equipment	use a range of equipment, including thermometers and data loggers	
			take repeat readings where appropriate and understand the importance of this
	carry out enquiries that involve observing over time	set up and carry out enquiries that involve observing over time	set up and carry out enquiries that involve observing over time, including changes over different periods of time

	KS1	LKS2	UKS2
NC	gathering and recording data to help in answering questions	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	recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
 Record	gather and record observations to help answer questions in a variety of ways, e.g. labelled diagrams or simple tables	gather, record and present observations in a variety of ways to help answer questions, e.g. written recordings using simple scientific language, drawings, labelled diagrams or tables	gather, record and present observations of increasing complexity, e.g. using scientific diagrams and labels
	gather and record measurements to help answer questions in a variety of ways, e.g. simple tables, pictograms, tally charts or block diagrams	gather, record and present measurements in a variety of ways to help answer questions, e.g. tables and bar charts	gather, record and present measurements in a variety of increasingly complex ways, e.g. using tables, scatter graphs, bar graphs or line graphs
	gather and record findings from their research (such as from secondary sources) in a variety of ways, e.g. fact files, answers to questions or giving explanations	gather, record and present findings from their research (such as from secondary sources) in a variety of ways, e.g. fact files, answers to questions or giving explanations	gather, record and present findings of increasing complexity from their research (such as from secondary sources) in a variety of ways, e.g. fact files, answers to questions or giving explanations
	record classification tasks using simple tables or sorting diagrams	record classification tasks in a variety of ways to help answer questions, e.g. simple keys, tables or Venn diagrams	record classification tasks in a variety of ways to help answer questions, e.g. classification keys
	use and apply mathematical skills at a level consistent with their increasing maths knowledge at key stage 1	use and apply mathematical skills at a level consistent with their increasing maths knowledge at lower key stage 2	use and apply mathematical skills at a level consistent with their increasing maths knowledge at upper key stage 2

	KS1	LKS2	UKS2
NC	using their observations and ideas to suggest answers to questions	<p>reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</p> <p>using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions</p> <p>identifying differences, similarities or changes related to simple scientific ideas and processes</p> <p>using straightforward scientific evidence to answer questions or to support their findings</p>	<p>using test results to make predictions to set up further comparative and fair tests</p> <p>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</p> <p>identifying scientific evidence that has been used to support or refute ideas or arguments</p>
Review 	with support, begin to notice patterns and relationships	with support, identify changes, patterns and similarities and differences, (e.g. in their data, from observations or from research of scientific ideas) to help answer questions and draw conclusions	notice patterns in their results (including those found in the natural environment)
			analyse results to determine and then explain causal relationships
	begin to draw simple conclusions	use straightforward scientific evidence (from observations, measurements or secondary sources) to answer questions or support their conclusions	draw increasingly complex conclusions based on their data, observations and scientific knowledge, identifying if this refutes or supports their previous ideas
		make predictions for new values	use their test results to make predictions to set up further comparative and fair tests
		raise further questions which could be investigated	

		suggest improvements to investigations	discuss the degree of trust they can have in a set of results, e.g. by considering measurement precision and accuracy, how variables were controlled and enquiry limitations.
	use a range of scientific vocabulary accurately. Read and spell some of these words at a level consistent with their increasing word reading and spelling knowledge at key stage 1	use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge	read, spell and pronounce scientific vocabulary correctly
	communicate their findings to a variety of audiences in a variety of ways	report and present their results and conclusions to different audiences in written and oral forms with increasing confidence	report and present their results and conclusions to others in oral and written forms with confidence
			talk about how scientific ideas have developed over time, with reference to scientific evidence that has been used to support or refute ideas or arguments

CONSOLIDATION

REVISITS

Our Science curriculum is designed to support children's learning and retention over time; its progressive and cyclical nature ensures that children revisit learning, make connections and build knowledge over time, retaining children's knowledge in their long-term memories and progressively broadening their understanding of Science. We support this in lessons through a number of ways:

Previous Learning Slides

At the beginning of the lesson, teachers will share a 'Previous Learning' slide with pupils. This provides teachers with the opportunity to discuss prior knowledge and previously taught skills from past lessons. The aim is that children are supported in making connections between what they already know and their new learning. Previous learning links could be drawn from a previous lesson, previous unit of work or learning from a previous year group or key stage. Children are prompted to recall previous learning with a question and an associated image. This short quiz encourages pupils to remember knowledge content covered in previous learning. Pupils work on whiteboards, discuss with their peers and have access to exercise books and working walls. It is not graded or recorded. The aim is to retain knowledge over time.

Remember It

To start off this topic, let's find out what you can remember about animals. Try to answer each of these questions. Click on the **Check** button next to each question if you need a bit of help.

What are animals? **CHECK**

Can you name any animal groups and think of some examples of animals in each one? **CHECK**

Which animal group do humans belong to? How do you know? **CHECK**

Remember It

We have been learning about the life cycles of different animals.

Can you remember the stages of a frog's life cycle?

- Work with your partner.
- Write numbers 1-4 on your whiteboard.
- Can you write the correct label next to each number?

PLAY GAME

Knowledge Organisers

Each Science topic has an accompanying knowledge organiser which highlights particular vocabulary, knowledge, images and diagrams which will be key to the topic. Pupils can refer back to this throughout the topic, helping them to recall prior knowledge.

Animals Including Humans

adult A fully grown animal or plant.	Some animals give birth to live young .	Some offspring look like their adult when they are born.
develop To grow bigger and become stronger.	Some animals lay eggs which the young hatch from.	Some offspring do not look like their adult when they are born.
life cycle The changes living things go through to become an adult.	Most of these types of young then develop into adults .	
offspring The child of an animal.		
young Offspring that has not reached adulthood.		
very young Offspring that has not hatched from an egg.		

All **human** animals change as they go through the different stages of their **life cycle** and **grow** into **adults**.

Human Life Cycle

Frog Life Cycle

Life Cycle

Plant Life Cycle

Seed Growth

Human Life Cycle

Frog Life Cycle

Plant Life Cycle

Human Life Cycle

Frog Life Cycle

Plant Life Cycle

KEY VOCABULARY

In order for pupils to be confident Scientists, we expect them to accurately and confidently use scientific vocabulary. The vocabulary that they need to know in each topic is mapped out on the progression of learning, ensuring children build on their vocabulary each year or each time they revisit a topic, and is detailed on the first page of each medium term plan. This aligns with the vocabulary provided by knowledge organisers and unit starters. In addition, this vocabulary is displayed on working walls with appropriate accompanying visuals or symbols, to support pupils' understanding.

The national curriculum for science reflects the importance of spoken language in pupils' development across the whole curriculum – cognitively, socially and linguistically. The quality and variety of language that pupils hear and speak are key factors in developing their scientific vocabulary and articulating scientific concepts clearly and precisely. They must be assisted in making their thinking clear, to both themselves and others, and teachers should ensure that pupils build secure foundations by using discussion to probe and remedy their misconceptions.

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Animals: Inhabiting Habitats	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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 structures 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. 	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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. 	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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. 	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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; compare and interpret a variety of food chains, identifying producers, predators and prey. 	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> describe the changes as humans develop to old age. 	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood; explain 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.
Vegetative Propagation	<ul style="list-style-type: none"> Names of animal groups: fish, amphibians, reptiles, birds, mammals. Animal diets: carnivores, herbivores, omnivores. Human and animal body parts: e.g. body, head, neck, arms, elbows, legs, knees, face, ear, eye, nose, hair, mouth, teeth, hand, feet, tail, wings, feathers, fur, beak, fins, gills. Human senses: sight, hearing, touch, smell, taste. Exploring animals: land, sea, soil, rough. Other: human, animal, pet. 	<ul style="list-style-type: none"> Being born and growing: Young, offspring, live young, grow, develop, change, hatch, lay, fly, crawl, walk. Young and adult names: e.g. lamb and sheep, kitten and cat, duckling and duck. Life cycle stages: e.g. baby, toddler, child, teenager, adult. Organisms: tadpole, froglet, frog. Survival and staying healthy: basic needs, survival, food, air, exercise, diet, nutrition, healthy, balanced diet, hygiene, germs. Food groups: fruit and vegetables, protein, dairy and alternatives, carbohydrates, oil and spreads, fat, salt, sugar. <p>Previously introduced vocabulary: water</p>	<ul style="list-style-type: none"> Food groups and nutrients: fibres, fat (saturated and unsaturated), vitamins, minerals. Skeleton and muscles: skeleton, muscles, tendons, joints, protection, support, organs, voluntary muscles, involuntary muscles, biceps, triceps, contract, relax, bone, cartilage, skull, vertebrate, invertebrate, endoskeleton, exoskeleton, hydrostatic skeleton. Names of human bones: e.g. skull, spine, backbone, vertebrae, ribcage, pelvis, clavicle, scapula, humerus, shin, pelvis, radius, femur, tibia, fibula. Other: energy. <p>Previously introduced vocabulary: movement</p>	<ul style="list-style-type: none"> Digestive system: digest, digestion, tongue, teeth, saliva, salivary glands, oesophagus, stomach, liver, pancreas, gall bladder, small intestine, duodenum, large intestine, rectum, anus, faeces, organ. Types of teeth and dental care: molar, premolar, incisor, canine, wisdom teeth, tooth decay, plaque, enamel, baby (milk) teeth. Food chains and animal diets: decomposer, food web. <p>Previously introduced vocabulary: producer, consumer, prey, predator, excretion, habitat</p>	<ul style="list-style-type: none"> Process of reproduction: gestation, sperm, egg, cells, clone. Changes and life cycle: embryo, fetus, uterus, prenatal, adolescence, puberty, menstruation, adulthood, menopause, life expectancy, old age, hormones, ovum. Changing body parts: e.g. breasts, penis, larynx, ovaries, prostate, pubic hair. <p>Previously introduced vocabulary: reproduction, reproduce, types of animals and animal groups, fertilisation</p>	<ul style="list-style-type: none"> Circulatory system: circulation, heart, pulse, heartbeat, heart rate, lungs, breathing, blood vessels, blood, pump, transport, oxygenated blood, deoxygenated blood, oxygen, arteries, veins, capillaries, chambers, plasma, platelets, white blood cells, red blood cells. Lifestyle: drug, alcohol, smoking, disease, cancer, energy input, energy output. Other: water transportation, nutrient transportation, waste products. <p>Previously introduced vocabulary: carbon dioxide</p>

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	
Plants	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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. 	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> observe and describe how seeds and bulbs grow into mature plants. find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. 	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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. explain the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. 				
Vegetative Propagation	<ul style="list-style-type: none"> Names of common plants: wild plant, garden plant, evergreen tree, deciduous tree, common flowering plant, weed, grass. Name some features of plants: e.g. flower, vegetable, fruit, berry, leaf/leaves, blossom, petal, stem, trunk, branch, root, seed, bulb, soil. Name some common types of plant: e.g. sunflower, daffodil. 	<ul style="list-style-type: none"> Growth of plants: germination, shoot, seed dispersal, grow, food store, life cycle, die, wilt, seeding, sapling. Needs of plants: sunlight, nutrition, light, healthy, space, air. Name different types of plant: e.g. lawn plant, cactus. Names of different habitats: e.g. meadow, desert. <p>Previously introduced vocabulary: water, temperature, warm, hot, cold, habitat</p>	<ul style="list-style-type: none"> Water transportation: transport, evaporation, evaporate, nutrients, absorb, anchor. Life cycle of flowering plants: pollination (insect/wind), pollen, nectar, pollination, seed formation, seed dispersal (animal/wind/water), reproduce, fertilisation, fertile, stamen, anther, filament, sepal (petal), stigma, style, ovary, ovule, oviput, carbon dioxide. <p>Previously introduced vocabulary: life cycle</p>				

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Using Things and Their Habitats		<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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. 		<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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. 	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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. 	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals; give reasons for classifying plants and animals based on specific characteristics.
Vocabulary Progression		<ul style="list-style-type: none"> Living or dead, living, dead, never living, not living, alive, never been alive, healthy. Habitats including microhabitats, depend, shelter, safety, survive, suited, space, abundant, air. Life, organisms, movement, sensitivity, growth, reproduction, nutrition, excretion, respiration. Food chains, food sources, food, produce, consumer, producer, prey. Names of habitats and microhabitats e.g. under stones, woodland, carpark, parking, ocean, urban, local habitats. <p>Previously introduced vocabulary: snail, carnivore, herbivore, omnivore, seed, water, names of materials.</p>		<ul style="list-style-type: none"> Living things; organisms, specimen, species. Grouping living things, classification, classification keys, classify, characteristics. Names of invertebrate animals: snails and slugs, worms, spiders, insects. Invertebrate body parts: e.g. wing case, abdomen, thorax, antenna, segments, mandible, proboscis, prolegs. Environmental changes: environment, environmental changes, adapt, natural changes, climate change, deforestation, pollution, urbanisation, invasive species, endangered species, extinct. <p>Previously introduced vocabulary: carbon dioxide, fish, bird, mammal, amphibian, reptile, skeleton, bone, vertebrate, invertebrate, backbone, names for animal body parts, names of common plants, photosynthesis.</p>	<ul style="list-style-type: none"> Reproduction; asexual reproduction, sexual reproduction, gestation, metamorphosis, gametes, zygote, zygote cell, branches, plaited, castings, embryo, adductor, penis, vagina, egg, progeny, postman. <p>Previously introduced vocabulary: life cycle, pollination, offspring, fertilise, fertilisation, sepal, filament, anther, stamen, pollen, petal, stigma, style, ovary, carpel, ovule, stem, bulb, roots, mammal, adult, baby, sperm, milk, live young.</p>	<ul style="list-style-type: none"> Classify: Carl Linnaeus, Linnaean system, flowering and non-flowering plants, variation. Microorganisms: bacteria, single-celled, microbes, microscopic, virus, fungi, fungus, mould, antibiotic, yeast, ferment, microbe, decompose.

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Habitats and Habitats						<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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; explain how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.
Vocabulary Progression						<ul style="list-style-type: none"> Evolution and inheritance: evolve, adaptation, inherit, natural selection, adaptive traits, inherited traits, mutation, theory of evolution, ancestor, biological parent, chromosome, genes, Charles Darwin. Other: selective breeding, artificial selection, breed, cross breeding, genetically modified food, cloning, DNA. <p>Previously introduced vocabulary: classification, offspring, characteristics, habitat, environment, adapt, variation, human, fossil, water, cells, names of different habitats, names of animals and their body parts, species, sedimentary rock, lava, igneous rock, metamorphic rock, magma, leaf, fertilisation.</p>

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Seasonal Changes	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> observe changes across the 4 seasons; classify and describe weather associated with the seasons and how day length varies. 					
Vocabulary Progression	<ul style="list-style-type: none"> Seasons: spring, summer, autumn, winter, seasonal change Weather: e.g. sun, rain, snow, wind, frost, ice, fog, cloud, hot/warm, cold, storm, wind, thunder, weather forecast Measuring weather: temperature, rainfall, wind direction, thermometer, rain gauge Day/length: night, day, daylight 					

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Force			<p>Forces and Magnets</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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. 		<p>Forces</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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 objects; recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect. 	
Vocabulary Progression			<ul style="list-style-type: none"> How things move: mass, movement, surface, distance, strength Types of forces: push, pull, contact force, non-contact force, friction Magnets: magnetic, magnetic field, magnetic force, bar magnet, horseshoe magnet, ring magnet, magnetic poles (north pole, south pole), attract, repel, compass Magnetic and non-magnetic material: e.g. iron, nickel, cobalt <p>Previously introduced vocabulary: metal, names of materials</p>		<ul style="list-style-type: none"> Types of forces: air resistance, water resistance, buoyancy, airbrake, Earth's gravitational pull, gravity, opposing forces, driving forces Mechanisms: levers, pulleys, gear teeth Measurements: weight, mass, kilogram (kg), Newton (N), scales, speed, fast, slow Other: streamlined, Earth <p>Previously introduced vocabulary: air, hot, space</p>	

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Light			<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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. 			<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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.
Vocabulary Progression			<ul style="list-style-type: none"> Light and seeing: dark, absence of light, light source, illuminate, visible, shadow, translucent, energy, block Light sources: e.g. candle, torch, fire, lantern, lightning Reflective light: reflect, reflection, surface, ray, scatter, reverse, beam, angle, mirror, shiny Sun safety: dangerous, glare, damage, UV light, UV rating, sunglasses, detect <p>Previously introduced vocabulary: opaque, transparent, sunlight, sun</p>			<ul style="list-style-type: none"> Reflective: periscope Sunlight: laser, visible spectrum, prism How light travels: light waves, wavelength, straight line, refraction <p>Previously introduced vocabulary: cause and properties of materials, absorb</p>

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Sound				<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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 faster as the distance from the sound source increases. 		
Vocabulary Progression				<ul style="list-style-type: none"> Parts of the ear; eardrums Making sound; vibration; vocal cords; particles Measuring sound; pitch, volume, amplitude, sound waves; quiet, loud, high, low, travel distance Other: soundproof, absorb sound 		

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Earth and Space					<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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 tilt of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky. 	
Vocabulary Progression					<ul style="list-style-type: none"> Solar system; star, planet; Names of planets; Mercury, Venus, Earth, Mars, Jupiter, Saturn, Neptune, Uranus Shape; spherical bodies, spheres Movement; rotate, spin, orbit, satellites Theories; geocentric model, heliocentric model, astronomer Day length; sunrise, sunset, shadow, time zone <p>Previously introduced vocabulary: Sun, moon, shadow, day, night, hour, light, reflect.</p>	

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Electricity				<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> identify common appliances that use electricity; construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers; decide 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. 		<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> associate the brightness of a lamp in the volume of a battery 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 switch points of switches; use recognised symbols when representing a simple circuit in a diagram.
Vocabulary Progression				<ul style="list-style-type: none"> Electricity; mains-powered, battery-powered, mains electricity, plug, appliances, devices Circuit; circuit, simple series circuit, complete circuit, incomplete circuit Circuit parts: bulb, cell, wire, buzzer, switch, motor, battery Materials: electrical conductor, electrical insulator Other: safety <p>Previously introduced vocabulary: name of materials</p>		<ul style="list-style-type: none"> Flow and amount of electricity: voltage, amper, resistance, electrons, volts (V), current Circuit: symbols, circuit diagram, component, function, filament Variables; dimmer, brighter, louder, quieter Types of electricity: natural electricity, house made electricity, solar panels, power station Other: positive, negative

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	
Materials	<p>Everyday Materials Pupils should be taught to:</p> <ul style="list-style-type: none"> • 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. 	<p>Use of Everyday Materials Pupils should be taught to:</p> <ul style="list-style-type: none"> • 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. 	<p>Rocks Pupils should be taught to:</p> <ul style="list-style-type: none"> • 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. 	<p>States of Matter Pupils should be taught to:</p> <ul style="list-style-type: none"> • 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 temperatures at which this happens in degrees Celsius (°C); • identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. 	<p>Properties and Changes of Materials Pupils should be taught to:</p> <ul style="list-style-type: none"> • 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 filtration, sieving and evaporation; • 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 new 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. 		
	Vocabulary Progression	<ul style="list-style-type: none"> • Names of materials: wood, plastic, glass, metal, water, rock, paper, cardboard, rubber, fabric. • Properties of materials: hard, soft, shiny, dull, smooth, rough, smooth, bendy, not bendy, transparent, opaque, waterproof, not waterproof, absorbent, not absorbent, shiny, dull. • Other: object. 	<ul style="list-style-type: none"> • Changing shape: squash, bend, twist, stretch. • Properties of materials: a strong, flexible, light, hard, opaque, elastic. • Other: suitability, recycle, solution. 	<ul style="list-style-type: none"> • Types of rock: sedimentary rock, igneous rock, metamorphic rock. • Properties of rocks: permeable, semi-permeable, impermeable, durable. • Names of rocks, e.g. marble, chalk, granite, sandstone, slate. • Formation of rocks and fossils: natural, human-made, magma, lava, molten rock, sediment, erosion, fossilisation, layers, bone fossil. • Soil: sandy, chalky, clay, peaty, loamy, topsoil, subsoil, bedrock, mineral, organic matter, compost. 	<ul style="list-style-type: none"> • States of matter: solids, liquids, gases, particles. • State changes: evaporate, condense, melt, freeze, heat, cool, boiling point, freezing point, boiling point, water vapour. • Water cycle: precipitation, evaporation, condensation, ground run-off, collection, underground water, bodies of water (sea, river, stream), water droplets, hail. • Other: strengthen. 	<ul style="list-style-type: none"> • Properties of materials: thermal conductor/insulator, magnetism, electrical resistance, transparency... • Mixtures and solutions: dissolved, substance, soluble, insoluble. • Changes of materials: reversible change, physical change, irreversible change, chemical change, burning, new material, product. • Separating: sieving, filtering, magnetic attraction. 	
			<ul style="list-style-type: none"> • Other: palaeontology. <p>Previously introduced vocabulary: soil, water, air.</p>	<p>Previously introduced vocabulary: temperature, rain, cloud, snow, wind, sun, hot, cold, absorb, carbon dioxide.</p>	<p>Previously introduced vocabulary: electrical conductor/insulator, bulb, translucent.</p>		

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Sustainability		<p>Biocapacity – Mini-beasts Pupils should be taught to:</p> <ul style="list-style-type: none"> • identify and name a variety of plants and animals in their habitats, including microhabitats; • 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; • 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 about and describe the basic needs of animals including humans, for survival (water, food and air); • find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. 	<p>Endure, Reuse, Recycle (LKS2) Pupils should be taught to:</p> <ul style="list-style-type: none"> • explain 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. 	<p>Endure, Reuse, Recycle (LKS2) Pupils should be taught to:</p> <ul style="list-style-type: none"> • recognise that environments can change and that this can sometimes pose dangers to living things. 		
	Vocabulary Progression		<ul style="list-style-type: none"> • Mini-beast: insect, invertebrate, hibernates, honey bee, earthworm (and other specific names) • Environment: local environment, habitat, microhabitat, biodiversity, ecosystem, conservation, protect, depend, advantage • Pollution: pollutant, noise, pollen • Food chain: consumer, predator, prey, food source, predator mini-beast • Decomposer: decompose, nutrients, healthy, unhealthy, food waste, natural materials, compost, leaf litter • Basic needs: shelter, suitable temperature <p>Previously introduced vocabulary: carnivores, omnivore, herbivore, plant, tree, plant and trees (e.g. flower), soil, water</p>	<ul style="list-style-type: none"> • Climate: climate change, greenhouse gas, greenhouse effect, global warming, carbon footprint • Reduce, reuse, recycle: waste, landfill, sustainable, biodegradable • Materials: litter, single-use plastic • Energy: renewable, non-renewable • Other: nutrients <p>Previously introduced vocabulary: material, pollution</p>	<ul style="list-style-type: none"> • Climate: climate change, greenhouse gas, greenhouse effect, global warming, carbon footprint • Reduce, reuse, recycle: waste, landfill, sustainable, biodegradable • Materials: litter, single-use plastic • Energy: renewable, non-renewable • Other: nutrients <p>Previously introduced vocabulary: material, pollution</p>	

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Science and Technology	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> identify and name a variety of common wild and garden plants, including deciduous and evergreen trees; 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; 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; observing and describe weather associated with the seasons and how day length varies. 	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> find out and describe how plants need water, light and a suitable temperature to grow and stay healthy; 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; describe the importance for humans of exercise, eating the right amounts of different types of food, and vitamins; 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 about people who have developed new materials (innovators). 	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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 that humans and some other animals have skeletons and muscles for support, protection and movement; 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; notice that light is reflected from surfaces; observe how magnets attract or repel each other and attract some materials and not others. 	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> recognise that environments can change and that this can sometimes pose dangers to living things; identify the different types of teeth in humans and their simple functions; 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); recognise that vibrations from sounds travel through a medium to the ear; identify common appliances that run on electricity; construct a simple series electrical circuit, identify and name its basic parts, including cells, wires, bulbs, switches and buzzers; recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. 	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird; 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; use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtration, sieving and evaporation; describe the movement of the Earth, and other planets, relative to the Sun in the solar system; find out about the work of naturalists and natural historians (see statutory); describe how scientific ideas have changed over time (see statutory). 	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> give reasons for classifying plants and animals based on specific characteristics; 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; recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago; use recognised symbols when representing a simple circuit in a diagram.

Progression of Vocabulary – Working Scientifically






KS1	LKS2	UKS2
aim arrows block diagram change compare cooperative test data describe difference different do equipment explore findings gather group identify (name) identifying, grouping and classifying investigate measure notice observe observing over time patterns pattern seeking pictures plan questions record researching review same scientific enquiry secondary sources	accurate bar chart chart classify conclusion (What have we found out?) criteria data develop diagram evaluate evidence explanation key making a test fair method observations practical enquiry prediction (What do you think will happen?) primary sources questioning recording relationships results (What happened?) secondary sources standard tests What do we change, what do we keep the same, what are we measuring?	accuracy causal relationship justify line graph precision readings refine repeat readings scatter graph support variables control variable (What do we keep the same?) independent variable (What do we change?) dependent variable (What do we measure?)

INCLUSION

When planning for children with SEND, teachers consider ways of minimising or reducing barriers so that children can fully take part and learn. This is done with an awareness and understanding of individual children's needs and preferred methods of working. This may mean meaning modifications or adjustments to ensure all children are included, or planning a 'parallel' activity for pupils with SEN so that they can work towards the same lesson objective as their peers, e.g. using audio recorders instead of written notes during investigations, accessing simulations or simple diagrams during the explanation of concepts, and making difficult-to-see processes visible through the use of a camera. For some children it may be necessary to pre-teach vocabulary or provide cards with symbols or images to support understanding, and classroom displays are used to support this. Teachers consider the questions that will be asked of groups and individuals, and the ways they will check pupils' understanding. Working scientifically skills are revisited and built on through the key stages; planning considers the objectives and outcomes more suited to the stage of learning of individual pupils, e.g. the support needed for a child to use equipment to take measurements.

Vocabulary

In order for pupils to be confident Scientists, we expect them to accurately and confidently use scientific vocabulary. The vocabulary that they need to know in each topic is mapped out on the progression of learning, ensuring children build on their vocabulary each year or each time they revisit a topic. This aligns with the vocabulary provided by knowledge organisers. In

translucent	
opaque	
shiny	
matt	
surface	

addition, this vocabulary is displayed on working walls with appropriate accompanying visuals or symbols, to support pupils' understanding.

Environment

All classrooms feature a Science working wall; regularly updated to reflect current learning, the working wall serves as a memory aid to children during lessons, displaying relevant prompts that will support pupils to recall and remember more over time. Science working walls include the symbols representing the focus enquiry type and 'working scientifically' skill for that week, supporting children's knowledge and understanding of these in context with their lessons and lessons where these may previously have been referenced. Key vocabulary is displayed, with appropriate visuals or symbols, and added to over the course of the topic gradually to support children's understanding of terms. Depending on the topic and learning journey, working walls may also include diagrams, images, children's work, children's post-it note questions or concept maps.



G&T

Gifted and talented children are challenged through differentiated tasks and optional POP tasks, which are provided in each lesson. These tasks enable the children to complete set tasks in any way they wish to show their understanding.

IMPACT

The impact and measure of this is to ensure children not only acquire the appropriate age related knowledge linked to the science curriculum, but also skills which equip them to progress from their starting points, and within their everyday lives.

All children will have:

- *A wider variety of skills linked to both scientific knowledge and understanding, and scientific enquiry/investigative skills.*
- *A richer vocabulary which will enable to articulate their understanding of taught concepts.*
- *High aspirations, which will see them through to further study, work and a successful adult life.*

Assessment

Assessment of Science is ongoing, with teachers assessing knowledge and skills throughout topics, using previous learning slides and through a range of enquiry types. Attainment is measured summatively during termly assessments, the results of which are recorded and analysed. Pupils complete a knowledge quiz at the end of each topic.

This helps teachers to assess who has gained the key knowledge detailed on the MTP. It is important that pupils have acquired and remembered this knowledge, to aid their retention of knowledge over time as well

as to help them build on learning in future topics and year groups.

Questions will take different formats, including multiple choice or open-ended questions. Quizzes and test are designed by teachers using key knowledge from the switched on Science scheme.



What's that sound? – Test

1. Finish the sentence.

The parts of our body we use to hear with are our _____

1 mark

2. Jane drives a tractor. She wears ear defenders. Why does she wear them?

1 mark

3. Richard hits the surface of his drum with a stick.

a) What does the surface do to produce a sound? _____

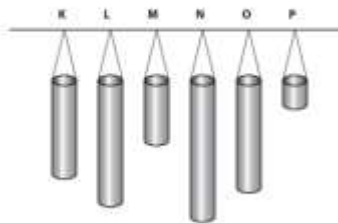
b) How can he make a louder sound with the drum? _____



1 mark

1 mark

4. Mike has made a set of tubular bells and hung them up.



Mike did not arrange the tubes in any order.

Write the letters of the tubes, K to P, in the correct order starting with the lowest pitched tube.

