SCIENCE

A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, 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.

The national curriculum for science aims to ensure that all pupils:

- develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
- develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them
- are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.

Pupils should be able to describe associated processes and key characteristics in common language, but they should also be familiar with, and use, technical terminology accurately and precisely. They should build up an extended specialist vocabulary. They should also apply their mathematical knowledge to their understanding of science, including collecting, presenting and analysing data. The social and economic implications of science are important but, generally, they are taught most appropriately within the wider school curriculum: teachers will wish to use different contexts to maximise their pupils' engagement with and motivation to study science.

KS1 Pupils should be taught:	**Lower KS2 Pupils should be taught:**	**Upper KS2 Pupils should be taught:**
The principal focus of science teaching in key stage 1 is to enable pupils to experience and observe phenomena, looking more closely at the natural and humanly constructed world around them. They should be encouraged to be curious and ask questions about what they notice. They should be helped to develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests, and finding things out using secondary sources of information. They should begin to use simple scientific language to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways. Most of the learning about science should be done through the use of first-hand practical experiences, but there should also be some use of appropriate secondary sources, such as books, photographs and videos. 'Working scientifically' is described separately in the programme of study, but must always be taught through and clearly related to the teaching of substantive science content in the programme of study. Throughout the notes and guidance,	The principal focus of science teaching in lower key stage 2 is to enable pupils to broaden their scientific view of the world around them. They should do this through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments, and by beginning to develop their ideas about functions, relationships and interactions. They should ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information. They should draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out. 'Working scientifically' is described separately at the beginning of the programme of study, but must always be taught through and clearly related to substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content.	The principal focus of science teaching in upper key stage 2 is to enable pupils to develop a deeper understanding of a wide range of scientific ideas. They should do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically. At upper key stage 2, they should encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They should also begin to recognise that scientific ideas change and develop over time. They should select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests and finding things out using a wide range of secondary sources of information. Pupils should draw conclusions based on their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings 'Working and thinking scientifically' is described separately at the beginning of the programme of study, but must

examples show how scientific methods and skills might be linked to specific elements of the content. Pupils should read and spell scientific vocabulary at a level consistent with their increasing word-reading and spelling knowledge at key stage 1.	Pupils should read and spell scientific vocabulary correctly and with confidence, using their growing word-reading and spelling knowledge.	always be taught through and clearly related to substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content. Pupils should read, spell and pronounce scientific vocabulary correctly.

Intent

Science at Anderton follows our Principles:

Science is good at Anderton…

- When children are discovering, exploring and making choices
- When children ask and answer their own questions
- When children are working like scientists to plan and record in a variety of ways, for different types of investigations
- When children explain their thoughts using scientific vocabulary to show their understanding
- When children work collaboratively and share ideas
- When it has links to real-life and includes real-life experiences
- When it is fun

Implementation

To ensure high standards of teaching and learning in science we implement a curriculum that is progressive throughout the whole school. Science is taught weekly through sequential and coherent patterns which build upon previous learning. Science focuses on the knowledge and skills stated in the National Curriculum. Pupils are encouraged to apply their Scientific skills in all areas of the curriculum, questioning their understanding of the world they experience, and developing ways to explore and answer their questions and to provide possible solutions which can be tested. Teachers plan lessons for their class using our progression of knowledge and skills documents. This progression document ensures the curriculum is covered and the skills/knowledge taught are progressive from year group to year group.

Impact

Our Science Curriculum is high quality, well thought out and is planned to demonstrate progression. At Anderton Primary School we measure the impact through regular assessment opportunities, discussions with the children and through evidencing the skills and knowledge within the children's written and practical learning. The children will be able to select appropriately from a variety of techniques to investigate and provide answers to questions, making links to the local and wider world.

Key Concepts (Curriculum Overview)

	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Animals including humans	Explore the natural world around them, flora and fauna.	Identify, name and compare common animals. Name the human body parts and the senses.	Explore the basic needs of animals for survival.	Explore that animals require nutrition and this is provided through food. Explore skeletons and muscles of animals.	Learn the basic functions of the digestive system in humans. Identify the different types and function of teeth in	The developing human body from birth to old age.	Learn the main parts and functions of the human circularity system. Explore the impact of lifestyle choices on human bodies.

					humans. Explore food chains.		
Plants	Explore and making observations of the natural world around them.	Identify and name a variety of common plants and describe the basic structure.	Identify the basic needs of plants.	Identify the basic functions of each part of a plant. Explore the life cycle of flowering plants.			
Everyday materials		Identify, name and group a variety of everyday materials.	Compare the suitability of materials and their properties.				
Seasonal Changes	Understand changes in the natural world.	Observe changes across the four seasons including weather.					
Living Things and their Habitats			Compare the differences between living, dead and never been alive and habitats.		Explore the use of classification keys to group living things.	Life cycles of different groups of animals and plants.	Classifying groups of animals and plants based on specific characteristics.
Rocks and Soils				Compare and group different types of rocks based on properties.			
Light				Recognise that dark is the absence of light. Explore reflection and shadows.			Recognise that light appears to travel in straight lines.
Forces and Magnets				Explore how objects move on different surfaces and the forces of magnets.		Identify the effect of air resistance, water resistance and friction when learning about gravity.	
States of Matter	Understand importance changes and processes in the natural world.				Explore solids, liquids and gases and the effects of these in evaporation and condensation in the water cycle.		
Sound					Identify how sounds are made and how these travel through vibrations.		
Electricity					Construct a simple series electrical circuit, identifying the basic parts.		Compare and give reasons for variations in how components function

Properties and changes of materials						Demonstrate that dissolving, mixing and changes of state are reversible changes explain that some changes result in the formation of new materials.	
Earth and Space						Describe the movement of The Earth, and other planets relative to the Sun in the solar system.	
Evolution and Inheritance							Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.

Skills and Knowledge Progression – Working Scientifically

	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
EXPLORING / OBSERVING	look closely at/notice features in the natural world including animals and plants, weather and seasons, and natural materials e.g. water, ice, sand, stones, etc.	Begin to use simple scientific language (from Y1 PoS) to talk about or record what they have noticed. Use observations to make suggestions and / or ask questions. Look / observe closely and communicate changes over time. Look / observe closely and communicate the features or properties of things in the real world. Observe closely using their senses.	Use simple scientific language from the Y2 PoS to talk about / record what they have noticed. Use observations to make suggestions and / or ask questions. Observe and describe simple processes / cycles / changes with several steps (e.g. growth cycle, simple food chain, saying how living things depend on one another). Observe closely and communicate with increasing accuracy the features or properties of things in the real world.	Observe and record relationships between structure and function (linked to Y3 PoS). Observe and record changes /stages over time (linked to Y3 PoS). Explore / observe things in the local environment / real contexts and record observations (linked to Y3 PoS) – see 'Communicating' section also relinks to vocabulary.	Suggest their own ideas on a concept and compare these with what they observe / find out. Use observations to suggest what to do next. Discuss ideas and develop descriptions from their observations using relevant scientific language and vocabulary (from Y4 PoS). Observe and record relationships between structure and function or between different parts of a processes (linked to Y4 PoS). Observe and record changes / stages over time (linked to Y4 PoS).	Use their developing scientific knowledge and understanding and relevant scientific language and terminology to discuss, communicate and explain their observations (incl. more abstract ideas from Y5 PoS (e.g. friction, air resistance, forces, Earth and space, reversible and irreversible changes). Evaluate their observations and suggest a further test, offer another question or make a prediction. Observe (including changes over time) and suggest a reason for what they notice.	Use correct scientific knowledge and understanding and relevant scientific language to discuss their observations and explorations (linked to Y6 PoS). Identify changes that have occurred over a very long period of time (evolution) and discuss how changes have impacted the world. Explore more abstract systems / functions / changes / behaviours and record their understanding of these (e.g. the relationship between diet, exercise, drugs, lifestyle and health; evolutionary changes; how light travels).

GROUPING AND CLASSIFYING	Notice similarities, notice differences in the natural world, including plants and animals; talk about what they know and understand about similarities and/or differences, e.g. in relation to the natural world around them and other environments they have learnt about through real experiences or books read at home or school	Name / identify common examples and some common features. With help, decide how to sort and group objects, materials or living things. Name basic features of objects, materials and living things. Say how things are similar or different. Compare and contrast simple observable features / characteristics of objects, materials and living things.	Name / identify common examples, some common features or different uses. Sort and group objects, materials or living things by observable and/or behavioural features. Compare and contrast… a variety of things [objects, materials or living things] - focusing on the similarities as well as the differences.	Decide ways and give reasons for sorting, grouping, classifying, identifying things / objects, living things, processes or events based on specific characteristics. Compare and contrast and begin to consider the relationships between different things (e.g. structures of plants, functions of plant parts, diets, skeletons of humans and other animals, changes over time, etc.). Record similarities as well as differences (e.g. what do all skeletons have? as well as the differences between skeletons.	Make a simple guide to local living things. Use guides or simple keys to classify / identify [animals, flowering plants and non-flowering plants]. Use their observations to identify and classify. Begin to give reasons for these similarities and differences. Record similarities as well as differences and / or changes related to simple scientific ideas or processes or more complex groups of objects / living things / events (e.g. evaporation and condensation, different food chains, different electrical circuits).	Suggest reasons for similarities and differences. Compare and contrast things beyond their locality and use these similarities and differences to help to classify (e.g. features of animals, life cycles of different living things, melting compared with dissolving, etc). Use secondary sources of information to identify and classify. Decide which sources of information (and / or equipment and / or test) to help identify and classify.	Recognise the importance of classification to the scientific world and form a conclusion from their sorting and classifying. Compare and contrast more complex processes, systems, functions (e.g. sexual and asexual reproduction). Construct a classification key / branching database using more than two items. Compare and contrast things beyond their locality and discuss advantages / disadvantages, pros / cons of the similarities and differences. Use research* to identify and classify things. Use classification systems, keys and other information records [databases] to help classify or identify things.
QUESTIONING	show an interest in and be curious about the natural world; ask questions about what they notice/observe or changes that occur, e.g. changes in plants throughout the seasons	Ask simple questions about what they notice about the world around them. Demonstrate curiosity by the questions they ask.	Raise their own logical questions based on or linked to things they have observed. With help / scaffolds, begin to ask questions such as 'What will happen if…?"	Explore their own ideas about 'what if….?' scenarios e.g. humans did not have skeletons. Ask questions such as 'What if we tried….? or 'What if we changed…?' Begin to understand that some questions can be tested in the classroom and some cannot. Within a group suggest questions that can be explored, observed, tested or investigated further. Within a group suggest relevant questions about what they observe and about the world around them.	Ask / raise their own relevant questions with increasing confidence and independence that can be explored, observed, tested or investigated further. Ask questions such as 'What will happen if…?" or 'What if we changed…? (linked with Y4 PoS). Choose / select a relevant question that can be answered [by research or experiment / test].	Recognise scientific questions that do not yet have definitive answers (linked to Y5 PoS). Refine a scientific question so that it can be tested e.g. 'What would happen to… if we changed…?' Decide whether their questions can be answered by researching or by testing. Independently ask their own scientific questions taking some ownership for finding out the answers.	Recognise scientific questions that do not yet have definitive answers (linked to Y6 PoS). Refine a scientific question to make it testable i.e. ask a testable question which includes the change and measure variables, e.g. what would happen to…if we changed…? e.g. What effect would we have on … if we…? e.g. How would exercise affect the pulse rate? Use observations to suggest a further (testable or research) question. Independently ask a variety of scientific questions and decide the type of enquiry needed to answer them.
RESEARCH	talk to people (visits/visitors/family), think of questions to ask	Ask people questions (e.g. an expert or hot-seating). Use simple primary and	Talk about how useful the information source was and express opinion	Find things out using a range of secondary sources of information	Make decisions about which information to use from a wide range of	Find out how scientific ideas have changed / developed over time	Research how scientific ideas have developed over time and had an

	to find out about plants, animals, seasons, processes; use first hand experiences/use secondary sources, (e.g. books, photographs, internet).	secondary sources (such as objects, books and photographs) to find things out.	about findings. Make suggestions about who to ask or where to look for information. Ask people questions to help them answer their questions. Use simple and appropriate secondary sources (such as books, photographs, videos and other technology) to find things out / find answers.	(e.g. books, photographs, videos and other technology).	sources and make decisions about how to present their research. Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations.	(linked to Y5 PoS). Articulate and explain findings from their research using scientific knowledge and understanding. Make decisions about which information to use from a wide range of sources.	impact on our lives. Use evidence from a variety of sources to justify their ideas Recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact. Interview people to find out information
MODELLING	With support, copy simple movements (dance / drama) to act out their science.	With help, follow movements (dance / drama) to act out their science.	Act out something to represent something else about the world around us (e.g a life cycle).	Act out or make a model of something to represent something in the real world using appropriate scientific vocabulary verbally.	Make a visual representation or a model of something to represent something they have seen or a process that is difficult to see. Suggest their own ideas on a concept and compare these with models or images.	Perform / create simple models to exemplify scientific ideas using scientific terminology where appropriate (e.g. spheres to represent movements of the Sun and Earth, solar system models, shadow clocks, a simple lever or mechanism).	Make / perform and use their own versions of simple models to describe and explain scientific ideas (e.g. circulatory system drama, periscopes to explain how light travels, burglar alarm to explain components in a circuit).
COLLABORATING	With support discuss ideas in a group and listen to the ideas of others. Work with others on a science task.	Share ideas in a group and listen to the ideas of others. Work with others on a science task.	Share ideas in a group and listen to the ideas of others. Work cooperatively with others on a science task making some choices.	Begin to make some decisions about an idea within a group from a list of choices (e.g. let's put them all in a pile first OR I think we should try…). With help; support, listen to and acknowledge others in the group (e.g. Yes. I prefer that one too). Build on / add to someone else's idea. (e.g. we could use x as well as y). Begin to understand that it is okay to disagree with their peers and offer a reason for their opinion.	Make some decisions about an idea within a group (e.g. I think we should find out by testing…) Increasingly support, listen to and acknowledge others in the group. Build on / add to someone else's idea to improve a plan. Understand that it is okay to disagree with their peers and offer reasons for their opinion.	Propose their own ideas and make decisions with agreement in a group. Support, listen to and acknowledge others in the group e.g. Yes. I prefer that one too. Check the clarity of each other's suggestions e.g. are you saying you think this one is a herbivore? Build on / add to someone else's idea to improve a plan or suggestion. Understand that it is okay to disagree with their peers and offer a reasons for their opinion.	Propose their own ideas and make decisions with agreement in a group. Support, listen to and acknowledge others in the group. Check the clarity of each other's suggestions. Build on / add to someone else's idea to improve a plan or suggestion. Understand that it is okay to disagree with their peers and offer reasons for their opinion.
PLANNING AND TESTING	make suggestions, show resilience, work with others.	With help, carry out a simple test / comparative test. With help, make a simple prediction or suggestion about what might happen. Begin to suggest some ideas e.g. choose which equipment to use, choose which materials to test from a	Carry out simple comparative tests as part of a group, following a method with some independence. Make a simple prediction about what might happen and try to give a vague reason (even though it might not be correct). With support, make suggestions on a	Help to decide about how to set up a simple fair test and begin to recognise when a test is not fair. Make a prediction based on everyday experience. With support / as a group, set up simple practical enquiries including comparative and fair tests e.g. make a	Carry out simple fair tests with increasing confidence investigating the effect of something on something else (linked to Y4 PoS). Start to make their own decisions about the most appropriate type of science enquiry they might use to answer scientific questions (is a	Carry our fair tests and other investigations with increasing independence. Suggest more than one possible prediction and begin to suggest which is the most likely. Justify their reason with some knowledge and understanding of the scientific concept. Make	Predict what a graph might look like before collecting results. Make a hypothesis where they say how one thing will affect another and give a reason for their suggestion with a developing understanding of the scientific concept. Identify variables to

		selection. Talk about ways of setting up a test.	method for setting up a simple comparative test. Talk about a practical way to find answers to their questions.	choice from a list of a things (variables) to change when conducting a fair test. (e.g. choose which magnets to compare and which method to use to test their strength). As a group, begin to make some decisions about the best way of answering their questions. Find / suggest a practical way to compare things e.g. rocks, magnets.	fair test the best way to investigate their question?) Make a prediction based on the knowledge acquired from previous explorations / observations and apply it to a new situation. Explain their planning decisions and choices. Make some of the planning decisions about what to change and measure / observe. Begin to recognise when a fair test is necessary.	decisions about which variables to change, measure and keep the same (linked to the appropriate units in the Y5 PoS). Make most of the planning decisions for an investigation. Recognise when it is appropriate to carry out a fair test.	change, measure and keep the same in order for a test to be fair. Independently plan investigations and explain planning decisions. Decide when it is appropriate to carry out a fair test investigation, comparative test or alternative.
USING EQUIPMENT AND MEASURES	use senses/use simple equipment to make observations, (e.g. magnifiers, pipettes, egg timers, digital microscopes, etc).	Measure using non-standard units e.g. how many lolly sticks / cubes / handfuls, etc. Observe closely, using simple equipment (e.g. hand lenses, egg timers). Use senses to compare different textures, sounds and smells.	Measure using non-standard and simple standard measures (e.g. cm, time) with increasing accuracy. Begin to make decisions about which equipment to use. Correctly and safely use equipment provided to make observations and/or take simple measurements.	Collect data from their own observations and measurements using notes / simple tables / standard units. Help to make some decisions about what observations to make, how long to make them for, the type of simple equipment that might be used and how to work safely. Make simple accurate measurements using whole number standard units, using a range of equipment. Gather data in a variety of ways to help in answering questions. Use equipment accurately to improve the detail of their measurements / observations (e.g. microscopes, measuring syringes, measuring cylinders, hand lenses).	Begin to identify where patterns might be found and use this to begin to identify what data to collect. Make more of the decisions about what observations to make, how long to make them for and the type of equipment that might be used. Recognise obvious risks and how to keep themselves and others safe. Learn how to use new equipment, such as data loggers and measure temperature in degrees Celsius (°C) using a thermometer. Collect data from their own observations and measurements, using notes / simple tables / standard units. Make accurate measurements using standard units [and more complex units and parts of units] using a range of equipment and scales.	Make their own decisions about what observations to make or measurements to use and how long to take them for (recognising the need for repeat readings on some occasions). Take measurements using a range of scientific equipment with increasing accuracy and using more complex scales / units. Identify possible risks to themselves and others and suggest ways of reducing these. Choose the most appropriate equipment and make accurate measurements.	Decide whether to repeat any readings and justify the reason for doing so. Make their own decisions about what measurements to take (and begin to identify the ranges used). Make, and act on, suggestions to control / reduce risks to themselves and others. Use equipment fit for purpose to take measurements which are increasingly accurate and precise. Decide the most appropriate equipment to use to collect data.
COMMUNICATING	Use simple vocabulary to name and describe objects, materials, living things and environments.	Communicate their ideas to a range of audiences in a variety of ways. Complete a pre-constructed table / chart using picture records or simple words. Contribute	Record and communicate their findings in a range of ways to a variety of audiences. Use simple scientific language with increasing accuracy (from Y2 PoS). Record simple	Record and present findings using simple scientific language and vocabulary from the Y3 PoS, including discussions, oral and written explanations,	Record findings using relevant scientific language and vocabulary (from Y4 PoS), including discussions, oral and written explanations, notes, drawings	Use their developing scientific knowledge and understanding and relevant scientific language and terminology to communicate more abstract concepts (linked	Articulate understanding of the concept using scientific language and terminology when describing abstract ideas, observations and findings (linked to the Y6 PoS).

		to a class display. Add annotations to drawings or photographs. Begin to use some simple scientific language from Y1 PoS. Record simple visual representations of observations made.	data with some accuracy to help in answering questions; With support or using frameworks, make decisions about how to complete a variety of tables/charts (e.g. a 2 column table, tally charts, Venn diagram, pictograms, block graphs with 1:1 scale). Present findings in a class displays. Sequence / annotate photographs of change over time. Produced increasingly detailed drawings which are labelled / annotated.	notes, annotated drawings, pictorial representations, labelled diagrams, simple tables, bar charts (using scales chosen for them), displays or presentations. With scaffold / support record, and present data in a variety of ways to help in answering questions. Communicate their findings in ways that are appropriate for different audiences. (linked to Y3 PoS).	(annotated), pictorial representations, labelled diagrams, tables and bar charts [where intervals and ranges agreed through discussion], displays or presentations. Begin to select the most useful ways to collect, record, classify and present data from a range of choices. Make decisions on how best to communicate their findings in ways that are appropriate for different audiences.	to Y5 PoS). Present and explain their findings through talk, in written forms or in other ways (e.g. using technology) for a range of audiences / purposes. Record data and results of increasing complexity using different formats e.g. tables, annotated scientific diagrams, classification keys, graphs and models. Make decisions about the most appropriate way of recording data.	Record data and results of increasing complexity using scientific diagrams and labels, recognised symbols, classification keys, tables, bar and line graphs, and models. Make decisions about how to present and explain their findings through talk, in written forms or in other ways (e.g. using technology).
DESCRIBING RESULTS / LOOKING FOR PATTERNS	Talk about changes they notice and changes over time, based on real experiences or books read to them at home or school.	Use recordings to talk about and describe what happened. Sequence photographs of an event / observation.	With guidance, begin to notice patterns in their data e.g. order their findings, sequence best to worst, say what happened over time, etc. Recognise if results matched predictions (say if results were what they expected). Use their recordings to talk about and describe what has happened.	With scaffold / support, describe and compare the effect of different factors on something (e.g. we noticed that larger magnets are not always stronger). With help, look for changes and simple patterns in their observations, data, chart or graph. Use their results to consider whether they met their predictions.	Notice / find patterns in their observations and data. (Describe the effect of something on something else). (e.g. as I lengthen the ruler I notice that the pitch gets lower). With some independence, analyse results / observations by writing a sentence that matches the evidence i.e. deciding the important aspect of the result and summarising in a conclusion (e.g. metals tend to be good conductors of electricity).	Describe straightforward patterns in results linking cause and effect e.g. using er or the word 'more' (e.g. the longer, thinner shapes move through the water more quickly OR the larger the wings, the longer it takes the spinner to fall). Look for / notice relationships between things and begin to describe these. Comment on the results and whether they support the initial prediction.	Spot unexpected results that do not fit the pattern (anomalies). Identify patterns in results collected and describe them using the change and measure variables (causal relationships) (e.g. as we increased the number of batteries the brightness the bulb increased.
EXPLAINING RESULTS	▪ Talk about what they notice/observe in the natural world, e.g. features of animals, plants, natural materials, seasons, weather, etc; draw pictures e.g. observational drawings of plants, mini-beasts, take photographs, make models or record in scrapbooks.	Begin to use simple scientific language (from Y1 PoS) to talk about what they have found out or why something happened.	Begin to use simple scientific language (from Y2 PoS) to explain what they have found out. Give a simple, logical reason why something happened (e.g. I think … because…).	Use their experience and some evidence or results to draw a simple conclusion to answer their original question. Write a simple explanation of why things happened (using the word 'because') and using simple scientific language and vocabulary from the Y3 PoS.	Begin to develop their ideas about relationships and interactions between things and explain them. Use relevant scientific language and vocabulary (from Y4 PoS) to begin to say / explain why something happened.	Use their scientific knowledge and understanding and appropriate scientific language and terminology (linked to Y5 PoS) to explain their findings and data and answer their initial question. Draw a valid conclusion (explain why it happened) based on their data and observations (from Y5 PoS).	Identify evidence that refutes or supports their ideas. Independently form a conclusion which draws on the evidence from the test (linked to Y6 PoS). Use scientific language and terminology (linked to Y6 PoS) to explain why something happened.
TRUSTING RESULTS			Begin to discuss if the test was unfair.	Say whether what happened was what they expected and notice any	Use results to suggest improvements, new questions and / or	Begin to recognise how repeated readings improve the reliability of	Be able to suggest reasons for unexpected results (anomalies).

				results that seem odd. Begin to recognise when a test is not fair and suggest improvements.	predictions for setting up further tests. Compare their results with others and give reasons why results might be different.	results. Compare results with others and comment on how reliable they are.	Describe how to improve planning to produce more reliable results. Say how confident they are that their results are reliable and give a reason.
Skills and Knowledge Progression – National Curriculum							
	EYFS	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Animals including Humans	Explore the natural world around them, making observations and drawing pictures of animals. Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class;	Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. Identify and name a variety of common animals that are carnivores, herbivores and omnivores. Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, and 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.	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	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.	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.	Describe the changes as humans develop to old age.	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 with animals, including humans.
Plants	Explore the natural world around them, making observations and drawing pictures of plants. Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class;	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.	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 *(and how changing these, affects the plant).*	Identify, locate and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant. Investigate the way in which water is transported within plants. Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.			

Everyday 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, rock *(and brick, paper and cardboard).* 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.	Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, water, 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 (applying a force).				
Seasonal Changes	Understand some important processes and changes in the natural world around them, including the seasons.	Observe changes across the four seasons. Observe and describe weather associated with the seasons and how day length varies.					
Living Things and their Habitats			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 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.		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. Construct and interpret a variety of food chains, identifying producers, predators and prey. Recognise that environments can change and that this can sometimes pose dangers to living things.	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.	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.
Rocks and Soils				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.			
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 can change.			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.
Forces and Magnets				Compare how some 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 *(like and unlike poles).* Predict whether two magnets will attract or repel each other, depending on which poles are facing.		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. Friction, air resistance and water resistance are forces which slow down moving objects. Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.	
States of Matter	Understand some important processes and				Compare and group materials together,		

	changes in the natural world around them, including changing states of matter.				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). Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.		
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. Find patterns between the volume of a sound and the strength of the vibrations that produced it. Recognise that sounds get fainter as the distance from the sound source increases.		
Electricity					Identify common appliances that run on electricity. Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery. Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp, lights in a simple series circuit. Recognise some common conductors and insulators, and associate metals with being good conductors.		Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches. Use recognised symbols (at least: cells, wires, switches, bulbs, buzzers and motors) when representing a simple circuit in a diagram.

Properties and changes of 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.	
Earth and 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.	
Evolution and Inheritance							Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.
Key Vocabulary							
	EYFS	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Working Scientifically	Name	Identify Notice Hear, see, taste, touch, smell Hard/ soft What, how, why Because Table compare	Describe Observe Sort Label Test	Data Measure Record Investigate Explain variables Data logger Chart graph	Systematic Conclusion Evidence Scientific Predict Diagram Fair test independent variables Dependent variables Line graph	Precision Findings Evaluate Causal relationships control Report	Support Refute
Plants		Trees - deciduous, evergreen, oak, horse chestnut, apple, willow, sycamore, fir, pine , holly, etc Wild flowering plants - daisy, dandelion, clover, Garden plants – crocus, daffodil, bluebells, etc Parts of plants – roots, branch, trunk, leaf, flower, petal, seeds, twigs	Trees - ash, birch, beech, common lime, Garden plants – rose, grass, vegetable plants such as potato, tomato, strawberry Parts of plants – bulbs, stalk, Need of plants – water, light, heat, soil, temperature	Trees rowan, common lime, sweet chestnut, horse chestnut, cherry Wild flowering plants - cleavers, coltsfoot, garlic mustard, mallow, mugwort, plantain, red clover, self heal, shepherd's purse, sorrel, spear thistle, white campion, white deadnettle and yarrow. Garden plants – crocus, Fushia Parts of a flower – stamen (anther + filament), carpel (stigma + style + ovary + ovule) Processes – pollination, fertilisation, germination			
Animals including humans		Birds, fish, amphibians, reptiles, mammals · Feathers, scales, gills, fins,	· Stages of growth of many insects – egg, larva, pupa, adult invertebrates	Nutrition Diet Vitamins, minerals, fats, proteins and carbohydrates	Digestive system –, oesophagus, stomach, acid, small intestine	Gestation Foetus Fertilisation Species Baby Toddler Adolescent Adult	Circulatory system – heart, blood, veins, arteries, pulse, clotting

		hair, land, water, bones, skeleton Carnivores, herbivores, omnivores · Meat, plants · (Common parts/structures of animals) · (Names of animals that can be found in the school grounds) Badger fox, squirrel, woodpecker, pigeon, rat, newt, bee, pond skater,	– ladybirds, butterflies, dragonflies, etc amphibians – smooth newt, common frog, toad · Stages of life – baby, toddler, child, teenager, adult growth, nutrition, respiration (breathing is part of this) · Hygiene – clean, wash, germs healthy, grow, strong, energy	skeletons – protect, support and aid movement, joints, hinge, ball and socket ribs, spine, skull	Protein, vitamin, mineral, carbohydrate, fats, energy, growth, repair. Saliva Teeth – Incisors, canines, premolars, molars Function Foodchain – producer, consumer, predator, prey	Elderly person Puberty Hormones Pituitary gland	Diet – balanced, vitamins, minerals, proteins, carbohydrates, sugars, fats Drugs – caffeine, nicotine, alcohol, cannabis, cocaine, heroine Lifestyle healthy, unhealthy
Living things and their habitats			Habitat, micro habitat Pond, meadow, log pile, woodland, river, plant, Trees - ash, birch, beech, common lime, Garden plants – rose, grass, vegetable plants such as potato, tomato, strawberry, sunflower Parts of plants – bulbs, stalk, Need of plants – water, light, heat, soil, temperature Invertebrates – snail, slug, woodlouse, spider, beetle, fly, Pond animals – pond skater, snail, pond snail, leech, common frog, newt		Habitat, lake, beach, cliff Organism Trees – elder, laurel, silver birch, copper birch, holm oak, Wild flowering plants - cleavers, coltsfoot, daisy, dandelion, garlic mustard, mallow, mugwort, plantain, red clover, self heal, shepherd's purse, sorrel, spear thistle, white campion, white deadnettle and yarrow. Garden plants – clematis, chamelion, geranium, marigold, Invertebrates – Pond animals – water slater, ramshorn snail, smooth newt, nymph	development – egg, larva, pupa, nymph, adult, metamorphosis Parts of a flower – petal, stamen (anther + filament), carpel (stigma + style + ovary + ovule) Processes – pollination, fertilisation, germination	Vertebrate, invertebrate Kingdoms: 'micro-organism' Species Prokaryotes • Bacteria • Blue-green algae • Protoctists • Amoeba • Paramecium Kingdom Protoctista . Fungi • Moulds • Mushrooms • Yeast
Materials	Senses: touch, see, hear, smell and taste	Types of materials: wood, plastic, glass, metal, water, rock, brick, fabric, sand, paper, flour, butter, milk, soil hard/soft, stretchy/not stretchy bend, cut, stretch, twist	Types of materials: polystyrene, silver, gold, iron, natural sponge, cardboard, jelly, oil elastic, dull, transparent/not transparent, sticky/not sticky, crumble, squash, wring, squeeze	Names of rocks – Chalk, limestone, granite, basalt, sandstone, flint, slate, shale, marble Types of rock – Sedimentary, metamorphic, igneous Types of minerals – Calcite, feldspar, topaz, diamond, talc, corundum Properties of rocks – Hard/soft, permeable/impermeable Processes – Heat, pressure, erosion, transportation, deposition, melt, solidify Size of rocks – Grain, pebbles Rock Crystals, layers Early areas of land – Gondwana, Pangea Land formations – Plates,	States of matter - Solid, liquid and gas Examples of gases (at room temperature and pressure) – Oxygen, hydrogen, helium, carbon dioxide, methane Examples of liquids (at room temperature and pressure) – Water, milk, juice, petrol, oil Examples of solids (at room temperature and pressure) –Wood, rocks, metal, plastic, glass, wool, leather, etc Processes – Melting, condensation, evaporation, solidifying, freezing Water cycle Water vapour Steam Heating Cooling	Thermal conductivity – thermal conductor, thermal insulator Electrical conductivity – electrical conductor, electrical insulator Dissolving – Solvent, solution, solute, soluble, insoluble, solid, liquid, particles, suspensions Separating materials – Sieve, filter, evaporate, condense	

				volcanoes, mountains, valleys			
Seasonal changes		Seasons; spring, summer, autumn, winter Year, months, days Hot, warm, mild, cold Sunny Cloudy Rain, sleet, snow, hail, thunder, lightning, rainbow Wet, damp, dry Windy, breezy, Temperature	Degrees Celsius Thermometer Weather vane Anemometer Gust Storm Heat wave Frost hail				
Light				Simple comparisons: dark, dull, bright, very bright Comparative vocabulary: brighter, duller, and darker Superlative vocabulary: brightest, dullest, and darkest Opaque, translucent, transparent Shadow – block, absence of light Reflect – bounce, mirror, reflection			Reflect – bounce, mirror, direction, travel, speed, reflection light source Sun – sunset, sunrise, position
Electricity					Electricity Volts, (V) Appliances: fridge, freezer, TV, computer, iron, kettle, etc Series circuit, current Components: battery, cell, bulb (lamp), bulb (lamp) holder, buzzer, crocodile clip, leads, wires, switch brighter, duller Conductor, insulator		Volts, (V) slow, fast, quiet, loud Resistance
Forces and magnets				Magnets – bar and horseshoe Attract, repel North and south poles Magnetic, Magnetic field force		gravity, friction, air resistance, upthrust, weight Measuring forces: Newton meter, Newtons (N) Particles Surface area	
Sound					bang, blow, shake, and pluck Loudness – quiet, quieter, quietest, loud, louder and loudest Pitch - low, lower, lowest, high, higher, and highest Vibrations, Source ear		
Earth and Space						Day and night - Earth, axis, rotate Solar system – Star = Sun, Planets = Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune (Pluto was classified as Dwarf	

						planet in 2006) Phases of the Moon - full moon, gibbous moon, half moon, crescent moon, new moon, waxing ,waning Moon's orbit: 29.5 days, lunar month Orbit, planets, revolve, sphere Universe Galaxy constellation	
Evolution and Inheritance							Evolution, evolve • Natural selection • Survival Kent Scheme of Work for Primary Science, 2019. 4 • Reproduction • Offspring, parents, siblings • Environment • Variation • Fossils; ammonites, belemnites, micrasters, etc