

Science Longterm Overview

2020 - 2023



National Curriculum (overview of learning)

KS1 – 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.

LKS2 – 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.

UKS2 - 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 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.

Curriculum Intent	To develop an aspirational and inspirational curriculum with a breadth of opportunities that is creative and challenging and develops key knowledge and skills that are enriched by visits and experiences. To ensure children understand the world around them through the specific disciplines of physics, chemistry and biology and retain prior learning and subject knowledge. This curriculum shall be inclusive (SEND) and incorporate cross curricular learning that is fun, exciting, relevant and engaging e.g. science through stories, exploring famous scientists and inventors. We will deliver a science curriculum that has a positive impact on pupils' behaviour and safety and contributes very well to their spiritual, moral, social and cultural development. We want to develop children's confidence and expressive skills by taking part in science visits and extra curricular clubs
Implementation	We implement our curriculum following the National Curriculum 2014 framework. We want to encourage children to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes. We shall develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics and encourage children to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. We will develop understanding of the nature, processes and methods of science by working scientifically through different types of science enquiries that help them to answer scientific questions about the world around them We will embed 'working scientifically' within the content of chemistry, biology and physics focusing on the key features of scientific enquiry so that children learn to use a variety of approaches to answer relevant scientific questions. We will develop children's spoken language cognitively, socially and linguistically by using discussion and scientific vocabulary and articulating scientific concepts clearly and precisely. We aim to ensure that children are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future. We want to develop children's confidence and expressive skills by taking part in science visits e.g. UCAS science festival, class trips, Mad science assemblies and science clubs e.g. Mad Science club, STEM lunchtime club, British Science week etc..
Measuring the Impact	Assessment of secure understanding of each key block of knowledge and concepts. Assess children's use of technical terminology, that they are using it accurately and precisely, building up an extended specialist vocabulary. Assess that they can apply their mathematical knowledge to their understanding of science, including collecting, presenting and analysing data. To provide a portfolio of evidence of breadth of opportunities, visits and experiences from photographs, videos, book scrutiny, teacher discussion, governor reports and pupil interviews.

	<u>EYFS</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Year 6</u>
Scientific knowledge and Conceptual Understanding Biology Physics	Plants Animals including humans	Plants Animals including humans	Plants Animals including humans Living things and their habitats	Plants Animals including humans	Living things and their habitats Animals including humans	Living things and their habitats Animals including humans	Animals including humans Living things and their habitats Evolution and inheritance
	Seasonal change	Seasonal change Scientists and inventors	Seasonal change Scientists and inventors	Forces and magnets Light	Sound Electricity	Earth and space Forces	Light Electricity
Chemistry	Everyday materials	Everyday materials	Uses of Everyday materials	Rocks	States of matter	Properties and changes of materials	

BIOLOGY

	EYFS	Y1	Y2	Y3	Y5	Y5	Y6
Animals, including humans	Myself (body, senses, similarities and differences) Healthy eating and hygiene Animals in hot and cold places Animals and their young.	Types of Animals 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. Parts of Animals 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.	Feeding and Exercise 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) describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. Living Things explore and compare the differences between things that are living, dead, and things that have never been alive notice that animals, including humans, have offspring which grow into adults.	Movement and Feeding 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.	Human Nutrition 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.	Life Cycles 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 the changes as humans develop to old age.	Our Bodies identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function describe the ways in which nutrients and water are transported within animals, including humans. Evolution and Inheritance<i>This unit also links to Y3 Rocks and Soils.</i> 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.
Plants	Spring, planting and growing	Plants 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.	Growing Plants 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	What Plants Need 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. Parts of Plants <i>This unit also links to Y5 Life Cycles.</i> identify and describe the functions of different parts of flowering plants: roots, stem/ trunk, leaves and flowers investigate the way in which water is transported within plants explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.			
Living things	Animals/bugs and where to find them		Habitats 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.		Grouping Living Things 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. Dangers to Living Things recognise that environments can change and that this can sometimes pose dangers to living things construct and interpret a variety of food chains, identifying producers, predators and prey.		Classifying Living Things 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.

PHYSICS

	EYFS	Y1	Y2	Y3	Y4	Y5	Y6
Earth and space	Seasonal Change (Autumn-winter / winter to spring/ spring to summer) The weather	Changing Seasons observe changes across the four seasons observe and describe weather associated with the seasons and how day length varies.				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.	
Electricity					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.		Changing Circuits associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches use recognised symbols when representing a simple circuit in a diagram.
Light				Light and Shadows 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 change.			Light and Sight 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				Magnets and Forces compare how things move on different surfaces notice that some forces need contact between two objects, but magnetic forces can act at a distance observe how magnets attract or repel each other and attract some materials and not others compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials describe magnets as having two poles predict whether two magnets will attract or repel each other, depending on which poles are facing.		Forces explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object identify the effects of air resistance, water resistance and friction, that act between moving surfaces recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.	
Sound					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 pitch of a sound and features of the object that produced it find patterns between the volume of a sound and the strength of the vibrations that produced it recognise that sounds get fainter as the distance from the sound source increases.		

CHEMISTRY

	EYFS	Y1	Y2	Y3	Y4	Y5	Y6
Materials and changes of state	Materials- Naming and sorting, exploring properties.	Comparing Materials 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. Identifying Materials distinguish between an object and the material from which it is made identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock.	Changing Shape find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. Uses of Materials identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.		Changes of State 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) identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	Separating Mixtures <i>Best taught before Y5 Types of Change.</i> 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. Types of Change 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. 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 give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.	
Rocks and soils				Rocks and Soils <i>This unit also links to Y6 Evolution and Inheritance.</i> 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.			

	Y1	Y2	Y3	Y4	Y5	Y6
Science Enquiry: Exploring and Observing	Begin to use simple scientific language (from yr1 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 year 2 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 (<i>e.g. growth cycle, simple food chain, saying how living things depend on one another</i>) Observe closely and communicate with increasing accuracy the features or properties of things in the real world	Developing their own ideas and their understanding of the world around them 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)	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 process (linked to Y4 PoS) Observe and record changes /stages over time (linked to Y4 PoS)	Developing a deeper understanding of a wide range of scientific ideas and encountering more abstract ideas 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 (<i>e.g. friction, air resistance, forces, Earth and space, reversible and irreversible changes</i>)). 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 (<i>e.g. the relationship between diet, exercise, drugs, lifestyle and health; evolutionary changes; how light travels</i>)
Grouping and Classifying	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 (<i>e.g. structures of plants, functions of plant parts, diets, skeletons of humans and other animals, changes over time, etc.</i>) Record similarities as well as differences (<i>e.g. what do all skeletons have? as well as the differences between skeletons</i>)	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 (<i>e.g. evaporation and condensation, different food chains, different electrical circuits</i>)	Suggest reasons for similarities and differences Compare and contrast things beyond their locality and use these similarities and differences to help to classify (<i>e.g. features of animals, life cycles of different living things, melting compared with dissolving, etc.</i>). 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 (<i>e.g. sexual and asexual reproduction</i>) 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 <i>research</i> to identify and classify things Use classification systems, keys and other information records [databases] to help classify or identify things.

	Y1	Y2	Y3	Y4	Y5	Y6
Questioning	Ask simple questions about what they notice about the world around them Demonstrate curiosity by the questions they ask	Ask their own simple questions based on or linked to things they have observed demonstrating curiosity. With help / scaffolds, begin to ask questions such as 'What will happen if...?'	Asking relevant questions 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].	Asking their own questions about scientific phenomena. 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. <i>what would happen to ... if we changed ...?</i> e.g. <i>What affect would we have on ... if we ...?</i> e.g. <i>How would exercise affect the pulse rate?</i> 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	Ask people questions (e.g. an expert or hot-seating) Use simple primary and secondary sources (such as objects, books and photographs) to find things out	Finding things out using simple and appropriate secondary sources of information (such as books, photographs, videos and other technology) Talk about how useful the information source was and express opinion about findings Make suggestions about who to ask or where to look for information. Ask people questions to help them answer their questions	Finding things out using a wide range of secondary sources of information (e.g. books, photographs, videos and other technology)	Make decisions about which information to use from a wide range of 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.	Summarise research from a wide variety of sources and recognising that scientific ideas change and develop over time Find out how scientific ideas have changed/developed over time (linked to Y5 PoS) Articulate and explain findings from their research using scientific knowledge and understanding (see 'Communicating' box re vocabulary) Make decisions about which information to use from a wide range of sources	Research how scientific ideas have developed over time and had an 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 help, follow movements (dance / drama) to act out their Science	Using dance, drama or a visual aid to represent science in the real world Act out something to represent something else about the world around us (e.g a life cycle)	Using dance, drama or a visual aid to represent science in the real world 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.	Using dance, drama or a visual aid to represent science in the real world 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).	Using dance, drama or a visual aid to represent science in the real world 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)

	Y1	Y2	Y3	Y4	Y5	Y6
Collaborating	Share ideas in a group and listen to the ideas of others Work with others on a science task	Interacting effectively as part of a group Share ideas in a group and listen to the ideas of others Work cooperatively with others on a science task making some choices	Interacting effectively as part of a group 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 and 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	Interacting effectively as part of a group 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 a reasons for their opinion
Planning and Testing	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 selection Talk about ways of setting up a test	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 method for setting up a simple comparative test Talk about a practical way to find answers to their questions	Making decisions about and setting up simple practical enquiries, comparative tests and fair tests 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 incl. comparative and fair tests e.g. make a 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 qus. Find/suggest a practical way to compare things e.g. rocks, magnets	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 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.	Enquiry making decisions about and explaining choices for testing 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 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.	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 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

	Y1	Y2	Y3	Y4	Y5	Y6
Using Equipment and Measures	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	Using simple equipment and gathering data to help in answering their questions 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	Making accurate measurements and gathering data 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. <i>microscopes, measuring syringes, measuring cylinders, hand lenses</i>)	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 & 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	Increasing complexity and increasing accuracy and precision 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 & 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	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 to a class display Add annotations to drawings or photographs Begin to use some simple scientific language from yr1 PoS Record simple visual representations of observations made	Data, presenting findings Read, spell and pronounce scientific vocabulary correctly linked to the relevant Yr Grp Record and communicate their findings in a range of ways to a variety of audiences Use simple scientific language with increasing accuracy (from year 1 & 2 PoS) Record simple 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 Produce increasingly detailed drawings which are labelled/annotated	Data, presenting findings Record and present findings using simple scientific language and vocabulary from the year 3 PoS, <i>including discussions, oral and written explanations, notes, annotated drawings, pictorial representations, labelled diagrams, simple tables, bar charts (using scales chosen for them), displays or presentations</i> 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)	Read, spell and pronounce scientific vocabulary correctly linked to the relevant Yr Grp Record findings using relevant scientific language and vocabulary (from Y4 PoS), including discussions, oral and written explanations, notes, drawings (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	Data, presenting findings Use their developing scientific knowledge and understanding and relevant scientific language and terminology to communicate more abstract concepts (linked 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	Read, spell and pronounce scientific vocabulary correctly linked to the relevant Yr Grp Articulate understanding of the concept using scientific language and terminology when describing abstract ideas, observations and findings (linked to the Y6 PoS) 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)

	Y1	Y2	Y3	Y4	Y5	Y6
Considering the results of an investigation / writing a conclusion	DESCRIBING RESULTS / LOOKING FOR PATTERNS Use recordings to talk about and describe what happened Sequence photographs of an event/observation EXPLAINING RESULTS Begin to use simple scientific language (from yr1 PoS) to talk about what they have found out or why something happened TRUSTING RESULTS N/A in Y1	DESCRIBING RESULTS / LOOKING FOR PATTERNS Talk about what happened / what they noticed 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 EXPLAINING RESULTS Begin to use simple scientific language (from year 1 & 2 PoS) to explain what they have found out. Give a simple, logical reason why something happened (e.g. I think ... because ...) TRUSTING RESULTS Beginning to spot and discuss if the test was unfair.	DESCRIBING RESULTS / LOOKING FOR PATTERNS Talk about what happened / what they noticed 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. <i>we noticed that larger magnets are not always stronger</i>) 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. EXPLAINING RESULTS Begin to use simple scientific language (from year 1 & 2 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 year 3 PoS TRUSTING RESULTS Say whether what happened was what they expected and notice any results that seem odd. Begin to recognise when a test is not fair and suggest improvements.	DESCRIBING RESULTS / LOOKING FOR PATTERNS Describing their findings / results Notice/find patterns in their observations and data. (Describe the effect of something on something else) (e.g. <i>as I lengthen the ruler I notice that the pitch gets lower</i>) 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. <i>metals tend to be good conductors of electricity</i>) EXPLAINING RESULTS Reporting on findings saying why something happened 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 <i>why</i> something happened TRUSTING RESULTS Suggest improvements for further tests Use results to suggest improvements, new questions and/or predictions for setting up further tests Compare their results with others and give reasons why results might be different	DESCRIBING RESULTS / LOOKING FOR PATTERNS Looking for patterns analysing functions, relationships and interactions more systematically Describe straightforward patterns in results linking cause and effect e.g. using er...er or the word 'more' (e.g. <i>the longer, thinner shapes move through the water more quickly OR the larger the wings, the longer it takes the spinner to fall</i>) Look for / notice relationships between things and begin to describe these. Comment on the results and whether they support the initial prediction EXPLAINING RESULTS Draw conclusions based on / supported by evidence Use their scientific K&U 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 <i>why</i> it happened) based on their data and observations (from Y5 PoS) TRUSTING RESULTS Comment on how reliable the data is Begin to recognise how repeated readings improve the reliability of results Compare results with others and comment on how reliable they are	DESCRIBING RESULTS / LOOKING FOR PATTERNS Looking for patterns analysing functions, relationships and interactions more systematically 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. <i>as we increased the number of batteries the brightness the bulb increased</i>) EXPLAINING RESULTS Draw conclusions based on / supported by evidence 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 Comment on how reliable the data is Be able to suggest reasons for unexpected results (anomalies) Describe how to improve planning to produce more reliable results Say how confident they are that their results are reliable and give a reason

	Y1	Y2	Y3	Y4	Y5	Y6
Key vocabulary - from sticky knowledge Think about the key vocabulary you will be expected to see/hear.	PLANTS Tree, Plant, Fruit, vegetable, environment, soil, sun, water ANIMALS INCLUDING HUMANS Fish, birds, human, Body parts EVERYDAY MATERIALS Materials, hard, waterproof, shiny SEASONAL CHANGES Autumn, Spring, Summer, Winter, weather	PLANTS Buds, bulbs, deciduous, evergreen, trunk, vegetable, wild plants, environment, blossom, petals, branches roots, crown, stem, woodland, habitat, oxygen, ANIMALS INCLUDING HUMANS Fish, amphibians, reptiles, birds, mammals, carnivore, herbivore, omnivore, tame, wild, nocturnal, healthy, diet, off-spring, exercise, proteins, carbohydrates, fats, nutrition, survival, hygiene EVERYDAY MATERIALS Materials, wood, plastic, metal, liquid, gas, stretch, stiff, bend, twist, squash, waterproof, shiny, Charles Macintosh, John Dunlop, John McAdam SEASONAL CHANGES Autumn, Spring, Summer. Winter, fall, weather, temperature, thermometer, weather symbol, deciduous, coniferous LIVING THINGS AND THEIR HABITATS Dinosaur, habitat, rivers, woodland, ponds, sea, rainforest, desert, species, microhabitats	ROCKS AND FORCES AND MAGNETS Fossil, soil, crystals, sedimentary, igneous, metamorphic, organic, magnetic pole, organic, matter, attract and repel, concave PLANTS Roots, crown, deciduous, evergreen, blossom, bulb, trunk, stem, woodland, habitat, oxygen ANIMALS INCLUDING HUMANS Pancreas, oesophagus, intestine, organ, molars, canine, food chain, predators, prey, salivary gland LIGHT Reflection, shadows, light source, opaque, refraction, periscope, nocturnal, orbits, convex	SOUND Vibrating, pitch, volume, insulation, outer, middle and inner ear, cochlea, auditory, frequency, hammer LIVING THINGS AND THEIR HABITATS Vertebrates, Invertebrates ANIMALS INCLUDING HUMANS Pancreas, oesophagus, intestine, organ, molars, canine, food chain, predators, prey, salivary gland STATES OF MATTER water vapour, condensation, precipitation, evaporation, substance, matter, lava, solid, liquid, gas, substance ELECTRICITY Circuit, buzzers, conductor, battery, cells, switch, socket, appliance, series circuit, insulator, conductor, socket	LIVING THINGS AND THEIR HABITATS & ANIMALS INCLUDING HUMANS Puberty, gestation, classification, precision, reproduction, teenager, obese, toddler, embryo, roots, stem, nutrients, pollination, seed, dispersal, fertiliser, seed formation, stigma, anther, soil PROPERTIES AND MATERIALS Solubility, conductivity, transparency, thermal, evaporation, dissolve, bicarbonate of soda, thermal, filtering, melting, separate EARTH AND SPACE Orbit, solar system, astronomical, plane, rotation, spherical, crescent moon, gibbous moon, eclipse, lunar FORCES Friction, gravity, air resistance, water resistance, levers, pulleys, gears, parachute, Galileo, Newton, UP THRUST	LIVING THINGS AND THEIR HABITATS micro-organism, vertebrates, invertebrates, species, fungi, monera, bacteria/micro- organisms, Linnaean system ANIMALS INCLUDING HUMANS THE CIRCULATORY SYSTEM blood vessels, drugs, atriums, intestine, cardiovascular, ultrasound, cardiologists, capillaries, pulse, ventricles EVOLUTION AND INHERITANCE off-spring, adaptation, evolution, inheritance, palaeontologist, Charles Darwin, genes, chromosomes, syndrome, genotype LIGHT light wave, light source, concave, convex, filters, lens, retina, cornea, iris, pupil ELECTRICITY Circuit, buzzers, conductor, battery, cells, switch, socket, appliance, appliance, series circuit, insulator, conductor, insulator, socket, series circuits, cells, volts, generator, turbine, fuses, Thomas Edison

ROLLING PROGRAMME CYCLE A

EYFS

	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
SCIENCE	Myself (body, senses, similarities and differences) Healthy eating and hygiene	Seasonal Change Autumn-winter (include animals/bugs) The weather	Animals in hot and cold places Animals and their young. Spring, planting and growing		Materials- Naming and sorting, exploring properties. Summer	

Year 1/2 CYCLE A

	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
SCIENCE	Seasonal change (throughout the year)	Animals including humans (body, senses, classification of animals and what they eat)	Living things and their habitats		Plants	Everyday materials

Year 3/4 CYCLE A

	AUTUMN 1	AUTUMN 2	SPRING	SUMMER 1	SUMMER 2
SCIENCE	States of matter	Electricity	Animals including humans (nutrition, skeleton) Famous scientists and inventors throughout the year where relevant	Rocks	Forces and magnets

Year 5/6 CYCLE A

	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
SCIENCE	Forces	Electricity	Earth and space	Living things and their habitats (life cycles)	Animals Including humans (heart)	Famous scientists

ROLLING PROGRAMME CYCLE B

EYFS

	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
SCIENCE	Myself (body, senses, similarities and differences) Healthy eating and hygiene	Seasonal Change – Autumn-winter (include animals/bugs) The weather	Animals in hot and cold places Animals and their young. Spring, planting and growing		Materials- Naming and sorting, exploring properties. Summer	

Year 1/2 CYCLE B

	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
SCIENCE	Seasonal change (throughout the year)	Animals including humans (animal babies, growing and changing, basic needs, healthy eating, exercise, hygiene)	Seasonal change	Plants and living things	Use of everyday materials	

Year 3/4 CYCLE B

	AUTUMN 1	AUTUMN 2	SPRING	SUMMER 1	SUMMER 2
SCIENCE	Sound	Animals Including humans (digestion, teeth)	Living things and their habitats Famous scientists and inventors throughout the year where relevant	Light	Plants

Year 5/6 CYCLE B

	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
SCIENCE	Properties and changes of materials (1)	Properties and changes of materials (2)	Living things and their habitats (classification)	Evolution and inheritance	Light	Animals Including humans (old age)

