Science Whole School Progression Working scientifically

	KS1	LKS2	UKS2
Asking Questions and Carrying Out Fair and Comparative Tests	**KS1 Science National Curriculum** Asking simple questions and recognising that they can be answered in different ways. Performing simple tests. Children can: a explore the world around them, leading them to ask some simple scientific questions about how and why things happen; b begin to recognise ways in which they might answer scientific questions; c ask people questions and use simple secondary sources to find answers; d carry out simple practical tests, using simple equipment; e experience different types of scientific enquiries, including practical activities; f talk about the aim of scientific tests they are working on; g with support, start to recognise a fair test.	**Lower KS2 Science National Curriculum** Asking relevant questions and using different types of scientific enquiries to answer them. Setting up simple practical enquiries, comparative and fair tests. Children can: a start to raise their own relevant questions about the world around them in response to a range of scientific experiences; b start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions; c recognise when a fair test is necessary; d help decide how to set up a fair test, making decisions about what observations to make, how long to make them for and the type of simple equipment that might be used; e set up and carry out simple comparative and fair tests.	**Upper KS2 Science National Curriculum** Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. Using test results to make predictions to set up further comparative and fair tests. Children can: a with growing independence, raise their own relevant questions about the world around them in response to a range of scientific experiences; b with increasing independence, make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions; c explore and talk about their ideas, raising different kinds of scientific questions; d ask their own questions about scientific phenomena; e select and plan the most appropriate type of scientific enquiry to use to answer scientific questions; f make their own decisions about what observations to make, what measurements to use and how long to make them for, and whether to repeat them; g plan, set up and carry out comparative and fair tests to answer questions, including recognising and controlling variables where necessary; h use their test results to identify when further tests and observations may be needed; i use test results to make predictions for further tests.

Observing and Measuring Changes	**KS1 Science National Curriculum** Observing closely, using simple equipment. Children can: a observe the natural and humanly constructed world around them; b observe changes over time; c use simple measurements and equipment; d make careful observations, sometimes using equipment to help them observe carefully.	**Lower KS2 Science National Curriculum** Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. Children can: a make systematic and careful observations; b observe changes over time; c use a range of equipment, including thermometers and data loggers; d ask their own questions about what they observe; e where appropriate, take accurate measurements using standard units using a range of equipment.	**Upper KS2 Science National Curriculum** Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. Children can: a choose the most appropriate equipment to make measurements and explain how to use it accurately; b take measurements using a range of scientific equipment with increasing accuracy and precision; c take repeat readings when appropriate; d understand why we take an average in repeat readings.
Identifying, Classifying, Recording and Presenting Data	**KS1 Science National Curriculum** Identifying and classifying. Gathering and recording data to help in answering questions. Children can: a use simple features to compare objects, materials and living things; b decide how to sort and classify objects into simple groups with some help; c record and communicate findings in a range of ways with support; d sort, group, gather and record data in a variety of ways to help in answering questions such as in simple sorting diagrams, pictograms, tally charts, block diagrams and simple tables.	**Lower KS2 Science National Curriculum** Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions. Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. Children can: a talk about criteria for grouping, sorting and classifying; b group and classify things; c collect data from their own observations and measurements; d present data in a variety of ways to help in answering questions; e use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge; f record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables.	**Upper KS2 Science National Curriculum** Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. Children can: a independently group, classify and describe living things and materials; b use and develop keys and other information records to identify, classify and describe living things and materials; c decide how to record data from a choice of familiar approaches; d record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar graphs and line graphs.

Drawing Conclusions, Noticing Patterns and Presenting Findings	**KS1 Science National Curriculum** Using their observations and ideas to suggest answers to questions. Children can: a notice links between cause and effect with support; b begin to notice patterns and relationships with support; c begin to draw simple conclusions; d identify and discuss differences between their results; e use simple and scientific language; f read and spell scientific vocabulary at a level consistent with their increasing word reading and spelling knowledge at key stage 1; g talk about their findings to a variety of audiences in a variety of ways.	**Lower KS2 Science National Curriculum** Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. Children can: a draw simple conclusions from their results; b make predictions; c suggest improvements to investigations; d raise further questions which could be investigated; e first talk about, and then go on to write about, what they have found out; f report and present their results and conclusions to others in written and oral forms with increasing confidence.	**Upper KS2 Science National Curriculum** Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations. Children can: a notice patterns; b draw conclusions based in their data and observations; c use their scientific knowledge and understanding to explain their findings; d read, spell and pronounce scientific vocabulary correctly; e identify patterns that might be found in the natural environment; f look for different causal relationships in their data; g discuss the degree of trust they can have in a set of results; h independently report and present their conclusions to others in oral and written forms.
Using Scientific Evidence and Secondary Sources of Information		**Lower KS2 Science National Curriculum** Identifying differences, similarities or changes related to simple scientific ideas and processes. Using straightforward scientific evidence to answer questions or to support their findings. Children can: a make links between their own science results and other scientific evidence; b use straightforward scientific evidence to answer questions or support their findings; c identify similarities, differences, patterns and changes relating to simple scientific ideas	**Upper KS2 Science National Curriculum** Identifying scientific evidence that has been used to support or refute ideas or arguments. Children can: a use primary and secondary sources evidence to justify ideas; b identify evidence that refutes or supports their ideas; c recognise where secondary sources will be most useful to research ideas and begin to separate opinion from fact; d use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas;

		and processes; d recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations.	e talk about how scientific ideas have developed over time.

	EYFS-Working Scientifically		
Asking Questions and Carrying Out Fair and Comparative Tests	Ask simple questions about their immediate, familiar environment. With adult support, carry out simple practical tests, using simple equipment.	Drawing Conclusions, Noticing Patterns and Presenting Findings	Discuss their findings using simple, everyday language. Notice simple patterns and say what they have discovered.
Observing and Measuring Changes	Make simple observations of the world around them and describe using everyday language. Use simple scientific equipment, e.g. magnifying glasses. Communicate observations through discussion and drawings. Identify simple changes as they occur.	Using Scientific Evidence and Secondary Sources of Information	
Identifying, Classifying, Recording and Presenting Data	Sort familiar objects into simple groups Identify key similarities and differences using everyday language. Communicate their findings verbally, using everyday language.		

Science Whole School Progression Animals and Humans

EYFS	Key Stage 1	Lower Key Stage 2	Upper Key Stage 2
Animals • Identify common native mammals, birds, amphibians and fish. • Identify common animals found in our local environment. • Show understanding of how we care for animals. • Describe and compare animals using simple scientific language, e.g. it has a beak, fur. It flies, it swims. • Make simple observations of changes in animals as they grow. •Show understanding of simple life cycles, e.g. frog, butterfly. **Humans** •Name the main external parts of the human body. •Match each sense to its associate body part, e.g. smell-nose, sight- eyes.	**My body, my senses and growth Autumn 1 Year B** • Identify, name and label the main external parts of the human body, e.g. hands, legs, feet, ears, eyes, ankle, shoulder, elbow. •Say which body part is associated with each sense. • Use senses to compare different textures, sounds and smells. • Perform simple tests, and gather and record data in the context of investigating each of the five senses. • Explain that animals, including humans, have offspring which grow into adults. Identify and classify, by matching animals and animal babies. • Describe some of the changes that take place when animals and humans grow • Use simple scientific terminology associated with human and animal growth e.g. egg, chick, chicken, egg, caterpillar, pupa butterfly, baby, toddler, child, teenager, adult. • Describe the basic needs of animals, including humans, for survival (water, food and air) **Exercise and Nutrition Autumn 2 Year B** • Describe the importance for humans of: -exercise,	**Skeletons, muscles and nutrition Year A** • Name the different types of skeletons. Identify and categorise animals based on the type of skeleton it has. • Use the scientific names for the main bones in the human body and explain how the skeleton protects, supports and helps the body to move. • Explain how pairs of muscles work together to enable movement • Explain the different ways that plants and animals including humans obtain food. • Explain the difference between food groups and nutrient groups. • Explain why humans need some types of nutrients. • Explain what the right type and amounts of nutrition are for human beings as well as some of the consequences related to eating the wrong type of diet. • Set up a simple practical enquiry and write an explanation for their findings • Identify the similarities and differences between animals based on their diets. • Identify the pros and cons of different types of skeletons and explain how the different parts of a skeleton work. • Extend their knowledge by identifying the main bones in the skeleton of animals other than humans. **The digestive system and teeth Year B** • Identify parts of the digestive system • Match the parts of the digestive system with their functions. • Match the types and functions of teeth.	**Puberty/gestation/human life cycles-Year A** **Circulation-Year B**

	-eating the right amount of different types of food. -good hygiene. • Identify the different food groups that make up a balanced diet and the role of each food group in keeping us healthy. • Identify healthy and unhealthy foods and explain that we need to eat more food from certain food groups than others. • Gather and record data to help in answering questions, by recording the ways that exercise affects the body. • Recognise ways to prevent germs spreading and the importance of hand washing. • Explain the importance of brushing your teeth. • Explain how and when we use medicines and how to do so safely. **Animal Classification Year A** • Identify, name and classify a variety of common animals including those from the following groups: birds, fish, mammals, amphibians, reptiles, including those kept as pets. • Identify and name a variety of common animals that are carnivores, herbivores and omnivores. • Describe and compare the structure/features of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets.	• Construct and interpret a food chain • Generate relevant scientific questions. • Distinguish between scientific and nonscientific evidence and select the best type of enquiry to answer a question. • Identify similarities and differences related to scientific ideas. • Give clear instructions to perform an enquiry. • Make predictions and suggest equipment. • Make careful observations, record findings using labelled diagrams and use results to make predictions for new values	

	• Use observations to compare and contrast animals at first hand or through videos/photos • Identify and classify animals, by sorting animals according to their features. • Identify animals in the local environment. • Take care of animals taken from the local environment and understand the need to return them safely after study.		

Science Progression Plants

EYFS	Key Stage 1	Lower Key Stage 2	Upper Key Stage 2
•Identify and name a variety of common wild and garden/cultivated plants growing in our immediate environment. •Identify deciduous and evergreen trees by identifying trees from their leaves. •Describe plants using simple scientific and everyday language. •Grow plants from seeds and observe changes. •Look after plants, and recognise that they need water and sunlight to grow. •Identify and describe the basic structure of a variety of common flowering plants •To observe closely using simple equipment	**Plant structure and identification Summer 1 Year A** •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. (leaves, flowers (blossom), petals, fruit, roots, bulb, seed, trunk, branches, stem). •Make observations of the growth of flowers and vegetables that they have planted. •Observe closely using magnifying glasses. •Compare and contrast familiar plants, describing how they were able to identify and group them. •Draw diagrams showing the parts of different plants including trees. •Keep records to describe how plants have changed over time, e.g. leaves falling off trees, buds opening. •Compare and contrast what they have found out about familiar plants. **Plants-conditions for growth, germination and survival Summer 2 Year A** • Observe, measure and record the growth of a variety of plants as they change over time from a seed or bulb. • Recognise that plants grow and reproduce and describe their life cycle. • Observe with accuracy similar plants at different stages of growth •Perform simple comparative tests to understand what plants need to germinate and grow. •Find out and explain that plants need water, light and a suitable temperature to grow and stay healthy by comparing the growth of seedlings under different conditions. •Explain the conditions required for growing plants for food.	**Plants Year A** • Identify the different parts of a flower. • Identify and describe the stages of the life cycle of flowering plants • Explain the functions of the different parts of plants. • Set up reliable and accurate investigations. • Make and explain predictions and conclusions. • Make and record accurate observations. • Use scientific language to explain their findings. • Be able to ask and answer questions based on their learning using scientific language	

Science Progression Weather and seasonal changes

EYFS	Key Stage 1	Lower Key Stage 2	Upper Key Stage 2
• Describe the daily weather and temperature using familiar language, e.g. sunny, cold, hot, rainy, windy. •Name animals that live in hot and cold places of the world. •Make practical observations of the weather and seasons. •Make links between the weather and the seasons.	**Wonderful Weather-cross curricular geography [Autumn 1 Year A]** • Identify daily weather patterns in the context of the weather of the UK. • Understand seasonal weather patterns in the context of the weather of the UK. • Identify daily weather patterns in the UK (Weather Forecasting). • Understand what weather forecasts show. • Identify daily weather patterns (dangerous/adverse weather) in the context of the UK weather. • Know how weather can affect people's lives. • Explain weather dangers and how people can protect themselves. • Identify the location of hot and cold areas of the world in relation to the Equator and the North and South Pole. • Understand the human/physical geography of a cold area of the world in the context of The Arctic. **Seasons and weather: Autumn and Winter [Autumn 2 Year A]** **Seasons and weather: Spring and Summer [Spring 2 Year A]** • Identify seasonal and daily weather patterns in the United Kingdom. • Observe and describe weather associated with the seasons and how day length varies. • Observe and describe how day length varies by exploring the average number of hours of day light in each season. • Observe and describe changes across the four seasons, e.g. vegetation, weather, temperature. • Answer questions about animals in the local habitat at different times in the year. • Gather and record data to help in answering questions by recording the weather, temperature, rainfall and wind direction. • Make tables and charts about the weather. • Use basic vocabulary to refer to: vegetation, season and weather. • Observe changes across the 4 seasons by exploring how some animals adapt to survive in different seasons.		

Science Progression Light

EYFS	Key Stage 1	Lower Key Stage 2	Upper Key Stage 2
• Identify every day light sources. • Recognise that we use our eyes to see. • Use the terms light and dark.		**Light Year A** • Identify light sources. • Understand that we need light to see. • Understand that dark is the absence of light. • Understand how surfaces reflect light. •Know that light travels in a straight line. • Identify opaque, translucent and transparent objects. • Explain the properties of materials that reflect light well. • Understand that a shadow is formed when a solid object blocks light. • Know how and why shadows change size. • Recognise that a mirror appears to reverse an image. • Identify some parts of the eye. • Understand how the Sun can damage parts of the eye how to protect their eyes from the Sun. • Set up reliable and accurate investigations. • Make and explain predictions. • Make and record accurate observations. • Use scientific language to explain their findings.	**Light Year B**

Science Progression Sound

EYFS	Key Stage 1	Lower Key Stage 2	Upper Key Stage 2
• State that we use our ears to hear. • Name and describe every day familiar sounds using simple language, e.g loud, quiet, soft, high, low. • Make sounds in different ways.		**Sound Year B** • Explain how sound sources vibrate to make sounds. • Describe how sounds change over distance • Explain how we hear and interpret sounds • Explain how vibrations change when the loudness of a sound changes. • Explain how sounds travel to reach our ears. • Describe the pitch of a sound. • Describe patterns between the pitch of a sound and the features of the object that made the sound. • Explain how sound travels through a string telephone. • Explain that sounds travel differently through different materials. • Explain why sounds travel better through solids than gases. • Identify the best material for absorbing sound. • Explain why some materials absorb sound • Create a musical instrument that can play high, low, loud and quiet sounds. • Explain how their musical instrument plays different sounds. • Set up reliable and accurate investigations. • Make and explain predictions. • Make and record accurate observations. • Use scientific language to explain their findings. • Be able to ask and answer questions based on their learning using scientific language.	

Science Progression Rocks

EYFS	Key Stage 1	Lower Key Stage 2	Upper Key Stage 2
• Talk about and explore rocks, bones and fossils through play and through child initiated learning and adult led learning, e.g. dinosaurs topic.		**Rocks Year A** • name the three different types of rocks. • give examples of natural and human-made rocks. • handle and examine rocks to identify their properties • state the four different types of matter of which soil is composed • group rocks by their properties and identify simple similarities and differences. • explain the difference between a bone and a fossil. • explain, using simple scientific language, how soil is formed. • make and record observations accurately. • explain the main processes of fossilisation. • identify the importance of Mary Anning's work to the field of palaeontology. • use simple scientific language accurately in oral and written work.	

Science Progression Forces and Magnets

EYFS	Key Stage 1	Lower Key Stage 2	Upper Key Stage 2
• Talk about and use pushes and pulls to make things move through child initiated play.		**Forces and Magnets Year A** • Identify forces as pushes and pulls. • Identify the type of force required to carry out an action. • Explain that magnets produce an invisible pulling force. • Identify magnetic materials. • Identify different types of magnet. • Investigate the strength of different magnets. • Identify and describe the invisible magnetic field around a magnet. • Identify when magnets will repel or attract based on their poles. • Use a magnetic compass with four points. • Investigate the force of friction produced by different surfaces. • Describe friction as a force that slows objects down. • Form a conclusion from their results. • Construct a bar chart of their results. • Explain their predictions and conclusions.	**Forces Year A**

Science Progression Living Things and their habitats

EYFS	Key Stage 1	Lower Key Stage 2	Upper Key Stage 2
•Find and explore a variety of familiar plants and animals in their habitats. •Describe habitats using familiar language e.g. cold, damp, dry, wet. •Give simple reasons why plant and animals are found in particular habitats.	**Living things and their habitats Year B** •Identify and name a variety of plants and animals in their habitats, by mapping a habitat and identifying its inhabitants, including minibeasts in microhabitats. •Describe the conditions in certain habitats/micro habitats and explain how the conditions affect the number and type(s) of plants and animals that live there. •Gather and record data to help in answering questions by investigating the preferred habitat of minibeasts. •Identify that most living things live in habitats to which they are suited. •Explain the adaptations of animals to their habitats. Describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other. •Compare animals found in different habitats, e.g. seashore, woodland, ocean, rainforest. •Explore and compare the differences between things that are living, dead, and things that have never been alive. •Sort and classify things in charts as to whether they are living, dead or never been alive and explain their reasons. •Identify the life processes common to all living things. [growth, reproduction, etc] •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. •Construct simple food chains, e.g. grass, cow, human	**Living things and their habitats Year B** • Identify the characteristics of living things • Generate criteria to use to sort living things. • Sort living things into a Venn diagram and Carroll diagram. • Identify similarities and differences between vertebrates. • Identify vertebrate groups. • Use questions to sort animals using a key. • Use a key to identify invertebrates by looking at their characteristics. • Use the characteristics of living things to sort them using a classification key. • Suggest how to have a positive effect on the local environment. • Name some endangered species. • Identify dangers to wildlife in the local and wider environment. • Record observations in a table. • Write a report.	**Living things and their habitats Year A** **Living things and their habitats Year B**

Science Progression Materials

EYFS	Key Stage 1	Lower Key Stage 2	Upper Key Stage 2
•Name a few simple every day materials e.g wood, plastic, metal, paper •State what familiar objects are made of, e.g. this toy is made from plastic. •Describe the simple properties of a variety of everyday materials e.g. hard soft, rough, smooth, bumpy, shiny, dull •Explore and test different materials with adult direction, e.g. is it waterproof? Does it float or sink?	**Everyday materials Spring 1 Year B** •Distinguish between an object and the material from which it is made. •Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock. •Describe the simple properties of a variety of everyday materials e.g. rough, smooth, hard, soft, shiny, dull, opaque, transparent, waterproof. •Compare and groups together a variety of everyday materials on the basis of their properties. •Perform simple tests to explore questions, e.g. what is the best material for an umbrella? Curtains? A leotard? •Describe the simple physical properties of a variety of everyday materials by testing different objects. **Using everyday materials Spring 1 Year B** •Identify and compare the suitability of a variety of materials for particular uses/purposes. •Describe how shapes of solid objects can be changed by squashing, bending, twisting and stretching. •Give examples of how the same material can be used for more than one thing [e.g. metal for bridges, coins, cars] and how different materials are used for the same thing, e.g. wooden, metal, plastic spoons. •Explain how the properties of materials make the suitable/unsuitable for particular purposes. •Compare the use of materials •Observe, identify and classify the use of different materials and record observations.	**States of Matter Year B** • Sort materials into solids, liquids and gases. • Describe the properties of solids, liquids and gases • Explain the behaviour of the particles in solids, liquids and gases • Explain that melting and freezing are opposite processes that change the state of a material. • Identify the melting and freezing point of several different materials including water. • Explain why a material's melting and freezing point is the same temperature. • Explain that evaporation and condensation are opposite processes that change the state of a material. • Explain that the higher the temperature, the quicker water evaporates. • Explain what happens to water at the different stages of the water cycle. • Use the water cycle to explain why the water we have on Earth today is the same water that has been here for millions of years. • Set up reliable and accurate investigations. • Make and explain predictions. • Make observations and conclusions. • Use scientific language to explain their findings. • Be able to ask and answer questions based on their learning using scientific language.	**Properties and changes of materials Year A**

Science Progression The Environment

EYFS	Key Stage 1	Lower Key Stage 2	Upper Key Stage 2
•Take part in simple ways to look after our immediate environment e.g. caring from minibeasts in their habitats, class recycling. •Talk about simple ways we can look after our planet and environment at a local level.	**The environment Year B** •Demonstrate a basic understanding of climate change. •Sort items for recycling based on their materials. •Suggest ways we can reduce, reuse and recycle. •Suggest ways to persuade people to use less energy. •Give examples of renewable energy alternatives. •Ask and answer questions about endangered animals. •Ask and answer questions about the threat to the rainforest. •Gather and record data and take measurements. •Observe closely, using simple equipment. •Perform simple tests.	**Year A [through geography]:** **Extreme Earth** • name the layers that make up the Earth; • describe the properties of the Earth's layers; • name the key parts of a volcano; • explain how a volcano is formed; • show where most volcanoes are found; • describe what happens when a volcano erupts; • describe some risks and benefits of living near a volcano; • categorise volcanoes as extinct, dormant or active; • explain the impact of volcanoes on people and the environment; • explain why earthquakes occur; • explain how to keep safe during an earthquake; • compare the strength of earthquakes; • describe a tsunami; • explain how tsunamis occur; • describe the damage caused by a tsunami; • explain how to keep safe in a tsunami; • explain how tornadoes form; • explain where tornadoes happen. • describe how scientists collect data about storms.	**Year B [through PSHE and geography]:** **Looking after our environment climate change** **Enough for everyone**

Science Progression Electricity

EYFS	Key Stage 1	Lower Key Stage 2	Upper Key Stage 2
•Explain that some appliances need electricity to work. •Distinguish between appliances that use and do not use electricity. •Know that electricity can be dangerous.		**Electricity Year B** •Identify electrical appliances and the types of electricity they use. •Distinguish between appliances that use and do not use electricity. •Sort appliances based on whether they use mains or batteries. Identify how to stay safe when using electricity. •Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. •Create a simple series circuit both with and without a switch. •Explain how a switch works and why they are needed. •Explain how a circuit works. •Identify complete and incomplete circuits. • Recognise some common conductors and insulators, and associate metals with being good conductors. •Report on findings from enquiries. Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. Explain the conclusions they draw in investigations. •Make systematic and careful observations and, where appropriate, taking accurate measurements using standard units.	**Electricity Year B**