Science Substantive Knowledge to build schema – Concepts and Categories - Progression EYFS to Year 6

CHEMISTRY			
	Properties of Materials	**Rocks and Soils**	**States of matter**
EYFS	**Foundational knowledge to build on as children progress to Key Stage 1:** - To know that objects are made from different materials e.g. wood, plastic, paper, - To begin to know vocabulary to describe different materials e.g. smooth, bumpy, soft, hard - To know that objects can be a solid, liquid or a gas - linking to their exploration of water throughout the seasons.		
YEAR 1	- Everyday Materials - **To distinguish between an object and the material from which it is made.** - **To name a variety of everyday materials, including wood, metal, paper, rock, glass and water.** - **To describe the simple physical properties of a variety of everyday materials (hard or soft, stretchy and stiff, rough and smooth, bendy/not bendy, waterproof/not waterproof and absorbent/not absorbent, opaque/transparent)** - To have the knowledge to **compare and group together a variety of materials based on their physical properties.**		
YEAR 2	- Uses of Everyday Materials - **To know that some materials are better suited to particular purposes e.g. glass for a window, wood for a chair, paper to wrap a present.** - **To know that some solid objects can change shape by squashing, bending, twisting and stretching.** - To know that different materials can be used to make the same item (eg. Spoons can be made with plastic, wood, metal, but not normally from glass, in order to serve different purposes)		
YEAR 3		- Rocks and Soils - **To know how rocks and soils are formed from organic matter, air, water and minerals.** - **To compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.** - **To know that fossils are formed in many different ways, but most are formed when a living organism (such as a plant or animal) dies and is quickly buried by sediment (such as mud, sand or volcanic ash).** - To know that organic matter is anything that was alive but now is in or on the soil. - How different rocks are used for different purposes e.g. chalk, lead/ graphite, charcoal, slate, diamonds. - To know that there are three types of naturally occurring rocks: sedimentary, igneous and metamorphic. - To know how sedimentary, igneous and metamorphic are formed and know some examples of each. - To know that rocks can be grouped by colour, porosity, whether they have crystals or grains, fossils, texture etc.	

YEAR 4	- States of matter - **To compare and group materials according to whether they are solids, liquids or gases** (unusual objects such as balloons, Vaseline, oublec etc.) - **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.** - **Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.** - **To know that materials can be grouped according to their: hardness, solubility, transparency, conductivity and response to magnets.*** - To know the particle structure of solids, liquids and gases. - To know that solids form a pile, whereas liquids form a pool. - To know that solids usually have a fixed shape, unless a force is applied to them, and a fixed volume. - To know that liquids take the shape of the container, have a definite volume but no fixed shape. - Gases have no fixed shape, no fixed volume and fill the whole space in a container. - To know that when liquids reach a certain temperature they change state into a liquid or a gas. - To know that when a solid is heated to its melting point it changes state from a solid to a liquid. - To know that 'freezing' is when a liquid changes to a solid. - To know that evaporation is the process whereby a liquid changes to a gas. - To know that condensation is the change of state of a gas to a liquid. - To know that a thermometer is used to measure temperature. - * This objective has been moved from year 5 to year 4 summer 2 (starting 2025-26)
YEAR 5	- Properties and changes of materials - **To know that materials can be grouped according to their: hardness, solubility, transparency, conductivity and response to magnets.*** - **To know that sometimes when a solid (solute) is mixed with a liquid (solvent) it will dissolve to form a solution.** - **To describe how to recover a substance from a solution.** - **To 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.** - **To know that some changes of state can be reversible (dissolving, changes of state and mixing).** - **To know that some changes are irreversible (burning and chemical reactions- acid on bicarbonate of soda).** - **To know that some changes result in the formation of new materials.** - To know that the dissolved solid has not disappeared, it has broken into smaller pieces. - To know that a soluble material can dissolve. - To know that an insoluble material cannot dissolve. - The process oxidation causes rusting i.e. exposure to oxygen and water. - * This objective has been moved to year 4 summer 2 (starting in 2025-26).

YEAR 6	

BIOLOGY	
	Animals - including humans
EYFS -	**Foundational knowledge to build on as children progress to Key Stage 1**. - To know and name different body parts. - To know and name the 5 senses. - To know that senses can be linked to different body parts e.g. eye to see, hand to touch etc. - To know that humans change as we grow. - To know that plants need certain conditions to grow e.g. water, sunlight - To know how to care for a plant. - To know adult animals and name their young e.g. cow/calf sheep/lamb - To know that animals have a life cycle e.g. stages of a butterfly to a caterpillar, tadpole to a frogs.
Year 1	- **To identify, name, draw and label the basic parts of the human body** - **To know which body part is associated with each sense (knowing that touch is felt by all of the skin not just hands)** - To know what a sense is and why we have them. - To know different vocabulary to describe/observe smell, taste, touch, sight, hearing. - To know that some people have to adapt to life without certain senses e. Sight or hearing. - To know which resources can be used to support people that are blind or deaf. - **To identify and name a variety of common animals: amphibians, mammals, fish, bird, reptiles** - **To describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets).** - **To identify, name and group a variety of common animals that are herbivores, carnivores and omnivores.** - To know that animals can be grouped according to their features.

Year 2	- **To describe the basic needs of animals for survival is water, food and air.** - **To know that animals, including humans, have offspring that grow into adults.** - **To know the significance for humans of exercise, eating the right amounts of different types of food, and hygiene.** - To know the main food groups and name some examples that belong in each group.
Year 3	- **To know that animals, including humans, need the right types and amount of nutrition, and they cannot make their own food; they get nutrition from what they eat.** - **To identify that humans, and some other animals, have skeletons and muscles for support, protection and movement.** - To know that certain bones protect vital organs. E.g. the skull protects the brain, our rib-cage the heart etc. - To name some parts of the human skeleton e.g.tibia, tibia, ulna, radius. - To know what the Eatwell plate is and some functions of different food groups.
Year 4	- **To name and describe the functions of the main parts of the digestive system in humans.** - **To name, identify and describe the functions of different types of teeth in humans (e.g canines for tearing, incisors for cutting, pre-molars and molars are for chewing and grinding).** - **To interpret and construct construct food chains including producers, predators and prey. (Building on knowledge from year 2- see living things and their habitats).** - To know how humans can damage the ecosystem/disrupt a food chain through human actions e.g. deforestation.
Year 5	- **To know the mental and physical changes as humans develop to old age.** - To know the developmental milestones from baby to child and understand why this varies. - To know the various bodily changes as a human goes through puberty and why this happens. (Building upon knowledge from y4 PSHE- pubic and body hair, menstruation, hormonal changes and body size).
Year 6	- **To know the main parts of the human circulatory system.** - **To describe the functions of the heart, blood vessels (arteries, veins and capillaries)** and valves**.** - **To describe the ways in which nutrients and water are transported within animals, including humans.** (Building on knowledge from y4 digestive system) - **To know the effects of diet, exercise, drugs and lifestyle on how the body functions.** - To label the main parts of the human heart. - To know the components of blood (platelets, plasma, red blood cells and white blood cells) and the function of each part.
Plants	
EYFS	- To know the names of some of the plants that they observe in the garden area. e.g. willow tree, herbs for the mud kitchen etc - To know what plants need to survive. - To know that a seed grows into a plant. - To know how to look after a plant - in the classroom and outside. - To know the difference between plants and animals through observation (similarity and difference).

Year 1	- **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.** - To observe similarities and differences between different types of root, stem, flower, petal and leaf of a flowering plant. - To know that evergreen trees do not lose their leaves in autumn. - To know that deciduous trees lose their leaves in autumn. - *Don't put too much emphasis on the functions of the parts of a plant as this is year 3 knowledge.
Year 2	- **To observe and describe the main changes as seeds and bulbs mature into plants.** - **To discover and describe how plants need water, light and suitable temperature to grow and stay healthy.** - To discuss how a plant grows (eg. Germination, seedling, flowering) - To explore the impact of changing a plant's basic needs: the leaves change colour without access to sunlight, plants wilt without water and a change in temperature can affect a plant's survival. - To know that seeds and bulbs need water to grow but most do not need light; seeds and bulbs have a store of food inside them.
Year 3	- **To identify and know the function of different parts of a flowering plant including: root, stem, trunk, leaves and flowers.** - **To know that different plants need different requirements for life and growth e.g. water, air, light, nutrients, room to grow.** - **To investigate how water is transported within a range of plants.** - **To explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.** - To be able to identify the parts of a plant used in pollination (eg. Stamen, anther).
Year 4	(See Living things and their environment)
Year 5	(See Living things and their environment)
Year 6	(See Living things and their environment)
Living things and their environment	
EYFS	- To know the need to respect and care for the natural environment and all living things. - To know that plastic pollution impacts on marine life - To know ways to have a role in looking after the environment e.g. recycling, litter
Year 1	- To identify and name a variety of common animals: amphibians, mammals, fish, bird, reptiles - To describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). - To identify, name and group a variety of common animals that are herbivores, carnivores and omnivores. - To know that animals can be grouped according to their features.

Year 2	- **To know and identify whether things are alive, dead or have never lived.** - **To name different plants and animals and describe how they are suited to different habitats, including micro-habitats.** - **To know that living things live in habitats to which they are suited, how they provide the basic needs of different plants and animals, and how they depend on each other.** - **To describe how animals get their food from plants and other animals, using a simple food chain.**
Year 3	
Year 4	- **To know that living things can be grouped in a variety of ways** (including vertebrates and invertebrates). - **To explore use classification keys to group, name and identify a variety of living things in the local and wider environment.** - **To recognise that environmental change can occur and that this can pose dangers to living things.** - To recognise that environments can change as a result of human and physical incidents (deforestation, drought, wildfires etc.) - To know that plants can be classified as flowering/non-flowering (ferns or mosses).
Year 5	- **To know the similarities and differences between the life cycles of a mammal, amphibian, an insect and a bird.** - **To describe the life process of reproduction in some plants and animals.** - To name the male and female parts of a plant (stamen, ovary, filament, stigma, style). - To know how plants reproduce sexually. - To know how plants reproduce asexually and how this differs from sexual reproduction.
Year 6	- **To describe how living things are classified into broad groups according to common observable characteristics, based on similarities and differences, including micro-organisms, plants and animals.** - **To give reasons for classifying plants and animals based on specific characteristics.** - To understand the importance of Carl Linnaeus' work on classification. - To create simple classification keys to classify a variety of living things. - To know the similarities and differences between bacteria, fungus and viruses. - To know that plants can be classified into flowering plants, conifers, ferns and mosses. -
Evolution and Inheritance	
EYFS	- To know that we inherit certain characteristics from our parents e.g. blonde hair, colour of eyes etc. - To know that humans and animals change overtime.

Year 5	- To know and recognise that living things have changed over time. - Build upon year 3 knowledge of fossil formation and explore how scientists can calculate the age of fossils based on the layers of soil. - To know that fossils provide information about living things that inhabited the Earth millions of years ago. - *This objective has been moved from year 6 to year 5 summer 2.
Year 6	- **Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.*** - **To identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.** - **To recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.** - To know that DNA is made up of inherited genes from the offspring's parents. - To know that inherited characteristics are passed on from the offspring's parent (genes). - To know that environmental characteristics are adopted after birth as a result of environmental factors/influences. - To know that multiple offspring from the same parents do not always look the same due to the allocation of genes. - *This objective has been moved to year 5 summer 2.

PHYSICS			
	Light and Sound	**Seasonal Changes**	**Earth and Space**
EYFS	- **Foundational knowledge to build on as children progress to Key Stage 1:** - To know and discuss that it is day when it is light and night when it is dark. - To understand the effect of changing seasons on the natural world around them. - To know there are four seasons and how the weather changes in each. - To know that we might wear different clothes as the seasons change. - To know and discuss that we live on planet Earth - Explore and talk about different forces they can feel.		

Year 1	Seasonal Changes - **Observe changes across the four seasons.** - **Observe and describe weather associated with the seasons and how day length varies.** - To know that the number of hours of daylight changes throughout the seasons (longest in the summer and shortest in the winter) - To know autumn includes the months - September, October, November - To know winter includes the months - December, January, February - To know spring incudes the months - March, April, May - To know summer includes the months - June, July, August - To know that the weather includes the temperature outside, the wind direction, and strength as well as rain, wind, sun, cloud.
Year 3	- **To know that light is required to see in order to see things and that dark is the absence of light.** - **To notice that light is reflected from surfaces** to a different extent. - **To know that light from the sun can be dangerous and that there are ways to protect their eyes.** - **To know that a shadow is formed when the light from a light source is blocked by an opaque object.** - **Find patterns in the way that the size of shadows change.** - To know that light is reflected from a shiny surface better than a dull surface. - To know that a transparent material allows all light to pass through. - To know that a translucent material allows some light to pass through it. - To know that an opaque object allows no light to pass through it.
Year 4	Sound: - **To identify how sounds are made, associating some of them with something vibrating.** - **To know 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 (the tighter the drum skin, the higher the pitch of the note produced (and vice versa), the tighter the string on a guitar, the higher the pitch of the note produced (and vice versa))** - **Find patterns between the volume of a sound and the strength of the vibrations that produced it.** - **To recognise that sounds get fainter as the distance from the sound source increases.** - To know that sound is an energy made by vibrations. - To know that the vibrations makes the air around the object vibrate and the air vibrations enter your ear. You hear them as sounds. - To know that sounds travel in waves. - To know that the pitch of a sound is how high or low the sound of the note is. - To know that the higher the pitch of the note, the sound waves are tightly packed together (and vice versa) - To know that a weaker vibration produces a quiet sound.

Year 5	Earth and Space: - **To describe the movement of the Earth, and other planets, relative to the sun in the solar system.** - **To describe the movement of the moon relative to the Earth (solar and lunar eclipse, not the phases of the moon)** - **To know that the Earth, sun and moon are roughly spherical bodies.** - **To use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.** - To know that the sun is a star at the centre of our solar system and that it has eight planets.
Year 6	- Light - **Recognise that light appears to travel in straight lines** - **To use the idea that light travels in straight lines to explain that objects are seen because they give out light or reflect light into the eye.** - **To explain that we see objects 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.** - To know that materials reflect light to different extents on different surfaces. - To explore how mirrors can be used to see behind us or around corners and observe patterns in the angle of reflection when using a mirror (the angle of incidence is equal to the angle of reflection). - To name the parts of the eye (cornea, retina, lens, pupil, iris, optic nerve) and explain how light enters the eye and enables us to see. - To know that the light is made up of different colours, and white light is a combination of all of them.
Forces	
EYFS	- To know that a force could be a push or a pull - To observe what happens when an object is pushed down in the water or through the water. - To observe how water moves and behaves. - To know that some objects float and some sink. - To know that some objects are attracted to a magnet and some are not.
Year 1	Non statutory: - To know that an object can change shape by bending, squashing, squeezing, twisting. - To know that a force can speed objects up and slow them down. - To know that on a ramp, objects move faster on a smooth surface than a rough surface. - To know that if an object is dropped, it falls to the ground. - To know that forces can be balanced and unbalanced.

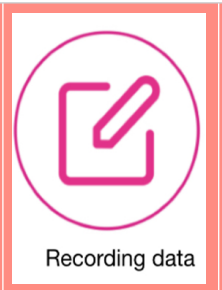
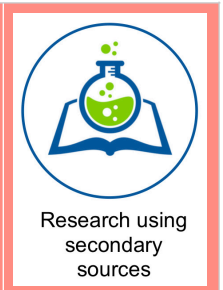
Year 3	Forces and magnets: - **To know that magnets have a North Pole and South Pole** - **To compare how things move on different surfaces** - **To notice that some forces need contact between two objects but magnetic forces can act at a distance.** - **To observe how magnets attract or repel each other and attract some materials but not others.** - **To compare and group everyday materials on the basis of whether they are magnetic or not and identify some magnetic materials.** - **To predict whether tow magnets will attract or repel each other, depending on which poles are facing.** - To know that like poles of a magnet repel. - To know that unlike poles of a magnet attract. - To locate the poles on various magnets (bar, ring, button, horseshoe) - Compare how objects move on different surfaces, using magnets.
Year 5	- **To know that unsupported objects fall towards the Earth because of the force of gravity acting between the core of the Earth and the falling object.** - **To identify the effects that air resistance, water resistance and friction has between moving surfaces.** - **To recognise that levers, pulleys and gears are mechanisms that allow a smaller force to have a greater effect.** - To know that friction exists wherever two surfaces meet. - To know the difference between high friction and low friction.
	Electricity
EYFS	- To know that some objects need a source of power to make them work. - To know about the dangers of electricity.
Year 2	- To know that some everyday appliances run on electricity. - To know what electricity is. - To know what a battery is. - To explore where electricity comes from renewable and non-renewable sources. - To know the difference between mains power and battery operated devices. - To know the uses of electricity. - To know when electricity was invented and some significant scientific discoveries/scientists. - To know how to construct a simple circuit.

Year 4	- **To know and identify common appliances that run on electricity.** - **To know how to construct a simple series circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.** - **To 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.** - **To recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit.** - **To recognise some common conductors and insulators, and associate metals with being good conductors.**
Year 6	- **To associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.** - **To 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.** - To know how electricity can be produced in a variety of ways. - To know the impact of keeping the voltage of the battery the same and introducing more bulbs into the circuit will make the bulbs dimmer or buzzer quieter. - To know that a series circuit is a continuous circuit such as fairy lights on a Christmas tree. - To know that a parallel circuit is a circuit with different routes. E.g. the lights on different circuits in a kitchen

Progression in Disciplinary Knowledge - EYFS to Year 6

Scientific enquiry skills	 Asking questions	 Making predictions	 Setting up tests	 Measuring and observing	 Recording data	 Interpreting and communicating results	 Evaluating	 Research using secondary sources
EYFS	- Use question prompts to generate their own questions (I observe…, wonder…, I think…)	- Verbally construct predictions about what they are exploring in continuous provision.	- Choose the equipment they need for their chosen activities in continuous provision and say when they do or don't need help. - Through discussion, children experience the idea of fairness linked to every day situations, including science scenarios.	- Observe changes over time: as a caterpillar turns into a butterfly, as a tadpole develops into a frog, as seeds germinate and grown into a variety of plants. - Observe changes linked to seasons and weather. - Explore and observe a variety of different materials (eg. Water, sand, fabrics and paint etc.) through continuous provision.	- Make marks which may be used for simple counts (eg. How many bugs did you see?) - Begin to draw pictures/ diagrams of animals and plants that they have observed.	- Participate in discussions to offer their own ideas and explanations about why things may have happened. - Make observations about similarities and differences in relation to places, objects, materials and living things.	- Reflect on and discuss what they could do differently next time. - Express their ideas and feelings about their scientific experiences.	-Have access to a range of secondary sources in the classroom. - Explore a science reading spine to look at images and ask and answer their own questions (I observe…, wonder…, I think…)

Scientific enquiry skills								
Year 1	- Ask simple questions and recognising that they can be answered in different ways.	- Verbally construct predictions about their experiments and, with support, will begin to explain their choices.	- Through whole-class discussions and adult support, pupils will identify what they will measure and observe in order to find answers to their questions. - Through discussion and adult support, pupils will identify (from a range of options) how to carry out a fair test. - Through group discussions and adults guidance, pupils will select what equipment (from a given range) will be most effective to complete their test.	- Observe closely, using simple equipment (eg. Magnifying glasses, sieves, measuring jugs). - Measure using non-standard units of measure (eg. Cubes, hands) and, with support, some equipment with standard units of measure (ruler, timers, thermometer) - Identify, group and classify (eg. Material and animals).	- Gather and record data to help in answering questions. - With adult support, choose appropriate ways of recording data. - Use text, simple labelled diagrams, pictures, photographs and pre-prepared tables to record their observations	- Participate in discussions to offer their own ideas and explanations. - Use their own observations to suggest answers to questions.	- Reflect on and discuss what they could do differently next time. - Express their thoughts about their scientific experiences. -	- Access a range of secondary sources in the classroom and during reading lessons. - Access a science reading spine to look at images and ask and answer their own questions (I observe…, wonder…, I think…)

Scientific enquiry skills								
Year 2	- Ask questions and suggest how it could be answered in different ways	- With guidance, children will make written predictions before carrying out experiments, beginning to justify their reasoning.	- Through discussion and adult support, pupils will decide what they need to measure and observe in order to find answers to their questions. - Through discussion and adult support, pupils will decide how to carry out a fair test. - Through group discussions, pupils will select what equipment (from a given range) will be most effective to complete their test.	- Measure using standard units (eg. mass, volume, capacity, temperature length and time). - Measure using standard units of measure (eg. ruler, timers, thermometer, measuring cylinders, weighing scales and data loggers). - Identify, group and classify in a variety of different ways (eg. Material and animals).	- Gather and record data to help in answering questions. - Use pictograms, histograms, block graphs, bar charts, tables, labelled diagrams and tallies. - Choose appropriate ways of recording data. - Children input data into blank table, choosing their own headings.	- Participate in discussions to offer their own ideas and explanations. - Use their own observations to suggest answers to questions. - dentify similarities, differences and changes in relation to places, objects, materials and living things.	- With guidance, pupils should identify new questions that have arisen from the data they have collected. - Through discussion, pupils should begin to make suggestions about how they could improve what they have already done.	Access a range of secondary sources in the classroom and during daily reading lessons. - Access a science reading spine to look at images and ask and answer their own questions.

Scientific enquiry skills								
Year 3	- Begin to raise questions of their own about the world around them - Begin to suggest what type of enquiry will be the most effective to answer questions.	- With guidance, children will make written predictions before carrying out experiments, justifying using some scientific vocabulary.	- With guidance, pupils will decide what they need to measure and observe in order to find answers to their questions. - With guidance, pupils will decide what variables they will change and what must stay the same. - With support, pupils will decide what equipment will be most effective to complete their test. - With support, pupils will begin to understand if their chosen method will result in a fair test.	- With support, pupils will record their observations systematically and accurately. - Take accurate measurements using standard units and a range of familiar equipment. E.g thermometers, measuring cylinders/jugs and data loggers.	-Make choices so they can decide how their data can be gathered, recorded, classified and presented in different ways. - Record their findings using simple scientific language, drawings, labelled diagrams, bar charts and tables. - Children will become increasingly independent when preparing their own tables, pictograms, tally charts, Venn and Carroll diagrams with prepared headings.	- With guidance, pupils should present and communicate their findings to others in the most effective way, using written, graphical and spoken methods. -Use their results to draw simple conclusions, suggest improvements and raise further questions. - With guidance, pupils should look for and describe patterns in their results and generate -er statements.	- With guidance, pupils should identify new questions that have arisen from the data they have collected and make predictions for new values within or beyond the data they have collected. - Begin to make suggestions about how they could improve what they have already done.	- With support, pupils should recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations - With guidance, pupils will access and use high quality texts, reliable websites etc within the lesson.

Scientific enquiry skills								
Year 4	- Raise questions of their own about the world around them to investigate. - Decide what type of enquiry would be best to answer their question.	- With increasing independence, make predictions about what may happen or what they may discover. - With increasing independence, justify their predictions, using scientific vocabulary.	- Decide what needs to measure/observe to find answers to a question. - Through class/peer discussions, pupils will decide what variables should be kept the same and what variables should be changed each time to ensure a fair test. - Decide which equipment would be most effective to measure their observations (thermometers, data loggers, iPads etc)	- Record their observations systematically and accurately. - Take accurate measurements using standard units and a range of familiar equipment. E.g tape measures, stop watches, thermometers, measuring cylinders/jugs and data loggers. - Begin to decide when to take repeat readings to improve reliability of data.	- Decide how their data can be gathered, recorded, classified and presented in different ways. - Record their findings using scientific language, drawings, labelled diagrams, bar charts and tables. - Children will become more independent when preparing their own tables, pictograms, tally charts, line graphs, Venn and Carroll diagrams. - Use pre-made classification keys to identify and classify living things.	- Make decisions about how they can present and communicate their findings to others in the most effective way, using familiar written, graphical and spoken methods - Describe patterns and relationships in their results and generate -er statements. - Look for changes, patterns, similarities and differences in their data to draw simple conclusions.	- Begin to identify new questions that have arisen from the data they have collected and make predictions for new values within or beyond the data they have collected. - Begin to make suggestions about how they could improve what they have already done.	- With support, pupils should recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigation. - With guidance, pupils will access and use high quality texts, reliable websites etc within the lesson.

Scientific enquiry skills								
Year 5	- Ask questions of scientific phenomena they would like to investigate. - Choose the type of scientific enquiry appropriate to their question	- Make predictions about what may happen or what they may discover during their enquiry. - Justify their predictions, using prior knowledge, experiences and relevant scientific vocabulary.	- Decide and explain the variables that will need to be controlled in order to answer the question. - With increasing independence, children can decide the independent and dependent variables for their experiment. - Begin to explain why this has produced a fair test. - Decide what to observe and record, over what period of time and will select what equipment they will need to use.	- Make accurate and precise measurements using the correct units, from their chosen equipment, including tape measures, thermometers, stopwatches, digital scales, measuring, Newton meters, cylinders/jugs, data loggers, ammeters/ voltmeters etc. - Recognise anomalies in results and repeat readings when necessary.	- Make choices to decide how their data can be gathered, recorded, classified and presented in different ways. - Record data and results of increasing complexity using scientific diagrams, classification keys, scatter graphs, bar charts, line graphs and tables etc. - Prepare their own tables, pictograms, tally charts, line graphs, Venn and Carroll diagrams to record data. - Begin to make their own classification keys with some given headings.	- Pupils will become more independent when choosing the most effective methods to present their findings to others. - Using both written and spoken methods, pupils use appropriate scientific language and vocabulary when presenting their findings to others. - Pupils will become more independent when seeking patterns in their results, identifying causal relationships and identifying anomalies	- Use their results to identify what needs to be improved and with support will identify when further tests and observations might be needed. -Identify evidence in their data that refutes or supports their ideas/argument. - Decide whether or not the test should be repeated to ensure a fair test.	- Recognise when and how secondary sources will be useful to research ideas and will begin to identify which sources are most reliable to answer their questions. - Access and use high quality texts and reliable websites within lessons.

Scientific enquiry skills	 Asking questions	 Making predictions	 Setting up tests	 Measuring and observing	 Recording data	 Interpreting and communicating results	 Evaluating	 Research using secondary sources
Year 6	- Independently raise questions about they want to investigate, using their past science experiences. - Choose and justify their choice of scientific enquiry they will use to answer the question.	- Make accurate predictions about what may happen or what they may discover during their enquiry. - When predicting, children will consider a range of possible outcomes for their experiments. - Justify their predictions, using prior knowledge, experiences and relevant scientific vocabulary.	- Independently decide what variables will be controlled in their investigation and what which variables will remain the same. - Use scientific language such as independent and dependent variables. - Explain how they have planned a fair test. - Explain and justify how they decided what to observe, how long for, how and why they selected their chosen equipment and how they will use it accurately.	- Make accurate and precise measurements using the correct units, from their chosen equipment, including tape measures, thermometers, stopwatches, digital scales, measuring, Newton meters, cylinders/jugs, data loggers, ammeters/ voltmeters etc. - Recognise anomalies in results and repeat readings when necessary.	- Choose how data can be gathered, recorded, classified and presented in different ways. - Record data and results of increasing complexity using scientific diagrams, classification keys, scatter graphs, bar charts, line graphs and tables etc. - Prepare their own tables, pictograms, tally charts, line graphs, Venn and Carroll diagrams to record data. - Make their own classification keys.	- Independently choose a variety of effective methods to present their findings, that are appropriate to the question they are answering. - Use precise and concise scientific language when presenting their findings. - Independently seek patterns in their results, identify causal relationships and identify anomalies	- Use their results to identify what needs to be improved and when further tests and observations might be needed. - Identify evidence in their data that refutes or supports their prediction. - Use their results to make further predictions - Decide whether or not the test should be repeated to ensure a fair test.	- Independently recognise when and how secondary sources will be useful to research ideas and will identify which sources are most reliable to answer their questions. - Pupils will access and use high quality texts and reliable websites within lessons.