Coates Primary School

Subject – Science 2023-2024	Overview and goals	Knowledge	Skills	Concepts
EYFS	To explore the natural world around them, making observations and drawing pictures of animals and plants. To know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. To understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.	To understand the key features of the life cycle of a plant and an animal. To begin to understand the need to respect and care for the natural environment and all living things. To explore and talk about different forces the children can feel. To be able to talk about the differences between materials and changes they notice. To explore the natural world around them. To describe what they see, hear and feel whilst outside. To recognise some environments that are different to the one in which they live. To understand the effect of changing seasons on the natural world around them.	To plant seeds and care for growing plants. To show and explain the concepts of growth, change and decay with natural materials. To observe growth and decay over time. To observe an apple core going brown and mouldy over time. To be able to care for animals and take part in first-hand scientific explorations of animal life cycles, such as caterpillars or chick eggs (with support). To use vocabulary related to explorations within their discussions. To know how the water pushes up when they try to push a plastic boat under it. To know how they can stretch elastic, snap a twig, but can't bend a metal rod. To identify magnetic attraction and repulsion. To combine different ingredients whilst cooking, and then be able to cool or heat them. To be able to melt ice cubes. To explore how different materials sink and float. To explore how you can shine light through some materials, but not others. To investigate shadows. To draw pictures of the natural world, including animals and plants. To observe and interact with natural processes, such as ice melting, a sound causing a vibration, light travelling through transparent material, an object	To know that a healthy diet includes eating a range of foods, not only snack type foods. To know that physical exercise includes running, biking, climbing. To discuss safety at all times including being outside, e.g. stay close to an adult, always hold someone's hand when crossing the road. To understand that keeping healthy includes exercising, eating different foods, washing your hands before eating. To discuss things that are the same and different between places that they study, e.g. whether it is cold or sunny, objects, e.g. hard or soft, materials, e.g. smooth or rough, living things, e.g. animals and people. To be able to talk about where they live and go to school, e.g. what they do there, what they have there. To say what they see about animals and plants, e.g. they have fur, that plant has a flower. Children are to be able to explain why changes happen to them, e.g. sheep shearing, a plant growing. Children are to be able to use the toilet without support, discuss first how this is done. Children to learn how to use buttons, zips, etc and then use this knowledge to be able to dress and undress themselves. Children are to look at different places, e.g. the seaside and their village and be able to tell you how they are different.

			casting a shadow, a magnet attracting an object and a boat floating on water. To encourage focused observation of the natural world. To listen to children describing and commenting on things they have seen whilst outside, including plants and animals. To name and describe some plants and animals children are likely to see, encouraging children to recognise familiar plants and animals whilst outside. To encourage children to observe how animals behave differently as the seasons change. To demonstrate understanding of the seasons and weather in their play.	Children to be able to use play to investigate solids and liquids, magnetic attraction and how shadows can change.
Y1	To experience and observe phenomena. To look closely at the natural and humanly-constructed world around them. To be encouraged to be curious and ask questions about what they notice. With support, children are to develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions. Scientific enquiries are to include 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. To begin to use simple scientific language to talk about what they have found out. To communicate their ideas to a range of audiences in a variety of ways. To use first-hand practical experiences as well as secondary sources, such as books, photographs and videos. To work scientifically throughout all topics and concepts covered in the programmes of study.	**Plants.** To identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. To identify and describe the basic structure of a variety of common flowering plants, including trees.	**SC1.** To ask simple questions. To use a microscope/magnifying glass. To perform simple experiments. To be able to identify a range of things. To find the answer to questions by looking carefully at things. To collect results and write them down.	**Plants.** Children to know that wild plants that are not grown in our garden, e.g. weeds such as dandelions. Children to know that garden plants are ones that are grown by people to look nice in their garden, e.g. roses and daffodils. Children are to understand that deciduous refers to a tree or shrub that loses its leaves annually. Children to understand that evergreen refers to a plant that keeps its green leaves throughout the year. Children to understand that the structure of a plant includes leaves, flowers, petals, fruit, roots, bulb, seed, trunk, braches and stem.

	To read and spell scientific vocabulary at a level consistent with their increasing word reading and spelling knowledge.	**Animals including humans.** To identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. To identify and name animals that can be kept as pets. To identify and name a variety of common animals that are carnivores, herbivores and omnivores. To identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. **Everyday materials.** To distinguish between an object and the material from which it is made. To identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. To describe the simple physical properties of a variety of everyday materials. **Seasonal changes.** To observe changes across the four seasons.	**Animals including humans.** To describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). **Everyday materials.** To compare and group together a variety of everyday materials on the basis of their simple physical properties.	**Animals including humans.** Children are to understand that there are different types of animals and the group names. Children are to then be able to give an example of each: Fish: sharks, goldfish Bird: parrots, owls Amphibian: frogs, toads Reptile: snakes, turtles Mammal: human, cows Children to then use this knowledge to compare them by using simple ideas, e.g. those with a skeleton, lays eggs. Children to know that some animals can be kept as pets and give examples of these, e.g. fish, cats, dogs, rabbits. Children to know that carnivores are animals that only eat meat, e.g. a wolf. Children to know that a herbivore are animals that only eat plants, e.g. rabbit. Children to know that omnivores are animals that eat both plants and meat, e.g. bear. Children to know the senses are taste, touch, smell, hear and see. They are to then use this to identify the associated body parts, e.g. eyes to see. **Everyday materials.** Children are to know what objects are made from originally, e.g. paper from trees, bags from plastic. Children to be able to identify the materials that have been given to them, e.g. knowing that the liquid given is water. Children to identify the properties (characteristics) of materials, e.g. glass is breakable. Children are to then use this information to then group them. **Seasonal changes.** Children to know that there are four seasons – Spring, Summer, Autumn and Winter.

		To observe and describe weather associated with the seasons and how day length varies.		They are to know which times of the year the seasons are and to describe the weather during the seasons and to know whether the day is longer or shorter. e.g. Summer, longer days, usually warner, sunnier. Remind children not to look directly at the Sun at all times. **<u>SC1.</u>** Plants – children are to use magnifying glasses and look closely at familiar plants. They are to use this knowledge to group them. Children are to also observe the growth of flowers and vegetables that they have planted. Animals including humans – children are to animals using first hand, photos or videos and use this knowledge to group them. Everyday materials – children are to be given a question, e.g. which material is best to use for an umbrella which they then complete a simple test. Seasonal changes – to make a table about the weather. **Children are to only write what has happened in simple terms. They do not need to write predictions or conclusions at this stage.**
Y2	To experience and observe phenomena. To look closely at the natural and humanly-constructed world around them. To be encouraged to be curious and ask questions about what they notice. With support, children are to develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions. Scientific enquiries are to include observing changes over a period of time, noticing patterns, grouping and classifying		**<u>SC1.</u>** To ask simple questions and understand that they can be answered in different ways. To use a microscope/magnifying glass. To perform simple experiments. To group things together by using their features to identify them. To suggest the answer to a question by making observations. To collect results and write them down to help answer questions.	

	things, carrying out simple comparative tests, and finding things out using secondary sources of information. To begin to use simple scientific language to talk about what they have found out. To communicate their ideas to a range of audiences in a variety of ways. To use first-hand practical experiences as well as secondary sources, such as books, photographs and videos. To work scientifically throughout all topics and concepts covered in the programmes of study. To read and spell scientific vocabulary at a level consistent with their increasing word reading and spelling knowledge.	**Living things and their habitats.** To explore the differences between things that are living, dead, and things that have never been alive. To identify that most living things live in habitats to which they are suited. To identify and name a variety of plants and animals in their habitats, including micro-habitats. To 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. **Plants.** To observe and describe how seeds and bulbs grow into mature plants. To find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.	**Living things and their habitats.** To compare the differences between things that are living, dead, and things that have never been alive. To describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other.	**Living things and their habitats.** Children to be able to be given pictures of different things and identify whether they are living (human running), dead (plank of wood) or whether they have never been alive (television). Children to then use this knowledge to identify differences between the three categories, e.g. dead leaves have once been alive as they were part of a tree. Children to understand that a living thing refers to things that are alive. Children understand that most animals live where it is best for them, e.g. elephants in Asia and Africa. Children to understand that a habitat refers to the natural home of an animal or plant. Children to understand that a micro-habitat refers to small, specialized habitat, e.g. a clump of grass. Children to identify that ladybirds, bees, etc live in their habitat as well as grass and wild flowers. Children to understand that animals gain their food from plants and other animals, e.g. grass, cow, human. They are to then use this to identify simple food chains such as the one above. Children are to name different sources of food, e.g. grass, wheat. **Plants.** Children to be introduced to the idea of reproduction (produce offspring) and growth in plants, as well as requirements of plants for germination (seed begins to grow into a pant), growth and survival in order to describe how seeds grow into plants.

				Children to understand what plants need in order to grow and stay healthy, e.g. the right amount of water.
		Animals including humans. To notice that animals, including humans, have offspring which grow into adults. To identify the names of the young of different animals. To find out about and describe the basic needs of animals, including humans, for survival (water, food and air).	**Animals including humans.** To describe the importance for humans to exercise, eat the right amounts of different types of food, and hygiene.	**Animals including humans.** Children are to understand that animals have offspring that grow into adults and to the know the name of the young of different animals, e.g. calf and cows, foals and horses. Children are to be introduced to the processes of reproduction and growth but only due to questions to help them to understand and recognize growth, e.g. egg, chick, chicken. Children are to understand that animals including humans need a variety of things to help to keep them healthy and to survive (stay alive). These are listed in the knowledge and skills columns.
		Use of everyday materials. To identify the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.	**Use of everyday materials.** To compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. To find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	**Use of everyday materials.** Children to understand that suitability refers to what something is best used for, e.g. wood and fire but that they can be used for other things as well. Children to understand that although materials are used for certain things they can be used for others but are possibly less suited, e.g. spoons made from glass.
		Electricity. To identify common appliances that run on electricity. To construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.		**Electricity.** Children to understand that electricity refers to energy. Children to understand that an appliance refers to a piece of equipment required to perform a particular task. Children to understand that appliances such as computers, televisions, toasters all run on electricity. **SC1.** Living things and their habitats - Children to sort and classify living, dead or were never alive things.

				Children to describe the conditions in particular habitats and use observations to find out about what lives there and the conditions. Plants – children to observe and record how a variety of plants grow over a period of time. Children to set up a comparative test to identify what plants need in order to survive. Animals including humans – observe through video or first hand experience and measuring how different animals grow. To ask questions about what animals need to survive or humans to stay healthy and suggest ways to find their answers. Use of everyday materials – children are to investigate how solid objects can be stretched, twisted, bent or squashed using a question such as which fabric is the stretchiest? **Children are to ask simple questions to complete a test.** **Children are to record their answers by writing them down (not in a chart).** **Children to then only write the answer as to what has happened.** **They do not have to predict what will happen or delve deeper into understanding what actually happened.**
Y3	To enable pupils to broaden their scientific view of the world around them. To broaden this knowledge through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments. To begin to develop their ideas about functions, relationships and interactions. To ask their own questions about what they observe and make some decisions about which types of scientific enquiry are		**<u>SC1.</u>** To ask questions and conduct experiments to answer them. To set up a practical experiment using comparative testing. To take accurate measurements using: Thermometers. Data loggers. Rulers. To record what they have found out using scientific vocabulary and tables.	

	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. To draw simple conclusions and use some scientific language to talk about what they have found out. To work scientifically through all science content in the programmes of study. To read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge.	**Plants.** To identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. To 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. To explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. **Animals including humans.** To 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.	To write what they have found out in a report and present this information in a display to the class. To use the results they have found to draw conclusions. To tell you what is different, what has stayed the same and what has changed in an experiment. **Plants.** To investigate the way in which water is transported within plants.	**Plants.** To understand that the different parts of a plant carry out different functions (roles). Roots – for anchorage. Stem/ trunk – connects roots to the leaves and to carry water from the roots to the different parts of the plant. Leaves – produce food for a plant. Flower – produce seeds. Children to revise what they need in order to grow. Children to use this knowledge to understand that different plants require different amounts of the requirements, e.g. cactus requires less water. Children to understand the following terminology to support their understanding of the part the flower plays in the life cycle of a plant: Pollination: insects, birds, bats and the wind take pollen between flowering plants which means the plants can make seeds and reproduce. Seed formation: where the seed is formed. Seed dispersal: movement of seed away from parent plant by wind, float, glide, spin, explosion or using animals. **Animals including humans.** Children to understand that all animals need the right amount of nutrition (food). Children to understand that they do not make their own food inside their bodies, they only get it from what they eat.

		To identify that humans and some other animals have skeletons and muscles for support, protection and movement. **Rocks.** To describe in simple terms how fossils are formed when things that have lived are trapped within rock. To recognise that soils are made from rocks and organic matter. **Light.** To recognise that they need light in order to see things and that dark is the absence of light. To notice that light is reflected from surfaces. To recognise that light from the sun can be dangerous and that there are ways to protect their eyes. To recognise that shadows are formed when the light from a light source is blocked by an opaque object. To find patterns in the way that the size of shadows change. **Forces and magnets.** 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 and not others. To identify some magnetic materials. To describe magnets as having two poles.	**Rocks.** To compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. **Forces and magnets.** To compare how things move on different surfaces. To compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet. To predict whether two magnets will attract or repel each other, depending on which poles are facing.	Children to understand that humans and some animals have skeletons (framework of bones) and muscles (tissue that enables things to move) and that they use this for protection (of vital organs), support (keeps you upright) and movement (to get to places, eat, etc). **Rocks.** Children to understand that a fossil is the remains of a plant or animal embedded into a rock. Children to group different rocks depending upon their appearance (what they look like) and their physical properties (e.g. rough, smooth). **Light.** Children to understand that light is needed in order to see. Children to understand that reflection refers to light being bounced back off surfaces. Children to understand that light is dangerous and they need to protect their eyes by not looking directly at the sun, wearing sun hats and wearing sunglasses. Children to understand that shadows change size depending on the time of the day, e.g. shorter at midday. **Forces and magnets.** Children to understand that a magnetic force is the force between two magnets and that they do not have to be touching to have a force. Children to understand that attract means come together and repel means push apart. They are to use this knowledge to identify magnetic materials, e.g. metals including iron.

				Children are to understand that magnets have a north and south pole. **<u>SC1.</u>** Plants - Children to compare the effect of different factors on plant growth, e.g. amount of light, amount of fertilizer. Children to carry out an investigation to find out how water is transported within plants by using food colouring with celery or carnations. Animals including humans – children to group animals with and without a skeleton. Children to group animals based upon their diets and the foods they eat. Rocks – children are to observe different rocks in buildings and how they might have changed over time. Children to use microscopes to identify and classify different rocks and identify their properties. Children to investigate what happens when rocks are rubbed together or put into water. Light – children to investigate what happens to shadows when the light source moves or the distance between the light source and object changes. Forces and magnets – children to compare how different things move and group them according to how far they travel, they are to test this using different surfaces. They are to gather and record information to find the answers to their questions. Children are to find a fair way to compare the strength of different magnets. Children to sort magnets into magnetic and non-magnetic materials and look for patterns in the way they behave and what might affect this.

				Children to ask questions and then complete experiments to find the answers. **They are to carry out the experiment and use scientific vocabulary and tables to record the results.** **They are to use their results to describe what they have found by drawing simple conclusions based upon their results.** **They are to not only write what happened but describe in further detail using scientific vocabulary to explain.** **Children to identify within the experiment what they kept the same, what was different and what they changed.**
Y4	To enable pupils to broaden their scientific view of the world around them. To broaden this knowledge through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments. To begin to develop their ideas about functions, relationships and interactions. To 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. To draw simple conclusions and use some scientific language to write about what they have found out. To work scientifically through all science content in the programmes of study. To read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge.		**<u>SC1.</u>** To ask relevant questions. To use different types of experiments to answer questions. To set up a practical experiment using fair testing. To make careful observations and take accurate measurements using: Thermometers. Data loggers. Rulers. To classify my results and present the data. To record results in a report using: Charts. Graphs. Diagrams. To deliver an oral report and written reports based upon on their findings. To use this then to create and share a presentation with the class. To use the evidence from their results to give a conclusion. To evaluate the experiment and suggest improvements, make predictions on what may happen next and generate further questions.	

			To use the evidence from their own and other people's experiments to support what they have found.	
		<u>Living things and their habitats.</u> To recognise that living things can be grouped in a variety of ways. To explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. To recognise that environments can change and that this can sometimes pose dangers to living things. To describe the life cycle of a flowering plant.		**<u>Living things and their habitats.</u>** Children to understand that they can be grouped in a variety of ways, e.g. animals and plants. Children to further understand the groupings from Year 1 by stating they are either vertebrates (with backbones) or invertebrates (without backbones, snails, slugs, worms, spiders and insects) and braking the vertebrates down and understanding the key information relating to them: Fish: live in water, have gills. Bird: have feathers, wings, lay eggs. Amphibian: cold-blooded, have gills and live in water to begin with but breathe air as adults. Reptile: cold-blooded, lay eggs, skin covered in scales. Mammal: warm-blooded, nurse young, have fur or hair. Children to understand that a classification key refers to categorizing and sorting living things by common characteristics. Children to understand that an environment refers to the surroundings in which something lives. Children to understand that the environment in which things live can cause danger (harm or hurt them), e.g. litter. Children to also understand that they can change them by adding in nature reserves to support. Children to put together their knowledge from previous years to understand the lifecycle of a flowering plant – Seed formation – seeds – germination – growth – pollination.

		Animals including humans. To describe the simple functions of the basic parts of the digestive system in humans. To identify the different types of teeth in humans and their simple functions. To construct a variety of food chains, identifying producers, predators and prey. **States of matter.** To observe that some materials change state when they are heated or cooled. To identify the part played by evaporation and condensation in the water cycle and	**Animals including humans.** To interpret a variety of food chains, identifying producers, predators and prey. **States of matter.** To compare and group materials together, according to whether they are solids, liquids or gases.	**Animals including humans.** Children to understand that the digestive system refers to how food gets into the body. Children to understand the system consists of the: Mouth – chews into smaller pieces, saliva in the mouth uses enzymes to breakdown food even further. Tongue – helps food to be pushed to the back of the throat. Esophagus – food is pushed along a pipe to get to the stomach. Stomach – enzymes within it break down the food even further. Small intestine – continues to break down the food with juices from the liver and pancreas. Second part of this is where the food gets absorbed into the blood. Large intestine – food that is not needed or cannot be used is sent here. Anus and rectum – waste products leave the body using this. Children to understand that the mouth contains different types of teeth that have different jobs, i.e. incisors for cutting, canines for tearing, premolars for crushing and molars for griniding. Children to develop their knowledge of food chains further from Year 2 by knowing and understanding the following terminology: Producer: source of food for others. Predator: hunts its prey (animals) for food. Prey: an animal hunted for food. Children to then understand which thing is which in food chain is that have been given. **States of matter.** Children to understand the three states of matter: Solids: hold their shape. Liquids: form a pool not a pile.

		associate the rate of evaporation with temperature. **Sound.** To identify how sounds are made, associating some of them with something vibrating. To recognise that vibrations from sounds travel through a medium to the ear. To find patterns between the pitch of a sound and features of the object that produced it. To 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. **Electricity.** To identify common appliances that run on electricity. To construct a simple series electrical 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 measure and research the temperature at which materials change state in degrees Celsius (°C).	Gases: escape from an unsealed container. Children to use this knowledge and observe what happens to water at various temperatures. Children to also use this knowledge to group materials by using the properties of the three different states. Children to understand that the water cycle refers to the way water moves around the world. Children to understand the following terminology in relation to the water cycle: Evaporation: liquid changes to a gas, sun heats up the water and rises into the air. Condensation: gas changes to a liquid, the water vapour cools down and changes back into tiny drops of water. **Sound.** Children to understand that sound is made when objects vibrate. Sounds can be heard by the air around an object vibrating and the air vibrations entering the ear. Children to understand that pitch refers to how high or low a sound is. Children to understand that volume refers to how loud or quiet the sound is. **Electricity.** Children to understand that electricity refers to energy. Children to understand that an appliance refers to a piece of equipment required to perform a particular task. Children to understand that appliances such as computers, televisions, toasters all run on electricity.

		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.		Children to understand that a series circuit is a circuit using a wire to the battery, to a bulb and back again. Children to be able to identify and explain why or why not lights would not work within simple series circuits – basing it upon whether it is a loop. Children to understand that switches need to be closed in order for lights to work within circuits. Children to understand the following: Conductors – allows electricity to flow through it. Insulators – stops electricity flowing through it. **<u>SC1.</u>** Living things and their habitats – make a guide or keys to identify local plants and animals. To raise and answer questions based upon observations of animals. Animals including humans – children are to investigate what damages teeth an how to look after them. Children to discuss their own ideas of the digestive system and compare them with models and images. States of matter – children to group and classify materials by exploring the effect of temperature on particular substances. Children to observe and record the rate of evaporation over a period of time on a puddle. Sound – children to investigate the different sounds made by changing the size of objects used or by using different thicknesses. Electricity – children to investigate the brightness depending upon the amount of batteries used. **Children to ask questions and then complete different types of experiments to answer the questions.**

				Children to identify what they think will happen – no explanation necessary. **They are to set up an experiment using fair testing to complete it.** **They are to make observations and accurate measurements.** **They are to record their results using charts, graphs and diagrams and continue to use scientific vocabulary to do so.** **They are to write a report as well as use oral presentations to share their results. Within these, they are to write a conclusion based upon the evidence they have gained. They are to explain what they have found out using the knowledge gained from completing the experiment.** **They are to identify whether their prediction was correct.** **They are to evaluate their experiment by stating what they could have done, thinking about what else they could ask and to predict what they think might happen next.** **To use what others have found to support their understanding.**
Y5	To develop a deeper understanding of a wide range of scientific ideas. To do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically. To encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. To begin to recognise that scientific ideas change and develop over time. To select the most appropriate ways to answer science questions using different types of scientific enquiry. These types of enquiry are to include observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out		**<u>SC1.</u>** To plan different kinds of fair experiments. To tell you how they control variables in their experiments. To take accurate measurements using lots of different scientific equipment. To tell you why it's important to take repeated measurements. To record data using: Labelled scientific diagrams. Classification keys. Tables. Bar charts. Line charts. To make predictions about how other tests will work using their results. To present findings in a written report with an introduction, conclusion and results.	

	comparative and fair tests and finding things out using a wide range of secondary sources of information. To 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. To complete working and thinking scientifically exercises through relating it to substantive science content in the programmes of study. To read, spell and pronounce scientific vocabulary correctly.	**Living things and their habitats.** To describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. To describe the life process of reproduction in some plants and animals. **Animals including humans.** To describe the changes as humans develop to old age.	To present findings in an oral presentation with an introduction, conclusion and results. To tell you about other experiments that have been done to support or disprove ideas.	**Living things and their habitats.** Children to understand the lifecycle of a mammal (dog) i.e. embryo, young, adult, amphibian (frog) i.e. egg mass, tadpole, tadpole with legs, young frog, adult, insect (butterfly) i.e. egg, larva, pupa, adult and bird (chicken) i.e. egg, young, adult. Sexual reproduction can occur in plants if they have both female and male reproductive parts. Sexual reproduction occurs in animals (complex organisms) and is about combining genetic information from both parents into a new organism. Asexual reproduction in plants – where only one parent is involved, the new plant is identical to its parent. **Animals including humans.** Children to understand the changes humans go through during their lives, i.e. egg, baby, toddler, child, teenager, adult, old age. Children to discuss what happens at each stage and when these ages ranges from. Egg – 0, egg fertilized, foetus formed. Baby – 0-1, completed dependent upon others. Toddler – 1-3, can walk, becoming more able to talk in sentences. Child – 4-12, primary school age, developing rapidly. Teenager – 13-18. Adult – 18-65. Old age – 65+

		Properties and changes of materials. To know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution. To demonstrate that dissolving, mixing and changes of state are reversible changes. To explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda. **Earth and Space.** 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. To describe the Sun, Earth and Moon as approximately spherical bodies.	**Properties and changes of materials.** To 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. To use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. To give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. **Earth and Space.** To use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.	**Properties and changes of materials.** Children to understand the following terminology and use this to group materials: Hardness: not easily broken. Solubility: whether a material with dissolve. Transparency: whether you can see through an object. Conductivity: allows either electricity or heat to pass through it. Response to magnets: whether a material is magnetic. Children to understand that a solution refers to a mixture where one substance dissolves into another, e.g. salt water. Children to understand that you can recover substances from a solution by performing reversible changes (a change that can be reversed) including evaporating (turning a liquid to a gas), sieving (separating materials using meshed apparatus), filtering (pouring a mixture through a film to separate materials), melting (heating a mixture) and dissolving (a substance that has mixed together to form a solution). Children understand that an irreversible change is a change that is difficult to reverse, e.g. by use of burning, rusting (chemical reaction) and other reactions such as vinegar and bicarbonate of soda (generates a gas, a reaction). **Earth and Space.** Children are to understand the Sun is a star and that that it is at the centre of our solar system. Children are to understand that it has eight planets that orbit around it. Children are to identify how the planets move around the Sun (orbit it). Children to understand that the orbits are elliptical.

		Forces. To identify the effects of air resistance, water resistance and friction, that act between moving surfaces. To recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.	**Forces.** To explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.	Children to understand that the Moon orbits the Earth in an elliptical pattern. Children to understand that day and night occurs because the Earth spins (rotates) on an imaginary line called its axis and different parts are facing towards and away from the Sun. They are to understand that it takes 24 hours to complete a whole rotation. **Forces.** Children to understand that gravity refers to the force that attracts a body towards the centre of the Earth. Children to understand that air resistance is a type of friction between air and another material. Children to understand that water resistance is a type of friction between water and another material. Children to understand that friction is a force between two surfaces. Children are to then use this knowledge to raise questions about air and water resistance. Children to understand that levers, pulleys and gears help make a job easier to do. Children to understand that levers are the simplest mechanism and mean that lifting is easier. Children to understand that gears are toothed wheels that lock together. Children to understand that pulleys are wheels that are joined by a belt. **SC1.** Living things and their habitats – children to observe and compare the lifecycles of plants and animals in their local environments. Animals including humans – children to research different gestation periods of other animals and comparing with humans. To do so by recording length and mass as the baby grows and use

				mathematical graphs to show this information. Properties and changes of materials – pupils to generate their own investigation regarding the explanation of tests to decide the uses of particular materials. Children are to research and discuss how chemical changes have impacted our lives. Earth and Space – Children to complete simple shadow clocks or sundials to identify why they think people believe that structures such as Stonehenge might have been used as astronomical clocks. Forces – children to investigate the effect of air resistance using parachutes. Children are to test water resistance by looking at boat shapes. Children to use gears, pulleys and levers to explore the effects they have. **Children are to plan different kinds of fair experiment throughout all topic areas.** **They are to identify how to control the variables to make the experiment accurate.** **They are to make predictions and explain why they think that this happen.** **They are to take accurate measurements using different scientific equipment.** **They are to explain why repeated measurements are required.** **They are to record data in different forms to share their understanding.** **They are to make predictions about how other tests will work using their results.** **They are to present their findings in both written and oral reports using a prediction, method, results and conclusion.** **They are to explain what happened in full detail within their experiment, state whether their predictions were correct and explain why this was the case.**

				They are to use other experiments to share whether their understanding is supported or disproved.
Y6	To develop a deeper understanding of a wide range of scientific ideas. To do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically. To encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. To begin to recognise that scientific ideas change and develop over time. To select the most appropriate ways to answer science questions using different types of scientific enquiry. These types of enquiry are to include 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. To 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. To complete working and thinking scientifically exercises through relating it to substantive science content in the programmes of study. To read, spell and pronounce scientific vocabulary correctly.	**Living things and their habitats.** To 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.	**SC1.** To plan different kinds of fair experiments. To recognise why controlling variables is important and explain how they do this in their experiments. To take accurate measurements using scientific equipment. To take repeated measurements when appropriate. To record data using: Labelled scientific diagrams. Classification keys. Tables. Bar charts. Line charts. Scatter graphs. To use the test results generated to make predictions and to set up further tests. To draw conclusions from results and describe causal relationships and degrees of trust within results. To present findings in a written report with an introduction, conclusion and results. To present findings in an oral presentation. To identify scientific evidence that has been used to support or refute ideas or arguments. **Living things and their habitats.** To give reasons for classifying plants and animals based on specific characteristics.	**Living things and their habitats.** Children to build upon their knowledge from Year 4 and look into subdividing their groupings further by using animals, plants and microorganisms (tiny, only seen by a microscope, e.g. bacteria).

				Children are to explain why they are found within particular groups, e.g. mammals and not another.
		Animals including humans. To identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. To describe the ways in which nutrients and water are transported within animals, including humans.	**Animals including humans**. To recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.	**Animals including humans**. Children to understand that the human circulatory system refers to taking oxygen around the body. Children know the heart is a muscle that pumps blood around the body. They should understand that the blood carries oxygen and nutrients throughout. They should know that the blood is moved through tubes called blood vessels (arteries and veins). Children need to refer back to the knowledge gained about healthy lifestyles in Year 3. They need to understand how some drugs and substances may be harmful to their bodies – PSHE link. Children to develop their understanding from Year 4 based upon the digestive system and look at this in more detail as well as the circulatory system in understand different ways nutrients and water are transported.
		Evolution and inheritance. To 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 recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. To identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.		**Evolution and inheritance.** Children are to develop their understanding of how living things have evolved from the knowledge they learnt in Year 3. They are to consider how characteristics are passed from parents to their offspring and how some have been developed to make them survive better in their environment giving examples of this, e.g. giraffes with long necks. Children are to understand that a fossil allows people to find out more about them, e.g. where they are found.
		Light. To recognise that light appears to travel in straight lines.	**Light.** To use the idea that light travels in straight lines to explain that objects are	**Light.** Children are to develop their understanding from Year 3 and looking in detail about the way the light behaves

			seen because they give out or reflect light into the eye. To 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. To use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.	including sources of light (an object that omits light), reflection (light bouncing off one thing to another) and shadow (any object that blocks the light casts a shadow).
		Electricity. 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 use recognise symbols when representing a simple circuit in a diagram.	**Electricity.** 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.	**Electricity.** Pupils to develop their level of understanding from Year 4 by investigating how the bright or the volume changes dependent upon the number and voltage of the battery. They are describe this in detail and explain these. Children are to be able to identify and use the symbols for each component within a circult. **SC1.** Living things and their habitats - To research unfamiliar animals and plants from a range of habitats and decide where they belong in the classification system. Animals including humans – explore scientists and research to look at the relationship between the different aspects of healthy living. Evolution and inheritance – children are to raise questions regarding adaptations including those living under severe conditions. They are also to think of the advantages and disadvantages of specific adaptations. Light – Children to make periscopes to investigate and explain how light appears to travel in straight lines. They are to also make shadow puppets to investigate the relationship between light sources, objects and shadows.

				Electricity – Children to investigate how bright or loud the circuit is dependent upon voltage and cells used. Children to share their understanding by making something that demonstrates this, e.g. a burglar alarm. **Children are to plan different kinds of fair experiment throughout all topic areas.** **They are to identify how to control the variables to make the experiment accurate.** **They are then able to use this knowledge to explain how they use these variables within their work.** **They are to make predictions and explain why they think that this happen using scientific knowledge to back their ideas up.** **They are to take accurate measurements using different scientific equipment and repeat these measurements at least twice.** **They are to explain why repeated measurements are required.** **They are to record data in different forms to share their understanding.** **They are to make predictions about how other tests will work using their results.** **They are to use the knowledge gained in order to make connections and conclusions about what had happened.** **They are to describe causal relationships (cause effect, when one event makes another work) and degrees of trust (trusting someone different amounts) to do this.** **They are to present their findings in written and oral reports using a prediction, method, results and conclusion.** **They are to explain what happened in full detail within their experiment, state whether their predictions were correct and explain why this was the case using**

				scientific evidence. They are to then use this to agree or disagree with other ideas or arguments and explain this thoroughly.