How our Science curriculum is constructed

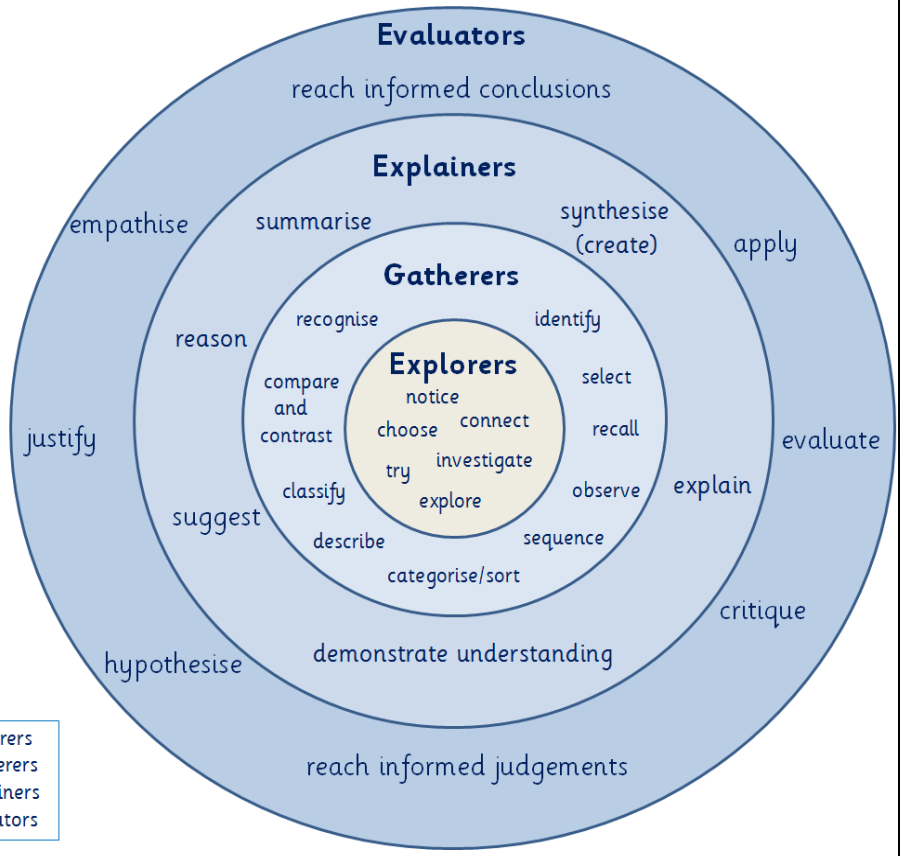
Our **'progression'** details how our pupils learn the National Curriculum content. Each objective in our progression document requires pupils to master key skills and techniques in order to understand the significance of the knowledge they have learned and can remember, some people call this **'disciplinary knowledge'**, and the language and skills are sequentially introduced as per the diagram to the right.

'Overview' details what is taught and when.

The progression document and our skills and techniques are sequenced small building blocks to enable children to achieve our **'key objectives' (end points)** we have decided as crucial to meeting the expected standard in each subject by the end of each academic year.

Our medium term planning identifies the **'sticky knowledge'**, what some people call **'substantive knowledge'**, and this is the body of knowledge we have selected as being of value for our children to know and remember. The sticky knowledge is sequenced and builds on relevant previous learning and supports future relevant learning.

Protected characteristics and British Values are actively promoted at Appledore School by how we act, treat one another and in what we learn. Examples of how we actively teach protected characteristics in science include: life cycles (age) and women in science (sex).



FSU - Explorers
Y1/2 – Gatherers
Y3/4 – Explainers
Y5/6 - Evaluators

Definitions & Phrasing

Explorers	Gatherers
Notice: see something and pay attention to it **Choose**: decide on something for a purpose **Connect**: make links between ideas and/or actions **Investigate**: find out about something (with a focus) **Try**: have a go at something that could be new or hard **Explore**: willingness to try out new things	**Recognise** - see something and know that it is similar to something you have seen before. **Compare/contrast** - say how something is the same or different to something else. **Classify** - group things according to their similarities **Describe:** - recall something in detail or talk about an observation in detail **Categorise/sort** - **t**he action of classifying **Sequence** - place a set of events into an order. **Observe** - notice something and say how it links to the learning. **Recall** - remember something learnt previously **Select:** - choose the information most suitable and relevant. **Identify** - understand something recalled or observed.
Explainers	**Evaluators**
Summarise: Write or say a shortened version to give the key facts and events. **Reason:** Thinking about something in a logical way to respond to a question or challenge. **Suggest:** Write or say ideas that could work in response to a question or challenge. **Demonstrate understanding:** share what you know and can explain using words, images or actions. **Explain:** Write or say how or why something happened the way it did **Synthesise:** Create statements or questions using ideas and facts.	**Reach informed conclusions:** sum up the main points about something supported by evidence. **Empathise:** place yourself in another's position. **Justify:** give reasons supported by evidence to show what you consider right or reasonable. **Hypothesise:** use your past knowledge and available facts to try and predict what might happen (make a good educated guess). **Reach informed judgement:** express a personal view about something supported by evidence. **Critique:** consider the validity or trustworthiness of evidence **Evaluating:** weigh up and judge the relative importance of something compared with other ideas and arguments. **Apply**: make use of information in a given situation/

Beginning to, ***developing*** and other similar phrasing means:
Teachers or TA's guide and support children to complete activities and/or demonstrate understanding.
In Key Stage 1 activities supported by adults through resources used, direction given and questions asked.
In Key Stage 2 teachers will explain, model and/or demonstrate before typically ask children to complete an activity with staff available to continue to support and guide towards successful completion/achievement.

Use, ***understand***, ***know***, ***secure*** and other similar phrasing means:
Children are secure in their understanding of knowledge and concepts and confidently and independently use and apply skills to achieve a desired outcome.

Science

FSU	1	2	3	4	5	6
Explorers	*Gatherers*		*Explainers*		*Evaluators*	
Working Scientifically (1)						
Explore the natural world around them, making observations.	Ask simple questions and **recognise** that they can be answered in different ways **Observe** closely, using simple equipment performing simple tests **Identify** and **classify** **Select/recall** information from observations and ideas to suggest answers to questions gather and record data to help in answering questions.		**Suggest** relevant questions and use different types of scientific enquiries to answer them Set up simple practical enquiries, **comparative** and fair tests Systematically and carefully **observe** and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers Gather, **record, classify** and present data in a variety of ways to **explain** the answers to questions Record and **explain** findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables **Explain** findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions Use results to draw simple conclusions, make predictions for new values, **suggest** improvements and **create** further questions **Identify** differences, similarities or changes **demonstrating understanding** of simple scientific ideas and processes Use straightforward scientific evidence to **suggest** answers to questions or to **explain** their findings.		**Suggest** and plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate to **justify** conclusions **Record** data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs **Apply** knowledge from test results to make predictions to **hypothesise** further comparative and fair tests Report and present findings from enquiries; **reach informed conclusions** **Identify** causal relationships and **evaluate** the degree of trust in results through oral and written forms such as displays and other presentations Use evidence to **justify** conclusions. **identify** and **evaluate** scientific evidence that has been used to justify or refute ideas or arguments.	

Explore the natural world around them, making observations and drawing pictures of animals and plants.	**Plants** **Identify** 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 . .	**Living things & their habitats** **Categorise** and **compare** things that are living, dead, and things that have never been alive. **Identify** that most living things live in habitats to which they are suited and **describe** how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other. **Identify** a variety of plants and animals in their habitats, including micro-habitats. **Describe** how animals obtain their food from plants and other animals, **sequence** a simple food chain and **identify** different sources of food. **Plants** **Observe** and **describe** how seeds and bulbs grow into mature plants. **Observe** and **describe** how plants	**Plants** **Identify** and **describe** the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. **Observe** the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and **identify** how they vary from plant to plant. **Observe** and **explain** the way in which water is transported within plants. **Recognise and describe** the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.	**Living things & their habitats** **Recognise** that living things can be **classified** in a variety of ways. **Demonstrate understanding** of and use classification keys to help **sort** and **identify** a variety of living things in their local and wider environment. **Explain** how environments can change and that this can sometimes pose dangers to living things, **suggesting reasons** why.	**Living things & their habitats** **Describe** the differences in the life cycles of a mammal, an amphibian, an insect and a bird. **Describe** the life process of reproduction in some plants and animals	**Living things & their habitats** **Describe** how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals. **Suggest** reasons for classifying plants and animals based on specific characteristics

		need water, light and a suitable temperature to grow and stay healthy				
Explore the natural world around them, making observations and drawing pictures of animals and plants.	**Animals, Including humans** **Identify** and **sort** a variety of common animals including fish, amphibians, reptiles, birds and mammals. **Identify** and **classify** a variety of common animals that are carnivores, herbivores and omnivores. **Describe** and **compare** the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). **Identify**, draw and label the basic parts of the human body and **recognise** which part of the body is associated with each sense.	**Health & Growth** **Recognise** that animals, including humans, have offspring that grow into adults. **Identify** and **describe** the basic needs of animals, including humans, for survival (water, food and air). **Describe** the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.	**Animals, Including humans** **Demonstrate understanding** 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. **Recognise** that humans and some other animals have skeletons and muscles and **explain** that they provide support, protection and movement.	**Animals, Including humans** **Describe** the simple functions of the basic parts of the digestive system in humans. **Identify** the different types of teeth in humans and **explain** their simple functions. **Identify** and **explain** a variety of food chains, identifying producers, predators and prey. **Create** food chains, **demonstrating an understanding** of the transfer of energy.	**Animals, Including humans** **Describe** the changes as humans develop to old age, **suggesting reasons** for these changes.	**Animals, Including humans** **Identify** the main parts of the human circulatory system; **describe and explain** the functions of the heart, blood vessels and blood. **Evaluate** the impact of diet, exercise, drugs and lifestyle on the way their bodies function. **Demonstrate understanding** of the ways in which nutrients and water are transported within animals, including humans.
Understand some important processes and changes in the natural world	**Properties of Materials** **Recall** names for objects and **identify** the materials from which they are made	**Changing materials** **Identify** and **compare** the suitability of a variety of everyday	**Rocks** **Compare** and **categorise** different kinds of rocks on the basis of their	**States of Matter** **Categorise** materials, according to whether they are	**Properties & Changes of** Materials **Compare** and **categorise** everyday materials based on their properties, including their hardness,	**Evolution & Inheritance** **Demonstrate understanding** that living things have changed over time

around them including the seasons and changing states of matter.	(distinguishing between the two). **Identify** a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. **Describe** the simple physical properties of a variety of everyday materials. **Compare, contrast** and **categorise** a variety of everyday materials on the basis of their simple physical properties.	materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. **Observe** how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching	appearance and simple physical properties. **Explain** in simple terms how fossils form when things that have lived are trapped within rock. **Demonstrate understanding** that soils are made from rocks and organic matter.	solids, liquids or gases. **Observe** that some materials change state when they are heated or cooled. Measure or research the temperature at which this happens in degrees Celsius (°C) to **reach an informed conclusion.** **Identify** the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	solubility, transparency, conductivity (electrical and thermal), and response to magnets. **Demonstrate understanding** that some materials will dissolve in liquid to form a solution, and **explain** how to recover a substance from a solution. **Apply** knowledge of solids, liquids and gases to **evaluate** how mixtures might be separated, including through filtering, sieving and evaporating. Give reasons, **applying** evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. **Demonstrate understanding** that dissolving, mixing and changes of state are reversible changes. **Explain** that some changes result in the formation of new materials, and that this kind of change is not usually reversible,	and that fossils provide information about living things that inhabited the Earth millions of years ago. **Recognise** that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. **Explain** how animals and plants are adapted to suit their environment in different ways and suggest reasons why that adaptation may lead to evolution.
			Forces & Magnets **Compare** how things move on different surfaces and **suggest reasons** why.	**Sound** **Identify** how sounds are made, associating some of them with something vibrating.	**Forces** **Explain** that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.	

			Observe that some forces need contact between two objects, but magnetic forces can act at a distance. **Observe** how magnets attract or repel each other and attract some materials and not others. **Compare** and **categorise** a variety of everyday materials based on whether they are attracted to a magnet, and identify some magnetic materials. **Describe** magnets as having two poles. **Suggest** a line of enquiry to demonstrate whether two magnets will attract or repel each other, depending on which poles are facing.	**Recognise** that vibrations from sounds travel through a medium to the ear. **Observe** and **identify** patterns between the pitch of a sound and features of the object that produced it. **Observe** and **identify** patterns between the volume of a sound and the strength of the vibrations that produced it. **Explain** why sounds get fainter as the distance from the sound source increases.	**Identify** the effects of air resistance, water resistance and friction that act between moving surfaces. **Recognise** that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect	
Understand some important processes and	**Seasonal Changes & Light**		**Light** **Demonstrate understanding**	.	**Space** **Describe** the movement of the Earth, and other	**Light** **Explain** that light appears to travel in

changes in the natural world around them including the seasons and changing states of matter.	**Observe** changes across the four seasons. **Observe** and **describe** weather associated with the seasons and how day length varies.		that they need light in order to see things and that dark is the absence of light. **Observe** that light reflects from surfaces. **Recognise** that light from the sun can be dangerous and **suggest** ways to protect their eyes. **Recognise** and **explain** how shadows form when the light from a light source is blocked by a solid object. **Explain** why the size of shadows change and **describe** patterns observed.		planets, relative to the Sun in the solar system. **Describe** the movement of the Moon relative to the Earth. **Describe** the Sun, Earth and Moon as approximately spherical bodies. **Apply knowledge** of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky	straight lines. **Apply** knowledge that light travels in straight lines to **explain** that objects are seen because they give out or reflect light into the eye. **Explain** that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes. **Apply** knowledge that light travels in straight lines to **explain** why shadows have the same shape as the objects that cast them.
				Electricity **Identify** common appliances that run on electricity. **Create** a simple series electrical circuit, **identifying** its basic parts, including cells, wires, bulbs, switches and buzzers. **Suggest** whether		**Electricity** **Identify** how the brightness of a lamp or the volume of a buzzer is associated with the number and voltage of cells used in the circuit. **Compare** and **give reasons** for variations in how components function, including the brightness of bulbs,

				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. **Explain** how a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. **Recognise** some common conductors and insulators, and associate metals with being good conductors		the loudness of buzzers and the on/off position of switches. **Apply** recognised symbols when representing a simple circuit in a diagram.

Science Curriculum Overview

	FSU	Y1	Y2	Y3	Y4	Y5	Y6
Autumn 1	What is Autumn and how does it fit in with seasons? Why do we celebrate Harvest?	Health and growth (animals) Seasonal changes and light	Living things and their habitats	Light and shadow	States of matter	Properties and changes of materials	Living things and their habitats
Autumn 2	Light linked to Diwali and Christmas.	Health and growth (animals)	Living things and their habitats	Rocks	States of matter (continued) Animals including humans (Teeth and Digestion)	Properties and changes of materials	Animals (including humans)
Spring 1	What is Winter and how does it fit in with seasons?	Weather Seasonal changes and light	Animals, including humans	Animals including humans (bones and muscles)	Animals, including humans (Teeth and Digestion continued)	Earth and Space	Evolution and inheritance
Spring 2	What is Spring and how does it fit in with seasons? Life cycles of a frog and a chicken.	Health and growth (humans)	Animals (including humans) Use of everyday materials	Forces and magnets	Living things and their habitats	Animals including humans (stage of human development)	
Summer 1	Testing materials Planting cress in different conditions	Everyday materials Seasonal changes and light	Use of everyday materials	Plants	Electricity	Living things and their habitats	Electricity

Summer 2	What is Summer and how does it fit in with seasons? Floating and sinking	Everyday materials Plants	Plants	Animals, including humans (nutrition)	Sound	Forces	Light and sight

Science 'Sticky' (substantive) Knowledge		Science Key Objective (end points)
FSU	Name the four seasons and their order and say one thing that occurs in each season. Explain what happens during Harvest, why we celebrate it and the season it occurs in. Talk about the order of the frog and chicken cycle. Explain that it goes round and round and that it doesn't stop. Name the season that it occurs in. Talk about what happens when something floats or sinks.	• Explore the natural world around them, making observations and drawing pictures of animals and plants; • Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class; • Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.
Year 1	**Animals including humans** • Know the different animal groups and be able to sort animals into these categories (birds, mammals, reptiles, insects, fish, amphibians). • Be able to group animals into carnivores, herbivores, omnivores. • Know the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). • Know the 5 senses (touch, smell, sight, taste, hearing) and know which body part we use for each sense. **Plants** • Know a variety of common wild and garden plants, including deciduous and evergreen trees. • Know the basic structure of a variety of common flowering plants, including trees • Know how seeds and bulbs grow into mature plants. • Know what plants need to survive, e.g. water, sunlight, space, time, nutrients. **Properties of Materials** • Be able to identify a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. • Describe and compare the simple physical properties of a variety of everyday materials, e.g. is it strong, flexible, waterproof.	By the end of Year 1 our young scientists are developing into *gatherers* and demonstrating age appropriate scientific knowledge and scientific working by achieving all objectives in the following units of enquiry: • animals including humans, plants, properties of materials and seasonal changes

	Seasonal changes ● Know how animals adapt to the changing seasons, e.g. hibernation and migration. ● Know how plants adapt to the changing seasons and which trees keep their leaves. ● Know how the length of daylight changes throughout the year, e.g. there is more daylight in summer. ● Know the different weather we might see in different seasons and how we need to adapt to this, e.g. what we might wear, activities we might do.	
Year 2	**Living things and their habitats** ● Know that some organisms were once alive but are now dead and be able to name some (animals, fallen leaves etc) ● Know that things that never lived are not dead and be able to name some (items made from plastic) ● Know that plants and animals live together in a habitat and be able to name some ● Know how to put a food chain together **Animals (including humans)** ● Know that changes take place as a baby grows and name some of them (walking, growing, feeding themselves). ● Know that bodies change as they grow older and be able to name and order the stages of being human and order the stages of some animals. ● Know what humans and animals need to survive (food, water, exercise, keeping clean) ● Know that different types of food belong to different groups and name some of the groups (meats, fruit/vegetables, dairy, cereals/bread, fats) ● Know that regular exercise will help keep us fit ● Know how we keep ourselves clean (washing hands, bathing/showering, cleaning teeth). **Uses of everyday materials** ● Know that we can change the shape of some solid objects and explain two ways in which the shape of an object can be changed (push, pull, squash, twist). ● Know that even if objects are made from the same material, they can have different properties. Be able sort objects that have been made from the same materials. Be able to explain how the properties of these objects vary. ● To know that some objects' shape can be changed when we bend or twist them and know that some materials' shape cannot be changed by bending or twisting. ● Know that materials are used for specific objects due to their properties (eg glass for windows as it is waterproof and transparent) ● Know some materials can be stretched (elastic, some fabrics). **Plants** ● To know that different seeds grow into different plants. Name two types of seeds name the plants that they will grow into (cress seeds - cress, sunflower seeds - sunflowers) ● To know what seeds need to germinate (need water, soil and nutrients to germinate). Know that seeds germinate in the dark ● To know what plants need in order to grow. (plants need water, light, and nutrients in order to grow. Plants need light to grow or they will die. ● To know how plants need to be planted in order to grow	By the end of Year 2 our young scientists are secure gatherers and demonstrate age appropriate scientific knowledge and scientific working having by achieving all objectives in the following units of enquiry: ● living things and their habitats, animals including humans, uses of everyday materials,plants and season changes

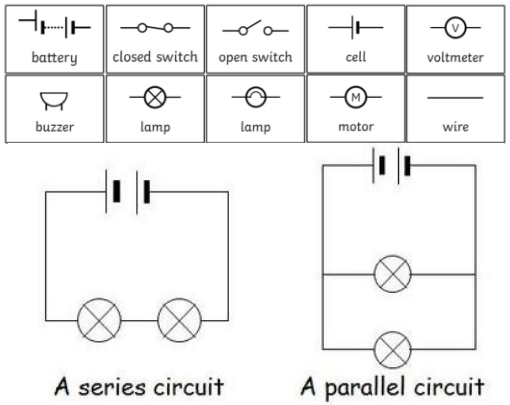
	• Explain what a plants needs to grow (water) • Know the life cycle of a plant (seed, seedling, small plant, adult plant)	
Year 3	**Light and Shadow** • Demonstrate understanding that they need light in order to see things and that dark is the absence of light. • Observe that light reflects from surfaces. • Recognise that light from the sun can be dangerous and suggest ways to protect their eyes. • Recognise and explain how shadows form when the light from a light source is blocked by a solid object. • Explain why the size of shadows change and describe patterns observed. **Rocks** • Compare and categorise different kinds of rocks on the basis of their appearance and simple physical properties. • Explain in simple terms how fossils form when things that have lived are trapped within rock. • Demonstrate understanding that soils are made from rocks and organic matter. **Animals including humans** • Demonstrate understanding 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. • Recognise that humans and some other animals have skeletons and muscles and explain that they provide support, protection and movement. **Forces and Magnets** • Compare how things move on different surfaces and suggest reasons why. • Observe that some forces need contact between two objects, but magnetic forces can act at a distance. • Observe how magnets attract or repel each other and attract some materials and not others. • Compare and categorise a variety of everyday materials based on whether they are attracted to a magnet, and identify some magnetic materials. • Describe magnets as having two poles. • Suggest a line of enquiry to demonstrate whether two magnets will attract or repel each other, depending on which poles are facing. **Plants** • Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. • Observe the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and identify how they vary from plant to plant. • Observe and explain the way in which water is transported within plants. • Recognise and describe the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.	By the end of Year 3 our young scientists are developing into explainers and demonstrating age appropriate scientific knowledge and scientific working by achieving all objectives in the following units of enquiry: • light and shadow, rocks, animals including humans, forces and magnets and plants
Year 4	**States of Matter** • Categorise materials, according to whether they are solids, liquids or gases.	By the end of Year 4 our young scientists are secure explainers demonstrating age

	• Observe that some materials change state when they are heated or cooled. Measure or research the temperature at which this happens in degrees Celsius (°C) to reach an informed conclusion. • Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. **Teeth and Digestion** • Describe the simple functions of the basic parts of the digestive system in humans. • Identify the different types of teeth in humans and explain their simple functions. • Identify and explain a variety of food chains, identifying producers, predators and prey. • Create food chains, demonstrating an understanding of the transfer of energy. **Living Things and their Habitats (Habitats, Plants and Animals, Environments)** • Recognise that living things can be classified in a variety of ways. • Demonstrate understanding of and use classification keys to help sort and identify a variety of living things in their local and wider environment. • Explain how environments can change and that this can sometimes pose dangers to living things, suggesting reasons why. **Electricity** • Identify common appliances that run on electricity. • Create a simple series electrical circuit, identifying its basic parts, including cells, wires, bulbs, switches and buzzers. • Suggest 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. • Explain how a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. • Recognise some common conductors and insulators, and associate metals with being good conductors **Sound** • Identify how sounds are made, associating some of them with something vibrating. • Recognise that vibrations from sounds travel through a medium to the ear. • Observe and identify patterns between the pitch of a sound and features of the object that produced it. • Observe and identify patterns between the volume of a sound and the strength of the vibrations that produced it. • Explain why sounds get fainter as the distance from the sound source increases.	appropriate scientific knowledge and scientific working by achieving all objectives in the following units of enquiry: • states of matter, teeth and digestion, living things and their habitats, electricity and sound
Year 5	**Materials** • Know that materials have different jobs which are dependent on their properties	

	● Know the key properties of magnets ● Know what the three states of matter are ● What are the key properties of metals and plastics are ● Explain how materials can be separated using different methods ● Know what dissolving means **Forces** ● Know that friction is a force ● Understand the need for gravity ● Know what balanced forces are ● Explain how levers work ● Know who Sir Isaac Newton was **Animals including humans** ● Know the stages of human development ● Understand how babies grow and develop ● Know the main changes that occur in puberty ● Identify the changes that take place in old age **Living things and their habitats** ● Describe a lifecycle ● Know that some plants are adapted to survive in water ● Know the function of all the parts of a plant involved in reproduction ● Know the life cycle of amphibians, insects and birds **Earth and Space** ● Identify the planets which make up our solar system ● Know that the rotation of the Earth causes day and night ● Explain what an eclipses is ● Know how we see the Moon ● Know the four main phases of the Moon ● Know why we have seasons	By the end of Year 5 our young scientists are developing into evaluators and demonstrating age appropriate scientific knowledge and scientific working by achieving all objectives in the following units of enquiry: ● materials, forces, animals including humans, living things and their habitats and Earth and space,
Year 6	**Living Things and Their Habitats** ● Organisms can be divided into groups or 'classified' by looking at the similarities and differences between them ● Animals are divided into two main groups animals that have a backbone are called vertebrates animals that do not have a backbone are called invertebrates ● Microorganisms are tiny living organisms they are so small they can only be seen with a microscope ● Yeast is a helpful microorganism which makes bread rise ● Bacteria is a microorganism which breaks down plants into nutrients ● Bacteria are among the smallest living things	By the end of Year 6 our young scientists have become secure evaluators demonstrating age appropriate scientific knowledge and scientific working by achieving all objectives in the following units of enquiry: ● living things and their habitats, animals including humans, evolution and inheritance, light and electricity

	• A single bacterium consists of just one cell, and is called a single-celled organism even though it is just a single cell, it can carry out all seven life processes (movement, respiration, sensitivity, nutrition, excretion, reproduction and growth = MRS NERG) **Animals (including humans):** • The heart is a muscle which pumps blood around the body. • Muscles need oxygen to release energy from food to do work. (Oxygen is taken into the blood in the lungs; the heart pumps the blood through blood vessels to the muscles; the muscles take oxygen and nutrients from the blood.) • Red blood cells are responsible for picking up the oxygen in the lungs and carry oxygen to the body cells the red blood cells then collect the carbon dioxide (waste gas product) produced by our cells and transport the carbon dioxide back to the lungs which we breathe out when we exhale • The body has a network of blood vessels that carry blood around it. Clever doors, called valves, make sure that the blood cannot go the wrong way. • We need to keep healthy (body and mind) by having a balanced diet and exercising as well as sleeping. **Evolution and Inheritance:** • Life cycles have evolved to help organisms survive to adulthood. • Over time the characteristics that are most suited to the environment become increasingly common. • Organisms best suited to their environment are more likely to survive long enough to reproduce. • Organisms are best adapted to reproduce are more likely to do so. • Organisms reproduce and offspring have similar characteristic patterns. • Variation exists within a population (and between offspring of some plants) • Competition exists for resources and mates • Inheritance is when living organisms pass on their characteristics when they reproduce • Some physical traits that are passed on are hair and eye colour • Know that offspring are not identical to their parents • Know that extinction means a species dies out. Main causes of extinction are: loss of habitat, pollution and over consumption when we change a habitat we can cause the extinction of a species • After an animal dies, the soft parts of its body decompose leaving the hard skeleton which is buried by small particles of rock called sediment. More sediment builds up and the skeleton begins to compact and turn to rock creating fossils. Fossils can be used to find out how species have evolved. **Electricity:** • Know batteries are a store of energy and this energy pushes electricity round the circuit and voltage measures the ‘push.’ • Know current is how much energy is flowing round a circuit.	

- Know that when current flows through wires heat is released and the greater the current, the more heat is released.
- Understand that a switch will break a circuit stopping the current.
- Know the difference between a series circuit means and a parallel circuit (ie each component is connected and each component can operate independently.
- Recognise most relevant scientific circuit symbols



Light and Sight:

- Know light travels in straight lines
- Understand that animals see light sources when light travels from the source into their eyes and objects when light is reflected off that object and enters their eyes.
- Know that light reflects off all objects (unless they are black). Non-shiny surfaces scatter the light, so we do not see the beam.
- Understand that shadows are formed when light from a source is blocked by an opaque object and what happens when that opaque object movers nearer or away from the the light source
- Know shadows from the sun can be used to tell the time in a sundial
- Know what refraction is (ie when light shines into water, glass, plastic or another more dense material it slows down quite dramatically light waves tend to bend.