Astley St Stephens CE Primary School – Progression of Science: Knowledge, Skills & Vocabulary

To be a scientist at St Stephens, I must…

- Be interested and passionate about the difference that science can make to the world.
- Think critically and ask questions about how things work or what would happen if I…
- Plan and carry out scientific investigations.
- Use the results of my investigations to support my theory and conclusion.
- Carry out research to find out key facts and learning.

EYFS:

Area of Study	Key Knowledge and Skills	Reception
ELG End Point: **Communication and Language - Listening, Attention & Understanding:** Make comments about what they have heard and ask questions to clarify their understanding. **Personal, Social and Emotional -Development Managing Self:** Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices. **Understanding the World - The Natural World:** 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.	**Animals, including Humans** • I know what can we do here to take care of animals in the jungle? • I can compare animals from a jungle to those on a farm • I can explore a range of jungle animals. I can learn their names and label body parts **Living things and their habitats/Plants** • I can describe and comment on things I have seen whilst playing outside, including animals and plants • I can interact with the outdoors to foster curiosity and have the freedom to touch, smell, and hear the natural world • I can observe the changes in living things • I know what rubbish can do to our natural environment **Seasonal Changes** • I can observe changes in the leaves, weather and seasons • I can explore the world around me and see how it changes as we enter Summer • I can note and record the weather **Everyday Materials** • I know what recycling is and how it can take care of our world • I can explore materials that float/sink • I can make a boat to explore floating and sinking • I know what materials are metallic and materials that are not metallic	**Communication and Language:** • Learn new vocabulary. • Ask questions to find out more and to check what has been said to them. • Articulate their ideas and thoughts in well-formed sentences. • Describe events in some detail. • Use talk to help work out problems and organise thinking and activities, and to explain how things work and why they might happen. • Use new vocabulary in different contexts. **Personal, Social and Emotional Development** • Know and talk about the different factors that support their overall health and well-being: Þ regular physical activity Þ healthy eating Þ tooth-brushing Þ sensible amounts of 'screen time' Þ having a good sleep routine Þ being a safe pedestrian

Area of Study		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
BIG QUESTION		*Do animals all have the same parts?*	*How do humans stay healthy?*	*How can animals move?*	*What happens to food when we eat it?*	*How do humans change as they grow older?*	*What affects the health of humans?*
KEY SCIENTIST(S)						*Sir David Attenborough*	
Animals, Including Humans *Biology*	**Key Knowledge**	I know that vertebrates are animals that have a backbone and that there are five groups of them: fish, amphibians, reptiles, birds and mammals. I know that carnivores are animals that only eat meat or other animals. I know that herbivores are animals that only eat plants. I know that omnivores are animals that eat both meat and plants. I know the names of a variety of animals in each of these groups. I know that mammals and birds are warm blooded and that reptiles, amphibians and fish are cold blooded. I know that mammals give birth to live young but reptiles, amphibians, fish and reptiles lay eggs. I know that fish and some amphibians can breathe underwater, but mammals, reptiles and birds can't. I know the names of the basic parts of the human body. I know that the nose is associated with smell, the mouth with taste, the eyes with sight, the ears with hearing and the skin with touch.	I know that a life-cycle is the change an animal or plant passes through from beginning of life until death. I know that animals, including humans, have offspring which grow into adults for example: cat-kitten, dog -puppy, cow – calf, horse – foal, duck – duckling, lion – cub etc. I know the basic needs of animals, including humans, and that they need water, food and oxygen to survive I know that to keep healthy humans need: > to eat a balanced diet and healthy food > exercise to keep muscles and bones healthy > to take medicines given by doctor when feeling ill > to keep good hygiene by washing regularly, having clean clothes and brushing teeth and hair	I know that vertebrates are animals that have a backbone. I know that these skeletons are called endoskeletons. This means they grow on the inside of their bodies. I know that exoskeletons exist outside the body and protects animals. I know that skeletons provide support, allow movements through joints and protect organs. I know that joints are where bones meet and move. I know that muscles contract and relax. I know the names of bones in the human skeleton structure. I know that animals, including humans, need the right types and amount of nutrition. I know that animals, including humans cannot make their own food; they get nutrition from what they eat.	I know that teeth are used for cutting and chewing food. I know that this starts the digestive process which gives us the energy we need to live. I know that not brushing our teeth can lead to plaque and tooth decay. I know the names of different types of teeth in humans; canines, incisors, premolars and molars, and their simple functions. I know the names of the different parts of the digestive system in humans; mouth, tongue, teeth, oesophagus, stomach, small intestine and large intestine. I know the special function of each one. I know that a producers are organisms that make their own food and begin the food chain. I know that predators are wild animals that hunt for food. I know that prey is an animal that is hunted by others.	I know the changes that happen as humans develop to old age. I know that a foetus is an unborn animal or human being at the early stages of development. I know that a new born baby has just been born. I know that infancy is a period of rapid change. I know that children learn new things and become more independent in childhood. I know that adolescence is when the body starts to change and prepare for adulthood and that hormonal changes can take place over a few years (puberty). I know that early adulthood is when humans are usually their fittest and strongest. I know that middle adulthood involves changes such as hair loss and late adulthood is where health can start to decline.	I know that the circulatory system is made of the heart, lungs and blood vessels. I know that arteries carry oxygenated blood from the heart to the rest of the body. I know that veins carry deoxygenated blood from the body to the heart. I know that nutrients, oxygen and carbon dioxide are exchanged via the capillaries. I know that some choices, such as smoking and drinking alcohol can be harmful to our health. I know that exercise can tone our muscles, reduce fat, increase fitness, strengthen the heart and improve lung function. I know how nutrients and water are transported within animals, including humans.

	Key Skills	I can identify the names of a variety of common animals including fish, amphibians, reptiles, birds and mammals and sort these into groups. I can identify a variety of common animals that are carnivores, herbivores and omnivores. I can describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals). I can identify the basic parts of the human body and say which part of the body is associated with each sense. I can use my own senses to compare different textures, sounds, smells and tastes. I can draw and label basic parts of the human body.	I can observe through video or first-hand how different animals, including humans, grow. I can ask questions about what animals need for survival I can match an animal/human with its offspring. I can describe the benefits of exercise, eating the right amounts of different types of food and having good hygiene.	I can draw and label a food plate. I can research different food groups and how they keep us healthy. I can design meals based on my research. I can identify the food type with what that food does for the body – i.e. protein – builds and repairs etc. I can label different bones within a human skeleton. I can label some muscles of the human body.	I can label the different parts of the digestive system in humans and match descriptions of their functions. I can compare the teeth of carnivores and herbivores and suggest reasons for differences. I can construct and interpret a variety of food chains and identify producers, predators and prey.	I can describe the changes as humans develop to old age and represent this in a diagram. I can research the gestation period of other animals and compare them with humans	I can identify the main parts of the human circulatory system. I can describe the functions of the heart, blood vessels and blood and show this in a diagram. I can produce a fact file showing the impact that diet, exercise, drugs and lifestyle has on the way the body functions. I can describe the ways in which nutrients and water are transported within animals, including humans and show this in a diagram.
	Vocabulary	Animals, classification, carnivore, herbivore, omnivore, Amphibian, reptile, bird, mammal, pet, backbone, cold-blooded, environment, farm, gills, temperature, vertebrate, warm-blooded, wild	Backbone, balanced diet, bones, disease, exercise, farm, healthy, hygiene, life-cycle, medicine, muscles, offspring, pet, skeleton, survive	Nutrients, carnivore, herbivore, omnivore, skeleton, joints, muscles, backbone, bones, contract, elbow, endoskeleton, exoskeleton, organs, protect, relax, support	Digestive system, digestion, herbivore, teeth, salvia, stomach, omnivore, stomach, small intestine, nutrients, oesophagus, large intestine, carnivore, predator, prey, absorb, canine, decay, excretion, incisor, molar, premolar,	Adolescence, adulthood, development, foetus, genitals, gestation, growth, hormones, independent, infancy, life-cycle, life processes, mature, menstruation, offspring, puberty, reproduction, toddler	Circulatory system, heart, blood, oxygen, carbon dioxide, respiration, blood vessels, diet, exercise, drug, lifestyle, nutrients, water, aorta, arteries, atrium, capillaries, deoxygenated, oxygenated, vena cava, ventricle

Area of Study		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
BIG QUESTION			*How can animals thrive in their environment?*		*What happens to living things as their habitat changes?*	*How do living things make copies of themselves?*	*How are living things grouped together?*
KEY SCIENTIST(S)							*Carl Linnaeus*
Living Things & their Habitats *Biology*	**Key Knowledge**		I know that a habitat is a place where living things live and can find everything they need to survive. I know that a habitat provides food, water, air, space to move and grow and shelter. I know that some habitats are large like the ocean, and some are very small like under a log. I know that some habitats in our local area include woodlands and ponds. I know that microhabitats are very small places where mini-beasts live. These include: grass, under fallen leaves and in soil. I know that some mini-beasts that can be found are snails, centipedes, ants and worms. I know that animals and plants depend on each other to survive. I know that a food chain shows how plants (producers) are eaten by animals (consumers) and that all living things have a part to play in food chains.		I know that all living things (organisms) have to do certain things to stay alive. I know that there are 7 life processes; movement, respiration, sensitivity, growth, reproduction, excretion and nutrition. I know that living things can be grouped in a variety of ways. I know that a classification key is a tool used to group living things to help us identify them. E.g. a series of questions that determine an organism's physical characteristics. I know that habitats and environments can change throughout the year and that this can sometimes pose dangers to living things. I know that humans can have positive and negative effects on the environment.	I know that reproduction is when an animal or plant produces one or more individuals to itself. I know that sexual reproduction requires to parents with male and female gametes (cell) and that it will produce offspring that is similar to, but not identical to, the parent. I know that asexual reproduction will produce offspring that is identical to the parent and requires only one parent. I know that pollination occurs when pollen from the anther is transferred to the stigma by bees and other insects. I know the life process of reproduction in some plants and animals. I know that the pollen travels down and meets the ovule and when this happens, seeds are formed. This is called fertilisation. I know that the life-cycles of mammals, birds, amphibians and insects have similarities and differences, one being metamorphism.	I know that living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals. I know that vertebrates are animals with a backbone, and invertebrates are animals without a backbone. I know that the word classifying means grouping something using its features. I know that plants and animals can be classified based on specific characteristics.

	Key skills		I can categorise/sort things that have been alive, things that are alive and things that area dead. I can compare differences between things that are dead, alive or have been alive. I can match an animal to the most appropriate habitat by drawing on my knowledge of what habitats provide and the features of the animal. I can read a simple food chain and use this to describe how animals obtain their food from plants and other animals.		I can use my local environment to raise and answer questions that help me to identify and study plants in my local environment. I can group living things in different ways and explain why I have grouped them in this way. I can use classification keys to help group, identify and name a variety of living things. I can explain the dangers of changes to the environment and the impact that these changes could have.	I can draw and label the life cycle of a mammal, an amphibian, an insect and a bird. I can observe and compare the life cycles of plants and animals in my local environment with other plants and animals around the world. I can escribe the life process of reproduction in some plants and animals and show this is in a diagram. I can observe changes in animals over a period of time.	I can identify and explain why animals and plants have been categorised in a certain way. I can classify plants and animals by identifying similarities and differences in their characteristics. I can use classification systems and keys to identify plants and animals in my immediate environment. I can research unfamiliar plants and animals from a broad range of other habitats and decide where they belong in the classification system.
	Vocabulary		Habitat, micro habitat, survival, food chain, woodland, rainforest, desert, ocean & seashore, carnivore, depend, herbivore, omnivore, mini-beast, plant, source,		Organisms, variation, classification, vertebrates, invertebrates, characteristics, mammals, reptiles, amphibians, bird & fish, biomes, carnivore, omnivore, herbivore, life processes, movement, reproduction, sensitivity, growth, respiration, excretion, nutrition	Amphibian, bird, dispersed, embryo, fertilised, insect, lifecycle, mammal, nectar, pollen, pollination & reproduction, anther, bulb, cell, dispersed, dissect, embryo, gamete, germination, metamorphis	Organism, micro-organism, fungus, mushrooms, classification keys, environment, fish, amphibians, reptiles, birds, mammals, vertebrates, invertebrates, name some of these, arachnid, mollusc, insect& crustacean

Area of Study		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
BIG QUESTION		What ways can I identify a plant?	What things do plants need to grow?	What do the different parts of a plant do?			
KEY SCIENTIST(S)			Jane Colden				
Plants *Biology*	**Key Knowledge**	I know that people can grow plants in their garden and care for them. I know that wild plants grow by themselves and that they do not need to be cared for. I know the names of a variety of common wild plants including dandelion, daisy and buttercup. I know that if a wild plant grows somewhere unwanted, it's a weed. I know the names of a variety of garden plants including rose, poppy and sunflower. I know that deciduous trees lose their leaves every Autumn and evergreen trees have their leaves all year round. I know the names of different parts of a flowering plant: flower, leaf, seed, stem, roots. I know the names of different parts of a tree: leaves, twig, branch, trunk, roots.	I know that plants require water, warmth, nutrients from soil and light to grow. I know that if plants don't have these things, they may stop growing and die. I know that plants can move, grow, react to surroundings, absorb nutrients and reproduce. I know that plants provide us with fruits which carry their seeds I know that seeds and bulbs grow into plants, flowers or trees. I know the parts of common trees and plants including leaves, flowers, trunks, branches, seeds, bulbs, stems, roots and twigs.	I know the petals of a plant are bright to attract bees to collect pollen and make seeds. I know that seeds can grow to make new plants. This is called germination. I know that leaves use carbon dioxide and sunlight to make food I know the stem carries water and other nutrients from the roots I know that roots help to anchor the plant in the soil. I know that plants need oxygen, water, sunlight, nutrients, room and a suitable temperature to grow. I know that this can vary depending on the type of plant. I know that the flowers' job is to create seeds so that new plants can grow. I know that pollination occurs when pollen from an anther is transferred to the stigma by bees and insects I know that seeds are dispersed so that germination can begin again			

	Key Skills	I can use my local environment to ask questions about plants I can observe the growth of plants and vegetables that I have planted I can identify a variety of common wild and garden plants, including deciduous and evergreen trees and sort these into groups. I can compare and contrast familiar plants I can draw and label the basic features of garden plants, including deciduous and evergreen trees. I can record how plants have changed overtime.	I can use my local environment to observe how plants grow I can, with accuracy, observe and record the growth of plants and how they change over time. I can plant a seed and give it everything it needs (water, light and a suitable temperature) to grow and stay healthy. I can set up a comparative test to show that plants need light and water to stay healthy	I can describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers I can carry out an experiment to test the requirements of plants to survive and how this varies from plant to plant. I can investigate the way in which water is transported within plants by carrying out an observation. I can produce a diagram to show the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.			
	Vocabulary	Plant, tree, deciduous, evergreen, flowering, branches, bulb, common, deciduous, evergreen, flower, fruit, garden, herb, petal, plants, roots, seed, stem, trunk, vegetable, weed, wild	Bulb, temperature, germination, roots, seed dispersal, shoots, mature, branches, deciduous, evergreen, fruit, garden, herb, nutrients, seed, stem, tree, trunk, wild	Nutrients, pollination, seed dispersal, seed formation, absorb, anther, branches, bulb, carbon dioxide, dissect, fertilisation, function, ovule, petal, pollen, roots, seeds, stem, stigma, structure, transported,			

Area of Study		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
BIG QUESTION		*What is it like in each season?*					
KEY SCIENTIST(S)		*Francis Beaufort*					
Seasonal Changes *Physics*	**Key Knowledge**	I know that there are four seasons within a year in the UK: Spring, Summer, Autumn and Winter. I know that Spring is in March, April and May. I know that Summer is in June, July and August. I know that Autumn is in September, October and November. I know that Winter is in December, January and February. I know a weather forecast tells us what the weather will be like, and will use symbols to help us. I know that the weather patterns are different in each season. I know a range of words that I can use to describe the weather. I know that the day is longer in Summer than Winter and that this is because of the how close it is to the sun.					
	Key Skills	I can observe and record what the weather is like during each season in a weather diary. I can make comparisons about the weather in each season.					
	Vocabulary	Season, spring, summer, autumn, winter, weather, hot, warm, cool, cold, sunny, cloudy, windy, rainy, snowing, hailing, sleet, frost, fog, mist, icy, rainbow, thunder, lightning, storm, light, dark, day, night, weather forecast, temperature, United Kingdom					

Area of Study		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
BIG QUESTION		*What are the things I use made from?*	*Why do we make certain things out of certain materials?*		*What happens to puddles after it rains?*	*What is a mixture and how do I separate it?*	
KEY SCIENTIST(S):		Peter Layton	*John Dunlop / Charles Macintosh*			*Spencer Silver / Ruth Benerito*	
Every Day Materials **States of matter (Y4)** *Physics*	**Key Knowledge**	I know that objects are things I can touch and see. I know that objects are made from materials. I know the names a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. I know a range of description words to use when describing the simple physical properties of a variety of everyday materials. These include: bendy, shiny, stiff, rough, stretchy, hard, smooth, waterproof, absorbent, opaque and transparent	I know that materials are used for different purposes based on their properties. For example, wood is used to make furniture and floors because it is stiff, hard and opaque. I know that materials can be changed by squashing, bending, twisting and stretching. I know some materials require more force than others for them to be changed. I know that wood, metal, plastic, glass, brick, rock, paper and cardboard all have different uses and that these uses are distinguished because of their physical properties.		I know that particles are what a material is made from. I know that a solid is a material that holds its shape and that their vibrating particles are closely packed together. I know that a liquid is a material that holds the shape of the container it is in and that liquids can change shape depending on the container they are in. Liquids have particles that are close together but random. I know that a gas has particles that can escape from its container and that its particles spread out and move in all directions. I know that materials can be grouped according to whether they are solids, liquids or gases. I know that some materials will change state when heated or cooled – ice, chocolate etc. I know that temperature is measured in degrees Celsius (C). I know that when water is heated, the particles gain more energy to move freely and turn into vapour. I know that when water is cooled, the particles slow down and form a solid structure. I know what the water cycle is and how condensation and evaporation is a critical part to this.	I know that materials can be grouped on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets. I know that materials which are good thermal conductors allow heat to move through them easily. I know that thermal insulators do not allow heat to move through them. I know that electrical conductors allow electricity to pass through them easily while electrical insulators do not. I know that when the particles of a solid mix with the particles of a liquid, this is called dissolving. I know that some materials will dissolve in a liquid to form a solution, sometime reversible and sometime irreversible. I know some ways of recovering a substance from a solution such as filtering, sieving and evaporating. I know that when an irreversible change occurs a new material is formed, usually associated with burning and the action of acid on bicarbonate of soda. I know that the term fair test means a test that controls all but one variable when attempting to answer a scientific question.	

	Key Skills	I can identify the materials that an object has been made from - wood, plastic, glass, metal, water, and rock. I can describe the simple physical properties of a variety of everyday materials. I can sort materials according to their physical properties. I can carry out an experiment to find the best material to use for a specific job.	I can compare the uses of everyday materials in and around school I can change the shape of a material by squashing, bending, twisting and stretching. I can suggest appropriate uses for the material based on their properties and how I can, with accuracy, record my observations		I can sort and group materials according to whether they are a solid, liquid or gas. I can use heating or cooling to change the state of a material and record my observations, including the temperature that the change occurred at. I can draw and label the water cycle, identifying where evaporation and condensation occurs. I can observe and record evaporation over a period of time.	I can sort and group materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets. I can carry out an investigate with regard to materials and ensure that this is carried out with fair testing – variables and invariables. I can dissolve a substance in liquid (for example salt) to form a solution and recover this by heating, sieving or filtering. I can demonstrate an irreversible change and show the new substance that has been formed.	
	Vocabulary	Absorbent, bendy, brick, dull, elastic, fabrics, foil, glass, manmade, metal, natural, opaque, plastic, rock, rough, shiny, smooth, soft, stiff, stretchy, transparent, waterproof, wood	Absorbent, bendy, brick, dull, elastic, fabrics, foil, glass, man-made, natural, metal, opaque, plastic, process, properties, purposes, recyclable, rock, rough, shiny, smooth, soft, squash, stiff, stretchy, suitable, transparent, twist, waterproof, wood		Solid, liquid, gas, particles, state, condensation, evaporation, precipitation, water vapour, cooling, freezing, heating, vibrations, water-cycle	Chemical, conductor, flexible, hard, insulator, irreversible, magnetic, material, permeable, property, separate, solution, suspension, condensation, dissolves, evaporation, filtering, gas, insoluble, liquid, melting, particles, thermal, variable	

Area of Study		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
BIG QUESTION				*Why are there different rocks?*			
KEY SCIENTIST(S)				Mary Anning			
Rocks *Chemistry*	**Key Knowledge**			I know that there are three types of rock that are formed naturally; igneous, sedimentary and metamorphic. I know that bricks are concrete and not rocks because they are man-made. I know that rocks can be sorted on the basis of their appearance and simple physical properties such as rough, smooth, hard, soft etc. I know that fossils are the remains of pre-historic life. I know that fossils are formed when a living thing dies and the body is covered by sediment over tens of thousands of years. I know that some fossils are formed when the tough bones and teeth in animals, and the woody parts of plants are preserved. I know that soil is made from rocks and organic matter. I know that there are layers to soil and that as the soil becomes deeper, the rock grains become larger.			*(See Evolution & Inheritance)*

	Key Skills			I can identify and sort rocks on both their appearance and how they are made. I can explore rocks in my local environment and describe how they have changed overtime. I can research and discuss different types of living things whose fossils are found in sedimentary rocks. I can investigate what happens when rocks are rubbed together and what changes occur when they are in water. I can explain the process of how fossils are made and show this on a diagram.			
	Vocabulary			Rock, stone, pebble, boulder, soil, fossils, grains, crystals, texture, absorb water, let water through, marble, chalk, granite, sandstone, slate, sandy soil, clay soil, chalky soil, peat, bedrock, decaying, igneous, imprint, leaf litter, magma, man-made, metamorphic, mineral, palaeontology,			

Area of Study		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
BIG QUESTION				*What is a shadow?*	*How are sounds made?*		*How does light travel?*
KEY SCIENTIST(S)							
Light (Y3 and 6) & Sound (Y4) *Physics*	**Key Knowledge**			I know that a light source is something that emits light by burning, electricity or chemical reactions. I know that I must never look directly at the sunlight as the light produced is very bright and can be harmful to our eyes. I know that light is needed in order to see things and that dark is the absence of light. I know that the moon is not a source of light even though we can see it in the dark. I know that light travels in straight lines and is reflected from surfaces. I know that when light is blocked by an opaque object, a shadow is formed. I know that light can be reflected from surfaces. I know that the size of shadow change s depending on how close or far way the object is to the light source. I know what the word transparent means you can see through the object. I know that translucent means that some light can pass through the object. I know that opaque means you cannot see through it.	I know that sounds are made by vibrations. I know that vibrations from sounds travel through the medium (such as air, water, wood etc.) to the ear. I know that the pitch of a sound is dependent on the features of the object that has produced the sound. I know that the louder the sound, the bigger the vibration and the quieter the sound the smaller the vibration. I know that when an object vibrates, the air around it vibrates too. This vibrating can also be known as sound waves. I know that the pitch of a sound is how high or low it is. I know that the higher pitched the sound, the closer together the vibrations are and the lower pitched the sound the is, the wider the vibrations. I know the volume of a sound is how loud or quiet it is. I know that sounds get fainter as the distance from the sound source increases. I know that amplitude measures how strong a sound wave is and that decibels measure how loud a sound is.		I know that light travels in a straight line but the direction can be changed when light bounces off another surface – this is called reflection. I know that shadows are formed when an opaque object blocks the light. I know that the size and position of a shadow can change depending on the position of the light source. I know that objects are seen because they give out or reflect light into the eye. I know that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes. I know the different parts of an eye; sclera, cornea, pupil, lens, iris, ciliary muscle, retina, optic nerve

	Key Skills			I can investigate whether a material is transparent, translucent and opaque and sort materials using these categories. I can make shadows by blocking the light rays and I can measure shadows. I can change the size of a shadow by adjusting the distance from the light source and record my findings. I can look for patterns in what happens to shadows when the light sources move or the distance between the light source and the object changes.	I can identify and label different parts of the ear I can find patterns in the sounds that are made by different objects I can show how sound travels on a diagram I can draw different sound waves depending on their pitch and dynamic. I can investigate how sound travels differently through different mediums. I can show in a sound wave drawing how sounds get fainter as the distance from the sound source increases.		I can identify and label different parts of the eye. I can draw on a diagram the direction that light travels from the light source to the object and then to the eye. I can change the direction of a ray of light. I can experiment with the shape of shadows and how these can be changed depending on where the light source is positioned.
	Vocabulary			Light source, opaque, transparent, translucent, reflection, shadow, darkness, angle, bright, chemical reaction, dark, dim, electricity, emits, reflects, source, sunglasses, surface, torches,	Vibrations, sound waves, volume, amplitude, pitch, ear, particles, distance, soundproof, absorb sound, ear drum, decibel, electricity, frequency,		Reflect, refract, light source, shadow, opaque, translucent, transparent, periscope, reflective, spectrum, sclera, cornea, pupil, lens, iris, ciliary muscle, retina, optic nerve

Area of Study		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
BIG QUESTION				*How do moving objects slow down?*		*How do machines work?*	
KEY SCIENTIST(S)						*Isaac Newton / Galileo Galilei*	
Forces and Magnets (Y3) **Forces (Y5)** *Physics*	**Key Knowledge**			I know that a magnet is an object that produces a magnetic field (force), which is invisible. I know that forces are pushes and pulls. I know that a magnet can move an object without having contact due to the magnetic field pulling it to it (attract) or pushing it away (repel). I know that all magnets have north and south poles. I know that iron and steel are magnetic, and that aluminium and copper are not. I know that opposite poles are attracted to each other, while the same poles repel each other. I know that when an object moves across a surface, friction acts as an opposite force. I know that some surfaces create more friction that others, meaning that objects move across slower. I know that some objects/materials are not magnetic such as aluminium, copper and gold whereas others are magnetic such as steel, iron, cobalt and nickel.		I know that a force is either a push or a pull and that forces can speed things up, slow things down, change shape or change direction. I know that gravity is a force that pulls all objects together. I know that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. I know that magnets attract each other, or repel other objects; North and South attract, but North and North and South and South will repel. I know different types of surfaces can impact the amount of force (push or pull) required for an object to move (Friction). I know that air resistance is a force that is caused by air. The force acts in the opposite direction to an object moving through the air. This slows it down. I know that water resistance is a type of force that uses friction to slow things down that are moving through water. I know that some mechanisms such as levers, pulleys and gears, allow a smaller force to have a greater effect.	

	Key Skills			I can use a magnet to test if an object or material is magnetic. I can compare how different things move by grouping them, raising questions and carrying out tests I can group objects/materials on the basis of whether they are attracted to a magnet or repel a magnet. I can predict whether two magnets will attract or repel each other, depending on which way the poles are facing. I can explore the strengths of different magnets.		I can explain why unsupported objects fall to the ground and show this in a diagram. I can make an object move by using force. I can add a mechanism to reduce the amount of force required to move and object. I can add resistance to increase the amount of force required to move an object.	
	Vocabulary			Force, friction, contact, force, magnet, bar magnet, horseshoe magnet, attract, repel, poles, bendy, gravity, opposite, push, pull, resistance		Force, friction, air-resistance, water resistance, gravity, push, pull, increase, decrease, mechanism, lever, pulley, gears, streamlined, surface, grip, drag, centre	

Area of Study		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
BIG QUESTION						*Why does the moon appear to change shape?*	*What happens to species after a long time?*
KEY SCIENTIST(S)						*Ptolemy / Alhazen / Copernicus*	*Mary Anning / Charles Darwin / Alfred Wallace*
Earth and Space (Y5) *Physics* **Evolution and Inheritance (Y6)** *Biology*	**Key Knowledge**					I know how Earth and other planets orbit the sun. I know how the moon orbits the Earth. I know that the Earth rotates on its axis anti-clockwise and makes a complete rotation over 24 hours (a day). I know that this makes it appear as the Sun moves through the sky but the Earth's rotation causes day and night. I know that different parts of the Earth experience daylight at different times - this means that it is morning, afternoon and night in different places. This is also the reason why we have time zones. I know that as the Earth rotates, shadows that are formed change in size and orientation I know that the Earth takes 365 days to orbit the sun and that the Earth's tilt is what causes the seasons. I know that the Moon orbits the Earth anticlockwise and takes approximately 28 days. I know that the Moon spins once on its axis every time it orbits Earth. This means that we only see one side of the Moon. I know that there are 8 planets in our Solar System (Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune). Pluto is a dwarf planet.	I know that evolution is a process of change that takes place over many generations, during which species of animals, plants, or insects slowly change some of their physical characteristics. I know that this is because offspring are not identical to their parents. I know that natural selection occurs when there is competition to survive. I know that evidence of evolution comes from fossils - when these are compared to living creatures from today, palaeontologists can compare similarities and differences. I know that adaptation is when animals and plants have evolved so that they have adapted to survive in their environments. I know that some environments provide challenges yet some animals and plants have adapted to survive there. I know that sometimes, adaptations can be disadvantageous. One example of this can be the dodo, which became extinct as it lost its ability to fly through evolution. I know that when adaptations are dangerous, these are called maladaptation's. I know that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.

	Key Skills					I can identify and label the solar system and the planets within in. I can explain the movement of Earth in space and the Earth's moon by using models, diagrams and drawings. I can demonstrate and explain why we have night and day. I can place the planets in order from distance from the sun.	I can look at fossils and talk about what they show and tell me about the past about animals during that time. I can explain why children may have the same physical features as their parents. I can explain why siblings may look different to each other. I can explain how animals and plants are adapted to suit their environment and show this on a diagram or by labelling a model. I can analyse the advantages and disadvantages of specific adaptations such as having gills or lungs
	Vocabulary					Astronomy, axis, earth, eclipse, moon, orbit, rotates, solar system, spherical, sun, universe, asteroid, comet, gravity, time zones, solar system	Organisms, characteristic, variation, adaptation, species, evolution, reproduce, fossil, observe, inheritance, ancestor, biodiversity, biome, breeding, environment, extinct, maladaptation, mutation, natural selection, theory

Area of Study		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
BIG QUESTION					*Which materials conduct electricity?*		*How do humans use electricity?*
KEY SCIENTIST(S)							
Electricity *Physics*	**Key Knowledge**				I know that electricity is generated using energy from natural sources such as Sun, oil, water and wind. I know that some supplies use batteries and some mains electricity. I can name some common appliances that use electricity; toaster, lamp, kettle, laptop, etc. I know that a complete circuit is a loop that allows an electrical current to flow through. I know that a circuit contains a battery (cell), wires and appliance that requires electricity to work. I know what a simple series electrical circuit looks like and what the symbols represent within a drawn circuit - cells, wires, bulbs, switches and buzzers. I know that a lamp will light in a simple series circuit as long as it has a power source and is a full circuit and wired correctly. I know that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple circuit. I know that electrical conductors are objects that are made from materials that allow electricity to pass through. I know that electrical insulators are objects that are made from materials that do not allow electricity to pass through.		I know that the brightness of a lamp or the volume of a buzzer is associated with the number and voltage of cells used in the circuit. I know what a more complex electrical circuit looks like and I know the symbols for each component of a circuit.

	Key Skills				I can identify a common appliance and say if it is run on electricity. I can identify its power source. I can make a simple circuit using basic parts including cells, wires, bulbs, switches and buzzers. I can draw a simple circuit using the correct representations. I can investigate what will happen to the strength of the light in a circuit if I add two lamps. I can add as witch to my circuit and demonstrate and explain how this works.		I can draw a more complex circuit using the correct representations. I can investigate what will happen to the strength of the light or volume of a buzzer in a circuit if I add two lamps or buzzers and explain why. I can systematically identify the effect of changing one component at a time in a circuit
	Vocabulary				Appliance, series circuit, component, electrical conductor, electrical insulator, main power, circuit, cell, natural energy, manmade energy, battery, bulb, buzzer,		Electricity, volt, mains electricity, cell, circuit, volume, components, switch, electrical symbols.