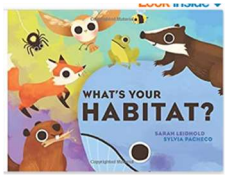
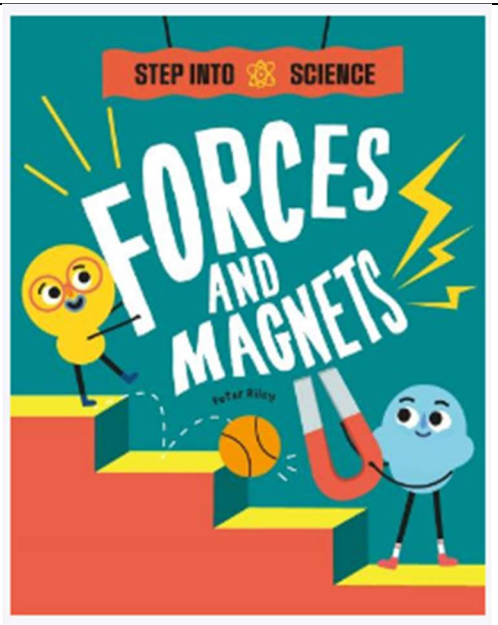
Spring Science -Medium Term Plan				
	Substantive/semantic knowledge – the stuff of science	**Disciplinary/procedural knowledge – how Science is studied.**	**Vocabulary**	**Big Question and linked texts**
EYFS Working Scientifically Growing Changes	I know that all living things grow and change that we are part of a family that our pets are familiar animals that animals change as they get older that we change as we get older the names of a wide range of domestic, wild and farmed animals different groups of animals such as birds and reptiles	I know how to explore materials using my senses some simple words to describe what I can see: soft, hard, see through, bendy, rough, smooth, wet dry I know how to ask questions to find out more and to check what has been said to them. articulate ideas and thoughts in well formed sentences use talk to work out problems and organise thinking and activities. explain how things work and why they might happen. Use new vocabulary in different contexts explain how parents care for babies explore the natural world make observations and drawings of animals and plants find and name a range of minibeasts	question, answer, equipment baby, child, adult, grow, change cat, dog, fish, cow, sheep, chicken, snake, bird forest, field, garden chick to hen, lamb to sheep, cat to kitten	<u>Resources/staff subject knowledge:</u>

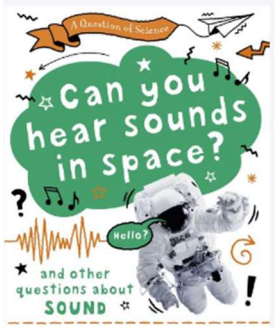
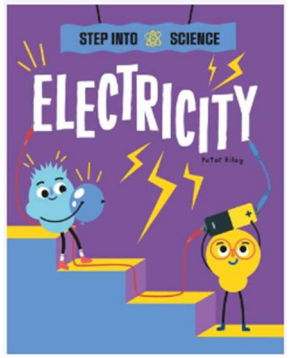
Year 1 – Working Scientifically Animals including Humans	I know the names of some common animals that animals are living things that living things move and eat that humans are animals that mammals, reptiles, amphibians, birds and fish are groups of animals. that humans are mammals that animals that eat meat are called carnivores that animals that only eat plants are called herbivores that animals that eat meat and plants are called omnivores. that humans are omnivores. that sight, hearing, smell, taste and touch are called senses. the names of parts of the human body. That observation is watching closely. That predication is making a guess based on facts. That investigating is testing. That results are what we find out from testing. That data is results.	I know that scientists ask questions and make predictions. that scientists observe and measure. that scientists gather and record data. I know how to ask simple questions and recognise that they can be answered in different ways. observe closely, using simple equipment; perform simple tests; identify and classify gather and record data to help in answering questions identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals identify name 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, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.	Testing, Observing closely Observe, observing, identify, classify, sort, group record, diagram, chart, map, data Compare, describe Common animals, fish, amphibians, reptiles, birds, mammals, pets Carnivores, meat, herbivores, omnivores Senses, touch, smell, taste, hearing and sight.	What is an animal? Are all animals the same? How can we group animals? How can we use our senses to keep safe? What body parts can I name? Resources/staff subject knowledge: Year 1 Animals including Humans - Grammarsaurus 

	That comparing is looking at what is the same and what is different That classifying is sorting into groups.			
Year 2 - Working Scientifically Animals including humans	I know that animals, including humans, have offspring which grow into adults. that some things are living that some things are dead that some things have never been alive. that living things breathe, are sensitive, grow, reproduce, excrete, eat and drink. that breathing is called respiration. that a habitat is where something lives that the ocean, rainforest, arctic and desert are habitats. that adaptation is learning to live successfully in a habitat. that all animals have adapted to live in their habitats so that they can survive.	I know that scientists ask questions and make predictions that scientists observe and measure. that scientists gather and record data. I know how to observe closely, using simple equipment; perform simple tests; identify and classify. gather and record data to help in answering questions. ask simple questions and recognise that they can be answered in different ways. ask simple questions to find out if something is living, dead or has never lived at all. find out about 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. how to create my own criteria for classifying	Fair test, careful observation Observe, observing, identify, classify, sort, group record, diagram, chart, map, data Compare, contrast, describe Offspring, grow, adults, nutrition, reproduce, survival, exercise, hygiene	What is a habitat? Which different microhabitats might there be on the pit mound? (underground, in deadwood, on plants, under logs, in holes in trees etc). Which creatures would live in which different places? <u>Resources/staff subject knowledge:</u> MRS GREN  

	that a microhabitat is a very small habitat. that observation over time is watching closely and carefully and looking for changes that a predication is making a guess based on facts and evidence what a Fair Test is. that testing needs to be fair to be reliable. that we collect data from our results. that we can share our data in a diagram, a map or a chart. that diagrams, maps and charts are that classifying is sorting into groups by comparing, contrasting and describing materials and objects based on specific criteria.	adaptations and habitats.		

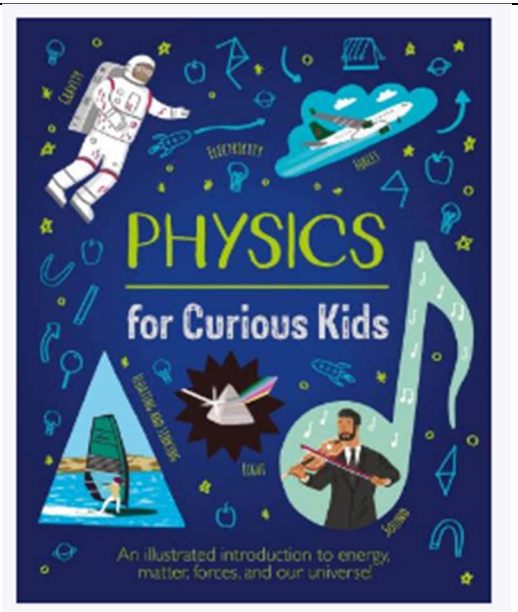
Year 3 - Working scientifically Light Forces and Magnets	I know: that light is a form of energy. that the Sun is a source of light that darkness is the absence of light. that light can be natural or man-made. that light is needed to see. forces need come contact between two objects that Push and Pull are forces objects move differently on different surfaces friction is a force brakes apply friction a magnet produces a magnetic field a magnet has north and south poles one of the properties of materials is magnetic or not-magnetic that observations can be made more precise with a	I know I know that scientists ask questions and make predictions I know that scientists observe and measure. I know that scientists gather and record data. I know how to Ask relevant questions and using different types of scientific enquiries to answer them. Set up simple practical enquiries, comparative and fair tests. recognise that they need light in order to see things and that dark is the absence of light notice that light is reflected from surfaces recognise that light from the sun can be dangerous and that there are ways to protect their eyes recognise that shadows are formed when the light from a light source is blocked by an opaque object find patterns in the way that the size of shadows change. compare how things move on different surfaces 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 group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials describe magnets as having two poles	Research, relevant questions, scientific enquiry, comparative test, systematic, accurate measurement, thermometer, data logger Light, see, dark, reflect, surface, natural, star, Sun, Moon, artificial, torch, candle, lamp, shadow, blocked, solid, sunlight, dangerous, protect eyes Force, push, pull, open, surface, magnet, magnetic, attract, repel, magnetic poles, North,South Gather, record, classify, present, drawings, labelled diagrams, keys, bar charts, tables	*What is our investigation question?* *What scientific skills are we using?* *What does ___ mean?* *What is an example of?* *How can the sun harm us?* *How can we protect our eyes?* *What is UV Light ?* *What does reflect mean?* *Can you explain how a mirror works?* *Which material was the most reflective? Why do you think this is?* Resources/staff subject knowledge: https://www.bbc.co.uk/bitesize/clips/ztcg9j6 

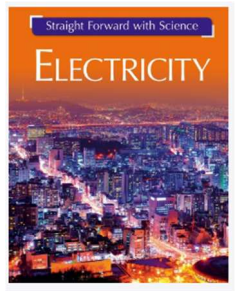
	light scale that predication is making an educated guess based on facts and evidence that the different elements of a Fair Test are called variables. that what we are measuring is the dependent variable. That we can record our results data in simple bar charts and tables with the correct labels. that a comparative test means comparing the results of one or more materials	predict whether two magnets will attract or repel each other, depending on which poles are facing.		

Year 4 – Working Scientifically Sound Electricity	I know that sound is a form of energy that sound travels in waves what vibrations are what volume is that sound creates vibrations how each part of the ear works that vibrations from sounds travel through the ear know what pitch is the difference between pitch and volume how distance effects sound what the vibrations become fainter, slower what soundproof means which materials are soundproof electricity that electricity is a form of energy that electricity travels in pulses	I know that scientists ask questions and make predictions. that scientists observe and measure. that scientists gather and record data. I know how to ask relevant questions and using different types of scientific enquiries to answer them. set up simple practical enquiries, comparative and fair tests. 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 find patterns between the pitch of a sound and features of the object that produced it How to find patterns between the volume of a sound and the strength of the vibrations that produced it How to recognise that sounds get fainter as the distance from the sound source increases . Electricity 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 recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights	Gather, record, classify, present, drawings, labelled diagrams, keys, bar charts, tables Vibrate, vibration, vibrating, air, medium, ear, hear, sound, volume, pitch, faint, fainter, loud, louder, string, percussion, woodwind, brass, insulate Appliances, electricity, electrical circuit, cell, wire, bulb, buzzer, insulators, conductors, switch	What sounds can you hear? How are different sounds made? Does the volume affect vibrations? What is the difference between volume and pitch? Why can't we hear sound when we are far away? What is electricity How does a circuit work? What does a circuit need to work? How does a switch affect a circuit? Resources/staff subject knowledge:  

	what a component is what an electrical circuit is that a circuit needs key components what those key components are what symbols represent those components how a switch effects a circuit what an open and closed circuit is what conductors and insulators are what a filament is	in a simple series circuit recognise some common conductors and insulators, and associate metals with being good conductors		

Year 5 - Working Scientifically Earth and Space Forces	I know that the Earth, Sun and Moon are Spherical. that the sun is at the centre of our solar system that the planets orbit the sun the names of the planets in our solar system What rotation is that time zones (Prime/Greenwich Meridian) are link to day and night that the rotation of the Earth creates day and night that the orbit of the Earth around the sun creates seasons how the Earth's tilt affects the seasons what a moon is That the Moon orbits the Earth that the Moon has a small gravitational pull that the moon influences tides that there are difference phases of the Moon Galileo was hugely inluential and why What forces are That gravity is a force	I know I know that scientists ask questions and make predictions. That a predication is called a hypothesis I know that scientists observe and measure in order to collect data. I know that scientists gather and record data. I know that data will either prove or disprove a hypothesis I know how to plan different and implement types of scientific enquiries to answer questions, including recognising and controlling variables when necessary. use test results to make predictions to set up further comparative and fair tests. take measurements, using a range of scientific equipment, including a thermometer, data logger and voltmeter with increasing accuracy and precision, taking repeat reading where appropriate, record data and results of increasing complexity (scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs) report and present findings from enquiries, including conclusions, causal relationships and explanations of a degree of trust in results, in oral and written form such as displays or presentations Describe the movement of the Earth, and other 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	Plan, variables, accuracy, precision, repeat readings Patterns, systematic, quantitative measurements, identify, classify, describe Scientific diagrams, labels, classification keys, scatter graphs, bar and line graphs Earth, Sun, Moon, planets, star, solar system, Mars, Uranus, Venus, Mercury, Pluto, Saturn, Jupiter, dwarf planet, rotate, orbit, axis, celestial body, sphere, spherical, heat, eclipse, satellite, universe, solar Gravity, air resistance, water resistance, friction, surface, force, effect, move, accelerate, decelerate, stop, change direction, brake, mechanism, pulley, gear, spring,	How long does it take for the Moon to fully orbit the Earth? Which planets in our solar system are known as gas giants? Apart from Earth, which other planet is known to have its own water supply? In what year did man first walk on the moon? How many years ago was the Sun born? <u>Resources/staff subject knowledge:</u> 

	That Isaac Newton discovered gravity That unsupported objects fall towards the Earth That friction, air resistance, water resistance, upthrust, drag and buoyancy are also forces. That for every force there is an opposing force That forces create energy what the effects of air resistance are What the effects of water resistance are What the effects of friction are The effect that levers, pulleys and cogs have on forces	spherical bodies Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky. explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object 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.		

Year 6	I know	I know	Plan, variables, accuracy, precision, repeat readings	Can light bend around corners? How are shadows made? Why is the moon bright? Can one bit of light bounce off another bit of light?
Working Scientifically Light Electricity	Light that dark is the absence of light that light can be reflected from some surfaces the moon reflects the light of the Sun that light travels in straight lines that shadow is the absence of light objects are seen because light is reflected from objects into the eye mirrors can be used to reflect light around corners what a periscope is and how it works how the lenses of the eye work what convex and concave mean Electricity That electricity is measured in voltage How many volts are in a cell That voltage is controlled by resistance. That increasing and decreasing the voltage controls the amount of energy flowing around a circuit What a series and parallel circuit is	that scientists ask questions and make predictions. that a predication is called a hypothesis that scientists observe and measure in order to collect data. that scientists gather and record data. that data will either prove or disprove a hypothesis I know how to plan different and implement types of scientific enquiries to answer questions, including recognising and controlling variables when necessary. use test results to make predictions to set up further comparative and fair tests. take measurements, using a range of scientific equipment, including a thermometer, data logger and voltmeter with increasing accuracy and precision, taking repeat reading where appropriate, record data and results of increasing complexity (scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs) report and present findings from enquiries, including conclusions, causal relationships and explanations of a degree of trust in results, in oral and written form such as displays or presentations how to recognise that light appears to travel in straight lines how to use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye how 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	Patterns, systematic, quantitative measurements, identify, classify, describe Scientific diagrams, labels, classification keys, scatter graphs, bar and line graphs Light, direction of travel, straight, reflect, reflection, light source, object, shadows, mirrors, periscope, rainbow, filters Voltage, brightness, volume, series circuit, circuit diagram, motor, recognised, symbols, electrical safety.	 Resources/staff subject knowledge: 

		how to use the idea 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 construct a simple series electrical circuit identifying and naming the basic parts of a simple electrical circuit, including cells, wires, bulbs, switches and buzzers 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 recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit how to compare and give reasons for variations in how components function. recognise some common conductors and insulators, and associate metals with being good conductors		