Scholar Green Primary School
Science (Physics) Progression Model

	Knowledge	Skills (Working Scientifically)	Vocabulary
		Motion and Forces	
Year 3	• To know how things move on different surfaces notice that some forces need contact between two objects, but magnetic forces can act at a distance • To know how magnets attract or repel each other and attract some materials and not others • To know that a variety of everyday materials can be grouped together on the basis of whether they are attracted to a magnet, and identify some magnetic materials • To know that magnets have two poles	• Compare how things move on different surfaces notice 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 • Predict whether two magnets will attract or repel each other, depending on which poles are facing • Ask relevant questions about how things move on different surfaces • Set up simple practical enquiries to find out how things move on different surfaces • Sorting materials into those that are magnetic and those that are not • Looking for patterns in the way that magnets behave in relation to each other and what might affect this, for example, the strength of the magnet or which pole faces another	Force Motion Magnet Magnetic Push Pull Friction Contact
Year 5	• 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.	• Ask questions about how different objects fall • Observe how different objects fall • Observe the effects of friction on different objects (in real life or video footage) • Identify scientific evidence to support understanding of gravity – Sir Isaac Newton's theory • Plan scientific enquiry to investigate the most effective parachute or boat, recognise and control variables where necessary • Take measurements with increasing accuracy and precision, taking repeat readings when appropriate to record the speed at which parachutes fall or the boat travels • Record the data from the above investigation	Friction Gravity Theory Sir Isaac Newton Air resistance Water resistance Surfaces Mechanisms Levers Pulleys Gears Variables

		• Report the findings of the above investigation • Observe how levers, pulleys and gears work • Present findings of how levers, pulleys and gears work using scientific diagrams and labels	

	Knowledge	Skills (Working Scientifically)	Vocabulary
		The Earth	
Year 1	• To know weather associated with the four seasons and how day length varies	• Observe changes across the four seasons • Make charts to show how day length changes	Day Week Month Year Weather Season Autumn Winter Spring Summer
Year 5	• To know that the sun is a star at the centre of our solar system and that is has eight planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune (Pluto was reclassified as a 'dwarf planet' in 2006) that orbit it. • To know the movement of the Earth, and other planets, relative to the Sun in the solar system • To know the movement of the Moon relative to the Earth • To know that the Sun, Earth and Moon are approximately 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. • Identify scientific evidence to support or refute ideas about the movement of bodies within in the solar system - Geocentric / Heliocentric • Take measurements to create scaled scientific drawings of the relative sizes of the earth, sun and moon • Record the length of the day at different times over the year using an appropriate graph	Star Sun Solar system Planet Dwarf planet Mercury Venus Earth Mars Jupiter Saturn Uranus Neptune Celestial body Geocentric Heliocentric

	Knowledge	Skills (Working Scientifically)	Vocabulary
		Light	
Year 3	• To know that they need light in order to see things and that dark is the absence of light • To know that light is reflected from surfaces • To know that light from the sun can be dangerous and that there are ways to protect their eyes • To know that shadows are formed when the light from a light source is blocked by an opaque object •	• Observe how shadows change throughout the day • Record observations using scientific language, diagrams and bar charts • Find patterns in the way that the size of shadows changes.	Light Dark Shadow Absence Light source Reflect Protect Opaque Transparent
Year 6	• To know that light appears to travel in straight lines • To 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	• 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 • Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. • Design and make a periscope to explain how it works • Observe different phenomena (such as rainbows, colours on soap bubbles, objects looking bent in water and coloured filters) and record their findings using labelled diagrams	

	Knowledge	Skills (Working Scientifically)	Vocabulary
		Sound	
Year 4	• To know how sounds are made, associating some of them with something vibrating • To know that vibrations from sounds travel through a medium to the ear • To know that sounds get fainter as the distance from the sound source increases.	• Find patterns between the pitch of a sound and features of the object that produced it • Find patterns between the volume of a sound and the strength of the vibrations that produced it • Identify differences and similarities between sounds that are made by different objects such as saucepan lids of different sizes or elastic bands of different thicknesses and how these sounds could possibly be changed • Take accurate measurements (using data loggers) to record the volume at different places around the school • Record their findings using a chart or table • Report their findings in an written explanation.	Sound Vibration Pitch Volume Wave Wave length Fainter Data logger Louder Quieter Decibels

		• Pattern seeking to see whether there is a link between the amount of noise in school and time of day?	

	Knowledge	Skills (Working Scientifically)	Vocabulary
		Electricity	
Year 4	• To know common appliances that run on electricity • To know the names of the basic parts of a simple circuit including cells, wires, bulbs, switches and buzzers • To know that a lamp will only light up if it is part of a complete loop with a battery • To know that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit To know some common conductors and insulators, and associate metals with being good conductors.	• Construct safely a simple series electrical circuit, identifying and naming its basic parts, 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 • Draw circuit diagrams to represent the components • Set up a simple practical enquiry as a fair test to investigate what happens to a bulb when more cells are added • Observe what happens to a bulb when more cells are added • Record their findings in a table using scientific language (such as brighter / dimmer) and write a conclusion about these findings. • Set up a simple practical enquiry to investigate which materials conduct / insulate electricity • Use the results of the above investigation to draw simple conclusions and make predictions about which materials may conduct electricity	Electricity Appliance Circuit Cell Battery Wire Bulb Switch Buzzer Brighter Dimmer Louder quieter Conduct Insulate
Year 6	• To 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 • To know that switches can be used to complete / break a circuit to turn it on or off • To know symbols when representing a simple circuit in a diagram.	• Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches • Draw circuit diagrams using symbols to represent the components • Plan a scientific enquiry to identify the relationship between the voltage of a cell and the performance of the component in the circuit • Use the results to make predictions and set up a further investigation • Report and present the findings from their investigation	Voltage Current Amp Circuit diagram Symbol performance