Electricity / Forces including Magnets Scientific enquiry

	Year 1	Year 2	Year 3 Forces / magnets	Year 4 Electricity	Year 5 Forces / magnets	Year 6 Electricity
Investigations			Create magnet related games. Investigation of forces on different surfaces Investigate which type of magnet is the strongest.	Identify the functions of each component in a circuit. What happens when one component is taken out? What arrangement is needed in order to light a bulb? What happens when you alter the location of a switch? Is graphite a conductor? What materials conduct electricity?	Investigate gravity – falling objects linked with air/ water resistance and friction. (Does the shape/weight of an object affect the speed at which it falls?)	What happens to a bulb when you change the voltage? Explore and investigate what happens when you vary the components in a circuit?
Working scientifically • **Research**			How does a compass work? How have our ideas about forces changed over time?	How does the thickness of a conducting material affect how bright the lamp is?	How do submarines sink if they are full of air?	How has our understanding of electricity changed over time?
Working scientifically • **How scientific ideas have changed over time**			How have our ideas about magnets changed over time?	Who actually invented the light bulb, Thomas Edison or Joseph Swan?	How have our ideas about gravity changed over time?	How has our understanding of electricity changed over time? How have batteries changed over time?
Working scientifically • **Identifying and classifying**			Which materials are magnetic?	How would you group these electrical devices based on where the electricity comes from?	Can you label and name all the forces acting on the objects in each of these situations?	How would you group electrical components and appliances based on what electricity makes them do?
Working scientifically • **Pattern seeking**			Does the size and shape of a magnet affect how strong it is?	Which room has the most electrical sockets in a house?	Does the shape of an object affect the speed at which it falls?	Does the temperature of a light bulb go up the longer it is on?
Working scientifically			If we magnetise a pin, how long does it stay magnetised for?	How long does a battery light a torch for?	How long does a pendulum swing for before it stops?	Does the temperature of a light bulb go up the longer it is on?

• **Observing over time**						
Working scientifically • **Comparative tests**			Which surface is best to stop you slipping? Which magnet is the strongest?	Which metal is the best conductor of electricity?	Which material is the best covering when rolling toy cars down a ramp? How does the surface area of paper affect the speed and efficency at which it falls to the ground?	Which make of battery lasts the longest? Which type of fruit makes the best fruity battery?
Working scientifically • **Fair tests**			How does the mass of an object affect how much force is needed to make it move? Which type of magnet is the strongest? Prove it.	How does the thickness of a conducting material affect how bright the lamp is? How does the number of batteries affect the brightness of a bulb? How does the number of bulbs affect the brightness of light emitted from each?	How does the angle of launch affect how far a paper rocket will go? How does the surface area of a container affect the time it takes to sink? How does the surface area of a parachute affect the time it takes to fall to the ground?	How does the voltage of the batteries in a circuit affect the brightness of the lamp? How does the voltage of the batteries in a circuit affect the volume of the buzzer?
Specialist Vocabulary			Force, push, pull, open, surface, magnet, magnetic, attract, repel, magnetic poles, north, south	Appliances, electricity, electrical circuit, cell, wire, bulb, buzzer, danger, safety, insulators, conductors, switch.	Gravity, air resistance, water resistance, friction, surface, force, effect, move, accelerate, decelerate, direction, brake, mechanism, pulley, gear, spring, theory of gravitation,	Voltage, brightness, volume, switches, danger, series circuit, circuit diagram, switch, bulb, buzzer, motor, recognised, symbols.
Equipment to be used			Magnets - diffferent types eg bar, horse shoe A selection of different metals (eg metal discs) so they can be tested to see which are magnetic.	Bulbs and holders, batteries, battery holders, wires, a selection of different metals (eg metal discs) so they can be tested Materials to test for conductivity.	Force/newton meter String (for pendulum) Stopwatch Ramp/wooden pieces for ramp Assortment of materials to cover ramp Parachutes/men - ensure different sizes	Bulbs and holders, batteries, battery holders, wires, buzzers, switches