



Pupil flightpath		Mastery Steps		
GCSE target	KS2 start point	Knowledge and Understanding	Skills and application	Analysis and evaluation
8/9	117-120		<ul style="list-style-type: none"> Explain observations about changing temperature in terms of energy transfer Explain how a method of thermal insulation works in terms of conduction, convection and radiation Explain observations about navigation using Earth's magnetic field Explain the choice of electromagnets or permanent magnets for a device in terms of their properties 	<ul style="list-style-type: none"> Predict the pattern of field lines and the force around two magnets placed near each other Predict how an object made of a magnetic material will behave if placed in or rolled through a magnetic field Suggest how bells, circuit breakers and loudspeakers work, from diagrams
6/7	102-116	<ul style="list-style-type: none"> Magnetic materials, electromagnets and the Earth create magnetic fields which can be described by drawing field lines to show the strength and direction. The stronger the magnet, and the smaller the distance from it, the greater the force a magnetic object in the field experiences An electromagnet uses the principle that a current through a wire causes a magnetic field. Its strength depends on the current, the core and the number of coils in the solenoid 	<ul style="list-style-type: none"> Describe how an object's temperature changes over time when heated or cooled 	<ul style="list-style-type: none"> Compare and contrast the three ways that energy can be moved from one place to another by heating Evaluate a claim about insulation in the home or for clothing technology Critique the design of a device using an electromagnet and suggest improvements
4/5	85-101	<ul style="list-style-type: none"> The thermal energy of an object depends upon its mass, temperature and what it's made of. When there is a temperature difference, energy transfers from the hotter to the cooler object Thermal energy is transferred through different pathways, by particles in conduction and convection, and by radiation Two 'like' magnetic poles repel and two 'unlike' magnetic poles attract Field lines flow from the north-seeking pole to the south-seeking pole The magnetic field of an electromagnet decreases in strength with distance 	<ul style="list-style-type: none"> Sketch diagrams to show convection currents in unfamiliar situations Use the idea of field lines to show how the direction or strength of the field around a magnet varies Use a diagram to explain how an electromagnet can be made and how to change its strength 	<ul style="list-style-type: none"> Sketch a graph to show the pattern of temperature change against time
2/3	80-84	Thermal conductor, Thermal insulator, Temperature, Thermal energy, Conduction, Convection, Radiation, Magnetic force, Permanent magnet, Magnetic poles, Electromagnet, Solenoid, Core		