

P15 Electromagnetism Knowledge Organiser (H)

Magnetic poles	<ul style="list-style-type: none"> •The region of a magnet where the magnetic field is strongest •A magnet has a north pole and a south pole •Like poles repel and unlike poles attract 	Solenoids	<ul style="list-style-type: none"> •A coil of wire that has a much stronger magnetic field than a straight wire. •When current flows through a solenoid, a magnetic field is set up. •The field is uniform inside the coils as all of the lines are parallel and gets weaker as the distance from the solenoid increases. It is also strongest inside the coils. • At the N pole of the solenoid the current flows anti-clockwise and at the S pole it flows clockwise •To increase the strength of the field, increase the current or increase the number of coils. •If the current is reversed the field also reverses. 	
Permanent magnetism	<ul style="list-style-type: none"> •Permanent magnets produce their own magnetic field •Permanent magnets are made using steel as steel doesn't lose its magnetism easily once it has been magnetised. 		Electromagnet	<ul style="list-style-type: none"> •A coil of wire (a solenoid) wrapped around an iron core •Iron is used because it loses its magnetism easily when the current is switched off
Induced magnetism	<ul style="list-style-type: none"> •When a material temporarily becomes a magnet when placed in a magnetic field. •Always causes a force of attraction •An induced magnet loses its magnetism when removed from a magnetic field 			The motor effect
Magnetic field	<ul style="list-style-type: none"> •The region around a magnet where a magnet or a magnetic material experiences a force •Field lines always go from the N pole to the S pole. •To find the field around a bar magnet, use iron filings or a plotting compass. •The further you go away from the magnet, the weaker the field. •The field is strongest at the poles of the magnet •The Earth has a magnetic field similar in shape to a bar magnet's field. A compass contains a small bar magnet that lines up with the field and so points in the same direction as it. 	Electric Motor	<ul style="list-style-type: none"> •This is a coil of current carrying wire that spins in a permanent magnetic field because the permanent and induced fields interact. •It spins because a force acts in opposite directions on each side of the coil due to the motor effect. •A split-ring commutator reverses the current direction every half turn. 	
Magnetic fields of electric currents	<ul style="list-style-type: none"> •When current flows in a wire, a magnetic field is set up around the wire. •The field is made up of concentric circles with the wire in the centre. •Higher current = stronger field •The field gets weaker further away from the wire. •The direction of the field depends on the direction of the current. •Use the Right Hand Grip rule to find the direction of the current. Your thumb points in the direction of the current (positive palm, negative nail) and your fingers will curl around in the direction of the current. 			