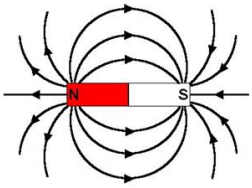
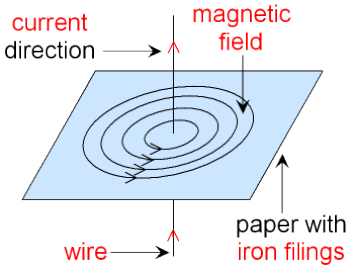
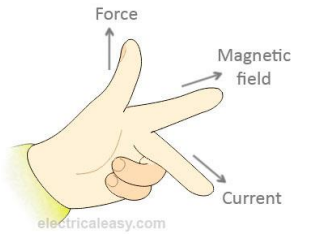
GCSE Physics Key Facts – Magnetism and Electromagnetism

Permanent and induced magnetism, magnetic fields and fields	
The region around a magnet where a force acts on another magnet or magnetic material (iron, steel, cobalt and nickel) is the magnetic field. Magnetic forces are strongest at the poles of a magnet. Like poles repel and unlike poles attract.	A permanent magnet is always magnetic. An induced magnet is a material that becomes a magnet when placed in a magnetic field. When removed from the magnetic field, it loses most/all of its magnetism quickly
The magnetic field gets weaker further from a magnet.	The direction of the magnetic field at a point is given by the direction of the force that would act on another north pole placed at that point. The direction of a magnetic field line is from the north (seeking) pole of a magnet to the south(seeking) pole of the magnet.
	A magnetic compass contains a small bar magnet. The Earth has a magnetic field due to its core being magnetic. The compass needle points in the direction of the Earth's magnetic field. The magnetic field pattern of a magnet can be plotted using a compass.
The motor effect	
When a current flows through a wire a magnetic field is produced around the wire. The strength of the magnetic field depends on the current through the wire and the distance from the wire. 	Shaping a wire to form a solenoid increases the strength of the magnetic field created by a current through the wire. The magnetic field inside a solenoid is strong and uniform. The magnetic field around a solenoid has a similar shape to that of a bar magnet.
Adding an iron core increases the strength of the magnetic field of a solenoid. An electromagnet is a solenoid with an iron core.	
HIGHER TIER ONLY When a conductor carrying a current is placed in a magnetic field, then the magnet and the conductor exert a force on each other. This is called the motor effect.	HT ONLY Fleming's Left hand rule can be used to find the direction of the force: 
HT ONLY Use the equation **F=BIl** (Given on formula sheet) F = force (N) B = magnetic flux density (Tesla) I = current (A) L = length (m)	HT ONLY A coil of wire carrying a current in a magnetic field will rotate. This is the basis of an electric motor