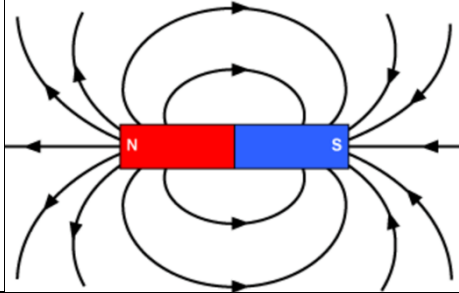
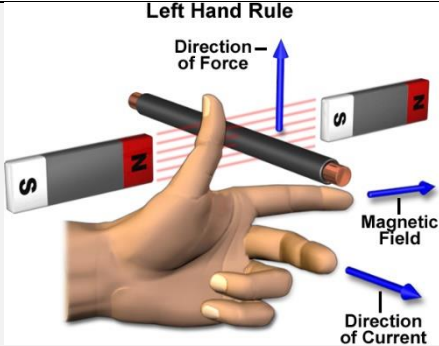
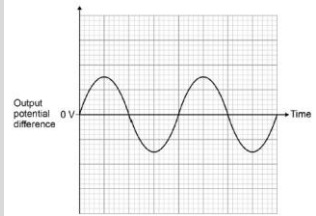
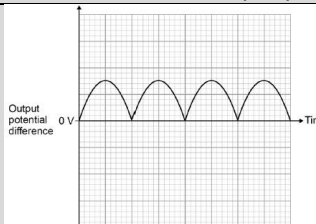


Core questions – Physics unit 7 – Magnetism and electromagnetism

	Question	Answer
1	What are the poles of a magnet?	The place where the magnetic forces are strongest
2	What happens when two magnets are brought close to each other?	They exert a force on each other
3	What happens when two like poles of magnets are brought close to each other?	They repel each other
4	What happens when two unlike poles of magnets are brought close to each other?	They attract each other
5	What type of force is magnetism an example of?	A non-contact force
6	What is a permanent magnet?	One which produces its own magnetic field
7	What is an induced magnet?	A material that becomes a magnet when it is placed in a magnetic field
8	What happens to an induced magnet when it is taken out of a magnetic field?	It loses most/all of its magnetism quickly
9	What is the only force that is caused by an induced magnet?	A force of attraction
10	What is a magnetic field?	The region around a magnet where a force acts on another magnet or on a magnetic material
11	What materials are magnetic?	Iron, cobalt, nickel, steel (an iron alloy)
12	What type of force exists between a magnet and a magnetic material?	Attractive magnetic force
13	What does the strength of the magnetic field depend upon?	The distance it is from the magnet. The field is strongest at the poles
14	How do we define the direction of the magnetic field?	The direction of the magnetic field at any point is given by the direction of the force that would act on another north pole placed at that point
15	What direction do magnetic field lines point?	From the north seeking pole of a magnet to the south seeking pole of a magnet
16	How does a magnetic compass work?	It contains a small bar magnet that points in the direction of the Earth's magnetic field
17	Why does Earth have a magnetic field?	It has an iron core
18	How can you use a compass to plot the magnetic field pattern of a magnet?	<ol style="list-style-type: none"> 1. Place the compass in the field around the magnet 2. Draw a dot where the compass points (north and south) 3. Move the compass so that the south direction of the needle is at the dot you just drew 4. Repeat until the lines form a loop and connect the dots
19	Draw the magnetic field pattern of a bar magnet.	
20	What happens when a current flows through a conducting wire?	A magnetic field is produced around the wire

21	What does the strength of a magnetic field depend on when a current flows through a wire?	The size of the current The distance from the wire
22	What is a solenoid?	A coil of wire
23	What happens to the magnetic field when a wire is shaped into a solenoid?	It becomes much stronger
24	Describe the magnetic field inside the solenoid?	It is strong and uniform (it has the same strength and direction at every point)
25	Describe the shape of the magnetic field around a solenoid?	The same as the shape of a magnetic field around a bar magnet
26	How can the strength of a solenoid be increased?	By adding an iron core
27	What is an electromagnet?	A solenoid with an iron core
28	How can the magnetic field of a solenoid be stopped?	Turn of the current
29	What is an advantage of using an electromagnetic instead of a permanent magnet?	The magnetic field can be turned on and off
30	Draw the magnetic field pattern for a straight wire carrying a current?	
31	Draw the magnetic field pattern for a solenoid?	
32	What is the motor effect? (higher tier only)	The term used when a current carrying wire experiences a force, causing it to move, when placed in a magnetic field
33	Describe what happens when a current carrying wire is put between magnetic poles? (higher tier only)	The magnetic field around the wire interacts with the magnetic field it has been placed in, causing the wire and the magnet to exert a force on each other
34	To experience the full force from the motor effect, what direction does the wire have to be compared to the magnetic field? (higher tier only)	90° to the magnetic field
35	When would a wire experience no force from the motor effect? (higher tier only)	If the wire runs parallel to the magnetic field
36	What does Fleming's left hand rule represent? (higher tier only)	The relative orientation of the directions of the force, the current in the conductor and the magnetic field

37	How can we use Fleming's left hand rule to determine the direction of the force, the direction of current and the direction of the magnetic field? (higher tier only)	 <p>Thumb = direction of force (motion) First finger = direction of magnetic field Second finger = direction of current</p>
38	What will affect the size of the force acting on the conductor in a magnetic field? (higher tier only)	The magnetic flux density, the size of the current, the length of the conductor that's in the magnetic field
39	What word equation represents the force exerted on a conductor carrying a current at 90° to a magnetic field? (higher tier only)	Force = magnetic flux density x current x length
40	What symbol equation represents the force exerted on a conductor carrying a current at 90° to a magnetic field? (higher tier only)	$F = B I l$
41	What is the unit and unit symbol of magnetic flux density (B) (higher tier only)	Tesla, T
42	What is the unit and unit symbol of current (I) (higher tier only)	Amps, A
43	What happens to a loop of wire carrying a current when placed in a magnetic field? (higher tier only)	It rotates
44	Why does a loop of wire rotate in a magnetic field? (higher tier only)	The current travels in opposite directions through the magnetic field meaning the forces acting on the wire act in opposite directions
45	What is used in an electric motor to switch the direction of the current in the wires causing it to continue to rotate? (higher tier only)	A split ring commutator
46	How do loudspeakers and headphones use the motor effect? (higher tier only)	They convert variations in current in electrical circuits to the pressure variations in sound waves
47	Describe how loudspeakers and headphones works? (higher tier only)	<ol style="list-style-type: none"> 1. A coil of wire is attached to a cone 2. When an alternating current flows through the wire it creates a magnetic field 3. The magnetic field interacts with the field from the permanent magnet 4. This produces a resultant force on the cone causing it to move 5. When the frequency of the AC current changes, the frequency of the sound changes
48	What is the generator effect? (triple science only)	The induction of a potential difference in a wire which is moving relative to a magnetic field
49	When would a current be induced during the generator effect? (triple science only)	If the conductor moving through the magnetic field was in a complete circuit

50	How does the magnetic field produced from an induced current interact with the magnetic field already there? (triple science only)	The magnetic field created by a induced current acts against the change that made it
51	How can the size of the induced potential difference be changed? (triple science only)	<ul style="list-style-type: none"> Increasing the speed of movement that the conductor is moving in and out of a magnetic field Increasing the strength of the magnetic field Turn the wire into a coil
52	How is the generator effect used in an alternator ? (triple science only)	To generate an alternating current (AC)
53	How is the generator effect used in a dynamo ? (triple science only)	To generate a direct current (DC)
54	Describe how an alternator works? (triple science only)	<ol style="list-style-type: none"> Generators rotate a coil in a magnetic field As the coil rotates, a current is induced in the coil AC generators have slip rings and brushes so the current changes every half turn generating an alternating current (AC)
55	Draw how the output potential difference of an alternator varies with time? (triple science only)	
56	Describe how a dynamo works? (triple science only)	<ol style="list-style-type: none"> Generators rotate a coil in a magnetic field As the coil rotates, a current is induced in the coil The wire is attached to a split ring commutator This keeps the current flowing in the same direction generating a direct current (DC)
57	Draw how the output potential difference of a dynamo varies with time? (triple science only)	
58	How do microphones use the generator effect? (triple science only)	They convert the pressure variations in sound waves into variations in current in electrical circuits
59	What is a transformer? (triple science only)	They can change the size of the potential difference
60	What type of current does a transformer only work for? (triple science only)	Alternating current
61	What does a basic transformer consist of? (triple science only)	A primary coil of wire and a secondary coil of wire wound on an iron core
62	Why is iron used as the core of a transformer? (triple science only)	It is easily magnetised
63	What is produced in the iron core when an alternating current is applied in the primary coil of wire of a transformer? (triple science only)	A magnetic field that is changing

64	Describe how a transformer works? (triple science only)	<ul style="list-style-type: none"> • An alternating current travels through the primary coil • This causes a changing magnetic field around the bar magnet • This induces an alternating current in the secondary coil
65	What equation is used to show how the potential difference across the coils relates to the number of turns on each coil? (triple science only)	$\frac{V_p}{V_s} = \frac{N_p}{N_s}$
66	In a step up transformer, in which coil of wire is the potential difference greatest? (triple science only)	The secondary coil
67	In a step down transformer, in which coil of wire is the potential difference greatest? (triple science only)	The primary coil
68	If transformers were 100% efficient, what would the electrical power output be? (triple science only)	Equal to the electrical power input
69	What equation relates the power input and output of transformers? (triple science only)	$V_s \times I_s = V_p \times I_p$
70	What are is the unit and unit symbol of power? (triple science only)	Watts, W