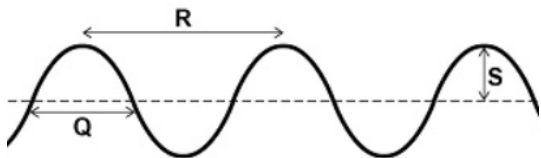
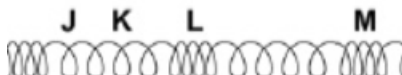
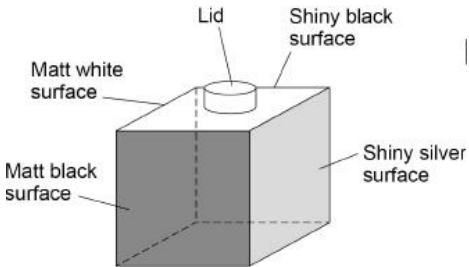
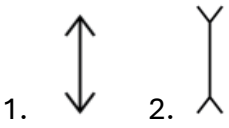

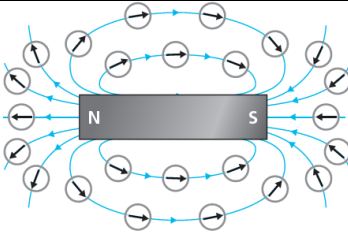


GCSE Physics – P6 Waves Knowledge Organiser

	Knowledge	Answer														
1	What is a wave?	Waves are oscillations that transfer energy without transferring matter														
2	What is a transverse wave?	The vibrations/oscillations of the particles are at right angles (perpendicular) to the direction of travel of the wave or energy transfer														
3	What is a longitudinal wave?	The vibrations/oscillations of the particles are in the same direction (parallel to) as the direction of travel or energy transfer														
4	Which letters represent wavelength and amplitude? 	R- Wavelength S- Amplitude														
5	Which letters represent a compression, rarefaction and the wavelength? 	K- Rarefaction M- Compression L to M- Wavelength														
6	What is the equation for a period?	Period = 1 ÷ frequency [T = 1 ÷ f]														
7	What is frequency?	The number of waves passing a point each second														
8	What is the equation for wave speed?	Wave speed = frequency × wavelength [v = f λ]														
9	Complete the electromagnetic spectrum: <table border="1" data-bbox="173 1167 777 1283"><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td>X-rays</td><td></td><td></td><td>Infrared</td><td>Microwaves</td><td></td></tr></table>									X-rays			Infrared	Microwaves		Gamma rays UV Light Radio
	X-rays			Infrared	Microwaves											
10	Which wave has the highest frequency and smallest wavelength?	Gamma rays														
11	(HT) What are the properties of EM waves?	Travel at the same speed in a vacuum, can be absorbed, transmitted, refracted or reflected														
12	Give a use for each EM wave in the spectrum	Radio waves – television and radio Microwaves – satellite communications, cooking food Infrared – electrical heaters, cooking food, infrared cameras Visible light – fibre optic communications Ultraviolet – energy efficient lamps, sun tanning X-rays and gamma rays – medical imaging and treatments														
13	What are the risks of UV, x-rays and gamma waves?	Ultraviolet waves can cause skin to age prematurely and increase the risk of skin cancer. X-rays and gamma rays are ionising radiation that can cause the mutation of genes and cancer														

14	(HT) How can radio waves be used in communications?	When radio waves are absorbed they may create an alternating current with the same frequency as the radio wave itself, so radio waves can themselves induce oscillations in an electrical circuit
15	What is the law of reflection?	Angle of incidence = angle of reflection
16	What is refraction?	Refraction is the change in the direction of a wave at the boundary of two transparent materials
17	Which surface is the best absorber/emitter? 	Absorber: Matt black Emitter: shiny silver
18	TRIPLE ONLY How do we hear sound?	Sound waves enter the ear canal and cause the eardrum to vibrate. Three small bones transmit these vibrations to the cochlea. This produces electrical signals which pass through the auditory nerve to the brain, where they are interpreted as sound
19	TRIPLE ONLY What are the two types of seismic wave?	Primary waves (P-waves), which are longitudinal waves Secondary waves (S-waves), which are transverse waves
20	TRIPLE ONLY What is a real image?	An image that is formed where the rays of light are focused
21	TRIPLE ONLY What is a virtual image?	An image from which rays of light appear to come from but in reality do not
22	TRIPLE ONLY What is the distance from the lens to the principal focus is called?	Focal length
23	TRIPLE ONLY What is the equation for magnification?	$\text{Magnification} = \frac{\text{Image height}}{\text{Object height}}$
24	TRIPLE ONLY What type of lens is represented with: 	1. Convex 2. Concave
25	TRIPLE ONLY What are the colours in visible light?	Red, orange, yellow, green, blue, indigo, violet
26	TRIPLE ONLY What happens when white light hits an orange filter?	An orange filter transmits orange light but absorbs all the other colours
27	TRIPLE ONLY What is a perfect black body?	An object that absorbs all of the radiation incident on it
28	TRIPLE ONLY How does the body maintain a constant temperature?	By absorbing radiation at the same rate as it is emitting radiation

GCSE Physics – P7 Magnetism & Electromagnetism Organiser

	Knowledge	Answer
1	What do like poles do?	Repel
2	What do opposite poles do?	Attract
3	What is the difference between a permanent and induced magnet?	A permanent magnet produces its own magnetic field. An induced magnet is a material that becomes a magnet when it is placed in a magnetic field.
4	What are the magnetic metals?	Iron (Fe), cobalt (Co) and nickel (Ni)
5	How do compasses work?	A magnetic compass contains a small bar magnet. The Earth has a magnetic field. The compass needle points in the direction of the Earth's magnetic field
6	Draw the magnetic field around this magnet: 	
7	What is a solenoid?	A coil of wire which creates a magnetic field around it
8	How can you increase the strength of an electromagnet?	Add more coils of wire, increase the current, add an iron core
9	(HT) What is the motor effect?	The interaction between two magnetic fields, causing a force that pushes the wire at right angles
10	(HT) What is the equation for magnetic flux density?	Force = magnetic flux density \times current \times length $F = B I l$
11	(HT) How does an electric motor work?	The force of a current carrying wire in a magnetic field pushes one side of a coil down and the other side up
12	TRIPLE ONLY (HT) What does a changing magnetic field around a conductor produce?	A potential difference that can create a current
13	TRIPLE ONLY (HT) What direction is the magnetic field around an induced current?	The opposite direction to the field that induced the current
14	TRIPLE ONLY (HT) How does an alternator work?	A rectangular coil is made to spin in a uniform magnetic field, causing an alternating current to be induced in the coil
15	TRIPLE ONLY (HT) What type of current is generated by an alternator?	Alternating current (AC)
16	TRIPLE ONLY (HT) What type of current is generated by a dynamo?	Direct current (DC)
17	TRIPLE ONLY (HT) Explain how a dynamo works	A split-ring commutator is used with an alternator to reverse the connection of the coil every half-turn, causing the output to be DC.
18	TRIPLE ONLY (HT) Explain how a transformer works	Alternating current passes through the primary coil and induces an alternating magnetic field in the iron core. This induces an alternating potential difference across the secondary coil.
19	TRIPLE ONLY (HT) What does the ratio of potential difference in a transformer depend on?	The ratio of the number of turns on the primary and secondary coil
20	TRIPLE ONLY (HT) How does a microphone work?	Sound waves make a diaphragm vibrate – the diaphragm is attached to a coil in a magnetic field and an alternating current is induced in the coil as it vibrates.
21	TRIPLE ONLY (HT) How do loudspeakers and headphones work?	An alternating current flows through a coil in a magnetic field, causing the coil to vibrate – the coil is attached to a diaphragm which vibrates and creates sound waves.
22	TRIPLE ONLY (HT) Why are transformers important for transferring electrical power efficiently?	A step-up transformer increases the potential difference so that power can be transported by cables with minimal loss due to heating.

23	TRIPLE ONLY (HT) How is the force on a conductor in a magnetic field used to turn a coil in an electric motor?	Because the conducting wire is in a loop, the current is flowing in opposite directions on each side of the coil – so there is a force acting up on one side of the coil and down the other – causing rotation.
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