Name_____

Topic title	Preparing for your mock exams - AQA P1	Links	Before revision			After revised		
			☺	😐	☹	☺	😐	☹
1.1 Infrared radiation and surfaces	Know that all materials emit and absorb infrared radiation.							
	Understand that the hotter an object is, the higher its rate of emission of infrared radiation.							
	Understand that infrared radiation is part of the electromagnetic spectrum (like light) and is NOT energy transfer by particles.							
1.2 Surfaces and Radiation	Recall that matt and dark-coloured surfaces are good at absorbing and emitting infrared radiation.							
	Describe that shiny and light-coloured surfaces are poor at absorbing and emitting infrared radiation.							
	Describe that shiny and light-coloured surfaces are good at reflecting infrared radiation.							
1.3 States of matter (Kinetic Theory)	Know the three states of matter — solid, liquid and gas.							
	Know that the particles in each state of matter have different amounts of energy.							
	Be able to use kinetic theory to explain the properties of solids, liquids and gases.							
	Understand and recognise simple models showing the differences between the particles in different states of matter.							
1.4 Conduction	Know that conduction transfers energy by particles colliding with each another.							
	Understand that whether a substance is a good insulator or conductor depends on the arrangement and movement of its particles.							
	Understand the process of conduction and that it is the main method of heat transfer in solids.							
	Understand that metals are good conductors because they contain free electrons.							
1.5 Convection	Know that Convection transfers energy by particles colliding with each another.							
	Understand that whether a substance is a good insulator (convection) or conductor depends on the arrangement and movement of its particles.							
	Describe how energy is transferred by convection in a liquid or gas (fluids).							

1.6 Evaporation and Condensation	Know that energy transfers by evaporation and condensation involve particles.							
	Be able to describe evaporation and condensation using kinetic theory.							
	Be able to explain the cooling effect of evaporation.							
	Know what factors will change the rate of evaporation or condensation of a substance.							
1.7 Energy Transfer by Design	Know that the rate of energy transfer between an object and its surroundings is higher the bigger the temperature difference is between them.							
	Be able to explain the design of objects designed to maximise or reduce the rate of heat energy transfer.							
	Be able to explain how animals have adapted to their environments, in terms of heat transfer.							
1.8 Specific Heat Capacity	Understand that the greater the mass of an object, the more energy required to raise its temperature.							
	Different substances/materials require different amounts of energy to raise their temperature.							
	Know that specific heat capacity is the amount of energy needed to change the temperature of 1 kg of a substance by 1 °C.							
	Be able to use the equation $E = m \times c \times \theta$.							
1.9 Heating and Insulating Buildings	Understand how types of building insulation reduce energy transfer.							
	Understand the term 'payback time' and be able to calculate it for a type of insulation.							
	Be able to evaluate how effective and cost-effective different types of insulation and materials are.							
	Know that U-values are a measure of how insulating a material is.							
	Know that the lower the U-value a material has, the better insulator it is.							
	Know that solar hot water panels heat water using radiation from the Sun, and that this water can be used to heat a building or supply it with hot water							
2.1 Forms of Energy & 2.2 Conservation of Energy	All will: recall forms of energy as: thermal, light, electrical, sound, kinetic, chemical, nuclear, potential elastic and potential gravitational.							
	Most could: recall that energy is conserved. (Cant be created/destroyed- only transferred).							
	Some should: use models or diagrams, effectively representing energy transfers.							
	Know that energy can't be created or destroyed — it is transferred usefully, stored or dissipated.							

	Be able to describe energy transfers, for example between gravitational, kinetic and elastic strain energy.							
2.3 & 2.4 Energy Efficiency & Sankey Diagrams	Know that when energy is transferred, only some of it is transferred usefully and the rest is wasted.							
	Be able to calculate the efficiency of a device as a decimal or a percentage.							
	Understand that wasted energy eventually spreads (dissipates) out into the surroundings, causing them to become warmer.							
	Be able to compare methods for reducing energy consumption in terms of efficiency and cost-effectiveness.							
	Understand how 'wasted' energy can be made useful, for example in heat exchangers.							
	Understand what a Sankey diagram shows and be able to draw one from given data.							
	Be able to calculate the efficiency of a device from a Sankey diagram.							
3.1 Electrical Appliances	Be able to evaluate why electrical appliances are so useful.							
	Discuss what electrical appliances are use often in the home and recall the energy transfers that take place.							
	Evaluate the best appliance to choose based on energy transfers and efficiency.							
3.2 Electrical Power	Recall the unit for power is Watt (W)- or Kilowatt (kW)							
	Know how to calculate the amount of electrical energy transferred by an appliance using equation $E = P \times t$.							
	Learn the skill to rearrange the focus of an equation e.g. $E = P \times t$. or $P=E/t$ etc. Use of a triangle to rearrange.							
3.3 Using Electrical Energy	Define a Kilowatt-hour and link this to mains appliances.							
	Know how to calculate the amount of electrical energy transferred by a mains appliance using equation $E = P \times t$.							
	Be able to calculate the cost of electricity being used. kWh used x cost per kWh.							
3.4 Cost Effectiveness Matters	Define what is meant by cost effectiveness based on both running costs and capital cost of the appliance.							
	For a given situation, evaluate the advantages and disadvantages of using different electrical appliances. THINK: environmental and social implications.							
	Understand and consider the idea of appliance payback time.							

4.1 Fuel for Electricity	Draw a flow chart showing the stages of electricity production in a power station.							
	Know differences between fossil fuel and nuclear fuel generation & name fossil fuels used.							
	Be able to suggest other fuels, (e.g. Biofuel) to generate electricity.							
4.2 Energy From Wind and Water	Describe how wind turbines can be used to generate electricity.							
	Describe how water can be used to generate electricity in a variety of ways e.g. (tidal, hydroelectric, waves etc).							
	Be able to create balanced arguments for the advantages and disadvantages of wind and water electricity generation.							
4.3 Power From The Sun and the Earth	Know that solar cells produce electricity directly from the Sun's radiation and geothermal energy can generate electricity in a variety of ways.							
	Know that electricity generated by solar cells is useful in remote areas or when only small amounts of electricity are needed.							
	Be able to create balanced arguments for the advantages and disadvantages of geothermal, solar hot water and solar electric cells.							
4.4 Energy and The Environment	Describe the environmental impacts, (for and against) from burning fossil fuels, (include carbon capture).							
	Describe the environmental impacts, (for and against) from using renewable energy sources.							
	Be able to explain why people are concerned about nuclear power, (advantages and disadvantages).							
4.5 The National Grid	Explain the advantages of providing electricity via the national grid.							
	Describe the role of pylons, cables and step-up and step-down transformers in the national grid.							
	Explain why electricity is transferred at very high voltage and low current.							
4.6 Big Energy Issues	Describe how we can supply our variable energy demands.							
	Describe the advantages and disadvantages of producing electricity by different techniques.							
	Evaluate the possible viable resources that could provide electricity generation for future demands.							
5.1 The Nature of Waves	Know that waves can be transverse or longitudinal and that the main difference between them is the direction in which they vibrate compared to the direction in which the wave transfers energy.							
	Know that electromagnetic waves are transverse.							
	Know that longitudinal waves have compressions and rarefactions.							

	Know that sound waves are longitudinal.							
	Know that mechanical waves can be transverse or longitudinal.							
5.2 Measuring Waves	Know that a wave transfers energy without transferring matter.							
	Understand the terms amplitude, wavelength and frequency as measurements of waves.							
	Know that all waves obey the wave equation: $v = f \times \lambda$							
	Know how to calculate wave speed using the wave equation.							
5.3 Wave Properties- Reflection	Know that the normal is a line perpendicular to the surface of reflection at the point where the wave is incident on the surface.							
	Know the law of reflection: for every reflection, the angle of incidence is equal to the angle of reflection.							
	Know that a reflection in a plane mirror produces a virtual image.							
	Know that the virtual image produced by a plane mirror is upright and laterally inverted.							
	Be able to draw a ray diagram of a reflection from a plane mirror.							
5.4 Wave Properties- Refraction	Know that waves can change direction at a boundary or obstacle by either reflecting, refracting or diffracting.							
	Know that reflection and refraction can happen when waves meet boundaries between media.							
	Know that waves are only refracted if they are not travelling along the normal.							
5.5 Wave Properties- Diffraction	Know that waves can be diffracted when they meet an obstacle or pass through a gap.							
	Know that a gap or obstacle the same size as the wavelength of a wave will cause it to diffract most.							
5.6 Sound	Know that sound waves are vibrations travelling through a medium and are caused by something vibrating.							
	Know that our ear detects the vibrations caused by a sound wave and we hear them as sound.							
	Know that sound waves are longitudinal.							
	Know that echoes are just sound waves reflecting.							

5.7 Musical Sounds	Know that the pitch of a sound is due to its frequency.							
	Know that the loudness of a sound is due to its amplitude.							
	Accurately recall scientific keywords.							
6.1 The Electromagnetic Spectrum	Know that the continuous spectrum of electromagnetic waves is known as the electromagnetic spectrum.							
	Know the order of the types of waves in the electromagnetic spectrum.							
	Know how wavelength, frequency and energy of the waves change across the electromagnetic spectrum.							
	Know that all waves in the electromagnetic spectrum travel at the same speed through a vacuum.							
6.2 Light-Infrared-Microwaves and Radiowaves	Understand what white light is.							
	Understand the uses of infrared, microwave and radiowave and that these can cause internal heating, with IR causing skin burns.							
	Know that infrared and visible light can be used for communication, e.g. visible light can be used for photography and infrared can be used for thermograms.							
6.3 Communications	Know the uses of waves for communication including radio waves for television and radio, microwaves for mobile phones and satellites and infrared for remote controls.							
	Understand the possible health risks that may be linked to mobile phone use.							
	Be able to compare the uses in communication of different EM waves.							
6.4 The Expanding Universe	Know that the Doppler effect is where the wavelength and frequency of waves from a moving wave source measured by a stationary observer change.							
	Know that the Doppler effect can happen to all waves.							
	Know how the change in observed frequency and wavelength depends on the direction of travel of the wave source relative to the stationary observer.							
	Know that the Doppler effect of light is called red-shift.							
	Know that the light from most distant galaxies is red-shifted.							
6.5 The Big Bang	Understand that the further away a galaxy is, the greater the red-shift of the light from it and the faster is it moving away from us.							
	Know that the red-shift of light from distant galaxies provides evidence that the universe is expanding, and supports the Big Bang theory.							
	Know that the Big Bang theory says that the universe began at a very small point and then began to expand.							
	Know that cosmic microwave background radiation (CMBR) is microwave radiation that fills and comes from all parts of the universe. It comes from radiation emitted shortly after the universe began.							
	Know how the Big Bang theory explains the CMBR and that it's the only theory we currently have to explain why it exists.							