Year 11 Science GCSE Revision – PHYSICS (PAPER 1)

Physics only content is the extra work that **separate science** students have studied

All support resources (specimen exam papers, mark schemes, powerpoints, summary sheets, core practicals) can be found on the reference drive at **N:\Reference\Science\NEW AQA GCSE**

Revision should be checked against syllabus content (different for TRIOLOGY and separate PHYSICS) at **N:\Reference\Science\NEW AQA GCSE\syllabus content (physics)**

Make sure you **revise the required practicals** properly. These are more likely to come up on the examination papers

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Week Beginning	Topic	Key Ideas	Topics for possible longer answer responses
Week 1 3rd March	P1 Energy	Energy calculations – elastic potential, kinetic and gravitational potential Work and energy transfers – including dissipation of energy Power Specific heat capacity calculation Global energy supply and demand - Renewable and non-renewable resources Required Practical: Specific heat capacity **Higher tier** **Efficiency**	Describe the energy transfers involved in a swinging pendulum/ roller coaster. How can you reduce the amount of energy dissipated from a house? Describe a method to determine the specific heat capacity of a block of brass. Discuss the advantages and disadvantages of wind power. Describe a method to determine the specific heat capacity of a metal block.
Physics only content		Describe how insulation prevents heat transfer by conduction, convection and radiation Required Practical: Effectiveness of different insulating materials	Describe a method to investigate which materials is the most effective insulator.
Week 2 10th March	P2 Electricity	Circuit symbols Current and voltage in series and parallel circuits The I-V characteristics and properties of a filament lamp, diode, thermistor and resistor	Describe and explain the shape of an I-V graph of a filament bulb, diode an ohmic conductor. Label the different wires in the plug and describe their function. Why is electricity transmitted at high voltages in the national grid?

		Resistance in series and parallel circuits – being able to calculate the total resistance in a series circuit Wiring of a plug – colours and functions of each part The National grid and the role of transformers Calculating power and energy Required practicals: Resistance of a length of wire; I-V characteristics of a resistor, lamp and diode; Resistors in series and parallel	Describe a method to investigate the resistance of different lengths of wire.
Physics only content		Static electricity – static charge and electric fields	
Week 3 17th March	P3 Particle Model of Matter	Density calculations of regular and irregular shaped objects Changes of state and the particle model of solids liquids and gases Specific heat capacity and latent heat – including heating and cooling curves Thermal conductivity Particle motion in gases Required practical: calculating the density of regular solids, irregular solids and liquids.	Describe a method to determine the density of an irregularly shaped object. Describe what happened during a change of state from solid to liquid in terms of particle arrangement and motion.
Physics only content		Increasing the pressure of a gas	Explain why increasing the number of particles in a container increases the pressure exerted by a gas.
Week 4 24th March	P4 Atomic Structure	Structure of the atom and relative mass and charge of protons, neutrons and electrons Properties of alpha, beta and gamma radiation Nuclear decay equations for alpha, beta and gamma Half life	Describe how you could determine the type of radiation being emitted by a source using paper, aluminium and lead. Why is alpha radiation more dangerous in contamination than irradiation? Describe how a person can protect themselves from radiation.

		Hazards of radiation - Irradiation and contamination	
Physics only content		Background radiation Uses of radiation in smoke detectors, paper thickness, tracers and medical applications Nuclear fission and nuclear reactors Nuclear fusion	How does a smoke detector work? Why would a smoke detector not work with gamma radiation? Explain how nuclear fission can lead to a chain reaction. Describe the process of nuclear fusion.

Year 11 Science GCSE Revision – PHYSICS (PAPER 2)

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Week Beginning	Topic	Key Ideas	Topics for possible longer answer responses
Week 5 31st March **+** **Week 6 7th April**	P5 Forces	Calculations of motion – speed, acceleration, $v^2 - u^2 = 2as$ Motion graphs – distance-time graphs, velocity-time graphs, Mass and weight Newton's Laws of motion – balanced, unbalanced, force pairs Calculating resultant forces Factors that affect stopping distance Force and energy in springs Required Practicals: Force and acceleration (ticker tape timer); force and extension of a spring **Higher tier** **Vector diagrams – drawn to scale** **Tangents to distance time-graphs** **Motion in a circle** **Free body diagrams and resolving forces** **Momentum and inertia**	Describe how you could determine the speed of an object using a distance-time graph. Describe which factors affect the thinking distance when stopping a car. Describe a method to investigate the extension of a spring when a force is applied to it. Why do we say a car is constantly accelerating when it is travelling around a roundabout?
Physics only content		Moments – levers and gears Pressure in fluids and atmospheric pressure	Why is atmospheric pressure lower at the top of a mountain compared to sea level?

Week 7 **14th April**	P6 Waves	Characteristics of transverse and longitudinal waves Measuring and calculating wave speed in a ripple tank and in solids Reflection and refraction The electromagnetic spectrum properties and uses Required Practicals: Calculating wave speed in liquids (water in ripple tank), gases (echo in air) and solids (vibrations on a string); How much infrared radiation is emitted/absorbed by different colour and texture surfaces **Higher tier** **Explain refraction using wave fronts** **Reflection and refraction of radiowaves**	Describe a method to measure the speed of a water wave in a ripple tank. Describe how microwaves heat up food. Explain how radiowaves are used in communication between two antennae on opposite sides of the planet.
Physics only content		Sound waves and ultrasound Seismic waves Colour, lenses, magnification Black body radiation Global warming Required Practicals: Reflection of light; Refraction of light	Explain how we discovered the structure of the Earth using seismic waves.
Week 8 **21th April**	P7 Electromagnetism	Magnetic fields and compasses The magnetic effect of a wire and a solenoid The earth's magnetic field **Higher tier** **Flemings left-hand rule** **Force on a conductor and magnetic flux density** **Electric motors**	Explain why we say compasses are 'north seeking'. What factors can increase the strength of an electromagnet? Describe how a dc electric motor works.

Physics only content		Electromagnets Loudspeakers and microphones The generator effect Transformers and the transformer equation	Describe how a loudspeaker works. Describe how a microphone works. Explain why we use step-up and step-down transformers in the national grid.
Week 9 **28nd April**	P8 Space (Physics only)	The solar system and orbits The life cycle of the sun and other stars Formation of elements Red-shift	Explain why Pluto is very difficult to see from Earth. Describe the relationship between the distance of a planet from the sun and the time it takes to orbit. Why do fusion reactions require high temperatures? Describe the life cycle of a star similar to our Sun.
Week 10 **5th May**	Physics Equations	Practise questions using and rearranging the following equations (they will be given in the exam) Practise converting between different units e.g. kN → N MJ → J nm → m	$W = m\ g$ $W = F\ s$ $F = k\ e$ $M = F\ d$ $p = F/A$ $s = v\ t$ $a = \Delta\ v/t$ $F = m\ a$ $p = m\ v$ $E_k = ½\ m\ v^2$ $E_p = m\ g\ h$ $P = E/t$ $P = W/t$ efficiency = useful output energy transfer/ total input energy transfer efficiency = useful power output/ total power input $v = f\ \lambda$ $Q = I\ t$ $V = I\ R$ $P = V\ I$ $P = I^2\ R$ $E = P\ t$ $E = Q\ V$ $\rho = m/V$
	Exam practise	Use specimen papers and summary sheets on the reference drive to develop exam technique.	

		Use your revision guides and class notes to recap the required practicals for each topic. A list is given on the reference drive.	