

Curriculum Map Year 10: Physics Separate Science AQA: Five lessons per fortnight

Examination Papers – End of Yr 11	% of GCSE	Question style
Paper 1 – Topics 1-4	50	Multiple choice, structured, closed short answer and open response
Paper 2 – Topics 5-8 Questions in paper 2 may draw on an understanding of energy changes and transfers due to heating, mechanical and electrical work and the concept of energy conservation from 'Energy' and 'Electricity (topics 1 & 2)	50	Multiple choice, structured, closed short answer and open response

	Topic	Key Knowledge <i>What will students know by the end of this topic?</i>	Key Skills <i>What skills will students have developed by the end of this topic?</i>	Assessment Opportunities <i>How will student progress be measured? What are the key assessment pieces?</i>
Half Term 1	4- Atomic Structure	Continue with topic 4 from Summer term of Year 9. - Recap of atoms & isotopes (from start of Year 9 Chemistry & end of year 9 Physics) - Radioactive decay & nuclear radiation - Nuclear equations - Half-lives - Contamination, irradiation & their hazards - Hazards & uses of radioactive emissions - Background radiation - Nuclear fission & fusion	- Recall key terminology including the nature of alpha, beta & gamma decay - Balance nuclear equations - Use graphs & calculations in relation to half-lives - Interpretation of data & application of knowledge to problem solving - Apply their knowledge of nuclear radiation to evaluate the best source of radiation to use in a given situation - Evaluate the perceived risk of using nuclear radiations in relation to given data	- Starter tasks to review prior learning - In-class assessment of familiarity of Year 9 Chemistry & Physics on the structure of an atom, isotopes & the discovery of the nucleus + Re-call required par topic 3 - Regular PPQ practice
	2- Electricity	Start topic 2 - Static charge - Electric fields	- Linking ideas (e.g. linking the concept of electric fields to explain the non-contact force between charged objects and the phenomenon of sparking)	
Half Term 2	2- Electricity (continued)	- Circuit symbols, current & potential difference - Series & parallel circuits - Required practical 4 – IV graphs (in 3 parts – resistor, filament lamp & diode) - Ohm's law & resistance - Concepts of directly proportional & inversely proportional - Thermistors & LDRs	- Recognise & recall circuit symbols - Draw simple circuits including the positioning of voltmeters & ammeters - Building simple circuits - Calculations involving current, energy, charge, p.d. & time - Use of models to understand the unobservable - Building more complex circuits & taking measurements	- Topic 4 assessment + Re-call topic 1 - Starter tasks to review prior learning - Building simple circuits from circuit diagrams - White-board activities on series & parallel circuits

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		- Required practical 3-Factors affecting resistance (2 parts length of a wire and resistors in series & parallel)	- Plot and draw appropriate graphs selecting appropriate scales for the axes. - Lines of best fit - Recall of practical terms from Year 9 - Method writing and clarity on variables - How to bring together ideas about components, equations and mathematical skills including graph interpretation in order to solve complex problems	- Graph drawing - Regular PPQ practice - Practical PPQs related to required practical activities
Half Term 3	2- Electricity (continued) 5 – Start Forces	- Mains electricity & the National Grid - Transferring energy & power - 100% efficient transformers Start Topic 5 - Distance-time graphs - Distance, displacement, speed & velocity - Scalar & vector quantities	- Connection to Topic 1 (Energy); noting that Topics 1 & 2 can be assessed in Paper 2. - Tackling synoptic questions - Recognition of scalar & vector quantities - Calculations & equation recall from an ever-increasing list - Interpreting graphs - Using data from a graph in calculations - Determining the gradient of a straight line	- Starter tasks to review prior learning - Electricity so far assessment - Equation recall - Regular PPQ practice
Half Term 4	5 – Forces (continued)	- Velocity-time graphs - Acceleration - SUVAT equations - What are forces? - Contact & non-contact forces - Weight, mass & gravity - Resultant forces	- Calculations & equation recall from an ever-increasing list - Interpreting graphs - Using data from a graph in calculations - Drawing tangents - Determining the gradient of a straight line - Scale diagrams & choice of suitable scale - Use of protractor - Revision technique - Exam technique - Equation recall - Review of own work and performance in examination - Reflective practice & goal setting for improvement - Connection to Topic 1 (Energy); noting that Topics 1 & 2 can be assessed in Paper 2.	- Starter activities with particular focus on previous topics in preparation for examination - Regular PPQ practice - Assessment Force and motion + Electricity main and national grid

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Half Term 5	5 – Forces (continued)	- Resultant forces & resolving force - Work done & energy transfers (from Year 9) - Forces & elasticity - Required Practical 6-Force & extension for a spring - Hooke's Law - Concept of directly proportionality (again) - Moments levers & gears - If an object is balanced then the total clockwise moment about a pivot equals the total anticlockwise moment about that pivot	- Scale diagrams & choice of suitable scale - Use of protractor - Plot and draw appropriate graphs selecting appropriate scales for the axes. - Lines of best fit - Recognition of variables that are directly proportional from data in a table & from a graph - Recognition of when direct proportionality reaches a limit - Be able to calculate forces or distance using the principle of balanced moments	- Starter tasks to review prior learning - Practical PPQs related to required practical activities - Regular PPQ practice - Year 10 examination (1 hour 30 minutes; Topics 1,2, 3, 4 & Topic 5 motion subtopic only.) -
Half Term 6	5 – Forces (continued)	- Pressure in fluids - Atmospheric pressure - Floating & sinking - Newton's 1st & 2nd laws of motion - Concepts of directly proportional & inversely proportional (again)	- Connections to Topic 3 (Particle model of matter) & pressure in a gas	- Starter tasks to review prior learning - Regular PPQ practice - Assessment to close gaps in knowledge based on last term assessment

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Half Term 1	5 – Forces (continued) 6 - Waves	- Required practical 7- investigation of Newton's 2nd Law (in 2 parts) - Concepts of directly proportional & inversely proportional (again) - Newton's 3rd law of motion - Terminal velocity - Stopping distance, thinking distance & braking distance - Reaction time & factors affecting it - Factors affecting braking distance - Momentum & conservation of momentum - Changes in momentum Start Topic 6 - Transverse & longitudinal waves - Properties of waves & wave speed - Frequency & Time Period - Required practical 8 -Speed of a wave in a solid & in a ripple tank (in 2 parts)	- Plot and draw appropriate graphs selecting appropriate scales for the axes. - Method writing and clarity on variables - Recall of practical terms from Year 9 and addition of new terms - Apply Newton's 3rd law of motion to equilibrium situations - Application of Newton's 2nd law of motion to stopping vehicles safely - Evaluate the effect of various factors on thinking distance based on given data - Describe & explain examples of conservation of momentum - Complete calculations involving an event such as a collision - Apply equations relating forces, mass, velocity & acceleration to explain how the changes are inter-related - Explain safety features such as air bags with reference to the rate of change of momentum - Recall key terminology on the anatomy & behaviour of waves - Identify the suitability of apparatus to measure the frequency, wavelength & speed of waves (in the required practical)	- Starter tasks to review prior learning - Practical PPQs related to required practical activity at the end of Year 10 (key revision & consolidation activity) - Regular PPQ practice - Assessment of Topic 5 + Re-call topic 1 - Practical PPQs related to required practical activities this half-term

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			- Be able to determine the uncertainty in a set of measurements - Calculations & equation recall from an ever-increasing list	
Half Term 2	6 – Waves (continued)	- Sound waves - Waves for detection and exploration - Ultrasound waves & their use - Seismic waves and their part in discoveries about the Earth's structure - Required practical 9 – reflection & refraction of light - Reflection of waves - Refraction of waves - Lenses - Opaque, transparent & translucent objects - Use of coloured filters - Colours of light and their perception to the human brain	- Revision technique - Exam technique - Equation recall - Review of own work and performance in examination - Reflective practice & goal setting for improvement - Connections to Topic 5 (Forces - speed subtopic) and Topic 3 (Particle model of matter) to explain the use of ultrasound to determine distances and to seismic waves to explain the structure of the Earth - Method writing - Be able to determine the uncertainty in a set of measurements - Draw ray diagrams to show reflection of waves - Draw ray diagrams to show refraction of waves - Draw wave front diagrams to illustrate refraction - Construct ray diagrams to illustrate the similarities and differences between convex and concave lenses - Recall key terminology used to describe images (e.g. real & virtual; upright & inverted) - Recall key terminology related to the absorption & transmission of light (opaque, transparent & translucent) - Explain the perception of colour due to the absorption, transmission and reflection of different wavelengths of light	- Starter activities with particular focus on previous topics in preparation for examination - equation recall - Year 11 mock examination (1 hour 30 minutes; Topics 1,2, 3, 4, 5 & Topic 6 wave anatomy & wave equation) - Regular PPQ practice - Checking of ray diagrams and wave front diagrams - Checking lenses diagrams - Practical PPQs related to required practical activities
Half Term 3	6 – Waves (continued)	- The Electromagnetic Spectrum - Properties of electromagnetic waves - Uses and dangers of electromagnetic waves - Required Practical 10 – investigation of the amount of IR radiation absorbed and emitted by different surfaces - Black body radiation	- Draw conclusions from given data about the risks and consequences of exposure to radiation - Connection to Topic 1 (Energy); noting that Topics 1 & 2 can be assessed in Paper 2. - Explain how the temperature of a body is related to the balance between absorbed and emitted radiation	- Starter tasks to review prior learning - Regular PPQ practice - Practical PPQs related to required practical activities

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			- Connection to Topic 5 (Newton's Laws) to explain the equilibrium between the gravitational collapse of a star and the expansion of a star due to fusion energy - Connection to Topic 5 (Motion subtopic & Newton's Laws) to explain how for circular orbits the force of gravity can lead to changing velocity but unchanged speed. - Connection to Topic 6 (Waves) to explain the observed increase in wavelength of light from galaxies that are moving away from the Earth	
Half Term 5	Preparation for external examinations	- Remaining time to be spent on preparation for external examinations.	- Previously learnt skill to be revisited prior to external examinations. Particular focus is usually on: - Electrical circuits - Method writing - Practical terms - Review of some required practicals	- Topic 8 assessment - Use of PPQs - Equation recall - 'Paper 2' assessment
Half Term 6	External examinations			External examinations