Curriculum Map Year 9: Physics

	Topic	Key Knowledge *What will students know by the end of this topic?*	Key Skills *What skills will students have developed by the end of this topic?*	Assessment Opportunities *How will student progress be measured?* *What are the key assessment pieces?*
Half Term 1	Particle model of matter	• Density differences between solids, liquids & gases • Use of the equation density = mass/volume (including rearranging) • How to determine the density of regular and irregular shaped objects and liquids experimentally (GCSE Required Practical 3) • Use of the words 'resolution', 'accuracy' and 'precision' • Differences in arrangement, motion & spacing of particles in solids, liquids and gases • The particle model of matter to explain density of materials. • Changes of state including heating & cooling curves • Internal energy of a system	• Use of formulae in calculations • Calculations involving rearranging • Use of correct units • Ensuring that units match (e.g. the need to convert between g & kg if density is given in kg/m^3 and mass in g) • Converting between cm & m; g & kg • Recording measurements to the correct number of decimal places (e.g. a length to 1mm using a ruler) • Answering questions as guided in the question itself (e.g. 'explain in terms of particles' requires the word particles to be used in the answer(!))	• Starter tasks to review prior learning (from year 7 Chemistry) • Density calculations for H/W • PPQ practice • Required practical 3 PPQs
Half Term 2	Particle model of matter (continued)	• Specific heat capacity. • Describing increases and decreases in the amounts of energy associated with temperatures • Specific latent heat • Using the particle model of matter explain motion of particles in a gas. • How gases exert forces on the walls of their containers. • How changing the temperature of a gas affects the pressure exerted • How changing the pressure of a gas affects the volume of the gas (and vice versa). • How pressure and volume of a gas are linked. (Boyle's Law) • Work done on a gas and the change in internal energy caused.	• Use of formulae in calculations • Calculations involving rearranging • Use of correct units • Ensuring that units match (e.g. the need to convert between J & kJ if SHC or SLH given in kJ/kg°C and energy in J) • Graph plotting and choice of appropriate scale (e.g. y axis does not need to start at 0) • Explanatory answers needing to be in appropriate depth for the number of marks on offer	• Starter tasks to review prior learning • SHC & SLH calculations for H/W • PPQ practice • Graph drawing • Assessment 1 (density, particle model, internal energy, required practical 5 &practical terms)
Half Term 3	Consolidate pressure in gases sub-topic Start Energy	• Energy stores & carriers • Processes that involve energy transfer (changing motion, dropping an object, stretching a spring, burning fuels)	• Use of increasingly complex formulae in calculations (e.g. squared terms) • Calculations involving rearranging (now including the need to use the square-root function) • Use of correct units	• Starter tasks to review prior learning (Year 7 & 8 energy)

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		• Calculations using work done, GPE, KE and EPE equations • Energy as a quantity that can be calculated • Total energy has the same value before and after a change • Product of force and displacement (work done)	• Use of SI units (kg, m and s must be used when working with N and J)	• Work done, GPE, KE & EPE calculations for H/W • PPQ practice • Assessment 2 (SHC, SLH, Gases & shifting energy)
Half Term 4	Energy (continued)	• Quantifying changes in energy stores using conservation of energy • Describing increases and decreases in the amounts of energy associated with movement, temperature, position in field (GPE) and elastic distortions • Power as the rate of doing work OR the rate of energy transfer • Determining the SHC of a metal block (GCSE Required Practical 1)	• Be able to use all energy equations in combination (work done, GPE, KE, EPE, SHC & SLH) This is another level of difficulty for equation use and problem solving. • SI units • Use of multipliers (especially kJ and kW)	• Starter tasks to review prior learning (Year 7 & 8 energy) • Work done, GPE, KE, EPE calculations for H/W • PPQ practice • Required practical 1 PPQs
Half Term 5	Energy (continued)	• Thermal conductivity • Use of insulators (GCSE required practical 2) • Heating and thermal equilibrium • Reducing unwanted energy transfers using lubrication • Reducing heat loss from a home by use of insulation, especially how the rate of cooling of a building is affected by the thickness and thermal conductivity of its walls • Calculating efficiency. • How to increase efficiency.	• Identification of independent, dependent and control variables • Writing a method • When to use bar charts and line graphs • Plotting bar charts & line graphs • Interpretation of data presented in graphical form	• Starter tasks to review prior learning (Year 7 energy) • Required practical 2 PPQs • Application of insulation PPQ H/W • End of year examination (1 hour); mostly GCSE questions
Half Term 6	Energy (continued) Revision of 'changing models of the atom' (covered	• Main energy resources • Renewable & non-renewable • Energy resources are used for transport, heating & electricity generation • Economic, social, ethical & political, issues • That new experimental evidence may lead to a scientific model being changed or replaced.	• Identify patterns & trends in data given in graphical and tabula form • Developing a line of argument using advantages and disadvantages of different energy resources • Comparing contrasting models of the atom • Explaining what led to changes in the model of the atom	• PPQ practice • Energy Issues PPQs

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	earlier in Year 9 by Chemistry & 100% common to the Physics GCSE)	• Discovery of the electron led to the plum pudding model of the atom • Results from the alpha particle scattering experiment led to the discovery of the nucleus and the replacement of the plum pudding model of the atom by the nuclear model • Further experimental discoveries that have led to the model now used at GCSE level in Chemistry & Physics		