Year 10 Physics Curriculum Map

Overview	Students will gain an overview of electricity and electrical circuits. Many circuits are powered with mains electricity, but portable electrical devices must use batteries of some kind. Electrical power fills the modern world with artificial light and sound, information and entertainment, remote sensing and control. The fundamentals of electromagnetism were worked out by scientists of the 19th century. If we all continue to demand more electricity this means building new power stations in every generation – but what mix of power stations can promise a sustainable future? The particle model is widely used to predict the behaviour of solids, liquids and gases and this has many applications in everyday life. It helps us to explain a wide range of observations and engineers use these principles when designing vessels to withstand high pressures and temperatures, such as submarines and spacecraft. It also explains why it is difficult to make a good cup of tea high up a mountain! Ionising radiation is hazardous but can be very useful. Although radioactivity was discovered over a century ago, it took many nuclear physicists several decades to understand the structure of atoms, nuclear forces and stability. Early researchers suffered from their exposure to ionising radiation. Today radioactive materials are widely used in medicine, industry, agriculture and electrical power generation.					
Year 10	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Topic	P3 Energy resources	P4 Electric circuits	P5 Electricity in the home	P6 Molecules and matter	P7 Radioactivity	P8 Forces in balance
Knowledge	4.1.3 National and global energy resources	4.2.1 Current, potential difference and resistance 4.2.2 Series and parallel circuits	4.2.3 Domestic uses and safety 4.2.4 Energy transfers	4.3.1 Changes of state and the particle model 4.3.2 Internal energy and energy transfers 4.3.3 Particle model and pressure	4.4.1 Atoms and isotopes 4.4.2 Atoms and nuclear radiation 4.4.3 Hazards and uses of radioactive emissions and of background radiation (physics only 4.4.4 Nuclear fission and fusion (physics only)	4.5.1 Forces and their interactions 4.5.4 Moments, levers and gears (physics only)

Skills	Describe how current energy demands are met, including how electricity is generated. Describe how to generate electricity with renewable sources. Suggest how demand for energy can be met in the future.	Explain charging and discharging in terms of electron movement. Explain attraction and repulsion using the idea of electric fields. Apply knowledge of series and parallel circuits.	Explain the purpose of fuses, earthing, circuit breakers, and plastic casings in electrical safety. Describe the link between charge, potential difference, current, time, energy and power and do calculations involving those quantities. Calculate peak potential difference and frequency from measurements of a trace on an oscilloscope screen.	Calculate density and describe factors that affect it. Analyse data in terms of specific latent heat. Calculate energy transfer to produce a change in state. Explain why a gas exerts a pressure. Explain the relationship between pressure and volume, and volume and temperature.	Describe the Thomson, Rutherford and Bohr models of the atom, the structure of the nucleus and evidence that led to the model changing. Describe what alpha, beta, and gamma radiation are, and their different properties and how to balance equations for nuclear decay. Use ideas about half-life to solve problems.	Calculate resultant forces. Describe why some objects are stable and others topple.
Assessment	October – Chapters 1, 2 and 3 assessed (Combined Science & Triple Science)		January – Assessment Combined Science - Chapters 1 – 4 Triple Science – Chapters 1 – 5	March – Mock Exams. Chapters 1 – 7 assessed (Combined Science & Triple Science)		June – Chapters on Paper 1 not assessed previously. Combined Science and Triple Science – Chapters 6 & 7