



Long Term Plan Year 10 Physics

Half Term	Unit Title	Key Knowledge/Content to learn and retain	Essential Skills to acquire (subject & generic)	Link to intent and ethos	Anticipated misconceptions	Links to previous KS	Link to future KS	Opportunity for stretch and high prior attainers	SMSC & British Values	Cultural Capital	Career Link
One	Energy	Stores, Pathways and energy transfers. Kinetic, Gravitational and Elastic energy calculations. Heat transfer and insulation Renewable and non-renewable resources.	Changing the subject of simple equations with three terms. Evaluation of an equation involving multiplication, division, squares and square roots Record accurate results in an appropriate format Present and interpret data in tabular and graphical form.		Students often speak of “types” of energy. This is fundamentally incorrect. Students must talk about energy in the context of stores and pathways Students often frame renewable and non-renewable in terms of “able to be used again” rather than in terms of the finite or infinite pool of resources.	This unit builds directly from KS3 study of energy stores and pathways.	Energy is studied in the first year of A-Level Physics	Students could be asked to consider more complex energy transfers involving more than two stores. Students could be asked to use data on efficiency and cost to evaluate appliances Changing the subject of energy equations to calculate theoretical maximum speed	The impact of non-sustainable resources and the everyday changes that can be made to promote the use of more sustainable resources	The ubiquity of energy means that problems can be framed in a variety of familiar and unfamiliar contexts	opens doors to a wide range of STEM field careers; particularly those in engineering, architecture and mechanical sciences
Two	Electricity	Static electricity Current, potential difference and resistance Ohms Law Circuit components and their resistance characteristics Series and parallel circuits Electricity in the home, and calculations of appliance power	Record accurate experimental data Present and interpret data in tabular and graphical form. Extended writing Change the subject of an equation, and evaluate an equation with three or four terms.		How current and potential difference split across series and parallel circuits	In Key Stage three students will have studied simple circuits and how the number of cells affects the brightness of bulbs. They will also have studied simple component symbols	Electricity is studied in the first year of A-Level Physics	Multistep calculations, involving two or more electricity equations	Working safely in a lab and respecting each other’s work space	The ubiquity of electricity means that problems can be framed in a variety of familiar and unfamiliar contexts	opens doors to a wide range of STEM field careers; particularly those in engineering, architecture and mechanical sciences
Three	The Particulate Model of Matter	Density The properties of solids, liquids and gases; as explained by their structure Specific heat capacity and specific latent heat. Gas pressure, and the impact of temperature on gas pressure Specific heat capacity and specific latent heat.	Record accurate experimental data Present and interpret data in tabular and graphical form. Extended writing Change the subject of an equation, and evaluate an equation with three or four terms. Record accurate experimental data.		That particles change in their properties when they change states, rather than change arrangement and movements.	At Ks3 students will have looked at the simple properties of solids, liquids and gasses, and will have explored simple changes of state	Particle model is a fundamental and is a major part of A-Level Physics	Multi-step calculations involving energy and temperature change Extended writing, linking properties to structure	Working safely in a lab and respecting each other’s work space	The ubiquity of the three states of matter means that problems can be framed in a variety of familiar and unfamiliar contexts	As an introductory course, the KS3 physics programme opens doors to a wide range of STEM field careers; particularly those in engineering, architecture and mechanical sciences
Four	Radiation	The development of the atom Alpha, Beta and Gamma radiation; how these alter the nucleus and the properties of these types of radiation Activity and half life (Triple Only) Nuclear fusion and fission	Record accurate experimental data Present and interpret data in tabular and graphical form. Extended writing Calculating the gradient of a graph		That Alpha radiation does not cause damage to cells. That gamma decay affects changes in the nucleus.	This will be the first time students have studied radiation, but the history of the atom as studied in KS3 chemistry builds up into this unit.	The standard model and interaction between subatomic particles are studied in the first year of A-Level Physics	Construction of decay equations. Calculation of half life using standard form	The impact of radiation and how we can stay safe while using it. The ethics of nuclear power	The use of radioactivity and nuclear power globally; including the approach of the UK and other nations	Radiology Radiograph technician Nuclear technician A wide range of careers in nuclear research
Five	Forces	Scalar and vector quantities Newton’s first and third laws (Triple Only) Turning forces (Higher Only) Resolving forces (Triple Only) Gears and levers Hooke’s Law	Changing the subject of simple equations with three terms. Simple multiplication and division Record accurate results in an appropriate format Present and interpret data in tabular and graphical form. Calculate the gradient of a line		Students often state that an object will be still if there is no force acting upon it, so it is important to stress that if it is moving it will remain moving.	This unit builds directly from the study of forces and motion at key stage three; extending students knowledge to look at more quantitative analysis and the affect of forces in more complex	Forces and mechanics forms a unit at A-Level, where the same concepts will be covered in more depth	Resolving forces in situations where they are not parallel or perpendicular	Working safely in a lab and respecting each other’s work space	The ubiquity of forces means that problems can be framed in a variety of familiar and unfamiliar contexts	This programme opens doors to a wide range of STEM field careers; particularly those in engineering, architecture and mechanical sciences
Six	Revision and Examinations	Half term six is dedicated to preparation for the summer PPEs, followed by targeted intervention, review, reflection and improvement work; which will be planned bespoke to each class depending on the data collected.									