All Saints' Catholic High School

Luceat lux Vestra

Subject: Physics and Trilogy **Stage:** KS4

NB:
-Bold indicates separate science Physics content only
-Topic vary in length and hay be delivered over multiple half terms, please see curriculum maps.
-Electricity has been delivered to year 10 last year
-Future year groups will begin Energy in year 10

KS4: Yr 10 & 11	**Energy**	**Electricity**	**Particle model of matter**	**Atomic Structure**	**Forces**	**Magnetism and electromagnetism**	**Waves**	**Space Physics**
	Yr 9, Half term 4							
Yr 10			*Yr 10 unit 1*	*Yr 10 Unit 2*	*Yr 10 Unit 3*			
Yr 11					*Yr 11 Unit 1*	*Yr 11 Unit 2*	*Yr 11 unit 3*	*Yr 11 Unit 4*
Aim of Unit	The aim of this topic is to build on the Energy topic from KS3 and further develop the	The aim of this topic is to build on the Electromagnets topic from KS3 and further develop the knowledge and	The aim of this topic is to build on the Matter topic from KS3 and further develop the	The aim of this topic is to build on the Earth topic from KS3 and further develop the knowledge	The aim of this topic is to build on the Forces topic from KS3 and further develop the knowledge	The aim of this topic is to build on the Electromagnets topic from KS3 and further develop the knowledge and	The aim of this topic is to build on the Waves topic from KS3 and further develop the knowledge and understanding	The aim of this topic is to build on the Earth topic from KS3 and further develop the

	knowledge and understanding around energy and the role it plays in our lives. It will also prepare pupils for the required disciplinary knowledge through the required practical activities.	understanding around electricity and the role it plays in our lives. It will also prepare pupils for the required disciplinary knowledge through the required practical activities.	knowledge and understanding around matter and the role it plays in our lives. It will also prepare pupils for the required disciplinary knowledge through the required practical activities.	and understanding around ionising radiation and the role it plays in our lives. It will also prepare pupils for the required disciplinary knowledge through the required practical activities.	and understanding around forces and the role they play in our lives. It will also prepare pupils for the required disciplinary knowledge through the required practical activities.	understanding around magnetism and the role it plays in our lives. It will also prepare pupils for the required disciplinary knowledge through the required practical activities.	around Sound and Light and the role it plays in our lives. It will also prepare pupils for the required disciplinary knowledge through the required practical activities.	knowledge and understanding around space and the role it plays in our lives. It will also prepare pupils for the required disciplinary knowledge through the required practical activities.
Composite Knowledge *(a task that requires several building blocks or components)*	Pupils will extend their understanding of key points and applications relating to Energy.	Pupils will extend their understanding of key points and applications relating to Electricity.	Pupils will extend their understanding of key points and applications relating to Particle Model of Matter.	Pupils will extend their understanding of key points and applications relating to Atomic Structure.	Pupils will extend their understanding of key points and applications relating to Forces.	Pupils will extend their understanding of key points and applications relating to Magnetism and Electromagnetism.	Pupils will extend their understanding of key points and applications relating to Waves.	Pupils will extend their understanding of key points and applications relating to Space Physics.
Component Knowledge *(the building blocks that together,*	4.1.1.1 Energy stores and systems 4.1.1.2 Changes in energy	4.2.1.1 Standard circuit diagram symbols 4.2.1.2 Electrical charge and current	4.3.1.1 Density of materials 4.3.1.1 Required practical 5: Density	4.4.1.1 The structure of an atom 4.4.1.2 Mass number, atomic	4.5.1.1 Scalar and vector quantities 4.5.1.2 Contact and non-contact forces	4.7.1.1 Poles of a magnet 4.7.1.2 Magnetic fields 4.7.2.1 Electromagnetism	4.6.1.1 Transverse and longitudinal waves 4.6.1.2 Properties of waves	**4.8.1.1 Our solar system** **4.8.1.2 The life cycle of a star** **4.8.1.3 Orbital**

when known, allow successful performance of a complex task)	4.1.1.3 Energy changes in systems 4.1.1.3 Required practical 1: Specific heat capacity 4.1.1.4 Power 4.1.2.1 Energy transfers in a system 4.1.2.1 Required practical 2: Thermal insulation 4.1.2.2 Efficiency 4.1.3.1 National and global energy resources	4.2.1.3 Current, resistance and potential difference 4.2.1.3 Required practical 3: Resistance 4.2.1.4 Resistors 4.2.1.4 Required practical 4: I-V characteristics 4.2.2.1 Series and parallel circuits 4.2.3.1 Direct and alternating potential difference 4.2.3.2 Mains electricity 4.2.4.1 Power 4.2.4.2 Energy transfers in everyday appliances 4.2.4.3 The National Grid **4.2.5.1 Static charge** **4.2.5.2 Electric fields**	4.3.1.2 Changes of state 4.3.2.1 Internal energy 4.3.2.2 Temperature changes in a system and specific heat capacity 4.3.2.3 Changes of heat and specific latent heat 4.3.3.1 Particle motion in gases 4.3.3.2 **Pressure in gases** **4.3.3.3 Increasing the pressure of a gas (HT only)**	number and isotopes 4.4.1.3 The development of the model of the atom (common content with chemistry) 4.4.2.1 Radioactive decay and nuclear radiation 4.4.2.2 Nuclear equations 4.4.2.3 Half-lives and the random nature of radioactive decay 4.4.2.4 Radioactive contamination **4.4.3.1 Background radiation** **4.4.3.2 Different half-lives of radioactive isotopes**	4.5.1.3 Gravity 4.5.1.4 Resultant forces 4.5.2.1 Work done and energy transfer 4.5.3.1 Forces and elasticity 4.5.3.1 Required practical 6: Force and extension **4.5.4.1 Moments, levers and gears** 4.5.5.1 Pressure in a fluid 4.5.5.1.2 Pressure in a fluid (HT only) 4.5.5.2 Atmospheric pressure 4.5.6.1.1 Distance and displacement 4.5.6.1.2 Speed	4.7.2.2 Fleming's left-hand rule (HT only) 4.7.2.3 Electric motors (HT only) **4.7.2.4 Loudspeakers (HT only)** **4.7.3.1 Induced potential (HT only)** **4.7.3.2 Uses of the generator effect (HT only)** **4.7.3.3 Microphones (HT only)** **4.7.3.4 Transformers (HT only)**	4.6.1.2 Required practical 8: Waves **4.6.1.3 Reflection of waves** **4.6.1.3 Required practical 9: Light** **4.6.1.4 Sound waves (HT only)** **4.6.1.5 Waves for detection and exploration (HT only)** 4.6.2.1 Types of electromagnetic waves 4.6.2.2 Properties of electromagnetic waves 1 4.6.2.2 Required practical 10: Radiation and absorption 4.6.2.3 Properties of electromagnetic waves 2 4.6.2.4 Uses and applications of	**motion, natural and artificial satellites** **4.8.2.1 Red-shift (physics only)**

				4.4.3.3 Uses of nuclear radiation **4.4.4.1 Nuclear fission** **4.4.4.2 Nuclear fusion**	4.5.6.1.3 Velocity 4.5.6.1.4 The distance–time relationship 4.5.6.1.5 Acceleration 4.5.6.2.1 Newton's First Law 4.5.6.2.2 Newton's Second Law 4.5.6.2.2 Required practical 7: Acceleration 4.5.6.2.3 Newton's Third Law 4.5.6.3.1 Stopping distance 4.5.6.3.2 Reaction time 4.5.6.3.3 Factors affecting braking distance 1 4.5.6.3.4 Factors affecting		electromagnetic waves **4.6.2.5 Lenses (physics only)** **4.6.2.6 Visible light (physics only)** **4.6.3.1 Emission and absorption of infrared radiation** **4.6.3.2 Perfect black bodies and radiation**	

					braking distance 2 4.5.7.1 Momentum is a property of moving objects 4.5.7.2 Conservation of momentum **4.5.7.3 Changes in momentum**			
Rationale *(why?):* Links to prior & future learning	Builds on KS3 in energy 1 and 2. This unit prepares pupils for continuing energy at KS5 in A level units such as further mechanics and thermal physics. It offers opportunities to explore Stem careers such as renewable	Builds on KS3 in Electromagnetism 1 and 2. This unit prepares pupils for continuing electricity at KS5 in A level units such as Electricity. It offers opportunities to explore Stem careers such as renewable energies, electrical and tele communications.	Builds on KS3 in Matter 1 and 2. This unit prepares pupils for continuing matter at KS5 in A level units such as Particles and radiation and also Mechanics and Materials. It offers opportunities to explore Stem careers such as	Builds on KS3 in Matter 1 and 2. This unit prepares pupils for continuing matter at KS5 in A level units such as Particles and radiation and also Mechanics and Materials. It offers opportunities to explore Stem careers such as	Builds on KS3 in Forces 1 and 2. This unit prepares pupils for continuing forces at KS5 in A level units such as Field and their consequences. It offers opportunities to explore Stem careers such as engineering as well as	Builds on KS3 in Electromagnetism 1 and 2. This unit prepares pupils for continuing electricity at KS5 in A level units such as Electricity. It offers opportunities to explore Stem careers such as renewable energies, electrical and tele communications	Builds on KS3 in Waves 1 and 2. This unit prepares pupils for continuing waves at KS5 in A level units such as Waves. It offers opportunities to explore Stem careers such as tele communications, digital marketing and media.	Builds on KS3 in Earth 1 and 2. This unit prepares pupils for continuing study on space at KS5 in A level units such as Astrophysics. It offers opportunities to explore Stem careers in the Army, Navy and Air force as well as the European Space

	energies and careers in the energy sector.		renewable energies, nuclear fission and research.	renewable energies, nuclear fission and research.	health and safety.			Agency, NASA and Space X.
Assessment Task	Energy topic assessment (Foundation or Higher). H/W quiz on SMH every week to retain knowledge (Interrupt the forgetting curve). Formative assessment though recall questioning and formative assessment tasks.	Electricity topic assessment (Foundation or Higher). H/W quiz on SMH every week to retain knowledge (Interrupt the forgetting curve). Formative assessment though recall questioning and formative assessment tasks.	Particle Model of Matter topic assessment (Foundation or Higher). H/W quiz on SMH every week to retain knowledge (Interrupt the forgetting curve). Formative assessment though recall questioning and formative assessment tasks.	Atomic Structure topic assessment (Foundation or Higher). H/W quiz on SMH every week to retain knowledge (Interrupt the forgetting curve). Formative assessment though recall questioning and formative assessment tasks.	Forces topic assessment (Foundation or Higher). H/W quiz on SMH every week to retain knowledge (Interrupt the forgetting curve). Formative assessment though recall questioning and formative assessment tasks.	Magnetism and Electromagnetism topic assessment (Foundation or Higher). H/W quiz on SMH every week to retain knowledge (Interrupt the forgetting curve). Formative assessment though recall questioning and formative assessment tasks.	Waves topic assessment (Foundation or Higher). H/W quiz on SMH every week to retain knowledge (Interrupt the forgetting curve). Formative assessment though recall questioning and formative assessment tasks.	Space topic assessment (Foundation or Higher). H/W quiz on SMH every week to retain knowledge (Interrupt the forgetting curve). Formative assessment though recall questioning and formative assessment tasks.
Enrichment	Practical lessons applied to everyday scenarios. Utilising GCSE POD or other	Practical lessons applied to everyday scenarios. Utilising GCSE POD or other online providers	Practical lessons applied to everyday scenarios. Utilising GCSE POD or other	Practical lessons applied to everyday scenarios. Utilising GCSE POD or other	Practical lessons applied to everyday scenarios. Utilising GCSE POD or other	Practical lessons applied to everyday scenarios. Utilising GCSE POD or other online providers	Practical lessons applied to everyday scenarios. Utilising GCSE POD or other online providers to	Practical lessons applied to everyday scenarios. Utilising GCSE POD or other

	online providers to facilitate enrichment.	to facilitate enrichment.	online providers to facilitate enrichment.	online providers to facilitate enrichment.	online providers to facilitate enrichment.	to facilitate enrichment.	facilitate enrichment.	online providers to facilitate enrichment.