



Curriculum Plan *Separate Physics*



Year 10	Golden Treads: State the big ideas that will be taught across the year (Threshold concepts) Matter, forces and motion, electricity and magnetism				Enrichment: What is offered through the year to support learning in the classroom?		Review and evaluation: Give date for review of the curriculum July 24
	Topics		Substantive Knowledge	Disciplinary Knowledge	Misconceptions	Key Vocabulary	Knowledge tracking
Term 1/2	Energy		Energy changes in a system, and the ways energy is stored before and after such changes <i>Energy stores and systems.</i> Changes in energy Energy changes in systems Power Conservation and dissipation of energy Energy transfers in a system Efficiency National and global energy resources	Required practical – specific Heat capacity. AT 1 and 5 <i>Investigating thermal insulators</i> AT 1 and 5	heat as an intangible substance that can flow into and out of objects hot object can ‘heat up’ another object, and think of heat as something that can move from one object to another Many students think that objects of different materials in the same room will have different temperatures the temperature of boiling water will continue to rise if it is heated, and that the temperature of a sample of ice will fall if more ice is added	Efficiency Dissipated System Conductivity Absorb/ emit Renewable Reliability Geothermal Hydroelectric biofuel	Prior learning – Particle model and energy term 1 Year 10, Forces and energy stores Year 9 term 1, Forces and energy stores Year7 term 3. Leading onto- forces, waves and electromagnetism in Year 11
	Electricity	Assessment 1 - Energy	Current, potential difference and resistance Standard circuit diagram symbols Electrical charge and current Current, resistance and potential difference Resistors Series and parallel circuits Domestic uses and safety Direct and alternating potential difference Mains electricity	Required practical- Investigating the factors that affect the resistance of a wire & Combinations of resistors in series and parallel AT 1, 6 and 7 Investigating I-V characteristics of components. AT 6 and 7	electric current or electric charge (or ‘electricity’), rather than energy, is stored in a battery a battery supplies the same current, regardless of the circuit in which it is used confused by the idea of conventional current	ampere coulomb current potential difference resistance alternating transformer Conductor Efficiency Ohmic conductor Electrostatic	Prior learning -Simple circuits Year 9 term 3 – Electricity Year 7 term 2 Leading onto - Electromagnetism Year 11



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			Energy transfers Power Energy transfers in everyday appliances The National Grid Static electricity (physics only) Static charge Electric fields				
Term 3	Particle model of matter	Assessment 2 - ENERGY, ELECTRICITY, PARTICLE MODEL OF MATTER AND ATOMIC STRUCTURE	Changes of state and the particle model Density of materials Changes of state Internal energy and energy transfers Internal energy Temperature changes in a system and specific heat capacity Changes of state and specific latent heat Particle model and pressure Particle motion in gases Pressure in gases (physics only) Increasing the pressure of a gas (physics only) (HT only)	Required practical Determining density AT 1 Link back to Required practical – specific Heat capacity. AT 1 and 5	Steam is visible. Steam and condensation are the same. Evaporation only occurs when water is boiling. When a solid dissolves in water it does not contribute to the mass of the solution. When a substance has dissolved it has 'disappeared'. ☐ Substances (like sugar) 'melt' in water.	condensation density evaporation fusion specific latent heat sublimation vaporisation	Prior learning – Elements and compounds Year 8 term1, particle model Year 7 term 3 Leading onto – Atomic structure Term 6 Year 10, Waves and space Year 11
Term 4/5	Atomic structure		Atoms and isotopes The structure of an atom Mass number, atomic number and isotopes		Learners find it difficult to understand the concept of half-life and giving the net decline using a ratio During radioactive	Alpha activity background radiation beta chain reaction contamination Fission	Prior learning – Particle model Year 10 term 4/5, Elements and compounds Year 8 term1, particle model Year 7 term 3. Leading onto space in Year 11



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		The development of the model of the atom (common content with chemistry) Atoms and nuclear radiation Radioactive decay and nuclear radiation Nuclear equations Half-lives and the random nature of radioactive decay Radioactive contamination Hazards and uses of radioactive emissions and of background radiation (physics only) Background radiation Different half-lives of radioactive isotopes Uses of nuclear radiation Nuclear fission and fusion (physics only) Nuclear fission Nuclear fusion		decay learners find it difficult to understand that when a beta particle is released a neutron is turned into a proton. Generally they think it is an electron being released as on the radioactive decay equation it is illustrated with a negative sign. Extra care needs to be taken when explaining the equations. Distinguishing between irradiation and contamination.	fusion gamma Geiger-Müller tube half-life ionisation irradiation isotope spontaneous	
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Term 6	Space		Solar system; stability of orbital motions; satellites Our solar system The life cycle of a star Orbital motion, natural and artificial satellites Red-shift		Some students observe the Sun moving up and down and this explains why it gets dark at night and light during the day Some students assume that the distances between planets in the solar system are much smaller than they are	Centripetal Protostar supernova	Prior learning –Space Year 9 term 1, forces and energy stores Year 9