	Autumn		Spring		Summer	
	Learning Cycle 1	**Learning Cycle 2**	**Learning Cycle 3**	**Learning Cycle 4**	**Learning Cycle 5**	**Learning Cycle 6**
Topic	18,22,23	19,20,24,25	26,28	27		
Critical Prior Knowledge	Motion in a circle, Gravitational Fields	KS4 Specific heat capacity, latent heat and particle model. KS5 Motion in a circle and SHM. Fields. Capacitors.	KS4 Radioactivity and Triple Science Lenses	KS4 Radioactivity and Ch26		
Overall Intent (Big ideas and key concepts)	Oscillations, Principles of SHM, More about sine waves Applications of SHM, Energy and SHM, Forced Vibrations and Resonance, Field Patterns, Electric Field Strength, Electric Potential, Coulomb's Law, Point Charges, Comparing fields, Capacitance, Energy stored in an capacitor, Charging and Discharging Capacitors, Dielectrics	Internal Energy and Temperature, Specific heat capacity, Change of state, The Gas Laws, Ideal Gas Law, Kinetic Theory of Gases, Current carrying conductors in a magnetic field, moving charges in a magnetic field, charged particles in circular orbits, Generating Electricity, The Laws of electromagnetic induction, The AC generator, Alternating current and power, Transformers.	Discovery of the Nucleus, Properties of alpha, beta and gamma radiation, More on Alpha/Beta/Gamma, Dangers of radioactivity, Radioactive Decay, Theory of radioactive decay, Radioactive isotopes in use, Decay Modes, Nuclear Radius, **Astrophysics OPTION**	Energy and Mass, Binding Energy, Fission and Fusion The thermal nuclear reactor.		
Essential Knowledge milestones (What students must master)	Oscillations and the principles of SHM. Resonance. Adaption of fields theory to electric charges. How capacitors work.	Define internal energy and deepen KS4 particle nature. Understand and use the gas laws. Extend field theory into magnetism. DC and AC motors and generators. Transformer theory.	Deep understanding of radioactivity and radioactive decay processes including chains. Uses and risk based dangers. Astrophysics: Lenses and telescopes, Stars and the universe.	Energy and Mass relationship, binding energy or atoms, fission/fusion and nuclear reactor science.		
Cultural Capital	Practical techniques, health and safety, applied physics skills. Communication of Science ideas and concepts.		Practical techniques, health and safety, applied physics skills. Communication of Science ideas and concepts.			
Assessment Points	Regular Afl embedded into lessons. End of Topic Tests per chapter. Jan AS Paper-A mock	Regular Afl embedded into lessons. End of Topic Tests per chapter. Jan AS Paper-A mock	Regular Afl embedded into lessons. End of Topic Tests per chapter. June AS Paper-A mock	Regular Afl embedded into lessons. End of Topic Tests per chapter. June AS Paper-A mock		
ECC Student Characteristics	Through these units we will encourage students to work hard and be **resilient individuals** who **embrace challenge** and through their **creativity** and endeavours become **reflective learners.** Mastering the key concepts of each topic before being able to build on these ideas as they are interleaved through other units later in the course.					
Connection to future learning (When is this developed / revisited)?						