

	Autumn	Spring	Summer
	Learning Cycle 1 Learning Cycle 2	Learning Cycle 3 Learning Cycle 4	Learning Cycle 5 Learning Cycle 6
Topic	Forces	Electromagnets	Energy / Waves
Critical Prior Knowledge	KS2: Forces	KS2 Electricity and Magnetism KS3 Forces	KS2 Energy KS3 Forces: Speed
Overall Intent (Big ideas and key concepts)	• Introduction to Forces; • Balanced and Unbalanced Forces; • Speed; Distance – Time Graphs • Gravity	• Potential Difference • Resistance • Series and parallel circuits • Current	• Food and Fuels • Energy Resources • Energy and Power • Energy Dissipation • Sound waves and Speed • Loudness and Amplitude; Frequency and Pitch • The Ear and Hearing • Light; Reflection; Refraction • The eye and vision • Colour
Essential Knowledge milestones (What students must master)	• Students are able to draw a force diagram for a specific problem e.g. involving gravity • Describe that when the resultant force on an object is zero, it is in equilibrium and so does not change its motion, i.e. it remains stationary or at constant speed • Describe one effect of a force is to change an object's form, causing it to be stretched or compressed • Be able to draw and read information from distance/time graphs • Know that Gravity is a non-contact force.	• Students can draw circuit diagrams to show how voltage, current and resistance can be measured in a simple circuit • Use Ohm's law • Use models/to explain why part of a circuit has higher resistance • Students can Describe how current changes in series and parallel circuits when components are changed • Turn circuit diagrams into real series and parallel circuits, and vice versa • Describe what happens when charged objects are placed near to each other or touching • Use a sketch to describe how an object charged positively or negatively became charged up.	ENERGY • Students can compare the amounts of energy transferred by different foods and activities • Compare the energy usage and cost of running different home devices • Explain the advantages and disadvantages of different energy resources • Represent the energy transfers from a renewable or non-renewable resource to an electrical device in the home • Show how energy is transferred between energy stores in a range of real-life examples • Calculate the useful energy and the amount dissipated

			• Explain how energy is dissipated in a range of situations. WAVES • Students can explain observations where sound is reflected, transmitted or absorbed by different media • Explain observations of how sound travels using the idea of a longitudinal wave • Describe the amplitude and frequency of a wave from a diagram or oscilloscope picture • Use drawings of waves to describe how sound waves change with volume or pitch • Explain how audio equipment converts sound into a changing pattern of electric current • Explain observations where coloured lights are mixed or objects are viewed in different lights • Use ray diagrams to describe how light passes through lenses and transparent materials • Describe how lenses may be used to correct vision • Explain differences in the damage done to living cells by light and other waves, in terms of their frequency • Students can also describe the properties of different longitudinal and transverse waves • Use the wave model to explain observations of the reflection, absorption, and transmission of a wave
Cultural Capital	• Practical techniques, health and safety, development of fine motor and dexterity skills • Communication of Science ideas and concepts	• Practical techniques, health and safety, development of fine motor and dexterity skills • Communication of Science ideas and concepts	• Practical techniques, health and safety, development of fine motor and dexterity skills • Communication of Science ideas and concepts
Assessment Points	• Regular Afl embedded into lessons • P1 Retrieval Mastery • Term 1 – Progress Assessment	• Regular Afl embedded into lessons • P2 Retrieval Mastery • Term 2 – Progress Assessment	• Regular Afl embedded into lessons • P3 Retrieval Mastery • Term 3 – Progress Assessment

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)?	KS4: Forces	KS4: Electrical Circuits; Electricity in the home	KS4: Energy; Waves