

# EMMANUEL COLLEGE

## THE SCIENCE DEPARTMENT

Year 11



Year 11	Autumn Term 1	Autumn Term 2	
<b>Unit Title</b>	Electromagnetism	Space Physics	
<b>Key Question(s)?</b>	How do magnetic fields work and what is the connection between electricity and magnetism?	How does our solar system work and how is the universe expanding?	
<b>Threshold Concepts</b>	<p>The region around a magnet where a force acts on another magnet or on a magnetic material (iron, steel, cobalt and nickel) is called the magnetic field.</p> <p>The direction of the magnetic field at any point is given by the direction of the force that would act on another north pole placed at that point.</p> <p>When a current flows through a conducting wire a magnetic field is produced around the wire.</p>	<p>Within our solar system there is one star, the sun, plus the eight planets and the dwarf planets that orbit around the sun. Natural satellites, the moons that orbit planets, are also part of the solar system.</p> <p>Our solar system is a small part of the Milky Way galaxy. The sun was formed from a cloud of dust and gas (nebula) pulled together by gravitational attraction. A star goes through a life cycle. The life cycle is determined by the size of the star.</p> <p>Gravity provides the force that allows planets and satellites (both natural and artificial) to maintain their circular orbits. There is an observed increase in the wavelength of light from most distant galaxies. The further away the galaxies, the faster they are moving and the bigger the observed increase in wavelength. This effect is called red shift.</p>	
<b>Link to Prior Learning</b>	This builds on the content covered in Year 8 on magnets and an introduction to electromagnetism.	This builds on the content covered in Year 8 on Earth and space.	
<b>Knowledge and</b>	Combined science groups will see just two new topics in Year 11, and then spend considerable time reviewing and applying what has been seen in Years 9 and 10. A specific area of focus is		

<b>Sequencing Rationale</b>	<p>the re-teaching of Forces 1 content from Year 9 which was potentially omitted for middle-/low-ability groups (Suvat, vectors, tangents to curves). The other topics are somewhat stand-alone but generally build on concepts introduced so far.</p> <p>Triple award students will extend their knowledge of the waves and forces topics and also apply themselves to space physics which builds on atomic structure and Forces 1 from Year 9. Electromagnetism feeds back into their knowledge of the national grid.</p>
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