FAIRFAX
SINCERITAS LABORIS

YEAR 11 CURRICULUM INFORMATION – Physics		
	Autumn 1	Autumn 2
What will students be learning?	**Electromagnetic Waves** • The Electromagnetic Spectrum • Light, IR, Micro and Radio Waves • Communications **Light** • Reflection of Light • Refraction of Light • Light and Colour **Electromagnetism** • Magnetic Fields • Magnetic Fields of Electric Current • Electromagnets • The Motor Effect • The Generator Effect • The AC Generator	**Electromagnetic Waves** • UV, X-Rays and Gamma Rays • X-Rays In Medicine **Light** • Lenses • Using Lenses **Electromagnetism** • Transformers • Transformers in action
How will students be assessed?	1. Milestone test at the end of the topic 2. In-class formative review each lesson 3. Required Practical - Investigating infrared radiation 4. Required Practical - Investigate the reflection and refraction of light	1. Milestone test at the end of the topic 2. In-class formative review each lesson

Literacy – What keywords will be taught?	Electromagnetic, spectrum, wavelength, frequency, velocity, speed of light, reflect, absorb, visible light, infra-red, microwave, radio wave, bandwidth, communication, ionosphere, microwave band, broadband, detection. Reflection, angle of incidence, angle of reflection, normal, perpendicular, refraction, medium, boundary, critical angle, partial reflection, angle of refraction, optical density, primary colour, secondary colour, transmission, filter, absorb. Magnetic field, polarity, North / South pole, attraction, repulsion, field line, solenoid, concentric, conventional current, electron flow, electromagnet, core, soft iron, direct current, motor effect, Fleming's left hand rule, generator effect, dynamo, alternator, split ring commutator, slip rings, brushes, contacts.	Ionising, ionisation, absorption, reflection, sterilising, gamma knife, CAT scan, X-ray, gamma ray, ultraviolet, detection, radiograph. Lens, lenses, concave, convex, focus, focal point, focal length, ray, diverge, converge, axis, enlarge, diminish, inverted, real, virtual. Transformer, step-up, step-down, current, power, potential difference, efficiency, national grid, coil, input, output, primary / secondary, winding, ratio, alternating, induced, electric field, conservation of energy.
What employability skills are being developed?	• Problem solving (Finding the direction of a third quantity knowing the direction of two of F, B and I using Fleming's Left Hand Rule, Discussion of selecting most appropriate EM wave to use for communications in long/short distances) • Numeracy (Calculations of magnetic field strengths, measuring of angles in reflection and refraction, wave speed and frequency calculations for EM waves) • Literacy (Reading information on bandwidth and uses of various sub sections of microwaves) • Extended writing (Comparison and contrast of EM waves and their properties) • Practical skills (Showing the shape of magnetic fields using iron filings, reporting this as a simplified diagram, measuring IR emission from surfaces, safety procedures with hot materials, using mirrors and glass blocks to measure varying light angles)	• Problem solving (Discussion of minimising exposure to ionising rays Vs. reduction of need for invasive surgery with high frequency EM waves,) • Numeracy (Calculation of wave speed and frequencies, application of ratio for windings / potential difference in transformers)

FAIRFAX
SINCERITAS LABORIS

Wider Curriculum Links?	• Drama / Performing Arts – Colour theory and stage lighting / costume design colour choices using available colour filters. • Art – application of emitted colour mixing concepts Vs. absorbing colour mixing concepts. • Careers – set designer, costume designer, event host, lighting engineer, motor industry designer / technician.	• Careers – Electrical engineering (application of transformer theory), healthcare careers such as doctor, radiologist, veterinarian, etc. (using non-invasive medical imaging with X-rays and gamma rays), optometrist and astronomer (applications of lenses in glasses and telescopes). • Biology – application of lens theory to how the lens in the eye works and application to myopia/hyperopia.
What useful websites are there for this topic? **Click links for more info**	 Free Science Lessons  Primrose Kitten GCSE Pod BBC Bitesize Oak National Academy *Select KS4 Science (Triple)*	
What wider reading could be done for this topic? **Click links for more info**	**Textbook** *(separate sciences)*: AQA GCSE Physics Student Book (3rd Ed) **Textbook** *(combined science)*: AQA GCSE Physics for Combined Science (Trilogy) Student Book (3rd Ed) **Revision Guide** *(separate sciences)*: AQA GCSE 9-1 Physics All-in-One Complete Revision and Practice *(available on ParentPay)* **Revision Guide** *(combined science)*: AQA GCSE 9-1 Combined Science Higher All-in-One Complete Revision and Practice *(available on ParentPay)*	
What else can students be doing independently to develop their understanding of this topic? **Click links for more info**	**Exam Question Practice** *(matches the revision guides on ParentPay)*: Collins AQA GCSE 9-1 Physics Workbook **Exam Question Practice** *(Separate Higher Tier)*: CGP GCSE Physics AQA Exam Practice Workbook - Higher **Exam Question Practice** *(Combined Higher Tier)*: CGP GCSE Combined Science AQA Exam Practice Workbook – Higher **Exam Question Practice** *(Separate Foundation Tier)*: CGP GCSE Physics AQA Exam Practice Workbook - Foundation **Exam Question Practice** *(Combined Foundation Tier)*: CGP GCSE Combined Science AQA Exam Practice Workbook - Foundation	