



CURRICULUM PLAN

COMBINED SCIENCE PHYSICS

(EDEXCEL 9-1)

BRAMHALL HIGH SCHOOL

Curriculum Intent

It is our intention as Science Department to provide all children, regardless of their prior learning, background, or special needs, with a broad and balanced science curriculum. We aim to promote positive attitudes to science as an interesting and enjoyable subject. To develop pupils` awareness of how science impacts on their everyday life.

Pupils are encouraged to develop their practical skills, to work collaboratively and to query and evaluate scientific evidence.

We aim to cultivate an environment conducive to learning. We encourage and value our pupils` opinions, ideas, and contributions. Similarly, we expect pupils to strive for excellence and respect the contributions of other adults and their peers. Our intention is for pupils to enjoy their learning, to be resilient, make progress and achieve at an appropriate level.

Academic Year: 2023-2024

Review Date: July 2024

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YEAR 10

Term	Programme of Learning	Links to the National Curriculum / Specification / Additional	Assessments	What extra learning opportunities are planned?	Disciplinary Literacy
Term 1a	<p>SP2 Forces & Motion</p> <ul style="list-style-type: none"> - Momentum - Momentum in collisions - Momentum and forces - Stopping distances - Car safety features <p>SP3 Energy Conservation</p> <ul style="list-style-type: none"> - Energy stores - Energy transfers 	<p>Energy</p> <p>Changes & transfers</p> <p>Changes in systems</p> <p>Scientific attitudes</p> <p>Experimental Skills</p> <p>Analysis and Evaluation</p>	<p>CPR- Crash hazards</p> <p>SP2 End of unit test</p>	<p>Stopping distance on a bicycle</p> <p>Investigating air bags</p> <p>Car testing challenge</p>	<p>Tier 1: Elastic, nuclear energy, system.</p> <p>Tier 2: Dissipated, *efficiency, lubrication, thermal energy,</p> <p>Tier 3: Atomic energy, chemical, potential, strain, gravitational potential, joule (J), kinetic, Sankey</p>
Term 1b	<p>SP3 Conservation of energy</p> <ul style="list-style-type: none"> - Energy efficiency - Keeping warm - kinetic energy - Potential energy - Renewable resources - Non-renewable resources - Energy trends & issues <p>SP4 Waves</p> <ul style="list-style-type: none"> - Types of waves - Wave properties 	<p>Energy</p> <p>Scientific thinking</p> <p>Experimental skills</p> <p>Analysis and Evaluation</p> <p>Measurement</p> <p>Units</p> <p>Wave Motion</p>	<p>CPR – Energy Transfers</p> <p>SP3 End of unit test</p>	<p>Consider systems which aren't 100% efficient in calculations</p> <p>Stress link GPE/KE and 6 markers</p> <p>Energy presentations</p>	<p>Tier 1: Elastic, nuclear energy, system. efficiency</p> <p>Tier 2: Dissipated, efficiency, lubrication, thermal energy,</p> <p>Tier 3: gravitational potential energy, *kinetic energy, conservation</p>

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<p>Term 2a</p>	<p>SP4 Waves</p> <ul style="list-style-type: none"> - Wave speed equations - Wave speed practicals - Waves at boundaries - Reflection - Refraction - Sound and hearing - Infra and ultrasound - Seismic waves & Earth 	<p>Wave Motion Scientific thinking Experimental skills Analysis and Evaluation Measurement Units</p>	<p>CPR – Waves</p> <p>SP4 End of unit test</p>	<p>Modelling and pHET for wave core practical</p> <p>Earth structure and p and s wave diagrams</p>	<p>Tier 1: ray, lens, Tier 2: Frequency, Tier 3: Wavelength, wave speed, *refraction, absorption, total internal reflection</p>
<p>Term 2b</p>	<p>SP5 Light and the Electromagnetic spectrum</p> <ul style="list-style-type: none"> - Lenses - Ray Diagrams - Dispersion - Colour - EM spectrum - EM properties and uses - Dangers of EM Spectrum - Radiation & temperature - Climate change 	<p>Wave Motion Scientific thinking Experimental skills Analysis and Evaluation Measurement Units</p>	<p>CPR - Lens Ray diagram</p> <p>SP5 End of unit test</p> <p>Year 10 Exams</p>	<p>Look at power of lenses More lens diagrams to consider object position Designing heat exp.</p>	<p>Tier 1: speed Tier 2: *transverse Tier 3: microwave, infrared, ultraviolet, gamma, radiation, conservation</p>

<p>Term 3a</p>	<p>SP6 Radioactivity</p> <ul style="list-style-type: none"> - History of the atom - Atomic structure - Nucleus structure - P, E, N for atoms - Electron orbits - Radiation and decay - Background radiation - Half-life 	<p>Atomic Structure Scientific thinking Experimental skills Analysis and Evaluation Measurement Units</p>	<p>CPR -History of the atom</p>	<p>Modelling radioactivity Flame tests and energy Carbon 14 dating</p>	<p>Tier 2: Gamma ray. Alpha, beta, electron, proton, Tier 3: Radioactive decay, activity, background, Becquerel (Bq), positron, *nucleus, ionisation, penetration, absorption</p>
<p>Term 3b</p>	<p>SP6 Radioactivity</p> <ul style="list-style-type: none"> - Contamination - Irradiation - Dangers of radiation - Using radioactivity - Dangers of radioactivity - Fission and Fusion - Radiation in medicine 	<p>Atomic Structure Scientific thinking Experimental skills Analysis and Evaluation Measurement Units</p>	<p>CPR – Nuclear Radiation SP6 End of unit test</p>	<p>Litvinenko Link to chem</p>	<p>Tier 1: energy, temperature, pressure Tier 2: Nuclear reactor, *fission, Main sequence Tier 3: contamination, irradiation, fusion, daughter nuclei, chain reaction, uranium, control rod, moderator,</p>

YEAR 11

Term	Programme of Learning	Links to the National Curriculum / Specification / Additional	Assessments	What extra learning opportunities are planned?	Disciplinary Literacy
Term 1a	<p>SP7 Astronomy</p> <ul style="list-style-type: none"> - The Solar System - Helio-centrism - Geo-centrism - Gravity and Orbits - Life cycle of stars - Redshift - CMBR - Origins of the Universe <p>SP8 Energy – Forces doing work</p> <ul style="list-style-type: none"> - Power and work <p>SP9 Forces and their effects</p> <ul style="list-style-type: none"> - Fields - Contact forces - Non-contact forces - Force vector diagrams - Rotational forces - Gears <p>SP10 Electricity & circuits</p> <ul style="list-style-type: none"> - Circuit symbols - Series and parallel rules - Energy & charge 	<p>Space Physics</p> <p>Forces</p> <p>Energy</p> <p>Scientific thinking</p> <p>Experimental skills</p> <p>Analysis and Evaluation</p> <p>Measurement</p> <p>Units Electricity</p> <p>Scientific thinking</p> <p>Experimental skills</p> <p>Analysis and Evaluation</p> <p>Measurement</p> <p>Units</p>	<p>CPR – Red shift</p> <p>SP7 End of unit test</p> <p>CPR - Work and Power</p> <p>CPR – Moments</p> <p>SP8/9 End of unit test</p> <p>CPR – Electricity</p>	<p>Fred model of fuses</p> <p>Wire wool fuses</p> <p>Enrichment – Tues revision</p> <p>Welding and heating effects</p> <p>A level Qs</p> <p>Weight, stairs & chair drag</p>	<p>Tier 1: Solar system, comet, *galaxy, universe, satellite, moon, asteroid, black hole force, work, *power, energy, *electrons, voltage, circuit, volt, emitting, diode</p> <p>Tier 2: Nebula, proton-star, white dwarf, *red giant, resultant, parallel, uniform, vector Series, parallel. moment</p> <p>Tier 3: supernova, neutron star, light year, resultant electrostatic, gravitational Current, coulomb, voltmeter, ampere,</p>

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<p>Term 1b</p>	<p>SP10 Electricity & circuits - Current - Potential Difference - Resistance - Special resistors - Power and Energy - Heating effect of currents - a.c and d.c - Fuses and the plug - Domestic electricity - Electrical Safety SP11 Static Electricity - Charges & electrostatics - Dangers of electrostatics - Electric Fields - Use of electrostatics</p>	<p>Electricity Scientific thinking Experimental skills Analysis and Evaluation Measurement Units</p>	<p>Year 11 Mock 1 exams SP10/11 End of unit test CPR – Static Electricity</p>	<p>Enrichment – Tuesday revision Van de Graaff pHET fields</p>	<p>Tier 1: earth, live, neutral, fuse, field Tier 2: neutral, negative, positive, induce, electrostatic Tier 3 Residual, *induction, precipitator</p>
<p>Term 2a</p>	<p>SP12 Magnetism and the motor effect - Magnets and fields - Electromagnetism - Magnetic forces - Motors - Loudspeakers CPI3 Electromagnetic Induction - EM induction - Microphone - Generators - Transformers - Transformer equation - National Grid & safety</p>	<p>Forces Magnetism & electromagnetism Scientific thinking Experimental skills Analysis and Evaluation Measurement Units</p>	<p>CPR - Transformers SP12/13 End of unit test</p>	<p>Enrichment – Tuesday revision How the Earth's magnetic field works Investigating electromagnets practical - modelling and evaluating methods</p>	<p>Tier 1: poles, field, compass Tier 2: *attraction, repulsion. Tier 3: permanent, magnetic, flux, solenoid, Fleming, transformer, primary coil, secondary coil, *induced voltage, induced current.</p>

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<p>Term 2b</p>	<p>SP14 Particle Model</p> <ul style="list-style-type: none"> - Particle model - Density - Changing state - Specific heat capacity - Specific latent heat - Energy Calcs - Gas temps and pressures - Gas pressures & volume - Absolute zero - Kelvin scale 	<p>Structure of matter Forces Scientific thinking Experimental skills Analysis and Evaluation Measurement Units</p>	<p>CPR – Core practical density</p> <p>CPR – core practical changes of state</p> <p>Year 11 Mock 2 Exams</p>	<p>Extend to different liquids and gas</p> <p>A Level SHC Q</p> <p>SHC metals and liquids</p>	<p>Tier 1: Particle, atom, molecule, state, melt, freeze, boil, volume. Tier 2: *Density, evaporate, condense, *state. Tier 2: Sublimation, vaporisation, specific heat capacity, specific latent heat.</p>
<p>Term 3a</p>	<p>SP15 Force and matter</p> <ul style="list-style-type: none"> - Bending and stretching - Hooke’s Law - Elastic limit - Work done on springs - Pressure - Pressure in fluids - Hydraulics - Pressure and upthrust 	<p>Structure of matter Forces Scientific thinking Experimental skills Analysis and Evaluation Measurement Units</p>	<p>CPR - Core Practical Springs</p> <p>SP14/15 End of unit test</p>	<p>Stretching other materials</p> <p>Extend to different liquids and gas</p> <p>Link to hydraulics and force multipliers</p>	<p>Tier 1: Force, weight, length, energy, spring, *pressure, force, area, density, depth, weight, volume, float, sink, Tier 2: *Extension, constant, upthrust. Tier 3: Newton, Pascal, Hooke, elastic limit, plastic deformation.</p>
<p>Term 3b</p>	<p>Revision, exam prep and consolidation of core practicals</p>				