



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.

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>CP2 / SP2 Forces & Motion RAAC CONSOLIDATION</p> <ul style="list-style-type: none"> - Newton's 1st & 2nd Law - Mass and weight - Gravity - Newton's Second Law <p>Usual year 10 starting point</p> <ul style="list-style-type: none"> - Acc. Core practical - Newton's third Law - Momentum - Momentum in collisions - Momentum and forces - Stopping distances - Car safety features <p>CP3/ 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>CP2 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: System, force, mass, gravity Elastic, nuclear energy, Tier 2: Equal, opposite, balanced, *stationary Dissipated, *efficiency, lubrication, thermal energy Tier 3: Impulse, *conservation, compensated, nuclear energy, *chemical, potential, strain, gravitational potential, joule (J), kinetic, *Sankey</p>

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<p>Term 1b</p>	<p>CP3 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>Energy Scientific thinking Experimental skills Analysis and Evaluation Measurement Units Wave Motion</p>	<p>CPR – Energy Transfers</p> <p>CP3 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 Tier 2: Dissipated, efficiency, lubrication, thermal energy, Tier 3: gravitational potential energy, *kinetic energy, conservation</p>
<p>Term 2a</p>	<p>CP4 Waves</p> <ul style="list-style-type: none"> - Types of waves - Wave properties Wave speed equations - Wave speed practicals - Waves at boundaries - Reflection - Refraction - Refraction Core Practical 	<p>Wave Motion Scientific thinking Experimental skills Analysis and Evaluation Measurement Units</p>	<p>CPR - Waves</p>	<p>Modelling and pHET for wave core practical</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>CP5 Light and the Electromagnetic spectrum</p> <ul style="list-style-type: none"> - 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>CP4/5 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, *longitudinal Tier 3: microwave, infrared, ultraviolet, gamma, radiation, conservation</p>
<p>Term 3a</p>	<p>CP6 Radioactivity</p> <ul style="list-style-type: none"> - History of the atom - Atomic structure - Nucleus structure - P, E, N for atoms - Electron orbits 	<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>CP6 Radioactivity</p> <ul style="list-style-type: none"> - Radiation and decay - Background radiation - Half-life - Contamination - Irradiation - Dangers of radiation 	<p>Atomic Structure Scientific thinking Experimental skills Analysis and Evaluation Measurement Units</p>	<p>CPR – Nuclear Radiation</p> <p>CP6 End of unit test</p>	<p>Litvinenko</p> <p>Link to chem</p>	<p>Tier 2: Gamma, *alpha, beta, electron, proton, Rutherford Tier 3: Radioactive decay, activity, background, Becquerel (Bq), positron, nucleus, *ionisation, penetration, absorption</p>
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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>CP8 Energy – Forces doing work</p> <ul style="list-style-type: none"> - Power and work - Energy stores - GPE & KE - Efficiency <p>- CP9 Forces and their effects</p> <ul style="list-style-type: none"> -Fields -Contact forces -Non-contact forces -Force vector diagrams <p>CP9 Electricity & circuits</p> <ul style="list-style-type: none"> - Circuit symbols - Series and parallel rules - Energy & charge - Current & resistance - Potential Difference - Electricity Core Practical 	<p>Forces Energy Scientific thinking Experimental skills Analysis and Evaluation Measurement Units Electricity Scientific thinking Experimental skills Analysis and Evaluation Measurement Units</p>	<p>CPR - Work and Power</p> <p>CP8/9 End of unit test</p> <p>CPR – Electricity</p>	<p>Fred model of fuses Wire wool fuses Enrichment – Tues revision</p> <p>Welding and heating effects</p>	<p>Tier 1: force, work, *power, energy, *Electrons, voltage, circuit, volt, emitting, diode Tier 2: resultant, parallel, uniform, vector Series, parallel. moment Tier 3: electrostatic, gravitational *current, potential difference (p.d.), voltmeter, ampere, coulomb</p>

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<p>Term 1b</p>	<p>CP10 Electricity & circuits</p> <ul style="list-style-type: none"> - Special resistors - Power and Energy - Heating effect of currents - Calculations - a.c and d.c - Fuses and the plug - Domestic electricity - Electrical Safety 	<p>Electricity Scientific thinking Experimental skills Analysis and Evaluation Measurement Units</p>	<p>Year 11 Mock 1 exams CP10 End of unit test</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>CP12 Magnetism and the motor effect</p> <ul style="list-style-type: none"> - Magnets and fields - Electromagnetism - Magnetic forces <p>CP13 Electromagnetic Induction</p> <ul style="list-style-type: none"> - EM induction - Transformers - Transformer equation - National Grid & safety 	<p>Forces Magnetism & electromagnetism Scientific thinking Experimental skills Analysis and Evaluation Measurement Units</p>	<p>CPR - Transformers CP12/13 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>CP14 Particle Model</p> <ul style="list-style-type: none"> - Particle model - Density - Density Core Practical - Changing state - Specific heat capacity - Specific latent heat - Water Core Practical - 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 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>
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<p>Term 3a</p>	<p>CP15 Force and matter - Bending and stretching - Hooke's Law - Elastic limit - Work done on springs - Springs Core Practical</p>	<p>Structure of matter Forces Scientific thinking Experimental skills Analysis and Evaluation Measurement Units</p>	<p>CPR - Core Practical Springs CP14/15 End of unit test</p>	<p>Stretching other materials</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 the core practicals</p>				