CURRICULUM PLAN

SEPARATE 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	**CP2 / SP2 Forces & Motion** **RAAC CONSOLIDATION** - Newton's 1st & 2nd Law - Mass and weight - Gravity - Newton's Second Law **Usual year 10 starting point** - **Acc. Core practical** - Newton's third Law - Momentum - Momentum in collisions - Momentum and forces - Stopping distances - Car safety features **CP3/ SP3 Energy Conservation** - Energy stores - Energy transfers	Energy Changes & transfers Changes in systems Scientific attitudes Experimental Skills Analysis and Evaluation	CPR- Crash hazards SP2 End of unit test	Stopping distance on a bicycle Investigating air bags Car testing challenge	**Tier 1:** System, force, mass, gravity Elastic, nuclear energy, **Tier 2:** Equal, opposite, balanced, *stationary Dissipated, *efficiency, lubrication, thermal energy **Tier 3: I**mpulse, *conservation, compensated, nuclear energy, *chemical, potential, strain, gravitational potential, joule (J), kinetic, *Sankey

Term 1b	**SP3 Conservation of energy** - Energy efficiency - Keeping warm - kinetic energy - Potential energy - Renewable resources - Non-renewable resources - Energy trends & issues **SP4 Waves** - Types of waves - Wave properties	Energy Scientific thinking Experimental skills Analysis and Evaluation Measurement Units Wave Motion	CPR – Energy Transfers SP3 End of unit test	Consider systems which aren't 100% efficient in calculations Stress link GPE/KE and 6 markers Energy presentations	**Tier 1:** Elastic, nuclear energy, system. efficiency **Tier 2:** Dissipated, efficiency, lubrication, thermal energy, **Tier 3:** gravitational potential energy, *kinetic energy, conservation

Term 2a	**SP4 Waves** - Wave speed equations - Wave speed practicals - Waves at boundaries - Reflection - Refraction - **Refraction Core Practical** - Sound and hearing - Infra and ultrasound - Seismic waves & Earth	Wave Motion Scientific thinking Experimental skills Analysis and Evaluation Measurement Units	CPR – Waves SP4 End of unit test	Modelling and pHET for wave core practical Earth structure and p and s wave diagrams	**Tier 1:** ray, lens, **Tier 2:** Frequency, *seismic **Tier 3:** Wavelength, wave speed, *refraction, absorption, total internal reflection

Term 2b	**SP5 Light and the Electromagnetic spectrum** - Lenses - Ray Diagrams - Dispersion - Colour - EM spectrum - EM properties and uses - Dangers of EM Spectrum - Radiation & temperature - Climate change - **Core Practical – Thermal radiation**	Wave Motion Scientific thinking Experimental skills Analysis and Evaluation Measurement Units	CPR - Lens Ray diagram SP5 End of unit test Year 10 Exams	Look at power of lenses More lens diagrams to consider object position Designing heat exp.	**Tier 1:** speed **Tier 2:** *transverse, *longitudinal **Tier 3:** microwave, infrared, ultraviolet, gamma, radiation, conservation

Term 3a	**SP6 Radioactivity** - History of the atom - Atomic structure - Nucleus structure - P, E, N for atoms - Electron orbits - Radiation and decay - Background radiation - Half-life	Atomic Structure Scientific thinking Experimental skills Analysis and Evaluation Measurement Units	CPR -History of the atom	Modelling radioactivity Flame tests and energy Carbon 14 dating	**Tier 2:** Gamma ray. Alpha, beta, electron, proton, **Tier 3:** Radioactive decay, *activity, background, Becquerel (Bq), positron, *nucleus, ionisation, penetration, absorption

Term 3b	**SP6 Radioactivity** - Contamination - Irradiation - Dangers of radiation - Using radioactivity - Dangers of radioactivity - Fission and Fusion - Radiation in medicine **SP7 Astronomy** - The Solar System - Helio-centrism - Geo-centrism - Gravity and Orbits	Atomic Structure Scientific thinking Experimental skills Analysis and Evaluation Measurement Units Space Physics Scientific thinking Analysis and Evaluation	CPR – Nuclear Radiation SP6 End of unit test	Litvinenko Link to chem	**Tier 1:** energy, temperature, pressure, Solar system, comet, *galaxy, universe, satellite, moon **Tier 2:** Nuclear reactor,*fission, Main sequence, Nebula, proton-star, white dwarf, *red giant **Tier 3:** *contamination, irradiation, *fusion, daughter nuclei, chain reaction, uranium, control rod, moderator, supernova, neutron star, light year, resultant electrostatic, gravitational

YEAR 11

Term	Programme of Learning	Links to the National Curriculum / Specification / Additional	Assessments	What extra learning opportunities are planned?	Disciplinary Literacy
Term 1a	**SP7 Astronomy** - Life cycle of stars - Redshift - CMBR - Origins of the Universe **SP8 Energy – Forces doing work** - Power and work - Energy stores - GPE & KE - Efficiency - **SP9 Forces and their effects** - Fields - Contact forces - Non-contact forces - Force vector diagrams - Rotational forces - Gears **SP10 Electricity & circuits** - Circuit symbols - Series and parallel rules - Energy & charge	Space Physics Forces Energy Scientific thinking Experimental skills Analysis and Evaluation Measurement Units Electricity Scientific thinking Experimental skills Analysis and Evaluation Measurement Units	CPR – Red shift SP7 End of unit test CPR - Work and Power CPR – Moments SP8/9 End of unit test CPR – Electricity	Fred model of fuses Wire wool fuses Enrichment – Tues revision Welding and heating effects A level Qs Weight, stairs & chair drag	**Tier 1:,** Solar system, comet, *galaxy, universe, satellite, moon, asteroid, black hole force, work, *power, energy, *electrons, voltage, circuit, volt, emitting, diode **Tier 2:** Nebula, proton-star, white dwarf, *red giant, resultant, parallel, uniform, vector Series, parallel. moment **Tier 3:** supernova, neutron star, light year, resultant electrostatic, gravitational, *current, coulomb, voltmeter, ampere,

Term 1b	**SP10 Electricity & circuits** - Current & resistance - Potential Difference - **Core Practical Electricity** - 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	Electricity Scientific thinking Experimental skills Analysis and Evaluation Measurement Units	Year 11 Mock 1 exams SP10/11 End of unit test CPR – Static Electricity	Enrichment – Tuesday revision Van de Graaff pHET fields	**Tier 1:** earth, live, neutral, fuse, field **Tier 2:** neutral, negative, positive, induce, electrostatic **Tier 3** Residual, *induction, precipitator
Term 2a	**SP12 Magnetism and the motor effect** - Magnets and fields - Electromagnetism - Magnetic forces - Motors - Loudspeakers **CP13 Electromagnetic Induction** - EM induction - Microphone - Generators - Transformers - Transformer equation - National Grid & safety	Forces Magnetism & electromagnetism Scientific thinking Experimental skills Analysis and Evaluation Measurement Units	CPR - Transformers SP12/13 End of unit test	Enrichment – Tuesday revision How the Earth's magnetic field works Investigating electromagnets practical - modelling and evaluating methods	**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.

Term 2b	**SP14 Particle Model** - Particle model - Density - **Density Core Practical** - Changing state - Specific heat capacity - Specific latent heat - Energy Calcs - Gas temps and pressures - Gas pressures & volume - Absolute zero - Kelvin scale	Structure of matter Forces Scientific thinking Experimental skills Analysis and Evaluation Measurement Units	CPR – Core practical density CPR – core practical changes of state Year 11 Mock 2 Exams	Extend to different liquids and gas A Level SHC Q SHC metals and liquids	**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.
Term 3a	**SP15 Force and matter** - Bending and stretching - Hooke's Law - Elastic limit - Work done on springs - **Springs Core Practical** - Pressure - Pressure in fluids - Hydraulics - Pressure and upthrust	Structure of matter Forces Scientific thinking Experimental skills Analysis and Evaluation Measurement Units	CPR - Core Practical Springs SP14/15 End of unit test	Stretching other materials Extend to different liquids and gas Link to hydraulics and force multipliers	**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.
Term 3b	**Revision, exam prep and consolidation of core practicals**				