



CURRICULUM PLAN

PHYSICS – KS3

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.

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YEAR 7

Term	Programme of Learning	Links to the National Curriculum / Specification / Additional	Assessments	What extra learning opportunities are planned?	Disciplinary Literacy
Term 1a	7I Energy - Energy stores & transfers - Generating electricity - Non-renewable resources - Environmental Issues - Renewable resources - Energy in food - Food requirements	Energy Changes & transfers Changes in systems Scientific attitudes Experimental Skills Analysis and Evaluation Units	7I Physics CPR 7I Summary test	Test variety of foods Demonstrate steam engines as power station Literacy and development of presentation skills	Tier 1: *Energy, *fuel, light, heat energy, sound. Tier 2: Energy transfer, energy resources, *nuclear, *renewable, non-renewable, Tier 3: Joule (J), kilojoule (kJ), kinetic, nuclear, electricity, gravitational potential energy
Term 1b	7J Electricity - Conductors - Insulators - Circuit symbols - Switches	Electricity Current electricity Analysis and Evaluation Measurement	Assessment on first biology, chemistry and physics units	Investigation – “Do some conductors conduct better than others?” Use pHET - Circuit builder	Tier 1: *Current, circuit, lamp, *charge, switch, cells. Tier 2: Series, parallel, *conductor, insulator, model. Tier 3: Ammeter, ampere.

Term 2a	7J Electricity - Series circuits - Parallel circuits - Voltage & resistance - Modelling electric current - Electrical dangers - Electrical safety	Electricity Current Electricity Experimental Skills Analysis and Evaluation Measurement	7J Summary test	High voltage dangers video Demo Wire wool & fuses Investigate wire length and resistance	Tier 1: Current, circuit, lamp, charge, switch, cells. Tier 2: Series, parallel, conductor, insulator, model. Tier 3: Ammeter, ampere, *resistance
Term 2b	7K Forces - Types of forces - Forces on elastic objects - Friction and its effects	Forces Balanced forces Forces & motion Experimental skills Measurement	Assessment on second biology, chemistry and physics units 7K Physics CPR	Using Focus software to model Hooke's Law	Tier 1: *Force, area, Pressure, *Friction Tier 2: Extension, *Elastic /Inelastic,

Term 3a	7K Forces - Pressure in solids - Balanced forces - Unbalanced forces 7L Sound - Vibrations - Comparing sounds - Describing sound waves - Media and sound	Forces Pressure Balanced forces Waves Sound waves Analysis and Evaluation	7K Summary test End of year 7 Exam	Maths skills on speed of sound How can we improve the practical results we obtain?	Tier 1: Wave, slinky, energy, light, sound, wavelength. Tier 2: Crest, trough, amplitude, parallel, perpendicular. Tier 3: *Pressure, newton, pascal, atmospheric pressure. Transverse, longitudinal,
Term 3b	7L Sound - Speed of sound - Hearing range - Detecting sounds - Ultrasound and its uses - Transverse waves - Longitudinal waves	Waves Observed waves Sound waves Scientific attitudes Experimental skills Analysis and Evaluation Measurement	7L Summary test	Extend to GCSE uses of ultrasound Interference of waves and the uses of this Why do we have a hearing range?	Tier 1: Wave, *echo, volume, speed, ultrasound, reflect, echo. Tier 2: *Vibration, pitch, *frequency, velocity. Tier 3: *Amplitude, hertz, *infrasound

YEAR 8

Term	Programme of Learning	Links to the National Curriculum / Specification / Additional	Assessments	What extra learning opportunities are planned?	Disciplinary Literacy
Term 1a	8I Fluids - Particle Model - Heating and cooling - Changing state - Density - Floating and sinking - Pressure in fluids - Drag and streamlining	Matter Physical changes Energy in matter Particle model Forces Pressure in fluids Experimental skills Analysis and Evaluation Measurement	8I Summary test	Expansion & contraction Anomaly of water to link to freeze thaw Boat design competition for LA Galileo - invented the thermoscope on which the Galileo thermometer is based.	Tier 1: Particle, atom, molecule, solid, liquid, gas, melt, freeze, boil, temperature, volume. Tier 2: Evaporate, condense, *density , compressible, incompressible. Tier 3: *State , kinetic, *pressure , *equilibrium
Term 1b	8J Light - Properties of light - Reflection - Refraction - Lenses - Camera and eyes	Waves Observed waves Light waves Scientific attitudes Experimental skills Analysis and Evaluation Measurement	8J Physics CPR Assessment on first biology, chemistry and physics units	Use PHET for modelling and speed data Lenses and inverted images Use LED and colours	Tier 1: Light, shadow, wave, ray. Tier 2: Transparent, opaque, translucent, beam, diffuse, specular, filter, *absorbed , transmission, reflection. Tier 3: Incident ray, reflected ray.

Term 2a	8J Light - Dispersion - Colours 8K Energy - Heat & temperature - Conduction - Convection	Waves Observed waves Light waves Energy Physical changes Calculations Changes & transformations Scientific attitudes Experimental skills Analysis and Evaluation Measurement	8J Summary test	Cones and rod cells and link to colour blindness Miner chimney, beach breezes, PHET prep for GCSE core practical skill development	Tier 1: Light, ray, *reflection, mirror, camera, eye, image, real magnification, lens, *convex Tier 2: Beam, inverted, virtual, converge, diverge. Tier 3: Incident ray, reflected ray, refracted ray, *dispersion, angle of reflection, normal, *refraction, focal point.
Term 2b	8K Energy - Radiation - How Insulation works - Insulation at home - Payback time - Sankey diagrams	Energy Energy in matter Calculations Changes & transformations Scientific attitudes Experimental skills Analysis and Evaluation Measurement	Assessment on second biology, chemistry and physics units	Thermal cameras and images Calculating energy supplied if given the output and efficiency as a percentage	Tier 1: *Conduction, *convection, *radiation, heating, thermometer, temperature, insulation, vacuum, particle. Tier 2: Rate. *power, *efficiency Tier 3: Thermal conductivity.

Term 3a	8K Energy - Efficiency - Energy and Power - Paying for electricity	Energy Energy in matter Calculations Space Physics Scientific attitudes Experimental skills Analysis and Evaluation Measurement	8K Summary test	Solar System extras	Tier 1: Earth, moon, model, orbit, planet, *solar system , star, *galaxy , *gravity , sun, weight, milky way, Mercury, Venus, Mars, satellite. Tier 2: Artificial satellite, natural satellite. Tier 3: Gravitational field, *Universe , Andromeda, light year, *geocentric
	8L Earth in space - Solar System Past and Present - Seasons		8L Physics CPR		
Term 3b	8L Earth in space - Magnetic Earth - Mass and Weight - Gravity and Orbits - Beyond the Solar System	Space Physics Forces Scientific attitudes Experimental skills Analysis and Evaluation Measurement	8L Summary Test End of year 8 exams	Astronomy debate and question and answer sessions Solving space travel problems and how the solutions benefit our everyday life	Tier 1: Magnet, pole, north, south, compass, iron filings, magnetic, attract, force field, *magnetic field . Tier 2: Repel. Tier 3: Field line, non-contact force, Earth's magnetism.

YEAR 9

Term	Programme of Learning	Links to the National Curriculum / Specification / Additional	Assessments	What extra learning opportunities are planned?	Disciplinary Literacy
Term 1a	9J Force Fields and electromagnets - Magnetic materials - Magnetic fields - Electromagnets - Investigating strength - Using electromagnets	Magnetism Static Electricity Scientific thinking Experimental skills Analysis and Evaluation Measurement	9J Physics CPR	Investigate the factors impacting the speed a motor rotates More able can link to a loudspeaker	Tier 1: Magnetic field, magnetism, electric motor, coil, current, coils, *electromagnet, Tier 2: Repel, motor effect. *static Tier 3: Relay, *repulsion
Term 1b	9J Force Fields and electromagnets - Electric motors - Electric Fields - Static Electricity 9I Forces and motion - Moments - Moments in balance - Levers	Forces Balanced Forces Forces & motion Scientific thinking Experimental skills Analysis and Evaluation Measurement	9J End of Unit test	Multiple item equilibrium questions Work done	Tier 1: force, mass, distance, *moment, pivot, *pulley, *gear Tier 2: balanced, fulcrum Tier 3: equilibrium, conservation.

Term 2a	9I Forces and Motion - Pulleys and work - Gears CP1 / SP 1 Motion - Vectors and scalars - Speed - Common Speeds - Distance/time graphs - Speed/time graphs - Acceleration	Forces & motion Scientific thinking Experimental skills Analysis and Evaluation Measurement	9I Physics CPR 9I End of unit test Year 9 exams	Working out tangents on speed/time graphs Working out distance travelled in multi-step journeys	Tier 1: Distance, momentum, mass, distance, time, *speed , energy, weight, average speed. Tier 2: Accelerate, *acceleration , displacement, velocity. Tier 3: *Vector , quantity, *scalar , gradient.
Term 2b	CP2 / SP2 Forces & Motion - Resultant forces - Force diagrams - Newton's first law - Mass and weight - Gravity - Newton's Second Law - Acc. Core practical	Forces Balanced Forces Forces & motion Scientific thinking Experimental skills Analysis and Evaluation Measurement	P1 End of unit test	Introduce idea of friction compensated ramps Develop usage of light gates and datalogging software	Tier 1: *mass , weight, *force , gravity Tier 2: acceleration, ratio, friction, light gate Tier 3: independent, dependant, controlled, compensated

Term 3a	CP2 / SP2 Forces & Motion - Newton's third Law - Momentum - Momentum in collisions - Momentum and forces	Forces Balanced Forces Forces & motion Scientific thinking Experimental skills Analysis and Evaluation Measurement	9T Physics CPR	Investigating "g" in class. Air track collisions for objects moving in different directions	Tier 1: force, mass, *momentum, collision Tier 2: equal, opposite, balanced, stationary Tier 3: impulse, conservation, momentum,
Term 3b	CP2 / SP2 Forces & Motion - Stopping distances - Car safety features	Forces & motion Forces Scientific attitudes Experimental Skills Analysis and Evaluation	P2 End of unit test	Stopping distance on a bicycle Investigating air bags Car testing challenge	Tier 1: force, mass, moment, collision Tier 2: equal, opposite, balanced, stationary Tier 3: impulse, conservation, momentum,