

Newall Green High School – Curriculum Plan



Subject	Science		Year Group		11
Rationale / Narrative					
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1
Knowledge	<p>Combined Biology- B15-Adaptations B16-Organising an Ecosystem B17-Biodiversity</p> <p>Combined Chemistry- C10- Chemical Analysis C11- Earth's Atmosphere C12- Earth's Resources</p> <p>PAPER 1 REVISION</p>	<p>Combined Physics- P8- Forces in Balance P9- Motion P10- Forces and Motion</p>	<p>Combined Biology- B12- Reproduction B13-Variation B14- Genetics</p> <p>Combined Chemistry- C8- Rates and Equilibrium</p>	<p>Combined Chemistry- C9- Crude Oil C6- Electrolysis C7- Energy Changes</p> <p>Combined Physics- P11- Waves</p>	<p>Combined Physics- P12-Electromagnetic waves P- 13 Electromagnets</p> <p>Students will then complete focused revision on a class-by class basis. This will involve: -Revisiting content from Biology, Chemistry and Physics units -Reflecting on college entry exams using personal learning checklists -Regular completion of past papers and exam style questions either individually, or through teacher modelling -Revision skills and exam technique will be explicitly taught</p>

<p>Skills</p>	<p>REQUIRED PRACTICAL- Investigate how paper chromatography can be used to separate and tell the difference between coloured substances</p> <p>REQUIRED PRACTICAL- Analysis and purification of water samples from different sources</p> <p>Recording first hand observations of organisms.</p> <p>Extract and interpret information from charts, graphs and tables.</p> <p>Interpret graphs used to model predator-prey cycles.</p> <p>Interpret and explain diagrams of carbon cycle and water cycles</p> <p>Link cross curriculums (water cycle BIO with Earth's atmosphere CHEM)</p>	<p>REQUIRED PRACTICAL- Hooke's law, investigating the relationship between force and extension of a spring.</p> <p>REQUIRED PRACTICAL- Investigate the effect of varying the force on the acceleration of an object of constant mass and the effect of varying the mass of an object on the acceleration produced by a constant force.</p> <p>Interpret distance time graphs, calculate gradients, rearrange equations and use calculations to support conclusions.</p> <p>Measure the effect of distractions on reaction time.</p> <p>Recall and application of the equations:</p>	<p>REQUIRED PRACTICAL- Investigate how changes in concentration affect the rates of reactions by measuring the volume of a gas produced and monitoring a change in colour or turbidity</p> <p>Model behaviour of chromosomes</p> <p>Use probability, proportion and ratios in relation to inheritance</p> <p>Plot and draw graphs, selecting appropriate scale for axes</p> <p>Drawing and interpreting appropriate graphs from data to determine rate of reaction.</p> <p>Plot two variables from experimental or other data.</p>	<p>REQUIRED PRACTICAL -electrolysis of an aqueous solution with specific focus on forming hypothesis and predicting products formed.</p> <p>REQUIRED PRACTICAL -Investigate the temperature change during different chemical reactions</p> <p>REQUIRED PRACTICAL- Make observations to identify the suitability of apparatus to measure the frequency, wavelength and speed of waves in a ripple tank and in a solid.</p> <p>Model alkane and alkene molecules</p> <p>Application of the equations: Period= 1/frequency</p>	<p>REQUIRED PRACTICAL- Investigate how the amount of infrared radiation absorbed or radiated by a surface depends on the nature of that surface</p> <p>Application of the equations: Force = magnetic flux density × current × length Period= 1/frequency</p> <p>Alongside revision of key content, the following scientific skills will be consolidated: -Use of scientific models -Evaluation of ethical, environmental, economic and social issues linked to scientific developments -Plan and devise scientific experiments to test hypotheses -Make and record observations and measurements -Present data using appropriate methods -Carry out statistical analysis</p>
----------------------	--	---	--	---	---

	<p>Recognise and use expressions in decimal form.</p> <p>Use ratios, fractions and percentages.</p> <p>Make estimates of the results of simple calculations.</p> <p>Translate information between graphical and numeric form.</p> <p>Use an appropriate number of significant figures.</p>	<p>Weight= mass x gravitational field strength</p> <p>Work done = force x distance</p> <p>Force= spring constant x extension</p> <p>Distance travelled= speed x time</p> <p>Acceleration = change in velocity / time taken</p> <p>Resultant force = mass x acceleration</p> <p>Momentum= mass x velocity</p> <p>Apply these equations from <i>Physics Equation Sheet</i>:</p> <p>Elastic potential energy = $0.5 \times \text{spring constant} \times (\text{extension})^2$</p> <p>$(\text{final velocity})^2 - (\text{initial velocity})^2 = 2 \times \text{acceleration} \times \text{distance}$</p>	<p>Determine the slope and intercept of a linear graph.</p> <p>Draw and use the slope of a tangent to a curve as a measure of rate of change.</p>	<p>Recall and application of the equation: Wave speed= frequency x wavelength</p> <p>Representing reactions at electrodes using half equations.</p>	<p>-Use scientific terminology, vocabulary and definitions</p> <p>-Use standard SI units</p> <p>-Interconvert units</p> <p>-Use an appropriate number of significant figure</p>
--	--	--	---	---	---

Assessments	2 x Peer assessed End of Topic tests Self assessed Homework past papers	Mock Assessment Teacher Assessed: <ul style="list-style-type: none"> • BIOLOGY 1 • CHEMISTRY 1 • PHYSICS 1 Self assessed Homework past papers	2 x Peer assessed End of Topic tests Self assessed Homework past papers	Mock Assessment Teacher Assessed: <ul style="list-style-type: none"> • BIOLOGY 2 • CHEMISTRY 2 • PHYSICS 2 Self assessed Homework past papers	
Home Learning	A combination of Doddle tasks, recall quizzes and 3 x past papers each half term	A combination of Doddle tasks, recall quizzes and 3 x past papers each half term	A combination of Doddle tasks, recall quizzes and 3 x past papers each half term	A combination of Doddle tasks, recall quizzes and 3 x past papers each half term	
Reading, Writing, Talk	AUTUMN 1 EXAMPLE: -Evaluate given information about methods that can be used to tackle problems caused by human impacts on the environment. -Scientific Write-Up of water purification. Subject-specific reading materials are provided throughout the curriculum in the form of scientific articles, newspapers, textbooks,	AUTUMN 2 EXAMPLES: -Scientific Write-Up on Hooke's Law practical -Biography of Isaac Newton -Discussion/debate on drink driving	SPRING 1 EXAMPLES: -Discussion/debates on cloning and genetic modification. -Extended writing explaining Darwin's theory of Natural Selection	SPRING 2 EXAMPLES: -Scientific Write-Up of Electrolysis and ripple-tank Required Practicals.	SUMMER 1 EXAMPLES: -Scientific Write-Up of Radiation practical. -Discussion of Nuclear disasters such as Chernobyl and the case of Alex Litvinenko

	<p>journals and reports. Science is committed to using the Newall Green Reading Strategies to develop student's subject specific knowledge and vocabulary, as well as a love for reading.</p> <p>We will continue the "take ten" minutes to read during allotted times to encourage both reading for subject-specific progress as well as reading for pleasure.</p> <p>Student's are provided with a subject specific word bank at the start of each topic to introduce new vocabulary and encourage it's use in both written and verbal questioning.</p> <p>Science gives many opportunities for extended writing including Scientific write-ups of Required Practicals, research activities and 6-mark written communication</p>				
--	--	--	--	--	--

	<p>questions present in GCSE papers. Student's skills are built up using exemplars, scaffolding and model answers to support their writing.</p> <p>Oracy in Science takes form of class discussions, debates, group work and of course encouragement of asking questions in Science.</p>				
Tier 3 Vocab	<p>Biomass Consumer Herbivore Carnivore Omnivore Predator Prey Producer Pollutants Abiotic Biotic Population Ecosystem Community Adaptation Habitat Extremophile Decay</p>	<p>Scalar Vector Magnitude Friction Air Resistance Tension Gravitational Electrostatic Magnetic Gravity Newton Work Done Elastic Extension Spring Constant Compression Displacement Velocity</p>	<p>Sexual Asexual Mitosis Meiosis Fusion Offspring Gametes Genes Clone Fertilisation Embryo DNA Genome Chromosome Inherit Allele Dominant Recessive</p>	<p>Electrolysis Ionic compound Dissolve Solutions Electrolytes Cathode Anode Molten Extraction Aqueous Exothermic Endothermic Combustion Oxidation Neutralisation Thermal Decomposition Hydrocarbon</p>	<p>Electromagnetic Spectrum Frequency Radio waves Microwaves Infrared Waves Visible light Ultraviolet X-rays Gamma Rays Cancer Magnet Repel Attract Induce Permanent Magnetic Field</p>

	Decomposer	Acceleration	Homozygous	Alkane	Solenoid
	Deforestation	Stationary	Heterozygous	Alkene	
	Formulation	Inertia	Genotype	Fractional Distillation	
	Chromatography	Reaction	Phenotype	Viscosity	
	Stationary	Deceleration	Polydactyl	Flammability	
	Mobile	Momentum	Cystic Fibrosis	Cracking	
	Solvent	Conservation	Variation	Polymer	
	Solute		Mutation	Saturated	
	Hydrogen		Evolution	Unsaturated	
	Oxygen		Selective Breeding	Transverse	
	Carbon dioxide		Genetic Engineering	Longitudinal	
	Chlorine		Natural Selection	Compression	
	Atmosphere		Fossil	Rarefaction	
	Photosynthesis		Extinction	Amplitude	
	Greenhouse Gases		Resistant	Wavelength	
	Climate		Classification	Frequency	
	Emission		Concentration	Period	
	Combustion		Pressure		
	Carbon Monoxide		Surface Area		
	Finite		Catalyst		
Potable		Temperature			
Desalination		Collision Theory			
Phytomining		Activation Energy			
Bioleaching		Enzyme			
		Reversible			
		Equilibrium			

SUCCESS

TOLERANCE

RESPECT

INDEPENDENCE

VISION

EXCELLENCE

<p>SMSC, British Values</p>	<p>Understanding conflict between the need for cheap available food production</p> <p>The challenge of reducing carbon emissions and greenhouse gases globally</p> <p>Implications of deforestation and its impact</p> <p>Understand that the Scientific consensus about global warming and climate change is based on systematic reviews of thousands of peer reviewed publications- which is why evidence is incomplete/uncertain.</p> <p>Evaluate and discuss methods that can be used to tackle problems caused by human impact.</p> <p>Consider how the rights of others may be affected by pollution.</p>	<p>Linked to this is the study on car safety related to drinking and driving</p> <p>The role of, and current laws on drugs and alcohol are explored as well as the physical, social and economic impact of their consumption and usage in UK society today.</p>	<p>Giving credit to Scientific discoveries of other cultures- Gregor Mendal (Austrian) – Father of Genetics.</p> <p>Opportunity to explore, understand and respect diversity, and to use evidence when forming opinions.</p> <p>Discussing ethics of genetic modification, cloning, abortion and IVF.</p> <p>The key role of British scientists, inventors and innovators are highlighted and celebrated – e.g Charles Darwin.</p>	<p>Considering the impact of multiple chemical and industrial processes on the environment – including the combustion of hydrocarbons and the impacts of global warming and acid rain on the environment.</p> <p>The production of ammonia during the Haber process and usage of excessive fertilisers on food chains are considered in detail.</p>	
------------------------------------	---	---	--	---	--

SUCCESS

TOLERANCE

RESPECT

INDEPENDENCE

VISION

EXCELLENCE