Hodgson Academy

Science (Separate & Combined)

KS4 Curriculum Overview

Combined Science: Key Stage 4 Curriculum Overview

	Autumn Term		Spring Term		Summer Term	
	Term 1		Term 2		Term 3	
Year 10	**DRUG DEVELOPMENT** Antibiotics and Painkillers The discovery and development of drugs **PLANT BIOLOGY** Photosynthesis Uses of Glucose Anaerobic Respiration in Plant and Yeast Cells Osmosis Plant Transport Systems Transpiration & Translocation	**BIOLOGICAL RATES OF REACTION** Enzymes & Enzyme Action Factors affecting the rate of photosynthesis	**ECOLOGY** Food chains and predator prey lifecycles Trophic levels and energy transfer Classification Variation Evolution & evidence Resistant bacteria Extinction		**HOMEOSTASIS: THE NERVOUS SYSTEM** The nervous system Reflex actions	**ENVIRONMENTAL BIOLOGY** Human population and pollution Human impact on climate Carbon cycle Biodiversity and maintaining biodiversity
	STRUCTURE AND BONDING Ionic, Covalent and Metallic Bonding Ionic and Metallic Structures and their properties Small Molecules and their properties	**MACROMOLECULES** Giant Covalent Structures Polymers Allotropes of Carbon Graphene and Fullerenes **CHEMICAL CHANGES** Reactions of Metals The reactivity series Extracting Metals The pH Scale Reactions of Acids Making a soluble salt	**ELECTROLYSIS** Electrolysis of molten ionic compounds Electrolysis of solutions The extraction of aluminium	**ENERGY CHANGES** Endothermic and exothermic reactions Reaction profile diagrams Bond energy calculations	**QUANTITATIVE CHEMISTRY** Conservation of mass Relative formula mass (M_r) Percentage composition by mass Moles and equations	**ENVIRONMENTAL CHEMISTRY** Earth's resources Obtaining safe drinking water Waste water treatment
	ELECTRICITY Series and parallel circuits Components in circuits Ohm's Law Current and potential difference	**ENERGY** Energy stores Energy transfers Internal energy Thermal energy transfer	**ENERGY** Specific heat capacity Specific latent heat Atmospheric pressure Pressure in fluids Gas pressure and work done	**WAVES** Wave speed The ripple tank Wave front diagrams	**NEWTON'S LAWS** Newton's laws of motion Resolving Forces Moments, Levers and Gears Speed and Velocity Terminal Velocity	

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Year 11	**GENETICS AND INHERITENCE** Asexual and Sexual reproduction including examples, advantages and disadvantages. Stem cells Ethics of stem cell use Chromosomes Mitosis Mitosis vs Meiosis		**HOMEOSTASIS: THE ENDOCRINE SYSTEM** Control of Blood Glucose Hormones in reproduction Contraception **Mock Exam Preparation Completion of Mock Exams and DIRT work**	**Revision for Final GCSE Exams**		
	ENVIRONMENTAL CHEMISTRY Composition and evolution of the Earth's atmosphere Global warming and the greenhouse effect Climate change **INDUSTRIAL CHEMISTRY** Collision Theory Factors affecting rate of reaction Measuring Rate of Reaction Reversible Reactions Dynamic Equilibrium		**ORGANIC CHEMISTRY** Crude oil & Hydrocarbons Fractional Distillation Cracking **Mock Exam Preparation Completion of Mock Exams and DIRT work**			
	NEWTON'S LAWS CONTINUED Newton's laws of motion Stopping distance and reaction time Braking distance Momentum		**MAGNETISM** Permanent and induced magnetism Electromagnets The motor effect Flemming's rules for magnetism **Mock Exam Preparation Completion of Mock Exams and DIRT work**			

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Year 10	**DRUG DEVELOPMENT** Antibiotics and Painkillers The discovery and development of drugs Plant Diseases Plant defence responses. **PLANT BIOLOGY** Photosynthesis Uses of Glucose Anaerobic Respiration in Plant and Yeast Cells Plant Organs and Tissues Osmosis Plant Transport Systems Transpiration & Translocation	**BIOLOGICAL RATES OF REACTION** Enzymes & Enzyme Action Factors affecting the rate of photosynthesis **ECOLOGY** Food chains and predator prey lifecycles Trophic levels and energy transfer Classification Variation Evolution & evidence Resistant bacteria Extinction		**HOMEOSTASIS: THE NERVOUS SYSTEM** The nervous system Reflex actions The Brain The Eye Control of body temperature		**ENVIRONMENTAL BIOLOGY** Human population and pollution Human impact on climate Carbon cycle Biodiversity and maintaining biodiversity Food security The role of biotechnology
	STRUCTURE AND BONDING Ionic, Covalent and Metallic Bonding Ionic and Metallic Structures and their properties Small Molecules and their properties **MACROMOLECULES** Giant Covalent Structures Polymers Allotropes of Carbon Graphene and Fullerenes	**CHEMICAL CHANGES** Reactions of Metals The reactivity series Extracting Metals The pH Scale Reactions of Acids Making a soluble salt	**ELECTROLYSIS** Electrolysis of molten ionic compounds Electrolysis of solutions The extraction of aluminium	**ENERGY CHANGES** Endothermic and exothermic reactions Reaction profile diagrams Bond energy calculations	**QUANTITATIVE CHEMISTRY** Conservation of mass Relative formula mass (M_r) Percentage composition by mass Moles and equations	**ENVIRONMENTAL CHEMISTRY** Earth's resources Obtaining safe drinking water Waste water treatment Composition and evolution of the Earth's atmosphere Global warming and the greenhouse effect Climate change
	SPACE PHYSICS Solar systems Orbits and satellites The sun and other stars Red shift The Big bang	**ELECTRICITY** Series and parallel circuits Components in circuits Ohm's Law Current and potential difference	**ENERGY** Energy stores Energy transfers Internal energy Thermal energy transfer Specific heat capacity Specific latent heat Atmospheric pressure Pressure in fluids Gas pressure and work done	**WAVES** Wave speed The ripple tank Wave front diagrams Earthquakes/ seismic waves Lenses Images and Magnification		**NEWTON'S LAWS** Newton's laws of motion Resolving Forces Moments, Levers and Gears Speed and Velocity Terminal Velocity

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Year 11	**GENETICS AND INHERITENCE** Asexual and Sexual reproduction including examples, advantages and disadvantages. Stem cells Ethics of stem cell use Chromosomes Mitosis Mitosis vs Meiosis	**HOMEOSTASIS – THE ENDOCRINE SYSTEM** Control of Blood Glucose Hormones in reproduction Contraception **Mock Exam Preparation Completion of Mock Exams and DIRT work**		**Revision for Final GCSE Exams**		
	INDUSTRIAL CHEMISTRY Collision Theory Factors affecting rate of reaction Measuring Rate of Reaction Reversible Reactions Dynamic Equilibrium	**ORGANIC CHEMISTRY** Crude oil & Hydrocarbons Fractional Distillation Cracking Organic molecules, functional groups and their reactions Condensation Polymers	**ANALYTICAL CHEMISTRY** Testing for common cations Testing for common anions Instrumental Methods **Mock Exam Preparation Completion of Mock Exams and DIRT work**			
	NEWTON'S LAWS CONTINUED Newton's laws of motion Stopping distance and reaction time Braking distance Momentum	**MAGNETISM** Permanent and induced magnetism Electromagnets The motor effect Flemming's rules for magnetism **Mock Exam Preparation Completion of Mock Exams and DIRT work**				