Combined Science: Trilogy
(Science)

KS4 Curriculum Breakdown

Sirius ACADEMY WEST
WHERE STARS ARE BORN

	Year 10	*Year 11*
HT1	**Biology: Cells** • Microscopes • Animal and plant cells • Eukaryotic and prokaryotic cells • Specialised cells • Diffusion and osmosis • Active transport • Cell division • Stem cells **Chemistry: Atomic Structure and the Periodic Table** • Atoms and structure of • Chemical Equations • Separating mixtures • History of the atom • Ions and isotopes • Electronic configuration	**Biology: Homeostasis and response** • Homeostasis • Nervous system • Reflex actions • Hormone control • Control of blood glucose • Treating diabetes • Negative feedback • Human Reproduction • Hormones and menstrual cycle • Contraception and IVF **Chemistry: Rates of Reaction** • Measuring and calculating rates • Factors affecting rates • Collision theory • Catalysts

	• Development of the Periodic Table • Group 1 • Group 7 **Physics: Energy** • Changes in energy stores • Conservation of energy • Energy and work • GPE • Kinetic and elastic energy stores • Energy dissipation • Energy and efficiency • Electrical appliances • Energy and power • Conduction • Specific heat capacity • Heating and insulating buildings • Energy demands • Energy from wind, water, Sun and the Earth • Energy and the environment	• Reversible reactions and energy changes • Equilibrium and factors affecting equilibrium **Physics: Forces** • Vectors and scalars • Forces between objects • Resultant forces • Centre of mass • Parallelogram of forces • Resolution of forces • Speed and distance-time graphs • Velocity & acceleration and velocity-time graphs • Force and acceleration • Weight and terminal velocity • Forces and braking • Momentum • Forces and elasticity
HT2	**Biology: Organisation** • Tissues and organs • Human digestive system • Food tests • Enzymes • The heart and blood vessels • The blood • Non-communicable disease and associated health issues • Plant tissues and organs • Transport systems in plants **Chemistry: Structures & Bonding** • States of matter • Atoms into ions	**Biology: Homeostasis and response (continued)** • Homeostasis • Nervous system • Reflex actions • Hormone control • Control of blood glucose • Treating diabetes • Negative feedback • Human Reproduction • Hormones and menstrual cycle • Contraception and IVF **Chemistry: Organic Chemistry** • Hydrocarbons • Fractional distillation of crude oil

	• Ionic bonding and properties of • Covalent bonding and properties of • Fullerenes and graphene • Metallic bonding and properties of **Physics: Electricity** • Current and charge • Potential difference and resistance • Series and parallel circuits • Alternating current • Cables and plugs • Electrical power and potential difference • Electrical currents and energy transfer • Appliances and efficiency	• Combustion of hydrocarbons • Cracking hydrocarbons **Physics: Forces (continued)** • Vectors and scalars • Forces between objects • Resultant forces • Centre of mass • Parallelogram of forces • Resolution of forces • Speed and distance-time graphs • Velocity & acceleration and velocity-time graphs • Force and acceleration • Weight and terminal velocity • Forces and braking • Momentum • Forces and elasticity
HT3	**Biology: Infection & Response** • Communicable diseases • Viral diseases • Bacterial diseases • Fungal and protists diseases • Human defence systems • Vaccinations • Antibiotics and painkillers • Discovery and development of drugs **Chemistry: Chemical Quantities and Calculations** • Relative masses and moles • Equations and reacting masses • From masses to balanced equations • Concentrations	**Biology: Inheritance, variation & evolution** • Types of reproduction • Cell division in sexual reproduction • DNA and genome • Inheritance in action • Inherited disorders and screening of • Variation • Evolution of natural selection • Ethics of genetic technologies • Evidence for evolution • Fossils and extinction • Antibiotic resistant bacteria • Classification

	Physics: Particle Model • Density • States of matter • Changes of state • Internal energy • Specific latent heat • Gas pressure and temperature	**Chemistry: Chemical Analysis** • Pure substances and mixtures • Analysing chromatograms • Testing for gases **Physics: Waves** • Nature and properties of waves • Reflection and refraction • Electromagnetic spectrum • Light, IR, microwaves and radio waves • Communications • UV, X-rays and gamma rays • X-rays in medicine
HT4	**Biology: Bioenergetics** • Rate of photosynthesis • How plants use glucose • Anaerobic and aerobic respiration • Response to exercise • Metabolism **Chemistry: Chemical Changes** • Reactivity series • Displacement reactions • Extracting metals • Salts from metals • Salts from insoluble bases • Neutralisation and pH scale • Strong and weak acids • Electrolysis • Extraction of aluminium • Electrolysis of aqueous solutions • Half equations (oxidation & reduction)	**Biology: Inheritance, variation & evolution (continued)** • Types of reproduction • Cell division in sexual reproduction • DNA and genome • Inheritance in action • Inherited disorders and screening of • Variation • Evolution of natural selection • Ethics of genetic technologies • Evidence for evolution • Fossils and extinction • Antibiotic resistant bacteria • Classification **Chemistry: Chemistry of the Atmosphere** • History and evolution of the atmosphere • Greenhouse gases • Climate change • Atmospheric pollutants

	Physics: Atomic Structure • Atoms and radiation • Discovery of the nucleus • Changes in the nucleus (alpha, beta and gamma) • Activity and half-life	**Physics: Magnetism & Electromagnetism** • Magnetic fields • Magnetic fields of electric currents • The motor effect
HT5	**Biology** • Key skill development • Application and exam technique **Chemistry: Energy Changes** • Exothermic and endothermic reactions (in terms of temperature changes and energy transfers) • Reaction profiles • Bond energy calculations **Physics** • Key skill development • Application and exam technique	**Biology: Ecology** • Importance of communities • Organisms in the environment • Distribution and abundance • Competition in animals and plants • Adaptations in animals and plants • Feeding relationships • Materials recycling • The carbon cycle • Human population • Land, air and water pollution • Deforestation and peat destruction • Global warming • Maintaining diversity **Chemistry: Using Resources** • Sustainable development • Potable water • Waste water treatment • Alternative ways of extracting metals • Life cycle assessment and recycling • Reducing the use of resources **Physics** • Key skill development • Application and exam technique

HT6	**Biology** • Key skill development • Application and exam technique **Chemistry** • Key skill development • Application and exam technique **Physics** • Key skill development • Application and exam technique	**Biology** • Key skill development • Application and exam technique **Chemistry** • Key skill development • Application and exam technique **Physics** • Key skill development • Application and exam technique