Science Intent and Curriculum Plans

Science plays an important role in everyone's life. It explains what happens inside us and around us. At St Margaret Ward Catholic Academy, we believe that when our students leave, they should be equipped with the essential knowledge and skills that allow them to make informed decisions and form opinions with economic, sociocultural, religious, ecological and political connections. As such we have developed a rigorous curriculum, covering all aspects of science. Embedded within the knowledge are skills that are transferable to everyday life.

This overview has been reviewed in the light of school closures and therefore sequencing of content has been carefully considered and adjusted where appropriate.

	Year 7	Year 8	Year 9
Term 1b	An introduction into the use of laboratory equipment and rules and basic science skills. Atoms Atomic structure and use of Periodic table. Cells Cell structure and use of microscopes. Forces Types of forces; Balanced and unbalanced forces Atoms Separation techniques	Systems Breathing and effects of lung damage. Electricity From power stations to modelling circuits; series and parallel circuits. Radiation Properties of waves; Sound waves and the ear. Atoms Writing chemical formula and reaction equations.	Systems Heart and circulatory system Reactions The reactivity series; extraction of metals. Bonding Ionic; Covalent and metallic bonding Energy Types of energy and using equations
Term 2b	Forces (continued) Types of forces; Balanced and unbalanced forces Atoms (continued) Separation techniques Energy Types of energy; Efficiency Systems Animal reproduction; Plant reproduction; the skeleton Reactions Acids and alkali's; neutralisation.	Radiation (continued) Properties of waves; Sound waves and the ear. Atoms (continued) Writing chemical formula and reaction equations. Atoms Patterns of reactivity in the Periodic table. Interdependence Communicable and noncommunicable disease; pathogens; Development of drugs; Immunity Earth science Composition of the earth and atmosphere and changes. Rock cycle; global climate change. Forces Density and pressure in gases and fluids. Interdependence	Interdependence Cycles in nature, Biodiversity and how humans affect it. Reactions Redox reactions and reaction profiles Inheritance Human genome project, structure of DNA and cell division Forces Velocity and acceleration and use of graphs. Stopping distances and momentum. Analytical chemistry Tests used in identification of elements. Radiation Interaction of waves and uses of ultrasound. Properties and uses of electromagnetic waves.

		Communities in the ecosystem and adaptations of plants and animals; Sampling techniques.	
Term 3a	Systems (continued)	Interdependence (continued)	Cells
	Animal reproduction; Plant	Communities in the	Movement of substances in
	reproduction; the skeleton	ecosystem and adaptations of	and out of cells.
	Reactions (continued)	plants and animals; Sampling	Bonding
- 01	Acids and alkali's;	techniques.	Relationship between the
Term 3b	neutralisation.	Forces (continued)	type of bonding and
	Radiation	Density and pressure in gases	properties of compounds.
	Light; Reflection and	and fluids.	Systems
	refraction		Bacteria and growing in a lab;
	Fields	Electricity	plant organs; plant disease
	The solar system; stars and	Potential difference, current	and protection; transpiration
	the moon.	and resistance in series and	and translocation
	Electricity	parallel circuits	Electricity
	Static charge	Electricity (continued)	Resistance and types of
		Potential difference, current	resistor
		and resistance in series and	
		parallel circuits	
		Earth science	
		Greenhouse gases; global	
		climate change; carbon	
		footprint; atmospheric	
		pollutants.	

Year 10 Science

All Year 10 students will study the curriculum for GCSEs in Biology, Chemistry and Physics. Throughout the year students will complete Required Practical's. Required practical's are specified by the examination board. During these lessons students are taught skills in using apparatus and investigative skills, all of which are examined in the final GCSE examinations in the summer of year 11.

Year 10	Biology	Chemistry	Physics
Term 1b	Systems Photosynthesis and factors affecting it; aerobic and anaerobic respiration. Cells Movement in and out of cells	Earth science Life cycle assessment and sustainability; potable and wastewater. Earth science Greenhouse gases; global climate change; carbon footprint; atmospheric pollutants. Analytical chemistry Moles and Avogadro's constant.	Radiation Light; Reflection and refraction Fields Electromagnets and motor effect; Loudspeakers and generators. Electricity Resistance and types of resistor
Term 2b	Cells (continued) Movement in and out of cells Interdependence Communicable and noncommunicable disease; pathogens; Development of drugs; Immunity Systems Control of blood glucose and body temperature. Control of water levels and kidney treatment.	Analytical chemistry (continued) Using moles. Reactions Calculating rates of reaction. Collision theory; catalysts	Resistance and types of resistor Electricity Mains electricity; National grid and transformers Radiation Radioactive decay
Term 3a Term 3b	Evolution Theories of evolution. Evidence of evolution	Reactions (continued) Calculating rates of reaction. Collision theory; catalysts Atoms Crude oil. Fractional distillation.	Radiation (continued) Background radiation; half- life. Radioactive contamination

Year 11 Science

All Year 11 will study the curriculum for GCSEs in Biology, Chemistry and Physics.

Year 11	Biology	Chemistry	Physics
Term 1a	Interdependence	Atoms	Radiation
	Communicable and	Crude oil. Fractional	Interaction of waves and uses
	noncommunicable disease;	distillation.	of ultrasound. Properties and
	pathogens; Development of	Atoms	uses of electromagnetic
Term 1b	drugs; Immunity	Alcohols and carboxylic acids	waves.
Tellii 10	Evolution	Reactions	Radiation
	Theories of evolution.	Titrations and electrolysis;	Reflection, refraction and
	Evidence of evolution	Electrolysis, cells and	uses of light.
		batteries.	
Term 2a	Interdependence	Reactions	Radiation
	Communities in the	Reversible reactions,	Radioactive decay.
	ecosystem and adaptations of	equilibrium; Haber process	Background radiation; half-
	plants and animals; Sampling	and NPK fertilisers	life. Radioactive
Term 2b	techniques. Carbon cycle and		contamination
Term 20	transpiration and	Mock 2	
	translocation.	Revision	Mock 2
	Evolution		Revision
	Genetic engineering, cloning		
	and selective breeding		
	Cells		
	Monoclonal antibodies and		
	their uses; hormones.		
	Mock 2		
	Revision		
Term 3a	GCSE examinations start	GCSE examinations start	GCSE examinations start
16111134	GCGL Examinations start	GCSL examinations start	GCSL examinations start

Year 12 Biology, Chemistry and Physics

Year 12	Biology	Chemistry	Physics
Term 1a	Maths and statistics	Physical chemistry	Introduction to physics
		Atomic structure; amount of	Measurements and errors;
	Biological molecules	substances; bonding;	Maths skills
		enthalpy; rates and kinetics.	
	Genetic information,		Electricity
Term 1b	variation and relationships	Inorganic chemistry	
	between organisms	Periodicity; Group 2 and	Particle physics
		Group 7 elements.	
			Mechanics 1
Term 2a	Cells	Physical chemistry	Materials
		Equilibrium	
	Organisms exchange		Mechanics 2
	substances with their	Organic chemistry	
	environment		Waves
Term 2b			
Term 3a	Genetics, populations, evolution and ecosystems	Physical chemistry Rate equations	Further mechanics 1
		Thate equations	Thermal physics 1
		Organic chemistry	mermar proyects 1
		Alkanes; halogenoalkanes;	
Term 3b		alkenes; alcohols; organic	
		analysis	

Year 13 Biology, Chemistry and Physics

Year 13	Biology	Chemistry	Physics
Term 1a	Energy transfers in and between organisms	Physical chemistry Acids and bases	Further mechanics 2
	a control or gament	7.6.6.5 6.7.6.5	Thermal physics 2
		Organic chemistry	, ,
		Optical isomerism; aldehydes	
		and ketones; carboxylic acids	
		and derivatives; aromatic	
		chemistry	
Term 1b	Organisms respond to	Physical chemistry	Field physics 1
	changes in their internal and	Thermodynamics	
	external environments		Nuclear physics
		Organic chemistry	
Term 2a	The control of gene	Amines; Polymers; Amino	Field physics 2
Terrii Za	expression	acids, proteins and DNA;	riela physics 2
		Organic synthesis	Astrophysics
		Inorganic chemistry	
		Transition metals; reactions	
		of ions in aqueous solution.	
Term 2b	Revision	Revision	Revision
Term 3a	A-level examinations start	A-level examinations start	A-level examinations start