Our Lady Queen of Peace
Catholic High School

Curriculum Overview

YEAR 10 SCIENCE

Careers		
Local Market Information	**Skills**	**Jobs**
Local science becomes industry, disease management and energy systems. Biology links to Ormskirk Hospital/NHS through infection, non-communicable disease and patient care. Chemistry links to P&G Skelmersdale and regional advanced manufacturing, where controlled processes, quality checks, chemical changes and calculations are essential. Physics links to energy transfer, electricity and systems thinking through manufacturing, medical equipment and utilities e.g. United Utilities	**Self-Management**; **Time Management**; **Accountability**	Nurse; healthcare support worker; process technician; utilities engineer; laboratory technician

	Knowledge & Understanding			**Subject Specific Literacy Development**	**Cultural Capital / Enrichment Opportunities**
	Topics (Bigger Picture)	**Knowledge (Key Concepts)**	**Recall & Retrieval Practice Focus**	**Key Vocabulary**	
Half Term 1	C1: The Periodic Table, Mixtures & Separation Techniques	Development of the Periodic Table, Group 1 – Alkali Metals, Transition Metals (Separate Science), Group 7 – Halogens, Metals and Non-metals, Mixtures and Pure Substances, Filtration, Crystallisation, Distillation, Chromatography.	Recall the structure of matter, including atoms, elements, compounds, materials and states of matter.	Periodic table Group & Period Alkali metal Halogen Pure substance Filtration Crystallisation Distillation Chromatography	Reading for meaning activities drawing on interesting articles in the news etc. Opportunities to help lead the STEM club
	B2: Organisation in Animals	Levels of Organisation, The Digestive System, Digestion, Food Tests Required Practical, Enzymes in Digestion, Enzymes Required Practical, The Blood, The Circulatory System, The Heart, Heart Interventions, Breathing and Gas Exchange,	Recall cell structures, nutrients and the main human body systems.	Organisation Tissue Organ & Organ system Digestive system Enzyme Substrate Reagent Variables Arte	Historical development of key concepts and discoveries; students will become familiar with influential scientists, experiments, and milestones, e.g. Louis Pasteur (germ

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				Denature Active site Blood Haemoglobin Stent Statin Pacemaker Gas exchange Alveoli	theory) Edward Jenner (vaccination), STEM careers lesson linked to international science day
	C2: Bonding, Structure and Properties	Ionic Bonding, Ionic Structures & Properties, Covalent Bonding, Simple Covalent Molecules & Properties, Giant Covalent Structures & Properties, Metallic Bonding, Nanoparticles & Application	Recall atomic structure, elements, compounds and particle behaviour.	Ion Ionic binding Giant ionic lattice Covalent bonding Molecule Metallic bonding Delocalised electron Nanoparticle	
Half Term 2	P1: Energy	Energy Stores, Gravitational Potential Energy, Kinetic Energy, Elastic Potential Energy, Energy Dissipation and Efficiency, Electrical Appliances & Energy and Power, Energy Transfer by Conduction, Specific Heat Capacity, Specific Heat Capacity RP, Heating & Insulating Buildings, Renewable Energy Resources, Energy Demands and the Environment,	Recall everyday examples of energy transfer, movement, heating and electricity.	Energy store System Transfer Gravitation potential energy Kinetic energy Elastic potential energy Efficiency Dissipation Power Conduction Specific heat capacity Insulation Renewable / Non-renewable	
	B3a: Infection & Response	Communicable Disease, Viral Diseases, Fungal and Protist Diseases, Bacterial Diseases and Prevention, Human Defences, Monoclonal Antibodies (Separates Only)	Recall microorganisms, hygiene and how diseases spread.	Pathogen Communicable disease Virus Host cell Protist Bacteria Antibiotic Immune response Phagocytosis Monoclonal antibody	

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Half Term 3	B3: Infection & Response	Vaccination, Antibiotics, antibiotic resistance and painkillers, Discovering Drugs, Developing Drugs, Plant Diseases and Defence (Separates Only)	Recall immunity, medicines and causes of illness.	Vaccination Herd immunity Antibiotic resistance Drug Clinical trail Placebo	Reading for meaning activities drawing on interesting articles in the news etc. Opportunities to help lead the STEM club Historical development of key concepts and discoveries; students will become familiar with influential scientists, experiments, and milestones, e.g. Eddison and Tesla (AC/DC current)
	C3a: Quantitative Chemistry	Writing Chemical Equations, Conservation of mass, Uncertainty of Chemical Measurements, Relative Masses, Calculating percentage by mass, Concentration,	Recall chemical formulae, reactions and measurement of mass and volume.	Chemical equation Conservation of mass Uncertainty Relative formula mass Concentration	
Half Term 4	P2: Electricity	Components, Current & Charge, Potential Difference & Resistance, Series Circuits, Parallel Circuits, Resistance of a wire RP, Resistors (LDR, & Thermistors), IV Characteristics RP, National Grid & AC/DC, Cables & Plugs, Electrical Power Calculations, Static Electricity (Separates ONLY)	Recall simple circuits, electrical devices and conductors and insulators.	Current Charge Potential difference Resistance Series circuit Parallel circuit LDR Thermistor Diode National grids Transformer Live wire Earth wire Static charge Electric field	
	B3b: Infection & Response: Non-Communicable Disease	Smoking and the Risk of Disease, Obesity and Diet-Related Disease, Alcohol and Disease, Cancer	Recall factors that contribute to healthy lifestyles.	Cardiovascular Obesity Diabetes Malignant Benign	
Half Term 5	C4: Chemical Changes	The Reactivity Series, Displacement reactions, Extracting Metals, Metals & Acids, Salts from insoluble bases, Preparing a Pure, Dry Soluble Salt RQP, Acids & Alkalis, Titration & Calculations (Separates Only), Strong and Weak Acids (Higher & Separates Only), Electrolysis,	Recall chemical reactions, acids, alkalis and metals.	Reactivity series Displacement Metal extraction Neutralisation Acid, Alkali, Base, Titration Strong & weak acids Electrolysis Aqueous solution	Reading for meaning activities drawing on interesting articles in the news etc. Opportunities to help lead the STEM club

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		Electrolysis of Aluminium, Electrolysis of Aqueous Solutions			Historical development of key concepts and discoveries; students will become familiar with influential scientists, experiments, and milestones, e.g. Marrie Currie (radioactivity)
	C5: Energy Changes	Endothermic & Exothermic Reactions, Endothermic and Exothermic Reactions (RQP), Reaction Profiles, Bond Energies (Higher & Separates Only), Cells and Batteries (Separates Only), Fuel Cells (Separates Only)	Recall energy transfer and temperature changes in everyday situations.	Exothermic Endothermic Energy change Reaction profile Bond energy Electrochemical cell Fuel cell	
	B4: Bioenergetics	Tissue and organs in plants, Transport in plants, Transpiration and Translocation, Factors affecting transpiration, Photosynthesis and Limiting Factors, The Rate of Photosynthesis RP	Recall plant structures and requirements for plant growth.	Xylem Phloem Photosynthesis Translocation Transpiration Potometer Limiting factor	
Half Term 6	B4: Bioenergetics	Respiration and Metabolism, Aerobic Respiration, Anaerobic Respiration, Response to Exercise	Recall the role of respiration in living organisms.	Respiration Metabolism Aerobic respiration Anaerobic respiration Oxygen debt	
	C3b: Quantitative Chemistry (HT)	Moles, Reacting Masses, Using moles to balance equations, Limiting Reactants, Percentage Yield (Separate ONLY), Atom Economy (Separate ONLY), Using Gas Volumes (Separate ONLY)	Recall relative masses, balanced equations and conservation of mass.	Titration Mole Reacting masses Limiting reactant Percentage yield Atom economy	
	P4: Atomic Structure	Atoms & Radiation, Changes in the nucleus, Properties of ionising Radiation, Half-Life, Nuclear Radiation in Medicine (SEP ONLY), Nuclear Fission (SEP ONLY), Nuclear Fusion (SEP ONLY),	Recall atomic structure and the existence of radiation.	Atomic structure Isotope Radioactive decay Alpha Beta Gamma Nuclear equation Ionising radiation Half life Irradiation Contamination Nuclear fission	

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				Nuclear fusion	

Key Assessments			
When	**What will be assessed?**	**Why is this being assessed?**	**How will results be stored & students receive feedback?**
Half Term 1	Biology – Organisation in Animals - End of topic test Chemistry – Bonding, Structure and properties – End of topic test	To assess students understanding of structures in humans – gas exchange system, digestive system, transport systems. To assess students understanding of bonding and how bonding relates to the structure and properties of substances	Pupil Progress Teacher marked with WWW and EBI on green sheet.
Half Term 2	In class assessment – B2, C2 & P1.	To assess students understanding of the topics covered in B2, C2 and key concepts from energy; stores, transfers, calculations, insulation.	Pupil Progress Whole class feedback.
Half Term 3	The Mid-Year Exam will assess content covered in the year so far, as well as the fundamental topics covered in Y9 Summer term – Cell Biology, Atoms, elements compounds, Particle model (Summative assessment). Chemistry – Quantitative Chemistry – End of topic test	To assess students' understanding of Biology, Chemistry and Physics topics and working scientifically skills, specifically their ability to: ○ Explain key concepts in required practical: ○ Improving methods ○ Explaining results/data ○ Analyse/evaluate data ○ Recall and apply knowledge about: ○ Cells, microscopy, cell transport ○ Elements, compounds, periodic table ○ Particle model ○ Systems in animals ○ Communicable disease – causes, treatments & prevention ○ Bonding, structures and properties ○ Energy stores & transfers To assess students understanding of chemistry calculations – moles, concentration, formula mass	Pupil Progress Whole class feedback. Pupil Progress Teacher marked with WWW and EBI on green sheet.

Half Term 4	Physics – Electricity – End of topic test Biology – Infection & Response, Non-communicable disease – End of topic test	To assess students understanding of electric circuits, current, potential difference, resistance, effects of components. Also, mains electricity & the national grid. To assess students understanding of the effect of lifestyle on non-communicable conditions.	Pupil Progress Teacher marked with WWW and EBI on green sheet. Pupil Progress Teacher marked with WWW and EBI on green sheet.
Half Term 5	Chemistry – Chemical Changes – End of topic test Chemistry – Energy Changes – End of topic test	To assess students understanding of the reactions between acids and metals, metal compounds and alkalis/bases and the process of electrolysis. To assess students understanding of chemical reactions identified as exothermic or endothermic in terms of energy.	Pupil Progress Teacher marked with WWW and EBI on green sheet. Pupil Progress Teacher marked with WWW and EBI on green sheet.
Half Term 6	Biology – Bioenergetics – End of topic test The End of Year Exam will assess content covered in the year so far, as well as the fundamental topics covered in Y9 Summer term. Physics – Atomic Structure – End of topic test	To assess students understanding of photosynthesis and respiration as vital reactions, how organisms are adapted to maximise these reactions and how they can be affected. To assess students' understanding of Biology, Chemistry and Physics topics and working scientifically skills, specifically their ability to: ○ Explain key concepts in required practical: ○ Improving methods ○ Explaining results/data ○ Analyse/evaluate data ○ Recall and apply knowledge about: ○ Cells, microscopy, cell transport ○ Systems in animals ○ Communicable disease – causes, treatments & prevention. ○ Non-communicable disease ○ Photosynthesis and respiration ○ Elements, compounds, periodic table ○ Bonding, structures and properties ○ Quantitative Chemistry ○ Chemical Changes ○ Energy changes ○ Energy stores & transfers ○ Particle model ○ Electricity	Pupil Progress Teacher marked with WWW and EBI on green sheet. Pupil Progress Whole class feedback. Pupil Progress

		To assess students understanding of how unstable atoms can emit nuclear radiation.	Teacher marked with WWW and EBI on green sheet.