

# Our Lady Queen of Peace

Catholic Engineering College

## Curriculum Overview

### YEAR 8 SCIENCE

	Knowledge & Understanding			Subject Specific Literacy Development		Cultural Capital / Enrichment Opportunities
	Topics	Knowledge (Key Concepts)	Recall & Retrieval Practice Focus	Read for Meaning Focus	Key Vocabulary	
Half Term 1	<b>Human Body and Health</b>  What keeps living things healthy?	Structure and function of major systems: circulatory, respiratory, digestive, skeletal and muscular systems. Balanced diet and the role of nutrients (carbohydrates, proteins, fats, vitamins, minerals, water, and fibre) Digestive system organs and their functions Enzymes and their role in digestion	<ul style="list-style-type: none"> <li>How do the major systems in your body—like the circulatory, respiratory, digestive, skeletal, and muscular systems—work together to keep you alive and active?</li> <li>What makes up a balanced diet, and why does your body need different types of nutrients?</li> <li>What happens to the food you eat as it travels through your digestive system, and what are the roles of each organ along the way?</li> </ul>	Food groups and a balanced diet	Digestive system Enzyme Carbohydrate Gas exchange Inhalation Exhalation Carbohydrates Vitamins Minerals Fibre	<p>Opportunity to discuss relevant news.</p> <p>Highlighting the relevance and transferability of science for daily and future lives.</p> <p>Challenging popular stereotypes.</p>
	<b>Chemical reactions</b>  How can substances be changed?	Identifying reactants and products in word equations Conservation of mass in chemical reactions Observing and interpreting evidence of chemical change (e.g., colour change, gas production, temperature change) Properties of acids and alkalis pH scale and indicators	<ul style="list-style-type: none"> <li>What signs can we look for to tell if a chemical change has happened?</li> <li>Why do you think the total mass of substances stays the same before and after a chemical reaction?</li> <li>How can we tell if a substance is an acid or an alkali, and what does the pH scale tell us about it?</li> </ul>	Acids, alkalis and their uses	Reactant Product Conservation of mass Chemical reaction Acid Base Alkali Corrosive Universal indicator pH scale	<p>Creating opportunities for students to explore STEM activities through practical and encouragement of STEM club.</p>
	<b>Electricity and Magnetism</b>  How does electricity and	Identifying and knowing the use of the following components: cell, battery, bulb, switch, resistor, ammeter, voltmeter Series and parallel circuits: structure and behaviour.	<ul style="list-style-type: none"> <li>What do the different components in a circuit—like bulbs, batteries, switches, and meters—do, and how can we recognise them in a circuit diagram?</li> <li>How do you think the arrangement of components in a circuit affects how</li> </ul>	Series and parallel circuits	Cell Battery Switch Resistor Ammeter Voltmeter Electrons	

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	magnetism work?		<p>electricity flows and how the circuit behaves?</p> <ul style="list-style-type: none"> <li>What happens to the brightness of bulbs or the reading on a meter when you add more components to a circuit?</li> <li>Why might we choose to use a series circuit in one situation and a parallel circuit in another?</li> </ul>		<p>Series circuit</p> <p>Parallel circuit</p> <p>Current</p>	
Half Term 2	<p><b>Electricity and Magnetism</b></p> <p>How does electricity and magnetism work?</p>	<p>Current and potential difference (voltage)</p> <p>Measuring current (A) and voltage (V)</p> <p>Resistance and its effect on current</p>	<ul style="list-style-type: none"> <li>What do you think electric current is, and how does it move through a circuit?</li> <li>What is potential difference (voltage), and how does it affect the way components in a circuit work?</li> <li>How can we measure current and voltage in a circuit, and where should we place the ammeter and voltmeter?</li> <li>What do you think resistance is, and how does it affect the current in a circuit?</li> </ul>	Understanding resistance from a graph	<p>Resistance</p> <p>Current</p> <p>Potential difference</p> <p>Ohm</p> <p>Volts</p> <p>Amps</p> <p>Proportional</p>	
	<p><b>Human Body and Health</b></p> <p>What keeps living things healthy?</p>	<p>Gas exchange in the lungs</p> <p>Effects of lifestyle factors (diet, exercise, drugs, alcohol, smoking)</p> <p>Communicable and non-communicable diseases</p>	<ul style="list-style-type: none"> <li>How do your lungs take in oxygen and get rid of carbon dioxide, and why is this process important for your body?</li> <li>How do lifestyle choices like diet, exercise, smoking, and alcohol affect how well your body works?</li> <li>What's the difference between a disease you can catch and one that develops over time, and how can we prevent them?</li> <li>Why is it important to understand how our choices affect our long-term health?</li> </ul>	Non-communicable diseases and lifestyle factors	<p>Alveoli</p> <p>Diffusion</p> <p>Capillaries</p> <p>Drug</p> <p>Non-communicable</p> <p>Communicable</p> <p>Pathogen</p> <p>Depressant</p> <p>Stimulant</p>	
Half Term 3	<p><b>Human Body and Health</b></p> <p>What keeps living things healthy?</p>	<p>Immune system basics and the role of vaccines</p>	<ul style="list-style-type: none"> <li>How does your body know when harmful microbes like bacteria or viruses have entered, and what does it do to fight them off?</li> <li>How do vaccines help your body fight diseases before you even get them?</li> <li>Why is it important for lots of people in a community to be vaccinated, even if some individuals can't be?</li> </ul>	How vaccines were discovered.	<p>Vaccine</p> <p>Antigen</p> <p>White blood cells</p> <p>Bacteria</p> <p>Virus</p> <p>Fungi</p> <p>Airborne</p> <p>Immunisation</p> <p>Immunity</p> <p>Antibiotics</p> <p>Herd immunity</p>	<p>Opportunity to discuss relevant news.</p> <p>Highlighting the relevance and transferability of science for daily and future lives.</p> <p>Challenging popular stereotypes.</p>

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	<b>Chemical reactions</b>  How can substances be changed?	Neutralisation and salt formation Everyday examples (e.g., indigestion remedies, cleaning products) Writing and interpreting word equations Introduction to simple symbol equations Balancing equations (basic level) Exothermic and endothermic reactions Energy changes and their practical applications.	<ul style="list-style-type: none"> <li>Can you think of everyday situations where neutralisation is useful, like in medicine or cleaning?</li> <li>How can we use word and symbol equations to show what's happening in a chemical reaction?</li> <li>Why do some chemical reactions give off heat while others take it in, and how can we use this in real life?</li> </ul>	What happens when metals and acids react?	Neutralisation Salt Symbol equation Endothermic Exothermic Energy change	Creating opportunities for students to explore STEM activities through practical and encouragement of STEM club.
Half Term 4	<b>Electricity and Magnetism</b>  How does electricity and magnetism work?	Magnetic materials and poles Attraction and repulsion Drawing and interpreting magnetic field lines Earth as a magnetic field Use of compasses Making an electromagnet Factors affecting strength of electromagnets Uses of electromagnets (e.g., motors, relays, MRI)	<ul style="list-style-type: none"> <li>What happens when you bring two magnets close together, and how can you tell which ends will attract or repel?</li> <li>How can we show the invisible magnetic field around a magnet, and what do the field lines tell us?</li> <li>How does a compass work, and what does it tell us about the Earth's magnetic field?</li> <li>How can we make an electromagnet, and what affects how strong it is or how it's used in real life?</li> </ul>	Uses of electromagnets	Magnet Poles Attraction Repulsion Magnetic field Electromagnet Solenoid	
	<b>Photosynthesis &amp; Respiration</b>  What are living thing made of?	Word equation for photosynthesis Role of chlorophyll and light energy Structure and function of leaves (adaptations for photosynthesis) Importance of photosynthesis for oxygen production and as the basis of food chains Factors affecting the rate of photosynthesis	<ul style="list-style-type: none"> <li>What do plants need to carry out photosynthesis, and what do they produce as a result?</li> <li>How are leaves specially adapted to carry out photosynthesis efficiently?</li> <li>Why is photosynthesis important for life on Earth, and what factors can affect how fast it happens?</li> </ul>	Photosynthesis and weird plants	Photosynthesis Chlorophyll Chloroplast Glucose Carbon dioxide Stoma Guard cells Diffusion Surface area Limiting factor	

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Half Term 5	<b>Photosynthesis &amp; Respiration</b>  What are living things made of?	Word equation for aerobic respiration Purpose of respiration Differences between aerobic and anaerobic respiration Anaerobic in animals and plants Oxygen debt and recovery	<ul style="list-style-type: none"> <li>How is anaerobic respiration different from aerobic respiration, and when might our bodies use it?</li> <li>How do plants and yeast carry out anaerobic respiration, and what are the products?</li> <li>What is oxygen debt, and how does your body recover after intense exercise?</li> </ul>	What happens to respiration when we exercise?	Aerobic Anaerobic Breathing rate Gas exchange Pulse Respiration Oxygen debt Lactic acid fermentation	<p>Opportunity to discuss relevant news.</p> <p>Highlighting the relevance and transferability of science for daily and future lives.</p>
	<b>Earth and Atmosphere</b>  How does chemistry affect the Earth?	Layers of the Earth and composition Tectonic plates and their movement Rock cycle Types of rocks: igneous, sedimentary, metamorphic Formation processes and examples	<ul style="list-style-type: none"> <li>What are the different layers of the Earth, and what is each layer made of?</li> <li>How do tectonic plates move, and what effects can their movement have on the Earth's surface?</li> <li>What are the main types of rocks, how are they formed, and can you give examples of each?</li> </ul>	Tectonic plates and Earthquakes	Mantle Crust Inner / Outer core Sedimentary Metamorphic Igneous Intrusive Extrusive Ore Tectonic plates	<p>Challenging popular stereotypes.</p> <p>Creating opportunities for students to explore STEM activities through practical and encouragement of STEM club.</p>
Half Term 6	<b>Earth and Atmosphere</b>  How does chemistry affect the Earth?	Composition of the atmosphere: Evolution of the atmosphere: Greenhouse effect and climate change Air pollution and its effects:	<ul style="list-style-type: none"> <li>What gases make up the Earth's atmosphere today, and why are they important for life?</li> <li>How has the Earth's atmosphere changed over time, and what caused those changes?</li> <li>What is the greenhouse effect, and how is it linked to climate change?</li> <li>How does air pollution affect our health and the environment, and what can we do to reduce it?</li> </ul>	The future of the atmosphere and its evolution	Rust Ceramics Composites Polymers Monomers Pollution Greenhouse gases Climate change Atmosphere	
	<b>Space</b>  How does the Earth fit into the universe?	Structure of the solar system Orbits and gravity Day, Night, and Seasons Phases of the Moon Space Exploration	<ul style="list-style-type: none"> <li>What objects make up our solar system, and how are they arranged in space?</li> <li>How does gravity keep planets and moons in orbit, and what would happen without it?</li> <li>Why do we experience day and night, seasons, and different phases of the Moon?</li> <li>How has space exploration helped us learn more about the universe, and what</li> </ul>	The future of our universe	Planet Star Satellite Moon Orbit Gravity Celestial Big Bang Day Night	

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			challenges do we face when exploring space?			

## Key Assessments – Year 8 Science

When	What will be assessed?	Why is this being assessed?
Half Term 1	<ul style="list-style-type: none"> <li>Students will have Essential knowledge checks but no big questions or tests in term 1</li> </ul>	<ul style="list-style-type: none"> <li>To look at the work in books and address gaps in knowledge early.</li> </ul>
Half Term 2	<ul style="list-style-type: none"> <li>The Mid-Year Exam will assess content covered in the year so far, from biology (human boy and health), chemistry (Chemical Reactions), and physics (Electricity and Magnetism) and science skills, safety in the lab, variables etc</li> </ul>	<ul style="list-style-type: none"> <li>To track progress and give teachers and students a clear picture of strengths and weaknesses, which can then be addressed through feedback and students' responses to feedback.</li> <li>The mid-year supports conversations at parents evening, and setting decisions where applicable, as well as giving students and teachers a quantitative test score so we can track progress over time</li> </ul>
Half Term 3	<ul style="list-style-type: none"> <li>The Human Body and Health topic, and the Chemical Reactions topic started in Half Term 1 and are assessed part way through Half Term 2 in the mid-year, the full topic is then assessed with the big questions, "What keeps living things healthy?" and "How can I calm my upset stomach?" in Half Term 3.</li> </ul>	<ul style="list-style-type: none"> <li>To track progress and give teachers and students a clear picture of strengths and weaknesses, which can then be addressed through feedback and students' responses to feedback.</li> </ul>
Half Term 4	<ul style="list-style-type: none"> <li>The Electricity and Magnetism topic started in Half Term 1 and is assessed in the mid-year test, but the full topic is then assessed with the big questions, "How do electromagnets work" in Half Term 4.</li> </ul>	<ul style="list-style-type: none"> <li>To track progress and give teachers and students a clear picture of strengths and weaknesses, which can then be addressed through feedback and students' responses to feedback.</li> </ul>
Half Term 5	<ul style="list-style-type: none"> <li>Topic 5 Photosynthesis and Respiration starts in Half Term 4 and is assessed in Half Term 5 with the big question, "How does exercise affect respiration and the body?"</li> <li>The End of Year Exam will also take place in HT 5, assessing a broad range of content covered in the year so far, from the Human Body and Health topic, Electricity and Magnetism and the Chemical Reactions Topic, as well as assessing skills e.g. drawing a graph, safety in the lab, and content from the becoming a scientist topic.</li> </ul>	<ul style="list-style-type: none"> <li>To track progress and give teachers and students a clear picture of strengths and weaknesses, which can then be addressed through feedback and students' responses to feedback.</li> <li>The End of year guides setting decisions where applicable, as well as giving students and teachers a quantitative test score so we can track progress over time and against progress targets.</li> </ul>
Half Term 6	<ul style="list-style-type: none"> <li>Topic 6: Earth and Atmosphere topic, will be assessed through the Big Question "Explain how the rock cycle works and describe how each of the three main types of rock are formed."</li> <li>Topic 7: Space will be assessed through the Big Question "How do scientists propose the Big Bang create the universe?"</li> </ul>	<ul style="list-style-type: none"> <li>To track progress and give teachers and students a clear picture of strengths and weaknesses, which can then be addressed through feedback and students' responses to feedback.</li> </ul>