Our Lady Queen of Peace
Catholic Engineering College

Curriculum Overview

YEAR 7 SCIENCE

	Knowledge & Understanding			Subject Specific Literacy Development		Cultural Capital / Enrichment Opportunities
	Topics (Bigger Picture)	**Knowledge (Key Concepts)**	**Recall & Retrieval Practice Focus**	**Read for Meaning**	**Key Vocabulary**	
Half Term 1	**Becoming a Scientist** What basic skills do I need to become a scientist?	• Recall and identify hazard symbols. • Safety in a laboratory, especially during practical investigations. • Identify and know the use of scientific equipment. • Define and identify each variable. • Plan and safely carry out and accurately record observations/results from a science investigation. • Use data to draw accurate bar charts and line graphs and draw conclusions from them.	• Why is it important to understand and follow safety rules and symbols when working in a science lab? • How do scientists choose and use the right equipment to carry out accurate and reliable investigations? • What do we mean by variables in an experiment, and why is it important to control them? • How can we use data and graphs to help us understand and explain the results of a scientific investigation?	Famous Scientists	Independent Variable Dependent variable Control variable Hypothesis Corrosive Accurate Hazard Safety Flame Precaution Reliable	Opportunity to discuss relevant news. Highlighting the relevance and transferability of science for daily and future lives. Challenging popular stereotypes. Creating opportunities for students to explore STEM activities through practical and encouragement of STEM club.
	Particles and Mixtures What are substances made from?	• Particle model of solids, liquids, and gases • Changes of state and the energy involved	• How do the particles behave differently in solids, liquids, and gases, and how does this explain their properties? • What happens to the particles when a substance changes state, like melting or boiling? • Why do some changes of state require energy to be added, while others release energy? • Can you think of real-life examples where understanding the particle model helps explain what's happening?	Unusual Uses of Solids, Liquids and Gases	Solid Liquid Gas Melting point Boiling point Condensing Freezing Evaporating Force of attraction Kinetic energy Sublimation	

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	Cells What are living things made of?	• Structure and function of animal and plant cells • Differences between unicellular and multicellular organisms	• What are the main parts of a cell, and how do they help the cell do its job? • How are plant cells different from animal cells, and why might they need different structures? • What do you think life would be like for an organism made of just one cell? • Why do multicellular organisms need different types of cells with different functions?	One cell or many?	Nucleus Cytoplasm Cell membrane Mitochondria Chloroplast Cell wall Vacuole Flagellum Unicellular Multicellular	
	Energy How is information and energy transferred?	• Different types of energy (kinetic, thermal, chemical, etc.) • Energy stores and transfers • Conservation of energy • Efficiency and energy dissipation	• What are some different types of energy you've heard of, and where do you see them in everyday life? • How does energy move or change from one form to another in machines, living things, or natural processes? • Why do we say that energy is never lost, only transferred or transformed? • What happens to energy that isn't usefully transferred, and how can we make systems more efficient?	Which metal conducts heat the fastest?	System Efficiency Dissipation Kinetic Thermal Gravitational potential Elastic Chemical Conservation of energy Temperature Heat	
Half Term 2	**Particles and Mixtures** What are substances made from?	• Define and calculate density. • Diffusion and gas pressure	• What do you think affects how heavy or light something feels for its size? • Why do smells spread through the air, and how might temperature affect how fast this happens? • Why do gases in a container push outwards, and what might change how strongly they do this?	Emperor penguins and density	Particle Diffusion Pressure Density Mass Volume Collison Temperature Concentration	Opportunity to discuss relevant news. Highlighting the relevance and transferability of science for daily and future lives. Challenging popular stereotypes. Creating opportunities for
	Cells What are living things made of?	• Specialised cells and their adaptations • Levels of organisation	• Why do different cells in the body look and work differently, and how are they adapted to their jobs? • How do cells work together to form tissues, organs, and systems in living organisms?	Specialised cells, built for the job.	Specialised cell Adaptation Cell Tissue Organ Organism Organ system	

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	Energy How is information and energy transferred?	• Heating and cooling, conduction, convection, and radiation	• How does heat move from one place to another, and what makes some materials better at transferring heat than others? • What happens to particles in a substance when it is heated or cooled?	Applications of conduction convection and radiation	Conduction Convection Radiation Insulator Conductor Thermal energy Emit Absorb Heat Power	students to explore STEM activities through practical and encouragement of STEM club.
Half Term 3	**Particles and Mixtures** What are substances made from?	• Separation techniques: filtration, evaporation, distillation, chromatography	• Why might we need to separate mixtures in everyday life or in science? • How do different separation techniques work, and what properties of substances do they rely on? • What would happen if you tried to use the wrong method to separate a mixture? • How can we use chromatography to identify substances in a mixture, like the colours in ink?	Reading and understanding a method	Mixture Solvent Solute Filtration Evaporation Distillation Chromatography Impure Dissolve Residue	Opportunity to discuss relevant news. Highlighting the relevance and transferability of science for daily and future lives. Challenging popular stereotypes. Creating opportunities for students to explore STEM activities through practical and encouragement of STEM club.
	Cells What are living things made of?	• Microscopy: using and interpreting microscope images • Diffusion and the movement of substances in and out of cells	• Why do scientists use microscopes, and what can they see that we can't with the naked eye? • How do substances like oxygen, water, or nutrients get into and out of cells? • What factors might affect how quickly substances move in and out of cells?	Microscopes	Microscope Magnification Resolution Stain Focus Diffusion Objective lens Eyepiece lens Specimen Concentration gradient	
Half Term 4	**Energy** How is information and energy transferred?	• Renewable and non-renewable energy resources	• Where does the energy we use every day come from, and how do different energy sources affect the environment? • Why is it important to find more efficient and sustainable ways to produce and use energy?	Interpreting renewable and non-renewable data	Solar Wind Tidal Geothermal Biomass Wave Hydroelectricity Renewable Non-renewable	

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					Fossil Fuels	
Half Term 5	**Substances** What give substances its properties?	• Define elements and identify them on the periodic table • Compare the properties and classify substances as elements and compounds. • Identify the number of atoms and elements in a compound. • Use patterns to predict the properties of elements. • Classify an element as a metal or non-metal	• What do you think an element is, and how can we use the periodic table to learn more about it? • How can we tell the difference between an element and a compound just by looking at their names or formulas? • If you're given a chemical formula like H_2O or CO_2, how can you figure out how many atoms and elements it contains? • What patterns can we find in the periodic table that help us predict whether an element is a metal or non-metal, and what its properties might be?	The periodic table	Atom Element Compound Group Period Molecule Chemical formula Metal Non-metal	Opportunity to discuss relevant news. Highlighting the relevance and transferability of science for daily and future lives. Challenging popular stereotypes. Creating opportunities for students to explore STEM activities through practical and encouragement of STEM club.
	Reproduction How do organisms grow and reproduce?	• Understand the changes that the body goes through during puberty.	• What kinds of physical and emotional changes do you think happen during puberty, and why might they be important? • Why do you think puberty starts at different times for different people? • How do hormones help control the changes that happen during puberty? • What can we do to stay healthy and confident during the changes that happen in puberty?	Understanding puberty through data	Puberty Hormones Testosterone Oestrogen Menstruation Reproductive system Fertilisation Gestation Ovary Testes Embryo Foetus	
Half Term 6	**Reproduction** How do organisms grow and reproduce?	• Structure and function of the male and female reproductive systems. • Purpose of the menstrual cycle. • Role and adaptations of the sex cells in fertilisation. • Stages of development during a healthy pregnancy.	• How are the male and female reproductive systems structured, and how do their parts work together to allow reproduction? • Why is the menstrual cycle important, and how does it prepare the body for pregnancy? • How are sex cells (sperm and egg) adapted for their roles in fertilisation, and what happens after they meet?	Reproduction in the animal kingdom	Fertilisation Gestation Ovary Testes Embryo Foetus Placenta Pollination Carpel Stamen	Opportunity to discuss relevant news. Highlighting the relevance and transferability of science for daily and future lives. Challenging popular stereotypes.

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		• Structure and function of the reproductive system in plants. • Pollination in plants • How seeds can be dispersed.	• How do plants reproduce, and what strategies do they use to spread their seeds?	Interpretation of drag and weight data	Germination	Creating opportunities for students to explore STEM activities through practical and encouragement of STEM club.
	Forces Why do things move and change?	• Describe how forces cause objects to move, stop, change shape or direction. • Identify and describe different forces. • Calculate a resultant force and state its effect • Identify examples of friction forces in everyday situations • Calculate weight • Explain why objects float in reference to density of water	• How can forces change the way an object moves, its shape, or the direction it's going? • What different types of forces can you think of, and where do you see them acting in everyday life? • What happens when more than one force acts on an object, and how can we work out the overall (resultant) force? • Why do some objects float while others sink, and what does this have to do with weight and density?		Force Friction Gravity Weight Mass Resultant forces Balanced forces Unbalanced forces Contract force Non-contact force Density Volume	

Key Assessments- Year 7 Science

When	What will be assessed?	Why is this being assessed?
Half Term 1	• Topic 1 is "Becoming a Scientist" and will be assessed using the Big Question – "What basic skills do I need to become a scientist?"	• 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.
Half Term 2	• The Mid-Year Exam will assess content covered in the year so far, from biology (cells), chemistry (changing states of matter), and physics (heat transfer by conduction) and science skills, safety in the lab, variables etc (from the becoming a scientist topic)	• 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. • 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 trach progress over time
Half Term 3	• The particles topic starts in Half Term 1 and is assessed part way through Half Term 2 in the mid year, the full topic is then assessed with the big question, What happens when an ice cube is heated?" in HT3 • Topic 3 Cells and also assessed at the end of Half Term 3 with the big question, "What are living things made up of?" •	• 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.
Half Term 4	• Topic 4: Energy will be assessed through the Big Question "How can we use our energy resources?"	• 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.
Half Term 5	• Topic 5 Substances starts in Half Term 4 and is assessed part way through Half Term 5 with the big question, "Describe these key elements from the periodic table" • 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 cells, particles and Energy topics, as well as assessing skills e.g. drawing a graph, safety in the lab, and content from the becoming a scientist topic.	• 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. • The End of year guides setting decisions where applicable, as well as giving students and teachers a quantitative test score so we can trach progress over time and against progress targets.
Half Term 6	• Topic 6: Reproduction, will be assessed through the Big Question "Compare reproduction in plants to animals" • Topic 7: Forces will be assessed through the Big Question "Describe the forces as a boat launches, travels at a steady speed and comes ashore"	• 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.