

## JUNIOR CYCLE SCIENCE OVERVIEW - ACADEMIC YEAR 2022/2023

### FIRST YEAR

Term 1	Strands:	Elements:	Learning Outcomes – Students should be able to...
			<b>Know Lab Safety / Rules of the lab</b>
	NoS 1	Understanding about Science	Appreciate how scientists work and how scientific ideas are modified over time.
	NoS 9	Science in Society	Research and present information on the contribution that scientists make to scientific discoveries and invention, and its impact on society.
	PW 1	Building Blocks	Select and use appropriate measuring instruments.
	PW 2	Building Blocks	Identify and measure/calculate length, mass, time, temperature, area, volume.
	PW 3	Systems and Interactions	Investigate patterns and relationships between physical observables.
	BW1	Building Blocks	Investigate the structures of animal and plant cells and relate them to their functions.
	BW4	Systems and Interactions	Describe the structure, function, and interactions of the organs of the human digestive system.
	BW6	Systems and Interactions	Evaluate how human health is affected by environmental factors including nutrition and lifestyle choices.
	CW1	Building Blocks	Investigate whether mass is unchanged when chemical and physical changes take place.
	CW2	Building Blocks	Develop and use models to describe the atomic nature of matter; demonstrate how they provide a simple way to account for the conservation of mass, changes of state, physical change, chemical change.
<b>Christmas Exams</b>			
Terms 2 & 3	Strands:	Elements:	Learning Outcomes – Students should be able to...
	NoS 4	Investigating in Science	Drawing graphs - Produce and select data (qualitatively/quantitatively), critically analyse data to identify patterns and relationships, identify anomalous observations, draw and justify conclusions.
	CW 2	Building Blocks	Develop and use models to describe the atomic nature of mixtures and their separation.
	PW 2	Building Blocks	Identify and measure/calculate: density, speed, acceleration and force.
	PW 3	Systems and Interactions	Investigate patterns and relationships between physical observables.
	CW 4	Building Blocks	Classify substances as elements, compounds, mixtures, metals, non-metals, solids, liquids, gases and solutions.
	CW 8	Systems and Interactions	Investigate reactions between acids and bases; use indicators and the pH scale.
	CW 10	Sustainability	Evaluate how humans contribute to sustainability through the extraction, use, disposal, and recycling of materials.
	NoS 8	Communicating in Science	Evaluate media-based arguments concerning science and technology.
<b>Summer Exams</b>			

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### SECOND YEAR

Term 1	Strands:	Elements:	Learning Outcomes – Students should be able to...
			<b>Know Lab Safety / Rules of the lab</b>
	BW 4	Systems and Interactions	Describe the structure, function, and interactions of the organs of the human respiratory system.
	E and S 5	Systems and Interactions	Describe the cycling of matter, including that of carbon and water, associating it with biological and atmospheric phenomena.
	NoS 2	Investigating in Science	Recognise questions that are appropriate for scientific investigation, pose testable hypotheses, and evaluate and compare strategies for investigating hypotheses.
	NoS 3	Investigating in Science	Design, plan and conduct investigations; explain how reliability, accuracy, precision, fairness, safety, ethics, and the selection of suitable equipment have been considered.
	NoS 4	Investigating in Science	Produce and select data (qualitatively/quantitatively), critically analyse data to identify patterns and relationships, identify anomalous observations, draw and justify conclusions.
	NoS 5	Investigating in Science	Review and reflect on the skills and thinking used in carrying out investigations [and apply their learning and skills to solving problems in unfamiliar contexts.]
	PW 6	Energy	Explain energy conservation and analyse processes in terms of energy changes and dissipation.
	PW 7	Energy	Design, build, and test a device that transforms energy from one form to another in order to perform a function; describe the energy changes and ways of improving efficiency.
	E and S 6	Energy	Research different energy sources: formulate and communicate an informed view of ways that current and future energy needs on Earth can be met.
	E and S 7	Sustainability	Illustrate how earth processes and human factors influence Earth’s climate, evaluate effects of climate change and initiatives that attempt to address those effects.
<b>Christmas Exams</b>			
Terms 2 & 3	Strands:	Elements:	Learning Outcomes – Students should be able to...
	BW 7	Energy	Describe respiration and photosynthesis as both chemical and biological processes; investigate factors that affect respiration and photosynthesis.
	E and S 1	Building Blocks	Describe the cycling of matter, including that of carbon and water, associating it with biological and atmospheric phenomena.
	E and S 2	Building Blocks	Recognise questions that are appropriate for scientific investigation, pose testable hypotheses, and evaluate and compare strategies for investigating hypotheses.
	E and S 3	Building Blocks	Design, plan and conduct investigations; explain how reliability, accuracy, precision, fairness, safety, ethics, and the selection of suitable equipment have been considered
	E and S 4	Systems and Interactions	Produce and select data (qualitatively/quantitatively), critically analyse data to identify patterns and relationships, identify anomalous observations, draw and justify conclusions
	E and S 8	Sustainability	Review and reflect on the skills and thinking used in carrying out investigations [and apply their learning and skills to solving problems in unfamiliar contexts.]
	BW 2	Building Blocks	Explain energy conservation and analyse processes in terms of energy changes and dissipation.
	BW 6	Systems and Interactions	Design, build, and test a device that transforms energy from one form to another in order to perform a function; describe the energy changes and ways of improving efficiency.
	BW 3	Building Blocks	Research different energy sources; formulate and communicate an informed view of ways that current and future energy needs on Earth can be met.
	NoS 10	Science in Society	Illustrate how earth processes and human factors influence Earth’s climate, evaluate effects of climate change and initiatives that attempt to address those effects.
<b>Summer Exams</b>			

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### THIRD YEAR

Term 1	Strands:	Elements:	Learning Outcomes – Students should be able to...
			Know Lab Safety / Rules of the lab
	PW 5	Systems and Interactions	Design and build simple electronic circuits.
	PW 2	Building Blocks	Identify and measure/calculate potential difference, current, resistance, electrical power.
	PW 3	Systems and Interactions	Investigate patterns and relationships between physical observables.
	CW 3	Building Blocks	Describe and model the structure of the atom in terms of the nucleus, protons, neutrons and electrons; comparing mass and charge of protons neutrons and electrons.
	CW 5	Systems and Interactions	Use the Periodic Table to predict the ratio of atoms in compounds of two elements.
	NoS 6	Communicating in Science	Conduct research relevant to a scientific issue, evaluate different sources of information including secondary data, understanding that a source may lack detail or show bias.
	NoS 7	Communicating in Science	Organise and communicate their research and investigative findings in a variety of ways fit for purpose and audience, using relevant scientific terminology and representations.
	CW 6	Systems and Interactions	Investigate the properties of different materials including solubility's, conductivity, melting points and boiling points.
	CW 7	Systems and Interactions	Investigate the effect of a number of variables on the rate of chemical reactions including the production of common gases and biochemical reactions.
	CW 9	Energy	Consider chemical reactions in terms of energy, using the terms exothermic, endothermic and activation energy, and use simple energy profile diagrams to illustrate energy changes.
	PW 8	Sustainability	Research and discuss the ethical and sustainability issues that arise from our generation and consumption of electricity.
<b>Christmas Exams</b>			
Terms 2 & 3	Strands:	Elements:	Learning Outcomes – Students should be able to...
	PW 4	Systems and Interactions	Research and discuss technological applications of physics in terms of scientific, societal and environmental impact.
	BW 4	Systems and Interactions	Describe the structure, function, and interactions of the organs of the human circulatory system.
	BW 5	Systems and Interactions	Conduct a habitat study; research and investigate the adaptation, competition and interdependence of organisms within specific habitats and communities.
	BW 8	Energy	Explain how matter and energy flow through ecosystems.
	BW 10	Sustainability	Evaluate how humans can successfully conserve ecological biodiversity and contribute to global food production; appreciate the benefits that people obtain from ecosystems.
	BW 9	Sustainability	Explain human sexual reproduction; discuss medical, ethical, and societal issues.
	NoS 5	Investigating in Science	Review and reflect on the skills and thinking used in carrying out investigations and apply their learning and skills to solving problems in unfamiliar contexts.
	BW 6	Systems and Interactions	Examine the role of micro-organisms in human health.
<b>State Examinations</b>			