

ST. JOSEPH'S COLLEGE

Department of Biology Secondary 3 (2024-25)

Teaching Syllabus

S3	Content	Remarks
1 st Term	- Introduction to biology (Aristo Bk1A Ch1)	<i>Knowledge needing attention:</i> <ul style="list-style-type: none"> - Characteristics of life - Brief introduction to branches of biology and its significance - Career in biology - Brief review of the scientific method
	- Molecules of life (Aristo Bk1A Ch2) (excluding biochemical tests)	<i>Knowledge needing attention:</i> <ul style="list-style-type: none"> - Chemical constituents of organisms (structure and function) - Relate functions of water to high specific heat capacity, high latent heat of vaporisation, and ice floating on water
	- Cellular organization (Aristo Bk1A Ch3)	<i>Knowledge needing attention:</i> <ul style="list-style-type: none"> - Cell theory - Types of microscopes and their features - Distinguishing images from light microscope, TEM and SEM - Linear magnification vs number of cells observed (optional) - Sub-cellular structures and in which types of cells they can / cannot be found - Mitochondria releases energy by respiration in the form of ATP molecules (and heat) - Animal cells vs plant cells - Prokaryotic cells vs eukaryotic cells - Levels of organization <i>Practical / Investigative skills:</i> <ul style="list-style-type: none"> - Steps in using light microscope - Preparation of temporary mounts - Basic rules in biological drawing and labelling of structures <i>Special exam skills:</i> <ul style="list-style-type: none"> - “with reference to...”
	- Movement of substances across the cell membrane (Aristo Bk1A Ch4)	<i>Knowledge needing attention:</i>

		<ul style="list-style-type: none"> - Membrane structure and meaning of fluid mosaic model - Authentic examples of membrane proteins - Diffusion, osmosis, active transport - Rate of osmosis vs equilibrium position - Cells of the same tissue may have slightly different water potential - Brief idea of endocytosis, exocytosis and facilitated diffusion - Basic concepts of polar, non-polar, hydrophilic, hydrophobic <p><i>Practical / Investigative skills:</i></p> <ul style="list-style-type: none"> - Drawing of a plasmolysed plant cell - Red blood cells burst to release haemoglobin when they are placed in hypotonic solution, staining solution red and the cells can no longer be observed under light microscope - More on SI (independent variable, dependent variable, controlled variables, control setup, reliability, assumptions, representation of results in table form, conclusion) - Importance of measuring percentage change instead of absolute change <p><i>Special exam skills:</i></p> <ul style="list-style-type: none"> - Graph plotting and reading of x-intercept
2nd Term	- Metabolism and enzymes (Aristo Bk1A Ch5)	<p><i>Knowledge needing attention:</i></p> <ul style="list-style-type: none"> - Energy level diagram - Specificity of enzymes - Rate of reaction can be given by the slope of curve of total amount against time - Relative rate of reaction can be given by the reciprocal of time taken for reaction completion <p><i>Practical / Investigative skills:</i></p> <ul style="list-style-type: none"> - Using milk agar plate to compare enzyme activity - Revision on SI (hypothesis vs prediction, independent variable, dependent variable, controlled variables, control setup, etc.) <p><i>Special exam skills:</i></p> <ul style="list-style-type: none"> - Describe and explain changes shown in a curve - Revision on graph plotting
	- Food and Humans (Aristo Bk1B Ch6)	<p><i>Knowledge needing attention:</i></p>

	<ul style="list-style-type: none"> - Food substances and deficiency diseases - Procedure of food tests (in textbook Ch2) - Balanced diet - Weight gain and weight loss is explained by comparing energy intake and energy output <p><i>Practical / Investigative skills:</i></p> <ul style="list-style-type: none"> - Observation of colour change of iodine solution, Benedict's solution and DCPIP solution (but not the food sample to be tested) in food tests <p><i>Special exam skills:</i></p> <ul style="list-style-type: none"> - Describe observations - Describe procedures of food tests - "With reference to...", "deduce..."
- Nutrition in humans (Aristo Bk1B Ch7)	<p><i>Knowledge needing attention:</i></p> <ul style="list-style-type: none"> - Processes of human nutrition - Drawing of tooth structure - Revision: transport of materials across membrane <p><i>Practical / Investigative skills:</i></p> <ul style="list-style-type: none"> - Observe microscopic slides of ileum