



**Subject: Year 9: B1: Cell structure and transport.**

Overarching Topic: B1: Cell structure and transport.			
<p>Why is this topic being studied at this time? How does it fit into the wider subject curriculum?</p>	<p>Cells are the basic unit of all forms of life. In this section we explore how structural differences between types of cells enables them to perform specific functions within the organism. These differences in cells are controlled by genes in the nucleus and can be observed histologically. We can explore the specialisation's of different cell types using microscopy. Students will then be in a position to confidently suggest the functions of previously unseen cells and even explain why an elephant might explode if it had the same metabolic rate of a mouse and relate this to SA:V ratios.</p>		
	Critical	Core	Pinnacle
<p><b>The Big Questions</b> (What questions will students be able to answer upon mastery of the topic?)</p>	<ul style="list-style-type: none"> <li>Can I label and explain the functions of organelles within cells?</li> <li>What is the difference between animal and plant cells?</li> <li>Can I label a diagram of a light microscope?</li> <li>What are the definitions of diffusion, osmosis and active transport?</li> <li>What are examples of diffusion, osmosis and active transport?</li> </ul>	<ul style="list-style-type: none"> <li>What is the difference between eukaryotic and prokaryotic cells?</li> <li>Can I use a light microscope to visualise, illustrate and label cells?</li> <li>How does cell differentiation result in cell specialisation?</li> <li>What are examples of specialised cells and how do their specialised structures convey specialised functions?</li> <li>Can I calculate magnification of an image, real size of an object or the size of the object, using standard form?</li> <li>What is the relationship between SA:V ratios and the need for respiratory and circulatory systems?</li> </ul>	<ul style="list-style-type: none"> <li>When presented with unknown or alien cell, can I confidently identify organelles and structures and assimilate this information to suggest a function of the unknown or alien specialised cell?</li> <li>Why would an elephant explode if it had the metabolic rate of a mouse and relate this information to the SA:V?</li> </ul>
	<p><b>TRIPLE ONLY QUESTIONS</b></p> <ul style="list-style-type: none"> <li>N/A</li> </ul>	<p><b>TRIPLE ONLY QUESTIONS</b></p> <ul style="list-style-type: none"> <li>N/A</li> </ul>	<p><b>TRIPLE ONLY QUESTIONS</b></p> <ul style="list-style-type: none"> <li>N/A</li> </ul>
<p><b>The Key Skills/ Techniques</b></p>	<p><b>The sophistication and application of skills will become more advanced as students' progress through the critical, core and pinnacle knowledge.</b></p>		
	<b>Skill/Technique</b>	<b>How will this skill be developed?</b>	
	1. Graphing & Drawing	Scientific drawing of cells and scientific equipment.	
	2. Variables	Be able to suggest improvement to the method of staining cells based upon an understanding of microscopic principles and factors that affect likely success of histological staining.	
	3. Data Analysis	Describe, explain and predict trends in SA:V relationships. Identify links and patters within and between topics. Statistical analysis of data to include mode/median/mean/range determination. Drawing justified conclusions from presented data.	
	4. Application	Apply known and taught theory in unfamiliar contexts. Making links to taught theory and extracting key ideas. Communicating using correct scientific terminology.	
5. Working Scientifically	Identify hazards and planning to limit risk. Describe how to improve accuracy/precision/repeatability/reproducibility/validity. Evaluate reliability of methods and investigations, taking into account data analysis.		