

## Progression Model: Biology Year 9

Module Title: Cells and Growth	Module Title: Cell transport and Enzymes	Module Title: Organisation, Body systems and Health
<p><b>Learning Intent for this module:</b> Students will build on their knowledge about cells as the basic unit of all forms of life including sub-cellular structures seen using microscopes. Students will learn that differences in cells are controlled by genes and for an organism to grow, cells must divide by mitosis producing two new identical cells.</p> <ul style="list-style-type: none"> <li>• Cell structure</li> <li>• Cell Division</li> </ul>	<p><b>Learning Intent for this module:</b> Students will learn how substances move in and out of cells across the cell membrane building on their knowledge of diffusion. They will build on their knowledge of digestion and learn the importance of enzymes as biological catalysts and the factors that affect their action.</p> <ul style="list-style-type: none"> <li>• Cell Transport</li> <li>• Enzymes</li> </ul>	<p><b>Learning Intent for this Module:</b> Students will build on their knowledge of how cells are organised in multi-cellular organisms and the function of organ systems to provide the body with nutrients and oxygen, and transport them to cells in the bloodstream. Students will learn about surgical techniques to treat coronary heart disease and reduction of disease risk through improved diet and lifestyle.</p> <ul style="list-style-type: none"> <li>• Organisation and Digestive system</li> <li>• Breathing and Circulatory systems</li> <li>• Health and lifestyle</li> </ul>
<p><b>Key Content to be learned:</b></p> <p>Students will learn the differences between eukaryotic and prokaryotic cell structure and the differences between the sub-cellular structures in plant and animal cells. In addition, they will use microscopes to view these cells and calculate magnification. They will learn how cells differentiate from stem cells and become specialised to perform different functions within an organism. They will learn how eukaryotic cells store genetic information in the nucleus, which is copied during the cell cycle prior to mitosis, and cell division and that error in the cell cycle can lead to cancer.</p>	<p><b>Key content to be learned:</b></p> <p>Students will learn how substances move in and out of cells through the partially permeable cell membrane by diffusion, osmosis and active transport. They will learn the key characteristics of exchange surfaces in humans and have the opportunity to investigate factors which affect the movement of water by osmosis in plant tissues. Students will also learn the importance of enzymes as catalysts in all biological reactions. They will learn about factors, which affect enzyme action and have the opportunity to carry out an investigation to study the effect of pH on the enzyme amylase.</p>	<p><b>Key Content to be learned:</b></p> <p>Students will learn how cells are organised into tissues, organs and systems in multicellular organisms. They will study the human digestive system and its role in food digestion and the uptake of nutrients. They will learn how to test for key nutrients in food samples and the importance of a balanced diet for health. Students will learn the importance of the gas exchange and circulatory systems in providing essential substances to all cells of the body. They will also learn how surgical interventions can help to repair damage due to CHD and the impact upon health of the major lifestyle diseases.</p>
<p><b>Prior Knowledge</b></p> <ul style="list-style-type: none"> <li>• An introduction to cell structure, specialised cells, cells division and microscopy is covered in Y7 Cells topic</li> </ul>	<p><b>Prior Knowledge</b></p> <ul style="list-style-type: none"> <li>• An introduction to the process of diffusion is covered in Y7 states of matter topic and how substances diffuse into cells is introduced in Y7 Cells and Y7 Gas exchange topic</li> </ul>	<p><b>Prior Knowledge</b></p> <ul style="list-style-type: none"> <li>• An introduction to digestion in the digestive system is covered in Y7 Nutrition and digestion topic</li> <li>• The breathing system and gas exchange is introduced in the Y7 gas exchange topic the Y8 respiration topic</li> </ul>

<ul style="list-style-type: none"> <li>• An introduction to chromosomes, DNA and genes is covered in Y8 Genetics topic</li> </ul>	<ul style="list-style-type: none"> <li>• The action of enzymes is introduced in the Y7 nutrition and digestion topic</li> </ul>	<ul style="list-style-type: none"> <li>• An introduction to the roles of risk factors in lifestyle diseases is covered in Y7 health topic.</li> </ul>
<p><b>Key tasks for this module:</b></p> <p>Stem cell Technology Cells and microscopy</p>	<p><b>Key tasks for this module:</b></p> <p>Cell Transport Enzymes</p>	<p><b>Key tasks for this module:</b></p> <p>Digestive system and digestion End of year assessment</p>