



Curriculum map – Y9 combined biology

YEAR 9 TOPIC(s)	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
What students will know	Cell Biology	Cell Biology	Cell Biology	Organisation	Organisation	Organisation
	<p>The organelles that make up plant and animal cells and their functions Orders of magnitude</p> <p>The important parts of a microscope and their functions</p> <p>Cells differentiate to form different cell types</p> <p>Mitosis is a type of cell division used for growth and repair</p>	<p>The cell cycle has 3 stages and mitosis is stage 2</p> <p>Body cells have 46 chromosomes and gametes have 23</p> <p>Stem cells are undifferentiated cells that can turn into all cell types</p>	<p>Diffusion is particles moving from a high to low concentration and this gradient can be affected by temperature, concentration and surface area</p> <p>Osmosis is the diffusion of water only and involves a partially permeable membrane</p> <p>Active transport moves substances against the concentration gradient which requires energy</p>	<p>Cells are the basic building blocks of all living organisms</p> <p>Enzymes catalyse specific reactions in living organisms due to the shape of their active site</p> <p>The nature of enzyme molecules and relate their activity to temperature and pH changes</p> <p>The 'lock and key theory' as a simplified model to explain enzyme action</p> <p>Digestive enzymes convert food into small soluble molecules that can be absorbed into the bloodstream</p>	<p>The role of bile</p> <p>Carbohydrases break down carbohydrates to simple sugars</p> <p>Amylase is a carbohydrase which breaks down starch</p> <p>Proteases break down proteins to amino acids</p> <p>Lipases break down lipids (fats) to glycerol and fatty acids</p>	<p>The structure and functioning of the human heart and lungs, including how lungs are adapted for gaseous exchange</p> <p>Artificial pacemakers are electrical devices used to correct irregularities in the heart rate</p> <p>The structure and function of the three main blood vessels</p> <p>The rate of transpiration is affected by changing temperature, humidity, air movement and light intensity</p> <p>Cancer is the result of changes in cells that lead to uncontrolled growth and division</p>

YEAR 9	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
What students will be able to do	<p>Identify animal and plant cells</p> <p>Prepare slides of animal and plant cells</p> <p>Describe how to use a light microscope correctly to view cells</p> <p>Calculate the magnification of a given structure</p>	<p>Explain how specialised cells are adapted to their function</p> <p>Explain the importance of cell differentiation</p> <p>Describe the cell cycle</p>	<p>Compare the 3 transport methods with relevant real-life examples</p> <p>Calculate surface area to volume ratio</p> <p>Analysis of plant cells left in different concentrations of glucose solutions</p>	<p>Describe the effect of pH on the rate of reaction of amylase</p> <p>Identify which foods contain certain nutrients based on qualitative reagents</p> <p>Plot and draw appropriate graphs, selecting appropriate scales for axes</p>	<p>Evaluate the advantages and disadvantages of treating cardiovascular diseases by drugs, mechanical devices or transplant</p> <p>Understand and use simple compound measures such as the rate of transpiration</p> <p>Translate information between graphical and numerical form</p>	<p>Extract and interpret information from graphs, charts and tables</p> <p>Describe the process of transpiration and translocation, including the structure and function of the stomata</p> <p>Calculate the rate of chemical reactions and blood flow</p>
Beyond the classroom	STEM club – design your own specialised cell	Stem cells in the news to cure diseases such as diabetes and blood cancer and other life changing treatments Stem cells - BBC News	Covid fighting enzymes? Lab-Made Enzymes Could Chop Up the Virus That Causes COVID - Scientific American	Journey of a red blood cell The Journey of a Red Blood Cell Lorne Laboratories UK (lornelabs.com)	Gene causing CHD found: better treatments ahead? Genes responsible for coronary artery disease, world's No. 1 killer, identified -- ScienceDaily	Pig heart anyone? Man gets genetically-modified pig heart in world-first transplant - BBC News