

## GCSE Biology – Year 9

Biology	Spec points covered	
<b>Microscopes</b>	B1.3 B1.4 B1.5 B1.6	<p>Explain how changes in microscope technology, including electron microscopy, have enabled us to see cells with more clarity and detail than in the past</p> <p>Demonstrate an understanding of size and scale in relation to microscopy, including magnification calculations.</p> <p>Demonstrate an understanding of the relationship between quantitative units, including</p> <p>(a) milli (<math>10^{-3}</math>), micro (<math>10^{-6}</math>), nano (<math>10^{-9}</math>), pico (<math>10^{-12}</math>)</p> <p>(b) calculations with numbers written in standard form</p> <p>Produce labelled scientific drawings from observations of biological specimens using microscopes</p>
<b>Plant and animal cells</b>	B1.1  B1.4 B1.6	<p>Explain how the sub-cellular structures of eukaryotic and prokaryotic cells are related to their functions, including:</p> <p>(a) animal cells - nucleus, cell membrane, mitochondria and ribosomes</p> <p>(b) plant cells - nucleus, cell membrane, cell wall, chloroplasts, mitochondria and ribosomes</p> <p>Demonstrate an understanding of size and scale in relation to microscopy, including magnification calculations</p> <p>Produce labelled scientific drawings from observations of biological specimens using microscopes</p>
<b>Cell Specialisation</b>	B1.1  B1.4 B1.6	<p>Explain how the sub-cellular structures of eukaryotic and prokaryotic cells are related to their functions, including:</p> <p>(a) animal cells - nucleus, cell membrane, mitochondria and ribosomes</p> <p>(b) plant cells - nucleus, cell membrane, cell wall, chloroplasts, mitochondria and ribosomes</p> <p>Demonstrate an understanding of size and scale in relation to microscopy, including magnification calculations</p> <p>Produce labelled scientific drawings from observations of biological specimens using microscopes</p>
<b>Inside Bacteria</b>	B1.1  B1.5	<p>Explain how the sub-cellular structures of eukaryotic and prokaryotic cells are related to their functions, including:</p> <p>(c) bacteria - chromosomal DNA, plasmid DNA, cell membrane, ribosomes and flagella.</p> <p>Demonstrate an understanding of the relationship between quantitative units, including (a) milli (<math>10^{-3}</math>), micro (<math>10^{-6}</math>), nano (<math>10^{-9}</math>), pico (<math>10^{-12}</math>)</p>
<b>Enzymes and nutrition</b>	B1.12  B1.5	<p>Explain the importance of enzymes as biological catalysts in the synthesis of carbohydrates, proteins and lipids and their breakdown into sugars, amino acids and fatty acids and glycerol</p> <p>(b) calculations with numbers written in standard form</p>
<b>Enzyme action</b>	B1.7  B1.8	<p>Explain the mechanism of enzyme action including the active site and enzyme specificity</p> <p>Explain how enzymes can be denatured due to changes in the shape of the active site</p>
<b>Enzymes activity</b>	B1.9  B1.11 B1.10	<p>Explain the effects of temperature, substrate concentration and pH on enzyme activity</p> <p>Demonstrate an understanding of rate calculations for enzyme activity</p> <p><i>Investigate the factors that affect enzyme activity</i></p>
<b>Transporting substances</b>	B1.15 B1.17 B1.16	<p>Explain how substances are transported by diffusion, osmosis and active transport.</p> <p>Calculate percentage gain and loss of mass in osmosis</p> <p><i>Investigate osmosis in potatoes</i></p>

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<b>Mitosis</b>	B2.1 B2.2 B2.3 B2.4	Describe mitosis as part of the cell cycle including the stages interphase, prophase, metaphase, anaphase and telophase and cytokinesis Describe the importance of mitosis in growth, repair and asexual reproduction Describe the division of a cell by mitosis as the production of two daughter cells, each with identical sets of chromosomes in the nucleus to the parent cell, and that this results in the formation of two genetically identical diploid body cells Describe cancer as the result of changes in cells that lead to uncontrolled cell division.
<b>Growth</b>	B2.5 B2.7 B2.6	Describe growth in organisms, including: (a) cell division and differentiation in animals Demonstrate an understanding of the use of percentiles charts to monitor growth Explain the importance of cell differentiation in the development of specialised cells
<b>Growth in plants</b>	B2.5 B2.6	Describe growth in organisms, including: (b) cell division, elongation and differentiation in plants Explain the importance of cell differentiation in the development of specialised cells
<b>Stem Cells</b>	B2.8 B2.9	Describe the function of embryonic stem cells, stem cells in animals and meristems in plants Discuss the potential benefits and risks associated with the use of stem cells in medicine
<b>The nervous system</b>	B2.13	Explain the structure and function of sensory neurones, motor neurones and synapses in the transmission of electrical impulses including the axon, dendron, [myelin sheath and the role of neurotransmitters]
<b>Neurotransmission speeds</b>	B2.13 B2.14	Explain the structure and function of sensory neurones, motor neurones and synapses in the transmission of electrical impulses including the [axon, dendron,] myelin sheath and the role of neurotransmitters Explain the structure and function of a reflex arc including sensory, relay and motor neurones