

Year 9 Autumn Term 1

Department: Science Unit of Work: Biology key concepts, cells and control.

Projection Grades (end of year 11) 1-3	Projection Grades (end of year 11) 4-6	Projection Grades (end of year 11) 7-9
<ul style="list-style-type: none"> <input type="checkbox"/> Draw and label a plant, animal and bacterial cell <input type="checkbox"/> State the meaning of the terms how eukaryotic and prokaryotic cells. <input type="checkbox"/> Label a light microscope and state an electron microscope can see structures with greater detail and clarity. <input type="checkbox"/> Describe the structure of an enzyme and name the factors that effect how an enzyme works. <input type="checkbox"/> Describe enzymes as biological catalysts and name the sub units of the main food groups. <input type="checkbox"/> Recall that mitosis is for growth and repair and name the stages of the cell cycle including the stages interphase, prophase, metaphase, anaphase and telophase and cytokinesis <input type="checkbox"/> Describe cancer as the result of changes in cells that lead to uncontrolled cell division <input type="checkbox"/> Describe growth in organisms, including: a cell division and differentiation in animals b cell division, elongation and differentiation in plants <input type="checkbox"/> Label the structures of the sensory, relay and motor neurones 	<ul style="list-style-type: none"> <input type="checkbox"/> Describe the functions of the sub-cellular structures of plant, animals and bacterial cells. <input type="checkbox"/> Describe how specialised cells are adapted to their function, including: a sperm cells – acrosome, haploid nucleus, mitochondria and tail b egg cells – nutrients in the cytoplasm, haploid nucleus and changes in the cell membrane after fertilisation c ciliated epithelial cells <input type="checkbox"/> Describe the difference between an electron and light microscope <input type="checkbox"/> Demonstrate an understanding of the relationship between quantitative units in relation to cells, including: a milli (10⁻³) b micro (10⁻⁶) c nano (10⁻⁹) d pico (10⁻¹²) <input type="checkbox"/> Explain how enzymes can be denatured due to changes in the shape of the active site and describe the effects of temperature, substrate concentration and pH on enzyme activity <input type="checkbox"/> Explain how substances are transported into and out of cells, including by diffusion, osmosis and active transport <input type="checkbox"/> Describe mitosis as part of the cell cycle, including the stages interphase, prophase, metaphase, anaphase and telophase and cytokinesis <input type="checkbox"/> Describe the function of embryonic stem cells, stem cells in animals and meristems in plants <input type="checkbox"/> Describe the structure and function of sensory receptors, sensory neurones, relay neurones in the CNS, motor neurones and synapses in the transmission of electrical impulses, including the axon, dendron, myelin sheath and the role of neurotransmitters <input type="checkbox"/> Explain the structure and function of a reflex arc 	<ul style="list-style-type: none"> <input type="checkbox"/> Explain how changes in microscope technology, including electron microscopy, have enabled us to see cell structures with more clarity and detail than in the past and increased our understanding of the role of sub-cellular structures <input type="checkbox"/> Complete calculations with numbers written in standard form and be able to convert between units. <input type="checkbox"/> Explain the mechanism of enzyme action including the active site and enzyme specificity <input type="checkbox"/> Explain 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 <input type="checkbox"/> Explain the importance of cell differentiation in the development of specialised cells <input type="checkbox"/> Discuss the potential benefits and risks associated with the use of stem cells in medicine <input type="checkbox"/> Explain the structure and function of sensory receptors, sensory neurones, relay neurones in the CNS, motor neurones and synapses in the transmission of electrical impulses, including the axon, dendron, myelin sheath and the role of neurotransmitters

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Department: Science Unit of Work: Cells and control

Projection Grades (end of year 11) 1-3	Projection Grades (end of year 11) 4-6	Projection Grades (end of year 11) 7-9
<ul style="list-style-type: none"> <input type="checkbox"/> State the stages of mitosis: interphase, prophase, metaphase, anaphase and telophase and cytokinesis <input type="checkbox"/> Recall that mitosis is for growth and repair. <input type="checkbox"/> Describe cancer as the result of changes in cells that lead to uncontrolled cell division <input type="checkbox"/> State growth in organisms, including: a cell division and differentiation in animals b cell division, elongation and differentiation in plants <input type="checkbox"/> Recall that percentile charts monitor growth <input type="checkbox"/> Recall the different types of stem cells: embryonic stem cells, stem cells in animals and meristems in plants <input type="checkbox"/> Label sensory neurones, relay neurones, the CNS and motor neurones. <input type="checkbox"/> Label the reflex arm and describe an example 	<ul style="list-style-type: none"> <input type="checkbox"/> Describe mitosis as part of the cell cycle, including the stages interphase, prophase, metaphase, anaphase and telophase and cytokinesis. <input type="checkbox"/> Describe the importance of mitosis in growth, repair and asexual reproduction <input type="checkbox"/> 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 <input type="checkbox"/> Demonstrate an understanding of the use of percentiles charts to monitor growth <input type="checkbox"/> Describe the function of embryonic stem cells, stem cells in animals and meristems in plants <input type="checkbox"/> Describe the structure and function of sensory receptors, sensory neurones, relay neurones in the CNS, motor neurones and synapses in the transmission of electrical impulses, including the axon, dendron, myelin sheath and the role of neurotransmitters <input type="checkbox"/> Describe the structure and function of a reflex arc including sensory, relay and motor neurones 	<ul style="list-style-type: none"> <input type="checkbox"/> Explain the importance of cell differentiation in the development of specialised cells <input type="checkbox"/> Discuss the potential benefits and risks associated with the use of stem cells in medicine <input type="checkbox"/> Explain the structure and function of sensory receptors, sensory neurones, relay neurones in the CNS, motor neurones and synapses in the transmission of electrical impulses, including the axon, dendron, myelin sheath and the role of neurotransmitters <input type="checkbox"/> Explain the structure and function of a reflex arc including sensory, relay and motor neurones