Curriculum Plans: Year 9 (Biology)

	Topic	Knowledge: By the end of the unit students will know:	Skills: What skills will students have developed by the end of this unit?	Key terms: What new key terms and vocabulary will be learnt in this unit?	Summative Assessment: How will pupils be assessed in this unit?
Michaelmas 1	**4.1.1 Cell structure**	• Structure of eukaryotic cells (plant and animal cells) • Structure of prokaryotic cells (bacterial cells) • Function of structural adaptations of specialised animal and plant cells • Microscopy including the use of a light microscope and comparison with an electron microscope	• Demonstrate an understanding of the scale and size of cells • Unit conversions • Order of magnitude calculations, including the use of standard form • Use a light microscope to observe, draw and label a selection of plant and animal cells • Magnification calculations	Eukaryotic Nucleus Cytoplasm Cell membrane Mitochondria Ribosomes Chloroplast Vacuole Prokaryotic Flagellum Plasmid Magnification Resolution Light microscope Electron microscope	TEST_Cells & Microscopes
Michaelmas 2	**4.1.3 Transport in cells**	• Movement of substances into and out of cells via Diffusion, osmosis and Active transport	• Calculate and compare surface area to volume ratios. • Recognise, draw and interpret diagrams that model diffusion. • Recognise, draw and interpret diagrams that model osmosis. • Use percentages • Calculate percentage gain and loss of mass of plant tissue. • Plot, draw and interpret appropriate graphs relating to osmosis	Diffusion Concentration Gradient Equilibrium Water potential Osmosis Partially permeable membrane Hypertonic Hypotonic Isotonic Active transport Helper protein ATP/energy	TEST_Transport in cells

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Lent 1	**4.1.2 Cell division**	• Stages of the cell cycle • Process of mitosis • Cell differentiation • Stem Cells in animals (adult and embryonic) • Stem cells in plants (meristem)	• Use models and analogies to develop explanations of how cells divide. • Recognise and describe situations in given contexts where mitosis is occurring • Evaluate the practical risks and benefits, as well as social and ethical issues, of the use of stem cells in medical research and treatments.	Interphase Chromosomes Chromatids Mitosis Cytokinesis Differentiation Stem cell Meristem	TEST_ Cell division & stem cells
Lent 2	**4.2.2.1 human digestive system**	• Principles of organisation (cells, tissues, organs, systems) • Digestive system (organisation and function of each organ) • Enzymes • Digestive enzymes • Food tests	• Develop an understanding of size and scale in relation to cells, tissues, organs and systems • Use lock and key model to explain enzyme action • Use a continuous sampling technique to determine the time taken to completely digest a starch solution at a range of pH values • Carry out rate calculations for chemical reactions • Use qualitative reagents to test for a range of carbohydrates, lipids and proteins (include: Benedict's test for sugars; iodine test for starch; and Biuret reagent for protein)	Tissue Organ Organ system Oesophagus Stomach Small intestine Large intestine Liver Pancreas Gall bladder Bile Carbohydrase Protease Lipase Substrate Enzyme Active site Denature Benedict's Biuret Iodine	TEST_ Biological molecules & digestion

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Trinity 1	**4.2.2.2/3/4 human circulation system**	• structure and function of the human breathing system, including how lungs are adapted for gaseous exchange. • Structure and function of the human heart and main blood vessels associated with the heart • Structure and function of the three main types of blood vessel • Composition of the blood	• Recognise/label different structures from a photograph or diagram • use simple compound measures such as rate and carry out rate calculations for blood flow • recognise different types of blood cells in • a photograph or diagram, and explain how they are adapted to their functions.	Trachea Bronchi alveoli capillary atrium ventricle valve pulmonary artery pulmonary vein vena cava aorta double circulation red blood cell white blood cell platelets plasma	
Trinity 2	**4.2.2.2/3/4 human circulation system**	• Coronary heart disease: a non-communicable disease. Risk factors of the disease, cause, symptoms and treatments.	• Interpret data about risk factors for coronary heart disease • evaluate the advantages and disadvantages of treating cardiovascular diseases by drugs, mechanical devices or transplant	coronary artery cholesterol stent statin pacemaker	EXAM_ End of year