

Curriculum Map: Year 9 Biology

	Half Term 1	Half Term 1	Half Term 2	Half Term 3	Half Term 5	Half Term 6
Topic	Cell Structure Microscopy	Specialised Cells Mitosis and cell cycle	Transport within Cells (Diffusion, Osmosis, Active transport)	Principles of Organisation and Enzymes and Digestion The heart, blood and blood vessels	Communicable Diseases Human Defence Systems Vaccination Drugs against disease Discovery of drugs	Photosynthesis, Respiration and Metabolism
Intent	Students develop a deeper understanding of cells as the building block of life. Students will learn the structure and function of cell components of both Prokaryotes and Eukaryotes. They will develop their ability to use a microscope to identify cells and record observations.	Students will explore how structural differences between types of cells enables them to perform specific functions within the organism. Understand that for an organism to grow, cells must divide by mitosis. Develop understanding of stem cells and stem cell technology and how this new branch of medicine allows doctors to repair damaged organs by growing new tissue from stem cells.	To understand how substances move into and out of cells. To begin to be able to link the importance of the substances to the bigger picture of the life of the organism.	Students learn the principles of organisation of the whole organism of animals and plants. Being able to relate their years' work on the building blocks of life to the whole organism and the 7 life processes (MRS GREN). Students will develop their existing knowledge of organism organisation, focussing on the digestive system. Students will develop a deeper knowledge of the digestive process including the action of enzymes and how nutrients are absorbed. Students will study the circulatory system learning about the structure and function of the heart and blood vessels.	To develop a deeper knowledge of micro-organisms. Learn about communicable diseases and how pathogens can be transmitted, relating this to real life current affairs. Understand the first and second line of human defence systems and begin to explore the workings of the immune system. Students are able to explain the process of vaccination and evaluate the global use of vaccination in the prevention of disease. To learn how other common drugs work to kill pathogens or relieve symptoms. Explore the development of new drugs from concept to use. Make links between the discovery of new drugs and the importance of the conservation of the planet.	Student will learn how substances are transported around the plant. They will develop their knowledge of the process of photosynthesis, the factors that affect it and apply this knowledge to real life situations. They will learn about the process of aerobic and anaerobic respiration. Students will understand the effects of exercise on respiration. Students will link their knowledge from other topics to consolidate their knowledge of metabolism.
Key Knowledge	Structure of eukaryotes and prokaryotes.	Identify specialised cells and explain how their structure is adapted to function	The process of diffusion. The process of osmosis.	Define and identify tissues, organs and organ systems in plants and animals.	The modes of transmission for micro-organisms. Process of vaccination.	Transpiration. Environmental effects of transpiration. Translocation.

	<p>Structure and function of animal and plant cell and cell structures.</p> <p>How to set up and use a microscope to analyse prepared slides. Eg. Onion cell.</p> <p>How to prepare a slide for analysis.</p> <p>Calculate magnification and size of objects.</p> <p>$I=A/M$</p>	<p>and place within the whole organism.</p> <p>The process and purpose of mitosis</p> <p>Steps of the cell cycle.</p> <p>Location and function of stem cells both within the body and as a therapeutic medical tool.</p>	<p>The process of active transport.</p> <p>Understanding what a concentration gradient is.</p> <p>Understanding surface area to volume ratio and perform calculations.</p>	<p>Describe the function of plant and animal tissues.</p> <p>Know the functions of different organ systems and how they link to MRS GREN.</p> <p>Cells, tissues, organs, and organ systems.</p> <p>The structure of the digestive system.</p> <p>The "Lock and Key Theory".</p> <p>Products of digestion linked to each type of enzyme.</p> <p>Heart and blood vessels.</p>	<p>Function and examples of antibiotic, painkillers, and antivirals.</p> <p>How pathogens can cause damage.</p> <p>Specifics of 7 communicable diseases.</p> <p>The non-specific human defences.</p> <p>Functions of white blood cells.</p> <p>Process of drug development.</p> <p>Understand that the results of testing and trials are published only after scrutiny by peer review.</p>	<p>Photosynthesis equation.</p> <p>Factors that affect photosynthesis.</p> <p>Aerobic respiration equation.</p> <p>Anaerobic respiration equation for animals, plants and yeast.</p> <p>Recall what is energy needed for.</p> <p>Describe the effect of exercise on the body.</p> <p>Define oxygen debt.</p> <p>Describe what metabolism includes.</p>
Key Skills	<p>Use scientific vocabulary, terminology and definitions confidently in both written and spoken work when recalling and comparing cells.</p> <p>Develop ability in method writing.</p> <p>Develop use of the microscope to make accurate observations.</p> <p>Use prefixes centi, milli, micro and nano.</p> <p>Calculations and manipulation of formula.</p>	<p>Through use of the relevant scientific vocabulary compose explanations and justifications.</p> <p>Evaluate the practical risks and benefits, as well as social and ethical issues, of the use of stem cells in medical research and treatments.</p>	<p>Use scientific vocabulary, terminology and definitions confidently in both written and spoken work.</p> <p>Graph skills.</p> <p>Calculations.</p> <p>Problem solving.</p> <p>Safely carry out required practicals.</p> <p>Analysis of data.</p> <p>Interpretation of diagrams that model osmosis.</p>	<p>Use scientific vocabulary, terminology and definitions confidently in both written and spoken work.</p> <p>Descriptive writing.</p>	<p>Use scientific vocabulary, terminology and definitions confidently in both written and spoken work.</p> <p>Graph skills.</p> <p>Descriptive writing.</p> <p>Describe and explain specified examples of the technological applications of science.</p> <p>Describe and evaluate, with the help of data, methods that can be used to tackle problems caused by human impacts on the environment.</p>	<p>Practical skills.</p> <p>Graph plotting and interpretation.</p> <p>Use scientific vocabulary, terminology and definitions confidently in both written and spoken work.</p> <p>Comparisons.</p> <p>Data interpretation.</p>

Key Vocabulary	Cell, nucleus, cytoplasm, cell membrane, chloroplast, mitochondria, ribosome, cell wall, vacuole, magnify, eukaryote, prokaryote, compare, calculate, identify.	Stem cells, mitosis, replicate, DNA, differentiate, specialised, embryo, phase, meristem, therapeutic, explain.	Diffusion, osmosis, active transport, concentration, passive, active, turgid, flaccid, ions, absorb, solution, ratio, surface area, partially permeable, calculate, explain.	Cell, tissue, organ, organ system, organism, MRS GREN, tissues, organisms, saliva, pancreas, protease, carbohydrase, amylase, lipase, bile, emulsifies, gall bladder, absorbed, ventricle, aorta, vena cava, pulmonary artery, coronary, pacemaker.	Communicable, immune, pathogen, bacteria, virus, fungi, transmission, infectious, toxin, neutralise, symptom, protest, vector, antibody, antitoxin, phagocytosis Vaccine, vaccination, toxicity, efficacy, dose, clinical, trial, stimulate, immunise, resistant, strains, placebo.	Photosynthesis, carbon dioxide, oxygen, glucose, starch, factor, energy, transfer, chloroplast, rate, inverse square law, intensity, cellulose, epidermal, xylem, phloem, mesophyll, palisade, meristem, transpiration, humidity, stomata, translocation, endothermic, respiration, aerobic, anaerobic, exothermic, lactic acid, yeast, fermentation, heart rate, breathing rate, oxygen debt, metabolism, reaction.
Key Reading	BBC Bite Size Combined Science Biology CGP Revision Guide	BBC Bite Size Combined Science Biology CGP Revision Guide	BBC Bite Size Combined Science Biology CGP Revision Guide	BBC Bite Size Combined Science Biology CGP Revision Guide	BBC Bite Size Combined Science Biology CGP Revision Guide	BBC Bite Size Combined Science Biology CGP Revision Guide
End Point	Students are competent in answering structured and longer response exam style questions. Able to structure comparative sentences. Can recall scientific equation.	Students are competent in answering structured and longer response exam style questions. Able to structure explanations. Required Practical 2	Students are competent in answering structured and longer response exam style questions. Students can plot and analyse line graphs.	Students are competent in answering structured and longer response exam style questions. Group presentations. Required Practical 3+4	Students are competent in answering structured and longer response exam style questions.	Students are competent in answering structured and longer response exam style questions.

	Required Practical 1= Microscopy					
Form of Assessment	Exam ready questions	Exam ready questions DC1	Exam ready questions	Exam ready questions	Exam ready questions	Exam ready questions DC2
Enrichment Opportunities	As Universities start to offer science based workshops again Y9 will be given the opportunity to take part. Linked with Duke of Edinburgh there is an opportunity for some students to gain hands on experience in a science career with a Science technician as part of their skills or volunteering section.					
Leadership Opportunities	Chances to formally present within lessons and take ownership of that process. Student helper to support other students especially in required practicals. Student example to demonstrate good quality work .					



AMBITION



RESILIENCE



COURTESY



KINDNESS