



Overview plans for academic year 2023-2024

Subject: Biology

Year group/cohort: Y10

	Knowledge and Understanding	Knowledge and Understanding	Skills	Skills	Assessment	Subject specific literacy	Cross curricular links
	Components (Key concepts)	Composite (Bigger picture)	Components (Key concepts)	Composite (Bigger picture)	What is being assessed, how, and when?	Key Vocabulary	Including Personal Development and SMSC
Autumn Term 1	Identify and describe the key parts of a microscope and calculate magnification. Identify key parts of animal and plant cells and the functions of organelles. Describe the process of mitosis using keywords. Describe differences between embryonic and adult stem cells. List some arguments for and against the use of stem	<u>Unit B1 Cell Biology</u>	To use a light microscope to observe, draw and label a selection of plant and animal cells. A magnification scale must be included. To investigate the effect of antiseptics or antibiotics on	<u>Required Practical Microscopy</u> <u>Required Practical Culturing Microorganisms</u>	Formative assessment Microscopy calculations 6 mark question	Organelle Magnification Diffusion Osmosis Active Transport Mitochondria	Ethical discussions around the use of embryonic stem cells in research

	<p>cells. Explain the differences between diffusion, osmosis, and active transport</p>		<p>bacterial growth using agar plates and measuring zones of inhibition</p> <p>To investigate the effect of a range of concentrations of salt or sugar solutions on the mass of plant tissue</p>	<p><u>Required Practical – Osmosis</u></p>	<p>Formative assessment – Osmosis</p> <p>End of Topic Assessment</p>		
<p>Autumn Term 2</p>	<p>Give functions of cells, tissues, organs, organ systems and organisms using examples. Describe the structure and function of organs within the digestive system and the specific roles. Describe the structure of specific molecules and how they can be broken down during digestion.</p>	<p><u>B2 Organisation</u></p>	<p>Use qualitative reagents to test for a range of carbohydrates, lipids and proteins. To include: Benedict's test for sugars; iodine test for starch; and Biuret</p>	<p><u>Required Practical – Food Tests</u></p>	<p>Formative assessment – Food Tests</p>	<p>Enzyme Vessel Non-communicable Benign Malignant</p>	<p>Discussion around health as wellbeing and the impact on the NHS.</p>

	<p>Discuss the role of enzymes in digestion. Describe the structure and function of the circulatory system, including the heart and blood vessels.</p> <p>Discuss interventions of the heart and evaluate different methods. Describe the structure and function of the respiratory system including adaptations.</p> <p>Discuss causes of non-communicable disease and the risks associated. Describe how cancers can form.</p>		<p>reagent for protein.</p> <p>Students use a continuous sampling technique to determine the time taken to completely digest a starch solution at a range of pH values.</p> <p>Student dissect a heart to view chambers, valves, muscle, arteries and veins</p>	<p><u>Required Practical – Enzymes</u></p> <p><u>Practical – Heart Dissection</u></p>	<p>6 mark question</p> <p>Formative Assessment - Enzymes</p> <p>Formative Assessment – Coronary Heart Disease</p> <p>End of Topic Assessment</p>		
Spring Term 1	<p>Recall cell structure of prokaryotic and eukaryotic cells. Introduce disease causing</p>	<u>B3 Infection and Response</u>			<p>6 Mark Question</p>	<p>Antibiotic resistance</p> <p>Antibody</p> <p>Antigen</p> <p>Antitoxin</p>	<p>This opportunity enables the incorporation of</p>

	<ul style="list-style-type: none"> • microorganisms such as virus, • protist, bacterial and fungi (pathogens). <p>Investigate diseases caused by each pathogen that can cause harm to both plants and animals and their impact on organisms defences. Categorise diseases as communicable and noncommunicable giving examples of each.</p> <p>Investigate vaccinations and the discovery of medicinal drugs to treat illness, using this information to understand the social implications of antibiotic resistance.</p>		<p>Students have the opportunity to revisit learning aseptic technique</p> <p>Students have the opportunity to revisit learning – use of the microscope and microscope calculations</p>	<p><u>Recall Aseptic Technique – Culturing Microorganisms</u></p> <p><u>Recall Use of Microscope</u></p>	<p>Formative Assessment – Immune System</p> <p>Formative Assessment – Herd Immunity</p>	<p>Communicable disease Immunisation Phagocytosis Vaccination</p>	<p>cultural capital through discussion of some great scientists from the past, such as Alexander Fleming, Ignaz Semmelweis and Louis Pasteur. They look at the work of these doctors and scientists and discuss why their work has been so important, a concept students may be familiar with the History curriculum and the development of</p>
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					End of Topic Assessment		medicine through time.
Spring Term 2	Recap the structures of a cell and their respective functions Include the plants uses for glucose Adaptation of the leaf to facilitate photosynthesis and factors that affect the rate of photosynthesis.	<u>B4 Bioenergetics</u>	Investigate the effect of light intensity on the rate of photosynthesis using an aquatic organism such as pondweed.	<u>Required Practical - Photosynthesis</u>	Formative Assessment - Photosynthesis	Photosynthesis Synthesis Aerobic Respiration Anaerobic Respiration Fermentation Limiting Factor Oxygen Debt Metabolism	
Summer Term 1	Compare and contrast between aerobic and anaerobic respiration focusing on their efficiency, investigate industrial applications to maximise the rates of both photosynthesis and respiration in supporting the farming, drinks and food industry.				Formative Assessment – Colonising Mars		Links made to food production and the cost of living. Discuss the impact of human activity on the environment.

					End of Topic Assessment		
Summer Term 2	<p>Define key terms – communities, biotic and abiotic, biodiversity, and ecosystem.</p> <p>Describe and explain the adaptations of organisms.</p> <p>Describe how to investigate the distribution of organisms in a given area.</p> <p>Discuss how materials are recycled.</p> <p>Discuss the impact of humans on organisms and the environment.</p>	<u>B7 Ecology</u>	<p>To measure the population size of a common species in a habitat. Use sampling techniques to investigate the effect of a factor on the distribution of this species</p> <p>To investigate the effect of temperature on the rate of decay of fresh milk by measuring pH change.</p>	<p><u>Required Practical</u> <u>Quadrats</u></p> <p><u>Required Practical</u> <u>Decay</u></p>	<p>Formative Assessment K&U – Biomass</p> <p>Formative assessment Quadrats/Sampling Techniques (NUM)</p> <p>6 Mark Question</p> <p>Formative Assessment Decay</p> <p>End of Topic Assessment</p>	<p>Community</p> <p>Biotic</p> <p>Abiotic</p> <p>Adaptation</p> <p>Biodiversity</p> <p>Ecosystem</p>	

Subject Information including exam board details:**AQA Biology 4461****Careers linked to this subject area:**

Biologist

Ecologist

Geneticist

Marine Biologist

Health Care

Paramedic

Medical Careers

Enrichment Opportunities:

Science in the News : [Science News Explores | News from all fields of science for readers of any age \(snexplores.org\)](https://www.snexplores.org/)

Seneca Learning [Free Homework & Revision for A Level, GCSE, KS3 & KS2 \(senecalearning.com\)](https://www.senecalearning.com/)

Focus Educational log in – Interactive Required Practicals <https://www.focuselearning.co.uk/u/38146/gbhzCgxzycptBrCnafDAomEiyydluFigv>

BBC Bitesize [GCSE Biology \(Single Science\) - AQA - BBC Bitesize](https://www.bbc.com/education/gcse-biology)

