



Year 12 Curriculum intent – 2022-23

	Autumn Term		Spring Term		Summer Term	
	1	2	1	2	1	2
Key Concepts	<p>Biological Molecules</p> <p>Within this unit pupils will study the molecular structure of common molecules found in living organisms. This will build upon their knowledge at GCSE of basic molecules like carbohydrates, lipids and proteins. Students will learn the fundamental condensation and hydrolysis reaction which enable these molecules to be pieced together as a primary building block of life. They will also learn the advantages and disadvantages of</p>	<p>Cells</p> <p>This unit will encompass cellular organisation of eukaryotic and prokaryotic cells to enable students to apply their understanding of biological processes. We will also uncover how these discoveries were made by investigating how cells can be studied with microscopes and other techniques. Cellular replication is introduced. The fundamentals of cellular transport are built upon from GCSE. Students will also have the opportunity to study the immune</p>	<p>Organisms exchange substances with their environment</p> <p>Within this unit pupils investigate how different groups of organism’s exchange gases including mammals, fish and insects; as well as the importance of managing this process. Digestion is studied and evaluated. Finally, pupils will begin to investigate how substances can be relocated within an organism, becoming familiar with both mammalian and botanic systems.</p>	<p>Genetic information, variation and relationships between organisms</p> <p>This unit will have pupils study the fundamentals of DNA within organisms as they follow the biological processes leading to its expression. Student must also investigate how mutations may affect an organism either positively or negatively. Th importance of genetic diversity which results from meiosis and the implications of this on the survival of a species. Classification of species is covered leading on to how scientist may investigate diversity in a given community and finally students will evaluate the benefits and drawbacks of conservation strategies.</p>	Revision	Revision



	<p>molecules to different organisms and finally understand the fundamentals of DNA.</p>	<p>system and fully comprehend the way our body responds to pathogens.</p>				
<p>Knowledge & Understanding</p>	<p>Students following the AQA A-level Biology specification will build upon their knowledge and understanding throughout the year. Pupils will continuously be introduced to new content and concepts relevant to today's biological landscape. Students are provided with ample opportunity to apply these in contextualised situations. Students will obtain biological knowledge which can be applied to many different industries allowing them to potentially access many different sectors.</p> <p>Biological molecules</p> <ul style="list-style-type: none"> - Key biological molecules - Enzymes and enzyme action - DNA Structure and replication - ATP - Water - Inorganic ions <p>Cells</p> <ul style="list-style-type: none"> - Cell structure - Methods of studying cells - Cellular replication 	<p>Students following the AQA A-level Biology specification will build upon their knowledge and understanding throughout the year. Pupils will continuously be introduced to new content and concepts relevant to today's biological landscape. Students are provided with ample opportunity to apply these in contextualised situations. Students will obtain biological knowledge which can be applied to many different industries allowing them to potentially access many different sectors.</p> <p>Organisms exchange substances with their environment</p> <ul style="list-style-type: none"> - Surface area to volume ratio - Gas exchange - Digestion - Mass transport <p>Genetic information, variation and relationships between organisms</p> <ul style="list-style-type: none"> - DNA, genes and chromosomes - DNA expression - Genetic diversity origins - Adaptation - Species and taxonomy - Investigating diversity 	<p>Students following the AQA A-level Biology specification will build upon their knowledge and understanding throughout the year. Key concepts actively addressed in this term will be:</p> <ul style="list-style-type: none"> - Exam technique - Comprehension - Extended response - A01,2 &3 			



	<ul style="list-style-type: none"> - Transport - Immunity 					
Assessment	Weekly extended response assessment	mock exams	Weekly extended response assessment	mocks exams	Weekly extended response assessment	End of Unit Assessment
Why this? Why now?	<p>These units are studied first as they provide a lot of key biological fundamentals. Within the biological molecules unit pupils are introduced to substances which they will later investigate the role these play within other systems. Knowledge of hydrolysis reactions is necessary to understanding phagocytosis. Pupils re introduced to the discovery of key concepts such as DNA to allow them to better understand its application later.</p>		<p>These units build upon the foundations set by cells and biological molecules. Within the exchange unit pupils must contextualise of cellular transport processes. By studying these units later students are able to build upon their knowledge and skills and can apply them to unfamiliar situations.</p>		<p>Having covered the entirety of the AS content students are well equipped to begin developing their ability to evaluate and apply knowledge to more unfamiliar contexts. With increasing scientific vocabulary pupils are able to access academic research in relevant areas to widen knowledge and understanding.</p>	
Skills & Characteristics	Wider application Writing skills Comparison Mathematical skills Comprehension	Wider application Writing skills Comparison Mathematical skills Comprehension	Wider application Writing skills Comparison Mathematical skills Comprehension	Wider application Writing skills Comparison Mathematical skills Comprehension	Wider application Writing skills Comparison Mathematical skills Comprehension	Wider application Writing skills Comparison Mathematical skills Comprehension
Aspirations & Careers	<p>Careers are constantly referenced within teaching. Where relevant links are made between professions and content, such as haemoglobin and medicine; investigating diversity and ecology; biological molecule and digestion with nutritional careers. Opportunities for guest speakers are explored to help expose students to pathways they may not have considered.</p> <p>Other careers facilitated may include, but are not limited to:</p> <ul style="list-style-type: none"> - Medical professions - Pharmacy - Physiotherapy 					



	<ul style="list-style-type: none"> - Biomedical engineering - Research scientists - Life sciences - Microbiology - Marine biology - Conservation and ecology - Environmental management - Food science - Agricultural engineering <p>Zoology</p>
End points	By the end of year 12, students will acquire all knowledge necessary for topics 1,2,3, &4 to be examined on AS paper 1 and 2. Student will be able to draw across the relevant specification to make cross curricular links. Student are familiar with key terminology and are able to effectively utilise scientific vocabulary when explaining concepts. Independent projects will have been undertaken which will deepen student understanding within an area of biology relevant to their interests or future career. Students will have developed research skills which will enable them to keep up to date on recent scientific discoveries.

Year 13 Curriculum intent – 2022-23						
	Autumn Term		Spring Term		Summer Term	
	1	2	1	2	1	2
Key Concepts	Energy transfers in and between organisms Students build upon their basic knowledge of metabolic processes like photosynthesis and respiration and their specific enzyme-controlled	Organisms respond to changes in their internal and external environments Building upon GCSE knowledge of survival responses such as taxes, kinesis, tropisms and reflexes. Following this student's investigate specific receptors and the	Genetics, populations, evolution and ecosystems Student recap key concepts of inheritance from GCSE before further developing their knowledge of the mechanisms such as	Control of gene expression Students will start by recapping the effect and types of mutations. They will then investigate the mechanisms of gene expression including STEM cells, regulation of transcription and translation cumulating with cancer. Students	Revision & essay skills	Revision & essay skills



	<p>reactions. Students will then research the energy pathways demonstrated within food webs. Finally studying nutrient cycles including carbon, phosphorous and nitrogen.</p>	<p>nervous coordination of heart rate. Nervous coordination of responses and synaptic transmission as the slowest point of transmission</p>	<p>codominance, epistasis and autosomal linkage. They also further develop their knowledge of population dynamics and evolution. This leads on to the types of speciation which may occur.</p>	<p>then have the opportunity to investigate gene technologies such as recombinant DNA, genetic fingerprinting, genome projects and how DNA is exploited.</p>		
<p>Knowledge & Understanding</p>	<p>Students following the AQA A-level Biology specification will build upon their knowledge and understanding throughout the year. Pupils will continuously be introduced to new content and concepts relevant to today's biological landscape. Students are provided with ample opportunity to apply these in contextualised situations. Students will obtain biological knowledge which can be applied to many different industries allowing them to potentially access many different sectors.</p> <p>Energy transfers in and between organisms</p> <ul style="list-style-type: none"> - Photosynthesis - Respiration - Energy and ecosystems - Nutrient cycles 	<p>Students following the AQA A-level Biology specification will build upon their knowledge and understanding throughout the year. Pupils will continuously be introduced to new content and concepts relevant to today's biological landscape. Students are provided with ample opportunity to apply these in contextualised situations. Students will obtain biological knowledge which can be applied to many different industries allowing them to potentially access many different sectors.</p> <p>Genetics, populations, evolution and ecosystems</p> <ul style="list-style-type: none"> - Inheritance - Populations - Evolution leading to speciation - Populations in ecosystems 	<p>Students will be actively revising key concepts and content from the 2 years. Pupils are also introduced to the 25 mark synoptic essays which require pupils to make cross specification links relevant to a singular simple prompt.</p>			



	Organisms respond to changes in their internal and external environments <ul style="list-style-type: none"> - Survival and response - Receptors - Control of heart rate - Nervous impulse - Synaptic transmission - Skeletal system - Homeostasis - Control of blood glucose - Control of blood water concentration 		Control of gene expression <ul style="list-style-type: none"> - Alteration of sequences of DNA - Gene expression - Cancer - Genome projects - Recombinant DNA technology - DNA exploitation - Genetic fingerprinting 			
Assessment	Weekly extended response assessment	mock exams	Weekly extended response assessment	mocks exams	Weekly extended response assessment	End of Unit Assessment
Why this? Why now?	A more complex biological knowledge is needed to fully comprehend the biological processes and interactions and is more appropriate at this level. Metabolic pathways are a basis for many processes' pupils may choose to study at higher education. Nutrient cycles link heavily to understanding the physical processes which underline biological organisms. The response to changes unit has high relevance to medical and human biology careers.		The interactions between species are studied at more complex levels building upon the foundations set during year 12. To fully comprehend the ways DNA can be utilised students must fully understanding the principles studied in biological molecules and genetic information.		In order to correctly answer the essay questions pupils must first have knowledge comprehensive of the AQA specification. It also provides opportunities to revise content.	
Skills & Characteristics	Wider application Writing skills Comparison Mathematical	Wider application Writing skills Comparison Mathematical skills	Wider application Writing skills Comparison	Wider application Writing skills Comparison Mathematical skills	Wider application Writing skills Comparison	Wider application Writing skills Comparison Mathematical skills



	skills Comprehension	Comprehension	Mathematical skills Comprehension	Comprehension	Mathematical skills Comprehension Essay	Comprehension Essay
Aspirations & Careers	<p>Careers are constantly referenced within teaching. Where relevant links are made between professions and content, such as haemoglobin and medicine; investigating diversity and ecology; biological molecule and digestion with nutritional careers. Opportunities for guest speakers are explored to help expose students to pathways they may not have considered. Within year 13 pupils look in depth at the work of a genetic counsellor.</p> <p>Other careers facilitated may include, but are not limited to:</p> <ul style="list-style-type: none"> - Medical professions - Pharmacy - Physiotherapy - Biomedical engineering - Research scientists - Life sciences - Microbiology - Marine biology - Conservation and ecology - Environmental management - Food science - Agricultural engineering - Zoology 					
End points	<p>By the end of year 13, students will acquire all knowledge necessary for topics 1,2,3, 4, 5, 6, 7, & 8 to be examined on A-Level paper 1, 2 and 3. Student will be able to draw across the relevant specification to make cross curricular links necessary to complete their synoptic essay. Student are familiar with key terminology and are able to effectively utilise scientific vocabulary when explaining concepts. Independent projects will have been undertaken which will deepen student understanding within an area of biology relevant to their interests or future career. Students will have developed research skills which will enable them to keep up to date on recent scientific discoveries.</p>					