	Intent: The Y12 Biology curriculum aims to introduce the first 4 modules of this linear course. Year 12 Biology bridges the gap between GCSE study, and begins to further develop critical thinking in practical work & mathematical skills as well as experimental design and analysis. The substantive knowledge from GCSE is further developed throughout Year 12, and students are equipped with the understanding of the core concepts to enable them to progress effectively to Year 13 Biology. Many practical skills are also developed over Year 12, allowing students to become familiar with more complex pieces of laboratory equipment and processes.		
Year 12 Biology	**Sept - Dec** **Unit 1 Spec code 3.1 (Biological Molecules)** **Unit 2 Spec code 3.2 (Cells – excluding immunity)**	**Jan - April** **Unit 2 Spec code 3.2 (Immunity)** **Unit 3 Spec code 3.4 (Genetic information, variation and relationships)**	**April - July** **Unit 4 Spec code 3.3 (Organism exchange substances with their environment)** **Unit 3 Spec code 3.4 (Biodiversity)**
Knowledge (facts, information, concepts and key terminology)	Many organelles exist within cells, and students can recognise them all, identify their roles and appreciate differences in specialised cells and both prokaryotic and eukaryotic cells. Cell membranes are composed of phospholipid bilayers, which allow transport of different molecules (depending on their nature) through by diffusion (facilitated or simple), active transport, co-tranport or osmosis) Process of mitosis in a cell, and calculating mitotic index. There are 5 main biological molecules within organisms that are made up of C, O, H & N. These are carbohydrates, proteins, lipids, nucleic acids and water. Students can identify molecular formula of both the monomer and polymers, describe condensation and hydrolysis reactions, identify these in a lab and discuss the features and how these link to the roles of the monomer and polymers.	The body effectively uses cell recognition to detect foreign antigens. Many different cells within the immune system coordinate an immune response. Antibodies can be used in many different ways, e.g. monoclonal & ELISA testing. How vaccines and herd immunity work. The structure and function of nucleic acids, how DNA is replicated and protein synthesis. The process of meisos and how it produces genetically unidentical daughter cells, which contributes to variation.	How a species is defined and ordered in a hierarchy using taxonomical terms. How diversity is affected directly and indirectly by humans, how we investigate and calculate it using mathematical manipulation. How surface area to volume ratio affects gas exchange in multiple different systems, and the anatomy of human, fish, insect and plant systems. The role of the digestive systems and the digestive enzymes. Mass transport in humans, including haemoglobin, the cardiac cycle and structure and function of the circularly system. Transpiration and translocation in plants.
Understanding (ability to connect and synthesise knowledge within a context)	All organisms are composed of cells, which contain a multitude of different organelles working together to enable to a functioning organism. How substances move through phospholipid bilayers depends on their chemical nature. This allows effective control of movement which regulates key processes in an organism, such as maintaining concentration gradients.	Students understand the role of membranes in cell recognition, we well as cells themselves in coordinating and immune response. The herd immunity concept links to the vaccine programme. How nucleic acids are replicated due to their structure, and how this links to protein synthesis.	Students can link their understanding of gas exchange to surface area to volume ratio to understand why specific gas exchange systems are structed in a certain way.
Skills (successful application of knowledge and understanding to a specific task)	Student carry out experiments to identify mitosis in a root tip squash (CPAC 2) & develop microscope skills (using graticule and calculating mitotic index) Produce a dilution series to investigate effects of solute concentration on osmosis and create/utilise a calibration curve (CPAC 3) Use colourimetry and investigate transport across membranes (CPAC 4) Investigate effect of temperature on enzyme activity, and calculate rate of reaction from data graphs (CPAC 1) Test for specific biological molecules in different samples.	Students learn about aseptic techniques and utilise these in an investigation on different antibiotic effects on bacterial growth (CPAC 6) Students develop mathematical skills during all practical investigations and apply these to results, e.g. statistical testing, standard deviation.	Student dissect a mass transport system (heart or plant) and develop biological drawing skills (CPAC 5) as well as safe handling of biological specimens.

Formal Assessments	End of unit tests. Assessment week 1 .Feedback on assessed practical work in lab book	End of unit tests. Assessment week 2. Feedback on assessed practical work in lab book	End of unit tests. 1st Mocks Feedback on assessed practical work in lab book

By the end of the year students on course for at least a grade C will…

- demonstrate knowledge and understanding of scientific, ideas, processes, techniques and procedures in a theoretical and practical context.
- Begin to analyse qualitative and quantitative data experimental data and draw conclusions.
- Develop and refine practical designs and procedures.
- Apply mathematical processes to data in order to confirm its validity.