



Intent: The Y10 Biology curriculum aims to introduce the first 5 modules of GCSE Biology, develop practical and mathematical skills and enable students to easily transition between KS3 into KS4 Science confidently and equip them with the substantive knowledge to enable them to progress into Y11 Science. To allow students to understand how Biology relates to the world that the live in, and how different careers also link to Biology.

Year 10 Biology	Term 1 September to December B2: Cells and control B3: Genetics	Term 2 January to Easter B4: Natural Selection and Genetic modification B5: Health, Disease and the Development of medicines.	Term 3 April to July B1: Catch up
Knowledge (facts, information, concepts and key terminology)	Mitosis, growth, stem cells, monitoring growth, nervous system. Brain structure, scans and treatment. Structure of the eye and eye defects. Meiosis, structure of DNA, extracting DNA, Alleles and inheritance, mutations, human genome project and variation. Sexual and Asexual reproduction, Protein synthesis, mutations, Mendel, inheritance of blood groups and sex-linked inheritance.	Natural selection, antibiotic resistance, fossil evidence of human evolution, stone tools, classification, selective breeding and genetic engineering. Darwin, Wallace, Pentadactyl limb, process of tissue culture. Use of fertilisers and biological control to increase yield in agriculture. Definition of health, communicable and non-communicable diseases. BMI and waist to hip ratio. Treatment of cardiovascular disease. Immune system and immunisation. Antibiotics and development of new medicines. Lifecycle of a virus, plant defence against pests and pathogens, methods of detecting and identifying plant diseases. Herd immunity. Aseptic techniques. Monoclonal antibodies and their uses.	Process of osmosis. Calorimetry and food tests.
Understanding (ability to connect and synthesise knowledge within a context)	Explain how animals and plants grow and why and how this is monitored. Explain how organisms respond to stimuli in their environment. Explain how to identify functions of areas in the brain. Identify structures in the eye and explain the cause and treatment of eye defects. Describe the structure of DNA and how it is extracted from organisms. Explain how traits are inherited and effect of mutations. Explain the process of protein synthesis and explain how co-dominant and sex-linked traits are inherited.	Explain the process of natural selection (Role of work of Darwin and Wallace in developing NS) in a variety of examples including development of antibiotic resistance in bacteria. Explain the process of genetic engineering and selective breeding (and tissue culture) . Explain how fossils (Pentadactyl limb) and stone tools provide evidence for human evolution. Describe what health is and the difference between communicable and non-communicable diseases. Describe that NC diseases are caused by interaction of a number of factors and their impact at local, global and national levels. Describe the term pathogen and the symptoms of certain pathogens, explain how they are transmitted and how this can be reduced. Explain how our immune system helps defend us against disease including the role of physical and chemical barriers, lymphocytes and immunisations. Describe the lifecycle of a virus (lysogenic and lytic pathways) and link to their spread. Explain how plants defend themselves against pests and pathogens. Describe what monoclonal antibodies are and how they can be produced and link this with their uses.	Explain the process of osmosis and link to different scenarios involving this process. Describe how to test for different nutrients in food and explain how to use calorimetry to measure the energy content in food.
Skills (successful application of knowledge and understanding to a specific task)	Mathematical calculations linked to mitosis. Use of Punnett squares to predict probabilities of certain alleles being inherited. Discuss the outcomes of the HGP and its potential applications in medicine. Practical skills-extract DNA, microscopes to identify cells in different stages of mitosis.	Identify advantages and disadvantages of immunisations. Use aseptic techniques to investigate the effect of antibiotics on microbial cultures. Calculate area of clear zones using πr^2. Use observations and data to identify causes of plant disease. Calculating BMI and waist to hip ratio. Use of agar plates to show how cleaning hands can reduce transmission of pathogens. Evaluating treatments of cardiovascular diseases.	Practical skills used to investigate osmosis in potatoes, interpretation of data to make conclusions and evaluations of practical techniques. Calculate percentage change in mass. Practical skills used to identify nutrients and energy content of different foods.
Formal Assessments	End of unit assessments for B2 & 3	End of unit assessments for B4 5	Mock exam 1 (Paper 1)
<p>By the end of the year students on course for at least a grade 5 will...</p> <ul style="list-style-type: none"> Describe and identify stages in mitosis and link back to cell structure from Y9, describe the steps in a reflex arc and identify different types of neurones. Describe the structures and functions of the brain and eye. Describe defects of the eye and how they can be corrected. Explain how gametes are formed by meiosis, the structure of DNA and reasons for steps in how DNA is extracted. Use genetic terms correctly and explain monohybrid inheritance using Punnett squares. (ABO blood groups). Identify the advantages and disadvantages of asexual and sexual reproduction Describe the steps in natural selection and selective breeding. Identify advantages and disadvantages of genetic engineering and selective breeding. Describe how fossil evidence, Ardi, Lucy and Leakeys fossils (pentadactyl limb) and stone tools provide evidence for human evolution. Identify advantages and disadvantages of use of fertilisers and biological control to meet increased food demands. Define health and describe the difference between communicable and non-communicable diseases. Describe using examples how pathogens can be spread and how spread can be reduced. Describe physical and chemical barriers used by the body to defend against pathogens. Explain the role of lymphocytes and antibodies in immunity. Describe the stages involved in developing new medicines. Describe the lifecycle of a virus and the physical and chemical defences plants use to defend themselves against pests and pathogens. Identify if water has been gained or loss by osmosis and describe the process of osmosis using key terms. Describe how to test for starch, reducing sugars, fats and protein and how to measure the energy content in foods. 			