Biology Separate Science			
Year 10 **Note all KS3 links refer to the year 9 course which was previously studied by these students.**			
Term 1 content and skills	**Term 2 Content and skills**	**Term 3 Content and Skills**	**Extended Curriculum (trips/visits/afterschool activities)**
Module 1: Cell Biology (Links to KS3 T21) • The structure of animal cells, plant cells and prokaryotic cells. • The subcellular structures within eukaryotic and prokaryotic cells. • How microscopy techniques have changed over time and carry out calculations involving magnification, real size and image size. **Required Practical:** Using a microscope to observe, draw and label cells. • Specialised cells. • Mitosis and the cell cycle. • Stem cells, how we can use them and the ethics of this. • Transport in cells: diffusion, osmosis and active transport.	**Module 2: Organisation (continuing from last term) (links to KS3 T11 and T17 and PSHE)** • The constituents of blood. • Coronary heart disease: what it is and how we treat it • Relationship between health and disease and the interactions between different types of disease • The effect of lifestyle factors including diet, alcohol and smoking on the incidence of noncommunicable diseases • Different types of cancer • The structures of plant tissues and organs and how they are related to their functions	**Module 4: Bioenergetics (links to KS3 T17, T24 GCSE Chem Module 9)** • Photosynthesis and the conditions which affect the rate of photosynthesis. • Required Practical: investigate the effect of light intensity on the rate of photosynthesis using an aquatic organism such as pondweed • Aerobic and anaerobic respiration - How the body responds to exercise Metabolism Start of paper 2 content:- continues into year 11 **Module 7: Ecology (links to T8)** • Ecosystems and how the community of living organisms (biotic) interacts	• Medtech challenge – links to engineering, design + tech, business skills. Provide industry mentor. • Stem Club • Launchpad- working with Form the Futures and local industry • STEM leaders • Engineering Club

Required Practical: Investigating the effect of a range of concentrations of salt or sugar solutions on the mass of plant tissue. **Module 2: Organisation** (taught across this term and next term) (**links to KS3 T11 and T17 and GCSE Chem Module 7**) • The human digestive system and the enzymes involved in digesting proteins, fats and carbohydrates. • How enzymes work by the 'lock and key' model. **Required Practical**: use qualitative reagents to test for a range of carbohydrates, lipids and proteins. **Required Practical:** investigate the effect of pH on the rate of reaction of amylase enzyme. • The structure of the heart and blood vessels.	**Module 3: Infection and Response** (taught across this term and next term) **(**Link to PSHE**)** • How diseases caused by viruses, bacteria, protists and fungi are spread in animals and plants (and how we try to prevent these diseases from spreading) • Human defences against pathogens (including non-specific defences and the immune system) • Vaccinations and antibiotics to protect us from pathogens - Discovery and development of drugs • Monoclonal antibodies • Plant diseases and plant defence responses	with the non-living (abiotic) parts of their environment. • Organisms have adaptations which may be structural, behavioural or functional. • Feeding relationships within a community can be represented by food chains **Required Practical**: use sampling techniques to measure the population size of a common species in a habitat.	
Assessment: A key skills set task per topic (based on practical work, numeracy, data analysis or literacy), end of topic test (which can be open book or closed book). Additionally low stakes testing (eg Microsoft forms quizzes, exam questions etc) are used within lessons.			
Assessment: End of term closed book written test	**Assessment:** End of term closed book written test	**Assessment:** End of term paper 1 exam	

Biology Separate Science			
Year 11			
Term 1 content and skills	**Term 2 Content and skills**	**Term 3 Content and Skills**	**Extended Curriculum (trips/visits/afterschool activities)**
Module 5: Homeostasis and response **(Links to GCSE Physics Module 6 and PSHE)** • Homeostasis - Structure and function of the human nervous system **Required Practical**: plan and carry out an investigation into the effect of a factor on human reaction time • The brain • The eye • Control of body temperature • Human endocrine system (glands and hormones) • Control of blood glucose concentration • Two types of diabetes and how they are treated • Maintaining water and nitrogen balance in the body • Hormones in reproduction and the menstrual cycle • Contraception	**Module 6:** Inheritance, variation and evolution **(links to KS3 T5, T20 and GCSE Chem Module 7)** • Sexual and asexual reproduction • Advantages and disadvantages of sexual and asexual reproduction • Meiosis • DNA and the genome • Structure of DNA and how proteins are synthesised • Genetic inheritance and inherited disorders • Sex determination • Variation: how a combination of genetics and environmental factors shape our characteristics • Evolution by natural selection • Selective breeding of plants and domesticated animals • Genetic engineering: science and ethics	**Module 7: Ecology continuing from year 10 (links to KS3 T8 and GCSE Chem Module 9)** • Explain how the carbon and water cycles are important to living organisms • Decomposition and the factors that affects its rate. **Required practical:** investigate the effect of temperature on the rate of decay of fresh milk by measuring pH change. • The impact of environmental changes on the distribution of species in an ecosystem • Biodiversity and the stability of ecosystems • The impact that human have had on ecosystems: waste management, land use, deforestation and global warming.	• Stem Club • Engineering Club

• Infertility and how we treat it • Plant hormones and how we can manipulate them	• Cloning of plants and animals • The different scientists that contributed towards our understand of the theory of evolution • Speciation • Fossils and evidence for evolution • How organisms become extinct • Classification of living organisms	• The importance of maintaining biodiversity • Trophic levels and pyramids of biomass • Food production: Food security, farming techniques, sustainable fishing and biotechnology to meet the demands of the growing human population Consolidation work and revision for exams	
Assessment: A key skills set task per topic (based on practical work, numeracy, data analysis or literacy), end of topic test (which can be open book or closed book). Additionally low stakes testing (eg Microsoft forms quizzes, exam questions etc) are used within lessons.			
Assessment: Interim exam on paper 1 content	**Assessment:** Mock exam on Paper 2 content	**Assessment:** GCSE exams	