Curriculum Subject: Biology KS4

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
YEAR 10	**B3 Digestive System B4 Plant and Animal Organisation** • Understand how specialised cells build up to form tissues, organs and organ systems. • The role of the digestive system and how food groups are broken down and used. • The importance of enzymes and the role of other chemicals such as bile and HCl. • The structures and functions of the circulatory and respiratory systems as well problems with heart. • Plant cell, tissue and organ organisation to include importance of xylem and phloem. • Importance of transpiration and factors that affect it. AQA required practicals 4 (food tests) and 5 (enzymes) and practice apparatus and technique skills 1, 2, 5 & 8 as well as investigative and mathematical skills. Rotation 1	**B5 Communicable Diseases and B6Preventing Diseases** • Understand the difference between communicable and non-communicable diseases. • Types of pathogens and the diseases they cause.Bacteria, viruses, fungi and protists. Including human and plant diseases. • Symptoms and treatments, having an understanding of why antibiotic resistance has emerged. • Human defense mechanisms, the immune response and vaccination. • The importance of medicines from plants and microbes. • How drugs are developed and tested. • The role of monoclonal antibodies in diagnostic medicine as well as potential to cure diseases. AQA required practical 2 (disinfectants & bacterial growth) and practice apparatus and technique skills 1, 3, 4 & 8. As well as analysis,mathematical and evaluative skills. Rotation 1	**B8 Photosynthesis and B9 Respiration** • The importance of photosynthesis in supplying energy to food chains and an understanding of the biochemistry of the process. • The role of leaves and how they are adapted for photosynthesis as well as the factors that affect the process. • To explain how the products of photosynthesis are used by the plant and how commercial growers ca maximise plant growth. • Review of cell structure to highlight importance of mitochondria in aerobic respiration. • How exercise affects the body and understand what happens when muscles respire anaerobically. • To understand reactions in the body as metabolism and the role of the liver. AQA required practical 6 (photosynthesis)and practice apparatus and technique skills 1, 2, 3, 4 & 5. As well as graphical and calculation skills. Rotation 2	**B7Non-Communicable Diseases** • Examine the link between risk factors and diseases caused by lifestyle. • Explain the difference between causation and correlation when analysing data. • Understand the difference between benign and malignant tumours and how cancer can be treated. • The health risks of smoking. • The effect of a lack of exercise and poor diet choices on development of obesity. • The causal relationship between obesity and type 2 diabetes. • The effect of alcohol abuse on the functioning of the brain and the liver as well as negatively impacting the health of unborn babies. Rotation 2	**B10Nervous System & Hormonal Communication** • Understand the body's control systems in terms of receptors, control centres and effectors. • The structure and function of the nervous system and the role of brain, sensory, motor neurones & synapses. • The importance of reflex actions to survival. • The structure and function of the eye and problems with vision and how they can be corrected. AQA Required practical 7 (human reaction times) consolitatiing apparatus and technique skills 1, 3 & 4 as well as translating information between numerical and graphical forms. Rotation 3	**B11Homeostasis** • To know the main organs and glands of the endocrine system and the importance of the pituitary gland. • To understand how blood glucose concentration is maintained by insulin and glucagon. • Differences in causes and treatments for type 1 and type 2 diabetes. • The role of negative feedback in homeostatic systems in the human body. • The role of hormones in female reproduction and how these can be controlled artificially to promote or inhibit fertility and pregnancy. • Understanding tropisms in plants and the role of hormones in agriculture and horticulture. AQA required practical 8 (effect of light on seedlings)apparatus and skills 1, 3, 4 & 7. As well as practical skills on planning, drawing and suggesting improvements. Rotation 3

	Autumn 1 **B16 & B17 Ecology**	Autumn 2 **B12 Homeostasis in action & B13 Reproduction**	Spring 1 **B14 Variation & Evolution** **B15 Genetics & Evolution**	Spring 2 **B18 Biodiversity & Ecosystems**	Summer 1 **Revision**	**External exams** **12th May 2020 paper 1** **1st June 2020 paper 2**
YEAR 11	• The importance of stable communities for ecosystems and how abiotic and biotic factors affect plants and animals. • Undertanding the complex interactions and competition between species and individuals for resources. • How organisms are adapted and the importance of extremophiles. • Explain how organisms & materials are decomposed and how water, carbon and nitrogen are recycled. AQA Required practical 9 (measuring a population in a habitat) consolidate apparatus and techniques 1, 3, 4, 6 & 8. As well as skills to calculate mean, mode and median. Required practical 10 (effect of temperature on decay of milk) Apparatus and techniques 1,3,4 & 5 as well as developing skills to hypothesize and evaluate.	• Understand how and why the human body maintains temperature. • Know how waste products of metabolism; urea, CO_2 , H_2O and mineral ions are monitored and removed from the body as required. • The role of the kidney in homeostasis and the function of the hormone ADH. • Evaluate the biological, ethical, social and economic treatments for kidney failure. • Explain the differences between asexual and sexual reproduction. • Understand meiosis and compare with mitosis. • Know the structure and function of DNA and its role as the molecule of inheritance. • Protein synthesis and how genes are inherited and how genetic disorders are passed on.	• Know that variation can be due to genes, environment or both. • Natural selection occurs due to selective pressures in the environment or mutations and results in survival of the fittest. • The advantages and disadvantages of selective breeding. • Explain the techniques of genetic engineering and cloning as well as consider the issues surrounding gene technology. • Understand how Mendel described inheritance. • Compare Lamarck and Darwin's theories of evolution and the evidence for evolution. • Know how species can evolve and become extinct. Including MRSA. • Classification, including the binomial system, the acceptance of the three domain classification and interpretation of evolutionary trees.	• The human population explosion and our impact on global resources. • Pollution of the air, water and land and measures to combat problems. • The science of global warming and its impact on ecosystems and climate. • Methods employed to maintain global biodiversity. • How energy and biomass are transferred through the food chain. • The importance of food security and how agriculture and industry can be optimised to ensure sustainable food production.	Using variety of revision resources including learning grids, specification, Seneca learning, Kerboodle, BBC Bitesize and AQA exam Qs and examiner's reports to prepare students for exams. Review of all 10 required practicals (1 and 3) completed in Year 9; focusing on AQA subject specific vocabulary, apparatus, techniques and skill development.	

St Bede's Curriculum Design Principles

Within subjects: depth, relevance, sequencing, spacing
Between subjects: breadth, cultural capital, coherence, progression, interlinking