
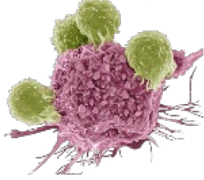

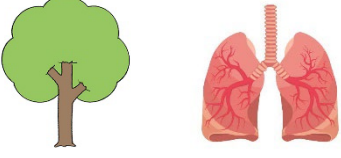
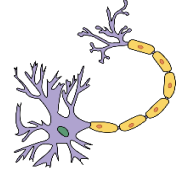
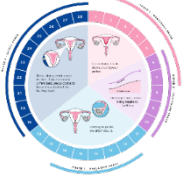


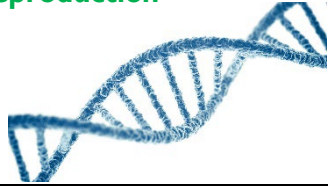





Key Stage 4 Curriculum Journey: Biology (1xGCSE)

The Science of 'life' will fascinate and motivate our KS4 pupils; who doesn't want to learn about the way our bodies work or the way 'life' finds a way? Biology is the Science of living things. Mrs Nerg is only the beginning. There is a whole world of organisms out there, from tiny bacteriophages which infect bacteria, to the humongous fungus known to be the largest living organism on Earth! Just how far have we come in maintaining and sustaining life.....?

YEAR 10 CURRICULUM JOURNEY						
	Half Term 1	Half Term 2	Half Term 3	Half Term 4	Half Term 5	Half Term 6
Topic	<p>Communicable Disease</p> 	<p>Health Issues & Non-Communicable Disease</p> 	<p>Cell Transport (Active Transport and Osmosis)</p> 	<p>Plant Transport & Respiration</p> 	<p>Homeostasis Part 1- Controlling Conditions</p> 	<p>Homeostasis Part 2 – Hormones in human reproduction</p> 
Biology	<ul style="list-style-type: none"> Explain how pathogens make us ill. Describe the symptoms and treatments for bacterial, viral, fungal and protist diseases. Explain how the human body protects itself from pathogens. Explain how vaccinations provide immunity. Explain the use of antibiotics and other medicines in treating diseases. Describe the process of discovery and development of potential new medicines. Evaluate the process of drug development. 	<ul style="list-style-type: none"> Identify physical and mental health issues. Explain how diseases interact. Compare the effects of lifestyle on non – communicable disease. Explain how cancer develops. Explain the difference between a malignant and benign tumour. Analyse risk factors for non – communicable disease. Translate information between graphical and numerical forms. Describe how monoclonal antibodies are produced. Describe some ways in which monoclonal antibodies can be used. Evaluate the advantages and disadvantages of monoclonal antibodies. Describe physical, chemical and mechanical plant defences, 	<ul style="list-style-type: none"> Describe how substances move in and out of cells across cell membranes via diffusion. Recognise, draw and interpret diagrams that model osmosis. Investigate the effect of concentration on the mass of plant tissue. (RP) Explain how active transport allows for minerals to be absorbed in plant root hairs. Explain how active transport allows sugar molecules to be absorbed into the blood. Compare and contrast all 3 cell transport mechanisms. 	<ul style="list-style-type: none"> Explain how the structures of plant tissues are related to their function. Explain how the structure of root hair cells, xylem and phloem are adapted to their functions. Explain the effect of temperature, humidity, air movement and light intensity on rate of transpiration. Describe the process of transpiration and translocation. Define the term 'respiration'. Use word and symbol equations to summarise aerobic and anaerobic respiration. Compare the process of aerobic and anaerobic respiration. Describe the process of fermentation with an equation. Describe and explain the effects of exercise on the body. Explain what is meant by 'oxygen debt' and recovery time. Explain the importance of sugars, amino acids and glycerol in the synthesis and breakdown of carbohydrates, proteins and lipids. 	<ul style="list-style-type: none"> Compare and contrast different control systems. Explain how the CNS coordinates a response. (reflex arc) Explain how the structures in a reflex arc relate to their functions. Plan an investigation to show the effect of a factor on reaction time. (RP) Identify the cerebral cortex, cerebellum, and medulla. Explain some of the difficulties of investigating brain function and treating brain damage. (HT) Identify structures of the eye and explain how each structure related to its function. Explain how the eye focuses on near/distant objects. Describe the principles of hormonal co-ordination and control by the endocrine system. Explain various thermoregulatory mechanisms. Identify the position of glands in the human body. Explain how blood glucose levels are controlled. Evaluate diabetes treatment. Describe the function of kidneys in maintaining water balance of the body. Explain how useful substances such as glucose and water are selectively reabsorbed. Evaluate the advantages and disadvantages of treating organ failure by mechanical device or transplant. 	<ul style="list-style-type: none"> Identify the hormones involved in human reproduction. Explain the roles of hormones in the menstrual cycle. (FSH/LH/Oestrogen) Extract and interpret data from graphs. Evaluate different methods of contraception. Show why issues around contraception cannot be answered by science alone. Explain the process of IVF. Evaluate the use of IVF treatment. Understand social and ethical issues associated with IVF treatments. Explain Explain the roles of thyroxine and adrenaline in the body. Interpret and explain simple diagrams of negative feedback control. Investigate the effect of light or gravity on the growth of newly germinated seedlings. (RP) Describe the effects of plant hormones and the way they can be used in agriculture and horticulture.

Key Knowledge, Skills & Understanding
 *RP = Required Practical
 **HT = higher tier content only

<p>GCSE Assessment Objectives-</p>	<p>Working scientifically (WS) - Students develop their working scientifically skills so that they can fully understand the scientific process. These skills fall broadly into four main strands and exams will include questions that assess all of these strands: 1. the development of scientific thinking 2. experimental skills and strategies 3. analysis and evaluation 4. vocabulary, units, symbols and nomenclature. Maths Skills (MS) – In Biology a minimum of 10% of marks will test mathematical skills. Assessment Objectives (AO) - The exams will measure how students have achieved the following assessment objectives. AO1-Demonstrate knowledge and understanding of scientific ideas, scientific techniques and procedures AO2-Apply knowledge and understanding of scientific ideas, scientific enquiry, techniques and procedures AO3-Analyse information and ideas to interpret, evaluate, make judgements, draw conclusions, develop and improve experimental procedures</p>					
<p>MAPs</p>	<p>MAP 1- Communicable Disease</p>	<p>MAP 2- Health Issues</p>	<p>MAP 3- Osmosis and Active Transport</p>	<p>MAP 4- Plant Transport and Respiration</p>	<p>MAP 5- Homeostasis</p>	<p>P2S3- Yr10 Mock Exam Paper 1</p>

YEAR 11 CURRICULUM JOURNEY						
	Half Term 1	Half Term 2	Half Term 3	Half Term 4	Half Term 5	Half Term 6
Topic	<p>Reproduction</p> 	<p>Variation and evolution</p> 	<p>Genetics and evolution</p> 	<p>Ecology 1</p> 	<p>Ecology 2</p> 	<p>Food Production</p> 
Key Knowledge, Skills & Understanding *RP = Required Practical **HT = higher tier content only	<ul style="list-style-type: none"> Compare sexual and asexual reproduction. Explain the process of meiosis. Compare meiosis with mitosis. Describe the structure of DNA. Discuss the importance of understanding the human genome. Draw genetic cross diagrams. Predict the likelihood of inheriting genetic disorders. Carry out genetic cross diagrams to show sex inheritance. Describe DNA as a polymer made from 4 different nucleotides. Recall a simple descriptions of protein synthesis. Describe how genetic variations may influence a phenotype. 	<ul style="list-style-type: none"> Collect class data to help explain environmental and inherited variation. Explain how evolution occurs by natural selection. Explain the impact of selective breeding of food plants and domesticated animals. Evaluate the use of selective breeding. Explain how genetic engineering can be used. Interpret information to make informed judgements about issues concerning cloning and GM. Explain how clones can be produced through cuttings, tissue cultures, embryo transplants and adult cell cloning methods. Explain the potential risks and benefits of cloning in agriculture and medicine. Describe the work of Darwin and Wallace in the development of the theory of evolution. Describe the steps that give rise to a new species. Describe the work of Mendel in the development of our understanding of genetics. 	<ul style="list-style-type: none"> Evaluate different theories of evolution. Explain how fossils are formed and how they support the theory of evolution. Discuss ways in which a species might become extinct. Explain how bacteria may become resistant. Describe the impact of developments in biology on classification systems. Understand how scientific methods and theories develop over time. Use evolutionary trees to show how organisms are related. 	<ul style="list-style-type: none"> Identify different communities Identify factors that may affect the survival of organisms. Describe and explain plant and animal adaptations. Draw diagrams to show levels of organisation in ecosystems. Measure the population size of a common species in a habitat (RP) Explain how to use sampling techniques. Interpret and explain the processes in diagrams of the carbon cycle and the water cycle. Explain how temperature, water and availability of oxygen affect the rate of decay of biological material. Investigate the effect of temperature on the rate of decay of fresh milk by measuring pH change. (RP) Evaluate the impact of environmental changes of species in an ecosystem. 	<ul style="list-style-type: none"> Describe the differences between trophic levels within an ecosystem. Construct pyramids of biomass from appropriate data. Explain how biomass is lost between trophic levels. Discuss ways in which waste can be managed in society. Identify different ways land is used by humans. Evaluate the environmental implications of deforestation. Describe some of the biological consequences of global warming. Describe both positive and negative human interactions in an ecosystem. Discuss different ways in which biodiversity can be maintained. 	<ul style="list-style-type: none"> Describe some of the biological factors affecting food security. Interpret population and food statistics to evaluate food security. Evaluate the advantages and disadvantages of modern farming techniques. Understand how application of different fishing techniques promotes recovery of fish stocks. Describe and explain some possible biotechnical and agricultural solutions to the demands of the growing human population. Explain how fusarium can be used in the production of mycoprotein.
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MAPs	MAP 1- Reproduction	MAP 2- Variation and Evolution P2S2- Yr11 Mock Exam Paper 1	MAP 3- Genetics and Evolution	P2S3- Yr11 Mock Exam Paper 2	MAP 4 - Biodiversity	MAP 5- Food Security