MOOR PARK HIGH SCHOOL: CURRICULUM

Key Stage 4 Long Term Planning

Year 10

Faculty Area: Biology Single Science

Year 10	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Syllabus	AQA Biology Collins - Chapter 4 Health Matters		AQA Biology Collins - Chapter 5 Coordination and Control		AQA Biology Collins - Chapter 6 Genetics	
Connections to prior KS3 learning	The effects of recreational drugs (including substance misuse) on behaviour, health and life processes. the functions of the cell wall, cell membrane, cytoplasm, nucleus, vacuole, mitochondria and chloroplasts The similarities and differences between plant and animal cells The role of diffusion in the movement of materials in and between cells the structural adaptations of some unicellular organisms		Reproduction in humans (as an example of a mammal), including the structure and function of the male and female reproductive systems, menstrual cycle (without details of hormones), gametes, fertilisation, gestation and birth. The effect of maternal lifestyle on the foetus through the placenta Aerobic and anaerobic respiration in living organisms, including the breakdown of organic molecules to enable all the other chemical processes necessary for life A word summary for aerobic respiration		Heredity as the process by which genetic information is transmitted from one generation to the next A simple model of chromosomes, genes and DNA in heredity Differences between species The variation between individuals within a species being continuous or discontinuous, to include measurement and graphical representation of variation The variation between species and between individuals of the same species means some organisms compete more successfully, which can drive natural selection Changes in the environment may leave individuals within a species, and some entire species, less well adapted to compete successfully and reproduce, which in turn may lead to extinction	
Knowledge	Communicable diseases Culturing microorganisms Viral, bacterial and fungal diseases in humans Protist diseases Human defence systems Vaccination Antibiotics Painkillers		Structure and function of the nervous system. The brain and Brain Control of body temperature Human endocrine system Control of blood glucose concentration Water and nitrogen balance Kidney function and Failure		Genetics Proteins and mutations Sexual and asexual reproduction. Meiosis. Advantages and disadvantages of sexual and asexual reproduction Gregor mendal	

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	Discovery and development of drugs Production and uses of MABs Plant disease Plant defence responses	ADH Hormones in human reproduction Contraception and the use of hormones to treat infertility. advantages and disadvantages of fertility treatment, Negative feedback. Control and coordination Use of plant hormones.	Sex determination. DNA. protein synthesis. Genetic inheritance and inherited disorders. The understanding of genetics Genetic engineering Examples of genetic engineering.
Skills	Evaluate risks when growing microbial cultures. Interpret graphs Carry out research and explain application of science and personal and social implications related to diseases. Plan investigations, make observations and analyse data Investigate the effect of disinfectants or antibiotics on bacterial growth	use of appropriate apparatus to make and record a range of measurements accurately including length use of appropriate apparatus and techniques for the observation and measurement of biological changes and/or processes safe and ethical use of a living organisms (plants or animals) to measure physiological functions and responses to the environment plan and carry out an investigation into the effect of a factor on human reaction time. investigate the effect of light or gravity on the growth of newly germinated seedlings.	Use bio-viewers, video clips or images to show chromosomes and meiosis. Use a Punnett square and a genetic cross diagram to illustrate the inheritance of sex; evaluate the chance of producing a male or female.
Assessment	End of unit test for Chapter 4 - Health Matters	End of unit test for Chapter 5 - Coordination and Control	End of unit test for Chapter 6 - Genetics
Homework	GCSE past paper exam questions Analysis / Evaluation of investigations Extended answer questions	GCSE past paper exam questions Analysis / Evaluation of investigations Extended answer questions	GCSE past paper exam questions Analysis / Evaluation of investigations Extended answer questions

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Cultural enrichment including Trips, Visits, Experiences, Extra-curricular	**School and University Network** Summer Term-UCLAN Visit (Topic to be confirmed)		
Literacy	Keywords: Aerobic respiration, Anaerobic respiration, Cellular respiration, Inverse proportion, Inverse square law, Limiting factor, Metabolism, Oxygen debt, Photosynthesis Communicable Culturing microorganisms Viral, bacterial, fungal, Protist diseases Vaccination Antibiotics Painkillers MABs disease defence	Keywords: Abstinence, *Accommodation, Adrenaline, *Antidiuretic hormone (ADH), Contraception, Coordination centres, *Deamination, *Dialysis, Effectors, *Ethene, Follicle stimulating hormone (FSH), *Geotropism/Gravitropism, Gibberellins, Gland, Glucagon, Homeostasis, *Hyperopia, In Vitro Fertilisation (IVF), Luteinising hormone (LH), *Myopia, Negative feedback cycle, Oestrogen, *Phototropism, Receptors, Reflex action, Selective reabsorption, Stimuli, Target organ, Testosterone, *The brain, The central nervous system (CNS), *The eye, *Thermoregulatory centre, Thyroxine, Type 1 diabetes, Type 2 diabetes, *Vasoconstriction,	Keywords: *Adult cell cloning, Allele, Amino acids, Archaea, Asexual reproduction, Binomial system, Charles Darwin, Chromosome, Classification,*Coding DNA, *Complementary, *Cuttings, Cystic fibrosis, DNA, Dominant, Embryo screening, *Embryo transplants, Evolution, Evolutionary tree, Extinction, Family tree,Fertilisation, Fossil, Gametes, Gene, Genetic engineering, Genome, GM crops, Heterozygous, Homozygous, Inbreeding, Linnaean system, Meiosis, Mitosis, MRSA, Natural selection, *Non-coding DNA, *Nucleotide, Phenotype, Polydactyly, *Protein synthesis, Punnett square, Recessive, Ribosomes, Selective breeding, Sex chromosomes, Sexual reproduction, *Speciation, Species, Three-domain system, *Tissue culture, Variation, Vector
Numeracy	Calculate cross-sectional areas of colonies Interpret data about vaccination rates and reported cases of diseases, eg whooping cough, MMR.	Measure skin temperature in different conditions. Analyse data and interpret information about sweating and temperature. Plot cooling curves. Measure heart rate and/ or blood pressure	Use a Punnett square and a genetic cross diagram to illustrate the inheritance of sex; evaluate the chance of producing a male or female.. Interpret genetic diagrams of Mendel's experiments
CIAG	What workplace skills does biology develop?		

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	Analysis: Students need analysis in any job which requires you to process information. GPs and vets analyse their knowledge of medicine along with the symptoms they observe in the patient in front of them in order to reach a conclusion about their medical condition. Curiosity: Engineers must always be searching for new solutions to the technical challenges they face to improve their efficiency and overcome new and seemingly impossible obstacles. Teachers must explore new approaches to adapt to different students' needs and constantly improve their teaching. Drawing: As well as the obvious – such as illustrators, graphic designers and animators – many other jobs benefit from good drawing skills. Any role which requires students to present their findings or plans through diagrams benefits from good drawing skills.

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Key Stage 4 Long Term Planning

Year 11

Curriculum Area: Biology Single Science

Year 11	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1
Syllabus	AQA Biology Collins - Chapter 7 Variation and Evolution	AQA Biology Collins - Chapter 8 Ecology in Action			
Connections to KS3 prior learning	How organisms affect, and are affected by, their environment The variation between individuals within a species being continuous or discontinuous, to include measurement and graphical representation of variation The variation between species and between individuals of the same species means some organisms compete more successfully, which can drive natural selection Changes in the environment may leave individuals within a species, and some entire species, less well adapted to compete successfully and reproduce, which in turn may lead to extinction	How organisms affect, and are affected by, their environment, including the accumulation of toxic materials. The importance of maintaining biodiversity and the use of gene banks to preserve hereditary material			
Knowledge	Variation. Selective breeding. Darwin and wallace Evolution. Speciation. Theory of evolution.	Classification Communities Biotic factors and Abiotic factors Adaptations Trophic levels and Transferring of biomass How materials are cycled			

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	Evidence for evolution – Fossils and Resistant bacteria. Extinction. cloning	Investigating decay Biodiversity Waste management Global warming Maintaining biodiversity Factors affecting food security Farming techniques Sustainable fisheries Role of biotechnology		
Skills	Draw a flow diagram to explain the steps involved in selective breeding. Interpret evolutionary trees. Interpret evidence relating to evolutionary theory.	use of appropriate apparatus to make and record a range of measurements accurately including length and area safe and ethical use of a living organism to measure physiological responses to the environment Construct food chains and identify the producer and consumers. measure the population size of a common species in a habitat. Use sampling techniques to investigate the effect of a factor on the distribution of this species. investigate the effect of temperature on the rate of decay of fresh milk by measuring pH change.		
Assessment	End of unit test for Chapter 7 Variation and Evolution	End of unit test for Chapter 8 Ecology in Action		
Homework	GCSE past paper exam questions Analysis / Evaluation of investigations	GCSE past paper exam questions Analysis / Evaluation of investigations		

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	Extended answer questions	Extended answer questions		
Cultural enrichment including Trips, Visits, Experiences, Extra-curricular	**School and University Network** Post Easter Revision-Lancaster University 6 week course			
Literacy	Keyword: Abiotic factors, Adaptation, *Anaerobic decay, *Apex predator, Biodiversity, *Biogas, Biotic factors, Carbon cycle, Community, Competition, *Compost, *Decomposers, *Decomposition, Deforestation, *Distribution, Ecosystem, Efficiency of biomass transfer, Extremophiles, Food chain,	Keywords: *Food security, Global warming, *GM crops, Interdependence, Mean, Median, Microorganisms, Mode, Peatlands, Pollution, Population, Predators, Prey, *Primary consumers, Producers, *Pyramid of biomass, Quadrat, *Secondary consumers, *Sustainable, *Sustainable fisheries, *Tertiary consumers, Transect, *Trophic level, Water cycle,		
Numeracy	Analyse variation in a plant species growing in different areas continuous and discontinuous variation Interpret data about antibiotic resistance	Measure height and calculate means. Present and analyse the results Analyse ecological data from quadrats and transects. Interpret population curves and explain predator – prey relationships Use quadrats and sensors; record and analyse results. Use a transect to investigate the change in type and number of plant species across a changing habitat, eg a footpath.		
CIAG	What workplace skills does biology develop? Analysis: Students need analysis in any job which requires you to process information. GPs and vets analyse their knowledge of medicine along with the symptoms they observe in the patient in front of them in order to reach a conclusion about their medical condition.			

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	Curiosity: Engineers must always be searching for new solutions to the technical challenges they face to improve their efficiency and overcome new and seemingly impossible obstacles. Teachers must explore new approaches to adapt to different students' needs and constantly improve their teaching. Drawing: As well as the obvious – such as illustrators, graphic designers and animators – many other jobs benefit from good drawing skills. Any role which requires students to present their findings or plans through diagrams benefits from good drawing skills.