

BMS Science - Year 11 GCSE Biology Curriculum Map - 2024-2025

The curriculum is designed for students to have fun and enjoy science lessons. The aim is for students to appreciate the value of science in their everyday lives. We want to help our young learners understand the world around them and make relevant connections. We encourage students to express their own thoughts and ideas, become curious learners; asking questions and developing independence and communication skills. We motivate students to reach their full potential by building on prior learning and skills, supporting and scaffolding their learning so they can achieve at all levels. Students are encouraged to address misconceptions, continue to develop and build upon the scientific skills and key scientific concepts they have developed from the KS3 curriculum and help them to prepare for the next steps after school and into adulthood.

Unit Title	Unit overview	Knowledge and Skills	Assessment	Key Words
------------	---------------	----------------------	------------	-----------

4) Bioenergetics	photosynthesis in order to make food. Students then explore the relationship between photosynthesis and respiration. Students also learn about anaerobic respiration and metabolism.	• The rate of photosynthesis and limiting factors • Required practical - investigating the effect of light intensity on the rate of photosynthesis. • Aerobic respiration • Anaerobic respiration • Exercise • Metabolism	wall, games, questioning, role play, speaking activities, modelling, card sorts, photographs of learners carrying out activities, storyboards, presentations/posters, evaluation sheets, past paper questions and testing.	endothermic word equation symbol equation cellulose lipids limiting factors random error reproducible independent variable control variable dependent variable aerobic precise oxygen debt recovery period exothermic respiration glucose amino acids starch mean repeatable precise accurate respiration anomalous valid precise lactic acid metabolism fermentation
5) Homeostasis and Response	In this unit students will explore how the body controls and regulates the internal environment to ensure optimal conditions for metabolism. This will include regulating blood sugar level, temperature and water levels. Students will study the structures and functions of the nervous system and the endocrine system. Students then go on to study specific animal and plant hormones.	<u>Homeostasis and Response</u> • The nervous system • Synapses and reflexes • Required practical - Investigating the effect of a factor on human reaction time. • The brain • The eye • correcting vision defects • controlling body temperature <u>The endocrine Systems</u> • Hormones • Controlling blood glucose • Controlling water content • Kidney failure	Teacher assessment through a variety of activities - quizzes, word wall, games, questioning, role play, speaking activities, modelling, card sorts, photographs of learners carrying out activities, storyboards, presentations/posters, evaluation sheets, past paper questions and testing.	homeostasis stimulus effector sensory neurone relay neurone response precise independent variable variable variable cerebral cortex cerebellum pupil ciliary muscle optic nerve reflect circular muscle refracts thermoregulatory centre control system receptor negative feedback motor neurone central nervous system synapse reflex arc dependent human error control fair test medulla sclera cornea iris retina lens suspensory ligament iris reflex radial muscle accommodation hyperopia myopia negative
Unit Title	Unit overview	Knowledge and Skills	Assessment	Key Words

<u>Spring Term</u> 5) Homeostasis and Response continued		<u>Animal and plant hormones</u> • Puberty and the menstrual cycle • Contraceptives • Plant hormones		feedback vasodilation insulin vasoconstriction hormones oestrogen endocrine system pituitary gland pancreas thyroid adrenal glands testosterone glycogen kidneys diabetes type 1 and 2 urine filtration follicle reabsorption dialysis stimulating hormone oestrogen luteinising hormone progesterone partially permeable membrane menstruation contraception auxin geotropism phototropism
<u>Summer Term -</u> 6) Inheritance and Evolution	This unit aims to give students an understanding of how characteristics and genetic information are passed on from one generation to another. Students will look at how genetic variation is the basis for natural selection and evolution. Students will look at how humans use their knowledge of genetics to create specific breeds of animals and create useful products such as insulin and genetically modified crops.	<u>DNA and Reproduction</u> • DNA • Reproduction • Meiosis <u>Genetics</u> • Sex chromosomes • Alleles and genetic diagrams • Inherited disorders • The work of Mendel <u>Evolution and Classification</u> • Variation • Evolution and extinction • Selective breeding • Genetic engineering • cloning • fossils • speciation and natural selection • antibiotic resistant bacteria • classification	Teacher assessment through a variety of activities - quizzes, word wall, games, questioning, role play, speaking activities, modelling, card sorts, photographs of learners carrying out activities, storyboards, presentations/posters, evaluation sheets, past paper questions and testing.	chromosome gene DNA double helix genome nucleotide base phosphate gamete sexual reproduction asexual reproduction meiosis genetic diagram phenotype genotype alleles recessive dominant homozygous heterozygous monohybrid cross cystic fibrosis polydactyly embryonic screening variation genes mutation evolution natural selection speciation extinction hypotheses selective breeding inbreeding genetic engineering cloning adult cell cloning surrogate fossils decay antibiotic resistance three-domain system binomial system evolutionary trees

Unit Title	Unit overview	Knowledge and Skills	Assessment	Key Words
Summer Term 7) Ecology	In this unit students study the main parts of an ecosystem looking at living and nonliving factors. They learn about interaction between organisms and how they are interdependent upon one another. Students learn about how ecosystems provide essential services that support human life and continued development. In this unit students will explore how humans are threatening biodiversity as well as the natural systems that support it and why it is essential that we engage with the environment in a sustainable way.	<u>Organisms and their environment</u> ● Competition ● Abiotic and biotic factors ● Adaptations ● Food chains ● Using quadrats and transects ● Required practical - Using sampling techniques to investigate the effect of a factor on distribution of a species ● The cycling of materials and decay ● Required practical - Investigating the effect of temperature on the rate of decay of milk by measuring changes in pH. <u>Humans impact on the environment</u> ● Biodiversity and waste ● Global warming ● Deforestation and land use ● Maintaining ecosystems and biodiversity <u>Biomass, food and biotechnology</u> ● Pyramids of biomass and trophic levels ● Food security and farming ● Biotechnology	Teacher assessment through a variety of activities - quizzes, word wall, games, questioning, role play, speaking activities, modelling, card sorts, photographs of learners carrying out activities, storyboards, presentations/posters, evaluation sheets, past paper questions and testing.	competition habitat population abiotic community biotic ecosystem species food chain food web adaptations extremophiles biomass producer primary consumer secondary consumer tertiary consumer predator prey quadrat transect water cycle transpiration evaporation precipitation carbon cycle detritus feeders combustion respiration compost decay biogas batch generator continuous generator population biodiversity global warming greenhouse effect climate change migration deforestation protection programmes trophic levels pyramids of biomass efficiency mycoprotein plasmid ligase recombinant DNA genetically modified crops
Revision and Exams				