

Key Stage 4

Subject: Biology

Intent

In Biology our students will work hard to become the scientists of tomorrow. In Biology we investigate Cell biology, including cell function, the way in which biologic systems are organised as well as the methods that biological systems maintain balance with their surroundings. We further learn about topics such as evolution, ecology and the variation amongst species including humans.

Students will not just gain knowledge of biology but also the skills need to complete biological investigations. We are proud to say that numerous students go on to study biology further at A-level with many eventually moving on to study biological based subjects at university.

Programme of study and assessment

	Autumn Term	Spring Term	Summer Term
Year 10	<u>Cell Biology</u> <ul style="list-style-type: none"> Eukaryotic and prokaryotic cells Specialisation Microscopy Movement of molecules Cell cycle Stem cells <u>Organisation</u> <ul style="list-style-type: none"> Plant tissues and organs Animal tissue and organs Heart and blood Digestive system Respiratory system 	<u>Bioenergetics (Respiration)</u> <ul style="list-style-type: none"> Aerobic respiration Anaerobic respiration Response to exercise Metabolism <u>Immunity</u> <ul style="list-style-type: none"> Health and risk factors Pathogens and disease Physical defences Immune system Vaccination, antibiotics and painkillers Drug development <i>Growing bacteria in the lab (triple only)</i> <i>Plant diseases (triple only)</i> <i>Monoclonal antibodies (triple only)</i> 	<u>Bioenergetics (Photosynthesis)</u> <ul style="list-style-type: none"> Photosynthetic equations Rate of photosynthesis Limiting factors of photosynthesis Uses of glucose Maximising photosynthesis <u>Homeostasis</u> <ul style="list-style-type: none"> Nervous system and reflexes Endocrine system Glucoregulation Contraception and the menstrual cycle Controlling fertility Negative feedback <i>The brain (triple only)</i> <i>The eye (triple only)</i> <i>Plant hormones (triple only)</i> <i>Thermoregulation (triple only)</i> <i>Osmoregulation (triple only)</i>
Assessment	Written Test 1 – Cells Multiple Choice Test 1 - Organization	Multiple Choice Test 2 – Respiration Written Test 2 - Immunity	Written Test 3 – Photosynthesis (with respiration elements) End of Year Assessment Multiple Choice test 3 - Homeostasis

Year 11	<u>Variation and evolution</u> <ul style="list-style-type: none"> • Types of reproduction • <i>Pros and cons of types of reproduction (triple only)</i> • DNA and the genome • <i>Protein synthesis (triple only)</i> • Inheritance and genetic disorders • Variation and natural selection • Selective breeding • Genetic engineering • <i>Cloning (triple only)</i> • <i>History of genetics (triple only)</i> • Evidence of evolution and fossils • <i>Theories of evolution (triple only)</i> • <i>Speciation (triple only)</i> • Extinction • Classification 	<u>Ecology</u> <ul style="list-style-type: none"> • Communities and ecosystems • Distribution and abundance of organisms • Competition and adaptations • Feeding relationships • Biological cycles • <i>Decomposition (triple only)</i> • Human population and it's effects • Pollution • Deforestation and peat destruction • Global warming • <i>Trophic levels and biomass (triple only)</i> • <i>Food security and production (triple only)</i> 	
Assessment	<p>Multiple Choice Test 4 - Variation</p> <p>Written Test 4 – Variation and evolution</p> <p>Full Mock Paper 1 (Nov; Content – Cell biology, Organization, immunity and bioenergetics)</p>	<p>Multiple Choice Test 5 - Ecology</p> <p>Written Test 5 – Ecology</p> <p>Full Mock Paper 2 (Feb; Content – Homeostasis, Variation and evolution, Ecology)</p>	<p>Summer Exams</p>