Higher Biology

# Course Rationale

Biology, the study of living organisms, plays a crucial role in our everyday existence, and is increasingly important in the modern world. Advances in technologies have made this varied subject more exciting and relevant than ever. This course aims to develop your interest and enthusiasm for biology in a range of contexts.

# Course Content

You will develop a deeper understanding of the underlying themes of biology: evolution and adaptation; structure and function; genotype and niche, ranging from molecular through to whole organism and beyond.

**Biology: DNA and the Genome** - In this unit you will study DNA and the genome, look at key areas of structure and replication of DNA, gene expression and the genome, and explore the molecular basis of evolution and biodiversity. You will understand gene expression at the cellular level, leading to the study of differentiation in organisms, and look at the evolution and structure of the genome and genomics, including personal genomics.

**Biology: Metabolism and Survival** – Here you investigate the central metabolic pathways of ATP synthesis and how control of the pathways is essential to cell survival. You will look at key areas of metabolisms as essential for life, maintaining metabolism, metabolism in micro-organisms, and investigate how cellular respiration is fundamental by examining the stages of respiration. You will consider the adaptations for the maintenance of metabolism for survival for whole organisms and examine the importance of the manipulation of metabolism in micro-organisms, both in the laboratory and in industry, including ethical considerations.

**Biology: Sustainability and Interdependence** - Here you will investigate how humans depend on sufficient and sustainable food production from a narrow range of crop and livestock species, focusing on photosynthesis in plants. You will cover key areas of the science of food production, look at the importance of plant productivity and the manipulation of genetic diversity to maintain food security and look at interrelationship and dependency, through symbiosis and social behaviour. You will attempt to measure, catalogue, understand and address human impact, including mass extinction, by studying biodiversity.

# Skills

The skills of scientific enquiry and investigation are developed throughout the course by investigating the applications of biology. This will enable you to become scientifically literate, and able to review the science-based claims you meet. You will develop analytical thinking and problem-solving skills in the context of each topic, as well as furthering your practical skills.

# Course Assessment

The course assessment has two components: a question paper (80%) and an assignment (20 %). The assignment is the report on a practical investigation carried out in class. Both are set and marked by the SQA. The course assessment is graded A-D.

# Progression

Successful completion may lead to **Advanced Higher** [Biology](http://www.learningatschool.net/PlainText/PlainText.aspx?SectionId=267ebbb2-54d3-4863-b9b5-0af5512b5ef6)**,** other qualifications or employment in Biology or related areas such as biological sciences and medicine, nursing, physiotherapy, dietetics, radiography, chiropody, biotechnology industries, beauty industries, land and animal industries, or sports and leisure.

# Career Pathways

# Agricultural Engineer Audiologist Biochemist Biotechnologist Clinical Psychologist Countryside Ranger Dentist Dental Hygienist Doctor Environmental Consultant Food scientist Geneticist Marine Biologist Microbiologist Midwife Nurse Occupational Therapist Optometrist Pharmacologist Speech and language therapist

# Teacher Paramedic Pharmacist Technical Brewer Vet Nurse Vet Zoologist