

SUBJECT: BIOLOGY

AWARD RECEIVED: ADVANCED HIGHER

ENTRY LEVEL

Students will normally have either Higher Biology or Higher Human Biology, preferably at A or B. Success in this course is very much dependent of learners committing to a significant amount of independent study out with the five timetabled periods.

COURSE CONTENT

The Course is split up into 3 Units, with the Key Areas covered in each outlined below:

Unit 1 - Cells and Proteins

This Unit covers the Key Areas of:

Laboratory techniques for biologists; Proteins.

This Unit builds on understanding of the genome from Higher Biology and Higher Human Biology. Learners will develop knowledge and understanding of proteomics, protein structure, binding and conformational change; membrane proteins; detecting and amplifying a stimulus; communication within multicellular organism and protein control of cell division. The study of protein is primarily a laboratory-based activity, so the Unit includes important laboratory techniques for biologists.

This skills-based sequence covers health and safety considerations, through the use of liquids and solutions, to a selection of relevant separation and antibody techniques. In addition, much work on cell biology is based on the use of cell lines, so includes techniques related to cell culture and microscopy. These techniques could be delivered in an integrated manner within this Unit.

Unit 2 - Organisms and Evolution

This Unit covers the Key Areas of:

Field techniques for biologists; Organisms.

This Unit builds on understanding of selection in the context of evolution and immune response from Higher Biology and Higher Human Biology. Learners will develop knowledge and understanding of evolution; variation and sexual reproduction; sex and behaviour and parasitism. It covers the role of sexual reproduction and parasitism in the evolution of organisms. Biological variation is a central concept in this Unit and is best observed in the natural environment.

This Unit covers suitable techniques for ecological field study. Methods of sampling and the classification and identification of organisms are introduced. Evolution is considered from the impact of drift and selection on variation. The study of sexual behaviour provides opportunities to use the techniques of ethology. There are many opportunities to explore the systems approach required for the understanding of parasite biology. In addition, there are many opportunities to explore wider ethical issues relating to the importance of scientific knowledge and its application in challenging social and economic circumstances.

Unit 3 - Investigative Biology

This Unit covers the Key Areas of:

Scientific principles and process; Experimentation; Critical evaluation of biological research.

This Unit builds on understanding of the scientific method from Higher Biology and Higher Human Biology. Learners will develop knowledge and understanding of the principles and practice of investigative biology and its communication. The Unit covers scientific principles and processes, experimentation and critical evaluation of biological research.

Learners will do this through the key aspects of the scientific method, literature and communication and ethics; pilot studies, variables, experimental design, controls, sampling and ensuring reliability; evaluating background information, experimental design, data analysis and conclusions. The collection of experimental data will provide an opportunity to develop planning and organising skills. This Unit can be integrated across the other Units of the Course.

Project

As part of their Advanced Higher Biology Course, students need to carry out a practical Investigation/Project. This could be on any related topic they choose, or it could be on a theme suggested by their teacher. Students will be supported through their Project, but they will also be expected to make progress independently for some of the time. They need to keep a 'log-book' of their on-going work and then produce a Report of their Investigation. The 'log-book' gets checked and marked internally by their teacher and the Report is externally marked by the SQA, which then counts towards their final, overall Grade, along with their Exam score.

In previous years, the practical work for this has been completed during a weekend field trip to Kindrogan Field Centre, Perthshire. In the coming year, we plan to visit Millport Field Centre on the Isle of Cumbrae. This trip will take place over the weekend of 26-29th October 2018. Pupils opting for Advanced Higher Biology are strongly encouraged to attend this field trip, as it is an excellent way for students to gather all their experimental data, with the support of experts in the field. The trip costs in the region of £300. The school has a hardship fund for those who are unable to fund this trip.

ASSESSMENT

To gain an overall Award for this Course, students need to pass the:

- **Unit Assessment** for each of the Units – these are marked internally in school;
- **Course Assessment**, which is marked by the SQA and includes an:
 1. **Project** (30 marks)
 2. **Exam** (100 marks)

The Course assessment is graded A–D. The grade is determined on the basis of the total mark for all components of the course assessment.

HOMEWORK

Homework is an essential part of the course. It helps prepare students for unit tests, prelim and final examinations. Homework will take the form of: write up of course lab work; extended answer questions; data handling questions and preparation of the investigation report.

TRANSFERABLE SKILLS

There are many very useful and valuable transferable skills gained by studying Advanced Higher Biology, including: researching, ICT, reporting, numeracy, literacy, graphing, investigating, practical experimental skills, analysing, presentation, evaluating, to name a few.

PROGRESSION

There is good progression from this Course on to further study at University as well as providing an excellent advantage to those seeking employment in a wide range of professions.