

## **Biology S3 Elective Course**

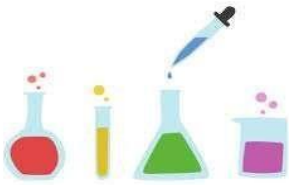
### **Course Content**

As well as developing your knowledge and understanding of the living world, you will work on a series of problem-solving skills, as well as graphing and calculations such as averages, percentages and ratios.

The units are:

#### **Cells 2 (Enzymes and Respiration)**

The biochemistry of cells is introduced when we look at enzymes and their essential role in speeding up chemical reactions that take place in cells. We also learn about the crucial reaction that keeps all living cells alive - respiration.



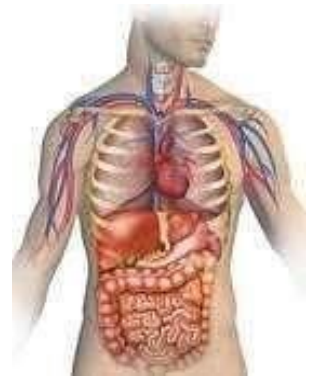
**Lessons cover:** Experiments investigating enzyme action. Practical work is used to look at Respiration.

#### **Body Systems**

Time for some human physiology. The unit covers the cardiovascular system, respiratory system and homeostasis (specifically, thermoregulation and blood-glucose regulation).

You will find out about the muscles that make blood flow round your body i.e. your heart and the muscles in the breathing system.

Maintaining constant conditions inside your body is vital for survival, this is called homeostasis. Many systems work together to achieve this.



**Lessons cover:** Heart and circulation. Lungs. Thermoregulation. Blood-glucose regulation.

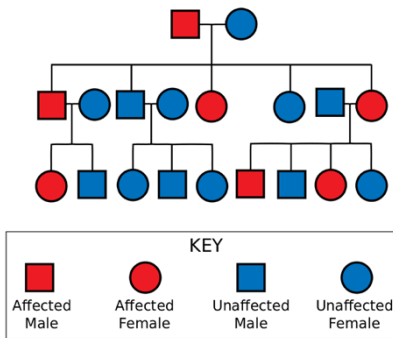
## Monitoring Health



You will find out about monitoring health and how to take measurements of pulse, blood pressure, peak flow and lung volume. You will develop your investigative and inquiry skills through designing, carrying out and reporting on an investigation into the effect of exercise on heart rate.

**Lessons cover:** Instruments used to monitor health and experimental design and reporting.

## Genetics



In this unit you will find out about ways that individuals in a species differ from each other. The genetic basis of some of these differences will be revealed. By performing lots of genetic crosses you will see the patterns of inheritance and allow you to understand family trees. A simple version of gel electrophoresis will introduce you to DNA profiling - a technique used in forensic science.

**Lessons cover:** Variation in species. DNA profiling. Genes and Genetic Inheritance. Sex determination. Research Project.

## DNA and Natural Selection



In this unit you will find out about the structure of DNA and how this determines the proteins which are synthesised. We will learn about how mutations in the DNA can affect these proteins. Mutations provide variation, the raw material for natural selection, which helps us to understand how and why species change over time.

**Lessons cover:** DNA Structure, Protein Synthesis, Mutations and Natural Selection.

## Scientific Literacy



This unit will further develop your scientific literacy skills in preparation for learning in S4. We will learn how to identify independent and dependent variables, comment on reliability and validity and how to process, analyse and present data.

**Lessons cover:** Experimental Design, Data Handling Skills and Experimental Reporting

**Teaching Methods** Pupils will learn by a mixture of direct interactive instruction and discovery, work individually or in small groups, plan investigations, and draw conclusions from results. Learning resources will be delivered via the One Note app on iPad and will also include

use of a variety of digital learning tools. Pupils will be given opportunities to acquire independent study skills which should help with their studies in the Senior Phase.

**Homework Policy** There will be a variety of Homework tasks in each unit, including tasks to consolidate classwork, research assignments and revision. Homework may be in Microsoft forms, One Note pages or other digital formats.

**Assessment** A range of assessments will be used to monitor progress and achievement, including research tasks and presenting work. At the end of most units there is a written test. The questions will test a mixture of Knowledge and Understanding and Problem-Solving skills. Practice Questions will be used in class and will be available in the Class Notebook in One Note.

**Progression into the Senior Phase** The S3 Biology Course will help you progress into the Biology Course at National 4 & 5 Levels. From there you can proceed to Higher Biology or Human Biology. National 5 Health Sector and National 5 Lab Science are also possible options.

The S3 Biology course will also be useful for progression into Chemistry, Physics National 4 or 5 level or into Science at National 4 level.