



## Why study Biology?

Biology is a fascinating and diverse subject which will have taught you many things already, such as how your body works and how living things interact in the world around you. TV, the news and the media are filled with new medical issues, such as COVID, Ebola, Zika, dementia and global challenges such as climate change, all of which can be solved by biologists. Amazing new discoveries in genetics are opening up surprising possibilities that a decade ago would have been considered almost a fantasy. Our advancing understanding of medicine, health and disease, genetic engineering and conservation to name but a few mean that it is an exciting time to study biology.

## What will you be learning?

To find out more about the course and discuss your suitability please contact Mrs Waters or Mrs Shuttleworth.

### **Biology – first year**

#### **1 Biological Molecules**

This includes all the molecules which make up 'life', how to test for them and their importance; we then focus on DNA and its central role in cells.

#### **2 Cell Biology**

A much more detailed look at what is inside every kind of cell and microscopy, as well as how the immune system works and responds to disease.

#### **3 Transport in organisms**

We look more closely at how substances are moved around inside cells and organisms, including the heart and circulatory system and lungs

#### **4 Genetics**

We find out more about chromosomes and how genes determine variation in organisms. We then go on to study biodiversity and the basis of genetics. At the end of your first year you will take part in a residential field course (June).

### **Biology – second year**

#### **5 Energy transfers between organisms**

A closer look at both photosynthesis and respiration and how energy flows on a global scale in agriculture and the natural world

#### **6 Response to stimuli**

Taking a close look at how hormones and the nervous system play a key role in organisms and how muscle contraction and kidney work at a cellular level

#### **7 Genetics and Population**

This is a mixture of studying wild populations of plants and animals and understanding the issues involved in their conservation. We also learn the genetics which underpin our

understanding of evolutionary change.

## 8 Control of Gene Expression

In this topic we learn about the latest advances in gene technology, from cloning cauliflower cells to splicing DNA and producing gene therapies to treat genetic disorders.

## What are lessons like?

There is a much greater emphasis on practical skills and working scientifically within the new curriculum and many of the lessons as possible will focus on the practical and analytical skills of the 12 required practicals. There will be some traditional lecture style lessons, whilst independent research, presentation work and peer-group learning will also be vital teaching and learning strategies. Hopefully the variety of techniques used will add to the enjoyment of the subject and help you to build confidence in practical work.

**Trips and Visits:** A residential field course will also form an integral part of the course, allowing you to gain access to the requirements of Topic 7 when you will carry out your own piece of original research and compete for the Ingleborough trophy. We also visit a local red squirrel colony, lectures at Manchester, the Aquarium of the Lakes and use patient DNA to diagnose genetic conditions during a laboratory day Castle Head Field Centre.

## What can it lead to?

Apart from the more obvious biological courses, such as medicine, dentistry, nursing, and other medical sciences the subject opens up opportunities into a wide range of associated careers. These include other health/medical areas such as radiography, pharmacology, physiotherapy and dietetics to name only a few; or the more environmental occupations in conservation, agriculture, horticulture, landscape management, marine conservation and plant pathology. The list really is quite vast.

## Want to know more?

To find out more about the course and discuss your suitability please contact [A.Waters@qes.org.uk](mailto:A.Waters@qes.org.uk)