

## **Biology - National 5**

### **AWARD RECEIVED**

You will be presented for National 5 units or the National 5 course award based on your progress throughout the year.

### **ENTRY LEVEL –what do I need to do it?**

Ideally you will have studied Biology in S2/3 and will have been advised in your report that National 5 Biology is your recommended progression pathway at this point in time. However, if you have not completed the S2/3 Biology Elective it may still be possible to study this course. If you are unsure whether this course is suitable please contact Mrs McDowell (PT Biology & Chemistry) for advice.

### **COURSE CONTENT: What will I learn?**

Practical work plays a large part in the course, which comprises 3 areas of study:

### **CELL BIOLOGY**

#### **Cell structure**

Remember the parts of the cell? This topic will extend that knowledge and show you that there are many other structures in a cell. You will use the microscope and study electron microscope pictures to view the amazing world that exists inside a cell.

#### **Transport across cell membranes**

You will revisit work on diffusion and osmosis and add in a third method of transporting substances into and out of cells: active transport.

#### **DNA and the production of proteins**

The magic of the molecule that is DNA is explored. What is its structure and how does it work? How can it control the type of proteins that a cell produces?

#### **Proteins**

Antibodies, enzymes and hormones. You will find out why proteins are so important and extend your knowledge of enzymes.

#### **Genetic engineering**

You will learn about the methods that are used to manipulate chromosomes and genes and how this affects organisms. The uses that genetic engineering is put to and how this has helped mankind. Are there any downsides to GM?

#### **Respiration**

Cells need energy to carry out lots of jobs. How they get the energy and what they use it for is explored in this topic.

## **BIOLOGY: MULTICELLULAR ORGANISMS**

### **Producing new cells**

When does a cell become a tissue and a tissue become an organ? How do tissues work together? This is where you find out how cells multiply. The detailed sequence of mitosis is observed and the methods by which humans have used this to increase the number of cells needed for transplant or to propagate plants. You will learn about a special cells called stem cells which can make copies of themselves and then turn into other types of cells with different jobs. You will discover how man has used stem cells in medicine.

### **Control and communication**

How cells keep in touch with each other and send messages to control other parts of the organism. You will learn about the nervous system and how your reflexes work. Other lessons investigate the role of hormones and the way in which they act on cells. The control of blood sugar and the role of insulin is the example chosen.

### **Reproduction & Variation and inheritance**

You will learn about the sex organs and their production of gametes. Then on to what happens at fertilisation so that you can appreciate that features are inherited from parents. The way in which this happens and how you inherit your features is fascinating and you will learn about the genetics of variation and inheritance.

### **Transport systems & Absorption of materials**

#### **Plants**

How plants take up water from the soil and how they transport sugars from leaves to the rest of the plant are investigated.

#### **Animals**

Your own transport systems: blood to carry oxygen and food, heart and blood vessels to deliver blood to all cells, lungs to absorb oxygen into the blood, small intestines to absorb digested food into the blood.

## **BIOLOGY: LIFE ON EARTH**

### **Ecosystems & Distribution of organisms**

You will extend your knowledge of ecosystems and look at biotic and abiotic factors, from biomes to niches. How humans have had an impact-for good and bad.

### **Photosynthesis**

Plants and their amazing ability to make food from simple molecules using light energy. The biochemistry of photosynthesis is examined in some detail and you will carry out experiments to show the limiting factors that affect the rate of photosynthesis.

### **Energy in ecosystems**

Up a pyramid-how does the number and energy change as you go along a food chain?

### **Food production**

An increasing human population requires increased food production. Fertilisers and pesticides can be used but what is the impact of using these and what are the alternatives?

### **Evolution of species**

A touch of Darwin here! Find out about how animals evolve and adapt to their changing environments.

## **TEACHING METHODS – what will I do?**

A ***Curriculum for Excellence*** approach will permeate all topics, giving you opportunities to learn by discovery, take ownership of tasks, make decisions for yourself and relate biology to your everyday life.

You will acquire transferable thinking skills using common cross-curricular language: remembering, understanding, applying, analysing, evaluating and creating. These skills will help you to cope in all aspects of your studies and enable you to take responsibility for your own learning.

## **ASSESSMENT**

Assessment of work will take various forms:

- Traditional pen and paper assessments, covering recall of facts and problem solving skills.
- Skills may be assessed through the design of posters, leaflets or class presentations.
- Self and peer assessments will be utilised.
- To gain N5 course award you will produce an assignment in school and you will also sit an external exam. The assignment makes up 20% of your overall award. The exam is 2.5 hours in duration and makes up the remaining 80%.

## **HOMEWORK**

The weekly homework contains numeracy, literacy and problem solving tasks. It may also include revision of class work, completion of unfinished work and opportunities to complete small projects at home on selected areas of the curriculum.

## **PROGRESSION**

Higher Biology and Higher Human Biology