

## Year 11 Transition to A Level Biology Projects

There are four research tasks for you to complete to prepare you for your study of A level Biology plus an extra challenge regarding career options related to this subject. You may want to make notes in addition to completing the tasks. These tasks will give you a flavour of some of the topics you will study in this course. They all link to topics you have studied at GCSE, however you need to do some research to complete these at an A level standard as more depth is required than just what you already know. In addition to these there is some extra information/tasks that you may choose to complete on Goggle classroom Intro to AS Biology, however the tasks listed below are the ones that **MUST** be completed.

### **Cells**

The cell is a unifying concept in biology, you will come across it many times during your two years of A level study. Prokaryotic and eukaryotic cells can be distinguished on the basis of their structure and ultrastructure. In complex multicellular organisms cells are organised into tissues, tissues into organs and organs into systems. During the cell cycle genetic information is copied and passed to daughter cells. Daughter cells formed during mitosis have identical copies of genes while cells formed during meiosis are not genetically identical

Read the information on these websites (you could make more Cornell notes if you wish):

<http://www.s-cool.co.uk/a-level/biology/cells-and-organelles>

<http://www.bbc.co.uk/education/guides/zvjycdm/revision>

And take a look at these videos:

<https://www.youtube.com/watch?v=gcTuQpuJyD8>

<https://www.youtube.com/watch?v=L0k-enzoeOM>

<https://www.youtube.com/watch?v=qCLmR9-YY7o>

### **Task:**

**Produce a one page revision guide to share with your class in September summarising one of the following topics: Cells and Cell Ultrastructure, Prokaryotes and Eukaryotes, or Mitosis and Meiosis.**

Whichever topic you choose, your revision guide should include:

Key words and definitions

Clearly labelled diagrams

Short explanations of key ideas or processes.

### **Biological Molecules**

Biological molecules are often polymers and are based on a small number of chemical elements. In living organisms carbohydrates, proteins, lipids, inorganic ions and water all have important roles and functions related to their properties. DNA determines the structure of proteins, including enzymes. Enzymes catalyse the reactions that determine structures and functions from cellular to whole-organism level. Enzymes are proteins with a mechanism of action and other properties determined by their tertiary structure. ATP provides the immediate source of energy for biological processes.

Read the information on these websites (you could make more Cornell notes if you wish):

<http://www.s-cool.co.uk/a-level/biology/biological-molecules-and-enzymes>

<http://www.bbc.co.uk/education/guides/zb739j6/revision>

And take a look at these videos:

<https://www.youtube.com/watch?v=H8WJ2KENIKO>

<http://ed.ted.com/lessons/activation-energy-kickstarting-chemical-reactions-vance-kite>

#### **Task:**

**Krabbe disease occurs when a person doesn't have a certain enzyme in their body. The disease effects the nervous system. Write a letter to a GP or a sufferer to explain what an enzyme is.**

Your letter should include what an enzyme is, the structure of an enzyme and a description of the "Lock and Key model" and the "induced fit model" of enzyme action, what Krabbe disease is, how it affects the body and any possible treatments/cures for it. Work should not be copied and pasted but you may use a variety of sources to help you.

**TASK:** Create a powerpoint presentation about the structure and function and importance of the following biological molecules: glucose, disaccharides, glycogen, cellulose, lipids, amino acids, proteins, water. You may include diagrams to show the structures.

### **Exchange and Transport**

Organisms need to exchange substances selectively with their environment and this takes place at exchange surfaces. Factors such as size or metabolic rate affect the requirements of organisms and this gives rise to adaptations such as specialised exchange surfaces and mass transport systems. Substances are exchanged by passive or active transport across exchange surfaces. The structure of the plasma membrane enables control of the passage of substances into and out of cells

Read the information on these websites (you could make more Cornell notes if you wish):

<http://www.s-cool.co.uk/a-level/biology/gas-exchange>

<http://www.s-cool.co.uk/a-level/biology/nutrition-and-digestion/revise-it/human-digestive-system>

And take a look at these videos:

<http://ed.ted.com/lessons/insights-into-cell-membranes-via-dish-detergent-ethan-perlstein>

<http://ed.ted.com/lessons/what-do-the-lungs-do-emma-bryce>

#### **Task:**

**Create a poster or display to go in your classroom in September. Your poster should either: compare exchange surfaces in mammals and fish or compare exchange surfaces in the lungs and the intestines. You could use a Venn diagram to do this. Your poster should:**

Describe diffusion, osmosis and active transport

Explain why oxygen and glucose need to be absorbed and waste products removed

Compare and contrast your chosen focus.

**Extra challenge:**

Do some research into the different career pathways that Biology can lead to. Some you may not have ever heard of! Websites such as UCAS, National Careers Service are useful starting points. Create some notes on the different options available, which ones might interest you and why.