



A Level Biology will give you an exciting insight into the contemporary world of biology. It covers the key concepts of biology and practical skills are integrated throughout the course. This combination of academic challenge and practical focus makes the prospect of studying A Level Biology highly appealing. You will learn about the core concepts of biology and about the impact of biological research and how it links to everyday life. You will learn to apply your knowledge, investigate and solve problems in a range of contexts. You will develop transferable skills including: investigative, problem solving, research, decision making, mathematical and analytical skills.

Should you have any questions or require any help, please contact Miss Jenkins [cjenkins@cardinalnewmanschool.net](mailto:cjenkins@cardinalnewmanschool.net) or Miss Daly [cdaly@cardinalnewmanschool.net](mailto:cdaly@cardinalnewmanschool.net)

**Please complete our transition task by your first lesson back in September and bring it with you.**

A level Biology will use your knowledge from GCSE and build on this to help you understand new and more demanding ideas. For your transition task you **must complete task A** and then you will **choose three of tasks B- F** this is to ensure you will enjoy studying A Level Biology and that you are ready to start the course (the more tasks you can do the better prepared you will be).

## TRANSITION WRITTEN TASK:

### Task A: Scientific and Investigative Skills

As part of your A level you will complete a practical assessment. This will require you to carry out a series of practical activities as well as planning how to do them, analysing the results and evaluating the methods. This will require you to: use appropriate apparatus to record a range of quantitative measurements (to include mass, time, volume, temperature, length and pH), use appropriate instrumentation to record quantitative measurements, such as a colorimeter or photometer, use laboratory glassware apparatus for a variety of experimental techniques including serial dilutions, use of light microscope at high power and low power, including use of a graticule, produce scientific drawing from observation with annotations, use qualitative reagents to identify biological molecules, separate biological compounds using thin layer/paper chromatography or electrophoresis, safely and ethically use organisms, use microbiological aseptic techniques, including the use of agar plates and broth, safely use instruments for dissection of an animal organ, or plant organ, use sampling techniques in fieldwork.

**Produce a glossary for the following key words which could be shared with other members of your class in September:**

accuracy, anomaly, calibration, causal link, chance, confounding variable, control experiment, control group, control variable, correlation, dependent variable, errors, evidence, fair test, hypothesis, independent, null hypothesis, precision, probability, protocol, random distribution, random error, raw data, reliability, systematic error, true value, validity, zero error,

## **TASK B: DNA and the Genetic Code**

In living organisms, nucleic acids (DNA and RNA) have important roles and functions related to their properties. The sequence of bases in the DNA molecule determines the structure of proteins, including enzymes. The double helix and its four bases store the information that is passed from generation to generation. The sequence of the base pairs adenine, thymine, cytosine and guanine tell ribosomes in the cytoplasm how to construct amino acids into polypeptides and produce every characteristic we see. DNA can mutate leading to diseases such as cancer and sometimes anomalies within the genetic code are passed from parents to babies in conditions such as cystic fibrosis, or can be developed in unborn fetuses such as Downs syndrome.

Read the information on these websites and videos:

- <http://www.bbc.co.uk/education/guides/z36mmp3/revision>
- <https://mmerevise.co.uk/gcse-biology-revision/dna/>
- <http://ed.ted.com/lessons/the-twisting-tale-of-dna-judith-hauck>
- <http://ed.ted.com/lessons/where-do-genes-come-from-carl-zimmer>

**Produce a wall display to put up in your classroom in September. You might make a poster or a thinking map or produce a PowerPoint; your display should include images, keywords and simple explanations to:**

- Define gene, chromosome, DNA and base pair
- Describe the structure and function of DNA and RNA
- Explain how DNA is copied in the body
- Outline some of the problems that occur with DNA replication and what the consequences of this might be.

## **TASK C: Exchange and Transport**

Organisms need to exchange substances selectively between 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 and videos:

- General Features of Exchange Surfaces (A-level Biology) - Study Mind
- <https://www.savemyexams.co.uk/a-level/biology/ocr/17/revision-notes/3-exchange--transport/3-1-exchange-surfaces/3-1-6-gas-exchange-in-fish--insects/>
- [https://www.youtube.com/watch?v=iGcUck7Vm\\_o](https://www.youtube.com/watch?v=iGcUck7Vm_o)
- <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>

**Produce a wall display to put up in your classroom in September. You might make a poster or a thinking map or produce a PowerPoint; your display must compare exchange surfaces in mammals and fish or compare exchange surfaces in the lungs and the intestines. 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.

### **TASK D: Cells and microscopy**

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 on to daughter cells. Daughter cells formed during mitosis have identical copies of genes while cells formed during meiosis are not genetically identical. Our knowledge of cells stems from improvements in microscope technology that allow us to see cells and their components in ever more detail.

Read the information on these websites and videos:

- <https://www.bbc.co.uk/bitesize/guides/z84jtv4/revision/1>
- <https://www.youtube.com/watch?v=dLJdRs5w4u4>
- <https://www.youtube.com/watch?v=gcTuQpuJyD8>
- <https://www.youtube.com/watch?v=L0k-enzoeOM>
- <https://www.youtube.com/watch?v=qCLmR9-YY7o>

**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, mitosis and meiosis or light microscopes and electron microscopes.**

- Whichever topic you choose, your revision guide should include:
- Key words and definitions
- Clearly labelled diagrams
- Short explanations of each of the key ideas or processes.

### **TASK E: 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 and videos:

- <https://www.savemyexams.co.uk/a-level/biology/ocr/17/revision-notes/2-foundations-in-biology/2-2-biological-molecules/2-2-1-properties-of-water/>
- <https://www.savemyexams.co.uk/a-level/biology/ocr/17/revision-notes/2-foundations-in-biology/2-4-enzymes/2-4-1-the-role-of-enzymes/>
- <https://www.youtube.com/watch?v=H8WJ2KENIKO>
- <http://ed.ted.com/lessons/activation-energy-kickstarting-chemical-reactions-vance-kite>

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

Your letter should include:

- Description of the structure of an enzyme
- Explain what enzymes do inside the body
- Outline factors affecting the activity of enzymes

## TASK F: Energy for Biological Processes

In cellular respiration, glycolysis takes place in the cytoplasm and the remaining steps in the mitochondria. ATP synthesis is associated with the electron transfer chain in the membranes of mitochondria and chloroplasts in photosynthesis energy is transferred to ATP in the light- dependent stage and the ATP is utilised during synthesis in the light-independent stage.

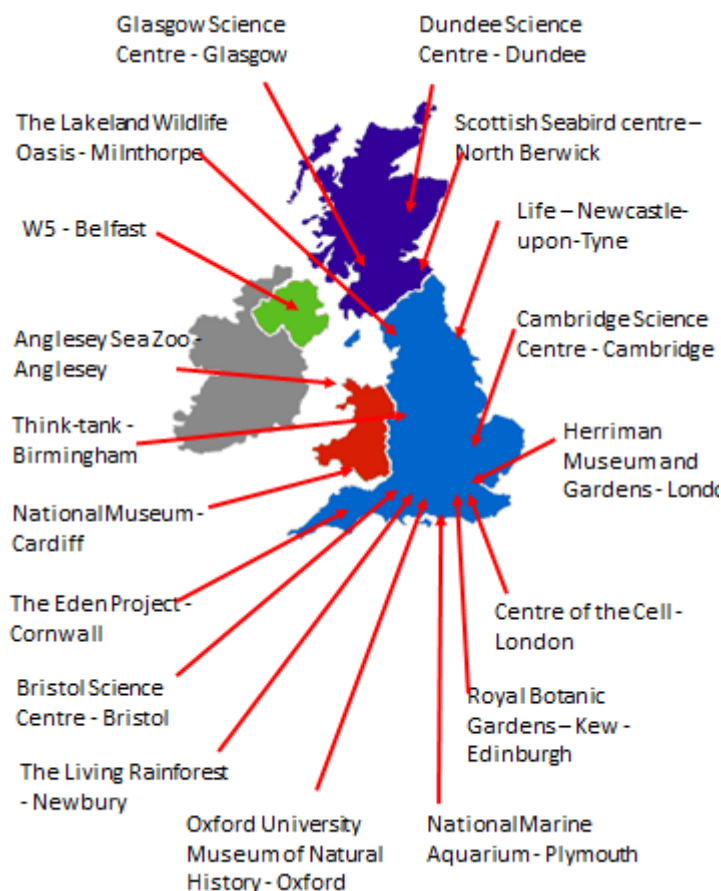
Read the information on these websites and videos:

- <https://www.savemyexams.co.uk/a-level/biology/ocr/17/revision-notes/5-communication-homeostasis--energy/5-7-respiration/5-7-1-the-need-for-cellular-respiration/>
- <https://www.bbc.co.uk/bitesize/guides/zp4mk2p/revision/2#:~:text=Respiration%20using%20oxygen%20to%20break%20down%20food%20molecules,%E2%86%92%20carbon%20dioxide%20%2B%20water%20%2B%20energy%20released>
- <https://www.youtube.com/watch?v=U4WwWuVZSe4>
- [https://www.youtube.com/watch?v=00jbG\\_cfGuQ](https://www.youtube.com/watch?v=00jbG_cfGuQ)
- <https://www.youtube.com/watch?v=2f7YwCtHcgk>

**Produce an annotated information poster that illustrates the process of cellular respiration and summarises the key points.**

- Your poster should include:
- Both text and images
- Be visually stimulating
- Key words and definitions
- Clearly labelled diagrams
- Short explanation of each key idea or process

**Enrichment Activities:** If you are on holiday in the UK, or on a staycation at home, why not plan a day trip to one of these:



Remember there are also lots of zoos, wildlife and safari parks across the country, here are some you may not have heard of and could consider visiting: **Whipsnade Zoo (Bedfordshire)**, **Woburn Safari Park (Bedfordshire)**, Colchester Zoo, Cotswold Wildlife Park, Banham Zoo (Norfolk), Tropical Birdland (Leicestershire), Yorkshire Wildlife Park, Peak Wildlife Park, International Centre for Birds of Prey (York), Blackpool Zoo, Beale Park (Reading).

There are also hundreds of nature reserves (some of which are free) located all over the country including: RSPB sites at **Sandy (Bedfordshire)**, Lochwinnoch, Saltholme, Fairburn Ings, Old Moor, Conwy, Minsmere, Rainham Marshes, Pulborough Brooks, Radipole Lake, Newport Wetlands. Wildlife Trust Reserves and others at Rutland Water, Pensthorpe, Insh Marshes, Attenborough Centre, Inversnaid, Skomer, Loch Garten, Donna Nook, Chapmans Well, Woodwalton Fen, London Wetland Centre, Martin Down and Woolston Eyes Reserve.

**Natural History Museum in Tring (Hertfordshire) or London**



## Movie Recommendations

If you have 30 minutes to spare, here are some great presentations (and free!) from world leading scientists and researchers on a variety of topics. They provide some interesting answers and ask some thought-provoking questions. Use the link or scan the QR code to view:

### A New Superweapon in the Fight Against Cancer

Available at :

[http://www.ted.com/talks/paula\\_hammond\\_d\\_a\\_new\\_superweapon\\_in\\_the\\_fight\\_against\\_cancer?language=en](http://www.ted.com/talks/paula_hammond_d_a_new_superweapon_in_the_fight_against_cancer?language=en)

Cancer is a very clever, adaptable disease. To defeat it, says medical researcher and educator Paula Hammond, we need a new and powerful mode of attack.



### Why Bees are Disappearing

Available at :

[http://www.ted.com/talks/marla\\_spivak\\_why\\_bees\\_are\\_disappearing?language=en](http://www.ted.com/talks/marla_spivak_why_bees_are_disappearing?language=en)

Honeybees have thrived for 50 million years, each colony 40 to 50,000 individuals coordinated in amazing harmony. So why, seven years ago, did colonies start dying en-masse?

### Why Doctors Don't Know About the Drugs They Prescribe

Available at :

[http://www.ted.com/talks/ben\\_goldacre\\_what\\_doctors\\_don\\_t\\_know\\_about\\_the\\_drugs\\_they\\_prescribe?language=en](http://www.ted.com/talks/ben_goldacre_what_doctors_don_t_know_about_the_drugs_they_prescribe?language=en)

When a new drug gets tested, the results of the trials should be published for the rest of the medical world — except much of the time, negative or inconclusive findings go unreported, leaving doctors and researchers in the dark.



### Growing New Organs

Available at :

[http://www.ted.com/talks/anthony\\_atalla\\_growing\\_organs\\_engineering\\_tissue?language=en](http://www.ted.com/talks/anthony_atalla_growing_organs_engineering_tissue?language=en)

Anthony Atalla's state-of-the-art lab grows human organs — from muscles to blood vessels to bladders, and more.