



Summer Tasks July 2020

So, you think you would like to study: **Biology**

Summer Task Title / Instructions:

A level Biology will use your knowledge from GCSE and build on this to help you understand new and more demanding ideas. You need to complete the following tasks to get you ready to start your studies in September. These activity directly link to the first 3 units you will cover at the start.

Task 1 - 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>

<https://www.thoughtco.com/cell-theory-373300>

<https://www.online-sciences.com/technology/what-are-uses-and-importance-of-microscopes/>

And take a look at these videos:

<https://www.youtube.com/watch?v=4OpBylwH9DU>

<https://www.youtube.com/watch?v=8XjKmR2heH8>

Task:

Use the following dates and information to construct a detailed timeline outlining the development of cell theory.

Dates:

1665, 1674-1683, 1832, 1833, 1837-1838, 1844(1855), 1860

Information:

Birth of universal cell theory

Cells first observed

Evidence for the origin of new animal cell

Evidence for the origin of new plant cells

First living cells observed

Nucleus first observed

Spontaneous generation disproved

Questions

1. Outline the importance of microscopes in the study of living organisms.
2. What is cell theory?
3. Suggest, with reasons, why cell theory was not fully developed before the mid-19th century

Task 2 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=H8WJ2KENIK0>

<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:

Describe the structure of an enzyme

Explain what enzymes do inside the body

Task 3 Plasma Membranes

Membranes are structures that separate the contents of cells from their environment. They also separate different areas within cells. The function of membranes is to control the passage of substances into and out of cells and organelles. There are several factors that affect a membranes structure and therefore its permeability. Molecules move across membranes by diffusion, facilitated diffusion and active transport. Water moves by osmosis.

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

<https://www.s-cool.co.uk/a-level/biology/cells-and-organelles/revise-it/the-cell-membrane>

And take a look at these videos:

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

Task:

Create a poster on Plasma membranes to go in your classroom in September. Your poster should

The structure and function of plasma membranes

Reference to diffusion, osmosis and active transport

Task 4 Mathematical, Scientific and investigative skills

Read Bridging unit GCSE to A Level – make sure you are secure on the mathematical content and the command words.

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 to include 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.

Task:

The diagram shows an image of human cheek cells.

The magnification of the cheek cells is $\times 100$.

Calculate the actual length of the cheek cell labelled B. (3)



Convert the following units:

127mm to μm

398 μm to nm

5400 μm to mm

39450 μm to mm

85,000nm to mm in standard form

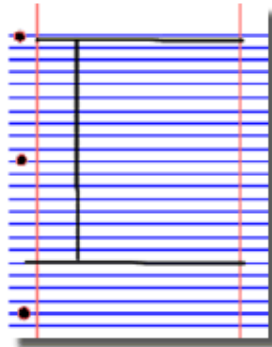
19mm to nm in standard form

Please submit the 4 tasks to your teacher on the first lesson in September. Feel free to do multiple summer tasks if you are unsure on what subjects to study.

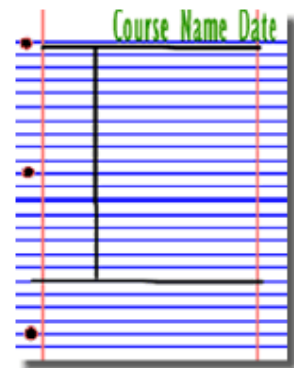
Taking Cornell notes

Research, reading and note making are essential skills for A level Biology study. For the following task you are going to produce 'Cornell Notes' to summarise your reading.

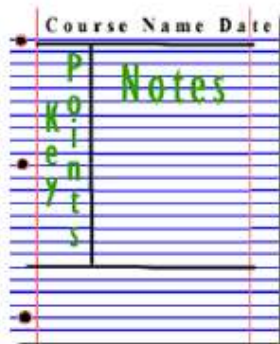
1. Divide your page into three sections like this



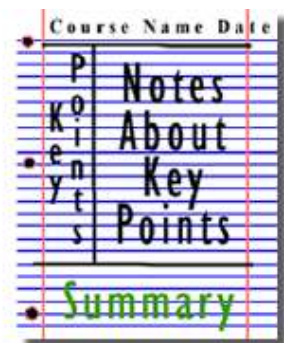
2. Write the name, date and topic at the top of the page



3. Use the large box to make notes. Leave a space between separate ideas. Abbreviate where possible.



4. Review and identify the key points in the left hand box



5. Write a summary of the main ideas in the bottom space

