

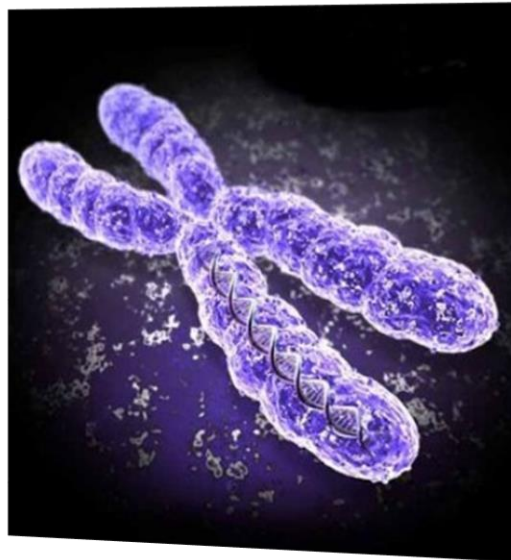
# SUMMER HOMEWORK

## Transition Pack

### A Level Biology 2021

A guide to help you get ready for A-level Biology

So you are considering  
A level Biology?

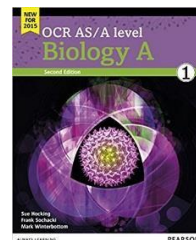


This pack contains activities and resources to prepare you to start an A level in Biology in September. It is aimed to be used over the Summer Holidays to ensure you are ready to start your course in September.

## WHAT YOU WILL **NEED TO PURCHASE** before September!

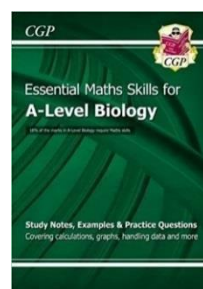
- **OCR BIOLOGY A student book 1**

[https://www.amazon.co.uk/OCR-Level-Biology-2015-ActiveBook/dp/144799079X/ref=sr\\_1\\_6?s=dmusic&ie=UTF8&qid=1495460643&sr=8-6&keywords=OCR+Biology+A+level+student+book+1](https://www.amazon.co.uk/OCR-Level-Biology-2015-ActiveBook/dp/144799079X/ref=sr_1_6?s=dmusic&ie=UTF8&qid=1495460643&sr=8-6&keywords=OCR+Biology+A+level+student+book+1) ISBN-13: 978-1447990796



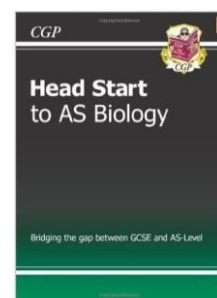
- **CGP: Essential Maths skills for A level Biology**

[https://www.amazon.co.uk/d/Books/New-Level-Biology-Essential-Skills-CGPBooks/1847623239/ref=sr\\_1\\_1?ie=UTF8&qid=1495461469&sr=81&keywords=Essential+maths+skills+for+A+level+biology](https://www.amazon.co.uk/d/Books/New-Level-Biology-Essential-Skills-CGPBooks/1847623239/ref=sr_1_1?ie=UTF8&qid=1495461469&sr=81&keywords=Essential+maths+skills+for+A+level+biology) ISBN-13: 978-1847623232



- You *may* wish to purchase CGP Head Start to AS Biology - it recaps all the tricky topics from GCSE that AS builds on. It will also be useful for reference throughout the course.

[https://www.amazon.co.uk/Head-Start-AS-Biology-exams/dp/1847621171/ref=sr\\_1\\_1?ie=UTF8&qid=1495461419&sr=8-1&keywords=Head+start+to+AS+biology](https://www.amazon.co.uk/Head-Start-AS-Biology-exams/dp/1847621171/ref=sr_1_1?ie=UTF8&qid=1495461419&sr=8-1&keywords=Head+start+to+AS+biology)  
ISBN: 978 -1847621177



The student book A and the Math skills book must be brought to very lesson along with the following items that **you will also need to purchase**

- A WHITE LABORATORY COAT (to allow you to participate in practical lessons – if you do not have one, you will not be allowed to participate!)
- 3 A4 ring binders each with a full set of dividers (**or** 1 lever arch folder and 1 ring binder)
- Scientific calculator.

\*Complete **TASKS 1 & 2** and present in a NEAT format.

**All tasks will be collected in during your FIRST biology lesson, you will also sit a baseline test on the work**

\*The sheet on Cornell notes is a help sheet to show you how to make notes

\*The book and movie recommendations are to encourage you to use alternative resources and are optional

1. Complete the following table and print it off:

Organelle	Description of structure	Function	Diagram: (drawn or from internet)
Nucleus			
Smooth Endoplasmic reticulum			
Rough endoplasmic reticulum			
Golgi apparatus			
Mitochondria			
Chloroplast			
Lysosomes			
Ribosomes			
Centrioles			

## 2. Independent research:

A level Biology will use your knowledge from GCSE and build on this to help you understand new and more demanding ideas. Complete the following tasks to make sure your knowledge is up to date and you are ready to start studying:

### 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 including cancer and sometimes anomalies in the genetic code are passed from parents to babies in disease such as cystic fibrosis, or can be developed in unborn fetuses such as Down's Syndrome.

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

<http://www.bbc.co.uk/education/guides/z36mmp3/revision>

<http://www.s-cool.co.uk/a-level/biology/dna-and-genetic-code>

And take a look at these videos:

<http://ed.ted.com/lessons/the-twisting-tale-of-dna-judith-hauck>

<http://ed.ted.com/lessons/where-do-genes-come-from-carlzimmer>

#### **Task:**

**Produce a wall display to put up in your classroom in September. You might make a poster or do this using PowerPoint or similar. Your display should use 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.

### 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 the 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:**

**Produce a glossary for the following key words:**

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

**Mathematical Skills**

Like it or loathe it maths forms a significant part of your A level. This will require you to use a scientific calculator, convert units, calculate magnification using scale bars, apply formulas to statistical data, extrapolate information from graphs, and perform calculations on graph and tabulated data.

**Task:**

**Produce a reference table for the following formula:**

surface area, volume, intercepts, rate, standard deviation, magnification

**Produce a glossary for the following key words:**

standard units, significant figures, standard form, ratios, mean, mode, median, correlation, gradients

**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.

**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.**

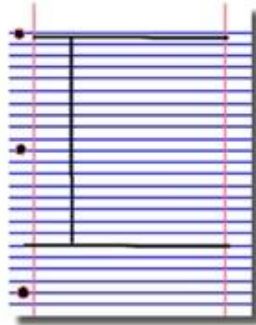
Your poster should:

- Describe the structure of an enzyme
- Explain what enzymes do inside the body

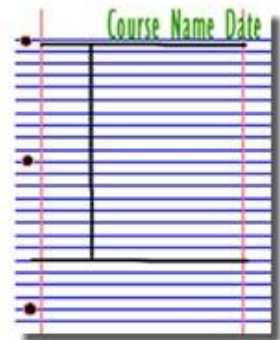
## Cornell Notes

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.

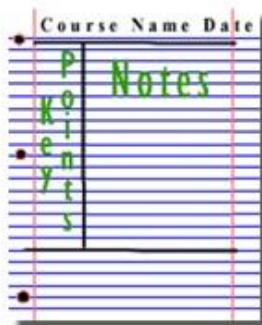
1. Divide your page into three sections like this



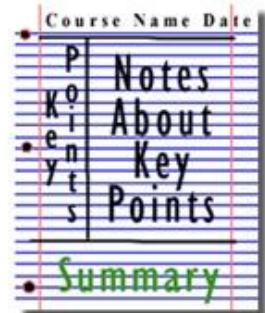
2. Write the name, date and topic at the top of the page



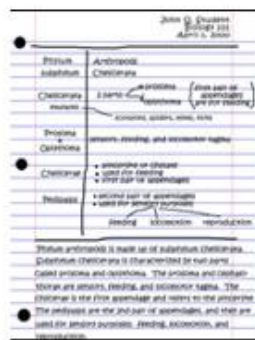
3. Use the large box to make notes. Leave a space between separate idea. Abbreviate where possible.



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

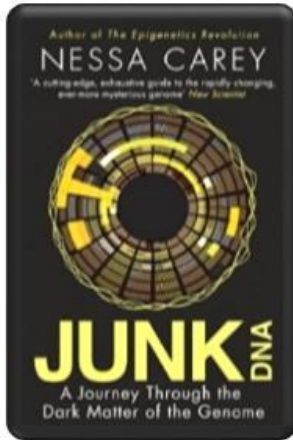


5. Write a summary of the main ideas in the bottom space



**Book Recommendations**

Kick back this summer with a good read. The books below are all popular science books and great for extending your understanding of Biology

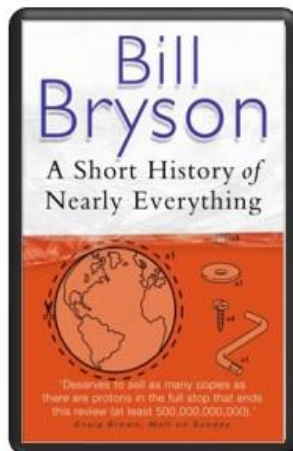
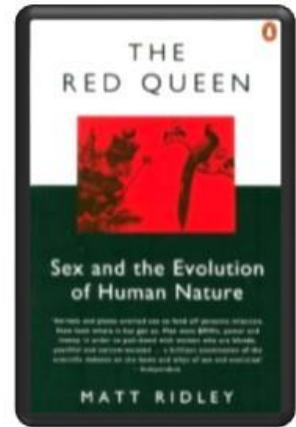


**Junk DNA**

Our DNA is so much more complex than you probably realize, this book will really deepen your understanding of all the work you will do on Genetics. Available at [amazon.co.uk](http://amazon.co.uk)

**The Red Queen**

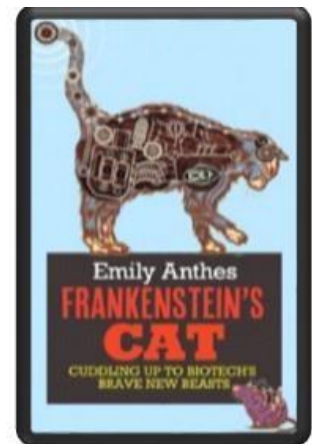
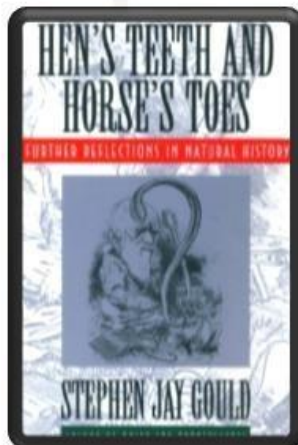
Its all about sex. Or sexual selection at least. This book will really help your understanding of evolution and particularly the fascinating role of sex in evolution. Available at [amazon.co.uk](http://amazon.co.uk)



**A Short History of Nearly Everything**

A whistle-stop tour through many aspects of history from the Big Bang to now. This is a really accessible read that will re-familiarise you with common concepts and introduce you to some of the more colourful characters from the history of science! Available at [amazon.co.uk](http://amazon.co.uk)

Studying Geography as well? **Hen's teeth and horses toes** Stephen Jay Gould is a great Evolution writer and this book discusses lots of fascinating stories about Geology and evolution. Available at [amazon.co.uk](http://amazon.co.uk)



An easy read..

**Frankenstein's cat**

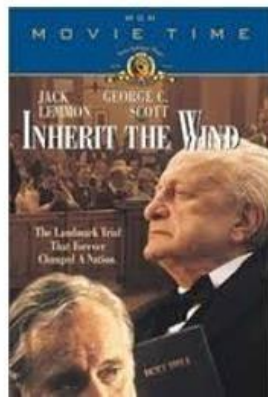
Discover how glow in the dark fish are made and more great Biotechnology breakthroughs. Available at [amazon.co.uk](http://amazon.co.uk)

## Movie Recommendations

Everyone loves a good story and everyone loves some great science. Here are some of the picks of the best films based on real life scientists and discoveries. You won't find Jurassic Park on this list, we've looked back over the last 50 years to give you our top 5 films you might not have seen before. Great watching for a rainy day.



**Inherit The Wind (1960)**  
Great if you can find it. Based on a real life trial of a teacher accused of the crime of teaching Darwinian evolution in school in America. Does the debate rumble on today?

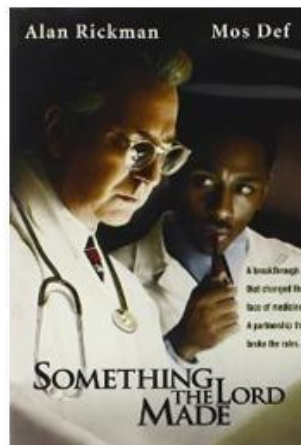


**Gorillas in the Mist (1988)**  
An absolute classic that retells the true story of the life and work of Dian Fossey and her work studying and protecting mountain gorillas from poachers and habitat loss. A tear jerker.

**Andromeda Strain (1971)**  
Science fiction by the great thriller writer Michael Crichton (he of Jurassic Park fame). Humans begin dying when an alien microbe arrives on Earth.



**Lorenzo's Oil (1992)**  
Based on a true story. A young child suffers from an autoimmune disease. The parents research and challenge doctors to develop a new cure for his disease.



**Something the Lord Made (2004)**  
Professor Snape (the late great Alan Rickman) in a very different role. The film tells the story of the scientists at the cutting edge of early heart surgery as well as issues surrounding racism at the time.

There are some great TV series and box sets available too, you might want to check out: Blue Planet, Planet Earth, The Ascent of Man, Catastrophe, Frozen Planet, Life Story, The Hunt and Monsoon.