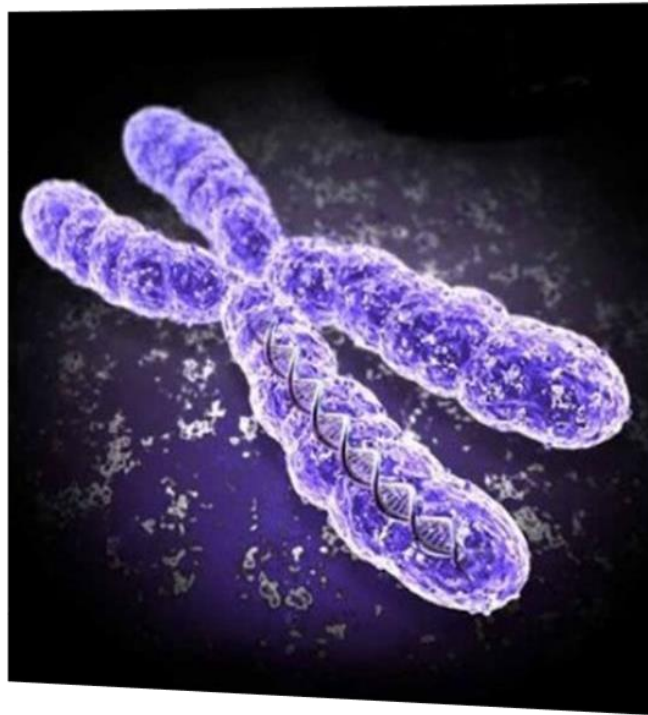


SUMMER HOMEWORK

Transition Pack

A Level Biology 2022

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

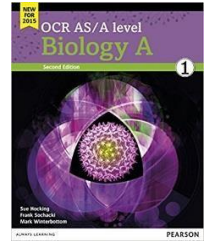


This pack contains activities and resources to prepare you to start an A level in Biology in September. It is aimed to be used over the Summer Holidays to ensure you are ready to start your course in September.

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

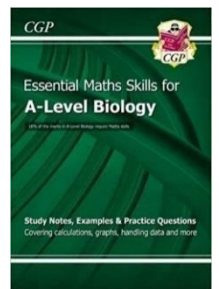
- **OCR BIOLOGY A student book 1**

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 ISBN-13: 978-1447990796



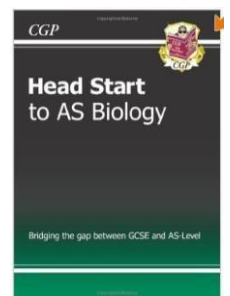
- **CGP: Essential Maths skills for A level Biology**

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 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
ISBN: 978-1782942795



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)
- Scientific calculator.

In September you will begin with the following topics:

- 2.1 Cell structure & microscopy
- 3.1 Exchange surfaces
- 2.2 Biological molecules

The following tasks will help you review and build on your GCSE knowledge in preparation for these topics as well as develop some key terminology that will be relevant throughout the course.

Complete all tasks and present in a NEAT format

All tasks will be checked and marked during your FIRST week of biology lessons – make sure you bring it to the first lesson. You will also sit a baseline test on the work within the first few weeks.

1. 2.1 Cell structure:

Complete the following table (in your own words) 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. 3.1 Exchange surfaces:

- a) Complete the table below to calculate the surface area to volume ratio for different size cubes:

Cube	Side length (cm)	Volume (cm ³)	Surface area (cm ²)	SA : V ratio
A	2			
B	15			
C	0.5			
D	7.5			
E	5			

- b) **Independent research:** Using jellyfish and cats as an example, describe the relationship between the size of an organism and surface area to volume ratio? How does the SA:V ratio relate to the anatomy of different organisms?

3. 2.2 Biological molecules:

- a) Put ticks in the correct column of the table below to identify the atoms found in the different types of biological molecules:

	Carbon	Hydrogen	Oxygen	Phosphorus	Sulfur
Protein					
Carbohydrate					
Triglyceride					
Phospholipid					
Nucleic acid					

- b) Independent research: Create a mind map to cover the following information – writing should be brief and diagrams can be included.

For each molecule describe the structure and role in living organisms.

Molecule
Carbohydrate – glycogen
Carbohydrate – cellulose
Protein
Triglyceride
Phospholipid

4. **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 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 (you may want to use the OCR Practical Skills Handbook to help <https://www.ocr.org.uk/Images/294468-biology-practical-skills-handbook.pdf>):

Accuracy, anomaly, control variable, dependent variable, error, independent variable, null hypothesis, precision, processed data, raw data, repeatability, reproducibility, resolution, validity.

5. Mathematical Skills

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:

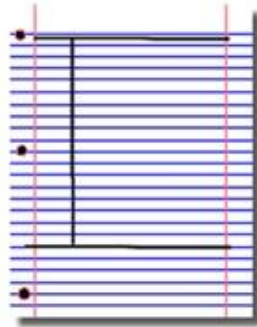
Produce a reference table for the following formulae for the following (you may want to use the OCR Maths Skills Handbook to help: <https://www.ocr.org.uk/Images/294471-biology-mathematical-skills-handbook.pdf>)

- Circumference and area of a circle
- Surface area and volume of a cuboid
- Surface area and volume of a cylinder
- Surface area and volume of a sphere

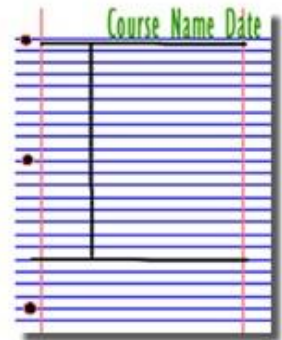
Useful notetaking skill: Cornell Notes

Research, reading and note making are essential skills for A level Biology study. You will be expected to do pre-reading tasks and post-lesson consolidation using class resources as well as the internet, textbook and other resources. You may wish to try this type of notetaking this in September when completing independent tasks and in lessons.

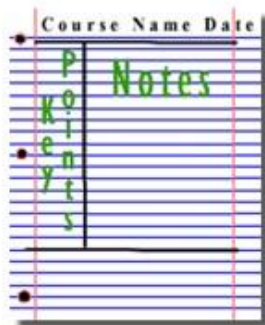
1. Divide your page into three sections like this



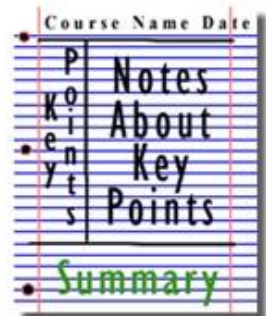
2. Write the name, date and topic at the top of the page



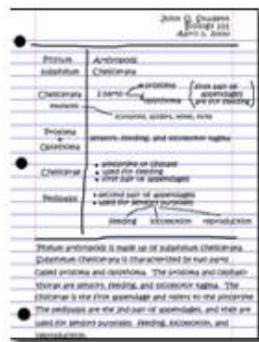
3. Use the large box to make notes. Leave a space between separate idea. Abbreviate where possible.



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

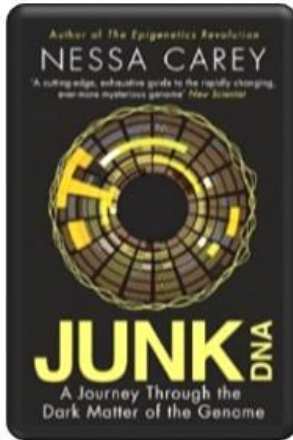


5. Write a summary of the main ideas in the bottom space



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

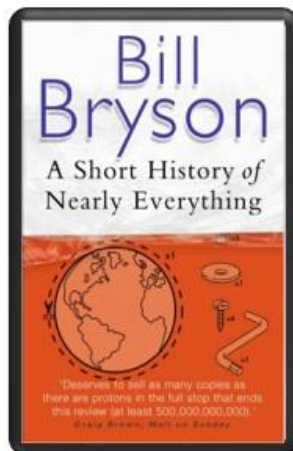
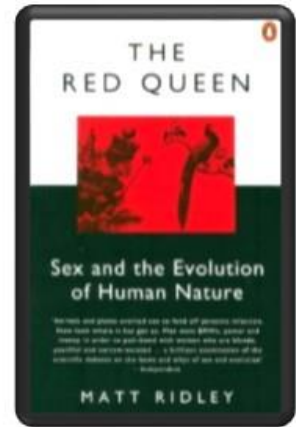


Junk DNA

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

The Red Queen

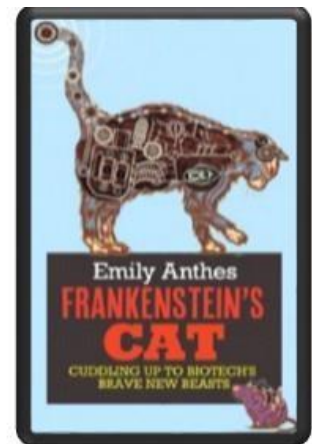
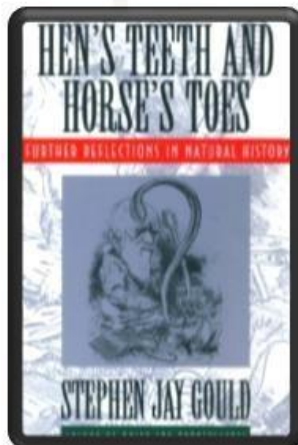
Its all about sex. Or sexual selection at least. This book will really help your understanding of evolution and particularly the fascinating role of sex in evolution. Available at amazon.co.uk



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

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



An easy read..

Frankenstein's cat

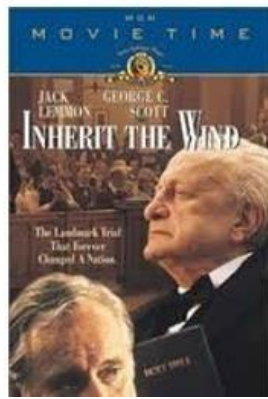
Discover how glow in the dark fish are made and more great Biotechnology breakthroughs. Available at amazon.co.uk

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?

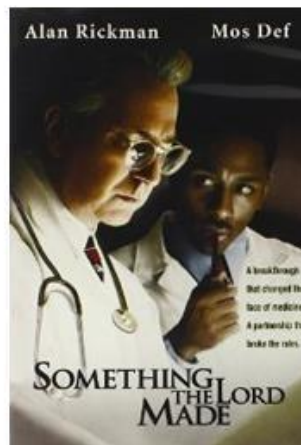


Gorillas in the Mist (1988)
An absolute classic that retells the true story of the life and work of Dian Fossey and her work studying and protecting mountain gorillas from poachers and habitat loss. A tear jerker.

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.