



# A LEVEL BIOLOGY INDUCTION



## Welcome to A level Biology

This booklet contains some helpful information to support your studies over the next 2 years.

Please complete the tasks at the end to help bridge the gap between GCSE and A level biology over the summer holidays.

# Content, Specification & Assessment

The full specification is found here:

<https://www.oqa.org.uk/subjects/science/as-and-a-level/biology-7401-7402/subject-content>

## Specification at a glance

### AS and first year of A-level

- 1 Biological molecules.
- 2 Cells.
- 3 Organisms exchange substances with their environment.
- 4 Genetic information, variation and relationships between organisms.

### A-level only

- 5 Energy transfers in and between organisms.
- 6 Organisms respond to changes in their internal and external environments.
- 7 Genetics, populations, evolution and ecosystems.
- 8 The control of gene expression.

## The assessment for the A-level consists of three exams

Paper 1	+	Paper 2	+	Paper 3
<b>What's assessed</b> <ul style="list-style-type: none"><li>• Any content from topics 1–4, including relevant practical skills</li></ul>		<b>What's assessed</b> <ul style="list-style-type: none"><li>• Any content from topics 5–8, including relevant practical skills</li></ul>		<b>What's assessed</b> <ul style="list-style-type: none"><li>• Any content from topics 1–8, including relevant practical skills</li></ul>
<b>Assessed</b> <ul style="list-style-type: none"><li>• written exam: 2 hours</li><li>• 91 marks</li><li>• 35% of A-level</li></ul>		<b>Assessed</b> <ul style="list-style-type: none"><li>• written exam: 2 hours</li><li>• 91 marks</li><li>• 35% of A-level</li></ul>		<b>Assessed</b> <ul style="list-style-type: none"><li>• written exam: 2 hours</li><li>• 78 marks</li><li>• 30% of A-level</li></ul>
<b>Questions</b> <ul style="list-style-type: none"><li>• 76 marks: a mixture of short and long answer questions</li><li>• 15 marks: extended response questions</li></ul>		<b>Questions</b> <ul style="list-style-type: none"><li>• 76 marks: a mixture of short and long answer questions</li><li>• 15 marks: comprehension question</li></ul>		<b>Questions</b> <ul style="list-style-type: none"><li>• 38 marks: structured questions, including practical techniques</li><li>• 15 marks: critical analysis of given experimental data</li><li>• 25 marks: one essay from a choice of two titles</li></ul>

# Getting organised

You will need an A4 lever arch ring binder folder to keep all the notes you make in class, and the independent work you complete as part of your studies.

Use the topics in the specification above and some dividers to split your folder into sections. This will help you to organise your notes.

Print this checklist and add it at the start of each topic to ensure you have notes that cover the entire course. This will also help you when you come to revise.

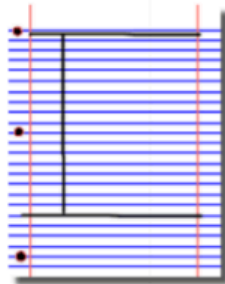
[A level biology checklist](#)

## Making notes

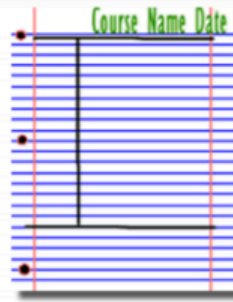
A good method of note taking is to use the Cornell system:

<https://coe.jmu.edu/learningtoolbox/cornellnotes.html>

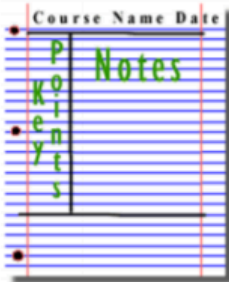
1. Divide your page into three sections like this



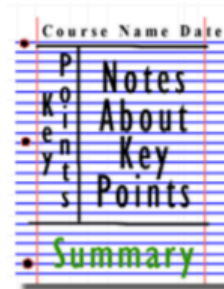
2. Write the name, date and topic at the top of the page



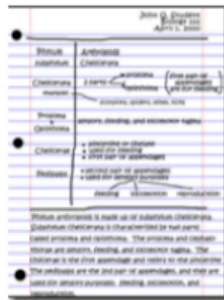
3. Use the large box to make notes. Leave a space between separate ideas. Abbreviate where possible.



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



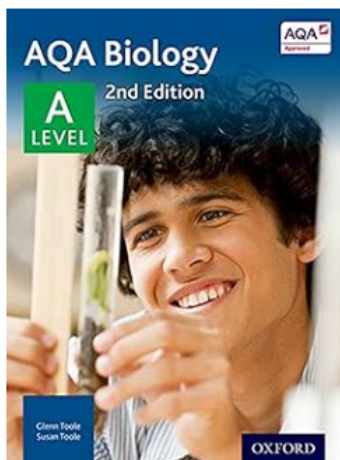
5. Write a summary of the main ideas in the bottom space



# Reading list

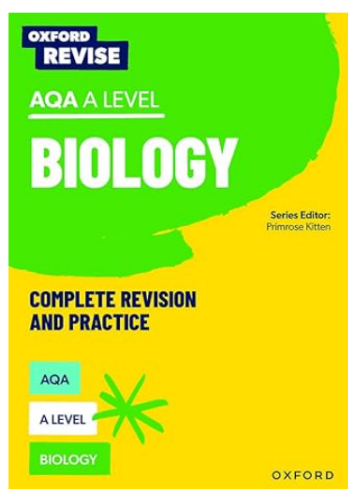
## Textbook

Recommended text book: AQA Biology: A Level: September 2015 by *Glen Toole & Susan Toole*  
[A level textbook](#)



## Revision guide

This recommended revision guide contains concise information which is easy to understand, retrieval practice and exam questions. [OUP A level Biology revision guide](#)



## Extra reading

Success in A level Biology depends on making connections between the different topics that you study. To achieve top marks you also need to pull on knowledge outside of the curriculum. Choose a few of these books, films and magazines to read over the next two years:

The Selfish Gene- *Richard Dawkins*

The Blind Watchmaker- *Richard Dawkins*

Y: The Descent of Men in the Blood: God, Genes & Destiny- *Steve Jobs*

Almost Like a Whale: The 'Origin of Species' Updated- *Steve Jones*

The Autobiography of a Species in 23 Chapters- *Matt Ridley Genome*

Nature via Nurture: Genes, Experience and What Makes Us Human- *Matt Ridley Genome*

DNA: The Secret of Life The Double Helix: Personal Account of the Discovery of the Structure of DNA- *James Watson*

The Lives of a Cell: Notes of a Biology Watcher- *Lewis Thomas*

The Rough Guide to the Brain- (*Rough Guides Reference Titles, Barry Gibb*)

A Short History of Nearly Everything- *Bill Bryson*

The Body: A Guide for Occupants- *Bill Bryson*

The Didden Life of Trees- *Peter Wohlleben*

She Has Her Mother's Laugh: The Powers, Perversions and Potential of Heredity- *Carl Zimmer*

### Magazines

- New scientist: <https://www.newscientist.com/>  
*Provides a weekly overview of recent discoveries across the sciences*
- Biological sciences review  
<https://www.hoddereducationmagazines.com/magazines/biological-sciences-review/>  
*A monthly publication written specifically for A level biology students, with articles directly linked to the specification*

### Podcasts

The curious cases of Rutherford & Fry: <https://www.bbc.co.uk/programmes/b07dx75g>

The life scientific: <https://www.bbc.co.uk/programmes/b015sqc7/episodes/downloads>

Inside science: <https://www.bbc.co.uk/programmes/b036f7w2/episodes/downloads>

Ologies: <https://www.alieward.com/ologies>

New scientist podcast: <https://www.newscientist.com/podcasts/new-scientist-weekly/2/>

### TED talks

<https://www.ted.com/topics/biology>

### Ms Estruch

[www.youtube.com/@MissEstruchBiology](https://www.youtube.com/@MissEstruchBiology)

# 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 organized into tissues, tissues into organs and organs into organ systems. Daughter cells formed during mitosis have identical copies of genes, while cells formed during meiosis are not genetically identical.

Read information on these websites and make cornell notes:

<https://pmt.physicsandmathstutor.com/download/Biology/A-level/Notes/OCR-A/2-Foundation-s-in-Biology/Summary/2.1.%20Cell%20Structure.pdf>

<https://www.thesciencehive.co.uk/cell-structure-a-level>

<https://www.stem.org.uk/resources/elibrary/resource/34589/cell-suitable-home-teaching#&gid=undefined&pid=5>

Watch these videos:

<https://youtu.be/uTYQ0zH7loU?feature=shared>

<https://youtu.be/URUJD5NEXC8?feature=shared>

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

**Task 1:** Produce a two-page revision guide to share with your class in September summarising Eukaryotic cell structure and ultrastructure. This should include:

- Key words and definitions
- Clearly labelled diagrams
- Short explanations of key ideas and processes

## 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 this information and make Cornell notes:

<https://www.thesciencehive.co.uk/enzymes-a-level#:~:text=All%20enzymes%20are%20globular%20proteins,to%20as%20the%20allosteric%20site.>

<https://www.savemyexams.com/a-level/biology/aqa/17/revision-notes/1-biological-molecules/1-4-proteins-enzymes/1-4-2-enzyme-specificity/>

<https://medlineplus.gov/genetics/condition/krabbe-disease/>

<https://rarediseases.org/rare-diseases/leukodystrophy-krabbes/>

Watch these videos:

<https://www.youtube.com/watch?v=O-3IaxNSPog>

<https://youtu.be/87XW1LGkHRs?feature=shared>

**Task 2:** Krabbe disease occurs when a person doesn't have a certain enzyme in their body. The disease affects the nervous system. Create a summary notes page for enzymes and include research on Krabbe disease and its effect.

You should include the following:

- A description of the structure of an enzyme, including a diagram.
- An explanation of what enzymes do inside the body
- A description of the different factors that affect the rate of enzymes
- What is Krabbe disease? What enzyme is affected? What is the cause of Krabbe disease? How does this impact their health? Why does it cause these symptoms? Are there any treatments?