

# A level Biology



## Bridging the Gap

Making the transition between GCSE and A level

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## Introduction

Biology is an interesting subject to study at advanced level as it provides an understanding of life at all levels from molecules and cells to ecosystems and the biosphere. A good grade in the subject rewards students with the respect of future employers and a wealth of career opportunities. The most challenging part of A level biology is bridging the gap between GCSE and A level work.

The transition between GCSE and A level is large, both for pupils who have completed a single GCSE in biology and for students who have completed GCSE science trilogy. The objective of this booklet is to help you to make this transition more easily.

## Expectations

As you embark upon your study of A level biology, you will begin to explore cells and important biological molecules. As well as developing skills, knowledge and understanding in biology and the necessary literacy skills to communicate your ideas, you will also need to demonstrate competence in applying practical and mathematical skills. In addition, to reach the highest grades in A-level biology, you should engage in wider reading around the subject to develop your understanding beyond the specification.

To give yourself the best possible start to the course:

**Task 1.** Complete the summer task from this booklet in the last week of the summer holidays so you arrive with the knowledge still fresh in your mind ready to start lessons. It should take about 3 hours. Try to complete it in a few small sittings.

**Tasks 2-5 (optional).** Try to carry out some of the optional reading / watching / listening tasks as they will help you fit everything you learn in lessons into context more easily, which, in turn, makes learning it all a lot more enjoyable!

Be aware that there will be a baseline test at the start of the course; this booklet will help you prepare.

## 1. Summer Tasks to Review GCSE Biology Key Ideas

Read or watch (it's your preference!) the key information from GCSE Biology to refresh your memory. Those shown in bold refer to topics from the single science specification. If you did the combined science (trilogy) course, spend a little more time on these as they will be new to you.

Topic	Read	Watch
<b>Cells</b>	<ul style="list-style-type: none"> <li><a href="https://www.bbc.co.uk/bitesize/guides/z84jtv4/revision/1">https://www.bbc.co.uk/bitesize/guides/z84jtv4/revision/1</a></li> </ul>	<ul style="list-style-type: none"> <li><a href="https://www.youtube.com/watch?v=HBZcpzr5B2g&amp;list=PL9IouNCPbCxVU74eQtCcqbaQdYmwzAnlC&amp;index=1">https://www.youtube.com/watch?v=HBZcpzr5B2g&amp;list=PL9IouNCPbCxVU74eQtCcqbaQdYmwzAnlC&amp;index=1</a></li> <li><a href="https://www.youtube.com/watch?v=EAoel2gXBRg&amp;list=PL9IouNCPbCxVU74eQtCcqbaQdYmwzAnlC&amp;index=5">https://www.youtube.com/watch?v=EAoel2gXBRg&amp;list=PL9IouNCPbCxVU74eQtCcqbaQdYmwzAnlC&amp;index=5</a></li> <li><a href="https://www.youtube.com/watch?v=GuY0n7-zfds&amp;list=PL9IouNCPbCxVU74eQtCcqbaQdYmwzAnlC&amp;index=4">https://www.youtube.com/watch?v=GuY0n7-zfds&amp;list=PL9IouNCPbCxVU74eQtCcqbaQdYmwzAnlC&amp;index=4</a></li> </ul>
<b>Transport in cells</b>	<ul style="list-style-type: none"> <li><a href="https://www.bbc.co.uk/bitesize/guides/zc7k2nb/revision/1">https://www.bbc.co.uk/bitesize/guides/zc7k2nb/revision/1</a></li> </ul>	<ul style="list-style-type: none"> <li><a href="https://www.youtube.com/watch?v=C5pMigXBAgk&amp;list=PL9IouNCPbCxVU74eQtCcqbaQdYmwzAnlC&amp;index=14">https://www.youtube.com/watch?v=C5pMigXBAgk&amp;list=PL9IouNCPbCxVU74eQtCcqbaQdYmwzAnlC&amp;index=14</a></li> <li><a href="https://www.youtube.com/watch?v=qqe2NhQt8bY&amp;list=PL9IouNCPbCxVU74eQtCcqbaQdYmwzAnlC&amp;index=16">https://www.youtube.com/watch?v=qqe2NhQt8bY&amp;list=PL9IouNCPbCxVU74eQtCcqbaQdYmwzAnlC&amp;index=16</a></li> <li><a href="https://www.youtube.com/watch?v=BXTi5tbnOr0&amp;list=PL9IouNCPbCxVU74eQtCcqbaQdYmwzAnlC&amp;index=18">https://www.youtube.com/watch?v=BXTi5tbnOr0&amp;list=PL9IouNCPbCxVU74eQtCcqbaQdYmwzAnlC&amp;index=18</a></li> <li><a href="https://www.youtube.com/watch?v=DHGWH3NdAjc&amp;list=PL9IouNCPbCxVU74eQtCcqbaQdYmwzAnlC&amp;index=15">https://www.youtube.com/watch?v=DHGWH3NdAjc&amp;list=PL9IouNCPbCxVU74eQtCcqbaQdYmwzAnlC&amp;index=15</a></li> </ul>
<b>Enzymes</b>	<ul style="list-style-type: none"> <li><a href="https://www.bbc.co.uk/bitesize/guides/zcctv9q/revision/1">https://www.bbc.co.uk/bitesize/guides/zcctv9q/revision/1</a></li> </ul>	<ul style="list-style-type: none"> <li><a href="https://www.youtube.com/watch?v=VLK2wANjQm0&amp;list=PL9IouNCPbCxXGDt3ATU1xM_X_F8JghPCB&amp;index=2">https://www.youtube.com/watch?v=VLK2wANjQm0&amp;list=PL9IouNCPbCxXGDt3ATU1xM_X_F8JghPCB&amp;index=2</a></li> <li><a href="https://www.youtube.com/watch?v=Rfvh4LIsEEM&amp;list=PL9IouNCPbCxXGDt3ATU1xM_X_F8JghPCB&amp;index=3">https://www.youtube.com/watch?v=Rfvh4LIsEEM&amp;list=PL9IouNCPbCxXGDt3ATU1xM_X_F8JghPCB&amp;index=3</a></li> </ul>
<b>DNA</b>	<ul style="list-style-type: none"> <li><a href="https://www.bbc.co.uk/bitesize/guides/z9pkmsg/revision/1">https://www.bbc.co.uk/bitesize/guides/z9pkmsg/revision/1</a></li> </ul>	<ul style="list-style-type: none"> <li><a href="https://www.youtube.com/watch?v=TQ_iCf8mzMA&amp;list=PL9IouNCPbCxWt28Bifo2jK9xn-ym956sf&amp;index=4">https://www.youtube.com/watch?v=TQ_iCf8mzMA&amp;list=PL9IouNCPbCxWt28Bifo2jK9xn-ym956sf&amp;index=4</a></li> <li><a href="https://www.youtube.com/watch?v=o4LHU79fB3s&amp;list=PL9IouNCPbCxWt28Bifo2jK9xn-ym956sf&amp;index=5">https://www.youtube.com/watch?v=o4LHU79fB3s&amp;list=PL9IouNCPbCxWt28Bifo2jK9xn-ym956sf&amp;index=5</a></li> <li><a href="https://www.youtube.com/watch?v=1GgNNYZ47rk&amp;list=PL9IouNCPbCxWt28Bifo2jK9xn-ym956sf&amp;index=6">https://www.youtube.com/watch?v=1GgNNYZ47rk&amp;list=PL9IouNCPbCxWt28Bifo2jK9xn-ym956sf&amp;index=6</a></li> </ul>

For each of the four topics, produce a summary (one side of A4) in your own words, detailing the extra knowledge and understanding you have gained from this reading.

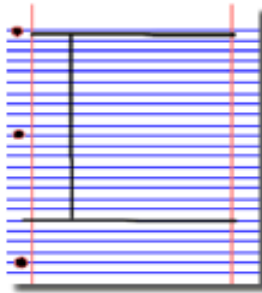
This could be presented in a variety of formats – as long as it is accurate and detailed - for instance, as handwritten paragraphs, a detailed mind map, or a series of flash cards. The 'Revision techniques 1-3' section of this booklet has some ideas for how you could present your work, or you can choose your own format.

Bring your four summaries to your first lesson of Biology in September. See you there!

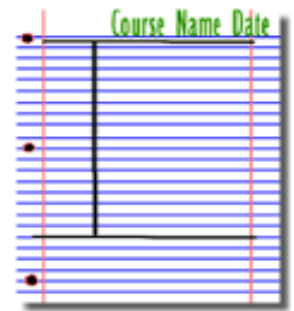
# Revision technique 1

## Making Effective Notes

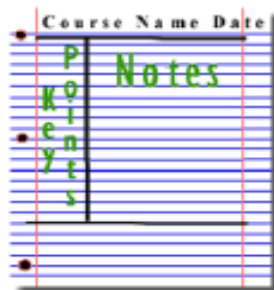
1. Divide your page into three sections like this



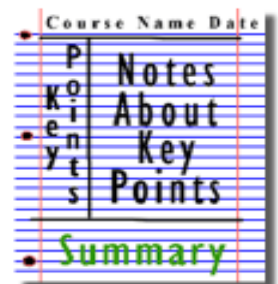
2. Write the name, date and topic at the top of the page



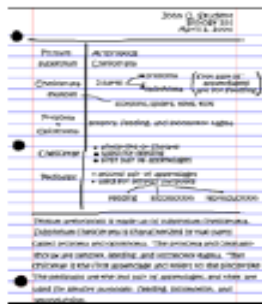
3. Use the large box to make notes. Leave a space between separate idea. Abbreviate where possible.



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



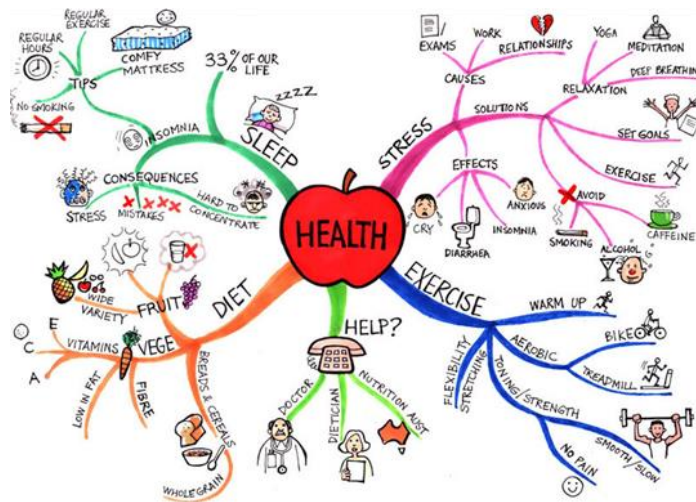
5. Write a summary of the main ideas in the bottom space



## Revision technique 2 Mind mapping

### Definition of a mind map

A mind map is a visual representation of a big amount of information that includes a central topic surrounded by connected branches of associated ideas/concepts.



### Benefits of mind mapping

- Engages creative parts of the brain
- Makes connections between ideas
- Helps to organise ideas
- Links details into the bigger picture
- Colourful and fun to make
- Works especially well for those who remember pictures easily

### Tips for a good mind map

- Choose a topic
- Add the associated ideas and concepts
- Limit use of words, use more images and symbols
- Use lines and colours to group and link these ideas

## Revision technique 3

### Flash cards

- Flash cards are cards with a question and often some key words or information on one side and the answer to that question on the other side.
- When reading your notes about a topic, ask yourself: “Can I think of a (test) question about what I just read?” If you can, you write this question on a card.
- When you’ve finished reading the notes, write the answers to your questions on the back of your cards; then check they are correct.
- By writing the answers on the cards, you are already starting to memorise those answers. And you have made a summary of the topic!

#### Effective flash cards

Key vocabulary

For longer answer questions in tests

For mathematical problems.

For complex diagrams to learn.

Questions to develop understanding i.e. things you have found difficult

## 2. Wider Reading (optional)

Going on holiday? Looking for something to do? Pick one of these for a great summer read!

### Other Minds: The Octopus and the Evolution of Intelligent Life

OTHER  
MINDS / THE OCTOPUS AND  
THE EVOLUTION  
OF INTELLIGENT  
LIFE



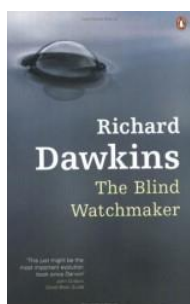
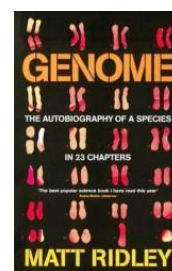
PETER GODFREY-SMITH

This is one of my favourite books and a must for those interested in evolutionary Biology (Mrs Lea)

News paper reviews say: 'Brilliant' Guardian 'Fascinating and often delightful' The Times What if intelligent life on Earth evolved not once, but twice? The octopus is the closest we will come to meeting an intelligent alien. What can we learn from the encounter?

### Genome

Probably the BEST popular introduction to modern genetics. Ridley's structure is wonderfully simple – 23 chapters to cover the 23 human chromosomes – but he uses it brilliantly. We start with Chromosome number 1 and a gene that we share with every other life form, including, probably, the very first living organism.

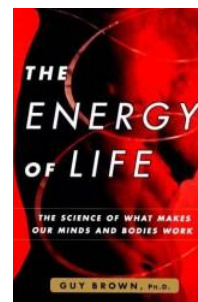


### The Blind Watchmaker

Every A-level Biology student should read at least one of Dawkins' books, and this may be the best place to start. Readable and provocative, you can accuse Dawkins of many things, but he is never dull.

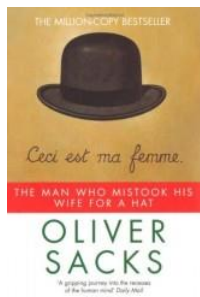
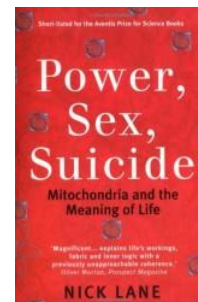
### The Energy of Life

An enthralling account of the electricity that keeps you alive and one of the best popular science books ever written. It complements the A2 Respiration topic perfectly and makes all kinds of complex issues immediately accessible.



## Power, sex, suicide: mitochondria and the meaning of life

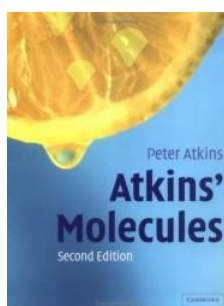
Not an easy read, but awesome in scope and mind-boggling in its implications. From the very origins of mitochondria in the murky bacterial soup, to the dangers of keeping DNA next to this bubbling furnace of free radicals, and the role of mitochondria in apoptosis. Includes all the latest research and ideas in the field, and is essential reading for anyone who's serious about Oxbridge.



## The Man Who Mistook His Wife For a Hat

Sack's case studies make fascinating reading and this is the most famous, and

probably the most accessible, of his books. The chapters are interesting for what they reveal about the human brain and how it works, but the stories are so much more than just dry case histories. Sacks never loses sight of the fact that his patients, for all their bizarre symptoms, are human beings, and his compassion is evident throughout. Extraordinary and moving, this book may change the way you view the world.



## Atkin's Molecules

This sounds terribly dry. A book about molecules? Ugh. But try this extract from the section of pheromones:

“Another component of male underarm sweat provides an engaging story. This component is a hormone molecule that closely resembles one secreted by a male pig encouraging mating behaviour in a sow. The same pheromone is also secreted by the fungus we know as the truffle. Because truffles do not appear above ground, they must be sought out by pigs, who end up frustrated. Whether our enjoyment of truffles is related to our perhaps unconscious enjoyment of our own underarm sweat is a matter of conjecture.” Could make you fall in love with

Biochemistry...



## The Periodic Table

Primo Levi is best known for his extraordinary accounts of his time in Auschwitz as a prisoner of the Nazis, how he lived, how he survived, and how he finally found his way home. These books, *If This Is A Man*, and *The Truce*, should be read by anyone and everyone. But Levi was an industrial chemist by training, and another of his books, the unpromisingly titled *The Periodic Table*, celebrates this first love. Forget the title. Each chapter has the name of an element, and each is a self-contained story. These vary hugely, from pure fantasy to historical fable to autobiographical snippets. Vanadium describes how his knowledge of that element's properties helped him survive the concentration camp. Lead tells the story of a mediaeval lead worker. Carbon, the best of all, narrates the journey of a carbon atom as it travels into and out of the living world. These are wonderful stories, wholly original and utterly compelling.

## Do zombies dream of undead sheep?

Interesting for those studying Biology and Psychology: Even if you've never seen a zombie movie or television show, you could identify an undead ghoul if you saw one. With their endless wandering, lumbering gait, insatiable hunger, antisocial behavior, and apparently memory-less existence, zombies are the walking nightmares of our deepest fears. What do these characteristic behaviors reveal about the inner workings of the zombie mind? Could we diagnose zombism as a neurological condition by studying their behavior? In *Do Zombies Dream of Undead Sheep?*, neuroscientists and zombie enthusiasts Timothy Verstynen and Bradley Voytek apply their neuro-know-how to dissect the puzzle of what has happened to the zombie brain to make the undead act differently than their human prey. Combining tongue-in-cheek analysis with modern neuroscientific principles, Verstynen and Voytek show how zombism can be understood in terms of current knowledge.





### 3. Watch some TED Talks (optional)

If you have 5 minutes to spare, here are some great talks from world leading scientists and researchers on a variety of topics. They provide some interesting answers and ask some thought-provoking questions. There are loads more to choose from on the website <https://www.ted.com/>:



*Susan Wardle*  
**Are you able to see faces in everyday objects?**  
Posted Jun 2023



*David M. Howard*  
**Can we recreate the voice of a 3,000-year-old mummy?**  
Posted Jun 2023



*Normand Voyer*  
**Are life-saving medicines hiding in the world's coldest places?**  
Posted May 2023



*G. Richard Scott*  
**Why do we have crooked teeth when our ancestors didn't?**  
Posted May 2023



*Kathryn M. Stephenson and David L. Susskind*  
**What is a poop transplant, and how does it work?**  
Posted Apr 2023



*Susan Freitas and Darren Parker*  
**How does this all-female species reproduce?**  
Posted Apr 2023



*Michael Middlebrooks*  
**The fantastically weird world of photosynthetic sea slugs**  
Posted Mar 2023



*Saad Bhamla*  
**The fascinating physics of insect pee**  
Posted Feb 2023



*Shannon N. Tessier*  
**Can you freeze your body and come back to life?**  
Posted Feb 2023



*Shannon Odell*  
**When are you actually an adult?**  
Posted Jan 2023



*Miles Zhang*  
**The bizarre world of parasitic wasps**  
Posted Jan 2023



*Colin Averill*  
**How to harness the ancient partnership between forests and fungi**  
Posted Jan 2023



*Glynnis Hood*  
**Why do beavers build dams?**  
Posted Jan 2023



*Jason W. Chin*  
**A virus-resistant organism — and what it could mean for the future**  
Posted Oct 2022



*Kenny Coogan*  
**This weird trick will help you summon an army of worms**  
Posted Jul 2022



*Liesbeth Demuyser*  
**What causes yeast infections, and how do you get rid of them?**  
Posted Jul 2022



*Noah R. Bressman and Douglas Fudge*  
**The world's slimiest animal**  
Posted Jul 2022



*Tierney Thys and Christian Sardet*  
**Meet the microbes that could eat your trash**  
Posted Jul 2022

#### **4. Follow some great biology accounts (and us!) on Instagram (optional)**

Crossley Heath Biology Department: @BIOLOGY\_CHS

Science magazine: @sciencemagazine

IFLScience: @iflscience

The Deep: @thedeephull

Chester Zoo: @chesterzoo

New Scientist: @newscientist

#### **5. Watch / listen to some biology documentaries on BBC iplayer / BBC sounds (optional)**

The Life Scientific (BBC Sounds) – Jim Al-Khalili interviews a famous scientist each week about their work and their life

Anything by Sir David Attenborough! (BBC iplayer)

Any episodes of Horizon or Panorama you find interesting (BBC iplayer)

More or Less (BBC Sounds) – a surprisingly entertaining look at the use and misuse of statistics in the news

The Infinite Monkey Cage (BBC Sounds) – a comedy science quiz hosted by Brian Cox

The Curious Cases of Rutherford and Fry (BBC Sounds) – a comedy show where two scientists investigate questions sent in by the public