

Course  
Transition

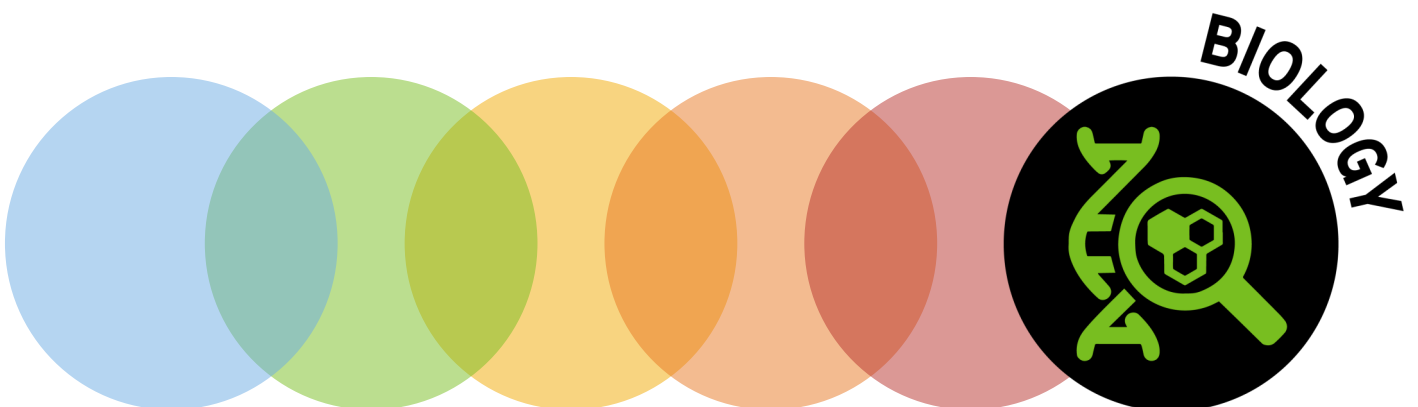


**Bridging the Gap**  
*from School to College*













**Warlingham**  
Sixth Form College

**Year 11 > Year 12 Transition**  
**Summer Term**  
**A Level Biology**



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# COURSE OVERVIEW

## Course title: AQA A Level Biology

Biologists are scientists who study the natural world and all the living things in it, from the largest mammals down to our very own microscopic DNA.

They try to understand how animals and organisms work (including us humans), how we evolved and the things that can make us sick or improve our health.

Biologists use this knowledge to try to stop the spread of disease, track down natural resources, improve public health, animal care and conservation and work out the true impacts of things like pollution.

The A level biology course covers diverse topics from DNA to photosynthesis, the immune response to ecology and conservation to prepare you for a wide range of career options and further study.

## What skills will I get from studying biology?

As with the other sciences, biology helps you to build up research, problem solving, organisation and analytical skills.

If you study biology, you will find yourself working on group projects, which will help you build your teamwork and communication skills too.

## What careers can I do with biology?

Biology is a key subject for lots of STEM careers, particularly in healthcare, medicine and jobs involving plants or animals. The list is pretty long and includes: nursing, dentistry, forensic science, psychology, physiotherapy, botany, environmental science, zoology, geology, oceanography, pharmaceuticals, energy, teaching, science writing, genetics and research.

**Entry requirements:** Grade 6-6 or above in GCSE Combined Science or a grade 6 or above in GCSE Biology. It is also strongly recommended that you have a grade 6 or above in GCSE Maths.

## Topics covered

### Year 1

Biological molecules, Nucleic acids, Cell structure, Transport across cell membranes, Cell recognition and the immune system, Exchange, Mass transport, DNA, genes and protein synthesis, Gene mutation and Biodiversity

### Year 2

Photosynthesis, Respiration, Energy and ecosystems, Response to stimuli, Nervous coordination and muscles, Homeostasis, Inherited change, populations and evolution, Populations in ecosystems, Gene expression and Recombinant DNA technology.



# COURSE OVERVIEW

## Assessment:

The A level Biology course is assessed at the end of Year 13, with 3 exam papers, each 2 hours long.

Paper 1	Paper 2	Paper 3
2 hours	2 hours	2 hours
Any content from year 1 plus knowledge of practical skills	Any content from year 2 plus knowledge of practical skills	Any content from year 1 and 2 plus practical skills
34% of A level	34% of A level	32% of A level
85 marks	85 marks	80 marks



# OUR EXPECTATIONS

## College Expectations for Academic Success

The College will work closely with all students and parents to create a purposeful, creative and stimulating environment in which students are encouraged to fully develop - both academically and personally.

We will expect you to take responsibility for your own behaviour and learning. The current College Committee along with the student body have discussed and agreed that students should commit to:

- Ensuring academic success through regular attendance and punctuality at all required registrations, lessons, supervised study lessons and Inspire Periods. Attendance which drops below 95% reduces Key Stage 5 performance by at least one grade, so it is taken very seriously.
- Completing all set tasks on time to the best of your ability, making full use of study periods and homework to enable you to meet all deadlines.
- Using study time effectively by bringing all required equipment and resources with you and making full and regular use of the College study rooms and LRC, respecting the need for silent studying conditions.
- Working closely with all your teachers to develop an effective working relationship based on mutual respect and discussing your work with them on a regular basis and meeting targets set.
- Developing your skills as an independent, self-evaluative learner and work closely with your tutor in monitoring and discussing your academic progress. As an independent learner, if you miss a lesson, it is your own responsibility to find the teacher and catch up with the work missed.
- Organising your work efficiently and effectively into folders for each subject, making full use of individual subject expectations and using Cornell Notes daily to ensure work in your folders is relevant and meaningful.
- Keeping mobile phones out-of-sight in all classrooms and during assemblies so that lessons are not disturbed and/or important information is missed.
- Attending all parents' evenings and arrange appointments with your teachers to discuss your progress and work.

## Course-specific Expectations for Academic Success

- Attend all lessons and be punctual.
- If you miss a lesson, speak to your teacher as soon as possible about the work missed and show evidence you have caught up by the following lesson.
- Attend Biology after school surgery sessions to enhance knowledge and develop exam technique.



# OUR EXPECTATIONS

- Be fully equipped every lesson, to include bringing textbooks, pens, pencils, ruler and scientific calculator.
- Complete extra notes during supervised study periods, as directed and bring evidence of these to the lessons.
- Maintain organised files and exercise books.
- CPAC Practical endorsement lessons form part of your final pass grade for practical skills, as such, the practical **MUST** be completed, Where this is not possible within the timetabled slot a suitable time must be agreed by both the student **AND** the supervising teacher.
- As with all laboratories, health and safety instructions must be strictly followed.
- Homework tasks are to be completed by the deadline given. They are often used in the following lesson or cover knowledge required to move on to the next concept covered within the learning journey.



# USING CORNELL NOTES

The Cornell Notes system is a note-taking system devised by Walter Pauk, an education professor at Cornell University. It is a proven method that establishes a more effective learning process.


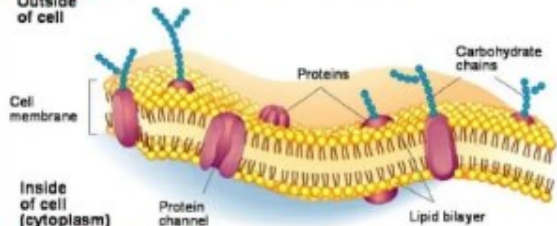
It is designed to help the user think and reflect upon the notes they have made as well as making them more useful for revision purposes.

Please [click here](#) to watch a video that explains how to take Cornell Notes properly.

Here is an example of Cornell note taking in a Biology context.

Note the main body of the page has the notes taken in the lesson, questions are on the left and a brief summary at the bottom of the page.

The notes you take do not need to have levelled questions like in this example.

<b>Cornell Notes</b>		<b>Topic/Objective:</b> Cell Transport	<b>Name:</b> Ella Herniak
		<b>Class/Period:</b> 6	<b>Date:</b> 1/20/17
<b>Essential Question:</b> How and why do substances move across a cell membrane???			
<b>Questions:</b>  Summarize the cell theory Level 1	<b>Notes:</b> <b>Cell theory:</b> well tested description made from multiple scientists and discoveries from observations <ul style="list-style-type: none"> <li>• Microscopes were used in 1600s</li> <li>• Robert hook studied cork and saw that it looked like cells</li> <li>• After more scientific discoveries:</li> </ul> <b>Cell theory:</b> <ol style="list-style-type: none"> <li>1. All living things are composing of cells.</li> <li>2. Cells are the basic units of life.</li> <li>3. New cells are produced from existing cells.</li> </ol> <b>Prokaryotic nucleus ex:</b> bacteria <b>Eukaryotic nucleus ex:</b> animals, plants		
Compare and contrast the parts of a phospholipid Level 2			
What kinds of macromolecules are found in the cell membrane and what are their uses? Level 3	<b>The cell membrane</b> <b>Function-</b> regulates the transport of what leaves and enters the cell. <ul style="list-style-type: none"> <li>• The membrane includes:</li> <li>• A <b>lipid bilayer</b>- a double sheet of phospholipids that provide a flexible cell structure. Hydrophilic polar phosphate head and hydrophobic nonpolar fatty acid tail</li> <li>• <b>Embedded proteins</b>- these proteins act as channel pumps to push large polar objects through the cell membrane. Cholesterol makes it flexible</li> <li>• <b>Carbohydrate chains</b>- act as a chemical ID card</li> </ul> <b>Fluid mosaic model:</b> membrane is made up of many different parts that freely move.		
Is a virus considered a cell? Level 4			
How can I apply this to the real world? Level 5			
<b>Summary:</b> The cell theory is made from multiple observations and discoveries and explains what cells are. The cell membrane is semi-permeable and made up of lipid bilayers. A lipid bilayer is made up of phosphate, polar, hydrophilic heads and fatty acid, hydrophobic, non- polar tails. The bilayer serves as a flexible barrier for the cell.			



## REVIEW / REVISE

You will need to make revision notes on the following topics using your GCSE revision guide and BBC bitesize.

- Cells structure, differences between plant, animal and bacterial cells
- Microscopy, types of microscope and magnification, image, actual size calculations
- Enzyme action
- Diffusion, osmosis, active transport
- DNA structure, punnet square diagrams and inheritance
- The heart and circulation
- Health and disease, pathogens and the immune system

Maths skills are a key element of the A level biology course and to support you with this you will need to complete the transition worksheets (see appendix).





# WATCH

All of life on Earth is made up using just 4 bases, which are used to create all the amino acids and all the proteins necessary for any form of life, from bacteria to humans. But what if we could make more bases? How many more amino acids and therefore proteins could we make and what could we do with them?

[TED talk 'Radical Possibilities of Man-made DNA'](#)

Watch and answer the following questions:

- 1) What are the bases used in DNA?
- 2) What names were given to the new bases made?
- 3) What key attribute did the new bases have to have to be useable?
- 4) How many natural amino acids are there?
- 5) What are some of the possible uses of the extra proteins?
- 6) Why would you produce a bacteria that glows green?
- 7) Should we be worried about releasing new man-made forms of life into the environment?



If you like this, try some other TED talks:

[The surprisingly charming science of your gut](#)

The bacteria in your gut (your microbiome) is more important than previously thought and could have huge health implications

[Animals can be deceptive](#)

[Why is it so hard to cure HIV/AIDS?](#)

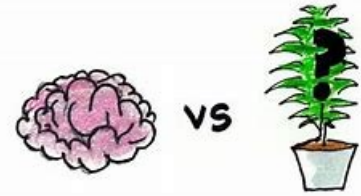
Recently, an article described the first person to be cured of AIDS. How? And why has it taken so long?



# LISTEN TO

Just how clever are plants? They seem to be able to do things that we use a brain for, but if they don't have a brain, how do they do that?

## Smarty Plants



There are 3 different experiments described in this podcast from Radiolab. Summarise each of the 3 experiments as a series of diagrams, using a maximum of 10 words.

Why is peer review important?

If you like podcasts, try:

[A plastic recycling enzyme](#) (Nature)

This also links to chemistry, if you're studying both subjects.

[Man against Horse](#) (Radiolab)

A story of evolution involving horses, humans and pigs on treadmills!

[Tapirs help reforestation via defecation](#)

Part of the 60 second science series from Scientific American.



# READ

Choose one of the BBC stories below and write a summary. What is the impact of each of these stories on the future?

[Malaria completely stopped by microbe](#)



[Spate of forest fires cause major environmental damage](#)

If you're interested in this, you could also read:

[Profile of a killer: the complex biology powering the coronavirus pandemic](#)

Other books you might be interested in:

- The Selfish Gene Richard Dawkins
- The Blind Watchmaker, Richard Dawkins
- The Body: A Guide for Occupants, Bill Bryson
- Sapiens, Yuval Noah Harari
- The Immortal Life of Henrietta Lacks, Rebecca Skloot
- Fragile Lives, Stephen Westaby



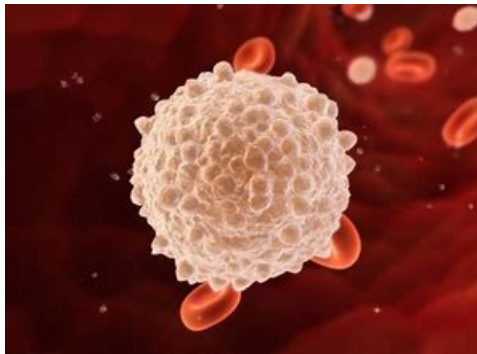
# RESEARCH

Research the differences between eukaryotic and prokaryotic cells, including the answers to the following questions:

- What are some examples of eukaryotic and prokaryotic cells?
- Which organelles are found in eukaryotic cells? Which organelles are found in prokaryotic cells?
- Are there any differences between the organelles in each type of organism?
- Choose 3 organelles and research the function of these organelles within the organism (either prokaryotic or eukaryotic).



*Pseudomonas* bacteria, SEM image



*White blood cell surrounded by red blood cells, SEM image*

Present your findings as a booklet, poster or report (typed or handwritten), including pictures. You also need to reference where you got the information from with a separate section at the end of the report (entitled 'References'). Any books you use (including textbooks), you must include the author surname, initial, *title of book* (in italics) and year of publication. For websites, you must copy the URL (not just the name of the website) and the date you accessed the site.



# COMPLETE

The futurelearn course below is all about cardiovascular disease and the risk factors associated with cardiovascular disease. This links to the year 12 unit 'Mass Transport' and takes you through the structure of the heart and the impact of heart disease. This will also be good revision from your GCSE course.



[Understanding cardiovascular disease](#)

Complete the course and make Cornell notes on each section.

Others you might be interested in:

[Exploring Cancer and Genetic Disease](#)



## APPENDICES / RESOURCES

Oxford A Level Sciences AQA Biology Transition from GCSE to A Level Worksheet. Please [click here](#).

The textbook we use is produced by OUP for AQA. You will have an opportunity to borrow one from school for a small deposit, alternatively you can purchase your own. The options are either two thinner books, one for each year of study or 1 larger book covering both years.

AQA A Level Biology (2nd edition) ISBN-13: 978-0-19-835177-1

Or

AQA A Level Biology Year 1 and AS (2nd edition), ISBN-13: 978-0-19-835176-4

AQA A level Biology Year 2 (2nd edition) ISBN-13: 978-0-19-835770-4

You can also buy a bridging book, produced by CGP, specifically to help bridge the gap between GCSE and A level (optional).

Head start to Biology A Level ISBN: 9781782942795

Essential Maths Skills for Biology ISBN-13: 978-1847623232

None of these are essential and you will be able to see examples of these books in September if you are not sure if you'd like to buy them.