

Biology Transition Work June 2020

Congratulations! Welcome to the Painsley Catholic College Biology department. All being well with GCSE results, you will be embarking on a rewarding and exciting A-level Biology course in September. Nothing less than a deeper understanding of your very existence is on offer. You are going to love it!

A Level biology is a challenging, yet, rewarding course. To help make this transition smoother and give you the best possible start, we have prepared this programme for you. It is important that you complete all the tasks set below as they cover both GCSE topics which you should have already covered and you will need a secure knowledge of these topics before you start the course in September

For each subject you will receive a detailed introduction to allow full transition into the college and your new learning. Please complete the weekly tasks outlined below and attend the meet sessions with the teachers for further guidance and information. Please keep all work created in a folder to present to me in the first lesson in September.

Biology A Level – 7401/7402	Google Classroom Code:	Google Meet code:
AQA	mdru3yi	biologytransition
Weekly Tasks	Topic	Resources
W/C 1.6.20	Introduction to A level Biology, Cornell Revision Notes and Scientific and Investigative Skills	<p>Introduction:</p> <p>Cornell Notes – see guidance on google classroom</p> <p>At A level and University, you will make large amounts of notes, but those notes are only of use if you record them in a sensible way. One system for recording notes is known as the Cornell notes system. This method encourages you to select relevant information, rather than trying to write a transcript of everything said. More importantly, it forces you to spend a few minutes reviewing what you have written, which has been scientifically proven to aid learning and memory retention. The ideal is to write everything on one page, but some students may prefer to type and others will handwrite their notes. Whichever option you use, remember the aim is to summarise and condense the content with a focus on the objectives that you are trying to learn and understand.</p> <p>There are three main sections to the Cornell notes</p> <p>1 Cue/ Objectives – This can be done before or after the lecture. You may have been provided with the objectives or you may need to decide what they were or you may want to make the link to your learning if this is an additional task or lecture you are viewing, such as this video.</p> <p>2 Notes – In this space you record concisely, simply the things you are LESS likely remember - The NEW knowledge.</p> <p>3 Summary – The most important step that is carried out after the lecture or video. This helps to reinforce learning.</p>

		<p>Scientific and Investigative Skills:</p> <p>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.</p> <p>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.</p> <p>Tasks:</p> <ol style="list-style-type: none"> 1. Read the A level Biology pack on SI Units and complete Activities A-D. 2. Read the pack on decoding scientific words and complete Activity E.
W/C 8.6.20	Cells	<p>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.</p> <p>Read the information on these websites (you could make some Cornell notes if you wish)</p> <p>https://www.s-cool.co.uk/a-level/biology/cells-and-organelles/revise-it/introduction-to-cells</p> <p>https://alevelnotes.com/notes/biology/cells</p> <p>https://studyrocket.co.uk/revision/a-level-biology-aqa/cells/cells</p> <p>https://alevelbiology.co.uk/notes/cell-structure/#0--summary-</p> <p>The following series of videos link to your learning. The first video shows in amazing detail the inner working of the cell. It will really help you appreciate the extraordinary complexity of the cell.</p> <p>The secret life of the cell (BBC)</p> <p>http://www.dailymotion.com/video/x4fjy56</p>

		<p>And take a look at these videos:</p> <p>https://www.youtube.com/watch?v=ZxMnGXKI8fM&list=PLz5_unScbEGhBYT1uuyjJshrV2vn-TvJ3 – cell structure</p> <p>https://www.youtube.com/watch?v=WDkamxy3EOQ&list=PLz5_unScbEGhBYT1uuyjJshrV2vn-TvJ3&index=2 – cell organelles</p> <p>https://www.youtube.com/watch?v=k-rN-EAdxi8&list=PLz5_unScbEGhBYT1uuyjJshrV2vn-TvJ3&index=3 – prokaryotic cells</p> <p>Task: Produce a poster/revision guide/factsheet/summary table to share with your class in September summarising the following topics: <u>Cells and Cell Ultrastructure of Prokaryotes and Eukaryotes.</u></p> <p>Success criteria: Include the definition of a prokaryotic cell and eukaryotic cell (both plant and animal) and all the organelles, ensuring that you compare and contrast the 2 types of cells. <i>You must include the difference in the type of ribosomes present in prokaryotic and eukaryotic cells.</i></p> <ol style="list-style-type: none"> 1) Add the organelles quoted below in the spec with their functions. 2) You must include the difference between the RER and SER, how would these look different when viewed with a microscope? As well as an explanation as to why the Golgi apparatus can sometimes be referred to as the ‘<i>sorting office</i>’ of the cell. 3) Link the structure of the cell wall containing murein/cellulose and describe the role of the lysosomes in cells and how these are used within the immune system <i>*hint: phagocytosis</i>
W/C 15.6.20	Carbohydrates	<p><u>Resources for these tasks are within the accompanying PowerPoint on google classroom</u></p> <ol style="list-style-type: none"> 1. Complete the transition Questions 2. Draw out the 2 monomers of alpha and beta glucose. 3. Draw out the condensation and hydrolysis reactions and describe what a condensation and hydrolysis reaction is. 4. Complete the table on Polysaccharides- use the slides on Starch, cellulose and glycogen to help you. 5. Exam Questions 6. Create a one-page overview of carbohydrates

		<p>The below links will give you more detail on mono and polysaccharides</p> <p>https://www.youtube.com/watch?v=E4itgKrEzak</p> <p>https://www.youtube.com/watch?v=WNHg_jV2PMo</p>
W/C 22.6.20	Protein	<p><u>Resources for these tasks are within the accompanying PowerPoint on google classroom</u></p> <ol style="list-style-type: none"> 1. Read the article on Protein https://www.eufic.org/en/whats-in-food/article/what-are-proteins-and-what-is-their-function-in-the-body 2. Draw out an amino acid and label the key components of it 3. Draw out a hydrolysis and condensation reaction occurring between 2 amino acids (dipeptide) 4. Watch the first 5 minutes of https://www.youtube.com/watch?v=He1zHW7Vydo&list=PLkocNW0BSuEEMyVUCyarpvj_cahCvjxAr&index=12 5. Complete the sheet regarding the structure of a protein. A protein (known as a polypeptide meaning ‘many peptide chains’) has 4 structures that make up the final protein. It is easier to think of these as building blocks to make the final protein. There is the primary structure, secondary, structure, tertiary structure and finally the quaternary structure. 6. Exam Q https://www.eufic.org/en/whats-in-food/article/what-are-proteins-and-what-is-their-function-in-the-body 7. First 5 minutes of https://www.youtube.com/watch?v=He1zHW7Vydo&list=PLkocNW0BSuEEMyVUCyarpvj_cahCvjxAr&index=12
W/C 29.6.20	Exchange and Transport	<p>Organisms need to exchange substances selectively with their environment and this takes place at exchange surfaces. Factors such as size, surface area to volume ratio and metabolic rate affect the requirements of organisms and this gives rise to adaptations such as specialised exchange surfaces and mass transport systems.</p> <p>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</p> <p>Read the information on these websites (you could make more Cornell notes if you wish):</p> <p>https://studyrocket.co.uk/revision/a-level-biology-aqa/cells/transport</p> <p>https://alevelnotes.com/notes/biology/cells/cell-membranes/crossing-membranes</p>

And take a look at these videos:

https://www.youtube.com/watch?v=xFOxkVNLv_k&list=PLz5_unScbEGhBYT1uuyjJshrV2vn-TvJ3&index=6 – transport across cell membranes

<https://www.khanacademy.org/test-prep/mcat/cells/transport-across-a-cell-membrane/v/how-do-things-move-across-a-cell-membrane> (use the first 3 arrows on the left hand side)

<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 1:

Create a Scientific Podcast

There are several types of evidence you will be asked to produce at university. In addition to the traditional essay and scientific poster, the use of Podcasts is becoming increasingly common. It is actually harder than you think to produce a short concise, detailed and accurate podcast, therefore this task will help you get ahead of the game when you get to university.

Creating your Podcast

There are lots of pieces of software to create podcasts and edit them, however, the easiest would be the voice recorder on your phone, just check that it runs for long enough and you can save it in a suitable format, e.g. MP3, before you complete your masterpiece and find you need to do it again! Alternatively, get set up with Audacity which is free and will help you familiarise yourself with it.

Here are 4 top tips for your success criteria:

- 1. Write out your objective and share it at the start of the podcast.**
- 2. Give it structure like you would in an essay.**
- 3. Whilst it is important to plan a structure, sometimes it is harder to listen to someone who is reading than someone who is more naturally talking, therefore, try to have an outline and allow some natural speech.**
- 4. Think about the recording, pick a quiet room and speak a bit louder than normal. Do a few trial runs and check the quality.**

Examples

The naked scientists produce a series of podcasts (and is also a useful website). Check out an example about a contagious cancer at

https://play.acast.com/s/naked_scientists_podcast/combating-cancer

		<p>OR</p> <p>Task 2:</p> <p>Create a comparative table to go in your classroom in September.</p> <p>Your table should:</p> <ol style="list-style-type: none"> Describe the 4 processes of diffusion, facilitated diffusion, osmosis and active transport with an image to support each method. Explain the importance as to why oxygen and glucose need to be absorbed and waste products removed Compare and contrast the 4 methods – such as is it passive/active, does it involve proteins, does it require energy? does it move with or against the concentration gradient? <p>Extension: 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)</p>
W/C 6.7.20	Enzymes	<p><u>Resources for these tasks are within the accompanying PowerPoint on google classroom</u></p> <ol style="list-style-type: none"> Recap GCSE Enzymes Compare the Lock and Key vs Induced Fit theories of enzyme action Factors affecting Enzymes -What are they? Key Skill: Describe and Explain the graph. An overview of the first Required Practical.
Fortnightly Meet: Date & Time	Teacher delivering	Resources
Mon 1 st June – 11:30am	Mrs R. Potts	Introduction to A level Biology, Cornell Revision Notes and Scientific and Investigative Skills + Cells
Thursday 18 th June - 9am	Miss C. Jones	Introduction to Carbohydrates and Proteins
Monday 29 th June -11:30 am	Mrs R. Potts	Exchange and Transport and Enzymes
<p><u>Specification Link:</u></p> <p>https://filestore.aqa.org.uk/resources/biology/specifications/AQA-7401-7402-SP-2015.PDF</p> <p><u>General resources:</u></p> <p>http://www.bbc.co.uk/schools/gcsebitesize/</p> <p>http://www.s-cool.co.uk/gcse</p> <p>http://www.bbc.co.uk/nature/</p>		

<http://www.bbc.co.uk/radio4/programmes/genres/factual/scienceandnature>

<http://www.newscientist.com/>

<http://www.guardian.co.uk/science>

<https://www.senecalearning.com/>

<https://www.physicsandmathstutor.com/biology-revision/gcse-aqa/>

<https://www.freesciencelessons.co.uk/>

<https://studyrocket.co.uk/revision/a-level-biology-aqa>

Any GCSE Trilogy/Biology revision guide

Your own old GCSE Science/Biology exercise books

Head Start to AS Biology Published by CGP

Additional reading:

Bill Bryson – The Body, An Occupants Guide – Explores the human *body*, how it functions and its remarkable ability to heal itself. Full of extraordinary facts and astonishing stories

Frankenstein’s Cat - Discover how glow in the dark fish are made and more great Biotechnology breakthroughs.

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.

The Blind Watchmaker – Richard Dawkins

The Energy of Life (A2 level – Respiration topic)

The Selfish Gene by Richard Dawkins (a classic, if difficult read).

The Origin of Species by Charles Darwin (the final chapter- although it is all very well written).

Bad Science by Ben Goldacre- very good on the scientific method and how science works.

Bad Pharma: How Drug Companies Mislead Doctors and Harm Patients is a book by British physician and academic Ben Goldacre about the pharmaceutical industry, its relationship with the medical profession, and the extent to which it controls academic research into its own products.

TED Talks

A New Superweapon in the Fight Against Cancer - Available at :

http://www.ted.com/talks/paula_hammond_a_new_superweapon_in_the_fight_against_cancer?language=en

Cancer is a very clever, adaptable disease. To defeat it, says medical researcher and educator Paula Hammond, we need a new and powerful mode of attack.

Why Bees are Disappearing

Available at : http://www.ted.com/talks/marla_spivak_why_bees_are_disappearing?language=en

Honeybees have thrived for 50 million years, each colony 40 to 50,000 individuals coordinated in amazing harmony. So why, seven years ago, did colonies start dying en-masse?

Why Doctors Don't Know About the Drugs They Prescribe

Available at :

http://www.ted.com/talks/ben_goldacre_what_doctors_don_t_know_about_the_drugs_they_prescribe?language=en

When a new drug gets tested, the results of the trials should be published for the rest of the medical world — except much of the time, negative or inconclusive findings go unreported, leaving doctors and researchers in the dark.

Growing New Organs

Available at :

http://www.ted.com/talks/anthony_atala_growing_organs_engineering_tissue?language=en

Anthony Atalla's state-of-the-art lab grows human organs — from muscles to blood vessels to bladders, and more.

Topic 1: The Cell

Available at: <http://bigpictureeducation.com/cell>

The cell is the building block of life. Each of us starts from a single cell, a zygote, and grows into a complex organism made of trillions of cells. In this issue, we explore what we know – and what we don't yet know – about the cells that are the basis of us all and how they reproduce, grow, move, communicate and die.



Topic 2: The Immune System

Available at:

<http://bigpictureeducation.com/immune>

The immune system is what keeps us healthy in spite of the many organisms and substances that can do us harm. In this issue, explore how our bodies are designed to prevent potentially harmful objects from getting inside, and what happens when bacteria, viruses, fungi or other foreign organisms or substances breach these barriers.



Topic 3: Exercise, Energy and Movement

Available at:

<http://bigpictureeducation.com/exercise-energy-and-movement>

All living things move. Whether it's a plant growing towards the sun, bacteria swimming away from a toxin or you walking home, anything alive must move to survive. For humans though, movement is more than just survival – we move for fun, to compete and to be healthy. In this issue we look at the biological systems that keep us moving and consider some of the psychological, social and ethical aspects of exercise and sport.



Magazines and subscriptions:

1. **The Wellcome Trust** (www.wellcome.ac.uk/) a fantastic, free online resource offering regular publications of the newest scientific discoveries as well as a multitude of excellent online learning resources

2. **New Scientist**

3. **Society of Biology**

4. **Biological Sciences Review** (Philip Allan Publishers): Specially written articles on recent research in the biological sciences, central to A-level topics, as well as grade-boosting advice from examiners (see Dr Graeble to find out about reduced subscription for this magazine)

5. **Scientific American**

6. **Focus** magazine

Film/TV/internet:

1. Look out for documentaries related to your subject choice, ie Panorama, Horizon, Richard Attenborough

2. A fantastic resource, in particular for animations, is **YouTube**.

3. Biology **podcasts**

4. **BBC.co.uk/science**: covers up to date topical science topic
http://www.dailymotion.com/video/xz_h0kb_the-hidden-life-of-the-cell_shortfilms

(If this link expires – google “BBC hidden life of the cell”)

5. Something the lord made (2004)

6. Lorenzo’s Oil (1992)

7. Andromeda Strain (1971)

8. Gorillas in the mist (1988)

Find on Facebook:

Nature - the profile page for nature.com for news, features, research and events from Nature Publishing Group

Marin Conservation Institute – publishes the latest science to identify important marine ecosystems around the world.

National Geographic - since 1888, National Geographic has travelled the Earth, sharing its amazing stories in pictures and words.

Science News Magazine - Science covers important and emerging research in all fields of science.

BBC Science News - The latest BBC Science and Environment News: breaking news, analysis and debate on science and nature around the world.

