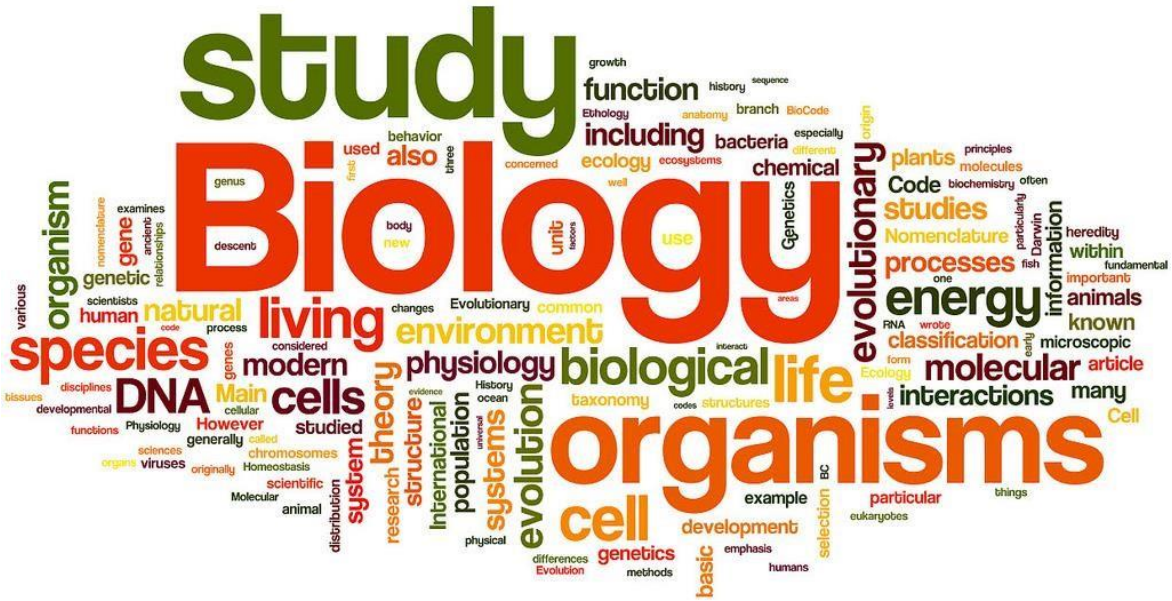
Welcome to Biology A Level at The Holt ☺

As teachers we are passionate about our subject and as students choosing this subject we hope you are too! We are looking forward to working with you from September to achieve the highest grades you possibly can in a subject you will hopefully really enjoy.

This is a guide to help you get ready for A-level Biology, including everything from research ideas, pre knowledge tasks and things to watch and read.

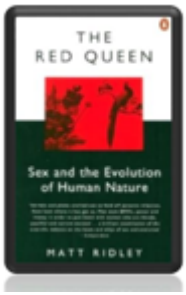
If you do have any questions or queries regarding A level Biology then please get in touch with Mrs Whitehouse over email. G.whitehouse@holt.wokingham.sch.uk

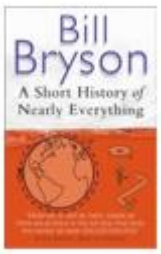


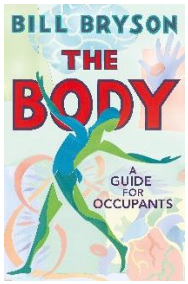
Book Recommendations

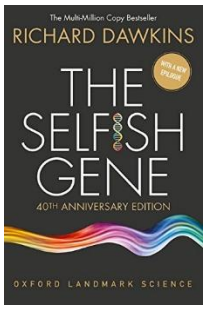
It is vital that you are accustomed to completing wider reading around topics you will cover during your A levels. As a starting point, we recommend the following titles:

(remember, you can add these to your wider reading log in September!)









There are a huge array of books on biology topics.

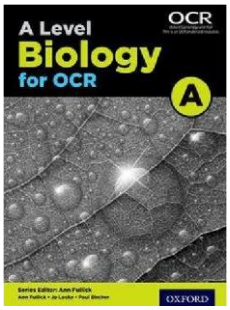
From genetics to fish behavior, from the human body to evolution of all life.

You just have to choose your area ☺

If you want a good generic introduction, Bill Bryson comes highly recommended.

Biological sciences review is also available online through school.

The text book we use in school for A level Biology is as follows:



Publisher: Oxford University Press

Editor: Ann Fullick

ISBN: 978-0-19-835192-4

The book contains all of the content for both years of the course.

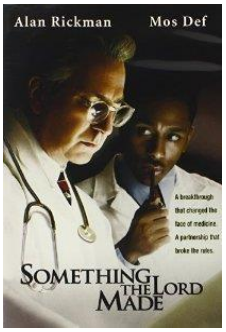
(Separate books are available for year 1 and year 2, though it does work out more expensive to buy them)

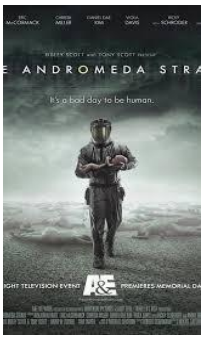
The book is also available for students to access for free through your kerboodle log in

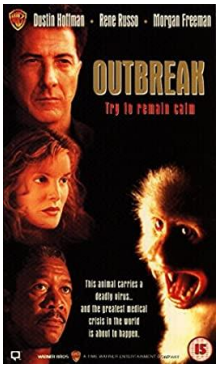
Film/ Documentary Recommendations

There are a number of useful films and documentaries that will develop your wider understanding of the topics covered. If you do watch anything, keep a record of what it was and why you found it interesting, this will be helpful later on ☺

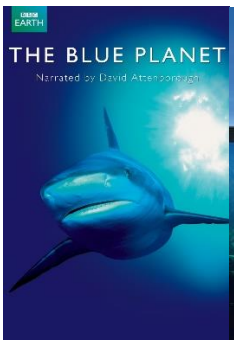
Older films:

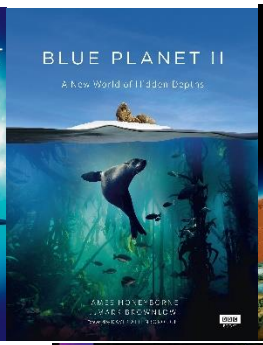


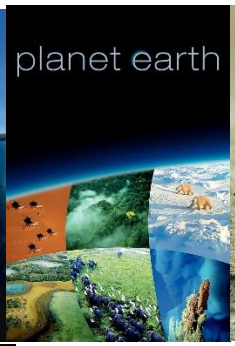


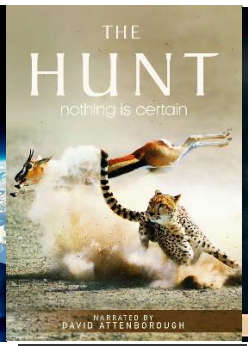


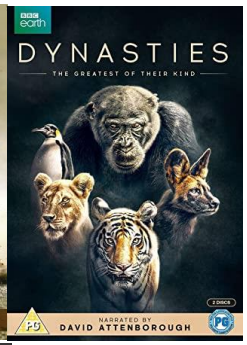
Don't forget the classic box sets available:

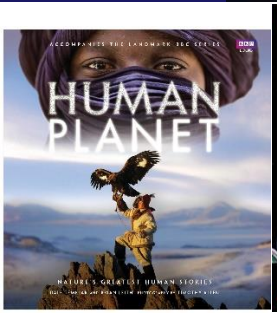


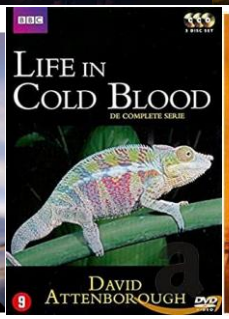


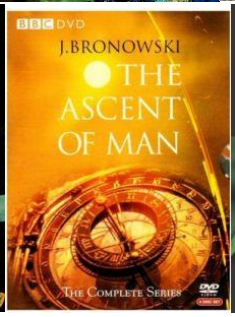


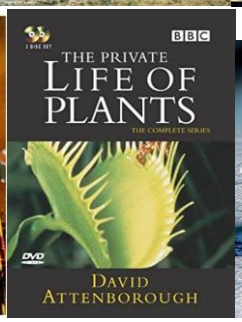


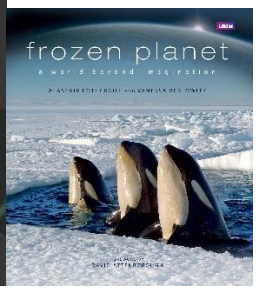












Netflix and Amazon Prime also have lots of documentaries available, as do BBC iplayer – recommended at the moment by the biology department: https://www.bbc.co.uk/iplayer/episode/m000h3nm/horizon-2020-9-coronavirus-special-part-1

Disney+ also has a lot of documentaries about specific species of animals ☺

You tube and Teded (available through the VLRC) are also good sources of videos!

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

Talks about Biology

Lara Durgavich
An evolutionary perspective on human health and disease
Posted Apr 2020

Janet Iwasa
The wonders of the molecular world, animated
Posted Apr 2020

Matt Walker
Why sleep matters now more than ever
Posted Apr 2020

Ananya Grover
A campaign for period positivity
Posted Mar 2020

Jim Hudspeth
The beautiful, mysterious science of how you hear
Posted Mar 2020

Lisa Mosconi
How menopause affects the brain
Posted Mar 2020

Adam Garske
How designing brand-new enzymes could change the world
Posted Jan 2020

Jen Gunter
Why can't we talk about periods?
Posted Jan 2020

If you have 30 minutes to spare, here are some great presentations (and free!) from world leading scientists and researchers on a variety of topics. They provide some interesting answers and ask some thought-provoking questions. Use the link or scan the QR code to view:

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.

Research Ideas

If you want to take a deeper look at some of the content you will be covering during your A Level in Biology, here are some big picture topic resources you can use. You could write a summary of which ever area you look at, this could then be added to your notes when you cover this topic in year 12. It will also help your understanding if you have covered some of the content before, as not everything will be new ☺

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.

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 4: Populations

Available at:
http://bigpictureeducation.com/populations
What's the first thing that pops into your mind when you read the word population? Most likely it's the ever-increasing human population on earth. You're a member of that population, which is the term for all the members of a single species living together in the same location. The term population isn't just used to describe humans; it includes other animals, plants and microbes too. In this issue, we learn more about how populations grow, change and move, and why understanding them is so important.

Topic 5: Health and Climate change

Available at: http://bigpictureeducation.com/health-and-climate-change
The Earth 's climate is changing. In fact, it has always been changing. What is different now is the speed of change and the main cause of change – human activities. This issue asks: What are the biggest threats to human health? Who will suffer as the climate changes? What can be done to minimise harm? And how do we cope with uncertainty?

Online resources

There are innumerable resources available, this is just a tiny selection!

Big Picture Science in association with the Seti Institute also does blogs: http://radio.seti.org/episodes

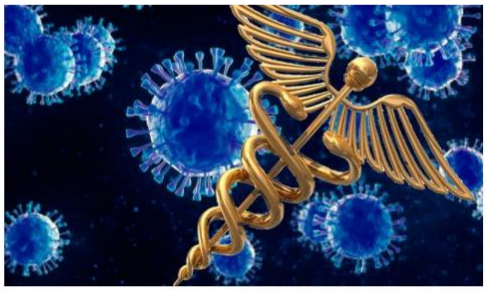
This is their latest offering!

BIG PICTURE SCIENCE

produced at the SETI Institute

Big Picture Science engages the public with modern science research through smart and humorous storytelling.
Read more

Episodes



Apr 20, 2020

Treating the Virus

While we wait for a vaccine

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There are online courses available:

Want to stand above the rest when it comes to UCAS? Now is the time to act.
MOOCs are online courses run by nearly all Universities. They are short FREE courses that you take part in. They are usually quite specialist, but aimed at the public, not the genius!
There are lots of websites that help you find a course, such as edX and Future learn.
You can take part in any course, but there are usually start and finish dates. They mostly involve taking part in web chats, watching videos and interactives.

Zoos and museums have a lot of online resources:

Or take part in citizen science projects:

Useful Pre-Knowledge Tasks – there is no expectation to complete these

1. **Symbols and Prefixes**

Standard form is commonly used in Biology, try and learn the prefixes, symbols and powers of ten ready for September.

Prefix	Symbol	Power of ten
Nano	n	x 10^{-9}
Micro	µ	x 10^{-6}
Milli	m	x 10^{-3}
Centi	c	x 10^{-2}
Kilo	k	x 10^{3}
Mega	M	x 10^{6}
Giga	G	x 10^{9}

2. **Produce a glossary for the following key words:**

accuracy, anomaly, calibration, causal link, chance, control experiment, control group, control variable, correlation, dependent variable, errors, evidence, hypothesis, independent, null hypothesis, precision, probability, protocol, random distribution, random error, raw data, reliability, systematic error, true value, validity and zero error

3. Answer the following questions;
    a. What are the 4 bases found in DNA? Can you spell them correctly? Can you describe the full structure of DNA
    b. What are the constituents of a balanced diet?
    c. What theory did Charles Darwin propose? Can you describe the full process?
    d. Draw and fully label a plant and animal cell? Can you give a function for each component?
    e. What is an enzyme? Describe in full the lock and key theory? Can you explain how the 4 factors affect enzyme action?
    f. Describe the stages of mitosis?
    g. Write the word and balanced chemical equations for aerobic respiration, anaerobic respiration in animals and in plants/yeast and photosynthesis
    h. Write the advantages and disadvantages of light and electron microscopes
    i. Explain how to do the biological molecules tests, what are positive results?
    j. What is the structure of the heart? Can you add all the labels to a diagram?

Cells and biological molecules are the first topics taught in September.

Have a lovely summer and remember if you have any questions or queries about the Biology A Level course then please email Mrs Whitehouse ☺