Y12 AQA Biology- Sixth form at Yate Academy

A-Level Biology

Welcome to A-Level Biology. I am thrilled that you have chosen to study this fantastic course with us at Yate Academy. Throughout the 2 years of A-Level Biology you will have the opportunity to study some familiar topics such as cell biology, plant and animal systems and health and disease. A-Level Biology will allow you to apply some of your knowledge from GCSE science to a range of different fields of biology to develop your understanding of the wonderful world around us. I am really excited to start this journey with you in September.

Miss Oram- Head of Science

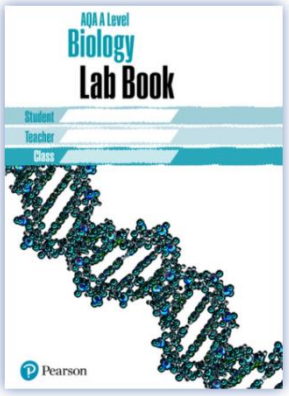
Understanding the course

Specification	AQA Biology A Level
Exams	All exams are at the end of Y13 Paper 1: AS content 2 hours Paper 2: A2 content 2 hours Paper 3: All content 2 hours In-class practical endorsement of skills in practical science
Teacher	Miss Oram eoram@yateacademy.co.uk

Course requirements

Please come prepared to your first lesson with the following materials:

- Pencil case with black pens, pencils, ruler, rubber
- A scientific calculator
- 2 lever arch folders
- AQA A-Level lab book
- 1 blank, lined exercise book for independent study
- A diary or planner



Summer bridging work

To ensure you start the year as successfully as possible, please come to your first lesson having completed the following tasks.

Consolidate

Task	Time expected	Complete
Draw an accurate biological drawing of a eukaryotic cell and label the following organelles: a) Plasma membrane b) Cytoplasm c) Mitochondria d) Nucleus e) Nuclear pore f) Golgi apparatus g) Rough endoplasmic reticulum h) Smooth endoplasmic reticulum i) Free ribosome Create a glossary for the organelles that outlines the roles in the cell	1 hour	
Draw an accurate biological drawing of a prokaryotic cell and label the organelles. Create a glossary for the organelles that outlines the roles in the cell	1 hour	
Create a comparison table which outlines the differences between: a) Optical microscope b) Scanning electron microscope c) Transmission electron microscope	30 minutes	

Apply

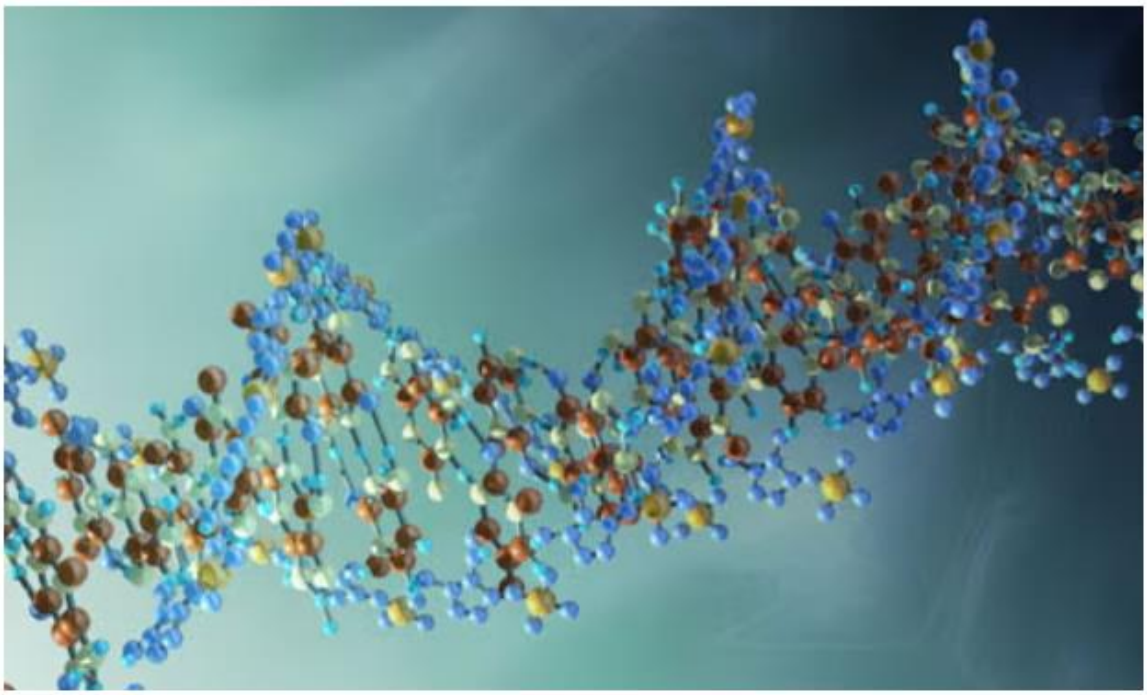
Task: Read the article about the mysteries of mitochondrial ancestral history and complete the questions

Mitochondrial DNA and the mysteries of human evolution

All living humans are more closely related than you might think. The earliest humans are silent witnesses: they testify only through their bones and tools.

But modern humans carry within their tissues a different kind of evidence. DNA serves as a lineal history, a family album, a passport that bears the marks of both origin and journey. Mitochondrial DNA (mtDNA) is inherited only from the mother. Every few generations, a random mutation creeps into this familial signature. So comparison of two samples of mtDNA will show degrees of kinship and ancestral origin. Conversely, the Y chromosome – a twisted rope composed entirely of DNA – is inherited by males from the father. Random infrequent changes once again provide a way of

estimating the number of generations back to a shared ancestor. The evidence of DNA reveals that all humans are very closely related. A Scot, a Japanese and an Australian Aborigine are far more closely linked by family inheritance than any three chimpanzees from different African groups. DNA research suggests that all surviving humans are descended from one woman who lived perhaps 200,000 years ago. Research also shows that the story begins in Africa, home to the greatest variation in human DNA, and therefore the oldest location. Accordingly, the woman was promptly dubbed "the African Eve"



DNA analysis can tell us a lot about the movements of early humans between continents. Photograph: Mopic/Alamy

Not surprisingly, people of the same ethnic and linguistic group turn out to be genetically more closely related to each other than to the rest of the planet, but the same research shows a great deal of mixing of populations as well. Studies of tell-tale markers in the DNA sequence have been used to reconstruct the journeys of ancient human groups around the globe, and not just ancient humans. Along the way from East Africa to Easter Island, early human voyagers picked up fellow travellers such as the stomach ulcer bug *Helicobacter pylori*. This bacterium also carries a DNA signature of its origins.

In 2009, it delivered an answer to one of the great mysteries of the human migration: all the settlers on the islands of Polynesia and Melanesia carried stomach bugs that their ancestors could only have picked up in Taiwan. So that became the jumping-off point for the colonisation of the Pacific. Long before agriculture, metalwork, settlement, writing, nationality and the idea of history, long before

formal territorial identity or ethnic tradition, all humans had a scrapbook, a set of passport stamps that are now beginning to reveal some twists in the great human journey. The beginning remains a mystery. But the blood and flesh of humans and chimpanzees holds a molecular story-so-far, a cryptic chemical summary of the 6m-year human thriller.

DNA is a new way of telling: the secrets of its decryption are exposed in less than one human lifetime. As they read it, the characters on the latest page are beginning to see what must have happened in the earlier chapters. There is more to come

Extend

Pick one of the videos or podcasts in the list to listen to or watch. Summarise the key points.

Topic	What is it about?	Link
Cell biology	**Are gut microbes affecting your personality?** Biologist Kathleen McAuliffe dives into new research that suggests certain bacteria in your gut can influence major parts of who you are, from your personality to life-changing neurological disorders. Learn more about how this emerging science could change how we treat disease — and discover the impact of your internal microbial makeup on your mood, weight and more	https://www.youtube.com/watch?v=UjGMiChiUFc **Watch time**: 10 minutes
Cell biology	**The mouse with two dads- A new frontier for biology** You're familiar with the story: a sperm and an egg meet to create an embryo, which has the potential to give rise to new life. But what if you could create a sperm or egg from any cell, even a single skin cell? Biologist Katsuhiko Hayashi discusses the science of in vitro gametogenesis (IVG) — an experimental technique for creating lab-made sperm or eggs out of just about any type of cell — and explores its implications for endangered species, human reproduction and more	https://www.youtube.com/watch?v=dDKozwjlt-Q **Watch time:** 8 minutes
Evolution	**4 billion years of evolution in 6 minutes** Did humans evolve from monkeys or from fish? In this enlightening talk, ichthyologist and TED Fellow Prosanta Chakrabarty dispels some hardwired myths about evolution, encouraging us to remember that we're a	https://www.youtube.com/watch?v=XyTcINLKq4c **Watch time**: 6 minutes

	small part of a complex, four-billion-year process -- and not the end of the line. "We're not the goal of evolution," Chakrabarty says. "Think of us all as young leaves on this ancient and gigantic tree of life -- connected by invisible branches not just to each other, but to our extinct relatives and our evolutionary ancestors.	

Extend