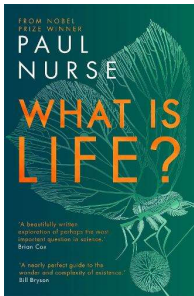


A level Biology summer work

Over the summer, please complete the following:

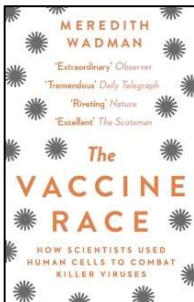
1. **Read a book** that delves into the world of Biology! Here are some suggestions that come highly recommended:



What is Life by *Paul Nurse*

Life is all around us, abundant and diverse, it is extraordinary. But what does it actually mean to be alive? Nobel prize-winner Paul Nurse has spent his career revealing how living cells work. In this book, he takes up the challenge of defining life in a way that every reader can understand. It is a shared journey of discovery; step by step he illuminates five great ideas that underpin biology. He traces the roots of his own curiosity and knowledge to reveal how science works, both now and in the past.

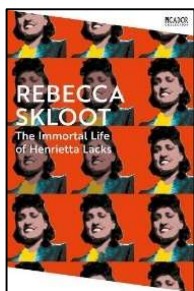
Using his personal experiences, in and out of the lab, he shares with us the challenges, the lucky breaks, and the thrilling eureka moments of discovery. To survive the challenges that face humans today – from climate change, to pandemics, loss of biodiversity and food security – it is vital that we all understand what life is.



The Vaccine Race by *Meredith Wadman*

Until the late 1960s, tens of thousands of children suffered crippling birth defects if their mothers had been exposed to rubella, popularly known as German measles, while pregnant. There was no vaccine and little understanding of how the disease devastated fetuses. In June 1962, a young biologist in Philadelphia produced the first safe, clean cells that made possible the mass-production of vaccines against many common childhood diseases. Two years later, in the midst of a German measles epidemic, his colleague developed the vaccine that would one day effectively wipe out rubella for good.

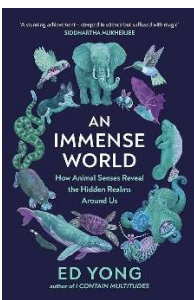
This vaccine - and others made with those cells - have since protected hundreds of millions of people worldwide, the vast majority of them preschool children. Meredith Wadman's account of this great leap forward in medicine is a fascinating and revelatory read.



The Immortal Life of Henrietta Lacks by *Rebecca Skloot*

Her name was Henrietta Lacks, but scientists know her as HeLa. She was a poor Southern tobacco farmer who worked the same land as her enslaved ancestors, yet her cells—taken without her knowledge—became one of the most important tools in medicine. The first “immortal” human cells grown in culture, they are still alive today, though she has been dead for more than sixty years. If you could pile all HeLa cells ever grown onto a scale, they'd weigh more than 50 million metric tons—as much as a hundred Empire State Buildings.

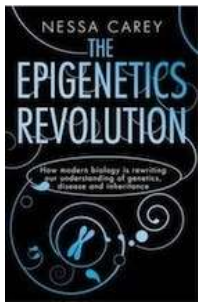
HeLa cells were vital for developing the polio vaccine; uncovered secrets of cancer, viruses, and the atom bomb's effects; helped lead to important advances like in vitro fertilization, cloning, and gene mapping; and have been bought and sold by the billions.



An Immense World by *Ed Yong*

The Earth teems with sights and textures, sounds and vibrations, smells and tastes, electric and magnetic fields. But every animal is enclosed within its own unique sensory bubble, perceiving but a tiny sliver of an immense world. This book welcomes us into a previously unfathomable dimension—the world as it is truly perceived by other animals.

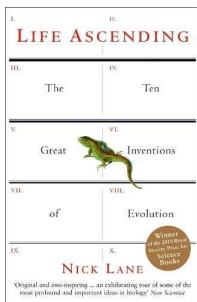
We encounter beetles that are drawn to fires, turtles that can track the Earth's magnetic fields, fish that fill rivers with electrical messages, and humans that wield sonar like bats. We discover that a crocodile's scaly face is as sensitive as a lover's fingertips, that the eyes of a giant squid evolved to see sparkling whales, that plants thrum with the inaudible songs of courting bugs, and that even simple scallops have complex vision. In *An Immense World*, author and acclaimed science journalist Ed Yong coaxes us beyond the confines of our own senses, allowing us to perceive the skeins of scent, waves of electromagnetism, and pulses of pressure that surround us. Because in order to understand our world we don't need to travel to other places; we need to see through other eyes.



The Epigenetics Revolution by Nessa Carey

At the beginning of this century enormous progress had been made in genetics. The Human Genome Project finished sequencing human DNA. It seemed it was only a matter of time until we had all the answers to the secrets of life on this planet. The cutting-edge of biology, however, is telling us that we still don't even know all of the questions. How is it that, despite each cell in your body carrying exactly the same DNA, you don't have teeth growing out of your eyeballs or toenails on your liver? How is it that identical twins share exactly the same DNA and yet can exhibit dramatic differences in the way that they live and grow? It turns out that cells read the genetic code in DNA more like a script to be interpreted than a mould that replicates the same result each time. This is epigenetics and it's the fastest-moving field in biology today.

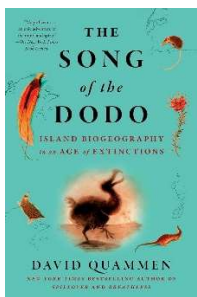
The Epigenetics Revolution traces the thrilling path this discipline has taken over the last twenty years. Biologist Nessa Carey deftly explains such diverse phenomena as how queen bees and ants control their colonies, why tortoiseshell cats are always female, why some plants need a period of cold before they can flower, why we age, develop disease and become addicted to drugs, and much more.



Life Ascending by Nick Lane

How did life invent itself? Where did DNA come from? How did consciousness develop? Powerful new research methods are providing vivid insights into the makeup of life. Comparing gene sequences, examining atomic structures of proteins, and looking into the geochemistry of rocks have helped explain evolution in more detail than ever before.

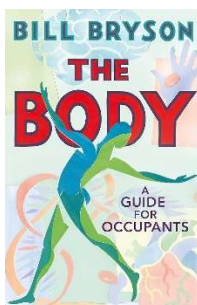
Nick Lane expertly reconstructs the history of life by describing the ten greatest inventions of evolution (including DNA, photosynthesis, sex, and sight), based on their historical impact, role in organisms today, and relevance to current controversies. Who would have guessed that eyes started off as light-sensitive spots used to calibrate photosynthesis in algae? Or that DNA's building blocks form spontaneously in hydrothermal vents? Lane gives a gripping, lucid account of nature's ingenuity, and the result is a work of essential reading for anyone who has ever pondered or questioned the science underlying evolution's greatest gifts to man.



The Song of the Dodo by David Quammen

David Quammen's book, *The Song of the Dodo*, is a brilliant, stirring work, breathtaking in its scope, far-reaching in its message -- a crucial book in precarious times, which radically alters the way in which we understand the natural world and our place in that world. It's also a book full of entertainment and wonders.

In *The Song of the Dodo*, we follow Quammen's keen intellect through the ideas, theories, and experiments of prominent naturalists of the last two centuries. We trail after him as he travels the world, tracking the subject of island biogeography, which encompasses nothing less than the study of the origin and extinction of all species. Why is this island idea so important? Because islands are where species most commonly go extinct -- and because, as Quammen points out, we live in an age when all of Earth's landscapes are being chopped into island-like fragments by human activity.



The Body: A Guide for Occupants by Bill Bryson

In the bestselling, prize-winning *A Short History of Nearly Everything*, Bill Bryson achieved the seemingly impossible by making the science of our world both understandable and entertaining to millions of people around the globe.

Now he turns his attention inwards to explore the human body, how it functions and its remarkable ability to heal itself. Full of extraordinary facts and astonishing stories, *The Body: A Guide for Occupants* is a brilliant, often very funny attempt to understand the miracle of our physical and neurological make up.

A wonderful successor to *A Short History of Nearly Everything*, this book will have you marvelling at the form you occupy, and celebrating the genius of your existence, time and time again.

2. Write a short summary of a particular area or chapter of the book you read that you found particularly interesting. You could consider the following...

- What surprised you?
- How has your understanding of a topic you've covered in previous Biology lessons been expanded?
- Why would you recommend this book to a secondary school student?