Pre-entry Preparation, Requirements and Recommendations

Welcome to A-Level Physics at Comberton Sixth Form! Well done for choosing what we personally think to be one of the most interesting subjects to study. At times you may find the course challenging however if you work hard and try your best you will achieve very high grades on the course. As John F. Kennedy once said, "We choose to go the Moon not because it is easy but because it is hard".

A level Physics students are expected to complete some summer work which is explained below, this will help prepare you for the demands of the A-Level Physics. **All of this work must be completed and handed in during your first physics lesson in September.** This work will help to ensure that any gaps in your GCSE physics knowledge are identified and possibly filled before the course starts. Students often struggle with the transition from GCSE to A-Level, but don't worry though, we will be there to support you 😊.

Summer work

Please complete the pack of past GCSE exam questions attached to this email. There are two packs: **Forces & Energy** and **Waves & Energy**.

The goal of this task is to ensure you are ready for the A-level content in September. Please complete all the past paper questions before the first lesson, your teacher will collect in your annotated papers during the first lesson. It is important that you get into good habits and demonstrate the following:

1. Evidence of a first attempt (feel free to use the internet and/or textbooks/revision guides while you are completing the questions)
2. Evidence of self-assessment (mark schemes are at the end of the documents)
3. Once self-assessed, incorrect answers should be corrected *with notes on the particular concept added,* again please use a different colour. Even if you got the correct answer, it is worth adding additional annotation if possible.

How to answer the questions.

When completing the questions, it is extremely important that you ***show every step in your calculation***, including any re-arrangement of formulae and units. Simply writing the final answer is bad practice. Please see this video as a guide: https://www.youtube.com/watch?v=38Eeqbh3Cwc

This link may also help

- http://www.wikihow.com/Solve-Any-Physics-Problem

If you get stuck?

Don't worry but try your best. Use the following videos to help you with a particular topic question. Look for the physics GCSE videos, scroll down and look at the videos for paper 1 and paper 2. There will some GCSE topics that you may not have covered because of the pandemic and/or you studied Combined Science. Don't worry, but try and answer them using the link below.
https://www.youtube.com/channel/UCqbOeHaAUXw9Il7sBVG3_bw/playlists?shelf_id=20&sort=dd&view=50

You will notice that there is a fair amount of work to complete over the summer. You should space out these tasks over the holidays and ensure you review them during the few days before starting at Comberton Sixth Form in September.

What do top students do differently when studying?

The following TED talk is worth watching. https://www.youtube.com/watch?v=Na8m4GPqA30

Course Resources

It is recommended that you purchase the following resources ***in September*** to help with your studies during their A-Level physics course in September.

- OUP A Level Physics A for OCR Kerboodle
- OUP A Level Physics A for OCR Student Book UK ed. Edition
- OUP OCR A Level Physics: A Revision Guide UK ed. Edition
- CGP A-Level Physics: OCR Year 1 & 2 Complete Revision & Practice with Online Edition (CGP A-Level Physics)
- Y12 Past Paper Exam Practice booklet

It is worth noting that you will be able to access digital copy of the textbook for free if you prefer this. The Y12 Past Paper Exam Practice booklet will also be available digitally if you prefer to print it yourself, however it is worth noting that the booklet is about 300 pages long.

We are currently in contact with both Oxford University Press and CGP and are hoping to negotiate a discount on the first three items in September. More information on this will be given to you at the beginning of September.

We look forward to seeing you all in September!

Kind Regards
Mr Winter, Mr Baker, Mr Collier, Mr Benger, Mrs Shi

Useful weblinks/videos:

Vertitasium
https://www.youtube.com/user/1veritasium

Fermilab
https://www.youtube.com/c/fermilab

PBS Space Time
https://www.youtube.com/c/pbsspacetime

AS/A Level Physics Content (use these during the course to help support your leaning)

A-Level Physics Online
https://www.alevelphysicsonline.com/

Brightstorm
https://www.youtube.com/playlist?list=PLF71B362214423F9D

Bozeman Science
https://www.youtube.com/playlist?list=PLlIVwaZQkS2rxqMXTH-cdE0LIX9Zi_oS1

Khan Academy
https://www.khanacademy.org/science/physics

Lectures by Walter Lewin
https://www.youtube.com/channel/UCiEHVhv0SBMpP75JbzJShqw

Feynman Lectures
http://www.feynmanlectures.caltech.edu/
https://www.youtube.com/user/FeynmanVideoLectures/videos

Mathematically enriched problems with a Physics theme (STEM Nrich):
http://nrich.maths.org/6465?part

Below details some of the benefits of studying physics or a physics related degree at university; even if you don't decide to continue studying physics beyond A-Level, having A-Level Physics on your CV will give you a distinct advantage when applying for jobs in the future!

Why study physics?

Physics is crucial to understanding the world around us, the world inside us, and the world beyond us. It is the most basic and fundamental science.

Physics challenges our imaginations with concepts like relativity and string theory, and it leads to great discoveries, like computers and lasers, that lead to technologies which change our lives—from healing joints, to curing cancer, to developing sustainable energy solutions

Like Science? It Began with Physics

Physics encompasses the study of the universe from the largest galaxies to the smallest subatomic particles.

Moreover, it's the basis of many other sciences, including chemistry, oceanography, seismology, and astronomy (and can be applied to biology or medical science). All are easily accessible with a bachelor's degree in physics.

Want transferrable skills? Physicists Learn Them

Physicists are problem solvers. Their analytical skills make physicists versatile and adaptable so they work in interesting places.

You can find physicists in industrial and government labs, on college campuses, in the astronaut corps, and consulting on TV shows. In addition, many physics grads work at newspapers and magazines, in government, and even on Wall Street—places where their ability to think analytically is a great asset.

Want a wide variety of career opportunities? People Hire Physicists

Physics brings a broad perspective to any problem. Because they learn how to consider any problem they are not bound by context. This inventive thinking makes physicists desirable in any field. A bachelor's degree in physics is a great foundation for careers in:

- Journalism
- Law
- Finance
- Medicine
- Engineering
- Computer Science
- Astronomy
- Biology

Want a high salary? Physics Beats Other Sciences

Even when the job market is slow, physicists get job offers—well paying jobs. Employers know that a physicist brings additional skills with expertise and pay accordingly. That's why physics graduates can expect career salaries similar to those of computer science and engineering majors.