Year 12 to Year 13 Physics Summer Work

Task 1: Complete PAG 12 (see PAG work sheet).

For this you need to conduct research into a chosen topic of your choice into an area of physics that extends beyond the curriculum of the A-level.

You should then write up a fully referenced (see below for instructions on this) report of no more than 1500.

Some ideas of what the reports can be on:

* Why does Kevlar stop bullets?
* What is superconductivity?
* What is string theory?
* How do we take a photo of a black hole?

There really is an endless list of topics you could choose – please do not feel you should choose any of those listed above. If unsure, please email both of your Physics teachers to confer on a research topic.

To meet the requirements **your work needs to be fully referenced using the Harvard system of referencing**. [Click here for an explanation of Harvard referencing.](https://www.open.ac.uk/library/referencing-and-plagiarism/quick-guide-to-harvard-referencing-cite-them-right)

Task 2: Capacitors

Research Capacitors, make notes on the following aspects of the specification:

1. What are capacitors? What is Capacitance? How does charge move in a circuit with capacitors?
2. How do capacitors behave when combined in series and parallel circuits?
3. If you have not studied A – Level Maths and Logarithms, watch the following videos (30 mins total) to get up to speed on logarithms:
   1. <https://www.youtube.com/watch?v=ntBWrcbAhaY> Intro to logarithms - 8 mins
   2. <https://www.youtube.com/watch?v=MEAwyRUsX2o> Intro to logarithms part 2 - 4 mins
   3. <https://www.youtube.com/watch?v=2Bu5NG1KIL4> Log laws 1 - adding Logarithms - 10 mins
   4. <https://www.youtube.com/watch?v=7GI8L5Vn-2E> Log laws 2 -Subtracting logarithms – 5 mins
   5. <https://www.youtube.com/watch?v=fh75jrgcl5A> Log laws 3 – Powers and coefficient - 5 mins

Task 3 – Revise Year 12 Content

To be ready for assessment in first week or two in September, use the spreadsheet I emailed you in early June to help you focus your studies by completion and self-assessment of question packs. Record how well you have done and track your improvement to help you improve your predicted grade.