PHYSICS

11 - 12 TRANSITION WORK

Introduction

This work aims to ensure you are confident with the basic maths skills you are expected to use throughout the course.

It will help develop skills such as:

- Converting Units
- Standard Form Conversion
- Rearranging Equations
- Reading and understanding complex scientific language
- Effective Note Taking

We will go through these in the first few lessons to ensure you are confident in your maths skills.

1 - Prepare for learning

For this subject you will need the following:

- ➢ Notepad
- ➢ Folder (Ring binder works best)
- ➢ Scientific Calculator
- ➢ Protractor
- ➢ Black Pen
- ➢ Green Pen
- ➢ Pencils
- ➢ Ruler (30cm if possible)

Bring this with you to your first lesson

Tasks for learning

The following tasks are basic expectations throughout the course that you need to be comfortable with. Complete these in your notebook that you will bring to the first lesson.

Converting Units- https://www.bbc.co.uk/bitesize/articles/z63qdp3#z9g7p9q

1. How many metres in 2.4 km?
2. How many joules in 8.1 MJ?
3. Convert 326 GW into W.
4. Convert 54 600 mm into m.
5. How many grams in 240 kg?
6. Convert 0.18 nm into m.
7. Convert 632 nm into m. Express in standard form.
8. Convert 1002 mV into V. Express in standard form.

9. How many eV in 0.511 MeV? Express in standard form.
10. How many m in 11 km? Express in standard form.

Standard Form- https://www.bbc.co.uk/bitesize/articles/zh4ny4j#z7s7m39

1. Write 2530 in standard form.
2. Write 280 in standard form.
3. Write 0.77 in standard form.
4. Write 0.0091 in standard form.
5. Write 1 872 000 in standard form.
6. Write 12.2 in standard form.
7. Write 2.4 x 10 2 as a normal number.
8. Write 3.505 x 10 1 as a normal number.
9. Write 8.31 x 10 6 as a normal number.
10. Write 6.002 x 10 2 as a normal number.
11. Write 1.5 x 10 -4 as a normal number.
12. Write 4.3 x 10 3 as a normal number.

Rearranging Equations- https://www.bbc.co.uk/bitesize/guides/z36vcj6/revision/4

1. E=m x g x h to find h
2. Q= I x t to find I
3. E = ½ m v 2 to find m
4. E = ½ m v 2 to find v
5. v = u + at to find u
6. v = u + at to find a
7. v 2 = u 2 +2as to find s
8. v 2 = u 2 +2as to find u

Significant Figures- https://www.bbc.co.uk/bitesize/guides/zscq6yc/revision/3

1. 3.4527
2. 40.691
3. 0.838991
4. 1.0247
5. 59.972

Calculate the following to an appropriate number of significant figures

1. 63.2/78.1
2. 39+78+120
3. (3.4+3.7+3.2)/3
4. 0.0256 x 0.129
5. 592.3/0.1772

Note Taking Task

Use this website to write a full page of Cornell notes (Successful note taking) on the topic of the Higgs Boson particle. https://home.cern/science/physics/higgs-boson/what

This will help you with terminology, note taking and exposing you to the new discoveries scientists are making regularly. We will also be completing a particle topic in this subject, which touches on the use of CERN and the particles discovered using the particle accelerator.

3 - Expand your mind

These tasks are not compulsory, but if you would like to delve a little deeper into your subject here are some suggested readings/ watch.

Books

1. Quantum Theory Cannot Hurt You: *Understanding the Mind-Blowing Building Blocks of the Universe*

2. Any Physics book by Marcus Chown is an excellent insight into some of the more exotic areas of Physics that requires no prior knowledge. In your first year of A-Level study you will meet the quantum world for the first time. This book will fill you with interesting facts and handy analogies to whip out to impress your peers!

3. A Short History of Nearly Everything

A modern classic. Popular science writing at its best. A Short History of Nearly Everything Bill Bryson's quest to find out everything that has happened from the Big Bang to the rise of civilization - how we got from there, being nothing at all, to here, being us. Hopefully by reading it you will gain an awe-inspiring feeling of how everything in the universe is connected by some fundamental laws.

Online Clips / Series

1. **Minute Physics** – Variety of Physics questions explained simply (in felt tip) in a couple of minutes. Addictive viewing that will have you watching clip after clip – a particular favourite of mine is "Why is the Sky Dark at Night?"

https://www.youtube.com/user/minutephysics

2. **Wonders of the Universe / Wonders of the Solar System** – Both available of Netflix as of 17/4/16 – Brian Cox explains the Cosmos using some excellent analogies and wonderful imagery.
3. **Shock and Awe, The Story of Electricity** – A 3 part BBC documentary that is essential viewing if you want to see how our lives have been transformed by the ideas of a few great scientists a little over 100 years ago. The link below takes you to a stream of all three parts joined together but it is best watched in hourly instalments. Don't forget to boo when you see Edison. (alternatively watch any Horizon documentary – loads of choice on Netflix and the I-Player)

https://www.youtube.com/watch?v=Gtp51eZkwoI

4. **NASA TV** – Online coverage of launches, missions, testing and the ISS. Plenty of clips and links to explore to find out more about applications of Physics in Space technology.

https://plus.nasa.gov/

5. **The Fantastic Mr. Feynman** - See the life's work of the "great explainer", a fantastic mind that created mischief in all areas of modern Physics.

https://www.youtube.com/watch?v=H9fjhQMsDW4

6. **PBS Space Time** - Space Time explores the outer reaches of space, the craziness of astrophysics, the possibilities of sci-fi, and anything else you can think of beyond Planet Earth. New episodes weekly, and a whole back-catalogue of gems.

https://www.youtube.com/channel/UC7_gcs09iThXybpVgjHZ_7g