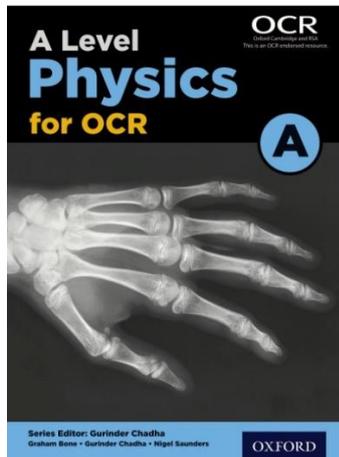
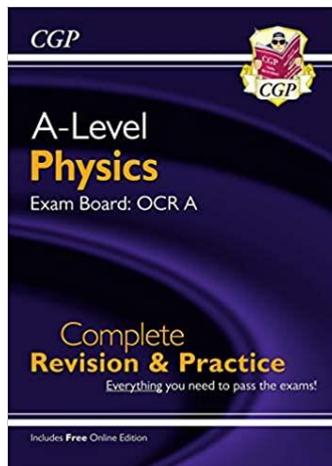


WHAT YOU WILL **NEED TO** PURCHASE before September!



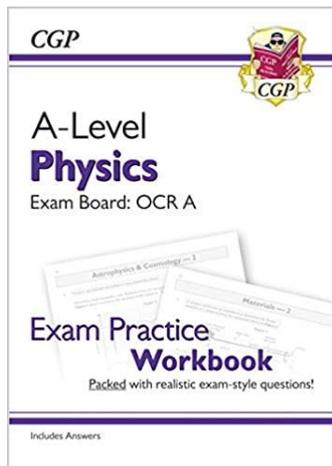
A Level Physics for OCR course textbook – Graham Bone, Gurinder Chadha and Nigel Saunders

ISBN: **0198352182**



A Level Physics for OCR complete revision and practice

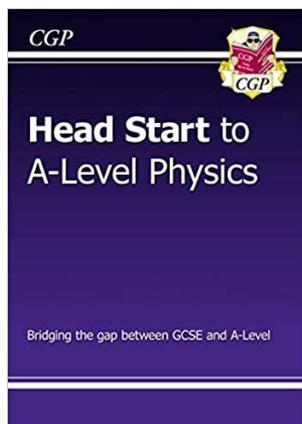
ISBN: **1789080398**



A Level Physics Exam Practice Workbook

ISBN: **1782949259**

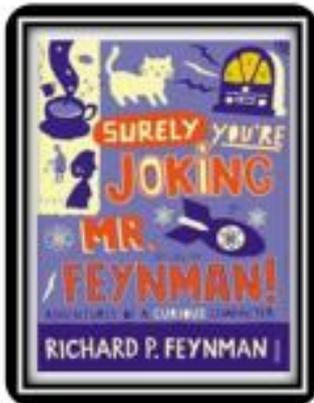
You *may* wish to purchase CGP Head Start to A Level Physics - it recaps all the tricky topics from GCSE that A Level builds on. It will also be useful for reference throughout the course.



Head Start to A Level Physics

ISBN: **1782942815**

Below is a selection of books that should appeal to a physicist – someone with an enquiring mind who wants to understand the universe around us.

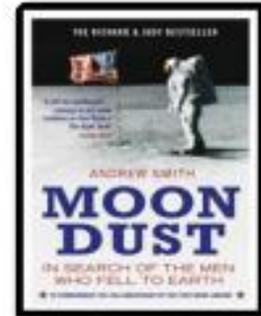


**Surely You're Joking Mr Feynman: Adventures of a Curious Character**

By reading this book you will get insight into his life's work including the creation of the first atomic bomb and his work in the field of particle physics.

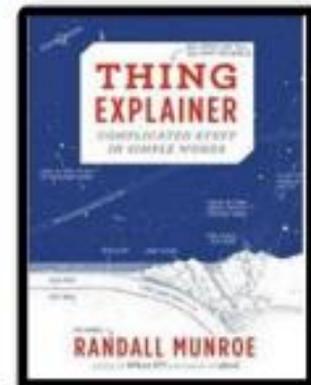
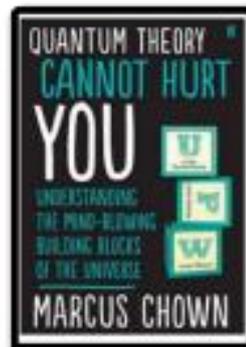
**Moondust: In Search of the Men Who Fell to Earth**

This book uses the personal accounts of 9 astronauts and many others involved in the space program, looking at the whole space-race era.



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

Any physics book by Marcus Chown is an excellent insight into some of the more exotic areas of physics that require no prior knowledge.

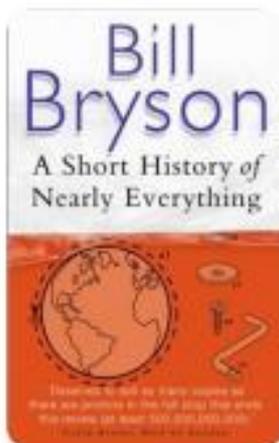


**A Short History of Nearly Everything**

A whistle-stop tour through many aspects of history from the Big Bang to now. This is a really accessible read that will re-familiarise you with common concepts and introduce you to some of the more colourful characters from the history of science.

**Thing Explainer: Complicated Stuff in Simple Words**

Written by the creator of online comic XTCD (a great source of science humour) is a book of blueprints from everyday objects such as a biro to the Saturn V rocket and an atom bomb.



\*Complete **TASKS 1 & 2** and present in a NEAT format.

**All tasks will be collected in during your FIRST Physics lesson, you will also sit a baseline test on the work**

Task 1

### **Research activities**

Use your online searching abilities to see if you can find out as much about the topic as you can.

**You can make a 1-page summary sheet/ poster for one you research using Cornell notes:**

<http://coe.jmu.edu/learningtoolbox/cornellnotes.html>

#### **Topic 1: Dark Matter**

What is dark matter? What is the evidence for dark matter and what are the likeliest candidates for dark matter?

#### **Topic 2: Gravitational Waves**

Research in to gravitational waves and the research centre LIGO. What is LIGO and how does it work to detect gravitational waves?

#### **Topic 3: Metallic Hydrogen**

Research the elusive metallic hydrogen. Described as the 'holy grail' of science, what is metallic Hydrogen and what would the properties of metallic Hydrogen be?

#### **Topic 4: Fusion reactors**

Investigate what fusion is and research ITER. This is the world's largest fusion experiment currently being built in France.

Task 2

Q1 Complete the following table:

| <b>Unit prefix</b> | <b>Meaning</b> |
|--------------------|----------------|
| k (kilo)           | x 1000         |
|                    | X 0.000001     |
| M (mega)           |                |
| n (nano)           |                |

[3]

Q2

a) Write the following numbers into standard form.

i. 0.012

ii. 120000

iii. 0.00000012

[3]

b) Complete the following calculations and right your answers to an appropriate number of significant figures.

i.  $2.1 \times 0.15$

ii.  $0.345 \div 0.114$

[4]

Q3 Re-arrange the following equations to make R the subject of the equation.

a)  $Q = WERTY$

b)  $Q^2 = WR^2$

c)  $Q = W - RT^2$

[3]

Q4 Name the 3 particles (from GCSE) that make up an atom.

..... [1]

a) Which one of the above particles is not found in the nucleus of an atom?

..... [1]

b) Which of the above particles will be found in varying quantities in the nuclei of isotopes of the same element?

.....[1]

Q5

a) Complete the following table

| Voltage (V) | Current (A) |          |         |
|-------------|-------------|----------|---------|
|             | Repeat 1    | Repeat 2 | Average |
| 2           | 0.23        | 0.26     | 0.25    |
| 4           | 0.46        | 0.53     |         |
| 6           | 0.69        | 0.78     | 0.74    |
| 8           | 0.92        | 1.04     | 0.98    |
| 10          | 1.15        | 1.30     | 1.23    |

[3] Q6

a) Use a piece of graph paper to plot a graph of Current (x-axis) against Voltage (y-axis) drawing a line of best fit through your data points. (You may plot a graph on excel <https://www.youtube.com/watch?v=3PwVWX28dEE> will show you how)

[4]

b) Find the gradient of your line of best fit

[3]



- c) Calculate the **average** acceleration in the first 20 seconds.

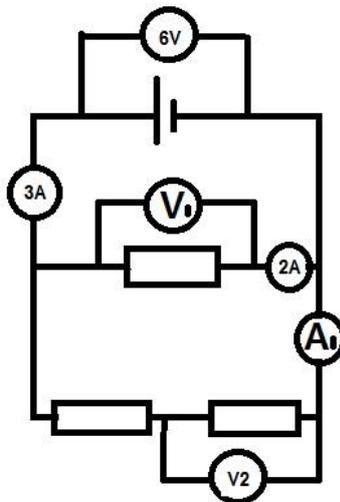
[2]

Q8

- a) Draw a circuit diagram to show how the resistance of a filament bulb could be measured using an ammeter and a voltmeter.

[2]

- b) Look at the circuit diagram below. All of the resistors are identical.



Write the missing values of current and potential difference:

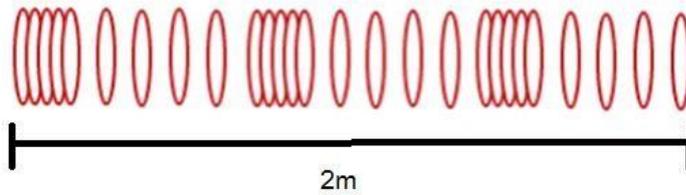
V1 =

V2 =

A1 =

[3]

Q9 The diagram below shows a diagram of 3 complete longitudinal wave oscillations on a slinky:



a) State the wavelength of the wave shown

..... [1]  
b) Label a complete wavelength on the diagram above with the correct symbol used for wavelength in GCSE and A Level Physics

[1]

c) If the above wave had a frequency of 5Hz how long would it take an individual hoop to complete 1 full oscillation? [1]

d) Calculate the speed of the wave

$$\text{wavespeed} = \text{frequency} \times \text{wavelength}$$

Wave speed = \_\_\_\_\_ Unit \_\_\_\_\_ [2]