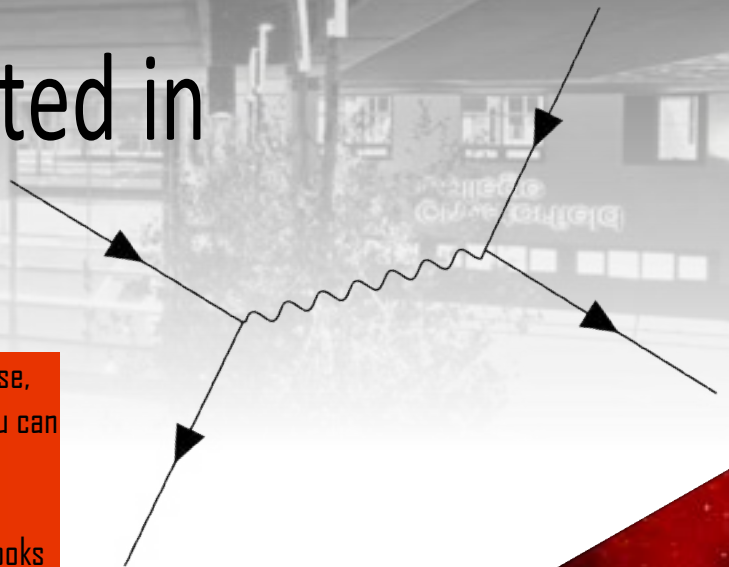# A level Physics

So you're interested in physics?

This pack contains some information about the course, including the textbooks that we recommend so that you can get a head start if you would like.

We have also included some recommendations for books and movies as the most impactful things you can do over your summer break is to stay engaged and interested in physics – we would love to hear your thoughts on some of them.
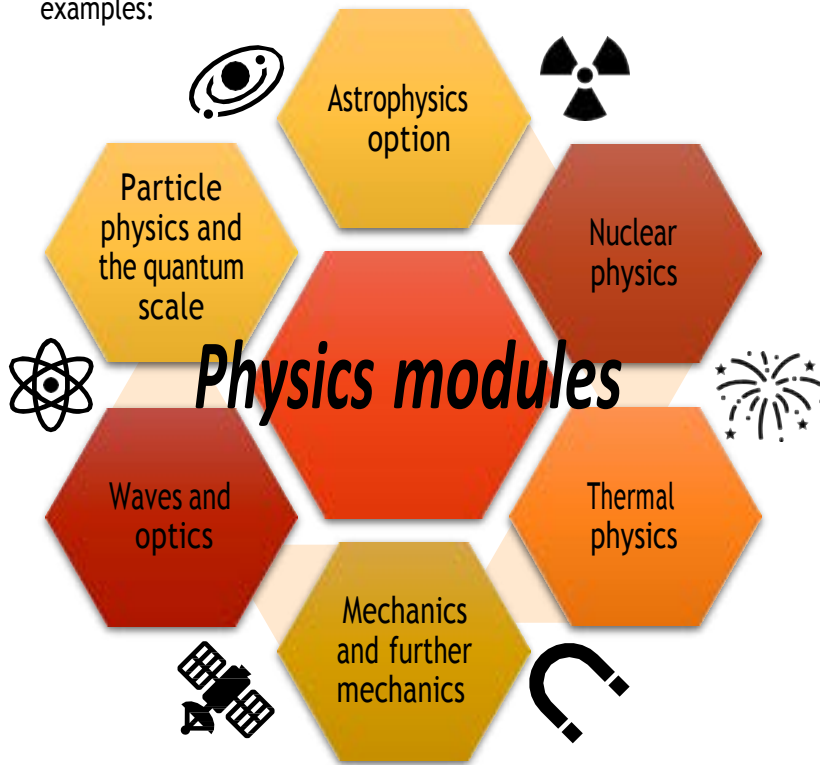
Lastly there is a "baseline assessment" that you will need to complete, we would like you to hand this in when you arrive in class in September. This give us a jump start on knowing where are when you start your A level in Physics in September.
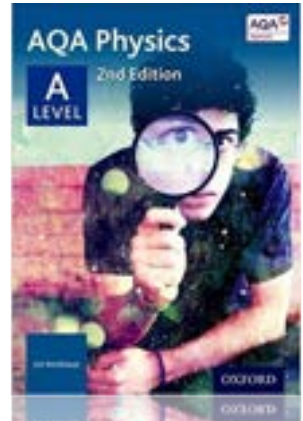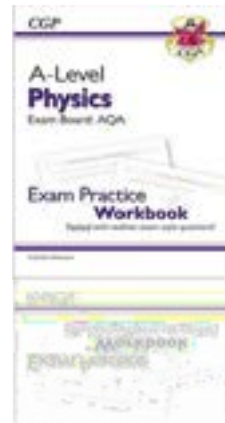
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Course Information

Your A Level physics will be brought to you in various lectures, workshops and practical laboratory sessions by an experienced lecturer: Tom Hogg(hoggt@chesterfield.ac.uk)
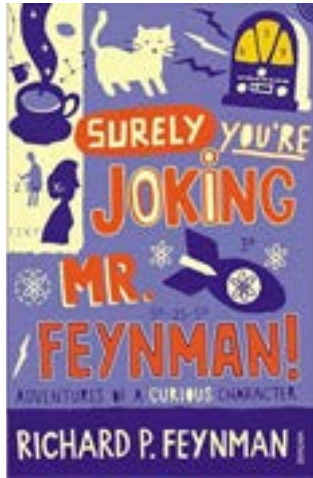
The A level is taught as a series of modules which are all examined at the end of year one (for AS level qualifications) or at the end of year 2 (for A level qualifications). The modules are quite different compared to what you will be used to at GCSE, here are some examples:

Physics modules

- Astrophysics option
- Particle physics and the quantum scale
- Nuclear physics
- Waves and optics
- Thermal physics
- Mechanics and further mechanics

→ We recommend the following text book and revision guides

CGP A-Level Physics Exam Board AQA Exam Practice Workbook

AQA Physics 2nd Edition A LEVEL

CGP A-Level Physics Exam Board: AQA Complete Revision & Practice

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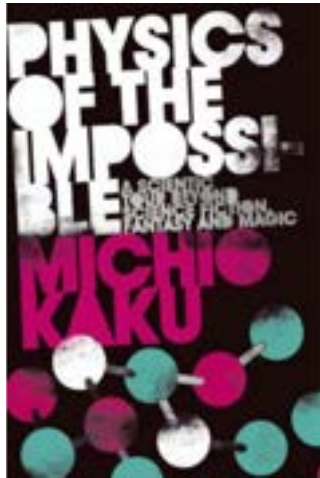
Book recommendations

Surely you're joking Mr Feynman! –
Richard P Feynman

An edited collection of reminiscences by the Nobel Prize-winning physicist Richard Feynman
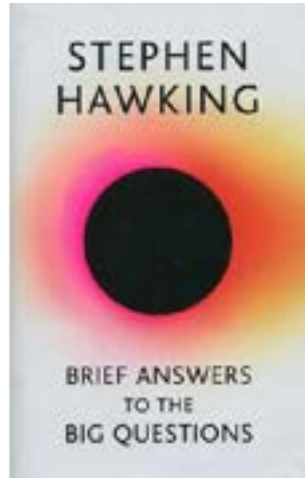
Physics of the Impossible –
Michio Kaku

A scientific exploration into the amazing things that happen in science fiction - from phasers to time travel.

Brief answers to the big questions –
Stephan Hawking

A book examining some of the universe's greatest mysteries. Science is very important in solving problems on planet Earth

Forces of Nature –
Brian Cox

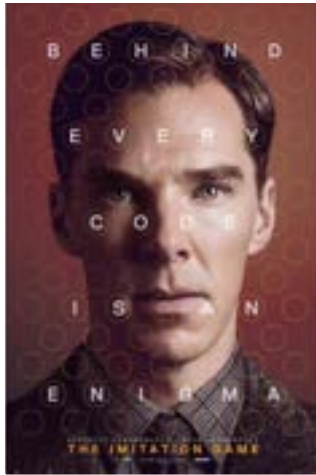This book uncovers how some of our planet's beautiful sights and events are forged by just a handful of natural forces

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film recommendations

The Martian – 2015

How do you survive as the only person on a planet with no food or oxygen?

The Imitation Game – 2014

The true story about the development of the first computer in the second world war.

The theory of Everything – 2000

A film depicting the life of Stephan Hawking and the discoveries he has made.

Interstellar – 2014

An exploration into black holes and exoplanets.

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Baseline Assessment

Please complete this baseline assessment. You can use the internet and any resources to help you. You will need a calculator.

The following 40 minute test is designed to test your recall, analysis and evaluative skills and knowledge.
Remember to use your exam technique: look at the command words and the number of marks each question is worth.
A suggested mark scheme is provided for you to check your answers.

A single piece of graph paper is required for the completion of the assessment.
You may use a calculator.

Question Number	Topic	Score
1	Symbols and Prefixes	/3
2	Standard Form	/4
3	Re-arranging Equations	/3
4	Atomic Structure	/3
5	Recording Data	/3
6	Graphing	/4
7	Forces and Motion	/10
8	Electrical Circuits	/5
9	Waves	/5
	Total	/40

Q1 Complete the following table:

Unit prefix	Meaning
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 write your answers to an appropriate number of significant figures.

   i.   2.1 X 0.15

   ii.   0.345 ÷ 0.114

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

a) $Q = WERTY$

b) $Q^2 = WR^2$

c) $Q = W - RT^2$

Q4

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

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

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

Q5

a) Complete the following table

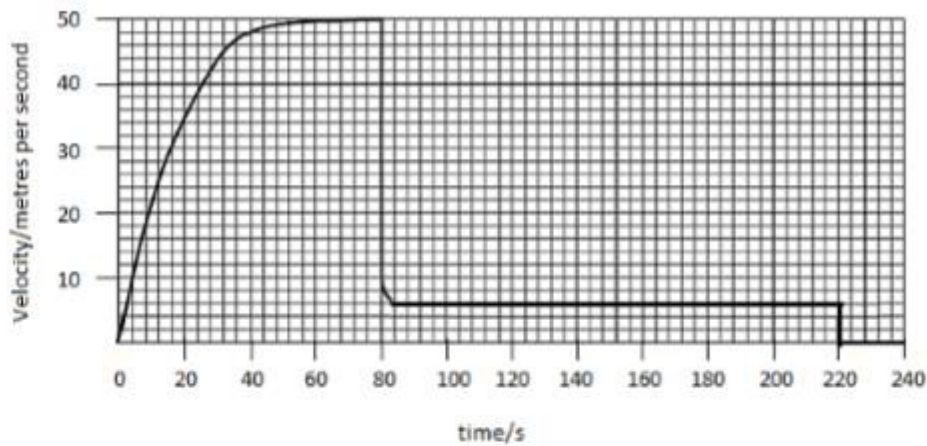| Voltage (__)	_____ (A)		
	Repeat 1	Repeat 2	Average
2	0.23	0.26	0.25
4	0.46	0.53	
6	0.69	0.78	0.74
8	0.92	1.04	0.98
10	1.15	1.30	1.23

[3]

Q6

a) Use your 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.

[4]

b) Find the gradient of your line of best fit

[3]

Q7 The graph below shows the journey of a skydiver after they have left the plane.

a) Explain the shape of the graph commenting on how and why the forces have changed.

_____

_____

_____

_____

_____

_____

_____

_____

_____

b) Calculate the distance travelled whilst at the second terminal velocity.

[2]

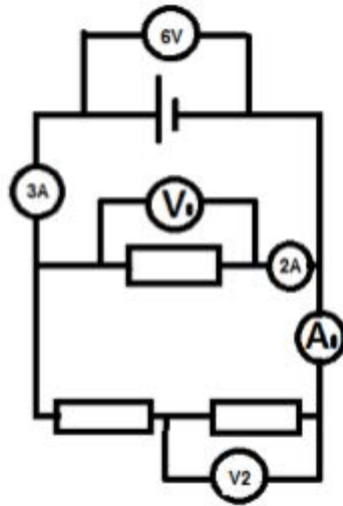c) Calculate the **average** acceleration in the first 20 seconds.

[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.
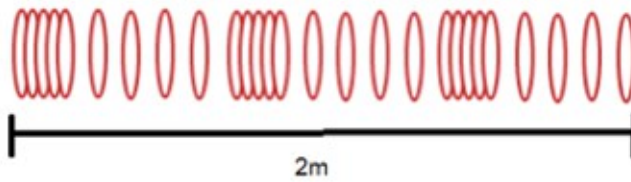
[2]

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

Write the missing values of current and potential difference:

    i.   V1 =

    ii.   V2 =

    iii.   A1 =

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

2m

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

$$wavespeed = frequency \times wavelength$$

Wave speed = _____ Unit _____[2]