

Subject: Physics Year Group: Year 11 into Year 12

Exam board: Edexcel

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1. Introduction

Moving from GCSE to A level can be a daunting step. There is a significant difference in terms of the amount you need to be able to recall, the level of detail required, and applying your new knowledge and skills to unfamiliar situations. This transition document is designed to help you prepare for the transition to A level. It includes sections on several topics which you have met at GCSE, tasks to ensure the fundamentals are embedded, in addition to suggested reading/ watching list to broaden your scope of the subject. Both task

The course requirements are a Grade 5 at GCSE in both Physics (or Combined Science) and Maths, however experience has shown that to do well and be secure in the subject, a Grade 6 in both Physics and Maths is preferred. Being such a demanding subject, you will want to demonstrate that you have a firm interest in Physics.

If you have any issues with the content, ***please email Mrs Chick*** on schick@wootton.beds.sch.uk to get them resolved.

2. Further reading

Text books. These are course texts that can be used in class. They both follow the specification and module structure that we teach. The * text book has been favoured by students for the last two years, so comes with a higher recommendation than the others.

* Pearson Edexcel a Level Physics (Year 1 and Year 2), Hodder Education Group, ISBN 151047003

Edexcel AS/a Level Physics Student Book 1 + ActiveBook, Pearson Education Ltd, ISBN 1447991184

Edexcel a Level Physics Student Book 2 + ActiveBook, Pearson Education Ltd, ISBN 1447991192

Online resources. All of these are free, but some have 'upgrades'. We never require you to pay for upgrades.

Course specific resources:

Specification - [Condensed Specification](#)

Formula Booklet - [Formula Booklet](#)

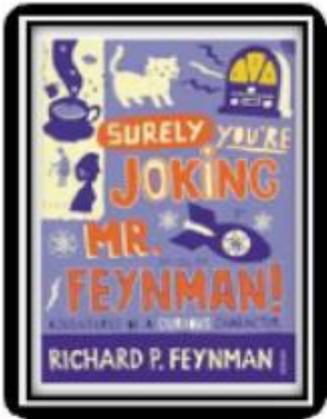
Physics & Maths Tutor - <https://www.physicsandmathstutor.com/physics-revision/a-level-edexcel/>

Physics online - <https://www.alevelphysicsonline.com/>

Enrichment resources:

Kurzgesagt - <https://www.youtube.com/channel/UCsXV37bltHxD1rDPwtNM8Q>

Books, Movies & QR lectures. The following are recommended books of interest, movies that could broaden your link to the curriculum and lectures/ presentations of interest.



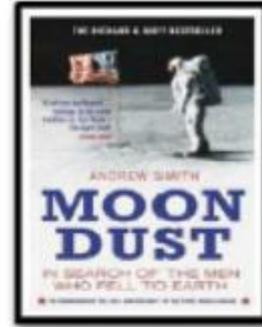
RICHARD P. FEYNMAN

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.

Moon dust: In Search of the Men Who Fell to Earth

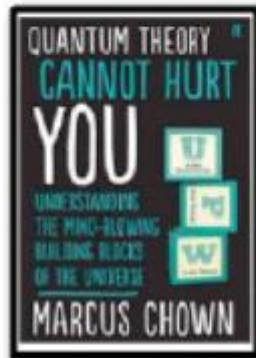
This book uses the personal accounts of 9 astronauts and many others involved in the space program, looking at the whole space-race era.



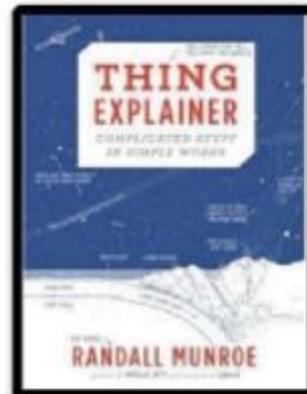
ANDREW SMITH

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.



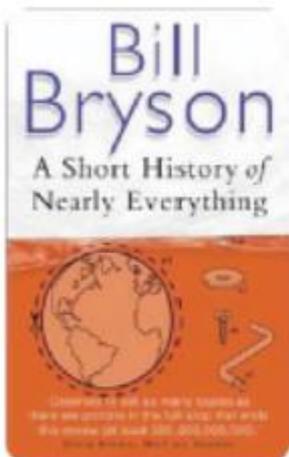
MARCUS CHOWN



RANDALL MUNROE

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.



BILL BRYSON

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.



Moon (2009)

With only three weeks left in his three year contract, Sam Bell is getting anxious to finally return to Earth. He is the only occupant of a Moon-based manufacturing facility along with his computer and assistant, GERTY. When he has an accident however, he awakens to find that he is not alone.

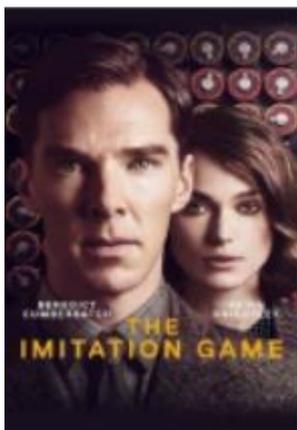
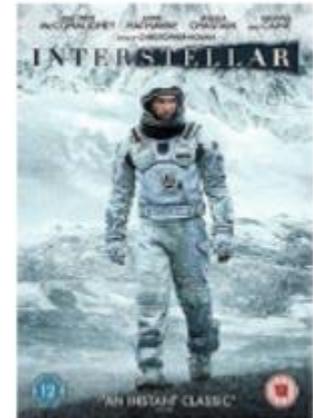


Gravity (2013)

Two astronauts work together to survive after an accident which leaves them stranded in space.

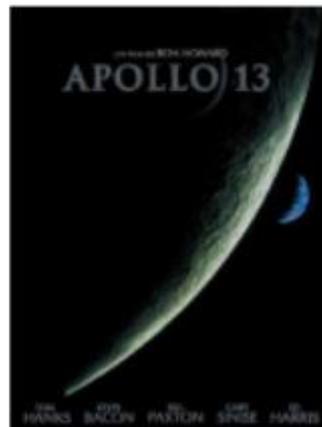
Interstellar (2014)

A team of explorers travel through a wormhole in space in an attempt to ensure humanity's survival.



The Imitation Game (2014)

Based on a true story. During World War II, the English mathematical genius Alan Turing tries to crack the German Enigma code with help from fellow mathematicians.



Apollo 13 (1995)

Based on a true story. NASA must devise a strategy to return Apollo 13 to Earth safely after the spacecraft undergoes massive internal damage putting the lives of the three astronauts on board in jeopardy.

From mach-20 glider to hummingbird drone

Available at:

https://www.ted.com/talks/regina_dugan_from_mach_20_glider_to_humming_bird_drone/up-next?language=en

"What would you attempt to do if you knew you could not fail?" asks Regina Dugan, then director of DARPA, the Defense Advanced Research Projects Agency. In this talk, she describes some of the extraordinary projects that her agency has created.



Is our universe the only universe?

Available at:

https://www.ted.com/talks/brian_greene_why_is_our_universe_fine_tuned_for_life?language=en

Brian Greene shows how the unanswered questions of physics (starting with a big one: What caused the Big Bang?) have led to the theory that our own universe is just one of many in the "multiverse."

The fascinating physics of everyday life

Available at :

https://www.ted.com/talks/helen_czerski_fun_home_experiments_that_teach_you_physics?language=en

Physicist Helen Czerski presents various concepts in physics you can become familiar with using everyday things found in your kitchen.



We need nuclear power to solve climate change

Available at :

https://www.ted.com/talks/joe_lassiter_we_need_nuclear_power_to_solve_climate_change?language=en

Joe Lassiter is focused on developing clean, secure and carbon-neutral supplies of reliable, low-cost energy. His analysis of the world's energy realities puts a powerful lens on the touchy issue of nuclear power.

3. Task 1 - Physics Oxford A Level Transition Pack

Please work through the Oxford A Level Transition Pack (separate document attached). This worksheet includes all of the key theory and skills that need to be honed before starting the course, and will support your transition into this difficult A Level subject.

The mark scheme for all the questions on this document is on the last few pages, meaning this can be self-assessed. Any issues with the content, ***please email Mr Foster-Smith*** on hsmith@wootton.beds.sch.uk to get them resolved.

4. Task 2 – Research Report

The purpose of this project is twofold; 1) To explore skills, knowledge and resources that you will need to use to succeed at A-Level, and 2) Evaluate the process of developing your work, noting your initial planning, problems that needed to be overcome and the learning skills you developed to succeed in this project.

Project Title:

How, if at all, will the Universe end?

Objective:

- Research and write a technical scientific report
- Evaluate your developing skills and knowledge

Outcomes (3 documents):

- ❖ Plan and action document
 - Time line of research
 - Document list, source of research
 - Initial ideas and structure of report (Headings/ subheadings), post research
 - Further research you plan to undertake
- ❖ Written report (three pages of font size 12 text – no more than this. You may use images to extend this to 4 pages)
 - Answering the question showing clear reasoning, research and with technical language and structure
 - References in text (Author/ Site Name, Year) with Bibliography at end of text. Text and images must be referenced to support any statement of fact or quoted opinion.
- ❖ Evaluation document
 - Successes
 - Problems that were overcome/ how you overcame them
 - Skills/ knowledge you have developed and those you want to explore further
 - Questions you still have

You may structure the report in any way you chose, but there must be a conclusion to the project title.

This report will be peer assessed when handed in, so be **proud** of your work!

Support videos:

Adding references in Word – https://www.youtube.com/watch?v=CnVg_BpwP2E

Adding a quick table of content in Word - <https://www.youtube.com/watch?v=2jkOgffOqr4>

Structure of a short scientific report (Degree level report) – <https://www.youtube.com/watch?v=FTC-5P1VFFU>

Avoiding plagiarism – https://www.youtube.com/watch?v=UsFcU1PH_8E