

A level Physics Transition Tasks 2022

Instructions

You are required to complete **three compulsory tasks** before your first Physics lesson in September. Ensure you bring all of your written work to your lesson where it will be collected by your teacher. Your written work should be on A4 paper, clearly structured and labelled. Your calculations must be logically presented. It is expected you will work independently, finding out any necessary information in order to carry out the tasks. The compulsory tasks are provided in this document (part 1) as well as in part 2 and part 3.

In addition, there are some **optional extension tasks** that you **may** wish to carry out. These are a selection of physics related interesting books, films and movie clips. You may wish to choose a particular book to read, for example, from the selection provided. The optional extension tasks are listed below in this document (part 1).

The 3 Compulsory tasks (Please note that you must do **all 3** of these compulsory tasks and you will be required to hand the written work in)

1. **Foundations of Physics Calculation sheet: determining uncertainty** (see 'A level Physics Summer Transition Tasks 2019 part 2'). This provides information and worked examples on uncertainties for you to read as well as questions for you to complete.
2. **17 exam style questions** involving uncertainties (see 'A level Physics Summer Transition Tasks 2019 part 3').
3. **Research activity: PhET resistance in a wire** (see the instructions on the next page in this document – 'A level Physics Summer Transition Tasks 2019 part 1')

Compulsory task 3: Research activity PhET resistance in a wire

To get the best grades in A Level Physics you will have to get good at completing independent research and making your own notes on difficult topics. Below is a link to a website that covers some interesting Physics topics.

Using the Cornell notes system:

<http://coe.jmu.edu/learningtoolbox/cornellnotes.html> make 1 page of notes **from the site** covering the topic below.

<https://phet.colorado.edu/en/simulations/category/html>

PhET create online Physics simulations when you can complete some simple experiments. Your task is to open up the **resistance in a wire simulation**. Conduct a simple experiment by adjusting the variables in a scientific manner. Make a one page summary of the experiment and your findings.

Now make sure you complete compulsory tasks 1 and 2 as well!

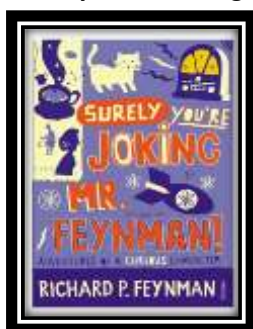
Optional Extension tasks (these are purely for your interest and are not compulsory)

A selection of interesting books, films and movie clips that you may wish to read/see are given below.

Book Recommendations

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. None of the selections are textbooks full of equation work (there will be plenty of time for that!) instead each provides insight to either an application of physics or a new area of study that you will be meeting at A Level for the first time.

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

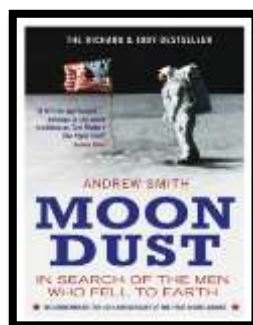


ISBN - 009917331X - Richard Feynman was a Nobel Prize winning Physicist. In my opinion he epitomises what a Physicist is. By reading this books you will get insight into his life's work including the creation of the first atomic bomb and his bongo playing adventures and his work in the field of particle physics.

(Also available on Audio book).

<https://www.waterstones.com/books/search/term/surely+youre+joking+mr+feynman++adventures+of+a+curious+character>

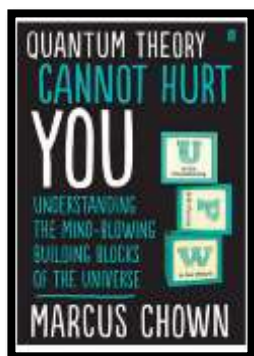
2. **Moondust: In Search of the Men Who Fell to Earth**



ISBN – 1408802384 - One of the greatest scientific achievements of all time was putting mankind on the surface of the moon. Only 12 men made the trip to the surface, at the time of writing the book only 9 are still with us. The book does an excellent job of using the personal accounts of the 9 remaining astronauts and many others involved in the space program at looking at the whole space-race era, with hopefully a new era of space flight about to begin as we push on to put mankind on Mars in the next couple of decades.

<https://www.waterstones.com/books/search/term/moondust++in+search+of+the+men+who+fell+to+earth>

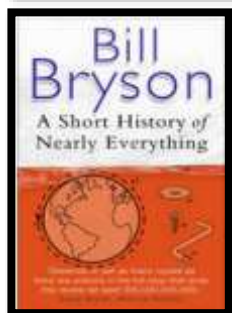
3. Quantum Theory Cannot Hurt You: Understanding the Mind-Blowing Building Blocks of the Universe



ISBN - 057131502X - Any Physics book by Marcus Chown is an excellent insight into some of the more exotic areas of Physics that require 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!

<https://www.waterstones.com/book/quantum-theory-cannot-hurt-you/marcus-chown/9780571315024>

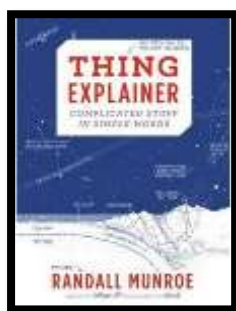
4. A Short History of Nearly Everything



ISBN – 0552997048 - 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.

<https://www.waterstones.com/books/search/term/a+short+history+of+nearly+everything>

5. Thing Explainer: Complicated Stuff in Simple Words



ISBN – 1408802384 - This final recommendation is a bit of a wild-card – a book of illustrated cartoon diagrams that should appeal to the scientific side of everyone. 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, each one meticulously explained BUT only with the most common 1000 words in the English Language. This would be an excellent coffee table book in the home of every scientist.

<https://www.waterstones.com/book/thing-explainer/randall-munroe/9781473620919>

Movie / Video Clip Recommendations

Hopefully you'll get the opportunity to soak up some of the Sun's rays over the summer – synthesising some important Vitamin-D – but if you do get a few rainy days where you're stuck indoors here are some ideas for films to watch or clips to find online.

Science Fictions Films

1. Moon (2009)
2. Gravity (2013)
3. Interstellar (2014)
4. The Martian (2015)
5. The Prestige (2006)

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=Gtp51eZkwol>

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.

<http://www.nasa.gov/multimedia/nasatv/>

5. **The Fantastic Mr. Feynman** – I recommended the book earlier, I also cannot recommend this 1 hour documentary highly enough. 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=LygleIxxTpw>