



Physics Summer Task

Summer Task Instructions:

This pack contains a programme of activities and resources to prepare you to start an A level in Physics in September. This is aimed to be used after you complete your GCSE, throughout the remainder of the Summer term and over the Summer Holidays to ensure you are ready to start your course in September.

Compulsory Task

Register with Isaac Physics, <https://isaacphysics.org>.

Your connection code is Z62HKR and once registered use this direct link, <https://isaacphysics.org/account?authToken=Z62HKR> which will allow you to access the tasks that have been set for you.

Optional Extension Task

Complete one or more of the following excellent free OpenLearn courses:

Engineering: environmental fluids

<https://www.open.edu/openlearn/science-maths-technology/engineering-environmental-fluids/>

The formation of exoplanets

<https://www.open.edu/openlearn/science-maths-technology/the-formation-exoplanets/>

Electromagnetism: testing Coulomb's law

<https://www.open.edu/openlearn/science-maths-technology/electromagnetism-testing-coulombs-law/>

If you have any issues accessing the summer task, please email

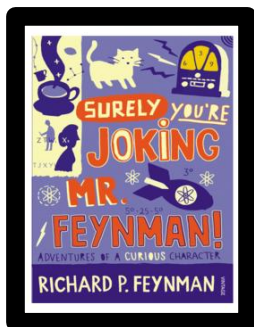
m.adcock@springwoodhighschool.co.uk

Please ensure these Summer tasks are completed online prior to your first lesson in September.

Suggested Additional Reading:

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.

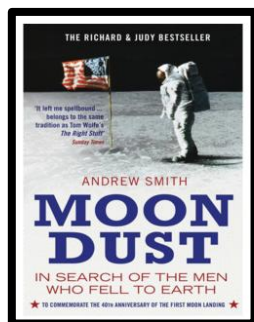
1. Surely You're Joking Mr Feynman: Adventures of a Curious Character



ISBN - 009917331X - Richard Feynman was a Nobel Prize winning Physicist. In my opinion he epitomises what a Physicist is. By reading this book 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 Audiobook).

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

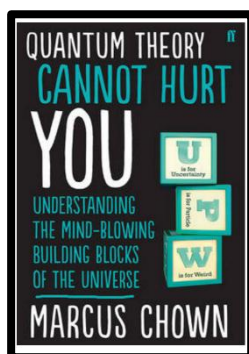
2. Moondust: In Search of the Men Who Fell to Earth



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 in 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.

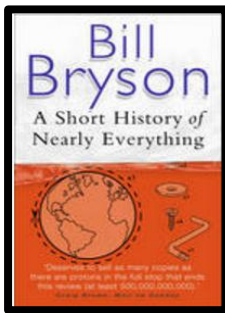
<https://www.waterstones.com/books/search/term/moondust++in+search+of+the+men+who+fell+to+earth>

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>

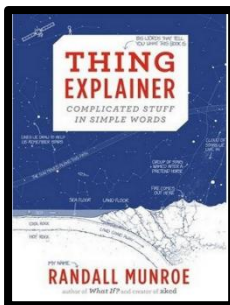


4. A Short History of Nearly Everything

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>

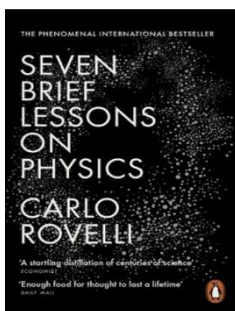
5. Thing Explainer: Complicated Stuff in Simple Words



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 XKCD (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>

6. Seven Brief Lessons on Physics (Paperback) [Carlo Rovelli](#) (author)



ISBN: 9780141981727 - We belong to a short-lived genus or species... All our cousins are already extinct. What's more, we do damage. Explaining the complex with relatable simplicity to make sense of ideas that seem too big to grasp is the methodology that leading theoretical physicist Carlo Rovelli applies to the writing of his slim book, which aims to show 'those who know little or nothing about modern science' that musing on the mysteries of the world need not be for the chosen few. First finding life as a series for the culture section of an Italian newspaper, Rovelli's book initially left Fifty Shades of Grey in the dust on publication in Italy. The lessons cover Einstein's general theory of relativity, quantum mechanics, the architecture of the cosmos, elementary particles, gravity, the nature of the mind and black holes.

<https://www.waterstones.com/book/seven-brief-lessons-on-physics/carlo-rovelli/9780141981727>

Suggested Visit: Here are some suggestions for some physics-themed days out for you to enjoy over the summer break. Try and have some fun as you prepare for two tough but rewarding years ahead!

Northern England and Scotland

1. **Jodrell Bank Observatory** – Cheshire – one of the largest moveable radio telescopes in the world and the location of the filming of the BBC's Stargazing Live. The site has both indoor and outdoor activities.
2. **MOSI** – Manchester – Massive free museum showing how science helped Britain lead the way through the industrial revolution. Contains hands on exhibits and displays and often host regular travelling exhibitions.
3. **Liverpool World Museum / Spaceport** – Liverpool/Wirral – Start the day off at an excellent family science museum with a top floor dedicated to astronomy including a planetarium. Take the ferry cross the Mersey to another family friendly museum dedicated to spaceflight.
4. **Kielder Observatory** – Northumberland – Book ahead at this popular observatory in the midst of the darkest night skies the UK has to offer. Regular tours and opportunities to view the stars through professional telescopes take place on a nightly basis.
5. **Glasgow Science Centre** - The Centre is home to hundreds of interactive exhibits throughout the three engaging floors

The Midlands and Wales

1. **Electric Mountain** – Snowdonia – Set against a mountainous backdrop is a working pumped storage power station. Take a tour deep into the heart of the mountain and see the turbines spring into action to meet our ever increasing demand for electricity. Take a stroll up on of the UKs highest peaks in the afternoon.
2. **National Space Centre** – Leicester - With six interactive galleries, the UK's largest planetarium, unique 3D Simulator experience, the award-winning National Space Centre in Leicester is an out of this world visitor attraction
3. **Alton Towers** – Staffordshire – Treat yourself to a go on a few rollercoasters whilst discussing Newton's Laws. You may want to download and take these handy rollercoaster physics notes with you <http://www.explainthatstuff.com/rollercoasters.html>

Southern England

1. **Royal Observatory** – London - Visit the Royal Observatory Greenwich to stand on the historic Prime Meridian of the World, see the home of Greenwich Mean Time (GMT), and explore your place in the universe at London's only planetarium.
2. **Herschel Museum of Astronomy** – Bath – As you walk around the picturesque Roman city – take an hour or two out at the home of one of the great scientists – discoverer of Infra-red radiation and Uranus.
3. **@Bristol** – Bristol - home to the UK's only 3D Planetarium and one of the biggest science centres.
4. **The Royal Institution** – London – The birthplace of many important ideas of modern physics, including Michael Faraday's lectures on electricity. Now home to the RI Christmas lectures and many exhibits of science history.