

physics.

A Level Preparation Pack



What is Physics?

<https://www.youtube.com/watch?v=ulojjqSm0m4>

Online Courses

Very popular online lessons. You can either watch videos on things that look interesting to you or use the specification to try and get a head start on your studies in September (we start with mechanics i.e. forces and motion)

<https://www.khanacademy.org/science/physics>

Activities

Excellent collection of interactive experiments. We will look at some of these in detail as part of the course.

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

The Scale of the Universe - Mind blowing interactive tool which shows you the contents of the universe from the extremely large to extremely small. (there is also a mobile app version)

<http://htwins.net/scale2/>

Reading

- * **Surely You're Joking Mr Feynman: Adventures of a Curious Character** - Richard Feynman
- * **Quantum Theory Cannot Hurt You: Understanding the Mind-Blowing Building Blocks of the Universe** - Marcus Chown
- * **A Short History of Nearly Everything** – Bill Bryson
- * **Why does $E=mc^2$?** - Brian Cox and Jeff Forshaw

More complicated reading:

- * **Six Easy Pieces** - Richard Feynman
- * **Just Six Numbers** - Martin Rees
- * **In Search of Schrodinger's Cat** - John Gribbin

Films



- **Moon (2009)**
- **Gravity (2013)**
- **Interstellar (2014)**
- **Primer (2004)** (So they aren't all about space! A very confusing film about time travel)

Videos



◇ **Richard Feynman – Fun to imagine.** Feynman is the master of explaining physics theories in an easily understood way. In this video, his enthusiasm for the subject shines through. An entertaining and educational watch.

<https://www.youtube.com/watch?v=P1ww1IXRfTA>

◇ **Minutephysics** – this whole YouTube channel is full of interesting short videos. Pick things that look interesting to you.

<https://www.youtube.com/user/minutephysics>

Podcasts



The Infinite Monkey Cage featuring Brian Cox on BBC Radio 4 has lots of interesting Science episodes. Look out for **Brits in Space**, **How We Measure the Universe**, **When Two Stars Collide** and **What Particles Remain to be Discovered**

<https://www.bbc.co.uk/programmes/b00snr0w/episodes/player?page=2>

Radio



The Secrets of Quantum Physics (BBC, Jim Al-Khalili) Professor of Physics Jim Al-Khalili investigates the most accurate and yet perplexing scientific theory ever - quantum physics.

<https://www.bbc.co.uk/programmes/b04v5vjz/episodes/guide>

Wonders of the Universe (BBC Brian Cox) Professor Brian Cox reveals how the fundamental scientific principles and laws explain not only the story of the universe but also answer mankind's greatest questions.

<https://www.bbc.co.uk/programmes/b00zdhtg/episodes/guide>

Shock and Awe – The History of Electricity (BBC, Jim Al-Khalili) Professor Jim Al-Khalili tells the story of our quest to master the power of electricity.

<https://www.bbc.co.uk/programmes/p00kjq6d/episodes/guide>

Course Specifications



<https://www.ocr.org.uk/qualifications/as-and-a-level/physics-a-h156-h556-from-2015/specification-at-a-glance/>