

# physics.

A Level Preparation Pack



## What is Physics?

<https://www.youtube.com/watch?v=ulojjaSm0m4>

## 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/>

