

Applied Science BTEC

Year 11 Transition Project

2020

Useful website:

<https://qualifications.pearson.com/en/qualifications/btec-nationals/applied-science-2016.html>

This is the link to the specification that we will study.

Lots of useful information on the specification and website.

Useful email:

Any questions or queries, please contact me on

callan.e@welearn365.com

Remember to bring all the work you have done to the first lesson of Science – any work you have done electronically, please save with a sensible title and bring on a memory stick or email to me (from school email, please) to the address above.

Looking forward to seeing you all soon and good luck with your summer project.

Mrs Callan

There are three parts to the transition project.....

1. Learning material for a test on your first Science lesson in Y12 (based on material in the CGP Head Start books)
2. Research an area of Science of your choice and prepare a presentation.
3. Research some of the new practical techniques you will meet during the Applied Science course.

1. Learning material for a Head Start test

- In your first Science lesson, you will be asked to complete a test based on the CGP Head Start books.
- You can order this book directly from CGP
- They are also available from Amazon
- And if you have a Kindle or download the Kindle App for free, you can download them (also for free)
- You need to learn the following information from the books as the test is based on it – page references are for Online version so check the titles for the correct pages too. These are topics that you will have met at GCSE.
- Biology book
 - Pages 6-8 Eukaryotic and Prokaryotic cells; Microscopes; Functions of Nucleus, Mitochondria and Cell Wall
- Chemistry book
 - Pages 1-3 Atomic Structure; Atomic number, Mass number and Isotopes; Relative Atomic Mass
 - Page 5 The Periodic Table
 - Page 11 Ionic Bonding
 - Page 16 Metallic Bonding
 - Page 18-19 Writing and balancing equations
- Physics book
 - Page 32 Waves
 - Page 35 Reflection and Diffraction

2. Research and presentation on an area of Science of your choice.

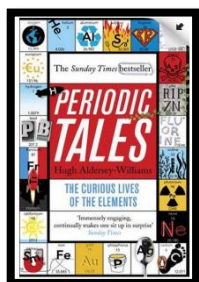
- Choose an area of Science that interests you.
- Research your topic carefully.
- Present your research in the form of a presentation (Power point or otherwise).
- Your final slide should include references for the sources of your research (use the Harvard or Vancouver method to reference your sources).
- There are some book and video recommendations at the end of this document to provide some inspiration if you are not sure.

3. Researching new scientific techniques

- There is lots of practical work throughout the Applied Science course, and the assignments you complete in year 12 are entirely practical based.
- Please find out why the following techniques are used in science, what equipment they use and how you carry out the practical. Remember to use a numbered list for your method and diagrams to show the equipment.
- The techniques are
 1. Making a standard solution
 2. Titration
 3. Calibration of thermometers and balance
 4. Calorimetry (also known as cooling curves)
 5. Chromatography (you will have met this at GCSE very briefly)
 6. Colorimetry (different spelling to number 4!)
- Complete your research in a Word document or similar and remember to include the references for any web pages you use.

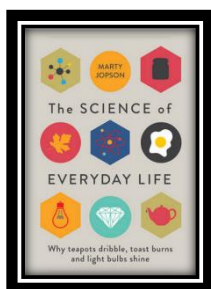
You might also like to do some science related reading or viewing, and the following recommendations are not compulsory but might provide some inspiration for your presentation.

CHEMISTRY



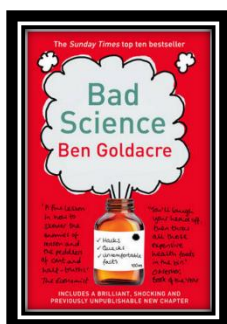
Periodic Tales: The Curious Lives of the Elements (Paperback)
Hugh Aldersey-Williams

This book covers the chemical elements, where they come from and how they are used. There are loads of fascinating insights into uses for chemicals you would have never even thought about.



The Science of Everyday Life: Why Teapots Dribble, Toast Burns and Light Bulbs Shine (Hardback) Marty Jopson

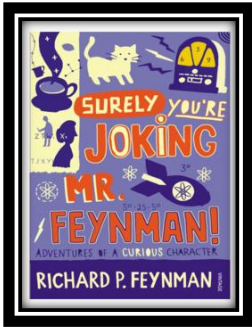
The title says it all really, lots of interesting stuff about the things around you home!



Bad Science (Paperback) Ben Goldacre

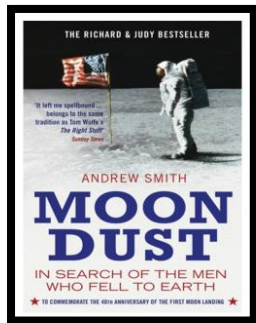
Here Ben Goldacre takes apart anyone who published bad / misleading or dodgy science – this book will make you think about everything the advertising industry tries to sell you by making it sound 'sciency'.

PHYSICS



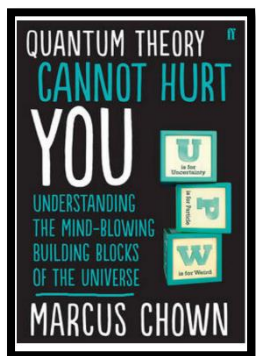
Surely You're Joking Mr Feynman: Adventures of a Curious Character

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 work in the field of particle physics.



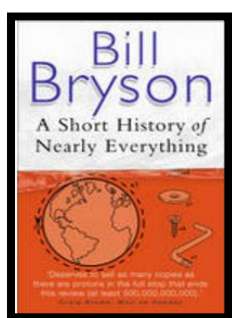
Moon dust: In Search of the Men Who Fell to Earth

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 and this book does an excellent job of using the personal accounts of the 9 remaining astronauts and others involved in the space program, 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.



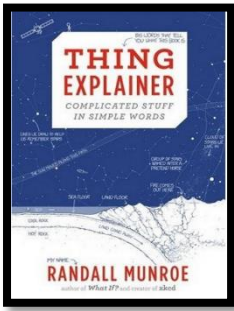
Quantum Theory Cannot Hurt You: Understanding the Mind-Blowing Building Blocks of the Universe

Any Physics book by Marcus Chown is an excellent insight into some of the more exotic areas of Physics that require no prior knowledge. 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!



A Short History of Nearly Everything

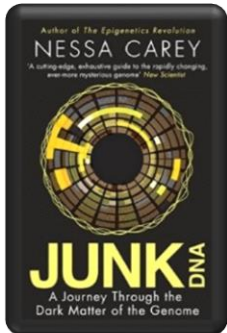
Popular science writing at its best. This is Bill Bryson's quest to find out everything that has happened from the Big Bang to the rise of civilization - how we got from there, being nothing at all, to here, being us. Hopefully by reading it you will gain an awe-inspiring feeling of how everything in the universe is connected by some fundamental laws.



Thing Explainer: Complicated Stuff in Simple Words

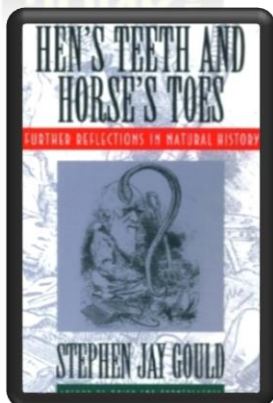
This final recommendation is a bit of a wild-card – a book of illustrated cartoon diagrams that should appeal to the scientific side of everyone. Written by the creator of online comic XTCD (a great source of science humour) is a book of blueprints from everyday objects such as a biro to the Saturn V rocket and an atom bomb, each one meticulously explained.

BIOLOGY

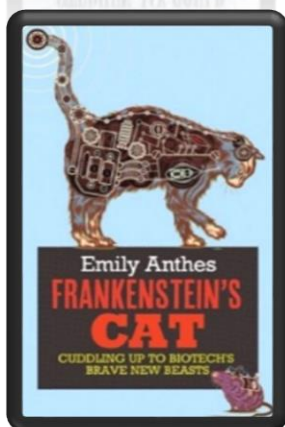


Junk DNA

Our DNA is so much more complex than you probably realize, this book will really deepen your understanding of Genetics.



Studying Geography as well? **Hen's teeth and horses toes** Stephen Jay Gould is a great Evolution writer and this book discusses lots of fascinating stories about Geology and evolution.



An easy read.. **Frankenstein's cat**

Discover how glow in the dark fish are made and more great Biotechnology breakthroughs.

Videos to watch online

Rough science – the Open University – 34 episodes available

Real scientists are 'stranded' on an island and are given scientific problems to solve using only what they can find on the island. Great fun if you like to see how science is used in solving problems. There are six series in total

<https://www.youtube.com/watch?v=IUoDWAt259I>

A thread of quicksilver – The Open University

A brilliant history of the most mysterious of elements – mercury. This program shows you how a single substance led to empires and war, as well as showing you some of the cooler properties of mercury.

<https://www.youtube.com/watch?v=t46lvTxHHTA>

10 weird and wonderful chemical reactions

<https://www.youtube.com/watch?v=0Bt6RPP2ANI>

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** – Try Netflix and iPlayer 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/>