

Painsley Catholic College

Introduction to Applied

Science transition booklet

Get ready for Applied Science!

A guide to help you get ready for AQA applied science.

For any extra information please contact Miss Bradley,

kbr@painsley.staffs.sch.uk

Specification link : <https://www.aqa.org.uk/subjects/science/applied-general/science>

THE TRANSITION WORK IN THE OVERVIEW IS COMPULSORY!! ALL OTHER WORK IN THIS INTRODUCTION DOCUMENT IS ADDITIONAL AND OPTIONAL!!

What is included:

- Transition work overview
- Live stream lesson timetable
- Textbook recommendations
- Book recommendations
- Movie recommendations
- Videos to watch on line
- Research activities
- Ideas for day trips / Science on social media/ Science websites for virtual tours



Transition work overview

Week 1	WC 1 st June	Complete Week 1 Biology work found in the document 'Biology – Applied Science Transition Booklet' (3 hours)
Week 2	WC 8 th June	Complete Week 2 Biology work found in the document 'Biology – Applied Science Transition Booklet' (3 hours)
Week 3	WC 15 th June	Complete Week 3 Chemistry work found in the document 'Chemistry – Applied Science Transition Booklet' (3 hours)
Week 4	WC 22 nd June	Complete Week 4 Chemistry work found in the document 'Chemistry – Applied Science Transition Booklet' (3 hours)
Week 5	WC 29 th June	Complete Week 5 Physics work found in the document 'Physics – Applied Science Transition Booklet' (3 hours)
Week 6	WC 6 th July	Complete Week 6 Physics work found in the document 'Physics – Applied Science Transition Booklet' (3 hours)
Week 7	WC 13 th July	Complete the AQA Transition booklets for Biology, Chemistry and Physics (1 hour each)

Live stream lessons

Google classroom code: pf26bkd

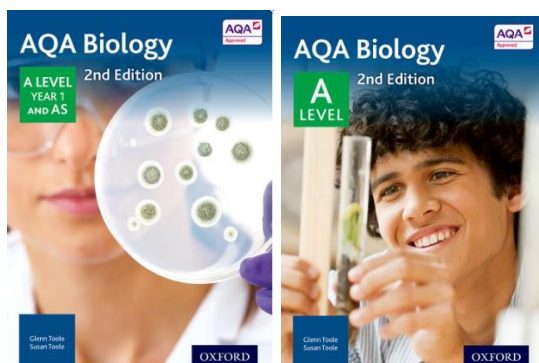
Google meet code: cj5il5kbaa

Thursday 11 th June 10.10am	Miss K. Bradley	Biology - How to use a light microscope, stage micrometer, and an eyepiece graticule, followed by magnification calculations.
Monday 22 nd June 10.00am	Miss H. Swinson	Chemistry Topic – The Periodic Table
Wednesday 8 th July 11.25am	Mrs L. Rhodes	Physics Topic - Energy

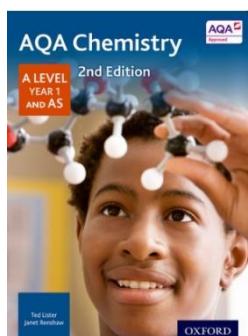
Text book Recommendations

The AQA applied science course does not have a specific textbook that relates exactly to the course. However, these textbooks may be helpful for your student in the future and are approved by AQA to be used for the Applied Science Course. You can buy full textbooks or revision guides for each textbook. The textbook is more expensive than the revision guides. Do not feel that you have to buy from new – you could look on ebay and amazon for used copies if you wanted to purchase the books.

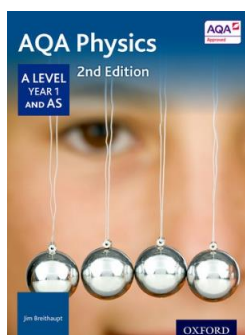
Biology



Chemistry

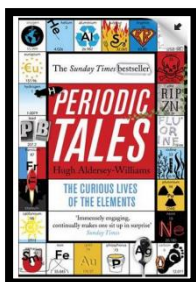


Physics



Book Recommendations

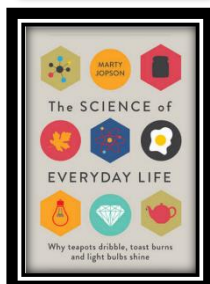
These are optional reads; Do not feel you need to buy the latest edition. You can pick up an old edition or second hand copies for a few pounds on ebay or amazon.



Periodic Tales: The Curious Lives of the Elements (Paperback) Hugh Aldersey-Williams
ISBN-10: 0141041455

<http://bit.ly/pixlchembook1>

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.

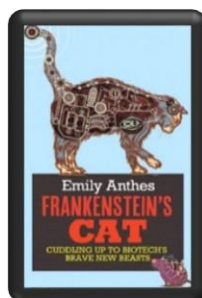


The Science of Everyday Life: Why Teapots Dribble, Toast Burns and Light Bulbs Shine (Hardback) Marty Jopson

ISBN-10: 1782434186

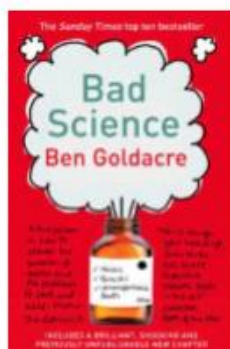
<http://bit.ly/pixlchembook2>

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



An easy read.. Frankenstein's cat

Discover how glow in the dark fish are made and more great Biotechnology breakthroughs. Available at amazon.co.uk

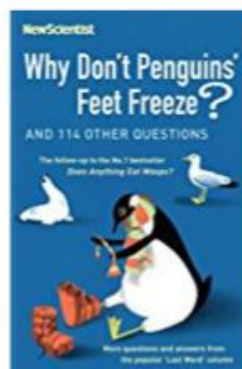


By Ben Goldacre

<http://bit.ly/pixlchembook3>

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

By New Scientist
Why Don't Penguins' Feet Freeze? is the latest compilation of readers' answers to the questions in the 'Last Word' column of *New Scientist*, the world's best-selling science weekly.



Videos to watch online

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 Imitation Game (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. **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

<http://bit.ly/pixlchemvid1a>

http://www.dailymotion.com/playlist/x2igjq_Rough-Science_rough-science-full-series/1#video=xxw6pr

or

<http://bit.ly/pixlchemvid1b>

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

3. **Growing New Organs**

Available at : http://www.ted.com/talks/anthony_atala_growing_organs_engineering_tissue?language=en

Anthony Atalla's state-of-the-art lab grows human organs — from muscles to blood vessels to bladders, and more.

4. https://www.ted.com/talks/paula_hammond_a_new_superweapon_in_the_fight_against_cancer?no_language=enCancer

A New Superweapon in the Fight Against Cancer
Available at :
http://www.ted.com/talks/paula_hammond_a_new_superweapon_in_the_fight_against_cancer?language=en
Cancer is a very clever, adaptable disease. To defeat it, says medical researcher and educator Paula Hammond, we need a new and powerful mode of attack.



5. https://www.ted.com/talks/marla_why_bees_are_disappearing?language=en



Why Bees are Disappearing

Available at :

http://www.ted.com/talks/marla_why_bees_are_disappearing?language=en
Honeybees have thrived for 50 million years, each colony 40 to 50,000 individuals coordinated in amazing harmony. In the last seven years ago, did colonies start en-masse?

6. https://www.ted.com/talks/ben_goldacre_what_doctors_dont_know_about_the_drugs_they_prescribe?language=en

Why Doctors Don't Know About the Drugs They Prescribe

Available at :

http://www.ted.com/talks/ben_goldacre_what_doctors_dont_know_about_the_drugs_they_prescribe?language=en

When a new drug gets tested, the results of the trials should be published for the rest of the medical world — except much of the time, negative or inconclusive findings go unreported, leaving doctors and researchers in the dark.



7. https://www.ted.com/talks/anthongrowing_organs_engineering_tissue?language=en



Growing New Organs

Available at :

http://www.ted.com/talks/anthongrowing_organs_engineering_tissue?language=en

Anthony Atalla's state-of-the-art lab grows human organs — from muscles to vessels to bladders, and more.

Research activities

The Big Picture is an excellent publication from the Wellcome Trust. Along with the magazine, the company produces posters, videos and other resources aimed at students studying for GCSEs and A level.

For each of the following topics, you are going to use the resources to produce one page of Cornell style notes.

Use the links or scan the QR code to take you to the resources.

BigPicture



Topic 1: The Cell

Available at: <http://bigpictureeducation.com/cell>

The cell is the building block of life. Each of us starts from a single cell, a zygote, and grows into a complex organism made of trillions of cells. In this issue, we explore what we know – and what we don't yet know – about the cells that are the basis of us all and how they reproduce, grow, move, communicate and die.



Topic 2: Exercise, Energy and Movement

Available at:

<http://bigpictureeducation.com/exercise-energy-and-movement>

All living things move. Whether it's a plant growing towards the sun, bacteria swimming away from a toxin or you walking home, anything alive must move to survive. For humans though, movement is more than just survival – we move for fun, to compete and to be healthy. In this issue we look at the biological systems that keep us moving and consider some of the psychological, social and ethical aspects of exercise and sport.



Topic 3: <http://home.cern/about>

CERN encompasses the Large Hadron Collider (LHC) and is the largest collaborative science experiment ever undertaken. Find out about it here and make a page of suitable notes on the accelerator.



Topic 4: Why is copper sulfate blue?

http://www.docbrown.info/page04/4_75trans.htm

Copper compounds like many of the transition metal compounds have got vivid and distinctive colours – but why?

The image shows a grid of educational resources. The top row includes 'Chemistry Homepage', '9-1 REVISION SUMMARIES', and 'SUBJECTS: 9-1 QUIZZES'. The second row features 'GCSE BIOLOGY 9-1 REVISION SUMMARIES', 'GCSE CHEMISTRY 9-1 REVISION SUMMARIES', 'GCSE PHYSICS 9-1 REVISION SUMMARIES', and 'UK KS3 95-100% BIOLOGY graded QUIZZES 4.8'. The third row contains 'UK GCSE CHEMISTRY 9-1 REVISION QUIZS', 'UK GCSE CHEMISTRY 9-1 REVISION QUIZS', 'UK A Level 100% CHEMISTRY QUESTIONS', and 'UK KS3 95-100% CHEMISTRY graded QUIZZES 4.8'. The fourth row lists 'UK A Level 100% ORGANIC CHEMISTRY', 'UK A Level 100% INORGANIC CHEMISTRY', 'UK A Level 100% THEORETICAL CHEMISTRY', and 'UK KS3 95-100% PHYSICS graded QUIZZES 4.8'. Below the grid is a yellow beaker icon and the text 'TRANSITION METALS', 'Doc Brown's Chemistry', and 'GCSE 9-1, IGCSE, O Level Chemistry Revision Notes'. At the bottom is a book cover for 'TRANSITION METALS Chemistry'.

Task 5: ITO and the future of touch screen devices
ITO <https://www.sciencedirect.com/topics/materials-science/indium-tin-oxide> – indium tin oxide is the main component of touch screen in phones and tablets. The element indium is a rare element and we are rapidly running out of it. Chemists are desperately trying to find a more readily available replacement for it. What advances have chemists made in finding a replacement for it?

The screenshot shows the ScienceDirect page for 'Indium Tin Oxide'. The page includes the ScienceDirect logo, 'Journals & Books', and a 'Create account' button. The main title is 'Indium Tin Oxide'. Below the title are options to 'Download as PDF' and 'Set alert'. On the right side, there is a 'Related terms:' section with a list of terms: 'Solar Cell, Graphene, D-Carbide, Indium, Carbon Oxide, Polymer, Thin Film'. At the bottom right, there is a 'View all Topics' link.

Places to visit

1. Go outdoors!
Have you actually spent any time observing the geology of the area you live in? What rocks or minerals are found in your area? Does your area have a history of extracting minerals? If so what were they, what were they used for, how did they obtain them? Are there any working or remains of mineral extraction industries?
2. Are there any chemical or chemistry based businesses in your area? A big ask, but one that could be really beneficial to you, write them a letter explaining that you are taking A level Applied Science and you want to see how chemistry is used in industry and you would like to visit / have some work experience. You never know this could lead to great things!!!!
3. You could also try writing to / searching for your nearest university to see if they are running any summer schools for chemistry, biology, physics or applied science – they are usually free and give you the opportunity to experience the laboratories in a university.
4. Science museums.
You could visit your nearest science museum. They often have special exhibitions that may be of interest to you.
https://en.wikipedia.org/wiki/List_of_science_museums#United_Kingdom
A 360 tour of the science museum
<https://360tour.sciencemuseum.org.uk/>
My favourite link is for the natural history museum (it has lots of different science activities for you to take part in!
<https://www.nhm.ac.uk/visit/virtual-museum.html>
5. Somerset Earth Science Centre:
<http://www.earthsciencecentre.org.uk>
6. The UK Association for Science and Discovery Centres (ASDC)
This association brings together over 60 major science engagement organisations in the UK.
<http://sciencecentres.org.uk/centres/weblinks.php>
7. 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.
https://www.rmg.co.uk/royal-observatory?gclid=EAlaIqobChMI27z7yeqr6QIVjO7tCh3E8QbsEAAAYASAAEgI4dPD_BwE
8. 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.
<https://herschelmuseum.org.uk/>
9. @Bristol – Bristol - home to the UK's only 3D Planetarium and one of the biggest science centres.
https://www.life.org.uk/planetarium?gclid=EAlaIqobChMIoLnPluur6QIVVu3tCh19PgrqEAAAYASAAEgJvEfD_BwE

10. Center of the Cell – whitechapel, London the first science education centre in the world to be located within working biomedical research laboratories.
<https://www.centreofthecell.org/>
11. Royal Botanic Gardens, Kew - Science has always been at the heart of Kew. Our research, partnerships and collections contribute to some of the most important issues facing our planet.
https://www.chelseaphysicgarden.co.uk/?gclid=EAlaIqobChMI47XzOur6QIViLPtCh3y1AHAEAYASA_AEgJgvvD_BwE
12. 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
https://www.rigb.org/?gclid=EAlaIqobChMI8bDD0-ur6QIViZntCh3xhwMAEAYAiAAEgL83vD_BwE