The Heathland School

A Mathematics and Science College

SIXTH FORM
INDUCTION TASKS

Committed to Excellence · Science · International School Award · Investors in People | Silver · World Class Schools · Ofsted Outstanding 2006/2007 · Ofsted Outstanding School 2012 2013




Dear student,

Congratulations on your enrolment for the Sixth Form at The Heathland School.

The leap from GCSE to Post 16 study is significant and it is essential that you make a strong and committed start to your courses in September.

In order to help you do this, we have asked departments to prepare some preliminary work for you to start before your first lessons begin. There are tasks to complete for each A Level or BTEC subject you are going to study in Year 12. Teachers will refer to these tasks during the first two weeks of study.

I would also ask you to view the specification for each subject by viewing the curriculum section on the school website.

The best of luck with your Sixth Form studies – we look forward to seeing you make good progress during Year 12 and beyond.

Personalised Checklists (PLCS)

A PLC is a Personalised Learning Checklist. It is an organised list of topics that you will study in your chosen subjects taken from the syllabus. It also provides an opportunity for you to reflect on your progress in your subjects.

MyPLC (https://www.my-plc.co.uk/register/) has a large bank of subject and exam board specific information. Sign up as a student and join the Sixth Form Students class by entering the code **ab4870.**

You will then have access to all the available PLC's for your subject and exam board. This will:

1. Show you all the topics you will be studying for your subjects
2. Allow you to rate your level of understanding for each topic as you study them
3. Help you direct your revision to make it specific, focused and individual to you; ensuring your revision is an effective use of time and energy

Previous students have said:

"PLC's help me see in advance what we will be learning so I can do some additional reading before the lesson"

"Using the PLC has helped me to focus my revision on areas I need to improve"

"It has been really helpful when Topic tests come up. I know specifically what to revise"

CHEMISTRY

Use your online searching abilities to see if you can find out as much about the topic as you can. Remember you are a prospective A level chemist and you should be aiming to push **your** knowledge.

Activity 1: Choose <u>two</u> of the tasks below. Make a 1-page summary for each one you research using Cornell notes: http://coe.jmu.edu/learningtoolbox/cornellnotes.html

- Task 1: The chemistry of fireworks

What are the component parts of fireworks? What chemical compounds cause fireworks to explode? What chemical compounds are responsible for the colour of fireworks?

- Task 2: Why is copper sulfate blue?

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

- Task 3: Aspirin

What was the history of the discovery of aspirin, how do we manufacture aspirin in a modern chemical process?

- Task 4: The hole in the ozone layer

Why did we get a hole in the ozone layer? What chemicals were responsible for it? Why were we producing so many of these chemicals? What is the chemistry behind the ozone destruction?

- Task 5: ITO and the future of touch screen devices

ITO – 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?

Activity 2 - Research and plan a method to determine the molar mass of an unknown solid sample of a carbonate with the formula X_2CO_3. Make sure you include:

- a step by step method, giving specific details about how to ensure accuracy using the equipment
- what variables need to be measured
- what equipment is going to be used
- what is the uncertainty in the equipment
- what calculations have to be made to determine the identity of metal X in the carbonate

Activity 3 - Do some extra reading/watching around the topic of chemistry using the resources below. Make notes on what you find interesting (these will also be handed in)

Recommended Reading

- Periodic Tales: The Curious Lives of the Elements (Paperback) Hugh Aldersey-Williams
- The Science of Everyday Life: Why Teapots Dribble, Toast Burns and Light Bulbs Shine (Hardback) Marty Jopson
- Bad Science (Paperback) Ben Goldacre
- Salters' Advanced Chemistry: Chemical Storylines

Recommended Watching

- Rough science – the Open University – 34 episodes available - https://www.youtube.com/watch?v=lUoDWAt259I
- A thread of quicksilver – The Open University **-** https://www.youtube.com/watch?v=t46lvTxHHTA
- 10 weird and wonderful chemical reactions **-** 10 good demonstration reactions, can you work out the chemistry of …. any… of them? - https://www.youtube.com/watch?v=0Bt6RPP2ANI
- Dantes Peak 1997: Volcano disaster movie. Use the link to look at the Science of acids and how this links to the movie.
  http://www.open.edu/openlearn/science-maths-technology/science/chemistry/dantes-peak
  http://www.flickclip.com/flicks/dantespeak1.html
  http://www.flickclip.com/flicks/dantespeak5.html
- Fantastic 4 2005 &2015: Superhero movie - Michio Kaku explains the "real" science behind fantastic four
  http://nerdist.com/michio-kaku-explains-the-real-science-behind-fantastic-four/
  http://www.flickclip.com/flicks/fantastic4.html