



Get off to a 'Flying Start' in

Chemistry - A Level

Welcome to Flying Start with North Devon College.

We hope that you are excited to join us at North Devon College. We want to help you to focus on your skills for your course with us and so below you will find questions to consider, tasks to complete and some background research to undertake before enrolment.

Please read the instructions and have a go at the activities.

If you get stuck, please see the Frequently Asked Questions (FAQs) section at the end of this document for help.

[A quick hello and introduction to the Flying Start](#) (video link)

Hello!

Welcome to the A level Chemistry Flying Start. We are excited for you to start here in September, and we hope you enjoy an introduction to the chemistry course through these activities. A level Chemistry is a fantastic course; it builds on the concepts you have learnt at GCSE and extends your knowledge further so that you are well prepared for your next steps. Some of the key skills that you will develop on this course are:

- **Problem solving!** There are some tricky questions in A level Chemistry and those who like a challenge will enjoy trying to solve the problems, whether it's identifying chemicals or a mathematical problem! We provide lots of support with how to tackle the questions in chemistry, the main thing is your willingness to have a go.

- **Practical skills!** We have practicals throughout the two years, including preparing aspirin, measuring rates of reactions and identifying unknown compounds. These will develop your confidence and independence with practicals and mean you are well prepared for progressing to future careers in science-based subjects.

- **Numerical skills!** Chemistry does contain calculations which will draw on your GCSE maths skills and build on these throughout the course. This will mean you have the skills for lots of future careers, not just in science, but also other roles.

You will receive lots of support here at North Devon College, our friendly and welcoming teachers on the course are always there to provide advice and support with the subject or with future career plans. We also have external speakers and plenty of opportunities to get involved in events that may inspire you to delve deeper into a certain aspect of science.

The flying start below is designed to get you thinking about chemical reactions, the importance of them and linking in some calculations. Have a go at the activities and there is an extension if you would like to take your knowledge further. Don't worry if you cannot complete it all, do the best you can.

We look forward to meeting you in September!

To get you started...

Task 1: Calcium oxide is an essential raw material in the production of cement. It is produced by the thermal decomposition of calcium carbonate.

Research the equation for the decomposition of calcium carbonate and use this to calculate the mass of calcium carbonate needed to produce 5000kg of calcium oxide.

Write a short introduction paragraph to describe the term thermal decomposition and describe the importance of the thermal decomposition of calcium carbonate.

Calculate the % atom economy for this process.

You should present your work as a written or typed report showing all calculations and workings clearly. All answers should be given to 3 significant figures.

Explore the links below to learn more about this concept and use them to support your work: ·

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

<https://www.youtube.com/watch?v=UzzFbLK-f8k>

<https://www.khanacademy.org/science/chemistry/chemical-reactions-stoichiome/stoichiometry-ideal/v/stoichiometry>

http://www.docbrown.info/page04/4_73calcs06rmc.htm

http://www.knockhardy.org.uk/sci_hm_files/15moles.pdf

Task 2: Sodium hydroxide is the main ingredient used in drain clearing products. To ensure they are effective the drain cleaner must be tested to confirm the concentration of sodium hydroxide. This is commonly done through a titration.

Research the process of a titration, write a full method for how you would carry one out. What would be the best indicator to use for this titration? Why?

Use this information to calculate the concentration of a 25cm³ sodium hydroxide solution when it is titrated with 44.75cm³ of 0.5 mol dm⁻³ hydrochloric acid.

You should present your work as a written or typed report, including a method, showing all calculations and workings clearly. All answers should be given to 3 significant figures.

Use the following links to learn about this concept and support you completing this task: ·

<https://www.youtube.com/watch?v=T3B8zRK80MY>

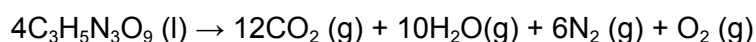
<https://www.youtube.com/watch?v=d1XTOSnNlqg>

http://www.docbrown.info/page04/4_73calcs12vct.htm

For those who want a bit more...

Task 1

Nitroglycerine is the explosive used in dynamite, it reacts rapidly by the following equation:



Research the ideal gas equation and the units of the variables used in the equation.

What is the equation, explain each aspect and give the standard units used for each one.

A stick of dynamite typically contains 190g of nitroglycerine by mass. Assuming it fully decomposes calculate the volume of gas produced if a stick of dynamite is detonated at 25°C and 101kPa pressure. All answers should be given to 3 significant figures.

Sometimes the reaction is incomplete. Calculate the volume of gas produced if only 68% of the sample decomposes. All answers should be given to 3 significant figures.

Use the following links to learn about this concept and support your work: ·

<https://www.youtube.com/watch?v=WScwPIpQZa0>

<http://chemguide.co.uk/physical/kt/idealgases.html>

<https://www.khanacademy.org/science/chemistry/chemical-reactions-stoichiome/stoichiometry-ideal/v/stoichiometry>

Task 2

Wider reading

Reading around the subject is a great way of improving your subject knowledge. Here are some titles and a link to a website where you can find many interesting articles. Read an article or one of the recommended books and write a short summary or review of it.

[Chemistry news, research and opinions | Chemistry World](#)

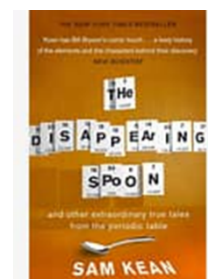
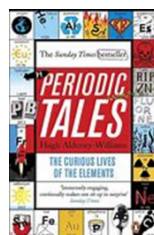
Stuff Matters by Mark Miodownik

The Disappearing spoon by Sam Kean

H₂O The Biography of water by Philip Ball

A short History of Nearly Everything by Bill Bryson

Uncle Tungsten by Oliver Sacks



Frequently Asked Questions (FAQs)

Q: Will this work be marked and when is it due?

A: This work may not be formally marked but will be discussed during your first classes with us in September. Just bring along what you have completed to your first timetabled sessions.

Q: I am not sure if I have the answers right, what should I do?

A: Don't worry, just have a go at getting something down and bring it along to the lesson where we can talk it through. There is no need to get anxious about the tasks, we are not expecting you to know everything before you arrive but are interested in your ideas and what you have found easy or difficult as it helps us support you right from the beginning.

Q: Do I have to do it?

A: Flying Start is not compulsory, but many students find it useful for getting them used to thinking about subjects at the next level. Early classroom sessions will also reflect on some of the Flying Start activities.