

A LEVEL CHEMISTRY



Reasons why current year 12 students opted for Chemistry....

- Relate to what is happening around you...it's interesting to make the links.
- Chemistry is very flexible - it keeps your options open for choosing Uni courses and careers. It's widely acceptable and well recognised.
- Really good A-level to have. It's recognised as being hard (which it is), but it carries a lot of weight with Universities and employers.
- Like the subject and find it interesting
- Like and know the teachers
- Do experiments....
- Find out about the World and how it works....
- It's a necessary A level to have for progressing into Science degrees and Science-based careers.

Advice from current year 12 chemists

- *It's a challenge - but you can do it and it will be useful where ever you go...*
- *Be prepared to work and you do need to put the hours in.*
- *Don't be put off by failure...learn from it as you will get it in the end - if you work at it.*
- *Mrs Bailey states 5 hours extra study....she is right, you need to do this to ensure you understand and are confident with the concepts.*
- *Really supports understanding of Biology and Physics.*
- *Gives a really good insight into how everyday processes work.*
- *Love it...but it's hard...*
- *About a third of the course is mathematical - so you need to be ok with maths from GCSE. Goes well with Maths A-level.*
- *It is staggeringly interesting and the teachers are extraordinarily capable and lively... (Believe it or not, this was not written by Mrs Bailey)*

A-Level Chemistry

Why choose A-level chemistry?

A qualification in chemistry is highly valued and leads to a wide variety of careers. If you are undecided about a degree course, your options are kept open by studying chemistry.

It is an interesting and engaging subject which develops a variety of skills.

Your chosen career requires a qualification in chemistry.

- **A levels have changed. No modular exams, and only final end of Year 13 examinations**

Our view:

Whilst the AS examinations have been removed, we will provide robust mock examinations and support for the students.

We are in favour of the new approach to practical assessment. There are no ISA's, but they do have mandatory practicals, which you may be examined on. It's much fairer.

We like the layout and detail of the new curriculum. It has been updated to include more biochemistry such as the chemistry of DNA and anti-cancer treatment. Topics we thought less relevant have been removed.

- **Course specification: AQA A LEVEL CHEMISTRY 7405**

Details of examinations:

	Topics covered	Assessment details
Paper 1	Physical chemistry; Inorganic chemistry; relevant practical skill knowledge	2 hour written exam 105 marks 35% A level
Paper 2	Physical chemistry; Organic chemistry; relevant practical skill knowledge	2 hour written exam 105 marks 35% A level
Paper 3	Any content Any practical skill knowledge	2 hour written exam 90 marks 30% A level Includes some multiple choice questions.

- **Why choose A level chemistry at JCSC?**

We know you and you know us.

We have a proven track record of success.

Due to their enjoyment and success in chemistry, many of our chemistry students have gone on to study science/chemistry based courses at Russell group universities, such as medicinal chemistry, biomedical science and engineering. Others have entered chemistry-based apprenticeships.

We have developed strong links with Newcastle University chemistry department, Arcinova and the James Spence unit for children's cancer research. This enables us to take students to visit these establishments.

- **What we need from you**

A commitment to work, and be challenged.

For further details, please contact Mrs Bailey, Director of Science

Subject Content:

Year 12

Physical Chemistry:

- Atomic Structure - how the atom is REALLY organised...
- Amount of Substance - the MOLE continued and a few more equations (lots of maths in this for maths lovers)
- Bonding - building on from GCSE...you can work out shapes of molecules and molecular modelling.
- Energetics - building on from Unit 3 GCSE chemistry, calculating the energy within the reaction (for used by engineers to calculate energy in an engine or a household boiler). Lots of maths in this too.
- Kinetics - rates of reaction in more detail and lots of maths
- Chemical Equilibria and Le Chatelier's principle - understand why reactions go...
- Oxidation, reduction and redox equations. - more of OILRIG

Inorganic Chemistry:

- Periodicity - understand the trends of the periodic table
- Group 2, the alkaline earth metals - an important group of chemicals - did you know BaSO_4 is used in medicine
- Group 7, the halogens - dodgy group of chemicals, wonderfully reactive but we are not allowed to use fluorine!

Organic Chemistry- provides fundamental understanding of the chemistry of life.

- Introduction to organic chemistry - learn a whole new internationally recognised language.
- Alkanes - building from GCSE, learn about applications...
- Halogenoalkanes - learn mechanisms of reactions. They are happening right now in the atmosphere...unfortunately (CFCs)
- Alkenes - fundamental in polymer and drug synthesis. Learn how.
- Alcohols - how is ethanol made?
- Organic analysis - develop lab and machine skills to analyse materials. This will include a visit to Newcastle University and Covance. Also it allows you to see if you would like a career in this field.

Year 13

Year 13 builds on the knowledge gained in Year 12. Therefore it is essential you have thorough understanding of Year 12 to enter onto the Year 13 course.

Physical Chemistry:

- Thermodynamics - builds on the energetics section of Year 12. It explains the importance of why chemical reactions occur and uses a lot of mathematics (changing the subject etc).
- Rate equations - mathematics again...! It delves into the relationship between rates of reaction and concentrations, and uses mathematics to provide evidence.
- Equilibrium constant - using algebra and mathematical expressions (logarithms) to enable equilibrium yields to be calculated. This is the starting point of chemical engineering.
- Electrode potentials and electrochemical cells - explains how electrons are transferred. Provides fundamental understanding of how we power portable electronic devices work, such as mobile phones. On a larger scale, how they provide energy to power a vehicle.
- Acids and Bases - for maths lovers again. Uses logarithmic scales to explain pH

Inorganic Chemistry:

- Periodicity continued - more periods to explore, in particular Period 3
- Group 2 alkaline earth metals - understanding trends and reasons why!
- Group 7 halogens - again, explaining why react in the way they do
- Transition metals - understand the chemistry of the metals (you will be able to explain those magic tricks!)

Organic Chemistry- provides fundamental understanding of the chemistry of life.

- Isomerism continued - learn the fundamental reason why drugs, with the same chemical formula, can act very differently on the body (we delve into the thalidomide tragedy)
- Aldehydes, Ketones, Carboxylic acids and derivatives - learn about how these chemicals react and how they make soap and biodiesel
- Aromatic chemistry - the benzene ring. Learn about how this molecule reacts. A major constituent in living organisms!
- Amines - lots of smells for this one
- Polymers - building on GCSE, learn how polymers are made and their applications
- Amino acids, proteins, enzymes, DNA - build on learning from biology to understand the fundamental biochemistry of these compounds and how they work in the body and in drugs.
- Action of anti-cancer drugs - be able to explain the biochemistry of how cisplatin works!
- Organic synthesis - learn how to make compounds with 2 or 3 steps in their synthesis - this is the basics of drug development
- Analysis using NMR and Chromatography

