



# Year 12 Chemistry



What have students at St. Crispin's been taught to understand and be able to do?

## Core Knowledge

### Module 2 – Foundations in chemistry

This module acts as an important bridge into AS and A-Level Chemistry from the study of chemistry within science courses at GCSE level.

This module provides learners with a knowledge and understanding of the important chemical ideas that underpin the study of A-Level Chemistry:

The importance of these basic chemical concepts is seen as a prerequisite for all further chemistry modules, and it is recommended that this module should be studied first during this course.

This module allows learners to develop important quantitative techniques involved in measuring masses, gas and solution volumes, including use of volumetric apparatus.

Learners are also able to develop their mathematical skills during their study of amount of substance and when carrying out quantitative practical work.

- Atoms, compounds, molecules and equations
- Amount of substance
- Acid-base and redox reactions
- Electrons, bonding and structure.

### Module 3 – Periodic table and energy

The focus of this module is inorganic and physical chemistry, the applications of energy use to everyday life and industrial processes, and current environmental concerns associated with sustainability.

## Core Skills

### Module 1 – Development of practical skills in chemistry

Practical skills assessed in a written examination

Practical skills assessed in the practical endorsement

Chemistry is a practical subject and the development of practical skills is fundamental to understanding the nature of chemistry. Chemistry A gives learners many opportunities to develop the fundamental skills needed to collect and analyse empirical data. Skills in planning, implementing, analysing and evaluating, will be assessed in the written papers.

Practical activities are embedded within the learning outcomes of the course to encourage practical activities in the classroom which contribute to the achievement of the Practical Endorsement (Section 5) as well as enhancing learners' understanding of chemical theory and practical skills.



# Year 12 Chemistry continued



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## Core Knowledge

The content within this module assumes knowledge and understanding of the chemical concepts developed in Module 2: Foundations in Chemistry.

This module provides learners with a knowledge and understanding of the important chemical ideas that underpin the study of inorganic and physical chemistry:

- The periodic table and periodicity
- Group 2 and the halogens
- Qualitative analysis
- Enthalpy changes
- Reaction rates and equilibrium (qualitative).

## Module 4 - Core organic Chemistry

This module introduces organic chemistry and its important applications to everyday life, including current environmental concerns associated with sustainability.

The module assumes knowledge and understanding of the chemical concepts developed in Module 2: Foundations in Chemistry.

In the context of this module, it is important that learners should appreciate the need to consider responsible use of organic chemicals in the environment. Current trends in this context include reducing demand for hydrocarbon fuels, processing plastic waste productively, and preventing use of ozone-depleting chemicals.

- Basic concepts
- Hydrocarbons
- Alcohols and haloalkanes
- Organic synthesis
- Analytical techniques (IR and MS)



## Year 12 Chemistry continued



### How has learning been assessed?

Students will complete regular chapter tests and written response task every half term. This develops writing ability and helps to identify gaps in knowledge.

Students will also complete a summative written mock exam twice a year.

### What is coming up in the following year?

In Year 13 students will develop each of these ideas into more applied topic areas, deepening their knowledge.



# Year 13 Chemistry



What have students at St. Crispin's been taught to understand and be able to do?

Core Knowledge	Core Skills
<p><b>Module 5: Physical chemistry and transition elements</b></p> <p>The content within this module assumes knowledge and understanding of the chemical concepts developed in Module 2: Foundations in chemistry and Module 3: Periodic table and energy.</p> <p>This module extends the study of energy, reaction rates and equilibria, and the periodic table.</p> <p>The main areas of physical chemistry studied include:</p> <ol style="list-style-type: none"><li>1. rate equations, orders of reaction, the rate-determining step</li><li>2. equilibrium constants, <math>K_c</math> and <math>K_p</math></li><li>3. acid-base equilibria including pH, <math>K_a</math> and buffer solutions</li><li>4. lattice enthalpy and Born-Haber cycles</li><li>5. entropy and free energy</li><li>6. electrochemical cells.</li></ol> <p>The main areas of inorganic chemistry studied include:</p> <ol style="list-style-type: none"><li>1. redox chemistry</li><li>2. transition elements.</li></ol> <p><b>Module 6: Organic Chemistry and analysis</b></p> <p>The content within this module assumes knowledge and understanding of the chemical concepts developed in Module 2: Foundations in chemistry and Module 4: Core organic Chemistry.</p> <p>This module introduces several new functional groups and emphasises the importance of organic synthesis. This module also adds NMR spectroscopy to the instrumentation techniques used in organic and forensic analysis.</p>	<p><b>Module 1 - Development of practical skills in Chemistry</b></p> <p>Practical skills assessed in a written examination</p> <p>Practical skills assessed in the practical endorsement.</p> <p>Chemistry is a practical subject and the development of practical skills is fundamental to understanding the nature of Chemistry. Chemistry A-Level gives learners many opportunities to develop the fundamental skills needed to collect and analyse empirical data. Skills in planning, implementing, analysing and evaluating, as outlined in 1.1, will be assessed in the written papers.</p> <p>Practical activities are embedded within the learning outcomes of the course to encourage practical activities in the classroom which contribute to the achievement of the Practical Endorsement (Section 5) as well as enhancing learners' understanding of chemical theory and practical skills.</p>



## Year 13 Chemistry continued



**What have students at St. Crispin's been taught to understand and be able to do?**

The main areas of organic Chemistry studied include:

1. aromatic compounds
2. carboxylic acids and esters
3. organic nitrogen compounds: amines and amino acids
4. polymerisation: addition polymers and condensation polymers
5. synthetic organic chemistry and further development of practical skills
6. the importance of modern analytical techniques in organic analysis.

**How has learning been assessed?**

Students will complete regular chapter tests. This develops writing ability and helps to identify gaps in knowledge

Students will also complete a summative written mock exam twice a year.

**What is coming up in the following year?**

Many students will use their A-Level Chemistry to gain entry into University courses studying Chemistry, chemical engineering and other related courses such as Medicine and Veterinary which require an understanding of Chemistry.