

Syllabus Outline

Cambridge Pre-U  
**CHEMISTRY**

Cambridge  
**Pre-U**

For examination in 2010



UNIVERSITY *of* CAMBRIDGE  
International Examinations

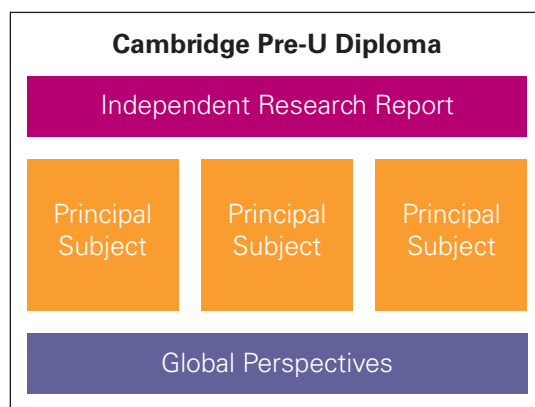
## Cambridge Pre-U Overview

Cambridge Pre-U equips students with the skills they need to make a success of their studies at university:

- a solid and coherent grounding in specialist subjects at an appropriate level;
- the ability to undertake independent and self-directed learning;
- the ability to think laterally, critically and creatively.

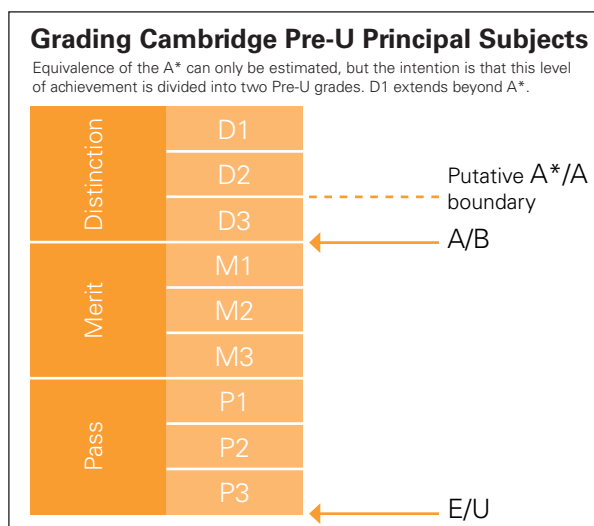
The Cambridge Pre-U Certificate in Chemistry is a stand-alone qualification, certificated separately.

Students can combine it with other individual Principal Subjects and core components (Global Perspectives, Independent Research Report) to gain the Cambridge Pre-U Diploma.



## Common characteristics of Cambridge Pre-U syllabuses

- **Stretch:** built into syllabus content (challenging concepts), assessment (problem solving) and grading outcomes (finer differentiation at the top end).
- **Innovation:** introducing new approaches to subjects, new topics, new methods of delivery and new forms of assessment.
- **Progression in learning:** building on prior knowledge gained at 14-16, where appropriate.
- **Linearity:** assessment at the end of the course makes for greater coherence in teaching and learning, by freeing up time currently used in module examinations and retakes, and by giving teachers the freedom to structure their courses in the most appropriate way for their students.



Cambridge Pre-U offers a joined-up approach to assessment, making possible a coherent approach to teaching and learning.

## Reporting of Achievement

Achievement is reported on a scale of nine grades: D1 (Distinction 1), D2, D3, M1 (Merit 1), M2, M3, P1 (Pass 1), P2, P3. The grade D1 reports achievement above the new A\* grade. The intention is to differentiate more finely and extend reporting at the top end, while keeping the grading scale accessible to the full range of ability currently achieving passes at A Level.

# Cambridge Pre-U Chemistry

## Assessment Objectives

Candidates will be expected to:

<b>AO1</b>	demonstrate knowledge and understanding of the syllabus content
<b>AO2</b>	analyse, interpret and apply learned and new information in a variety of contexts
<b>AO3</b>	plan and perform practical investigations, analyse and evaluate results

## Scheme of Assessment

The Cambridge Pre-U Certificate in Chemistry is assessed through four compulsory components at the end of the two-year course. A single grade is awarded. Candidates must also have completed the matriculation tasks.

Component	Component Title	Duration	Weighting(%)	Type of Assessment
–	Compulsory Matriculation	n/a	0	School-based 'can-do' tasks.
<b>Paper 1</b>	Part A Multiple Choice	1h	15	Written Paper, externally set and marked. 40 questions.
<b>Paper 2</b>	Part A Written	2h 15m	35	Written Paper, long structured questions. Externally set and marked
	Questions cross the boundaries of the different fields of chemistry covered in Part A (see reverse). Requires the application of Part A knowledge and skills to unfamiliar contexts, and an appreciation of the practical side of the subject, particularly planning and analysis skills.			
<b>Paper 3</b>	Part B Written	2h 15m	35	Written Paper, short and long answer questions. Externally set and marked
	The questions will focus on Part B topics (see reverse) but will require Part A knowledge and will cross the boundaries of the different fields of chemistry.			
<b>Paper 4</b>	Practical	2h	15	Practical exam, externally set and marked
	One question on qualitative analysis and one or more questions on quantitative analysis. The latter may involve a volumetric problem requiring titration, the measurement of enthalpy changes or reaction rate, thermometric titration or a gravimetric exercise.			

## Curriculum content

The syllabus is divided into physical, inorganic, organic and analytical chemistry. Each of these sections is split into Part A and Part B, with the Part A topics providing the foundation in the field and the Part B topics providing greater challenge.

### New Topics

This syllabus contains some completely new topics, which have not been examined at this level before. These new topics should allow candidates to develop an important insight into chemical processes and should help to rationalise new and unfamiliar compounds and reactions.

**Resource materials will be provided specially for these topics.**

- Van Arkel diagrams
- Functional group level
- Carbon-13 NMR
- Antibonding molecular orbitals.

### PHYSICAL CHEMISTRY

Candidates gain insight into the structure of atoms and molecules and the forces between them, and the theory and measurement of enthalpy changes. Later, candidates are exposed to the driving forces of chemical reactions, the mechanisms of reactions and how their rate is studied, and the analysis of equilibrium conditions.

### INORGANIC CHEMISTRY

Candidates gain an understanding of the three main types of bonding within the framework of electronegativity and in the continuum of the van Arkel diagram. The course enables them to rationalise a body of descriptive chemistry in terms of group and periodic trends and to develop knowledge and understanding of the structure, isomerism and redox properties of transition metal complexes. Candidates should also gain an appreciation of three-dimensional relationships in crystal structures.

### ORGANIC CHEMISTRY

This section equips candidates with the tools to understand the organic reactions through the framework of the functional group level, to suggest reagents and conditions for the transformations they have studied when encountered in unfamiliar reaction schemes, to consider the 3-dimensional nature of organic reactions, and to understand mechanisms of organic reactions and the acid-base properties of organic molecules.

### ANALYSIS

Candidates gain insight into the physical background of spectroscopic techniques, and the skills to interpret spectra without relying on tables of data. They should also acquire an appreciation of molecular symmetry and its importance in carbon-13 NMR in particular and the ability to interpret measurements and observations in classical laboratory analytical techniques.

### Support and Resources

CIE offers a programme of Cambridge Pre-U INSET training for teachers accompanied by support materials on a dedicated Cambridge Pre-U website.

Full syllabus details are at [www.cie.org.uk/cambridgepreu](http://www.cie.org.uk/cambridgepreu)

Specimen assessment materials are available from: [international@cie.org.uk](mailto:international@cie.org.uk)

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