

## Scheme of work – Cambridge IGCSE<sup>®</sup> Chemistry (0620)

### Overview

The aim of this scheme of work is to set out a progression through the syllabus content, and to give ideas for activities, together with references to relevant resources.

The scheme of work generally follows the 2012 and 2013 syllabus, but the order in which topics are covered has been adjusted to give a coherent flow to the course. The syllabus has been sub-divided into twelve units, each covering a theme.

The scheme of work is intended to give ideas to teachers upon which they can build. It is certainly not intended that teachers undertake all of the activities shown in the various units but rather to offer choices which could depend on local conditions.

The progression through these themes has been designed to build on students' own experiences, and to ensure that students have sufficient basic knowledge and understanding to tackle the more challenging issues.

### Outline

The units within this scheme of work are:

- Unit 1: Experimental techniques**
- Unit 2: Particles, atomic structure, ionic bonding and the Periodic Table**
- Unit 3: Air and water**
- Unit 4: Acids, bases and salts**
- Unit 5: Reaction rates**
- Unit 6: Metals and the Reactivity Series**
- Unit 7: Covalent bonding**
- Unit 8: Organic 1**
- Unit 9: Amount of substance**
- Unit 10: Organic 2**
- Unit 11: Redox, electrochemistry and Group VII**
- Unit 12: Equilibria**

## Details of unit structure

### Unit 1: Experimental techniques

- 1.1 Measurement
- 1.2 Criteria for purity
- 1.3. Methods of purification

*Cross-referenced to assessment objectives A2-4, B1-7, C1-4*

### Unit 2: Particles, atomic structure, ionic bonding and the Periodic Table

- 2.1 The particulate nature of matter
- 2.2 Atomic Structure and the Periodic Table
- 2.3 Bonding: the structure of matter
- 2.4 Ions and ionic bonds
- 2.5 The Periodic Table
- 2.6 Periodic trends
- 2.7 Group I

*Cross-referenced to assessment objectives A1-5, B1-6, C1-4*

### Unit 3: Air and water

- 3.1 Water
- 3.2 Air
- 3.3 Noble gases

*Cross-referenced to assessment objectives A1-5, B1-5, C1-3 and Unit 2*

### Unit 4: Acids, bases and salts

- 4.1 The characteristic properties of acids and bases
- 4.2 Types of oxides
- 4.3 Carbonates
- 4.4 Preparation of salts
- 4.5 Identification of ions and gases

*Cross-referenced to assessment objectives A1-5, B1-7, C1-4 and Units 1 & 2*

## **Unit 5: Reaction rates**

- 5.1 Energetics of a reaction
- 5.2 Rate (speed) of a reaction

*Cross-referenced to assessment objectives A1-5, B1-7, C1-4 and Unit 2*

## **Unit 6: Metals and the Reactivity Series**

- 6.1 Metallic bonding
- 6.2 Properties of metals
- 6.3 Reactivity Series
- 6.4 Extraction of metals
- 6.5 Uses of metals
- 6.6 Transition metals

*Cross-referenced to assessment objectives A1-5, B1-6, C1-4 and Units 2, 3 & 4*

## **Unit 7: Covalent bonding**

- 7.1 Molecules and covalent bonds
- 7.2 Macromolecules

*Cross-referenced to assessment objectives A1-4, B1-5, C1-3 and Units 2 & 6*

## **Unit 8: Organic 1**

- 8.1 Naming of compounds
- 8.2 Fuels
- 8.3 Homologous Series
- 8.4 Alkanes
- 8.5 Alkenes
- 8.6 Production of energy

*Cross-referenced to assessment objectives A1-5, B1-5, C1-3 and Units 2 & 7*

## **Unit 9: Amount of substance**

- 9.1 Stoichiometry
- 9.2 The mole concept

*Cross-referenced to assessment objectives A1-5, B1-7, C1-3 and Unit 2*

## **Unit 10: Organic 2**

- 10.1 Alcohols
- 10.2 Acids
- 10.3 Macromolecules
- 10.4 Synthetic polymers
- 10.5 Natural macromolecules

*Cross-referenced to assessment objectives A1-5, B1-5, C1-3 and Units 7 & 8*

## **Unit 11: Redox, Electrochemistry and Group VII**

- 11.1 Redox
- 11.2 Electricity and chemistry
- 11.3 Extraction of aluminium
- 11.4 Group VII

*Cross-referenced to assessment objectives A1-5, B1-6, C1-3 and Units 2 & 6*

## **Unit 12: Equilibria**

- 12.1 Reversible reactions
- 12.2 The Haber process
- 12.3 Sulfur

*Cross-referenced to assessment objectives A1-5, B1-6, C1-3 and Unit 5*

### **Teacher support**

The up-to-date list of resources for this syllabus can be found on the University of Cambridge International Examinations website [www.cie.org.uk](http://www.cie.org.uk). In addition, the password-protected Teacher Support website at <http://teachers.cie.org.uk> provides access to specimen and past question papers, mark schemes and other support materials. We offer online and face-to-face training; details of forthcoming training opportunities are posted on the website.

### **Resources**

Cambridge IGCSE Chemistry webpage

[www.cie.org.uk/qualifications/academic/middlesec/igcse/subject?asdef\\_id=840](http://www.cie.org.uk/qualifications/academic/middlesec/igcse/subject?asdef_id=840)

Cambridge Students – University of Cambridge International Examinations

[www.cambridgestudents.org.uk/subjectpages/chemistry/](http://www.cambridgestudents.org.uk/subjectpages/chemistry/)

Chemistry for IGCSE, R. Norris & R. Stanbridge, Nelson Thornes, 2009. ISBN 9781408500187

Royal Society of Chemistry Electronic Databook

[www.rsc.org/education/teachers/resources/databook/](http://www.rsc.org/education/teachers/resources/databook/)

Video clips on the various methods of extraction:

[www.rsc.org/Education/Teachers/Resources/Alchemy/](http://www.rsc.org/Education/Teachers/Resources/Alchemy/)

Excellent suite of video clips on various elements of the Periodic Table:

[periodicvideos.com/](http://periodicvideos.com/)

Video clips on various molecules from Nottingham University:

[periodicvideos.com/molecularvideos.htm](http://periodicvideos.com/molecularvideos.htm)

Excellent worksheets for teaching IGCSE Chemistry.

Chemistry Experiments, J. A. Hunt, A. Geoffrey Sykes, J. P. Mason, Longman 1996, ISBN 0582332087

Some very useful experimental worksheets:

[www.practicalchemistry.org/experiments/](http://www.practicalchemistry.org/experiments/)

[schools.longman.co.uk/gcsechemistry/worksheets/index.html](http://schools.longman.co.uk/gcsechemistry/worksheets/index.html)

Animation and video clips on particles, separating techniques and states of matter:

Royal Society of Chemistry Particles in Motion, CD ROM, 2006.

Variety of resources for IGCSE Chemistry

[www.chalkbored.com/lessons/chemistry-11.htm](http://www.chalkbored.com/lessons/chemistry-11.htm)

An excellent source of background notes for teaching IGCSE Chemistry

[www.chemguide.co.uk/](http://www.chemguide.co.uk/)

Useful revision sites:

[www.bbc.co.uk/schools/gcsebitesize/science/](http://www.bbc.co.uk/schools/gcsebitesize/science/)

[www.docbrown.info](http://www.docbrown.info)

[www.gcsescience.com/science-chemistry-links.htm](http://www.gcsescience.com/science-chemistry-links.htm)

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