

CAMBRIDGE IGCSE CHEMISTRY

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LESSON 1

WHAT IS CHEMISTRY?

Chemistry is a natural science that deals principally with the properties of substances, the changes they undergo, and the natural laws describing these changes.

- Did you study chemistry during the middle school? Did you carry out some chemistry experiments?
- What is your opinion about chemistry?
- ❖ Is chemistry useful? Why?
- ❖ Is chemistry a “bad science”? Why?

CHEMISTRY IS

- **Qualitative** (what is this substance? Can I synthesise it?) and **quantitative** (how much substance is in this sample?).
- **Everywhere!** Chemicals are everywhere and are everything. Anything you can see or touch or smell contains chemicals. Many occur naturally, other chemicals are man made.
- **In everything:** chemists study the natural world but also try to improve modifying the materials we use. So, chemistry is one of the foundations of modern industrial economies.
- **Discovery.** Chemists discover naturally occurring chemicals and make new ones. Chemists create! Chemists study the properties of the natural and man made chemicals. This information is used to understand how some chemicals may be modified to make them more useful and they develop methods in order to achieve this goal.

CHEMISTRY IMPROVES OUR WORLD

Advancements in the field of chemistry have brought about major improvements in our world:

- ✓ new medicines that cure disease,
- ✓ new materials that make us safer and stronger
- ✓ new sources of energy that enable new activities
- ✓ etc.



PUBLIC ATTITUDES TO CHEMISTRY

And you?

What do you think about chemistry?



WHY STUDY CHEMISTRY?

- To be better informed
- To be a knowledgeable consumer
- To make better decisions for yourself and society
- To learn problem-solving skills
- To enhance analytical thinking

HOW STUDY CHEMISTRY? YOU NEED:

- Motivation
- Dedication
- Time
- Effort
- Continuity

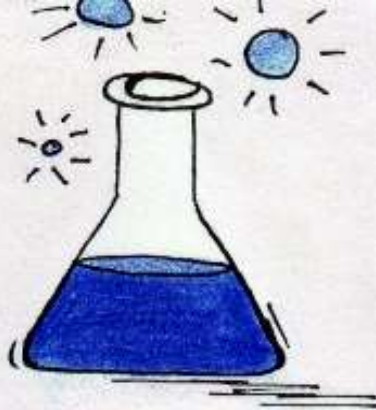
YOU HAVE TO:

- Plan and organise your day
- Avoid discontinuous, occasional study
- Choose a method of study and study in a quiet place
- Review topics in the afternoon, not after a week!!!
- Pay attention and participate during the lesson
- **Don't use phone during the class and at home**
- Repeat aloud at home, and find someone who listens to you
- Be curious
- Don't learn by heart!
- Try to understand concepts
- Study with your classmates (if you can)
- Ask the teacher immediately when you don't understand

STATE OF HIGH ENTROPY



SCIENCE CLASSES



"SCIENCE"
continued

1) Read your textbook before you come to class

- you'll know what the lecture is about, it won't be as overwhelming!
- lecture = Review
- you'll be ahead of schedule.

2) Break down your readings into smaller chunks:

- instead of reading all of ch. 3, read $\frac{1}{3}$ one day, $\frac{1}{3}$ the next, and the last $\frac{1}{3}$ on the last day
- ! → you'll feel less stressed!!!
- readings will be short & sweet (10 pages instead of 30, for example)

study-hack

3) After each paragraph, stop and make sure you understand it
→ go back + read slower if not.

4) After reading, summarize all information to create



5) In Class, listen closely-

- take clear, but concise notes
- mark your questions

6) After lecture, review + summarize + ask questions you noted before
- don't get caught behind!!!

study-hack

<http://study-hack.com/2014/04/10/to-those-taking-science-classes/>

YOU HAVE TO:

- Use Textbook
- Download power point slides from <http://www.teresacelestino.net/teresacelestino.net/Blog/Blog.html>
- Take notes
- Use photocopies provided by the teacher (that you will paste on your notebook papers)
- Buy a ring binders



EVALUATION WILL CONCERN:

- Oral test about homework
- Level of participation during class time and in laboratory work
- Way of working during class (alone or in groups)



IT IS VERY IMPORTANT TO CARRY OUT

DIFFERENT TYPES OF EXERCISES

- Multiple choice tests
- Open-ended questions
- Sentence-completion tests
- Description of experimental equipment and explanation of the related functions
- Etc.

The teacher will ask questions during every class.

Oral tests will be short-lived and frequent (in every class)

CONTENT OVERVIEW

Candidates study the following topics:

- 1 The particulate nature of matter
- 2 Experimental techniques
- 3 Atoms, elements and compounds
- 4 Stoichiometry
- 5 Electricity and chemistry
- 6 Chemical energetics
- 7 Chemical reactions
- 8 Acids, bases and salts
- 9 The Periodic Table
- 10 Metals
- 11 Air and water
- 12 Sulfur
- 13 Carbonates
- 14 Organic chemistry

ASSESSMENT OVERVIEW (CORE SUBJECT)

- Multiple Choice (questions will be based on the Core subject content; 40 four-choice multiple-choice questions)
- Theory (questions will be based on the Core subject content; short-answer and structured questions)
- Practical Test (questions will be based on the experimental skills)
- Externally assessed

CANDIDATES SHOULD BE ABLE TO DEMONSTRATE KNOWLEDGE AND UNDERSTANDING OF:

- scientific phenomena, facts, laws, definitions, concepts and theories
- scientific vocabulary, terminology and conventions (including symbols, quantities and units)
 - scientific instruments and apparatus, including techniques of operation and aspects of safety
- scientific and technological applications with their social, economic and environmental implications.

CANDIDATES SHOULD BE ABLE TO:

- locate, select, organise and present information from a variety of sources
- translate information from one form to another
- manipulate numerical and other data
- use information to identify patterns, report trends and draw inferences
- present reasoned explanations for phenomena, patterns and relationships
- make predictions and hypotheses
- solve problems, including some of a quantitative nature.

CANDIDATES SHOULD BE ABLE TO:

- demonstrate knowledge of how to safely use techniques, apparatus and materials (including following a sequence of instructions where appropriate)
- plan experiments and investigations
- make and record observations, measurements and estimates
- interpret and evaluate experimental observations and data
- evaluate methods and suggest possible improvements

HOW YOU WILL BE ASSESSED

You will be assessed using three components:

- Paper 1 or Paper 2 (Multiple choice)
- Paper 3 or Paper 4 (Written paper, Theory)
- and either Paper 5 (Practical Test) or Paper 6 (Alternative to Practical).

Your teacher will discuss with you which course is appropriate for you, Core or Extended. The Extended course covers all the same material as the Core course but also includes more to learn in some sub-topics and some additional sub-topics.

Macroscopic Properties
What you can see



Models
help link the
microscopic and
macroscopic



Microscopic Properties
What is happening
on a scale that you
cannot see

Chemistry is reasoning, imagination,
creativity, precision and rigour

