



Katedraliskolan Skara IB Diploma Programme



Chemistry course outline (first exam 2016) both Standard and Addition Higher Level (SL and AHL)

General course description

Chemistry is the study of matter- its structure, properties, composition and the changes that material substances undergo. It is called the central science, as chemical principles underpin both the physical environment in which we live and all biological systems. The course includes essential principles such as: atomic structure, periodicity, chemical bonds, organic chemistry, stoichiometry and types of chemical reactions with energetic and kinetic aspects. In addition to the above, one area of application is covered.

The core materials are studied by both SL and HL students. HL students are required to study some topics in greater depth and to study extension material of a more demanding nature in the common option. The distinction between SL and HL is in both breadth and depth.

Chemistry is a subject worth studying on its own and will develop awareness of how scientists work and communicate. In addition it is also a prerequisite for many other courses in higher education such as medicine, environmental and biological sciences, and engineering.

Topics /core/options

Core (95 hours)	Hours
Topic 1: Stoichiometric relationships	13.5
Topic 2: Atomic structures	6
Topic 3: Periodicity	6
Topic 4: Chemical bonding and structure	13.5
Topic 5: Energetics/thermochemistry	9
Topic 6: Chemical kinetics	7
Topic 7: Equilibrium	4.5
Topic 8: Acids and bases	6.5
Topic 9: Redox processes	8
Topic 10. Organic chemistry	11
Topic 11: Measurement and data processing	10
Additional higher level (AHL) (60 hours)	Hours
Topic 12: Atomic structure	2
Topic 13: The periodic table – the transition metals	4
Topic 14: Chemical bonding and structure	7
Topic 15: Energetics/thermochemistry	7
Topic 16: Chemical kinetics	6
Topic 17: Equilibrium	4



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Topic 18: Acids and bases	10
Topic 19: Redox processes	6
Topic 20: Organic chemistry	12
Topic 21: Measurement and analysis	2
Options* SL/HL 15/25 H	Hours
A: Materials	
B: Biochemistry	
C: Energy	
D: Medicinal chemistry	

*One option out of four is studied. The option studied will be decided by the teacher and students and can change between different classes and years.

The time spent on the different topics is presented below:

SL = core + option + practical scheme of work = 95 + 15 + 40 = 150 hours

HL = core + AHL + option + practical scheme of work = 95 + 60 + 25 + 60 = 240 hours

Methods

A variety of methods is used to teach Chemistry, reflecting the IB learner profile and different learning styles and interests of students. Theoretical and practical activities are closely integrated and used to enhance students' understanding of the subject. Theoretical lessons, laboratory work, simulations, and practical investigations will provide students opportunities to build knowledge and understanding of concepts, terminology, theories, methodologies and techniques used in chemistry. The students will also be able to apply their knowledge in different chemical contexts. Students will develop the ability to formulate, analyze and evaluate hypotheses, research questions, methodologies, techniques, data and scientific explanations. In addition to learning chemistry the students will also develop their way of reflecting, thinking and communicating. They will explore ideas and learn independently as well as with others. Topics are studied one at a time and many build upon prior topics. Written tests are given periodically to ensure students have achieved the knowledge requirements stated in the subject guide.

Link to core

Students will discuss a variety of questions linking TOK (theory of knowledge) and chemistry.

- Why is it important to have just one “scientific” language?
- How does scientific knowledge progress?
- How can our everyday experiences limit our ways of understanding for example Avogadro's constant?

- How can we know that there are subatomic particles when we cannot observe them directly?

International-mindedness is also developed during the course. SI-units, chemical symbols and equations provide an effective way of communication amongst scientists all over the world. The importance of some chemical reactions such as the Haber process, environmental issues and industrialization provide discussion points of the impact chemistry has on the world.

Assessment

Internal

In chemistry there is one compulsory internal assessment (10 hours) in which the student designs, performs, evaluates and presents her/his own investigation. This is an individual piece of work, and the written report will be internally assessed by the teacher and externally moderated by the IB. The internal assessment contributes 20% of the final grade.

There is also the group 4 project (10 hours). It is an interdisciplinary activity, and all students studying the Diploma Program must participate. The focus of the activity is for students to practice interaction and collaboration in order to solve a scientific problem.

External

Both levels of students sit three written exam papers that are sent for external marking by the IB.

Paper	Description	Duration (hours)		% Final Grade	
		SL	HL	SL	HL
1	Multiple choice questions based on the core syllabus	$\frac{3}{4}$	1	20	20
2	Short-answer and extended-response questions on core material.	$1\frac{1}{4}$	$2\frac{1}{4}$	40	36
3	Section A: Data-based and experimental work short-answer questions. Section B: short-answer and extended-response questions on optional material.	1	$1\frac{1}{4}$	20	24

Course material

C. Brown & M. Ford, *Chemistry – developed specifically for the IB Diploma, 2nd ed.* (2014). Pearson Education Limited

Teacher and email

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[Link to Diploma Programme Curriculum briefs](#)