

## Chemistry

### Introduction to Curriculum

The curriculum framework for Chemistry embodies the key knowledge, skills, values and attitudes that students are to develop at senior secondary level. The learning targets of the curriculum are categorized into three domains: knowledge and understanding, skills as well as values and attitudes.

### Structure of Curriculum

Compulsory Part		
I.	Planet earth*	<ul style="list-style-type: none"> <li>a. The atmosphere</li> <li>b. The ocean</li> <li>c. Rocks and minerals</li> </ul>
II.	Microscopic world I*	<ul style="list-style-type: none"> <li>a. Atomic structure</li> <li>b. The Periodic Table</li> <li>c. Metallic bonding</li> <li>d. Structures and properties of metals</li> <li>e. Ionic and covalent bond</li> <li>f. Structures and properties of giant ionic substances</li> <li>g. Structures and properties of simple molecular substances</li> <li>h. Structures and properties of giant covalent substances</li> <li>i. Comparison of structures and properties of important types of substances</li> </ul>
III.	Metals*	<ul style="list-style-type: none"> <li>a. Occurrence and extraction of metals</li> <li>b. Reactivity of metals</li> <li>c. Reacting masses</li> <li>d. Corrosion of metals and their protection</li> </ul>
IV.	Acids and bases*	<ul style="list-style-type: none"> <li>a. Introduction to acids and alkalis</li> <li>b. Indicators and pH</li> <li>c. Strength of acids and alkalis</li> <li>d. Salts and neutralisation</li> <li>e. Concentration of solutions</li> <li>f. Volumetric analysis involving acids and alkalis</li> </ul>
V.	Fossil fuels and carbon compounds*	<ul style="list-style-type: none"> <li>a. Hydrocarbons from fossil fuels</li> <li>b. Homologous series, structural formulae and naming of carbon compounds</li> <li>c. Alkanes and alkenes</li> <li>d. Addition polymers</li> </ul>
VI.	Microscopic world II*	<ul style="list-style-type: none"> <li>a. Bond polarity</li> <li>b. Intermolecular forces</li> <li>c. Structures and properties of molecular crystals</li> <li>d. Simple molecular substances with non-octet structures</li> <li>e. Shapes of simple molecules</li> </ul>
VII.	Redox reactions, chemical cells and electrolysis*	<ul style="list-style-type: none"> <li>a. Chemical cells in daily life</li> <li>b. Reactions in simple chemical cells</li> <li>c. Redox reactions</li> <li>d. Redox reactions in chemical cells</li> <li>e. Electrolysis</li> </ul>

## New Senior Secondary Curriculum

		f. Importance of redox reactions in modern ways of living
VIII.	Chemical reactions and energy*	a. Energy changes in chemical reactions b. Standard enthalpy change of neutralisation, solution, formation and combustion c. Hess's Law
IX.	Rate of reaction	a. Rate of chemical reaction b. Factors affecting rate of reaction c. Molar volume of gases at room temperature and pressure (r.t.p.) d.
X.	Chemical equilibrium	a. Dynamic equilibrium b. Equilibrium constant c. The effect of changes in concentration and temperature on chemical equilibria
XI.	Chemistry of carbon compounds	a. Introduction to selected homologous series b. Isomerism c. Typical reactions of various functional d. Inter-conversions of carbon compounds e. Important organic substances
XII.	Patterns in the chemical world	a. Periodic variation in physical properties of the elements from Li to Ar b. Bonding, stoichiometric composition and acid-base properties of the oxides of elements from Na to Cl c. General properties of transition metals

## Elective Part

XIII.	Industrial chemistry	a. Importance of industrial processes b. Rate equation c. Activation energy d. Catalysis and industrial processes e. Industrial processes f. Green chemistry
XIV.	Materials chemistry	a. Naturally occurring polymers b. Synthetic polymers and plastics c. Metals and alloys d. Synthetic materials in modern life e. Green chemistry
XV.	Analytical chemistry	a. Detecting the presence of chemical species b. Separation and purification methods c. Quantitative methods of analysis d. Instrumental analytical methods e. Contribution of analytical chemistry to our society

## Investigative Study

XVI.	Investigative study in chemistry	Overview This topic aims to provide students with opportunities to design and conduct an investigation with a view to solving an authentic problem. A portion of curriculum time is set aside for this purpose. Students are expected to make use of their knowledge and understanding of chemistry, together with generic skills - including, but not limited to,
------	----------------------------------	---

New Senior Secondary Curriculum

		creativity, critical thinking, communication and problem-solving - to engage in a group-based experimental investigative study. Through the learning process in this study, students can enhance their practical skills and develop an awareness of the need to work safely in the laboratory.
--	--	--

\*These topics are included in the chemistry part of Combined Science Curriculum.

**Introduction to Assessment**

Public examination

Paper 1 Compulsory Part      60%    2 1/2 hours

Paper 2 Elective Part        20%    1 hour

School-based assessment (SBA)

Practical related tasks and non-practical related tasks    20%