

Scheme of Work
for the
Academic Year 2017/2018

SUBJECT : Science(Single Award)- Chemistry
CLASS : 9
EXAMINATION : IGCSE
TEACHER IN CHARGE : Gateway College, Colombo

MONTH	UNIT No.	TOPICS	No. of PER.	OBJECTIVES
June	1a	States of matter	2	1.1 understand the three states of matter in terms of the arrangement, movement and energy of the particles ✓ 1.2 understand the inter-conversions between the three states of matter in terms of: • the names of the inter-conversions • how they are achieved • the changes in arrangement, movement and energy of the particles. ✓ * 1.3 understand how the results of experiments involving the dilution of coloured solutions and diffusion of gases can be explained. ✓
July	1b	Elements, compounds and mixtures	2	1.8 understand how to classify a substance as an element, compound or mixture ✓ # 1.9 understand that a pure substance has a fixed melting and boiling point, but that a mixture may melt or boil over a range of temperatures 1.10 describe these experimental techniques for the separation of mixtures: • simple distillation ✓ • fractional distillation ✓ • filtration ✓ • crystallisation • paper chromatography. 1.11 understand how a chromatogram provides information about the composition of a mixture 1.12 understand how to use the calculation of R _f values to identify the components of a mixture = 1.13 practical: investigate paper chromatography using inks/food colourings
	1c	Atomic structure	2	1.14 know what is meant by the terms atom and molecule 1.15 know the structure of an atom in terms of the positions, relative masses and relative charges of sub-atomic particles 1.16 know what is meant by the terms atomic number, mass number, isotopes and relative atomic mass (A _r)

				1.17 be able to calculate the relative atomic mass of an element (A_r) from isotopic abundances
July	1d	The Periodic Table	2	1.18 understand how elements are arranged in the Periodic Table: <ul style="list-style-type: none"> • in order of atomic number • in groups and periods. 1.21 identify an element as a metal or a non-metal according to its position in the Periodic Table
September	1f	Ionic bonding	4	1.37 understand how ions are formed by electron loss or gain 1.38 know the charges of these ions: <ul style="list-style-type: none"> • metals in Groups 1, 2 and 3 • non-metals in Groups 5, 6 and 7 • hydrogen (H^+), hydroxide (OH^-), ammonium (NH_4^+), carbonate (CO_3^{2-}), nitrate (NO_3^-), sulfate (SO_4^{2-}). 1.39 write formulae for compounds formed between the ions listed above 1.41 understand ionic bonding in terms of electrostatic attractions 1.42 understand why compounds with giant ionic lattices have high melting and boiling points
October	1g	Covalent bonding	4	1.44 know that a covalent bond is formed between atoms by the sharing of a pair of electrons 1.47 explain why substances with a simple molecular structures are gases or liquids, or solids with low melting and boiling points the term intermolecular forces of attraction can be used to represent all forces between molecules 1.49 explain why substances with giant covalent structures are solids with high melting and boiling points
November	1e	Chemical formulae and equations	4	1.25 write word equations and balanced chemical equations (including state symbols): <ul style="list-style-type: none"> • for reactions studied in this specification • for unfamiliar reactions where suitable information is provided. 1.26 calculate relative formula masses (including relative molecular masses) (M_r) from relative atomic masses (A_r)
January	2a	Group 1 (alkali metals) - lithium, sodium and potassium	6	2.1 understand how the similarities in the reactions of these elements with water provide evidence for their recognition as a family of elements 2.2 understand how the differences between the reactions of these elements with air and water provide evidence for the trend in reactivity in Group 1 2.3 use knowledge of trends in Group 1 to predict the properties of other alkali metals

February	2b	Group 7 (halogens)* - chlorine, bromine and iodine	4	2.5 know the colours, physical states (at room temperature) and trends in physical properties of these elements 2.6 use knowledge of trends in Group 7 to predict the properties of other halogens
February/March	2c	Gases in the atmosphere	4	2.9 know the approximate percentages by volume of the four most abundant gases in dry air 2.10 understand how to determine the percentage by volume of oxygen in air using experiments involving the reactions of metals (e.g. iron) and non-metals (e.g. phosphorus) with air 2.11 describe the combustion of elements in oxygen, including magnesium, hydrogen and sulfur 2.13 know that carbon dioxide is a greenhouse gas and that increasing amounts in the atmosphere may contribute to climate change 2.14 practical: determine the approximate percentage by volume of oxygen in air using a metal or a non-metal
March	2f	Chemical tests	2	2.44 describe tests for these gases: • hydrogen • oxygen • carbon dioxide • ammonia • chlorine. 2.45 describe how to carry out a flame test 2.46 know the colours formed in flame tests for these cations: • Li ⁺ is red • Na ⁺ is yellow • K ⁺ is lilac • Ca ²⁺ is orange-red • Cu ²⁺ is blue-green. 2.48 describe a test for CO ₃ ²⁻ using hydrochloric acid and identifying the gas evolved 2.49 describe a test for the presence of water using anhydrous copper(II) sulfate