REPUBLIC OF CAMEROON
Peace-Work-Fatherland
****
MINISTRY OF SECONDARY EDUCATION
****
INSPECTORATE GENERAL OF EDUCATION
****
INSPECTORATE OF PEDAGOGY IN CHARGE OF THE TEACHING OF SCIENCES
****
DEPARTMENT OF PHYSICS CHESMISTRY AND TECHNOLOGY
****

REPUBLIQUE DU CAMEROUN
Paix-Travail-Patrie
****
MINISTERE DES ENSEIGNEMENTS SECONDAIRES
****
INSPECTION GENERALE DES ENSEIGNEMENTS
****
INSPECTION DE PEDAGOGIE CHARGEE DE L'ENSEIGNEMENT DES SCIENCES
****
SECTION PCT
****

Official website of distance education lessons of MINESEC **:** **www.minesec-distancelearning.cm**

CHEMISTRY NATIONAL TEACHING SYLLABUS OUTLINE 2024/2025

FIRST CYCLE

CLASS	TOPICS	SUBTOPIC	
		S/N	TITLE
Form 1	**Module I** : Matter : Properties and Transformation	1	*Understanding chemistry*
		2	Effect of heat on substances
		3	Simple classification of substances
		4	Chemical elements
		5	Acids and bases
	Module II : Environmental Education	6	Air
		7	*Water and solutions*
Form 2	**Module I** : Matter : Properties and Transformation	1	The Atom
		2	Chemical symbols, formulae and valency
		3	Periodic Table
		4	Chemical Reactions and Equations
		5	Reactions with Oxygen of the air
		6	Mixtures and Pure substances

	Module III : Energy	7	Action of heat on materials
		8	Action of Electricity on materials
Form 3	**Module I** : Matter : Properties and Transformation	1	Atoms
		2	Structure of the atom in relation to the Periodic table
		3	Structure and Bonding
		4	Acidic and Alkaline Solutions
		5	Hydrogen
		6	Oxygen
		7	Phosphorus
		8	Halogens
		9	Carbon
Form 4	**Module I** : Matter : Properties and Transformation	1	*Sulphur*
		2	*Nitrogen*
		3	Formulae, Moles and Equations
		4	*Gaseous state*
		5	Alkali metals and Alkaline Earth metals
		6	Transition metals
		7	Identification of ions
		8	Salts
		9	*Organic chemistry Part 1- Hydrocarbons*
Form 5	**Module III** : Energy	1	Energetics
		2	*Electro chemistry*
	Module I : Matter : Properties and Transformation	3	Rates of Reaction

		4	*Reversible Reaction*
		5	*Solutions and Acid-Base Titrations*
		6	*Organic Chemistry 2 : Alcohols and Carboxylic acids*
	Module II : Environmental Education	7	Extraction of metals
		8	Heavy Chemical Industries
	SECOND CYCLE		
LSS	**Module I** : Matter : Properties and Transformation	1	The Mole Concept
		2	Atomic Structure and Related Patterns in the Periodic Table
		3	Bonding and Structure, and Intermolecular forces
		4	Organic Chemistry I : Fundamentals
		5	Descriptive Inorganic Chemistry : Modern Periodic Table, Periodicity and s-block elements
		6	Phase Equilibria and Raoult's law
	Module III : Energy	7	Thermochemistry/ Energetics
USS	**Module I** : Matter : Properties and Transformation	8	Equilibria
		9	Organic Chemistry 2 : Study of other organic compounds (functional groups)
		10	Organic Chemistry 3 : Reaction mechanism and synthetic routes
		11	Descriptive Inorganic Chemistry : Group IV, Group VII, Transition metals
	Module III : Energy	12	Reaction Kinetics
	Module II : Environmental Education	13	Chemistry and Society

NATIONAL HARMONISED CHEMISTRY SCHEMES OF WORK (PROGRESSIONS) 2024/2025

FIRST CYCLE

School: …….. Class: Form 1 **Hours per Week:** 02 **Annual Teaching Hours:** 60

Teacher: …….. Qualification: …… **Subject:** CHEMISTRY **Nº. of Periods per week: 2**

Official website of distance education lessons of MINESEC **:** www.minesec-distancelearning.cm

TERM	WEEK	TOPIC/SUBTOPIC	LESSONS	PRACTICAL ACTIVITIES	Digitalized		Duration	OBSERVATION
					ResourcesAvailable on line	Use (yes or no, how ?		
I	1	**Topic I: Matter: Properties and Transformation.** *1.* ***Understanding Chemistry.***	***1.1.*** *Chemistry and its importance in everyday life*		Available		2H	
	2		***1.2.*** *Some basic equipment used in the study of chemistry*	*- Visit of the chemistry laboratory.*	Available		2H	
	3		***1.3.*** *Hazardous symbols on reagent bottles and their meanings* ***1.4.*** *Safety rules observed in the Lab.*		Available		2H	
	4		***1.5.*** *Measurements of mass, volume, time and temperature.*	*- Use of balances, measuring cylinders, stopwatch, thermometer, etc.*	Available		2H	
			ACTVITY OF INTEGRATION					
	5	**Topic II: Energy: Applications and uses.** **2. Effect of heat on Substances.**	**2.1.** Physical and chemical changes.	- Melting candle wax, ice, etc.	Available		2H	
	6		**REVISION AND EVALUATION**				2H	
	7		**2.2.** States of matter and changes of states.	- Melt ice, evaporate water, etc.	Available		2H	
	8		**2.3.** Simple kinetic theory of matter and change of state.		Available		2H	
			ACTVITY OF INTEGRATION					
	9	**Topic I: Matter: Properties and Transformation.**	**3.1.** Mixtures and pure substances. **3.2.** Types of mixtures and examples.		Available		2H	

	10	**3. Simple classification of substances.**	**3.3.** Methods of separating mixtures	- Experiments on separation of mixtures.	Available		2H	
	11		**3.3.** Methods of separating mixtures	-Filtration, hand picking, winnowing, etc	Available		2H	
	12		**REVISION AND EVALUATION**				2H	
			END OF FIRST TERM					
II	13		**3.4.** Matter and its constituents.				2H	
	14		**3.5.** Pure substances. -Differences between mixtures and pure substances. -Differences between compounds and mixtures.				2H	
	15	**4. Chemical elements**	**4.1.** Elements and compounds.				2H	
	16		**4.2.** Metal and non-metals elements -Physical properties of metals and non-metals	-Testing physical properties of metals and non-metals.			2H	
			ACTIVITY OF INTEGRATION					
	17	**5. Acids and Bases**	**5.1.** Definition, examples, properties and reaction of acids				2H	
	18		**REVISION AND EVALUATION**				2H	
	19		**5.2.** Definition, examples, properties and reactions of bases.				2H	
	20		**5.3.** Tests for acids and bases with familiar indicators. **5.4.** Extraction of indicators.	-Preparation of natural indicators and testing for acids and bases			2H	
	21		**5.5.** The pH scale. **5.6.** Reaction of acids with bases and alkalis. Importance of neutralization reactions.				2H	
			ACTIVITY OF INTEGRATION					
	22	**Topic III:** **Environmental Education and Sustainable Development**	**6.1.** Composition of air: -Active and inactive air -Composition of air by volume	-Experiment to determine the active part of air			2H	
	23		**6.2.** Functions of gases in air **6.3**. Air as a mixture **6.**4. Effects of active air				2H	

	24	**6. Air**	**REVISION AND EVALUATION**				2H	
			END OF SECOND TERM					
	25		**6.5.** Air pollution -Definition -Sources of air pollution -Types of pollutants, sources, effects and possible solutions				2H	
			ACTIVITY OF INTEGRATION					
	26	***7. Water and solutions***	***7.1.*** *Natural sources of water and the water cycle*	.			2H	
	27		***7.2.*** *Methods of purification of water. Undesirable features of water and quality of good drinking water* ***7.3.*** *Test for water.*	*-Test for water with anhydrous* $CuSO_4$ *,* $CoCl_2$*.*			2H	
	28		***7.2.*** *Methods of purification of water. Undesirable features of water and quality of good drinking water* ***7.3.*** *Test for water.* ***7.4.*** *Uses of water.*	*-Construction and use of sand filter for water purification*			2H	
	29		***7.2.*** *Methods of purification of water. Undesirable features of water and quality of good drinking water* ***7.3.*** *Test for water.* ***7.4.*** *Uses of water.*	*-Construction and use of sand filter for water purification*			2H	
	30		***7.5.*** *Water pollution.* ***7.6*** *Solutions: Definitions and preparations of solutions.* ***7.7.*** *Solubility in water.*				2H	
	31		***7.5.*** *Water pollution.* ***7.6*** *Solutions : Definitions and preparations of solutions.* ***7.7.*** *Solubility in water.*				2H	
	32		***7.8.*** *Crystallisation* ***ACTIVITY OF INTEGRATION***				2H	
	33		**General Revision and Evaluation**				2H	
	34		**General Revision and Evaluation**				2H	
	35		**HOLIDAYS**					

NB: This scheme of work is summarised and should be used alongside the syllabus to put in all the details.

School: …….. Class: Form 2 **Hours per Week:** 02 **Annual Teaching Hours:** 60

Teacher: …….. Qualification: …… **Subject:** CHEMISTRY **Nº. of Periods per week: 2**

***Official website of distance education lessons of MINESEC* : www.minesec-distancelearning.cm**

Term	Week	Topic/Subtopic	Lessons	Practical Activities	Digitalized		Duration	Observation
					ResourcesAvailable s on line	Use (yes or no, how ?)		
I	1	**Topic I: Matter: Properties and Transformation.**	**1.1.** Composition and Simple structure of the Atom (sub-atomic particles)				2H	
	2	**1. The Atom**	**1.2.** Composition and Simple structure of the Atom (Bohr's model of an atom)		Available		2H	
	3		**1.3** Simple electronic structure (Identification of group and period from the electronic structure)				2H	
			ACTIVITY OF INTEGRATION					
	4	**2. Chemical symbols, formulae and valency.**	**2.1**. Dalton's Atomic Theory. **2.2.** Chemical symbols, formulae and valencies of elements and radicals.		Available		2H	
	5		**2.2.** Chemical symbols, formulae and valencies of elements and radicals.		Available		2H	
	6		**REVISION AND EVALUATION**				2H	
	7		**2.3.** Use of tables to derive the formulae of compounds.		Available		2H	
			ACTIVITY OF INTEGRATION				2H	
	8	**3. Periodic Table**	**3.1.** The Periodic Table: History and purpose for classifying elements. Metal/ Non-metal. The Modern periodic table				2H	
	9		**3.2.** Families of Elements and Reactivity of Families				2H	
	10		**3.2**. Families of Elements and Reactivity of Families				2H	

	11		***ACTIVITY OF INTEGRATION***			2H	
	12		**REVISION AND EVALUATION**				
			END OF FIRST TERM				
II	13	**4. Chemical reactions and equations.**	**4.1.** Chemical Changes.	-Heat sugar	Available	2H	
	14		**4.2.** Chemical equations: Writing and Balancing chemical equations		Available	2H	
	15		**4.2.** Chemical equations: Writing and Balancing chemical equations		Available	2H	
	16		**4.3.**The law of conservation of mass. Types of changes in matter, definitions and differences		Available	2H	
			ACTIVITY OF INTEGRATION			2H	
	17	**5. Reactions with oxygen of air.**	**5.1.** Composition of Air Separation of the components of Air by Fractional Distillation		Available	2H	
	18		**REVISION AND EVALUATION**			2H	
	19		**5.1.** Composition of Air Separation of the components of Air by Fractional Distillation		Available	2H	
	20		**5.2.** Reaction of substances with oxygen of air (Burning)	-Burn paper, piece of cloth, etc	Available	2H	
	21		**5.3.** Reaction of substances with oxygen of air (Burning)		Available	2H	
	22		**5.4.** Rusting (conditions, composition and prevention)	-Iron sponge kept dry and in moist conditions	Available	2H	
			ACTIVITY OF INTEGRATION				
	23	**6. Mixtures and pure substances**	**6.1.** States of Matter : Summary review			2H	
	24		**REVISION AND EVALUATION**				
			END OF SECOND TERM				
	25		**6.2.** Techniques for separation: distillation, paper chromatography.	-Simple distillation of ethanol/water mixture, paper chromatography to separate blue ink colours, etc		2H	
	26		**6.3.** Definitions: Sublimation, melting point and boiling point. Simple Criteria for purity			2H	

			ACTIVITY OF INTEGRATION				
III	27	**Topic II: Energy: Application and Uses** **7. Action of heat on materials.**	**7.1.** Sources of energy: renewable and non-renewable.			2H	
	28		**7.2.** Action of heat on substances: carbonates, hydrates, nitrates etc.			2H	
	29		**7.3.** Experimental study of change in mass resulting from heating of substances. **7.4.** Concept of reversibility.	-Heat $CaCO_3$ solid while measuring the mass before and after heating		2H	
			ACTIVITY OF INTEGRATION				
	30		**REVISION AND EVALUATION**			2H	
	31	**8. Action of electricity on materials.**	**8.1.** Action of electricity on metals, non-metals,	-Verify conduction of solids like spoons, nails, wood using a 9V battery.		2H	
	32		**8.1.** Action of electricity on solid compounds and their solutions. **8.2.** Electrolytes and Non-electrolytes	-Verify conduction of electricity by solutions of common salt and liquids such as kerosene using a 9v battery		2H	
	33		***ACTIVITY OF INTEGRATION***			2H	
	34		**GENERAL REVISION AND EVALUATION**			2H	
			HOLIDAYS				

NB: This scheme of work is summarised and should be used alongside the syllabus to put in all the details.

School: …….. Class: Form 3 **Hours per Week: 2** **Annual Teaching Hours: 60**

Teacher:……..Qualification: …… **Subject: CHEMISTRY.** **Nº. of Periods per Week : 2**

Official website of distance education lessons of MINESEC **:** **www.minesec-distancelearning.cm**

Term	Week	Topic/Subtopic	Lessons	Practical activities	Digitalized Lessons		Duration	Observation
					Resource Available on line	Use (yes or no, how ?)		
I	1	**Topic I: Matter: properties and transformation** **1. Atoms**	**1.1** Review of simple structure of the Atom **1.2** Diffusion and Brownian motion **1.3** Charge and approximate mass of subatomic particles	-Place some $KMnO_4$ in water. -Spray some perfume at one end of the classroom.	Available		2H	
	2		**1.1**. Review of simple structure of the Atom **1.2** Diffusion and Brownian motion **1.3** Charge and approximate mass of subatomic particles		Available		2H	
	3		**1.4**. Isotopy and Calculation of Relative Atomic Mass (RAM) A Mole of atoms: Explanation of Avogadro's Constant.	-Calculations done on the board in groups and individually by students.	Available		2H	
			ACTIVITY OF INTEGRATION					
	4	**2. Structure of the atom in relation to the Periodic Table.**	**2.1.**Structure of the Atom and electronic configuration		Available		2H	
	5		**2.2.** Valence Electrons and the Periodic Table **2.3.** Electronic Configuration and Chemical Properties		Available		2H	
	6		**REVISION AND EVALUATION**				2H	
	7	**2. Structure and Bonding.**	**3.1** Chemical Bond formation and the Octet Rule (Noble gas Configuration) **3.2** Ionic Bond: Formation and properties of ionic compounds		Available		2H	

	8		**3.3** Covalent Bond: Formation and properties of covalent compounds *Structure and shapes of simple covalent compounds (VSERP theory)				2H	
	9		**3.4.** The metallic bond: Formation and properties of metals. **3.5.** Crystals: Definition and types of crystal structures.				2H	
	10		Properties of Substances related to bond type and structure.				2H	
			ACTIVITY OF INTEGRATION					
	11	**4. Acidic and alkaline solutions.**	**4.1** Acid-base Indicators **4.2** Acids, Alkalis and Neutralization **4.2** Acids, Alkalis and Neutralization	-Use some common solutions: orange juice, tomatoe juice, baking powder solution, water, kanwa solution, NaOH solution, H_2SO_4 solution Moist litmus paper pH paper Dip litmus paper in different solutions.			2H	
	12		**REVISION AND EVALUATION**				2H	
			END OF FIRST TERM					
II	13		***4.3** Some properties of Acid Solutions (Action on metals, Metal Oxides and Carbonates)* **4.4** Classify oxides as acidic, basic or amphoteric, based on metallic/non-metallic character.	-Carry out acid-base titration to demonstrate change from acidic to basic medium passing through neutralization.			2H	
			ACTIVITY OF INTEGRATION					
	14	**5. Chemistry of the elements : Hydrogen**	**5.1** Laboratory preparation and properties of Hydrogen				2H	
	15		**5.2** Effect of dilute acid and alkalis on some metals. **5.3.** Reaction of hydrogen with oxygen and chlorine				2H	
	16	**6. Chemistry of the elements : Oxygen**	**6.1** Physical properties: state, colour, odour and solubility. **6.2** Simple description of a laboratory preparation of oxygen from potassium chlorate (V) or some common reagent. Chemical test for oxygen.	-Preparation of oxygen by heating $KClO_3$			2H	

	17		**6.3** Preparation of Oxides of common elements and definition of oxidation. From methods of preparation, establish order of reactivity of elements on reacting with oxygen.				2H	
	18		**REVISION AND EVALUATION**				2H	
	19		**6.4** Reaction of oxides with water and classification of oxides. (Soluble, Insoluble, Acidic, Basic or Neutral) **6.5** Reduction of Oxides with hydrogen and Carbon.	-Preparation and reactions of oxides.			2H	
	20		**6.6** Reaction of oxides with water and classification of oxides. (Soluble, Insoluble, Acidic, Basic or Neutral) **6.7** Reduction of Oxides with hydrogen and Carbon.				2H	
			ACTIVITY OF INTEGRATION					
	21	**7. Chemistry of the elements : Phosphorus**	**7.1.** Structural forms of phosphorus: white, red, black. **7.2** Reactions of phosphorus with: air, oxygen and chlorine. Uses of phosphorus and its compounds.	-Use of PCl_5 as reagent to test for alcohols (through the presence of the – OH group).			2H	
	22	**8. Chemistry of the elements : Halogens**	**8.1** The elements fluorine, chlorine, bromine, iodine: Physical properties and electronic configuration. **8.2** Preparation and properties of chlorine. Test and uses of chlorine.	-Laboratory preparation of chlorine by reacting HCl with $KMnO_4$.			2H	
	23		**8.3** Preparation and properties of hydrogen chloride; test and uses. **8.4** Obtaining chlorine from sodium chloride and sodium chloride from chlorine.	-Place a glass rod dipped in aqueous ammonia into a gas jar of hydrogen chloride.			2H	
	24		**REVISION AND EVALUATION**				2H	
			END OF SECOND TERM					

	25		**8.3** Preparation and properties of hydrogen chloride; test and uses. **8.4** Obtaining chlorine from sodium chloride and sodium chloride from chlorine.	-Place a glass rod dipped in aqueous ammonia into a gas jar of hydrogen chloride.			2H	
	26		**8.5** Preparation of other halides of the alkali metals	-Displacement reactions of halogens			2H	
	27		**8.6** Displacement reaction of one halogen by another.				2H	
	28		**8.7** Tests for chlorides, bromides and iodides. **8.8** Some uses of halogens and their compounds.	-Add $AgNO_3$ (aq) to aqueous solutions of common salt, a metal bromide and iodide.			2H	
III	29	**9. Chemistry of the elements : Carbon**	**9.1** Structural forms of carbon: Structure, physical Properties and uses. **9.2** Reactions of carbon with metal oxides.	-Students to identify charcoal graphite, soot, lampblack as forms of carbon.			2H	
	30		**Revision and Evaluation**				2H	
	31		**9.3** Preparation, properties and reactions of Carbon dioxide; tests and uses.	-Test for carbon dioxide with lime water and flame.			2H	
	32		**9.4** Preparation and properties of Carbon monoxide.				2H	
	33		**9.5** Preparation and reactions of carbonates.				2H	
	34		**9.6** Uses and hazards of carbon dioxide and carbon monoxide.				2H	
	35		***ACTIVITY OF INTEGRATION***				2H	
	36		**REVISION AND EVALUATION**				2H	
			HOLIDAYS					

NB: This scheme of work is summarised and should be used alongside the syllabus to put in all the details.

School: …….. Class: Form 4 **Hours per Week: 03** **Annual Teaching Hours: 90**

Teacher:……Qualification: …… **Subject: CHEMISTRY. Nº. of Periods per Week : 3**

Official website of distance education lessons of MINESEC : www.minesec-distancelearning.cm

Term	Week		Topic/Subtopic	Lesson	Practical activity	Digitalized Lessons		Duration	Observation
						Available on line	Use (yes or no, how ?)		
I	1		**Topic I: Matter: properties and Transformation.**	**1.1** Occurrence: extraction of sulphur by the Frasch process. Allotropes of sulphur. Physical and chemical properties of sulphur. Structural forms of sulphur allotropes.				3H	
	2		***1. Chemistry of the Elements : Sulphur***	***1.2** Sulphur dioxide: Preparation and Properties:*				3H	
	3			***1.3** Sulphides and hydrogen sulphide: Preparation and Properties.* ***1.4** Reactions of sulphuric acid. Uses of sulphur and its compounds.*				3H	
	4		***2. Chemistry of the Elements : Nitrogen***	***2.1** Source and Physical properties of nitrogen.* ***2.2** Ammonia: Laboratory preparation and properties.*	-Laboratory preparation of ammonia using NH_4Cl and $Ca(OH)_2$			3H	
	5			***2.3** Nitric acid: Preparation and properties* ***2.4** Nitrates: Effect of heat on nitrates* ***2.5** Oxides of Nitrogen: Nitrogen dioxide, Nitrogen oxide and Dinitrogen oxide; Preparation and properties.* ***2.6** The nitrogen cycle.* ***2.7** Uses of nitrogen compounds.*	-Decompose a nitrate (Group I or Group II or higher nitrate) and test for NO_2 and O_2.			3H	
	6			**Revision and Evaluation**				3H	
	7		**3. Principles of chemistry : Formulae, Moles and Equations**	**3.1.** Definition of the mole and its application to atoms, molecules and ions. The Avogadro's number, L, and what it represents. **3.2.** Definitions: relative atomic mass, relative molecular mass, molecular mass, molecular volume		Available		3H	

	8			**3.3.** Experimental determination of formulae of water and Magnesium Oxide or Copper Oxide.	-Use partially inflated balloons to observe volume and pressure changes.			3H	
	9			**3.4.** Calculations involving : Percentage composition by mass Determination of empirical and molecular formulae Limiting reagents Theoretical and percentage yield Molecular volumes		Available		3H	
	10			**3.5.** Balancing chemical equations using the mole concept. Stoichiometry of chemical reactions; full formula equation. Write equations including state symbols.		Available		3H	
	11		***4.Principle of chemistry : Gaseous state***	***4.1*** *Changes of state: solid, liquid, gas. Kinetic theory (particle theory, diffusion and Brownian motion explained in terms of kinetic theory).*		Available (F5 page)		3H	
	12			***Revision and Evaluation***	**END OF FIRST TERM**			3H	
II	13			***4.2*** *Molar enthalpies of evaporation and fusion. Use of values to compare energy needed to separate molecules of substances. Molar enthalpies and structure.*		Available (F5 page)		3H	
	14			***4.3*** *Boyle's and Charles' laws. Calculations on the combined gas law:* $\frac{P1V1}{T1} = \frac{P2V2}{T2}$		Available (F5 page)		3H	
	15		**5. Chemistry of the Elements : Alkali metals and Alkaline-Earth metals.**	**5.1** Group I: Alkali metals. a) Action of metal on water and oxygen. b) Preparation of hydroxides, halides, sulphates, nitrates and carbonates.	-Investigate the effects of metal on water by dropping a piece of sodium metal in water -Test resulting solution with litmus	Available		3H	

	16			**5.1.** c) Properties (solubility and stability to heat) of hydroxides, halides, sulphates, nitrates and CO_3^{2-} **5.2.** Group II: Alkaline-earth metals. a) Action of metals on water and action of magnesium on acid. b) Preparation of oxide, hydroxide, carbonate and chloride	-Drop a piece of magnesium and calcium in cold and in warm water -Heat a piece of $CaCO_3$ on a crucible lid	Available		3H	
	17			c) Properties of oxide, hydroxide of magnesium and calcium. d) Hardness of water: Causes, effects, methods of removal (boiling, distillation, precipitation, washing soda and use of ion exchange. - Industrial uses of calcium carbonate.	-Using soap, wash your hands with rain water and tap water	Available		3H	
	18			**Revision and Evaluation**				3H	
			6. Chemistry of the Elements : Transition Metals.	**6.1** Position of Transition Metals in the Periodic Table General Characteristics				3H	
	19			**6.2.** Reactions of Iron and Copper				3H	
	20		**7. Chemistry of the Elements : Identification of ions**	**7.1** Use the flame test, physical properties and appropriate reagents to test for cations and	-Test for cations and anions			3H	
	21			**7.2** Use of appropriate reagents to identify anions				3H	
	22		**8. Principles of chemistry : Salts**	**8.1** Preparation of salts a) Soluble salts by action of acids on metals, metal hydroxides, metal oxides and metal carbonates. b) Insoluble salts by precipitation.	-Prepare each type of salt and collect a pure dry sample.			3H	
	23			**8.2** Solubility of some salts, sulphates, chlorides, nitrates, carbonates. Solubility curves.	-Determine solubility of salts & draw curve; get info from curve.			3H	
	24			**8.3** Action of heat on salts; carbonates, nitrates, sulphates, hydrated salts and ammonium salts. .	-Experiments on action of heat on substances.			3H	
	25			**8.4** Definition and examples of Deliquescent, hygroscopic and efflorescent compounds				3H	
	26			**Revision and Evaluation**	**END OF SECOND TERM**				

III	27		***9. Organic chemistry part 1 ; Hydrocarbons***	***9.1** Introduction: Definition, Characteristics, shapes and properties of organic compounds. Definition of a homologous series and general physical properties.*	*-Recall burning of kerosene in stoves/ lamps.* *- Demonstrate volatility of ethanol, flammability of gas, etc.*			3H	
	28			**9.2** Fractional distillation of crude oil, physical properties of products, uses of products, combustion of products. Cracking.				3H	
	29			**9.3** Alkanes: (C_1-C_4) Saturated hydrocarbons with General formula CnH2n +2.				3H	
	30			**9.3.** Preparation, manufacture, properties and uses. Isomerism of butanes.				3H	
	31			**9.4** Alkenes and Alkynes(C_1-C_4); Preparation, manufacture, properties and uses. Test for unsaturation. Polymerisation.	-Use Br_2/CCl_4 or Br_2/H_2O to test for alkenes and alkynes.			3H	
	32			**9.4** Alkenes and Alkynes(C_1-C_4); Preparation, manufacture, properties and uses. Test for unsaturation. Polymerisation.				3H	
	33			**Revision and Evaluation**					
	34			**General Revision**				3H	
	35			**Revision and Evaluation**				3H	
	36			**HOLIDAYS**					

NB: This scheme of work is summarised and should be used alongside the syllabus to put in all the details.

School: ……. Class: Form 5 **Hours per Week: 03** **Annual Teaching Hours: 90**

Teacher: …… Qualification: …… **Subject: CHEMISTRY Nº. of Periods per Week: 3**

***Official website of distance education lessons of MINESEC* : www.minesec-distancelearning.cm**

Term	Week		Topic/Subtopic	Lessons	Practical activity	Digitalized Lessons		Duration	Observation
						Available on DE Website	**Used by Teacher**		
I	1		**1. Principles of chemistry : Energetics**	**1.1** Latent heat: molar heat of fusion and evaporation as evidence of inter-particle forces. Enthalpy notation (ΔH) for exothermic and endothermic reactions.				3H	
	2			**1.2** Heat of reaction and calculations. Quantitative determination of enthalpies of: a)Combustion e.g. ethanol and methanol b)Neutralisation c)Solution d)Reaction Precipitation		Available		3H	
	3			**1.3**Simple energy level diagrams. Hess's law. (Principle of conservation of energy)				3H	
	4		***2. Principles of chemistry : Electrochemistry***	***2.1** a) Formation of ions.* *b) Define electrolyte and non-electrolyte, electrolysis, electrodes, anode, cathode, anion, cation and electrolytic cell (voltameter).*		Available		3H	
	5			***2.2** a) Migration of ions to Electrodes and Selective Discharge of ions* *b) Half Reactions and Overall Cell Reactions*		Available		3H	
	6			***Revision and Evaluation***				3H	
	7			***2.3** Electrolysis of:* a) *Molten electrolyte (Sodium Chloride or Lead Bromide)*	*-Electrolysis of $CuSO_4$(aq) using carbon and copper electrodes.*	Available		3H	

				b) *An aqueous electrolyte (i) Copper sulphate solution (ii) Acidified water (dil. H_2SO_4)*					
	8			***2.4** Faraday's laws of Electrolysis. Mathematical expression and related calculations*		Available		3H	
	9			***2.5** a) The Electrochemical Series* b) *The Electrochemical Cell* c) *Uses and Applications of Electrolysis. d) Redox reactions*		Available		3H	
	10			***2.5** a) The Electrochemical Series* b) *The Electrochemical Cell* c) *Uses and Applications of Electrolysis. d) Redox reactions*	*-Electroplate a piece of iron material with copper.*	Available		3H	
	11		**3. Principles of chemistry : Rates of reaction.**	**3.1** Factors which affect rate of reaction: surface area, concentration, temperature, catalyst. Homogeneous and heterogeneous reactions		Available		3H	
	12			**Revision and Evaluation**	**END OF FIRST TERM**			3H	
II	13			**3.2** Experiments to show effects of factors on rate of reaction and related graphs/curves.	-Experiments on rates of reactions	Available		3H	
	14		***4. Principles of chemistry : Reversible reactions***	***4.1** The concept of reversible reactions, equilibrium and its notation.* ***4.2** Equilibrium state :Open and closed systems.*				3H	
	15			***4.3** Le Chatelier's principle, factors affecting the equilibrium position and the yield of important products, such as in industrial processes: Haber/Contact process.*				3H	
	16		***5. Principles of chemistry : Solutions and Acid-Base Titration***	***5.1**Definition of Terms.* ***5.2** Preparation of standard solutions.*	*-Preparation of standard solutions and Acid- base titration*	Available		3H	
	17			***5.3**Titration Technique and calculations based on titration results*		Available		3H	

				5.4 *Calculations of concentrations from given amounts of substance and / or volume*					
	18			**Revision and Evaluation**				3H	
	19		***6. Organic chemistry part 2 : Alcohols and Carboxylic acids***	***6.1*** *Alcohols: (C_1-C_4) Preparation, manufacture, properties and uses.*				3H	
	20			***6.1*** *Alcohols: (C_1-C_4) Formation and polymerization of Esters.*				3H	
	21			***6.2*** *Carboxylic acids (C_1 to C_4) carboxylic acids as a homologous series containing the $–CO_2H$ group. Preparation, manufacture, properties and uses.*				3H	
	22			***6.3*** *Soap and detergents: Saponification - Uses -Properties of soap*	*-Production of soap from palm/kernel oil or alternative source.*			3H	
	23		**Topic III: Environmental Education and Sustainable development**	**7.1**The Electrochemical Series and principles underlining the Extraction of metals		Available		3H	
	24			**Revision and Evaluation**	**END OF SECOND TERM**				
III	25		**7. Chemistry in society: Extraction of metals.**	**7.2** The extraction of aluminium by electrolytic reduction Physical properties of aluminium.		Available		3H	
	26			**7.2** Extraction of iron and copper		Available		3H	
	27			**7.3** Extraction of titanium and Properties of these metals and their alloys related to their uses.		Available		3H	
	28		**8. Chemistry in society: Heavy chemical industries.**	**8.1** Sources of raw material: air, water, the sea, nitrates, limestone, iron oxides, sulphur, silicates, phosphates.		Available		3H	
	29			**8.2** Industrial manufacture of ammonia, nitric acid, Uses and effect on environment.		Available		3H	
	30			**8.2** Industrial manufacture of sulphuric acid Uses and effect on environment		Available		3H	
	31			**8.3** Industrial manufacture of sodium hydroxide, chlorine and hydrogen. Uses and effect on environment				3H	
	32			**Revision and Evaluation**					

	33			**8.4** Fertilizers: nitrogenous and phosphatic, composition and calculation of components.				3H	
	34			**8.5** Definition of Polymerization a) Addition polymers b) Condensation polymers c) natural polymers				3H	
	35			**General Revision and Evaluation**				3H	
	37			**HOLIDAYS**					

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REPUBLIC OF CAMEROON
Peace-Work-Fatherland
****
MINISTRY OF SECONDARY EDUCATION
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INSPECTORATE GENERAL OF EDUCATION
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INSPECTORATE OF PEDAGOGY IN CHARGE OF THE TEACHING OF SCIENCES
****
DEPARTMENT OF PHYSICS CHESMISTRY AND TECHNOLOGY
****

REPUBLIQUE DU CAMEROUN
Paix-Travail-Patrie
****
MINISTERE DES ENSEIGNEMENTS SECONDAIRES
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INSPECTION GENERALE DES ENSEIGNEMENTS
****
INSPECTION DE PEDAGOGIE CHARGEE DE L'ENSEIGNEMENT DES SCIENCES
****
SECTION PCT
****

SCHOOL YEAR: 20----/20----

HARMONISED NATIONAL SCHEMES OF WORK (PROGRESSIONS)

SECOND CYCLE

School: …… Class: LSS **Hours per Week: 08** **Annual Teaching Hours: 276**

Teacher: …… Qualification: …….. **Subject: CHEMISTRY. Nº. of Periods per Week: 08**

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Term	Week		Topic / Subtopic	Lessons	Practical activities	Digitalized Lessons		Duration	Observation
						Available on DE Website	Used by Teacher		
I	1		**Topic I: Matter: Properties and transformation.** **1. The Mole Concept**	**1.1.** Definitions: The Mole, Avogadro's constant, Relative atomic mass, relative molecular mass, molar mass **1.2.** Empirical and Molecular Formulae. **1.3.** Gas Laws and ideal gas equation.Mole quantities of gases, Molar Volume at s.t.p. and r.t.p. Experimental determination of the relative molecular mass of a volatile liquid, and calculations.	- Introduction to the chemistry laboratory and equipment. - Guidance on use of laboratory equipment	Available		6H	
	2			**1.4.** Mole quantities of solutions:concentrations of homogeneous solutions in mol dm^{-3} and g dm^{-3} **1.5.** Interpretation of chemical equations: yields of reactions and limiting reagents	- Preparation of a standard solution. - Using of burette, pipette, etc	Available		6H	

	3			**1.6.** Redox and oxidation numbers: Rules for assigning oxidation numbers. Writing and balancing redox equations.		Available		6H	
	4			**1.7.** Types of titrations and related calculations Acid-base titrations Redox titrations Precipitation titrations Complexometric titration Back titrations	-Acid-base titrations -Redox titrations	Available		6H	
	5		**2. Atomic Structure and Related Patterns in the Periodic Table**	**2.1.** The Atom and subatomic particles: discovery of electrons, protons, nucleus, neutrons and their characteristics.		Available		6H	
	6			**Revision and Evaluation**					
	7			**2.2.** The mass spectrometer: Functioning and uses. **2.3.** Radioactivity: Characteristics, uses and dangers of radiations, nuclear equations.		Available		6H	
	8			**2.4.** The electronic structure of atoms - electromagnetic spectrum		Available		6H	
				- absorption spectrum and - emission spectrum **2.5.** Atomic emission spectrum of hydrogen **2.6.** Experimental evidence of ionization energy		Available		6H	
	9			**2.7**. Building up principle and electronic configuration **2.8.** Description of s-orbitals, electron density, uncertainty principle and the wave-particle duality, shape of the porbital **2.9.** Electron affinity as converse of ionization energy, and definition of periodic trends		Available		6H	
	10			**3.1.** Types of chemical bonds **3.1.1.** The Ionic bond:Formation and characteristics of ionic compounds. **3.1.2.** Covalent bond: Formation and characteristics of covalent bonds				6H	

	11		**3. Bonding, Structure and Intermolecular Forces**	**3.1.3.** Intermediate bond types **3.1.4.** Metallic bond: Formation and characteristics of metals. **3.2.** Intermolecular Forces **3.2.1.** Van der Waals, dipole-dipole, hydrogen-bonding **3.2.2.** Effects of intermolecular forces on physical properties of substances.				6H	
	12			**Revision and Evaluation**	**END OF FIRST TERM**				
II	13			**3.3.** Shapes of simple molecules and ions **3.4.** Bonding, structure and physical properties	-Use of models to explain shapes of molecules			6H	
	14			**3.5.** Crystal structures 3.5.1. X-ray diffractions 3.5.2. Ionic solids 3.5.3. Covalent solids and molecular crystals				6H	
	15		**4. Organic Chemistry: Fundamentals and the chemistry of hydrocarbons**	**4.1.** Introduction Definition of organic chemistry. The peculiar nature of carbon. Brief review of bonding and hybridization of carbon. **4.2.** Classification of organic compounds **4.3.** Functional groups and homologous series	- Carry out practical work to identify functional groups such ascarbon to carbon double and triple bonds			6H	
	16			**4.4.** Isomerism **4.5.** Nomenclature				6H	
	17			**4.6.** Determination of structures 4.6.1. Isolation techniques; extraction, synthesis 4.6.2. Methods of purifying organic compounds 4.6.3. Qualitative analysis of elements					
	18			**Revision and Evaluation**					
	19			4.6.4. Quantitative analysis of elements 4.6.5. Empirical and molecular formulae 4.6.6. Spectroscopic techniques (U.V, IR, NMR, mass spectroscopy, x-ray diffraction) **4.7.** Types of organic reactions	- Carry out Lassaigne's tests			6H	
	20			**4.8.** Chemistry of hydrocarbons 4.8.1 Petroleum chemistry 4.8.2 Saturated H.C.s				6H	
				4.8.3 Unsaturated H.C.s					

	21			**4.8.** Chemistry of hydrocarbons 4.8.1 Petroleum chemistry 4.8.2 Saturated H.C.s 4.8.3 Unsaturated H.C.s	-Use of models to explain bonding in organic compounds			6H	
	22			**4.8.** Chemistry of hydrocarbons 4.8.4. Aromatic hydrocarbons 4.8.5. Pollution from organic compounds				6H	
	23			**5.1.** Introduction and Measurements of enthalpy changes. Hess' law and its applications.				6H	
	24			**Revision and Evaluation**	**END OF SECOND TERM**				
III	25		**Topic II: Energy: Applications and uses** **5. Thermochemistry and Enthalpy Changes**	**5.1.** Introduction and Measurements of enthalpy changes. Hess' law and its applications.	- Carry out practical work on measuring temperatures changes during neutralisation reactions			6H	
	26			**5.2.** Energetics of formation of covalent molecules **5.3.** Energetics of formation of ionic compounds				6H	
	27			**5.4.** Solvation **5.5.** Energy sources				6H	
	28		**Topic I: Matter: Properties and transformation.** **6. Descriptive Inorganic Chemistry**	**6.1.** The long form of the Periodic Table **6.2.** Periodicity (from Li to Ar)	- Practical work on identification of cations. -Identification of anions -Practical work on thermal decomposition of carbonates, nitrates and hydroxides of s-block elements			6H	
	29			**6.1.** The long form of the Periodic Table **6.2.** Periodicity (from Li to Ar)				6H	
	30			**Revision and Evaluation**					
	31			**6.3.** Periodic relationships amongst the oxides, chlorides and simple hydrides of elements of periods 2 & 3 (Li to Cl)				6H	
	32			**6.4.** Comparative study of the s-block elements				6H	
	33		**7. Raoult's law and phase Equilibria**	**7.1.** Equilibrium state **7.2.** One-component systems **7.3.** Two-component systems **7.4.** Solutions **7.5.** Ideal solutions				6H	
	34			**7.6.** Non-ideal solutions **7.7.** Non-miscible liquids				6H	
	35			General Revision				6H	
	36			General Revision				6H	
	36			**Revision and Evaluation**				6H	
	37			**HOLIDAYS**					

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- **The Hours in this progression sheet are for theory. In addition to this, 2 Hours (3 periods) should be allocated for practicals.**

School: …… Class: USS **Hours per Week:** 08 **Annual Teaching Hours:** 147

Teacher: …… Qualification: …… **Subject: CHEMISTRY** **Nº. of Periods per Week: 08**

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Term	Week		Topic / Subtopic	Lessons	Practical activities	Digitalized Lessons		Duration	Observation
						Available on DE Website	Used by Teacher		
I	1		**Topic I: Matter: Properties and transformation** **8. Equilibria**	**8.1. Chemical Equilibria** Concept of reversibility The equilibrium State Types of Equilibrium Equilibrium law and Equilibrium constants: Calculations		Available		6H	
	2			**8.1. Chemical Equilibria** Factors Affecting Equilibrium Position and State Solubility and Solubility Product Common Ion Effect Solvent Extraction		Available		6H	
	3			**8.2. Redox Equilibria** Qualitative Introduction; Balancing Redox Reactions. Metal/metal-ion and Ion/ion Systems; The Daniel Cell	-Practical work on redox tirations	Available		6H	
	4			**8.2. Redox Equilibria** Standard Electrode Potentials: The Hydrogen Electrode and Other Reference Electrodes Coupling Half-Cells and Measurement of Redox Potentials Uses of E^{θ} Values	-Practical work on redox titrations	Available		6H	

II	5			**8.3. Acid-Base Equilibria** Acid-Base theories; ionic product of water The pH meter; Calculation of pH of strong and weak Acids and Bases Dissolution of Salts in Solution and Calculation of pH Values	-Practical work acid-base titrations	Available		6H	
	6			**Revision and Evaluation**					
	7			**8.3. Acid-Base Equilibria** Acid-Base Indicators, Titrations and Titration Curves. Buffer solutions and salt hydrolysis.	-Practical work on acid-base titrations	Available		6H	
	9		**9. Organic chemistry 2 : Study of other organic compounds.**	**9.1** Halogenoalkanes and aromatic halogenobenzenes		Available		6H	
	10			**9.2** Alcohols, ethers and phenol	-Qualitative analysis tests on alcohols.	Available		6H	
	11			**9.3** Aldehydes and ketones	-Qualitative analysis tests on aldehydes and ketones			6H	
	12			**Revision and Evaluation**	**END OF FIRST TERM**				
	13			**9.4** Carboxylic acid and derivatives	Qualitative analysis tests on carboxylic acids and derivatives			6H	
	14			**9.5** Organic nitrogen compounds	Qualitative analysis tests on amines, amides, etc			6H	
	15		**10. Organic Chemistry 3: Reaction mechanisms and synthetic routes.**	**10.1** Reaction mechanisms in organic chemistry				6H	
	16			**10.2** Synthetic routes				6H	
	17		**11. Descriptive inorganic Chemistry:**	**11.1. Halogens** 11.1.1 The halogen group: Comparative study of the Halogens 11.1.2 Reactions of the halides	Qualitative analysis tests on halides			6H	
	18			**Revision and Evaluation**					
	19			11.1.2 Reactions of the halides 11.1.3 The idea of variable oxidation number				6H	
	20			**11.2. Group IV** 11.2.1 Study of trends 11.2.2 Compounds of Group IV elements	Qualitative analysis tests on Group IV cations			6H	

	21			**11.3. d-block metals** 11.3.1 Introduction 11.3.2 Variable oxidation states				6H	
	22			11.3.3 Complex compounds of transition metals 11.3.4 Stereo structures of complex ions 11.3.5 Magnetic and catalytic properties	Qualitative analysis tests on transition metal cations			6H	
	23			**12.1** Introduction **12.2** Rate determination				6H	
	24			**Revision and Evaluation**	**END OF SECOND TERM**				
	25		**12. Reaction kinetics**		Carry out practical work on rates of reactions.			6H	
III	26			12.3 Rate measurement				6H	
	27			**12.4** Order of reaction **12.5** Energy factors				6H	
	28			**12.6** Simple theories of kinetics **12.7** Catalysis				6H	
	29			**Revision and Evaluation**					
	30		**Topic III: Environmental education and sustainable development** **13. Aluminium, Sulphur and Nitrogen**	**13.1** Sulphur				6H	
	31			**13.2** Nitrogen				6H	
	32			**13.3** Pollution from organic compounds and heavy chemicals.				6H	
	33			**Revision and Evaluation**				6H	
				HOLIDAYS					

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