

THE PRESIDENT'S OFFICE- REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT

SCHEME OF WORK

TEACHER'S NAME:

SCHOOL'S NAME:

SUBJECT: CHEMISTRY

CLASS: FORM THREE

TERM: 1st& 2nd TERM

YEAR: 2024

COMPETENCE	OBJECTIVES	MONTH	WEEK	MAIN-TOPIC	SUB-TOPIC	PERIOD	TEACHING ACTIVITIES	LEARNING ACTIVITIES	T/L RESOURCES	REFERENCE	ASSESSMENT	REMARKS
By the end of the topic the student should have developed competences in manipulating chemical equations	By the end of the topic the students should be able to establish accurate quantities of the reacting substances in various chemical reactions	JANUARY	2	1.0 CHEMICAL EQUATIONS	1.1 Molecular equations	4	To assist students to discuss the rules of prediction reaction products and necessary steps needed in writing a formula equation and balance them	Students to discuss the rules of prediction reaction products and necessary steps needed in writing a formula equation and balance them	Wall charts marker pens symbols	TIE,(2005), CHEMISTRY FOR SECONDARY SCHOOL BOOK TWO, THP, DSMpg 1-3	Students to discuss the rules of prediction reaction products and necessary steps needed in writing a formula equation and balance them	
			3		1.2 Ionic equations	4	To lead a discussion on the differences between molecular and ionic equations	Students to discuss major steps of writing balanced ionic equations and balance them.	chemicals		Students to discuss major steps of writing balanced ionic equations and balance them.	
By the end of the topic the student should have developed competences in solving problems of hardness of water in daily life	By the end of the topic the students should be able to promote knowledge on hardness of water	FEBRUARY	4	2.0 HARDNESS OF WATER	2.1 The concept of Hardness of water	1	To guide students to discuss the meaning of hardness of water	students to discuss the meaning of hardness of water and distinguish hard water from soft water by washing with soap	Wall charts soap water(hard)&soft	TIE,(2005), CHEMISTRY FOR SECONDARY SCHOOL BOOK TWO, THP, DSMpg 5-9	students to discuss the meaning of hardness of water and distinguish hard water from soft water by washing with soap	
			1		2.2 Types of hardness of water	1	To guide students to carry out an experiment to determine temporary and permanent hard water and state their causes	Students to carry out an experiment to determine temporary and permanent hard water and state their causes	Source of heat wall charts		Students to carry out an experiment to determine temporary and permanent hard water and state their causes	
					2.3 Treatment and purification of hard water	2	To guide students to perform experiment on removal of hardness by using Ca(OH)_2 and its importance	Students to perform experiment on removal of hardness by using Ca(OH)_2 and its importance, state the importance of hard water in daily life	Ca(OH)_2		Students to perform experiment on removal of hardness by using Ca(OH)_2 and its importance, state the importance of hard water in daily life	
By the end of the topic the student should have developed competences in applying chemistry principles in understanding industrial	By the end of the topic the students should be able to realize chemistry principles in industrial processes	FEBRUARY	2 & 3	3.0 ACIDS, BASES AND SALTS	3.1 Acids and Bases	8	To guide students to collect natural sources of acids and bases, perform an experiment on the reactions of acid with metal,carbonates, oxides and hydroxides, determine reaction of alkali with different materials, prepare the clear solution of potash and discuss applications of neutralization reaction in	Students to collect natural sources of acids and bases, perform an experiment on the reactions of acid with metal,carbonates, oxides and hydroxides, determine reaction of alkali with different materials, prepare the clear solution of potash and discuss applications of neutralization reaction in	Lemon citrus fruits, vinegar, sour milk apples, wood ash,	TIE,(2005), CHEMISTRY FOR SECONDARY SCHOOL BOOK TWO, THP, DSMpg 12-27	Students to collect natural sources of acids and bases, perform an experiment on the reactions of acid with metal,carbonates, oxides and hydroxides, determine reaction of alkali with different materials, prepare the clear solution of potash and discuss applications of neutralization reaction in	

processes							daily life.	daily life.			daily life.	
		FE R U A R Y	4		3.2 Indicators	4	To guide students to prepare the indicator from red, yellow, pink flowers and test the acidity and alkalinity of substances using indicators	Students in groups to prepare the indicator from red, yellow, pink flowers and test the acidity and alkalinity of substances using indicators	Flowers water beakers		Students in groups to prepare the indicator from red, yellow, pink flowers and test the acidity and alkalinity of substances using indicators	
		M A R C H	1		3.3 Salts	4	To guide students to brainstorm on the natural sources of salts through questions and answers and analyze solubility of salts in water	Students to rainstorm on the natural sources of salts through questions and answers and analyze solubility of salts in water.	Samples of salts metals hydroxides, oxide		Students to rainstorm on the natural sources of salts through questions and answers and analyze solubility of salts in water.	
							To guide students to do experiment on preparation of soluble salts by reacting metal oxides and carbonates with dilute acids, examining heating effects on salts and explain uses of salts in daily life	Students to do experiment on preparation of soluble salts by reacting metal oxides and carbonates with dilute acids, examining heating effects on salts and explain uses of salts in daily life			Students to do experiment on preparation of soluble salts by reacting metal oxides and carbonates with dilute acids, examining heating effects on salts and explain uses of salts in daily life	
By the end of the topic the student should have developed competences in establishing accurate quantities of the reacting substances in various chemical reactions	By the end of the topic the students should be able to establish accurate quantities of the reacting substances in various chemical reactions	M A R C H	2	4.0 THE MOLE CONCEPT AND RELATED CALCULATIONS	4.1 The mole as a unit of measurement	4	To guide students to discuss the mole as a unit for amount of substances and guide students to construct the molar volume box of 22.4 liters capacity To lead students to discuss the relationship between the mole and the Avogadro's constant (L)	Students in groups to compare the mole with other units of measurements and construct the molar volume box Students to use a chemical balance to measure the molar masses of different compounds and discuss the Avogadro's constant		TIE, (2005) CHEMISTRY F3 & F4, LONGMAN, DSMpg 29-33	Students in groups to compare the mole with other units of measurements and construct the molar volume box and use a chemical balance to measure the molar masses of different compounds and discuss the Avogadro's constant	
			3		4.2 Application of the mole concept	4	To guide students to discuss the conversion of known masses of elements , molecules or ions to moles. Guiding students to discuss the conversion on known volumes of gases at s.t.p to moles To lead students to discuss the conversion of masses of solids or volumes of known gases to actual number of	students to discuss the conversion of known masses of elements , molecules or ions to moles Students to discuss the conversion on known volumes of gases at s.t.p to moles students to discuss the	Periodic table wall chart molar volume box manila cards	TIE, (2005) CHEMISTRY F3 & F4, LONGMAN, DSMpg 35-38	students to discuss the conversion of known masses of elements , molecules or ions to moles to discuss the conversion on known volumes of gases at s.t.p to moles to discuss the conversion of masses of solids or volumes of known gases to actual number of particles	

		M A R C H	4			4	particles To guide students to discuss the methods used to dissolve different substances in water To guide students to perform some calculation based on the mole concept and balanced equations in groups and then individually	conversion of masses of solids or volumes of known gases to actual number of particles students to discuss the methods used to dissolve different substances in water students to perform some calculation based on the mole concept and balanced equations in groups and then individually	magic markers		students to discuss the methods used to dissolve different substances in water and perform some calculation based on the mole concept and balanced equations in groups and then individually	
By the end of the topic the student should have developed competences in using the concept of volumetric analysis in solving daily life problems	By the end of the topic the students should be able to establish accurate quantities of the reacting substances in various chemical reactions		4	5.0 VOLUMETRIC ANALYSIS	5.1 Standard volumetric apparatus	2	To demonstrate to students to brainstorm on how volumetric analysis is used to determine unknown volumes and concentration of volumetric analysis To guide students on how to use volumetric analysis apparatus	students to brainstorm on how volumetric analysis is used to determine unknown volumes and concentration of volumetric analysis Students to use water on practice of taking accurate measurements of liquid volumes using pipettes and burettes	Burette pipette conical flask beakers		students to brainstorm on how volumetric analysis is used to determine unknown volumes and concentration of volumetric analysis and use water on practice of taking accurate measurements of liquid volumes using pipettes and burettes	

MIDTERM TEST

MIDTERM BREAK 28TH MARCH – 08TH APRIL 2024

		A P R I L	2		5.2 Standard solutions	4	To guide students to interpret the data on the tables of containers carrying commercial acid and demonstrate to student how to carry out the dilution and how to prepare basic solution	Students in groups to discuss the preparation of standard solutions of common acids and bases and practice to perfection the titration process and reading volumes on a burette correct to two decimal places and data recording	Basic solutions commercial acids		Students in groups to discuss the preparation of standard solutions of common acids and bases and practice to perfection the titration process and reading volumes on a burette correct to two decimal places and data recording	
			3		5.3 Volumetric calculations	4	To guide students in groups and then individually to prepare a standard solution of sodium carbonate and carry out the titration and work out the relative mass of the unknown element To guide students in groups and individually in the titration experiment find out the percentage purity or	Students in groups and then individually to use the standard sodium carbonate solution to standardize dilute HCl acid Students in groups and individually in the titration experiment find out the percentage purity or impurity of an acid or an alkali Students in groups and	Measuring cylinders pipette white tiles titration flasks	TIE, (2005) CHEMISTRY F3 & F4, LONGMAN, DSMpg 39-41	Students in groups and then individually to use the standard sodium carbonate solution to standardize dilute HCl acid the titration experiment find out the percentage purity or impurity of an acid or an alkali	

						impurity of an acid or an alkali To lead a discussion on students activities with emphasis on accuracy	individually to carry out an experiment to find out number of moles of water of crystallization			to carry out an experiment to find out number of moles of water of crystallization	
			4		5.4 Application of volumetric analysis	4 To lead students to discuss the usefulness of volumetric analysis To organize a study visit and provide guidelines to students	Students to discuss the usefulness of volumetric analysis Students in groups to discuss the findings from the study visit	Wall charts		Students to discuss the usefulness of volumetric analysis And discuss the findings from the study visit	
By the end of the topic the student should have developed competences in applying chemistry principles in understanding industrial processes	By the end of the topic the students should be able to understand effects of electricity on chemical substances	MAY	1	6.0 IONIC THEORY AND ELECTROLYSIS	6.1 Ionic Theory	4 To guide students to discuss electrolytes, non electrolytes, weak and strong electrolytes and categorize them	students to discuss electrolytes, non electrolytes, weak and strong electrolytes and categorize them	Common salt wax ethanol sugar		students to discuss electrolytes, non electrolytes, weak and strong electrolytes and categorize them	
			2		6.2 The Mechanism of Electrolysis	4 To guide students to set up the experiment and discuss the migration of ions during electrolysis To guide students to carry out experiments using different electrodes and electrolytes and identify the products at each case	Students in groups and then individually to set up an experiment and discuss the migration of ions Students in groups and then individually to carry out experiments using different electrolytes and electrodes and identify the products at each case	Carbon rod copper rod sulphuric acid wall charts	TIE and Bob McDuell, SECONDARY CHEMISTRY F3 & F4, (2005) LONGMAN, DSM pg 42-51	Students in groups and then individually to set up an experiment and discuss the migration of ions And carry out experiments using different electrolytes and electrodes and identify the products at each case	
			3		6.3 Laws of electrolysis	4 To guide students to measure the mass of solid deposited on or eroded from an electrode by a specific current supplied for a specific time and verify faradays first and second laws of electrolysis To supervise students to discuss the mathematical interpretation of the faraday's second law of electrolysis	students to measure the mass of solid deposited on or eroded from an electrode by a specific current supplied for a specific time and verify faradays first and second laws of electrolysis students to work out some calculations based on the second law	Electrolytic cell chemical balance copper rods		students to measure the mass of solid deposited on or eroded from an electrode by a specific current supplied for a specific time and verify faradays first and second laws of electrolysis and work out some calculations based on the second law	
			4		6.4 Application of electrolysis	4 To guide students to discuss the purification of copper by electrolysis and essential steps for electroplating an object	students to discuss the purification of copper by electrolysis and essential steps for electroplating an object	Spoon copper rod wall charts		students to discuss the purification of copper by electrolysis and essential steps for electroplating an object	
By the end of the topic the student should have developed competences in describing the	By the end of the topic the students should be able to explain the speeds of various chemical reaction		4	7.0 CHEMICAL KINETICS, EQUILIBRIUM &ENERGETICS	7.1 the rate of chemical reactions	4 To guide students to discuss the concept of rapid and slow reactions	Students to demonstrate a very rapid reaction by mixing KI with lead nitrate solutions and aqueous silver	Manila sheets test tube graph papers nails		Students to demonstrate a very rapid reaction by mixing KI with lead nitrate solutions and aqueous silver And measure the rate of evolution of hydrogen when	

speeds of reactions	in daily life						To guide students to carry out a slow reaction by allowing iron nails to rust under favorable conditions	Students to measure the rate of evolution of hydrogen when zinc is dissolved in dilute HCl Acid	water		zinc is dissolved in dilute HCl Acid	
TERMINAL EXAMINATIONS												
TERMINAL LEAVE 31TH MAY – 01TH JULY 2024												
		J U L Y	4		7.2 factors affecting the rate of chemical reactions	4	To guide students to use dil. Hcl and Na ₂ S ₂ O ₃ to study the effect of concentration on the rate of precipitation of sulphur	students to use dil. Hcl and Na ₂ S ₂ O ₃ to study the effect of concentration on the rate of precipitation of sulphur	Mortor and pestle	TIE and Bob McDuell, SECONDARY CHEMISTRY F3 & F4, (2005) LONGMAN, DSM pg. 54-66	students to use dil. Hcl and Na ₂ S ₂ O ₃ to study the effect of concentration on the rate of precipitation of sulphur	
							To guide students to use dil. Hcl and Na ₂ S ₂ O ₃ to study the effect of temperature on the rate of precipitation of sulphur	To guide students to use dil. Hcl and Na ₂ S ₂ O ₃ to study the effect of temperature on the rate of precipitation of sulphur and plot a graph	stop watches		to use dil. Hcl and Na ₂ S ₂ O ₃ to study the effect of temperature on the rate of precipitation of sulphur and plot a graph	
							To instruct students to use blocks of CaCO ₃ and its powder to study the effect of particles size on the rate of evaluation of carbon dioxide when reacted with dil. Hcl acid	students to use blocks of CaCO ₃ and its powder to study the effect of particles size on the rate of evaluation of carbon dioxide when reacted with dil. Hcl acid	measuring cylinders		use blocks of CaCO ₃ and its powder to study the effect of particles size on the rate of evaluation of carbon dioxide when reacted with dil. Hcl acid	
							To guide students in groups to use solid MnO ₂ to study the effect of the catalyst on the rate of evolution of oxygen from H ₂ O ₂ .	students in groups to use solid MnO ₂ to study the effect of the catalyst on the rate of evolution of oxygen from H ₂ O ₂ and plot a graph	sylinges		to use solid MnO ₂ to study the effect of the catalyst on the rate of evolution of oxygen from H ₂ O ₂ and plot a graph	
		A U G U S T	1		7.3 Reversible and Irreversible reactions	4	To guide students to discuss the concept of reversible and irreversible processes and demonstrate one reaction in each case	Students in groups to perform an experiment on reversible and irreversible reactions and discuss the results obtained	graph papers		Students in groups to perform an experiment on reversible and irreversible reactions and discuss the results obtained	
									Heat source litmus paper ice			
			2		7.4 Equilibrium reaction	4	To guide students to discuss the differences and similarities between equilibrium reactions and reversible reactions	students to discuss the differences and similarities between equilibrium reactions and reversible reactions and give examples	Wall charts showing Haber process		students to discuss the differences and similarities between equilibrium reactions and reversible reactions and give examples	
							To guide students to discuss the factors affection the position of equilibrium	students to discuss the factors affection the position of equilibrium according to Le Chateliers principle				

			3		7.5 Endothermic and exothermic reactions	2	To guide students to discuss the concept of endothermic and exothermic reactions To guide students to discuss the special features of energy level diagrams for exothermic and endothermic reactions	Students to discuss the concept of endothermic and exothermic reactions students to discuss the special features of energy level diagrams for exothermic and endothermic reactions	Wall charts diagrams		Students to discuss the concept of endothermic and exothermic reactions And discuss the special features of energy level diagrams for exothermic and endothermic reactions	
By the end of the topic the student should have developed competences in using technological skills in extraction of metals and conservation of environment	By the end of the topic the students should be able to recognize the appropriate methods of extraction of metals and the consequences of environmental destruction	AUGUST	4	8.0 EXTRACTION OF METALS	8.1 Occurrence and Location of Metals in Tanzania	2	To guide students to discuss the distribution of metal ores in Tanzania and their types and abundances	students to discuss the distribution of metal ores in Tanzania and their types and abundances	Wall charts maps	TIE Bob McDuell SECONDARY CHEMISTRY F3 &F4(2005) LONGMAN, DSMpg71-76	students to discuss the distribution of metal ores in Tanzania and their types and abundances	
			4		8.2 Chemical properties of metals	2	To elaborate on that sodium and potassium are very weak physically but they are among the strongest metals chemically To lead a discussion on the reactivity of different metals with water and steam to include K, Na, Ca Mg, Al, Zn, Pb, Cu	Students to demonstrate the reactivity of different metals and write electronic configuration of the common metals to show the stability obtained after losing electrons Students to discuss on the reactivity of different metals with water and steam to include K, Na, Ca Mg, Al, Zn, Pb, Cu	Periodic table charts sample of different metals		Students to demonstrate the reactivity of different metals and write electronic configuration of the common metals to show the stability obtained after losing electrons	
MIDTERM TEST												
MIDTERM BREAK 30 TH AUGUST – 16 TH SEPTEMBER 2024												
		SEPT	4		8.3 extraction of metal by electrolytic reduction	4	To guide students to discuss how the reactivity series is used to select the best method for extracting a metal from its ore and explain the extraction of sodium metal by Down's process	students to discuss how the reactivity series is used to select the best method for extracting a metal from its ore and explain the extraction of sodium metal by Down's process	Wall charts		students to discuss how the reactivity series is used to select the best method for extracting a metal from its ore and explain the extraction of sodium metal by Down's process	
			OCTOBER		1	8.4 extraction of metal by chemical reduction	2	To guide students to discuss the extraction of iron in the blast furnace	Students to discuss and write the important reaction equations taking place in the blast furnace	Wall charts		Students to discuss and write the important reaction equations taking place in the blast furnace
						8.5 environmental consideration	2	To guide students to visit the following sites: Quarries, Mineral mines, Coal mines and lead a discussion on environmental destruction and their implications	students to visit the following sites: Quarries, Mineral mines, Coal mines and lead a discussion on environmental destruction and their implications	Land maps wall charts		students to visit ,Quarries, Mineral mines, Coal mines and lead a discussion on environmental destruction and their implications

By the end of the topic the student should have developed competences in using technological skills in extraction of metals and conservation of environment	By the end of the topic the students should be able to recognize the appropriate methods of extraction of metals and the consequences of environmental destruction	O C T O B E R	2	9.0 COMPOUNDS OF METALS	9.1 Oxides	4	To guide students to prepare metal oxides by heating elements calcium and magnesium in air and discuss the results To guide students in groups to use guideline to test and classify metal oxides into groups of soluble, insoluble, basic and amphoteric To guide students in groups to discuss the uses of oxides of metals	students to prepare metal oxides by heating elements calcium and magnesium in air and discuss the results students in groups to use guideline to test and classify metal oxides into groups of soluble, insoluble, basic and amphoteric students in groups to discuss the uses of oxides of metals	Wall charts sample of different metals heat source	TIE Bob McDuell SECONDARY CHEMISTRY F3 &F4(2005) LONGMAN, DSM pg.78-79	students to prepare metal oxides by heating elements calcium and magnesium in air and discuss the results and use guideline to test and classify metal oxides into groups of soluble, insoluble, basic and amphoteric and discuss the uses of oxides of metals	
			3		9.2 Hydroxides	4	To guide students in their work and make general comment To provide guidelines to students on the properties and uses of metal hydroxides	Students to prepare the hydroxide of calcium by adding the metal directly in water Students to prepare insoluble hydroxides by reaction the solutions of NaOH, KOH with aqueous solutions of soluble salts and classify metal hydroxides Using guidelines students to perform experiments on the chemical properties of some common metal hydroxides and state their uses	KOH NaOH water chlorides of Fe, Mg, Zn, Cu beakers test tube		Students to prepare the hydroxide of calcium by adding the metal directly in water And prepare insoluble hydroxides by reaction the solutions of NaOH, KOH with aqueous solutions of soluble salts and classify metal hydroxides perform experiments on the chemical properties of some common metal hydroxides and state their uses	
		O C T O B E R	4		9.3 Carbonates and Hydrogen carbonates	4	To supervise students' work and give general comments To provide guidelines to students to find the properties of metal carbonates and their uses	Students to prepare soluble carbonated by passing carbon dioxide to an alkali and then prepare insoluble carbonates by passing excess of carbon dioxide into lime water, and prepare precipitate insoluble carbonates by adding sodium carbonate solution to a solution of a salt of a heavy metal eg, CuSO₄ Students in groups to prepare a table of soluble and insoluble carbonates Using guidelines students to determine the chemical properties of metal	Carbonates of metals wall charts lab. apparatus		Students to prepare soluble carbonated by passing carbon dioxide to an alkali and then prepare insoluble carbonates by passing excess of carbon dioxide into lime water, and prepare precipitate insoluble carbonates by adding sodium carbonate solution to a solution of a salt of a heavy metal eg, CuSO₄ to prepare a table of soluble and insoluble carbonates	

	N O V E M B E R					carbonates and their uses					
		1		9.4 Nitrates	2	To demonstrate on the preparation of metal nitrates and explain their chemical properties To guide students to discuss the uses of metal nitrates	Students in groups to carry out an experiment to identify a nitrate from unknown mixtures, in the solid, and liquid form Students to discuss the uses of metal nitrates	Wall charts		Students in groups to carry out an experiment to identify a nitrate from unknown mixtures, in the solid, and liquid form And discuss the uses of metal nitrates	
				9.5 Chlorides	2	To guide students to prepare insoluble chlorides by adding Hcl in an aqueous salt of lead or silver. To guide students to discuss chemical properties of metal chlorides and their uses	Students to prepare soluble chlorides by mixing dil. Hcl with oxides, hydroxides, carbonates and metals students to discuss chemical properties of metal chlorides and their uses	Litmus paper any alkali	TIE, (2005) CHEMISTRY F3 & F4, LONGMAN, DSM pg 86-88	Students to prepare soluble chlorides by mixing dil. Hcl with oxides, hydroxides, carbonates and metals And to discuss chemical properties of metal chlorides and their uses	
		2		9.6 Sulphates	4	To supervise students in their work and give general comments	Students to dissolve a metal, a carbonate, a hydroxide or an oxide in dil. H ₂ SO ₄ and isolate the crystal Students to perform an experiment to study the properties of sulphates and describe their uses	Wall charts lab. Reagents		Students to dissolve a metal, a carbonate, a hydroxide or an oxide in dil. H ₂ SO ₄ and isolate the crystal To perform an experiment to study the properties of sulphates and describe their uses	
		2 3	REVISION								
		ANNUAL EXAMS & ANNUAL HOLIDAYS									