S1 CHEMISTRY SCHEME OF WORK 2021-2022

Academic year: 2021-2022 **Term**: I **School**:…… ……. **Subject**: CHEMISTRY
Subject leader's: …… **Class** : S1 **Number of period per week**: 4

Dates & number of week	Units title	Lessons and evaluation	Learning objectives + units competences	Teaching methods & techniques and evaluation procedures	Resources and references	Observation
Week 1 11-15/10/2021	**Unit1:** CHEMISTRY AND SOCIETY	**Lesson title1-2:** Introduction and definition of chemistry Why do we study chemistry? **Lesson title3** application of chemistry in daily life **Lesson title 4**Application of chemistry in Rwanda traditional context **Lesson title 5** Application of chemistry in Rwanda	**Knowledge and understanding:** -Explain the importance of chemistry in daily life. -Explain the reasons for studying chemistry in secondary schools. -Identify chemistry related careers. State the contribution of chemistry to the Rwandan economy. **Skills:** -Link chemistry	Group discussion -Observation in groups -Research from library or internet -Project work -Watching video Evaluation procedures (oral, written, practical, …)	***Resources:*** -Computers, projectors, flip charts and internet connection. *Books:* *-New Chemistry teacher's guide for S_1, S_2 and S_3 , 2010* *-Ordinary level chemistry syllabus ,2015* *- Chemistry the central*	

			applications to culture and work. -Write a standard report on field visits and findings of research. -Present the findings of the research and field visits in a convincing way. **Attitudes and values:** -Appreciate the need to study chemistry in secondary schools. -Develop a culture of cooperation and working in a team. -Develop self-confidence to deliver presentations.	Group discussion -Observation in groups -Research from library or internet -Project work -Watching video Evaluation procedures (oral, written, practical, …)	*science -Cambridge-igcse-chemistry-teachers-resource-fourth-edition, 2014 -cambridge-international-as-and-a-level-chemistry-coursebook-second-edition, 2014* -Tony ONEN(2016) *chemistry course for rwanda secondary schools* Excel education partners publisher	
		Summative Evaluation	**Key unit competence:** To be able to Appreciate the scientific, social, economic, environmental and	**Evaluation procedures: (oral, written, practical)**		

			technological implications of chemistry.			
Week2 18-22/10/21	**Unit 2:** LABORATORY SAFETY AND APPARATUS	**Lesson title 1:** Definition of Laboratory and laboratory rules. **Lesson title2** laboratoty safety and precautions	**Knowledge and understanding:** -State the safety rules and precautions usually followed in a chemistry laboratory. -Explain the uses of common laboratory apparatus. **Skills:** -Appropriately interpret warning signs about dangers and hazards. -Effectively use and handle common laboratory apparatus /equipment. - Draw common laboratory apparatus. **Attitudes and values:**	Group discussion -Observation in groups -Research from library or internet -Project work -Watching video Evaluation procedures (oral, written, practical, …)	***Resources:*** -Computers, projectors, flip charts and internet connection. *Books:* *-New Chemistry teacher's guide for S_1, S_2 and S_3 , 2010* *-Ordinary level chemistry syllabus ,2015* *- Chemistry the central science* *-Cambridge-igcse-chemistry-teachers-resource-*	
Week3 25-29/10/21		**Lesson title 3:** Laboratory apparutus and their uses. **Lesson title 4:** Apparutus for measuring and their uses.				

			-Respect laboratory rules and regulations. -Take care of oneself, colleagues, individual and public materials. -Develop confidence in the use of laboratory apparatus.		*fourth-edition, 2014 -cambridge-international-as-and-a-level-chemistry-coursebook-second-edition, 2014* -Tony ONEN(2016) *chemistry course for rwanda secondary schools* Excel education partners publisher	
		Summative Evaluation	**Key unit competency:** To be able to use effectively laboratory equipment/materials to carry out experiments.	**Evaluation procedures: (oral, written, practical)**		
Week 4	**unit 3:**	**Lesson title1**-State	**Knowledge and**	Group discussion	***Resources:***	

1-5/11/21	STATES AND CHANGES OF STATES OF MATTER	of matter and example. **Lesson title 2**- changes of matter state	**understanding:** -Explain the states of matter using kinetic theory. -State differences between physical and chemical changes of matter and give examples of each. -Explain the factors that affect the rate of diffusion. **Skills:** -Interpret a graph of temperature against time for a substance changing state. -Perform experiments to show the change of state of matter. -Carry out experiments to distinguish between physical and chemical changes. **Attitudes and**	-Observation in groups -Research from library or internet -Project work Watching video Evaluation procedures (oral, written, practical	-Computers, projectors, flip charts and internet connection. *Books:* *-New Chemistry teacher's guide for S_1, S_2 and S_3 , 2010* *-Ordinary level chemistry syllabus ,2015* *- Chemistry the central science* *-Cambridge-igcse-chemistry-teachers-resource-*	
Week 5 **8-12/11/21**		**Lesson title3** Difference of chemical and physical changes. **Lesson tile 4** Kinetic theories of matter. **Lesson title 5** Brownian motion				

			values: -Develop a teamwork approach during group activities and experiments. -Develop self-confidence in experiments and the presentation of findings.		*fourth-edition, 2014 -cambridge-international-as-and-a-level-chemistry-coursebook-second-edition, 2014* -Tony ONEN(2016) *chemistry course for rwanda secondary schools* Excel education partners publisher	
		Summative Evaluation	**Key unit competency:** To be able to relate properties of matter to daily life physical and chemical phenomena.	**Evaluation procedures: (oral, written, practical)**		
Week 6 15-19/11/21	**Unit 4: Pure substances and mixtures.**	**Lesson title1** Difference of pure substance and mixture. **Lesson title 2** Types of mixtures.	**Knowledge and understanding:** -Differentiate between pure substances and mixtures. -Identify different types of mixtures.	Group discussion -Observation in groups -Research from library or internet -Project work Watching video Evaluation procedures	***Resources:*** -Computers, projectors, flip charts and internet connection.	
Week 7 22-		**Lesson title3** Methods of				

26/11/21		separating of mixtures.	-Describe different methods of separating mixtures. -State applications of each separation technique. **Skills:** -Apply a suitable separation technique for a given mixture. -Interpret a simple chromatogram. -Calculate percentage composition by mass and by volume. **Attitudes and values:** -Develop a responsible attitude to team work in group activities. -Appreciate the importance of pure substances and mixtures in daily life.	(oral, written, practical	*Books:* *-New Chemistry teacher's guide for S_1, S_2 and S_3 , 2010* *-Ordinary level chemistry syllabus ,2015* *- Chemistry the central science* *-Cambridge-igcse-chemistry-teachers-resource-fourth-edition, 2014* *-cambridge-international-as-and-a-level-chemistry-coursebook-second-*	
		Summative	**Key unit competency:**	**Evaluation**		

		Evaluation	To be able to separate mixtures and determine their composition.	**procedures: (oral, written, practical)**	*edition, 2014* -Tony ONEN(2016) *chemistry course for rwanda secondary schools* Excel education partners publisher	
Week 8 **29/11-3/12/21**	Unit 5: ATOMS AND ELEMENTS	**Lesson title 1** Definition of element, atom and molecule. **Lesson title 2:** Symbol of chemical elements	**Knowledge and understanding:** -Distinguish between an element and a compound. **Skills:** Write the symbols of different chemical elements. **Attitudes and values:** Appreciate the uniqueness of atoms of elements.	Group discussion -Observation in groups -Research from library or internet -Project work Watching video Evaluation procedures (oral, written, practical	***Resources:*** -Computers, projectors, flip charts and internet connection. **-Periodic Table**	
Week 9 **6-10/12/21**	**REVISION**					

Week 10 13-17/12/21	**EXAMINATIONS OF FIRST TERM**	
Week 11 20-24/12/21	**MARKING & SCHOOL REPORT**	

TERM 2

Dates & number of week	**Units title**	**Lessons and evaluation**	**Learning objectives + units competences**	**Teaching methods & techniques and evaluation procedures**	**Resources and references**	**Observation**
Week1 10-14/1/22	Unit 5: ATOMS, ELEMENTS AND COMPOUNDS.	**Lesson title 3**: Main components of an atom **Lesson title 4**: Atomic number(Z),mass number(A) and isotopes.	**Knowledge and understanding:** -Name the different sub-particles of an atom and their properties. -Explain the concept of isotopes. **Skills:** -Write the electronic configuration of the first 20 elements in	-Group discussion -Observation in groups -Research from library or internet -Project work Watching video Evaluation procedures (oral, written, practical	***Resources:*** -Computers, projectors, flip charts and internet connection. *Books:* *-New Chemistry teacher's guide for S_1, S_2 and S_3 ,*	
Week2 17-21/1/22		**Lesson title 5:** Electronic configuration of the first twenty elements of periodic table.				
Week 3		**Lesson title 6:**				

24-28/1/22		Drawing the atomic structures **Lesson title 7:** Outer most and inner electron shells.	terms of energy levels. -Determine the number of protons, neutrons and electrons from atomic numbers and mass. **Attitudes and values:** Appreciate the uniqueness of atoms of elements. -Appreciate the role of an atom as the building block or unit of matter. -Appreciate that atoms of elements combine to form compounds.		*2010 -Ordinary level chemistry syllabus ,2015* *- Chemistry the central science*	
Week 4 31/1-4/2/22		**Lesson title 8:** Lewis representation of electronic configuration. **Lesson title 9**: Stability of atom.				
		Summative Evaluation	**Key unit competency:** To be able to comprehend the structure of an	**Evaluation procedures: (oral, written, practical)**		

			atom and relate the valency to the chemical formulae of compounds.			
Week 5 7-11/2/22	**Unit 6:** ARRANGEMENT OF ELEMENTS IN THE PERIODIC TABLE.	**Lesson title 1:** Position of an element in the modern periodic table. **Lesson title 2:** Metallic and non-metallic trend in the periodic table.	**Knowledge and understanding:** -Describe the historical evolution of the modern Periodic Table. -State the trends in metallic and nonmetallic character of elements across a period and down a group of the Periodic Table. **Skills:** Deduce the position of an element in the Periodic Table from its electronic configuration. **Attitudes and values:**	-Group discussion -Observation in groups -Research from library or internet -Project work Watching video Evaluation procedures (oral, written, practical	***Resources:*** -Computers, projectors, flip charts and internet connection. *Books:* *-New Chemistry teacher's guide for S_1, S_2 and S_3 , 2010* *-Ordinary level chemistry syllabus ,2015* *- Chemistry the central science*	

			Appreciate the importance of classifying elements in the Periodic Table.			
		Summative Evaluation	**Key unit competency:** To be able to use the atomic number, valence electrons and number of shells to classify the first 20 elements in the Periodic Table.	**Evaluation procedures: (oral, written, practical)**		
Week 6 14-18/2/22	**Unit 7:** WATER AND ITS COMPOSITION.	**Lesson title1-2:** Water sources and Physical properties of water **Lesson title3:** Testing the presence of water **Lesson title4**: Characteristics of different categories of water.	**Knowledge and understanding:** -State the physical properties of pure water. -Outline the steps involved in the treatment and purification of water. -Explain the water cycle and its importance in daily life.	-Group discussion -Observation in groups -Research from library or internet -Project work Watching video Evaluation procedures (oral, written, practical	***Resources:*** -Computers, projectors, flip charts and internet connection. *Books:* *-New Chemistry teacher's guide for S_1, S_2 and S_3 ,*	

Week 7 21-25/2/22		**Lesson title5:** Treatment and purification of water. **Lesson title6:** Uses of water **Lesson title7**: Water cycle	-Differentiate between pure water and clean water. **Skills:** -Perform experiments to the show properties of water. -Test for the presence of water in any given substance in the laboratory. **Attitudes and values:** -Develop the sense for the importance of managing natural resources correctly. -Appreciate the value of clean water for our health.		*2010 -Ordinary level chemistry syllabus ,2015* *- Chemistry the central science* *-Cambridge-igcse-chemistry-teachers-resource-fourth-edition, 2014* *-cambridge-international-as-and-a-level-chemistry-coursebook-second-edition, 2014* -Tony ONEN(2016) *chemistry course for rwanda*	
		Summative Evaluation	**Key unit competency:** To be able to state standard requirements for	**Evaluation procedures: (oral, written, practical)**		

			different categories of water and explain steps involved in water treatment.		*secondary schools* Excel education partners publisher	
Week8 28/2-04/3/22	**Unit 8:** AIR COMPOSITION AND POLLUTION.	**Lesson title1:** Components of air and their percentages **Lesson title2:** Active and inactive part of the air	**Knowledge and understanding:** -State the main components of air and their percentages. -Define air pollution. -State the major air pollutants and their sources. -Discuss the different ways of preventing air pollution. **Skills:** -Carry out an experiment to determine the percentage of oxygen in the atmosphere. **Attitudes and**	-Group discussion -Observation in groups -Research from library or internet -Project work Watching video Evaluation procedures (oral, written, practical,)		
Week 9 7-11/3/22		**Lesson title3:** Importance of the air. **Lesson title4:** Air pollution. **Lesson title5:** Effects of air pollution and its prevention methods.				

			values: Develop a culture of managing natural resources.			
		Summative Evaluation	**Key unit competency:** To be able to assess the components of air and analyse the causes of air pollution and its prevention.	**Evaluation procedures: (oral, written, practical)**		
Week 10 14-18/3	**REVISION**					
Week 11 21-25/3/22	**EXAMS**					
Week 12 28-31/3/22	**SCHOOL REPORTS**					

TERM 3

Dates & number of week	Units title	Lessons and evaluation	Learning objectives + units competences	Teaching methods & techniques and evaluation procedures	Resources and references	Observation
Week 1 **18-22/4/22**	UNITY 9: WASTE MATERIALS	**Lesson title1**: Definition and types of wastes **Lesson title2**: Sources of wastes **Lesson title3**: sources of wastes at school level **Lesson title4**:Hazard of wastes to environment.	**Knowledge and understanding:** -Define a waste material. -Identify different types of wastes. -Identify the hazards of wastes to people and the environment. -Identify different sources of waste materials. **Skills:** -Categorise waste materials according to their nature and sources. -Identify the solid, liquid and gaseous wastes in the school environment.	-Group discussion -Observation in groups -Research from library or internet -Project work Watching video Evaluation procedures (oral, written, practical,)	***Resources:*** -Computers, projectors, flip charts and internet connection. *Books:* *-New Chemistry teacher's guide for S_1, S_2 and S_3 , 2010* *-Ordinary level chemistry syllabus ,2015*	

			Attitudes and Values: -Develop a sense of responsibility to maintaining a clean environment.		- *Chemistry the central science -Cambridge-igcse-chemistry-teachers-resource-fourth-edition, 2014 -cambridge-international-as-and-a-level-chemistry-coursebook-second-edition, 2014* -Tony ONEN(2016) *chemistry course for rwanda secondary schools* Excel	
		Summative Evaluation	**Key unit competency:** To be able to minimise and properly manage waste materials.	**Evaluation procedures: (oral, written, practical)**		
Week 2 25-29/4/22	UNITY 10: CHEMICAL EQUATIONS	**Lesson title1**: Chemical reactions Balancing chemical equations **Lesson title 2:** Law of conservation of matter. **Lesson title 3:** Interpreting and translating word equation and chemical equations.	**Knowledge and understanding:** -State the law of conservation of matter. -Explain how a chemical equation relates to the law of conservation of matter. -State the rules of balancing equations. **Skills:** -Relate a chemical equation to a chemical reaction.	Group discussion -Observation in groups -Research from library or internet -Project work Watching video Evaluation procedures (oral, written, practical,		

			-Write balanced chemical reactions with state symbols. -Translate a word equation into a chemical equation and vice-versa. **Attitudes and Values:** Develop confidence in writing and interpreting chemical formula and equations.		education partners publisher ***Resources:***	
		Summative Evaluation	**Key unit competency:** To be able to write and use balanced chemical equations.	**Evaluation procedures: (oral, written, practical)**	-Computers, projectors, flip charts and internet connection.	
Week 3 **2-6/5/22**	Unit 11: ACIDS BASES AND pH	**Lesson 1:**Definition of an acid/base, and alkali in terms of H+ and OH- ions, and acid-alkali indicators. **Lesson title 2:** Properties of acids and alkalis.	**Knowledge and understanding:** -Describe the existence of acids and bases in nature. -State applications	-Group discussion -Observation in groups	*Books:* *-New*	

Week4 9-13/5/22		**Lesson title 3:** Existence of indicators for acids and alkalis in nature and in common products. **Lesson 4** Definition of the pH of a solution as a measure of alkalinity.	of acids and bases in daily life. -Understand the difference between a base and an alkali. -Explain the pH scale. -Compare the properties of acids and bases. -State the dangers associated with handling bases and acids. **Skills:** -Test acidity and alkalinity in different solutions using indicators. -Use common laboratory indicators such as litmus, phenolphthalein and methyl orange. Use Universal indicators and pH paper to measure	-Research from library or internet -Project work Watching video Evaluation procedures(oral, written, practical,	*Chemistry teacher's guide for S_1, S_2 and S_3 , 2010* *-Ordinary level chemistry syllabus ,2015* *- Chemistry the central science -Cambridge-igcse-chemistry-teachers-resource-fourth-edition, 2014 -cambridge-international-as-and-a-level-chemistry-*	
Week 5 16-20/5/22		**Lesson 5:** Explanation of the pH- scale and pH-meter. **Lesson title 6** -pH of common commodities in daily life. **Lesson 7** - Applications of acids and bases. **Lesson title 8** -Dangers associated with acids and bases.				

			acidity and alkalinity of solutions. **Attitudes and Values:** -Develop orderliness and a careful approach when handling acids and bases.		*coursebook-second-edition, 2014* -Tony ONEN(2016) *chemistry course for rwanda secondary schools* Excel education partners publisher	
		Summative Evaluation	**Key unit competency:** To be able to extract indicators from flowers and use them to test the observable properties of acids and bases in common domestic substances.	**Evaluation procedures: (oral, written, practical)**		
Week 6 23-27/5/22	UNIT 12: INORGANIC SALTS AND THEIR PROPERTIES	**Unit title 1:** -Definition of a salt. **Unit title 2** -Nomenclature and chemical formulae of simple salts i.e. chlorides, nitrates and sulphates.	**Knowledge and understanding:** -Define the term salt. -Distinguish between soluble and insoluble	-Group discussion -Observation in groups	*Books:* *-New Chemistry*	

		Unit title 3 -Physical properties of inorganic salts:	salts. -State the physical properties of salts. -Describe the effect of heat on different salts. **Skills:** -Classify salts into soluble and insoluble by dissolving them in water. -Perform experiments to show the effect of heat on solid salts. **Attitudes and Values:** Develop a keen eye for detail when observing experiments.	-Research from library or internet -Project work Watching video Evaluation procedures(oral, written, practical,	*teacher's guide for S_1, S_2 and S_3 , 2010* *-Ordinary level chemistry syllabus ,2015* *- Chemistry the central science* *-Cambridge-igcse-chemistry-teachers-resource-fourth-edition, 2014* *-cambridge-international-as-and-a-level-chemistry-coursebook-second-*	
Week 7 30/5-3/6/22		**Unit title 4**-Action of heat on carbonates, hydrogen carbonates, sulphates and nitrates				
		Summative Evaluation	**Key unit competency:** To be able to analyse properties of different types of	**Evaluation procedures: (oral, written, practical)**		

			salts.		*edition, 2014* -Tony ONEN(2016) *chemistry course for rwanda secondary schools* Excel education partners publisher	
Week 8 6-10/6/22	Unity 13: PREPARATION OF OXYGEN AND ITS PROPERTIES	**Unit title 1:** Methods of preparation of oxygen gas: **Unit title 2:** Testing for oxygen gas and Physical properties.	**Knowledge and understanding:** -Recall the physical properties of oxygen. -Describe the reaction of oxygen with metals and non-metals. -Describe different methods of gas collection and explain when they are appropriate. -Explain the importance of O_2 and O_3. **Skills:** -Prepare and test oxygen gas. -Collect gases using appropriate methods. -Write equations for the reactions of oxygen with other	-Group discussion -Observation in groups -Research from library or internet -Project work Watching video		
Week 9 13-17/6/22		**Unit title 3:** Chemical properties of oxygen. **Unit title 4:** Methods of collecting gases				
Week 10 20-24/6/22		**Unit title 5:** Uses and allotropes of oxygen. **Unit title 6 :** Ozone: -Dangers related to ozone layer depletion				

			elements. **Attitudes and Values:** -Develop a sense of responsibility when carrying out experiments. -Develop orderliness in handling apparatus and chemicals.			
		Summative Evaluation	**Key unit competency:** To be able to prepare oxygen and show how it supports burning and reaction with some elements. Prepare other gases to demonstrate different methods of collection.	**Evaluation procedures: (oral, written, practical)**		
Week 11 27/6-1/7/22	**REVISION**					
Week 12	**EXAMS**					

4-8/7/22		
Week 13 11-15/7/22	**SCHOOL REPORTS**	

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