RWANDA - GASABO DISTRICT

MINISTRY OF EDUCATION

**SCHEME OF WORK**

**Academic year:** 2022-2023 **School:**   **Subject:** CHEMISTRY **Teacher: Class:** S2 **all Periods per Week:** 4

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| Dates  | Unit title  | Lesson title+Evaluation  | Learning objectives (copied or adapted from the syllabus depending on the bunch of lesson) + Key unit competence | Teaching methods & techniques+Evaluation procedures | Resources & References  | Observations |
| **1st week****26-30/09/2022****2nd week****03-07/10/2022****3rd week****10-14/10/2022** | Unit 1:CHEMICAL BONDING  | **Lesson title1:**Stability of atoms by losing, gaining and sharing electrons(formation of ionic compound**)****Lesson title 2:**Covalent bonding **Lesson title3:**Metallic bonding  | **Knowledge and Understanding**:Explain the nature of ionic, covalent and metallic bonding. -State the typical physical properties of ionic compounds, and of covalent compounds. -Explain the physical properties of metals in terms of their structure. **Skills:**Show the formation of bonds using dot and cross diagrams. - Classify various chemical compounds as ionic or covalent. - Perform experiments to show the physical properties of metals, ionic compounds and covalent compounds.**Attitudes and Values:**Develop a sense of orderliness and self-confidence in presentations of results. -Respect the procedures while carrying out experiments. - Appreciate that being soluble in water is not sufficient evidence to indicate a compound is ionic. |  | BOOKS OF SENIOR TWO (CBC) |  |
| **Summative Evaluation 1** | Key unit competence: tobe able to relate the nature Of bonding to properties of substances. | Evaluation procedures **(oral, written, practical, …)** |  |  |
| **4th week** **17-21/10/2022****5th week****24-28/10/2022****6th week****14-18/11/2022** | 2.**UNIT TRENDS IN PROPERTIES OF ELEMENTS IN PERIODIC TABLE** | **Lesson title 1:**Classification of elements into metals ,nonmetals and metalloids **Lesson title 2:**Physical properties of metals and non-metals**Lesson title** 3:Trends in reactivity for metals and non-metals**Lesson title 4:**Chemical properties (reaction with water ,acids and halogens) | **Knowledge and Understanding**:Describe trends in reactive elements with acids, water, and halogens. -Explain the trends in the physical properties across a period and down a group. **Skills:**Classify elements into metals, metalloids and non-metals. - Compare and contrast the physical properties of metals and non- metals using simple experiments. -Compare the reactivity of metals across the period and down the group with the help of simple experiments **Attitudes and Values:**Respect the procedures during practical activities. - Develop teamwork in group activities. - Appreciate that some elements exhibit a mixture of the properties of metals and non-metals and are therefore best described as metalloids.  | Teaching methods & techniques:-Group discussion-Observation in groups-Research from library or internet -Project work Watching video  | BOOKS OF SENIOR TWO (CBC) |  |
| **Summative Evaluation 2** | **Key unit competence 2**:- to be able to describe the trends and patterns in properties of elements in groups and periods  | **-Evaluation procedures****(oral, written, practical, …)**-Teaching methods & techniques:-Group discussion-Observation in groups-Research from library or internet -Project work Watching video  |  |  |
| **7th week****31/10-04/11/2022****8th week****07-11/11/2022****9th week****21-25/12/2022****10th week****28/11-02/12/2022** | 3.**UNIT WATER POLLUTION****4.EFFECTIVE WAYS OF WASTE MANAGEMENT**  | **Lesson title1:**-Main water pollutants **Lesson title 2:**Dangers of polluted water **Lesson title 3:**Prevention of water pollution | **Knowledge and understanding**Define water pollution. - Identify the main water pollutants. - Describe the dangers of polluted water. - Suggest the ways of preventing water pollution. **Skills:**Develop research skills -Evaluate ways of minimizing pollution. **Attitudes and Values:**Develop awareness of the dangers of polluted water. Develop a sense of responsibility for caring about the environment. **Key competences:**To be able to assess the cause and effects of water Pollution and suggest ways of control  | Evaluation procedures **(oral, written, practical, …)** | BOOKS OF SENIOR TWO (CBC) |  |
| **Summative Evaluation 4** |
| **Lesson Title 1:**Steps to effective waste management **Lesson Title 2:**Importance and benefits of recycling wastes**Lesson Title 3** Effects and poor disposal  | **Knowledge and understanding:**Describe the steps involved in effective waste management. - Explain the importance and benefits of waste recycling. - Discuss the various effects of waste materials and poor waste disposal **Skills:**-Make some useful materials from waste **Attitudes and Values:**Develop a sense of managing natural resources while discussing effective ways of waste management. -Develop teamwork and confidence in group activities and presentations. - Develop a sense of responsibility in minimizing waste materials  | -Teaching methods & techniques:-Group discussion-Observation in groups-Research from library or internet -Project work Watching video  | BOOKS OF SENIOR TWO (CBC) |  |
| **Summative Evaluation 4** | **Key unit competence 4:**To be able to transform waste materials into different useful materials e.g. fuel (briquettes) and fertilizers (Composted Manure). | **Evaluation procedures****(oral, written, practical, …)**-Teaching methods & techniques:-Group discussion-Observation in groups-Research from library or internet -Project work Watching video  |  |  |
| **11th week****05-09/12/2022** |  | REVISION |
| **12th week****12-16/12/202** |  | EXAMS |
| **13th week** **20-24/12/2023** |  | **Report distribution and End of term I** |

**Academic year: 2022-2023 Term:** II **School: Subject:** CHEMISTRY

**Teacher’s name:**  **Class:** S2 ALL **Number of period per week:** 4

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| **Dates**  | **Unit title**  | **Lesson title****+****Evaluation** | **Learning objectives (copied or adapted from the syllabus depending on the bunch of lesson) + Key unit competence** | **Teaching methods & techniques****+****Evaluation procedures** | **Resources & References** | **Observation**  |
| **1st week****09-13/1/2023****2nd week****16-20/01/2023** | **Unit 5:****CATEGORIES OF CHEMICAL REACTIONS** | **Lesson title1:**-Types of reactions**Lesson title 2**-Classification of chemical reactions as endothermic and exothermic reactions.**Lesson title 3:**Ionic equations/rules of writing ionic equations  | **Knowledge and understanding**Explain the difference between a decomposition reaction and combination reaction. - Explain single displacement, double displacement (precipitation and neutralization) and combustion reactions. -Write and balance ionic equations. **Skills:**Apply the rules of balancing equations to write balanced chemical reactions. - Carry out experiments to show precipitation reactions, and to differentiate endothermic and exothermic reactions - Classify chemical reactions as endothermic and exothermic using simple experiments. - Properly use a thermometer to measure changes in temperature **Attitudes and Values:**Develop a team spirit, sense of responsibility when performing experiments |  | BOOKS OF SENIOR TWO (CBC) |  |
| **3rd week****23-27/01/2023** |  | **Summative** **Evaluation 5** | **Key unit competence 5:**To be able to differentiate between the types of chemical reactions | **-Evaluation procedures****(oral, written, practical, …)**-Teaching methods & techniques:-Group discussion-Observation in groups-Research from library or internet -Project work Watching video  |  |  |
| **4th week****30/10-3/02/2023****5th week****06-10/02/2023****6th week****13-17/03/2023** | 6. **PREPARATION OF SALT AND IDENTIFICATION OF IONS** | **Lesson title 1**To be able to differentiate between the types of chemical reactions**Lesson title 2**Factors influencing solubility of different salts **Lesson title 3**Solubility curves and calculations of solubility **Lesson title 4**Different ways of preparing normal salts from reaction  | **Knowledge and understanding:**Define solubility. - Describe factors that affect solubility. -Explain the concept of unsaturated, saturated and supersaturated solutions. - Explain the solubility curves of different salt solutions. - Describe different methods of preparing Soluble and insoluble salts. - Name the sources and uses of salts in daily life. **Skills:**Prepare different soluble and insoluble salts using suitable chemicals. - Interpret solubility curves of different solutions. - Carry out experiments to show the effect of temperature on the solubility of different salts. - Use solubility curves to determine the solubility of different salt solutions at different temperatures. -Perform tests to identify cations and anions. **Attitudes and Values:**Develop a team spirit and sense of responsibility during experiments. - Appreciate the uses of salts in daily life such as sodium chloride as a table salt  |  | BOOKS OF SENIOR TWO (CBC) |  |
| **7th week****20-24/02/2023** |  | **Summative** **Evaluation 6** | **Key unit competence 6**To be able to prepare a salt from suitable starting materials and identify cations and anions in a solution. | -Teaching methods & techniques:-Group discussion-Observation in groups-Research from library or internet -Project work Watching video **-Evaluation procedures****(oral, written, practical, …)** |  |  |
| **8th week****27/02-03/03/2023****9th week****06-10/03/2023** | 7.**THE MOLE CONCEPT AND GAS LAWS.** | **Lesson title1**Avogadro number and the mole concept.**Lesson title 2**Calculation of the number of moles.  |  |  | BOOKS OF SENIOR TWO (CBC) |  |
| **10th week**13-17/03/2023 | **Revision** |
| **11th week****20-24/03/2023** | **Theoretical exams and Practical exams**  |
| **12th week****27-****31/03/2023** | **Report distribution and End of term I** |

 **Unit plan for chemistry S2**

Academic year: **2022-2023** Term: III……… School: Subject: **CHEMISTRY**

Teacher’s name:

Class: ……**S2All** Number of period per week: **4 PERIODS**

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| **Dates**  | **Unit title**  | **Lesson title****+****Evaluation** | **Learning objectives (copied or adapted from the syllabus depending on the bunch of lesson) + Key unit competence** | **Teaching methods & techniques****+****Evaluation procedure** | **Resources & References** | **observation** |
| **1st week****17-21/04/2023****2nd week****24-28/04/2023****3rd week****01-05/05/2023****4th week****08-12/05/2023** | UNIT 7. **THE MOLE CONCEPT AND GAS LAWS** | **Lesson title3:**Definition of relative atomic mass.  And calculation of relative molecular mass. **Lesson title 4:**-Definition and calculation of relative formula mass. **Lesson title 5**- Calculation of molar mass. **Lesson title 6**Relationship between numbers of moles, mass and molar mass. **Lesson title 7**Calculation of mass percentage composition of an element in a compound.**Summative Evaluation 7****Lesson title 8**Empirical and molecular formulae. **Lesson title 9** Stoichiometric calculations.**Lesson title 10** Limiting reactants. **Lesson title 11**Gas laws (Gay-Lussac, Charles’ law, Boyle’s law and the ideal gas law, Grahams’ law of diffusion) and perform simple calculations on gas laws. **Lesson title 12** Calculation of molar gas volume under standard conditions.  | **Knowledge and understanding:**Explain the mole concept. - Explain the concepts of: relative atomic mass, relative formula mass, relative molecular mass, molar mass, limiting reactant, empirical and molecular formulae. - State the gas laws: Gay-Lussac, Charles’ law, Boyle’s law and the ideal gas law, Grahams’ law of diffusion. **Skills:**Experimentally determine the mass composition of a compound using magnesium oxide as an example. - Calculate the molar masses of various substances and weigh out 1 mole of each. - Perform calculations involving empirical and molecular formulae. - Apply the gas laws to calculate the volume, temperature and pressure of gases, and molecular weight of gases **Attitudes and Values:**Develop a teamwork approach in research, group activities and exercises. - Respect procedures while performing experiments. - Appreciate the work done by different personalities in the formulation of gas laws e.g. Gay-Lussac, Charles, Boyle, and Graham **Key unit competence 7**To be able to determine the composition of compounds by mass, volume and number of moles.  | -Teaching methods & techniques:-Group discussion-Observation in groups-Research from library or internet -Project work Watching video **-Evaluation procedures****(oral, written, practical, …)** | BOOKS OF SENIOR TWO (CBC) |  |
| **5th week****15-19/05/2023****6th week****22-26/05/2023** | UNIT 8.**PREPARATION AND CLASSIFICATION OF OXIDES.** | **Lesson title 1**Preparation of oxides from: - Direct combination of an element with oxygen. - Thermal decomposition of hydroxides carbonates and nitrates. **Lesson title 2** Reactions of oxides with water, acids and bases**Lesson title 3** Classification of oxides as acidic, basic, neutral and amphoteric oxides.**Lesson title 4** Uses and production of slaked lime (ishwagara) | **Knowledge and understanding:**Categorize different oxides. - Explain how different oxides are formed. - State the uses of different oxides. - Describe the reaction of oxides with other substances. - Describe the process of producing slaked lime **Skills:**Experimentally prepare different oxides from elements and compounds -Test the properties of oxides prepared in the laboratory. - Classify oxides into alkaline, acidic, amphoteric and neutral **Attitudes and Values:**Develop a team approach and a sense of responsibility in group activities. -Respect for the procedures while performing experiments. - Care about harmful oxides like sulphur dioxide and nitrogen dioxide, during experiments  |  | BOOKS OF SENIOR TWO (CBC) |  |
|  |  | **Summative Evaluation 8** | **Key unit competence 8**To be able to prepare oxides and classify them based on their properties. | -Teaching methods & techniques:-Group discussion-Observation in groups-Research from library or internet -Project work Watching video **-Evaluation procedures****(oral, written, practical, …)** |  |  |
| **7th week****29/05-02/06/2023****8th week****05-09/06/2023** | **UNIT 9.****ELECTROLYTES AND NON- ELECTROLYTES** |  **Lesson title: 1**- Definition of electrolyte and non-electrolyte. **Lesson title: 2**Definition of electrolysis.**Lesson title:3**  Strong and weak electrolyte.  **Lesson title: 4**Conductivity of electricity by electrolytes.  **Lesson title: 5**Applications of electrolytes in daily life e.g. Leclanché cell (dry cell) and car batteries  | **Knowledge and understanding:**Define an electrolyte and a non-electrolyte. - Give examples of weak and strong electrolytes and non-electrolytes.- State applications of electrolytes in daily life **Skills:**Carry out experiment to distinguish between electrolytes and non-electrolytes. -Carry out experiments to classify solutions as strong electrolytes, weak electrolytes or non-electrolytes **Attitudes and Values:**Develop an awareness of safety issues when carrying out experiments. -Appreciate the importance of electrolytes in daily life like sulphuric acid in a car battery  |  | BOOKS OF SENIOR TWO (CBC) |  |
|  |  | **Summative Evaluation 9** | **Key unit competence 9:**To be able to distinguish between non-electrolytes, weak electrolytes and strong electrolytes. | -Teaching methods & techniques:-Group discussion-Observation in groups-Research from library or internet -Project work Watching video **-Evaluation procedures****(oral, written, practical, …)** |  |  |
| **9th week****12-16/06/2023** | UNIT 1**0.****PROPERTIES OF** **ORGANIC COMP****OUNDS AND** **USES OF** **ALKANES** | **Lesson title: 1**-Definition of organic chemistry. **Lesson title: 2**Differences between organic and inorganic chemistry. **Lesson title: 3** Occurrence of organic compounds. **Lesson title: 4**Homologous series , General formulae and nomenclature of alkanes (from C1-C10). **Lesson title: 5** Structural isomerism up to C4. **Lesson title: 6**Physical properties of alkanes. **Lesson title: 7**Chemical properties (reaction with halogens, combustion and thermal cracking). **Lesson title: 8**Laboratory preparation of methane. **Lesson title: 9**Uses of alkanes (methane) in daily activities  | **Knowledge and understanding:**Identify organic compounds and their origin. - Describe the physical and chemical properties of alkanes (methane). - State the uses of methane and some other alkanes. - Explain structural isomerism **Skills:**Use simple experiments to classify compounds into organic and inorganic. - Prepare methane gas in the laboratory. - Apply IUPAC rules to the nomenclature of alkanes. **Attitudes and Values:**Develop a team approach and sense of responsibility in group discussions and experiments. -Appreciate the economic importance of alkanes in daily life such as fuels.  |  | BOOKS OF SENIOR TWO (CBC) |  |
| **10th week**19-23/06/2023 |  | **Summative evaluation**  | **Key unit competence 10:**To be able to compare the properties of organic and inorganic compounds and explain the uses of alkanes in daily life. | -Teaching methods & techniques:-Group discussion-Observation in groups-Research from library or internet -Project work Watching video **-Evaluation procedures****(oral, written, practical, …)** |  |  |
| **11th week** 26-30/06/2023 | GENERAL REVISION |
| **12th week**03-07/07/2023 | EXAMS |
| **13th week**10- 14/07/2023 | **Exams and marking/report distribution** |

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