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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