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| **Topic** | **Learning**  **Outcome** | **CA Competence** | **Level of Ability** | | | | |
| **Imitation/**  **Receiving** | **Manipulation/**  **Responding** | **Precision/**  **Valuing** | **Articulation/**  **Organization** | **Naturalization/**  **Characterization** |
| **9.0**  **CARBON IN LIFE**  **(Page 31)**  **S3**  **Term 1** | h). Know the process of making soapy detergents from natural fats and oils and appreciate that soaps are effective in removing oily stains. | Appreciates scientific methods of investigation | The learner imitates the teacher, peers, video clips, lab technician, manual and:  1. Develops the aim of the experiment.  2. Develops hypothesis/problem to be investigated 3. Identifies independent and dependent variables  4. Identifies equipment and materials required 5. Identifies the risks and precautions that may arise and ways to prevent/ mitigate them.  6.writes the steps followed and carries out the experiment.  7. Records the data /obtains product from the experiment.  8. Analyses the data recorded/ evaluates product (scent, cleansing ability, smoothness, hardness, effect on skin) from on the experiment  9. Draws conclusions basing on the analysis made on the experiment  10. Writes recommendations on the experiment.  DECISION RULE  **All the indicators** | The learner follows instructions of Teacher, lab technician, peers, manual, video clips and:  1. Develops the aim of the experiment.  2. Develops hypothesis/problem to be investigated  3. Identifies independent and dependent variables  4. Identifies equipment and materials required 5. Identifies the risks and precautions that may arise and ways to prevent/ mitigate them.  6.writes the steps followed and carries out the experiment.  7. Records the data /obtains product from the experiment.  8. Analyses the data recorded /evaluates product (scent, cleansing ability, smoothness, hardness, effect on skin) from the experiment  9. Draws conclusions basing on the analysis made on the experiment  10. Writes recommendations on the experiment.  DECISION RULE  **All the indicators** | The learner independently with minimum errors;  1. Develops the aim of the experiment but may interchange variables, may omit a key word.  2. Develops hypothesis/problem to be investigated but may omit key word, interchange variables.  3. Identifies independent and dependent variables but may not identify them all or may interchange them.  4.Identifies equipment and materials required but may select inappropriate ones.  5. Identifies the risks and precautions that may arise and ways to prevent/ mitigate them but may incorrectly identify risks and precautions.  6.writes the steps followed but may omit some steps, may not write steps in order or may not obtain expected values.  7. Records the data /obtains products from the experiment but may interchange values, interchange units, records some incorrect units etc.  8. Analyses the data recorded /evaluates product (scent, cleansing ability, smoothness, hardness, effect on skin) from on the experiment but may interchange variables during analysis, interchange axes etc.  9. Draws conclusions basing on the analysis made on the experiment but the conclusion may not be related to the findings or experiment.  10. Writes recommendations on the experiment but may write incorrect recommendations.  DECISION RULE  **All the indicators with at most 3 errors.** | The learner innovatively;  1. Develops the aim of the experiment.  2. Develops hypothesis/problem to be investigated  3. Identifies independent and dependent variables  4. Identifies equipment and materials required  5. Identifies the risks and precautions that may arise and ways to prevent/ mitigate them.  6.writes the steps followed and carries out the experiment.  7. Records the data /obtain product from the experiment.  8. Analyses the data recorded /evaluates product (scent, cleansing ability, smoothness, hardness, effect on skin) from on the experiment  9. Draws conclusions basing on the analysis made on the experiment  10. Writes recommendations on the experiment.  DECISION RULE  **All the indicators** | The learner consistently with ease;  1. Develops aim of the experiment.  2. Develops hypothesis/ problem to be investigated.  3. Identifies independent and dependent variables.  4.Identifies equipment and materials required.  5. Identifies risks and precautions and ways to prevent/ mitigate them.  6.Writes steps systematically followed and carries out the experiment.  7. Records data /obtains product from the experiment.  8. Analyses data recorded/ evaluates product (scent, cleansing ability, smoothness, hardness, effect on skin) from on the experiment  9. Draws conclusions basing on the analysis made on the experiment.  10. Writes recommendations on the experiment.  DECISION RULE  **All the indicators** |
| **14.0**  **Chemical reaction rates**  **(page 37)**  **S3**  **Term 3** | a). Understand and appreciate that chemical reactions take place at different rates |
| b). Understand the effect of various factors on the rate of chemical reactions and recognise that many reactions are reversible |
| **18.0.**  **ENERGY CHANGES DURING CHEMICAL REACTIONS**  **S.4**  **TERM 2**  **Page 41** | Understand the concept of heat of reaction and interpret energy profiles of chemical reactions |
|  |  | **Practices scientific attitudes and values** | The Learner imitates teacher, peers, lab technicians, video clips, manuals while carrying out scientific investigations and practices;  1. Validity  2.Honesty  3. Flexibility  4. Integrity  5. Persistence  6.Responsibility  7. Objectivity  8.Accountability  9.Reproducibility  10. Collaboration  11. Open-mindedness.  12. Empiricism (Evidence based)  DECISION RULE  **Any 8 indicators** | The Learner follows instructions of teacher, peers, lab technician, manual, video clips while carrying out scientific investigations and practices;  1. Validity  2.Honesty  3. Flexibility  4. Integrity  5. Persistence  6.Responsibility  7. Objectivity  8.Accountability  9.Reproducibility  10. Collaboration  11. Open-mindedness.  12. Empiricism (Evidence based)  DECISION RULE  **Any 8 indicators** | The Learner independently carries out scientific investigations, with minimal errors and practices;  1. Validity  2.Honesty  3. Flexibility  4. Integrity  5. Persistence  6.Responsibility  7. Objectivity  8.Accountability  9.Reproducibility  10. Collaboration  11. Open-mindedness.  12. Empiricism (Evidence based)  DECISION RULE  **Any 8 indicators** | The Learner innovatively carries out scientific investigations and practices;  1. Validity  2.Honesty  3. Flexibility  4. Integrity  5. Persistence  6.Responsibility  7. Objectivity  8.Accountability  9.Reproducibility  10. Collaboration  11. Open-mindedness.  12. Empiricism (Evidence based)  DECISION RULE  **Any 8 indicators** | The Learner consistently, with ease carries out scientific investigations and practices;  1. Validity  2.Honesty  3. Flexibility  4. Integrity  5. Persistence  6.Responsibility  7. Objectivity  8.Accountability  9.Reproducibility  10. Collaboration  11. Open-mindedness.  12. Empiricism (Evidence based)  DECISION RULE  **Any 8 indicators** |
| **Mathematical computation and ICT proficiency.** | Demonstrate mathematical computation and ICT proficiency skills. | Demonstrates mathematical computation and ICT proficiency skills. | The learner imitates teacher, lab technicians, peers, video clips, manual (guides), simulations when carrying out scientific investigations and:  1.Uses numbers and measurements accurately  2.Interpretes and interrogates mathematical data  3.Uses mathematics to justify and support decisions  4. Uses technology to create, manipulate and process information  5. Uses technology to collaborate, communicate and refine their work.  DECISION RULE  **At least 1 indicators** | The learner follows instructions teacher, lab technicians, peers, video clips, manual (guides), simulations when carrying out scientific investigations and:  1.Uses numbers and measurements accurately  2.Interpretes and interrogates mathematical data  3.Uses mathematics to justify and support decisions  4. Uses technology to create, manipulate and process information  5. Uses technology to collaborate, communicate and refine their work.  DECISION RULE  **At least 1 indicators** | The learner independently carries out scientific investigations with minimum errors and:  1.Uses numbers and measurements accurately  2.Interpretes and interrogates mathematical data  3.Uses mathematics to justify and support decisions  4. Uses technology to create, manipulate and process information  5. Uses technology to collaborate, communicate and refine their work.  DECISION RULE  **At least 1 indicators** | The learner innovatively carries out scientific investigation and:  1.Uses numbers and measurements accurately  2.Interpretes and interrogates mathematical data  3.Uses mathematics to justify and support decisions  4. Uses technology to create, manipulate and process information  5. Uses technology to collaborate, communicate and refine their work.  DECISION RULE  **At least 1 indicators** | The learner consistently with ease carries out scientific investigations and:  1.Uses numbers and measurements accurately  2.Interpretes and interrogates mathematical data  3.Uses mathematics to justify and support decisions  4. Uses technology to create, manipulate and process information  5. Uses technology to collaborate, communicate and refine their work.  DECISION RULE  **At least 1 indicators** |
| **11.0**  **FORMULAE, STOICHIOMETRY AND MOLE CONCEPT**  **S.3**  **TERM 2**  **(Page 34)** | g). Practice scientific attitudes and values in investigating matter. | **8a).** Practices scientific attitudes and values in investigating matter. | The learner receives information from the teacher, peers, recorded materials, videos, lab technicians etc. on investigation of matter and practices;  1. Validity  2.Honesty  3. Flexibility  4. Integrity  5. Persistence  6.Responsibility  7. Objectivity  8.Accountability  9.Reproducibility  10. Collaboration  11. Open-mindedness.  12. Empiricism  DECISION RULE  **At least 8 indicators** | The learner asks questions/ responds to questions/ researches more about investigation of matter and practices;  1. Validity  2.Honesty  3. Flexibility  4. Integrity  5. Persistence  6.Responsibility  7. Objectivity  8.Accountability  9.Reproducibility  10. Collaboration  11. Open-mindedness.  12. Empiricism  DECISION RULE  **At least 8 indicators** | The learner independently investigates matter and practices;  1. Validity  2.Honesty  3. Flexibility  4. Integrity  5. Persistence  6.Responsibility  7. Objectivity  8.Accountability  9.Reproducibility  10. Collaboration  11. Open-mindedness.  12. Empiricism  DECISION RULE  **At least 8 indicators** | The learner advocates, supports, encourages and sensitizes others on investigating matter and practices;  1. Validity  2.Honesty  3. Flexibility  4. Integrity  5. Persistence  6.Responsibility  7. Objectivity  8.Accountability  9.Reproducibility  10. Collaboration  11. Open-mindedness.  12. Empiricism  DECISION RULE  **At least 8 indicators.** | The learner consistently investigates matter and practices;  1. Validity  2.Honesty  3. Flexibility  4. Integrity  5. Persistence  6.Responsibility  7. Objectivity  8.Accountability  9.Reproducibility  10. Collaboration  11. Open-mindedness.  12. Empiricism  DECISION RULE  **At least 8 indicators** |
| **Co-operation and self-directed learning.** | Demonstrate cooperation and self-directed learning. | Demonstrates cooperation and self-directed learning. | The learner receives information from the teacher, peers, recorded materials, videos, lab technicians etc. on investigation of matter and:  1.Works effectively in diverse teams  2. Interacts effectively with others  3. Takes responsibility for own learning.  4.Works independently with persistence.  5. Manages goals and time.  DECISION RULE  **At least 1 indicator** | The learner asks questions/ responds to questions/ researches more about investigation of matter and:  1.Works effectively in diverse teams  2. Interacts effectively with others  3. Takes responsibility for own learning.  4.Works independently with persistence.  5. Manages goals and time.  DECISION RULE  **At least 1 indicators** | The learner independently investigates matter and:  1.Works effectively in diverse teams  2. Interacts effectively with others  3. Takes responsibility for own learning.  4.Works independently with persistence.  5. Manages goals and time.  DECISION RULE  **At least 1 indicators** | The learner advocates, supports, encourages and sensitizes others on investigating matter and:  1.Works effectively in diverse teams  2. Interacts effectively with others  3. Takes responsibility for own learning.  4.Works independently with persistence.  5. Manages goals and time.  DECISION RULE  **At least 1 indicators.** | The learner consistently investigates matter and:  1.Works effectively in diverse teams  2. Interacts effectively with others  3. Takes responsibility for own learning.  4.Works independently with persistence.  5. Manages goals and time.  DECISION RULE  **At least 1 indicators** |
| **16.0**  **INDUSTRIAL PROCESSES**  **(page 37)**  **Theme: REDOX reactions**  **S.4**  **Term 1** | a). Knows about some of the main industries that produce useful chemicals such as oil industry for our organic chemicals, the production of metals, the acid industry, the alkali industry, the fertilizer industry and cement industry.  f). Recognise the importance of industrial processes in utilizing the natural resources to make useful chemicals and appreciate that industrial processes have social benefits and cause problems of pollution and environmental destruction.  g). Describes some of the dangers to the community arising from these industrial processes and the steps that may be taken to minimize these dangers. | **9a).** Appreciates industrial processes (Extraction and Manufacturing) | Learner while receiving information from teacher, lab technician, peers, video clips, manuals (guides) on industrial processes, associated dangers and how to minimize them:  1.Identifies raw materials used in industrial processes e.g. ores for extraction of metals, ammonia and nitric acid for manufacture of Nitrate fertilizers  2. Writes steps, conditions and reaction vessels  3. Identities products and by-products /wastes (purified metals or nitrate fertilizer, acidic gases)    **DECISION RULE**  **At least two indicators** | Learner while asking/ responding /researching more/consulting on information from teacher, lab technician, peers, video clips, manuals (guides) on industrial processes, associated dangers and how to minimize them:  1.Identifies raw materials used in industrial processes e.g. ores for extraction of metals, ammonia and nitric acid for manufacture of Nitrate fertilizers  2. Writes steps, conditions and reaction vessels  3. Identities products and by-products /wastes (purified metals or nitrate fertilizer, acidic gases)    **DECISION RULE**  **At least two indicators** | Learner without reminder in relation to industrial processes, associated dangers and how to minimize them:  1.Identifies raw materials used in industrial processes e.g. ores for extraction of metals, ammonia and nitric acid for manufacture of Nitrate fertilizers  2. Writes steps, conditions and reaction vessels  3. Identities products and by-products /wastes (purified metals or nitrate fertilizer, acidic gases)  **DECISION RULE**  **At least two indicators** | Learner while sensitising others in relation to industrial processes, associated dangers and how to minimize them:  1.Identifies raw materials used in industrial processes e.g. ores for extraction of metals, ammonia and nitric acid for manufacture of Nitrate fertilizers  2. Writes steps, conditions and reaction vessels  3. Identities products and by-products /wastes (purified metals or nitrate fertilizer, acidic gases)  **DECISION RULE**  **At least two indicators** | Learner in relation to industrial processes associated dangers and how to minimize them consistently:  1.Identifies raw materials used in industrial processes e.g. ores for extraction of metals, ammonia and nitric acid for manufacture of Nitrate fertilizers  2. Writes steps, conditions and reaction vessels  3. Identities products and by-products /wastes (purified metals or nitrate fertilizer, acidic gases)  **DECISION RULE**  **All indicators** |
| **Communication** |  | Demonstrates communication skill | Learner while receiving information from teacher, lab technician, peers, video clips, manuals (guides) on industrial processes, associated dangers and how to minimize them;  1.Listens attentively and with comprehension  2.Talks confidently and explains ideas/ options clearly  3.Reads accurately and fluently  4.Writes and presents coherently  5.Uses a range of media to communicate ideas.  **DECISION RULE**  **At least 1 indicators** | Learner while asking/ responding /researching more/consulting on information from teacher, lab technician, peers, video clips, manuals (guides) on industrial processes, associated dangers and how to minimize them:  1.Listens attentively and with comprehension  2.Talks confidently and explains ideas/ options clearly  3.Reads accurately and fluently  4.Writes and presents coherently  5.Uses a range of media to communicate ideas.  **DECISION RULE**  **At least 1 indicators** | Learner without reminder in relation to industrial processes, associated dangers and how to minimize them:  1.Listens attentively and with comprehension  2.Talks confidently and explains ideas/ options clearly  3.Reads accurately and fluently  4.Writes and presents coherently  5.Uses a range of media to communicate ideas.  **DECISION RULE**  **At least 1 indicators** | Learner while sensitising others in relation to industrial processes, associated dangers and how to minimize them:  1.Listens attentively and with comprehension  2.Talks confidently and explains ideas/ options clearly  3.Reads accurately and fluently  4.Writes and presents coherently  5.Uses a range of media to communicate ideas.  In relation to industrial processes, associated dangers and how to minimize them.  **DECISION RULE**  **At least 1 indicators** | Learner in relation to industrial processes associated dangers and how to minimize them consistently:  1.Listens attentively and with comprehension  2.Talks confidently and explains ideas/ options clearly. 3.Reads accurately and fluently  4.Writes and presents coherently  5.Uses a range of media to communicate ideas.  **DECISION RULE**  **At least 1 indicators** |