



REPUBLIC OF KENYA  
MINISTRY OF EDUCATION

## **JUNIOR SECONDARY SCHOOL CURRICULUM DESIGN**

# **INTEGRATED SCIENCE**

## **GRADE 7**



**KENYA INSTITUTE OF CURRICULUM DEVELOPMENT**

First Published in 2022

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## **FOREWORD**

The Government of Kenya is committed to ensuring that policy objectives for Education, Training and Research meet the aspirations of the Kenya Constitution 2010, the Kenya Vision 2030, National Curriculum Policy 2019, the United Nations Sustainable Development Goals (SDGs) and the Regional and Global conventions to which Kenya is a signatory. Towards achieving the mission of Basic Education, the Ministry of Education (MoE) has successfully and progressively rolled out the implementation of the Competency Based Curriculum (CBC) at Pre-Primary and Primary School levels. The roll out of Junior Secondary School (Grade 7-9) will subsequently follow as from 2023-2025.

The curriculum designs at this level build on competencies attained by learners at the end of the Primary School cycle. Further, they provide opportunities for learners to continue exploring and nurturing their potentials as they prepare to transit to Senior Secondary School.

The curriculum designs present National Goals of Education, essence statements, general and specific expected learning outcomes for the learning areas (subjects) as well as strands and sub strands. The designs also outline suggested learning experiences, key inquiry questions, core competencies, Pertinent and Contemporary Issues (PCIs), values, Community Service Learning (CSL) activities and assessment rubric.

It is my hope that all Government agencies and other stakeholders in Education will use the designs to plan for effective and efficient implementation of the CBC.

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## **PREFACE**

The Ministry of Education (MoE) is implementing the second phase of the curriculum reforms with the national roll out of the Competency Based Curriculum (CBC) having been implemented in 2019. Grade 7 is the first level of the Junior Secondary School (JSS) in the new education structure.

Grade 7 curriculum furthers implementation of the CBC to the JSS education level. The main feature of this level is a broad curriculum for the learner to explore talents, interests and abilities before selection of pathways and tracks at the Senior Secondary education level. This is very critical in the realisation of the Vision and Mission of the on-going curriculum reforms as enshrined in the Sessional Paper No. I of 2019 whose title is: *Towards Realizing Quality, Relevant and Inclusive Education and Training for Sustainable Development* in Kenya. The Sessional Paper explains the shift from a Content - Focused Curriculum to a focus on **Nurturing every Learner’s potential**.

Therefore, the Grade 7 curriculum designs are intended to enhance the learners’ development in the CBC core competencies, namely: Communication and Collaboration, Critical Thinking and Problem Solving, Creativity and Imagination, Citizenship, Digital Literacy, Learning to Learn and Self-efficacy.

The curriculum designs provide suggestions for interactive and differentiated learning experiences linked to the various sub strands and the other aspects of the CBC. The curriculum designs also offer several suggested learning resources and a variety of assessment techniques. It is expected that the designs will guide teachers to effectively facilitate learners to attain the expected learning outcomes for Grade7 and prepare them for smooth transition to the next Grade. Furthermore, it is my hope that teachers will use the designs to make learning interesting, exciting and enjoyable.

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## **ACKNOWLEDGEMENT**

The Kenya Institute of Curriculum Development (KICD) Act Number 4 of 2013 (Revised 2019) mandates the Institute to develop curricula and curriculum support materials for basic and tertiary education and training. The curriculum development process for any level of education involves thorough research, international benchmarking and robust stakeholder engagement. Through a systematic and consultative process, the KICD conceptualised the Competency Based Curriculum (CBC) as captured in the *Basic Education Curriculum Framework* (BECF), that responds to the demands of the 21<sup>st</sup> Century and the aspirations captured in the Kenya Constitution 2010, the Kenya Vision 2030, East African Community Protocol and the United Nations Sustainable Development Goals (SDGs).

KICD receives its funding from the Government of Kenya to enable the successful achievement of the stipulated mandate and implementation of the Government and Sector (Ministry of Education (MoE) plans. The Institute also receives support from development partners targeting specific programmes. The Grade 7 curriculum designs have been developed with the support of the World Bank through the Kenya Secondary Education Quality Improvement Program (SEQIP) commissioned by the MoE. Therefore, the Institute is very grateful for the support of the Government of Kenya, through the MoE and the development partners for the policy, resource and logistical support. Specifically, special thanks to the Cabinet Secretary – MoE and the Principal Secretary – State Department of Early Learning and Basic Education.

We also wish to acknowledge the KICD curriculum developers and other staff, all teachers, educators who took part as panelists; the Semi-Autonomous Government Agencies (SAGAs) and representatives of various stakeholders for their roles in the development of the Grade 7 curriculum designs. In relation to this, we acknowledge the support of the –Chief Executive Officers of the Teachers Service Commission (TSC) and the Kenya National Examinations Council (KNEC) for their support in the process of developing these designs.

Finally, we are very grateful to the KICD Council Chairperson Prof. Elishiba Kimani and other members of the Council for very consistent guidance in the process. We assure all teachers, parents and other stakeholders that these curriculum designs will effectively guide the implementation of the CBC at Grade 7 and preparation of learners for Grade 8.

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## LESSON ALLOCATION

| S/No. | Subject                       | Number of Lessons Per Week<br>(40 minutes per lesson) |
|-------|-------------------------------|---|
| 1.    | English                       | 5   |
| 2.    | Kiswahili/KSL                 | 4   |
| 3.    | Mathematics                   | 5   |
| 4.    | Integrated Science            | 4   |
| 5.    | Health Education              | 2   |
| 6.    | Pre-Technical Studies         | 4   |
| 7.    | Social Studies                | 3   |
| 8.    | Religious Education           | 3   |
| 9.    | Business Studies              | 3   |
| 10.   | Agriculture                   | 3   |
| 11.   | Life Skills Education         | 1   |
| 12.   | Physical Education and Sports | 2   |
| 13.   | Optional Subject              | 3   |
| 14.   | Optional Subject              | 3   |
|       | <b>Total</b>                  | <b>45</b>   |







- iv) Promote sound moral and religious values.**  
Education should provide for the development of knowledge, skills and attitudes that will enhance the acquisition of sound moral values and help children to grow up into self-disciplined, self-reliant and integrated citizens.
- v) Promote social equality and responsibility.**  
Education should promote social equality and foster a sense of social responsibility within an education system which provides equal educational opportunities for all. It should give all children varied and challenging opportunities for collective activities and corporate social service irrespective of gender, ability or geographical environment.
- vi) Promote respect for and development of Kenya's rich and varied cultures.**  
Education should instill in the youth of Kenya an understanding of past and present cultures and their valid place in contemporary society. Children should be able to blend the best of traditional values with the changing requirements that must follow rapid development in order to build a stable and modern society.
- vii) Promote international consciousness and foster positive attitudes towards other nations.**  
Kenya is part of the international community. It is part of the complicated and interdependent network of peoples and nations. Education should therefore lead the youth of the country to accept membership of this international community with all the obligations and responsibilities, rights and benefits that this membership entails.
- viii. Promote positive attitudes towards good health and environmental protection.**  
Education should inculcate in young people the value of good health in order for them to avoid indulging in activities that will lead to physical or mental ill health. It should foster positive attitudes towards environmental development and conservation. It should lead the youth of Kenya to appreciate the need for a healthy environment.



## **LEARNING OUTCOMES FOR MIDDLE SCHOOL**

By end of Middle School, the learner should be able to:

1. Apply literacy, numeracy and logical thinking skills for appropriate self-expression.
2. Communicate effectively, verbally and non-verbally, in diverse contexts.
3. Demonstrate social skills, and spiritual and moral values for peaceful co-existence.
4. Explore, manipulate, manage and conserve the environment effectively for learning and sustainable development.
5. Practise relevant hygiene, sanitation and nutrition skills to promote health.
6. Demonstrate ethical behavior and exhibit good citizenship as a civic responsibility.
7. Appreciate the country's rich and diverse cultural heritage for harmonious co-existence.
8. Manage pertinent and contemporary issues in society effectively.
9. Apply digital literacy skills for communication and learning.

## **ESSENCE STATEMENT**

Science is a dynamic, collaborative human endeavour that enables use of distinctive ways of logistical valuing, thinking and working to understand natural phenomena in the biological, physical and technological world. The emphasis of science education at Lower Secondary levels is to enhance learners' scientific thinking through learning activities that involve planning, designing, measuring, observing, evaluating procedures, examining evidence, and analysing data. This is envisaged in the Kenya Vision 2030, which states in part that; "The achievement of the vision greatly depends on Science, Technology and Innovation." Equally, Sessional Paper No.1 of 2005 highlights the fact that "for a breakthrough towards industrialisation, achievement of the desired economic growth targets and social development, a high priority needs to be placed on the development of human capital through education and training by promoting the teaching of sciences and information technology." Both Sessional Paper No. 14 of 2012 and Sessional Paper 1 of 2019 equally underscore the need for sustainable basic and higher education, with an emphasis on Science, Technology and Innovation.



Integrated Science, as a learning area, is therefore expected to inculcate a scientific culture and enhance scientific literacy among learners to enable them to make informed choices in their personal lives and approach their life challenges in a systematic and logical manner. This learning area intends to enable learners to practically explore and discover knowledge within their environment and in the laboratory to allow them understand themselves and relate with their environment through application of scientific principles and ideas. It will equip learners with the relevant basic integrated scientific knowledge, skills, values and attitudes needed for their own survival and/or career development. Concepts in Integrated Science are presented as units within which there are specific strands that build on the competencies acquired in Science and Technology at Upper Primary School level. This provides the learner with the basic requisite skills, knowledge, values and attitudes necessary for specialisation in pure sciences (Physics, Chemistry, and Biology), Applied Sciences, Careers and Technology Studies (CTS) and Technical and Engineering offered in the STEM pathway at Senior School. Integrated Science is taught through inquiry-based learning approaches with an emphasis on the 5Es: engagement, exploration, explanation, elaboration and evaluation.

### **SUBJECT GENERAL LEARNING OUTCOMES**

By the end of Junior Secondary School, the learner should be able to:

1. Acquire scientific knowledge, skills, values and attitudes to make informed choices on career pathways at Senior Secondary School.
2. Select, improvise and safely use basic scientific tools, apparatus, materials and chemicals effectively in everyday life.
3. Explore, manipulate, manage and conserve the environment for learning and sustainable development.
4. Practise relevant hygiene, sanitation and nutrition skills to promote good health.
5. Apply the understanding of body systems with a view to promote and maintain good health.
6. Develop capacity for scientific inquiry and problem solving in different situations.
7. Appreciate and use scientific principles and practices in everyday life.
8. Apply acquired scientific skills and knowledge in everyday life.



## STRAND 1.0: SCIENTIFIC INVESTIGATION

| Strand   | Sub Strand  | Specific Learning Outcomes  | Suggested Learning Experiences   | Key Inquiry Questions   |
|--|---|---|--|---|
| <b>1.0 Scientific Investigation</b>  | <b>1.1 Introduction to Integrated Science</b><br><br><b>(4 Lessons)</b> | By the end of the sub-strand the learner should be able to:<br>a) identify the components of Integrated Science as a field of study,<br>b) relate knowledge and skills gained in Integrated Science to career opportunities,<br>c) appreciate the importance of Integrated Science in daily life. | The learner is guided to:<br><ul style="list-style-type: none"> <li>• discuss the meaning and components of Integrated Science with peers,</li> <li>• discuss in a group, career opportunities related to knowledge and skills gained in Integrated Science,</li> <li>• identify pathways related to Integrated Science at Senior School,</li> <li>• Search for information on the importance of Integrated Science from other sources like the internet among others,</li> <li>• discuss in a group, the importance of scientific knowledge in daily life.</li> </ul> | How is the knowledge acquired in Integrated Science useful in daily life? |
| <p><b>Core competencies to be developed:</b></p> <ul style="list-style-type: none"> <li>• <b>Communication and collaboration:</b> promoted as the learner discusses with peers in a group the importance of scientific knowledge in daily life.</li> <li>• <b>Citizenship:</b> promoted as the learner searches for local and international career opportunities related to Integrated Science.</li> </ul> |   |   |  |   |



- **Digital literacy:** developed as the learner uses digital devices to search for information on the application of Integrated Science.

**Pertinent and Contemporary Issues (PCIs)**

- **Safety and security skills:** promoted as the learner searches for information on the internet using the digital devices in observing cyber security regulations.

**Links to other subjects:**

- **Computer Studies:** promoted as the learner applies computing devices to search for information on the importance of Integrated Science from the internet.

**Values:**

- **Respect:** promoted as the learner respects each other’s opinions as they discuss with peers in a group, the importance of scientific knowledge in daily life.

**Assessment Rubric**

| Indicator  | Exceeds expectations  | Meets expectations   | Approaches expectations   | Below expectations   |
|--|---|--|---|--|
| Ability to identify the components of Integrated Science.                                    | Correctly and consistently identifies the components of Integrated Science.                                       | Correctly identifies components of Integrated Science.                                       | Identifies some components of Integrated Science.   | Has difficulty in identifying the components of Integrated Science.                                      |
| Ability to relate knowledge and skills gained in Integrated Science to career opportunities. | Correctly and consistently and relates knowledge and skills gained in Integrated Science to career opportunities. | Correctly relates knowledge and skills gained in Integrated Science to career opportunities. | Correctly relates some knowledge and skills gained in Integrated Science to career opportunities. | Has difficulty in relating in knowledge and skills gained in Integrated Science to career opportunities. |



| Strand                       | Sub-Strand                               | Specific Learning Outcomes  | Suggested Learning Experiences   | Key Inquiry Questions  |
|------------------------------|--|---|--|--|
| 1.0 Scientific Investigation | 1.2 Laboratory Safety<br><br>(8 Lessons) | By the end of the sub-strand the learner should be able to:<br>a) identify common hazards and their symbols in the laboratory,<br>b) analyse causes of common accidents in the laboratory,<br>c) demonstrate First Aid safety measures for common laboratory accidents,<br>d) appreciate the importance of safety in the and access to a healthy working environment. | The learner is guided to:<br><ul style="list-style-type: none"> <li>● identify common hazards and accidents in the laboratory,</li> <li>● interpret common hazard symbols, including but not limited to flammable, corrosive, toxic, and carcinogenic, radioactive substances,</li> <li>● discuss in groups, causes of common laboratory accidents and related first aid measures (<i>burns and scalds, cuts, and ingestion of harmful substances</i>),</li> <li>● role-play some First Aid procedures for common accidents in the laboratory,</li> <li>● practise safety measures in the laboratory and the general school learning environment,</li> </ul> | <ol style="list-style-type: none"> <li>1. Why do accidents happen in the laboratory?</li> <li>2. What safety measures should be considered while constructing a laboratory?</li> </ol> |



|   |  |  |   |  |
|---|--|--|---|--|
|   |  |  | <ul style="list-style-type: none"> <li>• discuss with peers the importance of safety measures in the laboratory,</li> <li>• search for laboratory safety procedures from other sources (internet, e-libraries among others).</li> </ul> |  |
| <p><b>Core competencies to be developed:</b></p> <ul style="list-style-type: none"> <li>• <b>Communication and collaboration:</b> enhanced as the learner works with peers in a groups during discussions and practice laboratory safety measures.</li> <li>• <b>Imagination and creativity:</b> promoted as the learner prepares and role-plays First Aid procedures for common accidents in the laboratory.</li> <li>• <b>Digital literacy:</b> developed as the learner uses digital devices to access and study content on First Aid procedures for common accidents in the laboratory.</li> <li>• <b>Citizenship:</b> enhanced as the learner adheres to laboratory safety measures for self and others as they practise safety measures in the laboratory and the general school learning environment.</li> </ul> |  |  |   |  |
| <p><b>Pertinent and Contemporary Issues (PCIs)</b></p> <ul style="list-style-type: none"> <li>• <b>Disaster risk reduction:</b> enhanced as the learner practices safety precautions in the laboratory and the general school learning environment.</li> <li>• <b>Citizenship:</b> promoted as the learner uses knowledge and skills gained in safety and First Aid to assist peers and community.</li> </ul>   |  |  |   |  |
| <p><b>Values:</b></p> <ul style="list-style-type: none"> <li>• <b>Respect:</b> promoted as the learner becomes considerate of the opinions of others while working in groups, discussing and role-playing.</li> </ul>   |  |  |   |  |



- **Responsibility:** promoted as the learner learns to become responsible for their own safety and safety of others when working in the laboratory; responsible and prudent usage of laboratory materials and proper disposal of waste is enhanced.

**Links to other subjects:**

- **Health Education:** as the learner practices safety and first aid.
- **Home Science:** as the learner role-plays first aid procedures to demonstrate safety.

**Assessment Rubric**

| Indicator   | Exceeds expectations   | Meets expectations  | Approaches expectations  | Below expectations   |
|---|--|---|--|--|
| Ability to identify common hazards and their symbols in the laboratory.   | Correctly and consistently identifies hazards and their symbols in the laboratory.   | Correctly identifies hazards and their symbols in the laboratory.   | Correctly identifies some hazards and their symbols in the laboratory.   | Has difficulty in identifying hazards and their symbols in the laboratory.   |
| Ability to analyse causes of common accidents in the laboratory.  | Correctly and comprehensively analyse causes of common accidents in the laboratory.  | Correctly analyses causes of common accidents in the laboratory.  | Correctly analyses causes of some common accidents in the laboratory.  | Has difficulty in analysing causes of common accidents in the laboratory.  |
| Ability to demonstrate procedures of First Aid safety measures for common laboratory accidents in the laboratory. | Correctly and creatively demonstrates procedures of First Aid safety measures for common laboratory accidents in the laboratory. | Correctly demonstrates procedures of First Aid safety measures for common laboratory accidents in the laboratory. | Correctly demonstrates some procedures of First Aid safety measures for common laboratory accidents in the laboratory. | Has difficulty in demonstrating procedures of First Aid safety measures for common laboratory accidents in the laboratory. |





| Strand  | Sub-Strand                                    | Specific Learning Outcomes   | Suggested Learning Experiences   | Key Inquiry Questions                                    |
|---|---|--|--|--|
| 1.0 Scientific Investigation  | 1.3. Basic Science Skills<br><br>(10 Lessons) | By the end of the sub-strand the learner should be able to:<br>a) Identify basic skills in science,<br>b) use the International System of Units (SI) for basic and derived quantities in science,<br>c) appreciate the application of basic skills in science. | The learner is guided to:<br><ul style="list-style-type: none"> <li>● identify basic skills in science (<i>manipulative, observation, measurement, classification, prediction, communication and conclusion skills</i>),</li> <li>● brainstorm on the importance of reading packing labels on quantities/products,</li> <li>● apply the International System of Units (SI) to determine temperature, length, mass, time, electric current, area, volume and density,</li> <li>● search for information on science skills from the internet.</li> </ul> | How are basic skills in science important in daily life? |
| <p><b>Core competencies to be developed:</b></p> <ul style="list-style-type: none"> <li>● <b>Communication and collaboration:</b> enhanced as the learner identifies methods of communicating information in science.</li> <li>● <b>Citizenship:</b> promoted as the learner identifies and states the SI units for basic and derived quantities for international awareness.</li> <li>● <b>Self-efficacy:</b> promoted as the learner practices presenting science information appropriately.</li> </ul> |   |  |  |  |



| <b>Values</b>   |   |  |   |   |
|---|---|--|---|---|
| <ul style="list-style-type: none"> <li>● <b>Respect:</b> enhanced as the learner learns how to value and respect each other's views in the process of applying science skills in their learning.</li> </ul> |   |  |   |   |
| <b>Links to other subjects</b>  |   |  |   |   |
| <ul style="list-style-type: none"> <li>● <b>All subjects:</b> as the learner applies science skills in their daily life and learning to identify and solve problems.</li> </ul>                             |   |  |   |   |
| <b>Assessment Rubric</b>  |   |  |   |   |
| <b>Indicator/Level</b>  | <b>Exceeds expectations</b>   | <b>Meets expectations</b>  | <b>Approaches expectations</b>  | <b>Below expectations</b>   |
| Ability to identify basic skills in science.  | Correctly and consistently identifies basic skills in science.                            | Correctly identifies basic skills in science.                            | Correctly identifies some basic skills in science.                        | With hint, identifies basic skills in science.                                    |
| Ability to use the SI units for basic and derived quantities in science.  | Correctly and consistently uses the SI units for basic and derived quantities in science. | Correctly uses the SI units for basic and derived quantities in science. | Correctly uses some SI units for basic and derived quantities in science. | Has challenges in using the SI units for basic and derived quantities in science. |
| Ability to apply methods of communicating science information.  | Correctly and consistently applies methods of communicating science information.          | Correctly applies methods of communicating science information.          | Correctly applies some methods of communicating science information       | Has challenges in applying methods of communicating science information.          |



| Strand                       | Sub-Strand   | Specific Learning Outcomes   | Suggested Learning Experiences  | Key Inquiry Question(s)  |
|------------------------------|--|--|---|--|
| 1.0 Scientific Investigation | 1.4 Laboratory apparatus and instruments<br><br>(11 Lessons) | By the end of the sub-strand the learner should be able to:<br>a) identify apparatus and instruments used in the laboratory,<br>b) handle with care the apparatus and instruments in the laboratory,<br>c) appreciate the importance of consumer protection when handling different apparatus and chemicals in the laboratory. | The learner is guided to:<br><ul style="list-style-type: none"> <li>● identify apparatus and instruments in the laboratory (for heating, measuring <i>mass, temperature, length, volume, weight, magnification and time</i>) (include parts and functions of a <i>microscope and burnsen burner</i>),</li> <li>● handle and use apparatus and instruments in the laboratory,</li> <li>● search for information from the internet on safety precautions to take when handling apparatus and instruments in the laboratory,</li> <li>● practise safety precautions when handling chemicals, apparatus and instruments in the laboratory.</li> </ul> | <ol style="list-style-type: none"> <li>1. What are the uses of different laboratory apparatus and instruments?</li> <li>2. What are the basic measures that should be considered when storing different laboratory apparatus?</li> </ol> |



**Core competencies to be developed:**

- **Citizenship:** promoted as the learner observes their own safety and that of others when handling apparatus and instruments.
- **Digital literacy:** developed as the learner uses digital devices to search for content on safety precautions to observe when handling apparatus and instruments.

**Pertinent and Contemporary Issues (PCIs)**

- **Environmental education:** promoted as the learner learns how to care for the environment while appropriately disposing of the consumables and any broken equipment as they handle chemicals, apparatus and instruments in the laboratory.
- **Disaster Risk Reduction:** promoted as the learner observes safety precautions when handling apparatus and instruments in the laboratory.

**Values:**

- **Respect:** promoted as the learner respects others' opinions while working in groups.
- **Responsibility:** promoted as the learner cares for apparatus, chemicals and specimen, as they handle laboratory equipment and apparatus during experiments.

**Links to other subjects:**

- **Home Science:** as the learner carries out measurements of ingredients when preparing meals.
- **Mathematics:** as the learner carries out measurements of various quantities of substances.



| <b>Assessment Rubric</b>   |  |  |   |   |
|--|--|--|---|---|
| <b>Indicator</b>   | <b>Exceeds expectations</b>  | <b>Meets expectations</b>  | <b>Approaches expectations</b>  | <b>Below expectations</b>   |
| Ability to identify apparatus and instruments used in the laboratory.        | Correctly and consistently identifies apparatus and instruments used in the laboratory.                  | Correctly identifies apparatus and instruments used in the laboratory.       | Correctly identifies some apparatus and instruments used in the laboratory.   | Has challenges in identifying apparatus and instruments used in the laboratory. |
| Ability to handle with care the apparatus and instruments in the laboratory. | Correctly and consistently handles with care the laboratory apparatus and instruments in the laboratory. | Correctly handles with care the apparatus and instruments in the laboratory. | Correctly handles some apparatus and instruments with care in the laboratory. | Have challenges in handling apparatus and instruments in the laboratory.        |



## STRAND 2.0: MIXTURES

| Strand                                      | Sub-Strand                       | Specific Learning Outcomes   | Suggested Learning Experiences  | Key Inquiry Questions  |
|---|----------------------------------|--|---|--|
| <b>2.0 Mixtures, Elements and Compounds</b> | <b>2.1 Mixtures (14 Lessons)</b> | <p>By the end of the sub-strand the learner should be able to:</p> <ol style="list-style-type: none"> <li>classify different types of mixtures as homogeneous or heterogeneous,</li> <li>distinguish between pure and impure substances using melting and boiling points,</li> <li>separate mixtures using different methods,</li> <li>appreciate the use of different methods of separating mixtures in day-to-day life.</li> </ol> | <p>The learner is guided to;</p> <ul style="list-style-type: none"> <li>categorise different mixtures as homogeneous (uniform) and heterogeneous (non-uniform); (<i>solid-solid, solid-liquid, liquid-liquid and gas-gas mixtures</i>),</li> <li>carry out, in groups, simple experiments to determine the boiling and melting points of pure and impure substances (<i>ice, candle wax, water, salty water</i>),</li> <li>search for, and watch videos and animations on determining melting and boiling points of substances,</li> <li>separate, in a group, different types of mixtures (<i>simple distillation, filtration, decantation, use of a magnet, sublimation, paper</i></li> </ul> | <ol style="list-style-type: none"> <li>How can mixtures be classified?</li> <li>What should be considered when separating various mixtures?</li> </ol> |



|  |  |  |   |  |
|--|--|--|---|--|
|  |  |  | <p><i>chromatography, solvent extraction, crystallisation</i>),</p> <ul style="list-style-type: none"> <li>• discuss with peers, the applications of separating mixtures in day to day life (<i>crude oil refining, fractional distillation of liquefied air, extracton of oil from nuts</i>).</li> </ul> |  |
| <p><b>Core competencies to be developed:</b></p> <ul style="list-style-type: none"> <li>• <b>Communication and collaboration:</b> developed as the learner discuss with peers, the applications of separating mixtures in day to day life.</li> <li>• <b>Digital literacy:</b> developed as the learner searches, watches and discuss videos and animations on determining melting and boiling points of substances.</li> <li>• <b>Learning to learn:</b> developed as the learner carries out experiments to determine the boiling and melting points of pure and impure substances.</li> </ul> |  |  |   |  |
| <p><b>Pertinent and Contemporary Issues (PCIs)</b></p> <ul style="list-style-type: none"> <li>• <b>Social cohesion: developed</b> as the learner works in harmony while carrying out, in groups, experiments to determine the boiling and melting points of pure and impure substances.</li> <li>• <b>Safety:</b> as the learner observes safety precautions while carrying out experiments on mixtures and in determining the boiling and melting points of pure and impure substances.</li> </ul>  |  |  |   |  |
| <p><b>Values:</b></p> <ul style="list-style-type: none"> <li>• <b>Respect and Love:</b> promoted and as the learner works harmoniously in groups, respect each other’s opinions while carrying out simple experiments on mixtures.</li> <li>• <b>Integrity:</b> promoted as the learner provides his/her honest results when carrying out experiments to determine the boiling and melting points of pure and impure substances.</li> </ul>  |  |  |   |  |



**Links to other subjects:**

- **Home Science:** as the learner handles different recipes.
- **Agriculture:** as the learner applies the knowledge on separating mixtures in agricultural processes like straining milk, winnowing grains and straining honey.
- **History and Citizenship:** as the learner relates traditional methods of separating mixtures to modern methods.

**Assessment Rubric**

| <b>Indicator</b>  | <b>Exceeds expectations</b>   | <b>Meets expectations</b>  | <b>Approaches expectations</b>  | <b>Below expectations</b>  |
|---|---|--|---|--|
| Ability to classify different types of mixtures as homogeneous and heterogeneous.           | Correctly and consistently classifies different types of mixtures as homogeneous and heterogeneous.           | Correctly classifies different types of mixtures as homogeneous and heterogeneous.           | Correctly classifies some types of mixtures as homogeneous and heterogeneous.                     | Have challenges in classifying different types of mixtures as homogeneous and heterogeneous.           |
| Ability to distinguish between pure and impure substances using melting and boiling points. | Correctly and consistently distinguishes between pure and impure substances using melting and boiling points. | Correctly distinguishes between pure and impure substances using melting and boiling points. | Correctly distinguishes between some pure and impure substances using melting and boiling points. | Have challenges in distinguishing between pure and impure substances using melting and boiling points. |
| Ability to separate mixtures using different methods.                                       | Correctly and consistently separates mixtures using different methods.  | Correctly separates mixtures using different methods.  | Correctly separates some mixtures using different methods.  | Have challenges in separating mixtures using different methods.  |





| Strand                                      | Sub-Strand  | Specific Learning Outcomes   | Suggested Learning Experiences  | Key Inquiry Questions                                 |
|---|---|--|---|---|
| <b>2.0 Mixtures, Elements and Compounds</b> | <b>2.2 Acids, bases and indicators</b><br><br><b>(16 Lessons)</b> | By the end of the sub-strand the learner should be able to: <ol style="list-style-type: none"> <li>use plant extracts as acid-base indicators,</li> <li>categorize different household solutions as either acidic or basic using indicators,</li> <li>determine the strength of acids and bases using universal indicator,</li> <li>outline applications of acids, bases and indicators in real life,</li> <li>appreciate the applications of acids and bases in real life.</li> </ol> | The learner is guided to; <ul style="list-style-type: none"> <li>Prepare and use plant extract indicator to classify common household solutions as either acidic or basic, in a group,</li> <li>in groups, classify different household solutions as either acidic or basic using indicators (use <i>methyl orange</i>, <i>litmus</i> or <i>phenolphthalein</i>),</li> <li>search, watch videos and animations showing different colours of acid-base indicators in different solutions,</li> <li>classify acidic or basic solutions as either strong or weak, in a group. (use <i>universal indicator</i>, <i>pH scale</i> and <i>pH chart</i>),</li> <li>explore applications of acids and bases (include <i>antacid tablets</i>, <i>common fruits in the locality</i>, <i>fertilisers</i>, <i>liming of soil</i>, <i>detergents</i>).</li> </ul> | How can a substance be identified as acidic or basic? |



**Core competencies to be developed:**

- **Critical thinking and problem solving:** as the learner explores applications of acids and bases.
- **Creativity and imagination:** as the learner works with peers in a group to classify acidic or basic solutions as either strong or weak.
- **Learning to learn:** as the learner classifies different household solutions as either acidic or basic.

**Pertinent and Contemporary Issues (PCIs)**

- **Citizenship:** as the learner tests for the acidity or alkalinity of soil samples for food security.
- **Life skills:** as the learner acquires knowledge on applications of acids and bases and apply it in day-to-day life.

**Values:**

- **Responsibility:** as the learner plays different roles while using plant extract indicator to classify common household solutions as either acidic or basic, in a group.
- **Respect:** as the learner respect each other's opinion, give each other time for self expression as they work in groups to classify different household solutions as either acidic or basic using indicators.
- **Integrity:** as the learner gives his/her honest results while working in group to classify acidic or basic solutions as either strong or weak.

**Links to other subjects:**

- **Agriculture:** as the learner uses lime and fertilizers to improve soil fertility in day-to-day life and learn how to test for the level of acidity in the soil.
- **Health Education:** as the learner acquire knowledge on the use of antacid to relieve stomach upsets.



| <b>Assessment Rubric</b>   |  |   |  |   |
|--|--|---|--|---|
| <b>Indicator</b>   | <b>Exceeds expectations</b>  | <b>Meets expectations</b>   | <b>Approaches expectations</b>   | <b>Below expectations</b>   |
| Ability to use plant extracts as acid-base indicators.                         | Correctly and consistently uses plant extracts as acid-base indicators.                        | Correctly uses plant extracts as acid-base indicators.                        | Correctly uses some plant extracts as acid-base indicators.              | Has difficulty in using plant extracts as acid-base indicators.                         |
| Ability to categorise different household solutions as either acidic or basic. | Correctly and consistently categories different household solutions as either acidic or basic. | Correctly categories different household solutions as either acidic or basic. | Correctly categories some household solutions as either acidic or basic. | Has difficulty in categorizing different household solutions as either acidic or basic. |
| Ability to determine the strength of acids and bases.                          | Correctly and consistently determines the strength of acids and bases.                         | Correctly determines the strength of acids and bases.                         | Correctly determines the strength of some acids and bases.               | Has difficulty in determining the strength of acids and bases.                          |
| Ability to outline the applications of acids and bases.                        | Correctly outlines the applications of acids and bases, giving examples from the locality.     | Correctly outlines the applications of acids and bases.                       | Correctly outlines some applications of acids and bases.                 | Has difficulty in outlining the applications of acids and bases.                        |



## STRAND 3.0: LIVING THINGS AND THEIR ENVIRONMENT

| Strand   | Sub-Strand   | Specific Learning Outcomes   | Suggested Learning Experiences  | Key Inquiry Question(s)   |
|--|--|--|---|---|
| <b>3.0 Living Things and their Environment</b> | <b>3.1 Reproduction in human beings</b><br><br><b>(16 Lessons)</b> | By the end of the sub-strand the learner should be able to: <ol style="list-style-type: none"> <li>describe the menstrual cycle in human beings,</li> <li>describe challenges related to the menstrual cycle,</li> <li>describe the process of fertilisation and implantation,</li> <li>appreciate the existence of sex-related challenges.</li> </ol> | The learner is guided to; <ul style="list-style-type: none"> <li>discuss human menstrual cycle (details of hormonal control not required; only mention),</li> <li>discuss various challenges related to the menstrual cycle (include <i>irregular periods, irregular bleeding, pains</i>, among other common challenges),</li> <li>use illustrations, charts and digital devices to observe animations showing fertilisation and implantation (<i>movement of the sperm, fusion with the egg, formation, zygote and its implantation on uterus</i>).</li> </ul> | <ol style="list-style-type: none"> <li>How does reproduction occur in human beings?</li> <li>What challenges are associated with menstruation in human beings?</li> <li>How best can issues related to the menstrual cycle be managed?</li> </ol> |



**Core competences to be developed:**

- **Digital literacy:** developed as the learner uses various digital devices to observe animations showing fertilisation and implantation.
- **Self-efficacy:** promoted as the learner shares experiences and discuss the management of challenges related to menstruation and sex-related disorders.
- **Learning to learn:** enhanced as the learner works with peers in groups various challenges related to the menstrual cycle.

**Pertinent and Contemporary Issues (PCIs):**

- **Social cohesion:** promoted as the learner works in harmony with others in a group while discussing human menstrual cycle.
- **Life skills/human sexuality:** promoted as the learner discusses in groups various challenges related to the menstrual cycle.

**Values:**

- **Respect:** promoted as the learner respects each other's opinion as they discuss various challenges related to the menstrual cycle.

**Links to other subjects:**

- **Health Education:** as the learner learns about healthy living during pregnancy.
- **Home Science:** as the learner learns about proper nutrition for healthy expectant mothers and babies.



| <b>Assessment Rubric</b>   |   |  |  |  |
|--|---|--|--|--|
| <b>Indicator</b>   | <b>Exceeds expectations</b>   | <b>Meets expectations</b>  | <b>Approaches expectations</b>   | <b>Below expectations</b>  |
| Ability to describe the menstrual cycle in human beings.           | Correctly and comprehensively describes the menstrual cycle in human beings.    | Correctly describes the menstrual cycle in human beings.           | Correctly describes the menstrual cycle in human beings with guidance.           | Has difficulty in describing the menstrual cycle in human beings even with guidance.       |
| Ability to describe challenges related to the menstrual cycle.     | Correctly and comprehensive describes challenges related to the menstrual cycle | Correctly describes challenges related to the menstrual cycle.     | Correctly describes some challenges related to the menstrual cycle.              | Has difficulty in describing challenges related to the menstrual cycle.                    |
| Ability to describe the process of fertilization and implantation. | Correctly and comprehensively describes the fertilization and implantation.     | Correctly describes the process of fertilization and implantation. | Correctly describes the process of fertilization and implantation but with help. | Has difficulty in describing the process of fertilization and implantation even with help. |



| Strand   | Sub- Strand  | Specific Learning Outcomes   | Suggested Learning Experiences   | Key Inquiry Questions  |
|--|--|--|--|--|
| <b>3.0 Living Things and their Environment</b> | <b>3.2 Human Excretory System-Skin and Urinary System</b><br><br><b>(12 Lessons)</b> | By the end of the sub-strand the learner should be able to: <ol style="list-style-type: none"> <li>identify parts of the human skin and their functions,</li> <li>identify parts of the urinary system and their functions,</li> <li>describe causes of kidney disorders,</li> <li>appreciate the importance of proper use of cosmetics for a healthy lifestyle and the need adopt a healthy lifestyle to promote kidney and skin health.</li> </ol> | The learner is guided to; <ul style="list-style-type: none"> <li>use a chart/model, in groups, to brainstorm on parts and functions of the human skin (<i>hair, sweat glands and epidermis</i> –avoid homeostatic functions of the skin),</li> <li>Discuss parts of the urinary system (external appearance of the kidney and vessels serving <i>kidney, ureter, bladder, urethra</i>),</li> <li>discuss the waste products excreted through the skin (<i>salts and water</i>) and kidneys (<i>urine</i>),</li> <li>in groups, use hand lens to observe the external parts of the skin (<i>hair and sweat pores</i>),</li> <li>search for information and brainstorm on examples of</li> </ul> | <ol style="list-style-type: none"> <li>Why is the skin important in humans?</li> <li>Why is excretion important to the human body?</li> <li>Why is proper use of cosmetics important?</li> </ol> |



|  |  |  |   |  |
|--|--|--|---|--|
|  |  |  | <p>cosmetics and their health effects on human body (e.g skin lightening creams and lotions),</p> <ul style="list-style-type: none"> <li>• use a chart brainstorm on the external parts and functions of the human kidney (avoid details of the nephron and osmoregulation),</li> <li>• search for information on the causes and prevention of kidney disorders,</li> <li>• discuss healthy lifestyles that promote kidney and skin health, for instance, adequate hydration.</li> </ul> <p><b>Project</b><br/>Model of the urinary system.</p> |  |
| <p><b>Core competencies to be developed:</b></p> <ul style="list-style-type: none"> <li>• <b>Citizenship:</b> promoted as the learner sensitises the community on proper use of cosmetics and promote use of locally made cosmetics.</li> <li>• <b>Digital literacy:</b> developed as the learner uses various digital devices in the learning process (e.g search and watch videos showing the structure of the skin and kidney as excretory organs).</li> <li>• <b>Imagination and creativity:</b> promoted as the learner models the urinary system.</li> </ul> |  |  |   |  |





- **Critical thinking and problem solving:** enhanced when the learner discusses in a group healthy lifestyles that promote kidney and skin health, for instance, adequate hydration.
- **Learning to learn:** enhanced as the learner develops self-awareness on healthy living to keep their skins and kidneys healthy and promoting the same amongst peers and community.

#### **Pertinent and Contemporary Issues (PCIs)**

- **Life skills:** promoted as learners develop self-awareness while learning the effects of cosmetics on the skin and healthy lifestyles that promote kidney and skin health, for instance, adequate hydration.
- **Environmental education:** as the learner discusses the effects of cosmetics on the environment and human beings.
- **Financial literacy:** as the learner improvises teaching and learning resources such as a model of urinary system using locally available materials in terms of;
  - Economical use of available resources.
  - Planning of projects.

#### **Values:**

- **Respect:** promoted as the learner respects each other's opinions while they are discussing the waste products excreted through the skin and kidneys,
- **Responsibility:** promoted as the learner handles charts and models with care as they work in groups, to brainstorm on parts and functions of the human skin, and kidney, taking care of their skin and the environment, and observing a correct diet.
- **Peace and unity:** promoted as the learner works harmoniously when using chart/model, in groups, to brainstorm on parts and functions of the human skin.
- **Integrity:** promoted as the learner report honest findings when searching for information and brainstorm on examples of cosmetics and their health effects on human body.



**Links to other subjects:**

- **Health Education** as the learner learns about lifestyle diseases, taking care of the skin
- **Home Science** as the learner learns about nutrition for healthy skin and kidney

**Assessment Rubric**

| <b>Indicator</b>   | <b>Exceeds expectations</b>   | <b>Meets expectations</b>  | <b>Approaches expectations</b>   | <b>Below expectations</b>  |
|--|---|--|--|--|
| Ability to identify parts of the human skin and state their functions. | Correctly and consistently identifies the parts of the human skin and states their functions. | Correctly identifies the parts of the human skin and states their functions. | Correctly identifies the parts of the human skin and states their functions with guidance. | Has difficulty in identifying the parts of the human skin and states their functions even with guidance. |
| Ability to identify parts of the urinary system and their functions.   | Correctly and consistently identifies the parts of the urinary system and their functions.    | Correctly identifies the parts of the urinary system and their functions.    | Correctly identifies some parts of the urinary system and some of their functions.         | Has difficulty in identifying the parts of the urinary system and their functions.                       |
| Ability to describe causes of kidney disorders.                        | Correctly and consistently describes causes of kidney disorders.                              | Correctly describes causes of kidney disorders.                              | Correctly describes some causes of kidney disorders.                                       | Has difficulty in describing causes of kidney disorders.   |



## STRAND 4.0: FORCE AND ENERGY

| Strand   | Sub-Strand  | Specific Learning Outcomes  | Suggested Learning Experiences  | Key Inquiry Questions  |
|--|---|---|---|--|
| <b>4.0 Force and Energy</b>  | <b>4.1 Static Electricity</b><br><br>(12 Lessons) | By the end of the sub-strand the learner should be able to:<br>a) demonstrate the existence of static charges in objects,<br>b) charge objects using different methods,<br>c) demonstrate the effects of force between charged objects,<br>d) appreciate the use of static charges in daily life. | The learner is guided to;<br><ul style="list-style-type: none"> <li>• rub different objects to show the presence of static charges in objects,</li> <li>• charge different objects by rubbing and induction,</li> <li>• search for, play and watch videos showing types of charges</li> <li>• show attraction and repulsion between charged objects,</li> <li>• discuss safety measures when dealing with static charges (include <i>lightning</i>).</li> </ul> | <ol style="list-style-type: none"> <li>1. How do materials get charged?</li> <li>2. What are the dangers of static charges?</li> </ol> |
| <p><b>Core competencies to be developed:</b></p> <ul style="list-style-type: none"> <li>• <b>Digital literacy:</b> enhanced as the learner uses digital devices to search, play and observe videos and animations showing types of charges.</li> <li>• <b>Self-efficacy:</b> promoted as the learner learns how to handle static electricity in day-to-day life.</li> <li>• <b>Communication and collaboration:</b> enhanced as the learner discusses the safety measures when dealing static charges</li> </ul> |   |   |   |  |
| <p><b>Pertinent and Contemporary Issues (PCIs)</b></p> <ul style="list-style-type: none"> <li>• <b>Disaster risk reduction:</b> promoted as the learner learns about safety measures during lightning and when dealing static charges.</li> </ul>  |   |   |   |  |



- **Safety and security:** enhanced as the learner learns how to avoid dangers associated with static electricity and discuss safety measures when dealing static charges.

**Values:**

- **Responsibility:** enhanced as the learner performs their different roles when charging different objects by rubbing and induction.
- **Unity:** enhanced as the learner works in harmony with others when rubbing different objects to show the presence of static charges in objects.

**Links to other subjects:**

- **Pre-Technical Studies:** as learners learn about lightning arrestors installed in buildings.

**Assessment Rubric**

| Indicator  | Exceeds expectations  | Meets expectations   | Approaches expectations  | Below expectations  |
|--|---|--|--|---|
| Demonstrating the existence of static charges in objects.            | Correctly and accurately demonstrates the existence of static charges in objects.     | Correctly demonstrates the existence of static charges in objects.   | Correctly demonstrates the existence of static charges in some objects.      | With assistance, demonstrates the existence of static charges in objects. |
| Charging objects using different methods.                            | Correctly and consistently charges objects using different methods.                   | Correctly charges objects using different methods.                   | Correctly charges objects using some methods.                                | With help, charges objects using different methods.                       |
| Ability to demonstrate the effects of force between charged objects. | Correctly and consistently demonstrates the effects of force between charged objects. | Correctly demonstrates the effects of force between charged objects. | Correctly demonstrates some of the effects of force between charged objects. | With help, demonstrates the effects of force between charged objects.     |



| Strand                      | Sub-Strand  | Specific Learning Outcomes  | Suggested Learning Experiences   | Key Inquiry Questions  |
|-----------------------------|---|---|--|--|
| <b>4.0 Force and Energy</b> | <b>4.2 Electrical Energy</b><br><br><b>(12 Lessons)</b> | by the end of the sub-strand the learner should be able to: <ol style="list-style-type: none"> <li>a) identify various sources of electricity in their environment,</li> <li>b) set up simple electrical circuits in series and parallel using dry cells, bulbs, ammeters and voltmeters,</li> <li>c) classify materials as conductors and non-conductors of electricity,</li> <li>d) identify electrical appliances in the locality,</li> <li>e) identify safety measures when handling electrical appliances,</li> <li>f) appreciate the use of electricity in their daily life.</li> </ol> | The learner is guided to; <ul style="list-style-type: none"> <li>• discuss and identify sources of electricity (<i>hydro-electric power, geothermal, solar, wind power</i>),</li> <li>• search for and observe videos and photographs on sources of electricity</li> <li>• Set up simple electrical circuits. (<i>Series and parallel arrangement of cells and bulbs</i>), in a group,</li> <li>• search for and observe videos and animations showing how to set up simple electrical circuits, in a group</li> <li>• carry out experiments to classify materials as conductors and non-conductors of electricity,</li> <li>• discuss and identify various electrical appliances in their locality,</li> <li>• identify safety measures to observe when using electrical appliances</li> <li>• explore uses of electricity in their environment.</li> </ul> | <ol style="list-style-type: none"> <li>1. What are the sources of electricity?</li> <li>2. What are the differences between conductors and non-conductors of electricity?</li> </ol> |



**Core competencies to be developed:**

- **Learning to learn:** enhanced as the learner applies the knowledge on electricity to safely use electrical appliances.
- **Digital literacy:** promoted as the learner uses digital devices to search and observe videos and photographs on sources of electricity.
- **Citizenship:** promoted as the learner observes safety measures for self and others as they use electrical appliances.

**Pertinent and Contemporary Issues (PCIs)**

- **Disaster risk reduction:** as learners observe safety measures when using electrical appliances.

**Values:**

- **Unity:** promoted as the learner works in harmony as they perform the activities in groups while setting up simple electrical circuits.
- **Responsibility:** promoted as the learner plays different roles when setting up simple electrical circuits.

**Links to other subjects:**

**Pre-technical Studies:** as learners learn to set up simple electrical circuits

**Assessment Rubric**

| <b>Indicator</b>                                    | <b>Exceeds expectations</b>   | <b>Meets expectations</b>                            | <b>Approaches expectations</b>                    | <b>Below expectations</b>                             |
|---|---|--|---|---|
| Ability to identify various sources of electricity. | Correctly and consistently identifies various sources of electricity. | Correctly identifies various sources of electricity. | Correctly identifies some sources of electricity. | With help, identifies various sources of electricity. |



|  |  |   |  |  |
|--|--|---|--|--|
| Ability to set up simple electrical circuits.                                  | Correctly and procedurally sets up simple electrical circuits.                                   | Correctly sets up simple electrical circuits.                                   | Correctly sets up some simple electrical circuits.                                   | With assistance, sets up simple electrical circuits.                             |
| Ability to classify materials as conductors and non-conductors of electricity. | Correctly and consistently classifies materials as conductors and non-conductors of electricity. | Correctly classifies materials as conductors and non-conductors of electricity. | Correctly classifies some materials as conductors and non-conductors of electricity. | With hint, classifies materials as conductors and non-conductors of electricity. |
| Ability to identify electrical appliances in the locality.                     | Correctly and consistently identifies electrical appliances in the locality.                     | Correctly identifies electrical appliances in the locality                      | Correctly identifies some electrical appliances in the locality.                     | With hint, identifies electrical appliances in the locality.                     |
| Ability to identify safety measures when handling electrical appliances.       | Correctly and consistently identifies safety measures when handling electrical appliances.       | Correctly identifies safety measures when handling electrical appliances.       | Correctly identifies some safety measures when handling electrical appliances.       | With prompt, identifies safety measures when handling electrical appliances.     |



| Strand   | Sub-Strand                        | Specific Learning Outcomes  | Suggested Learning Experiences   | Key Inquiry Questions  |
|--|-----------------------------------|---|--|--|
| <b>4.0 Force and Energy</b>  | <b>4.3 Magnetism (10 Lessons)</b> | By the end of the sub-strand, the learner should be able to:<br>a) classify materials in the environment as magnetic or non-magnetic,<br>b) investigate the force between like and unlike poles of magnets,<br>c) identify the uses of magnets in day-to-day life,<br>d) appreciate the applications of magnets in day-to-day life. | The learner is guided to;<br><ul style="list-style-type: none"> <li>● identify and collect materials within their environment, sort and group them as magnetic and non-magnetic materials,</li> <li>● carry out activities showing attraction between two unlike poles and repulsion between two like poles of magnets,</li> <li>● discuss the uses of magnets with peers,</li> <li>● Search for and watch animations showing force between like and unlike poles of magnets.</li> </ul> | <ol style="list-style-type: none"> <li>1. How can magnetic materials be identified in our environment?</li> <li>2. How are magnets used in day-to-day life?</li> </ol> |
| <p><b>Core competencies to be developed:</b></p> <ul style="list-style-type: none"> <li>● <b>Communication and collaboration:</b> enhanced as the learner discusses the uses of magnets with peers.</li> </ul>   |                                   |   |  |  |
| <p><b>Pertinent and Contemporary Issues (PCIs)</b></p> <ul style="list-style-type: none"> <li>● <b>Environmental education:</b> enhanced as the learner uses magnets to collect and separate magnetic materials in the environment to reduce pollution.</li> </ul> |                                   |   |  |  |
| <p><b>Values:</b></p> <ul style="list-style-type: none"> <li>● <b>Responsibility:</b> promoted as learner performs different roles when carrying out activities showing the force between like and unlike poles of magnets.</li> </ul>                             |                                   |   |  |  |





- **Unity:** promoted as the learner works in harmony as they magnetize and demagnetize materials.
- **Respect:** promoted as the learner learns to respect and accept others' opinions during the discussion involving magnetism and also play different roles as they magnetize and demagnetize materials.

**Links to other subjects:**

- **Pre-Technical Studies:** promoted as the learner uses magnets to classify materials in the environment as magnetic and non-magnetic.
- **Social Studies:** as the learner determines direction using magnetic compass.

**Assessment Rubric**

| <b>Indicator</b>   | <b>Exceeds expectations</b>  | <b>Meets expectations</b>   | <b>Approaches expectations</b>   | <b>Below expectations</b>  |
|--|--|---|--|--|
| Ability to classify materials into magnetic and non-magnetic.                            | Correctly and consistently classifies materials into magnetic and non-magnetic.                                  | Correctly classifies materials into magnetic and non-magnetic.                                | Correctly classifies some materials into magnetic and non-magnetic.                                | With help, classifies materials into magnetic and non-magnetic.                                |
| Ability to carry out activities showing action between like and unlike poles of magnets. | Correctly and systematically carries out activities showing the action between like and unlike poles of magnets. | Correctly carries out activities showing the action between like and unlike poles of magnets. | Correctly carries out some activities showing the action between like and unlike poles of magnets. | With help, carries out activities showing the action between like and unlike poles of magnets. |
| Ability to identify the uses of magnets.   | Correctly and consistently identifies the uses of magnets.   | Correctly identifies the uses of magnets.   | Correctly identifies some of the uses of magnets.  | With prompt, identifies the uses of magnets.   |



## GUIDELINES ON COMMUNITY SERVICE LEARNING CLASS ACTIVITY

Community Service Learning (CSL) is an experiential learning strategy that integrates classroom learning and community service to enable learners to reflect, experience and learn from the community. CSL is expected to benefit the learner, the school and local community. Knowledge and skills on how to carry out a CSL project have been covered in Life Skills Education (LSE).

All learners in Grade 7 will be expected to participate in only one CSL class activity. The activity will give learners an opportunity to practise the CSL project skills covered under LSE. This activity will be undertaken in groups for purposes of learning. Learners will be expected to apply knowledge and skills on steps of the CSL project to carry out an activity of their choice as per the guidelines provided in the template. The learning approach will take the form of a whole school approach, where the entire school community will be engaged in the learning process. Teachers will guide learners to execute a simple school-based integrated CSL class activity. This activity can be done in 4 to 6 weeks outside the classroom time.

### CSL skills to be covered:

- i) **Research:** Learners will develop research skills as they investigate PCIs to address the activity, ways and tools to use in collecting the data, manner in which they will analyse information and present their findings.
- ii) **Communication:** Learners will develop effective communication skills as they engage with peers and school community members. These will include listening actively, asking questions, presentation using varied modes etc.
- iii) **Citizenship:** Learner will be able to explore opportunities for engagement as members of the school community and providing a service for the common good.
- iv) **Leadership:** Learners develop leadership skills as they take up various roles within the CSL activity.



- v) **Financial literacy skills:** Learners consider how they can undertake the project as well as sourcing and utilising resources effectively and efficiently.
- vi) **Entrepreneurship:** Learners consider ways of generating income through innovation for the CSL class activity.

| Suggested PCIs   | Specific Learning Outcomes   | Suggested Learning Experiences  | Key Inquiry Questions   |
|--|--|---|---|
| <p>The learners will be guided to consider the various PCIs provided in the various subjects in Grade 7 and choose one suitable to their context and reality</p> | <p>By the end of the CSL class activity, the learner should be able to:</p> <ol style="list-style-type: none"> <li>identify a problem in the school community through research,</li> <li>plan to solve the identified problem in the community,</li> <li>design solutions to the identified problem,</li> <li>implement solutions to the identified problem,</li> <li>share the findings with relevant actors,</li> <li>reflect on own learning and relevance of the project,</li> </ol> | <p>The learner is guided to:</p> <ul style="list-style-type: none"> <li>brainstorm on pertinent and contemporary issues in their school that need attention,</li> <li>choose a PCI that needs immediate attention and explain why,</li> <li>discuss possible solutions to the identified issue,</li> <li>propose the most appropriate solution to the problem</li> <li>discuss ways and tools they can use to collect information on a problem (questionnaires, interviews, observation)</li> <li>develop tools for collecting the information/data,</li> </ul> | <ol style="list-style-type: none"> <li>How does one determine community needs?</li> <li>Why is it necessary to be part of a community?</li> <li>What can one do to demonstrate a sense of belonging?</li> </ol> |



|  |  |  |  |
|--|--|--|--|
|  | <p>g) appreciate the need to belong to a community</p> | <ul style="list-style-type: none"> <li>● identify resources they need for the activity,</li> <li>● collect the information/data using various means,</li> <li>● develop various reporting documents on their findings</li> <li>● use the developed tools to report on their findings,</li> <li>● implement the project,</li> <li>● collect feedback from peers and school community regarding the CSL activity,</li> <li>● share the report on activity through various media to peers and school community,</li> <li>● discuss the strengths and weaknesses of the implemented project and lessons learnt,</li> <li>● reflect on how the project enhanced own learning while at the same time facilitated service on an issue in the school community.</li> </ul> |  |
|--|--|--|--|



| <b>Assessment Rubric</b>   |   |  |  |   |
|--|---|--|--|---|
| <b>Indicator</b>   | <b>Exceeds Expectation</b>  | <b>Meets Expectation</b>   | <b>Approaches Expectation</b>  | <b>Below Expectation</b>  |
| The ability to identify and analyse a pertinent issue in society to be addressed | Learner critically defines and elaborately discusses a pertinent issue to be addressed.   | Learner defines and discusses a pertinent issue to be addressed.   | Learner defines and discusses a pertinent issue to be addressed with minimal support.  | Learner has difficulty in defining and discussing a pertinent issue to be addressed.  |
| The ability to plan to solve the identified problem                              | Learner correctly and systematically establishes resources needed, develops plans, assigns responsibilities, and generates data on the CSL project. | Learner correctly establishes resources needed, develops plans, assigns responsibilities, and generates data on the CSL project. | Learner sometimes establishes resources needed, develops plans, assigns responsibilities, and generates data on the CSL project. | Learner has difficulty establishing resources needed, developing plans, assigning responsibilities and in generating data on the CSL project. |
| The ability to design solutions to the identified problem and implement them     | Learner constantly applies the knowledge and skills gained in subjects to address the identified issue.   | Learner applies the knowledge and skills gained in subjects to address the identified issue.                                     | Learner applies the knowledge and skills gained in subjects to address the identified issue with some support.                   | Learner requires a lot of probing to apply the knowledge and skills gained in subjects to address the identified issue.                       |



|  |   |   |   |   |
|--|---|---|---|---|
| Ability to share findings with relevant actors                       | Learner comprehensively and confidently shares findings of the issue addressed in the activity.                       | Learner confidently shares findings of the issue addressed in the activity.                         | Learner shares some of the findings of the issue addressed in the activity.                         | Learner has difficulty in sharing the findings of the issue addressed in the activity.                  |
| The ability to reflect on own learning and relevance of the activity | Learner distinctively and clearly outlines the benefits of the CSL activity on the target community and own learning. | Learner clearly outlines the benefits of the CSL activity on the target community and own learning. | Learner outlines some of the benefits of the CSL activity on the target community and own learning. | Learner struggles to outline the benefits of the CSL activity on the target community and own learning. |



**APPENDIX: LIST OF ASSESSMENT METHODS, LEARNING RESOURCES AND NON-FORMAL ACTIVITIES**

| <b>Strand</b>               | <b>Sub-Strand</b>                     | <b>Suggested Assessment Methods</b>   | <b>Suggested Learning Resources</b>   | <b>Suggested Non-Formal Activities</b>  |
|-----------------------------|---------------------------------------|---|---|---|
| 1. Scientific Investigation | 2. Introduction to Integrated Science | <ul style="list-style-type: none"> <li>● Observation</li> <li>● Practical Work</li> <li>● Assessment Rubrics</li> <li>● Checklist</li> <li>● Anecdotal Records</li> <li>● Written Test</li> <li>● Oral Questions and Answers</li> </ul> | Course book<br>Library  | <ul style="list-style-type: none"> <li>● Watching video tapes on components of Integrated Science as a field of study</li> <li>● Oral Speeches on the importance of Integrated Science in daily life</li> </ul>                                       |
|                             | 1.2.Laboratory Safety                 | <ul style="list-style-type: none"> <li>● Practical Work</li> <li>● Observation Schedule</li> <li>● Checklist</li> </ul>   | <ul style="list-style-type: none"> <li>● Science Kit</li> <li>● Basic Laboratory Apparatus, equipment and selected specimens</li> <li>● SEPU Kit</li> <li>● First Aid Kit</li> <li>● Internet</li> <li>● Library</li> </ul> | <ul style="list-style-type: none"> <li>● Interacting actively with resource persons to understand issues to do with common hazards and their symbols in the laboratory.</li> <li>● Preparing charts, posters and slogans, First Aid safety</li> </ul> |



|                                       |   |  |  |   |
|---------------------------------------|---|--|--|---|
|                                       |   |  |  | measures for common laboratory accidents  |
|                                       | 1.3. Basic science skills                 | <ul style="list-style-type: none"> <li>• Assessment Rubric</li> <li>• Practical Work</li> <li>• Observation Schedule</li> <li>• Checklist</li> </ul> | <ul style="list-style-type: none"> <li>• Basic Laboratory Apparatus, equipment and selected specimens</li> <li>• SEPU Kit</li> <li>• Course book</li> </ul>                        | <ul style="list-style-type: none"> <li>• Writing articles in school magazines on units (SI) for basic and derived quantities in science.</li> <li>• Engaging resource persons in discussing basic science process skills</li> </ul> |
|                                       | 1.4. Laboratory apparatus and instruments | <ul style="list-style-type: none"> <li>• Practical Work</li> <li>• Observation Schedule</li> <li>• Checklist</li> </ul>                              | <ul style="list-style-type: none"> <li>• Course book</li> <li>• SEPU Kit</li> <li>• Basic Laboratory Apparatus, equipment and selected specimens (including microscope)</li> </ul> | <ul style="list-style-type: none"> <li>• Engaging resource persons to talk about how to safely handle and use apparatus and instruments in the laboratory</li> </ul>  |
| 2.0. Mixtures, Elements and Compounds | 2.1 Mixtures                              | <ul style="list-style-type: none"> <li>• Written Test</li> <li>• Assessment Rubrics</li> <li>• Checklist</li> </ul>                                  | <ul style="list-style-type: none"> <li>• Course book</li> <li>• Basic Laboratory Apparatus, equipment and</li> </ul>   | <ul style="list-style-type: none"> <li>• Organising and participating in exchange programmes / field trips to distinguish between</li> </ul>  |





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|--|--------------------------------------|---|--|--|
|  |                                      | <ul style="list-style-type: none"> <li>• Anecdotal Records</li> <li>• Oral Questions and Answers</li> </ul>   | <p>selected specimens</p> <ul style="list-style-type: none"> <li>• Ice</li> <li>• Candle wax</li> <li>• Water/salty water.</li> <li>• Sieve</li> <li>• magnet</li> </ul>   | <p>pure and impure substances using melting and boiling points</p>   |
|  | 2.2 Acids, bases and indicators      | <ul style="list-style-type: none"> <li>• Assessment Rubrics</li> <li>• Checklist</li> <li>• Oral Questions and Answers</li> <li>• Written Test</li> </ul> | <ul style="list-style-type: none"> <li>• Course book</li> <li>• Basic Laboratory Apparatus, equipment and selected specimens</li> <li>• Universal indicator, pH scale and pH chart</li> <li>• Antacid tablets, common fruits in the locality, fertilisers, liming of soil, detergents</li> </ul> | <ul style="list-style-type: none"> <li>• Engaging resource persons on how to use plant extracts as acid-base indicator.</li> </ul> |
|  | 2.3. Solid–Liquid Mixture separation | <ul style="list-style-type: none"> <li>• Practical Work</li> <li>• Observation Schedule</li> <li>• Checklist</li> </ul>                                   | <ul style="list-style-type: none"> <li>• Basic Laboratory Apparatus, equipment and</li> </ul>  | <ul style="list-style-type: none"> <li>• Inviting a resource person to talk about different methods of</li> </ul>                  |



|   |   |   |   |   |
|---|---|---|---|---|
|   |   |   | selected specimens <ul style="list-style-type: none"> <li>● Portfolio and file</li> <li>● Course book</li> </ul>  | separating mixtures in day-to-day life <ul style="list-style-type: none"> <li>● Conducting debates during club meetings on separate mixtures using different methods</li> </ul>                 |
| 3.0 Living Things and their Environment | 3.1 Reproduction in human beings            | <ul style="list-style-type: none"> <li>● Observation</li> <li>● Practical Work</li> <li>● Assessment Rubrics</li> <li>● Checklist</li> <li>● Anecdotal Records</li> <li>● Written Test</li> <li>● Oral Questions and Answers</li> </ul> | <ul style="list-style-type: none"> <li>● Charts</li> <li>● Course book</li> <li>● Basic Laboratory Apparatus, equipment and selected specimens</li> </ul>     | <ul style="list-style-type: none"> <li>● Engaging in straight talk on reproduction in human beings.</li> <li>● Engaging a resource person to talk about reproduction in human beings</li> </ul> |
|   | 3.2 Human Excretory System-Skin and Kidneys | <ul style="list-style-type: none"> <li>● Practical Work</li> <li>● Observation</li> <li>● Oral Questions and Answers</li> <li>● Assessment Rubrics</li> <li>● Checklist</li> </ul>  | <ul style="list-style-type: none"> <li>● Basic Laboratory Apparatus, equipment and selected specimens</li> <li>● Charts</li> <li>● Salts and water</li> </ul> | <ul style="list-style-type: none"> <li>● Conducting document analysis on human Excretory System-Skin and Kidneys</li> <li>● Holding discussions on causes of kidney disorders</li> </ul>        |



|                      |                        |   |   |   |
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|                      |                        | <ul style="list-style-type: none"> <li>• Anecdotal Records</li> <li>• Written Test</li> </ul>   | <ul style="list-style-type: none"> <li>• Course book</li> </ul>   | <ul style="list-style-type: none"> <li>• Inviting a resource person to talk about how to adopt a healthy lifestyle to promote kidney and skin health.</li> </ul>  |
| 4.0 Force and Energy | 4.1 Static Electricity | <ul style="list-style-type: none"> <li>• Assessment Rubrics</li> <li>• Checklist</li> <li>• Anecdotal Records</li> <li>• Written Test</li> <li>• Practical Work</li> <li>• Observation Schedule</li> <li>• Portfolio</li> </ul> | <ul style="list-style-type: none"> <li>• Basic Laboratory Apparatus, equipment and selected specimens</li> <li>• Course book</li> </ul> | <ul style="list-style-type: none"> <li>• Watching animations on existence of static charges in objects</li> <li>• Taking part in symposia on charging objects using different methods</li> <li>• Carrying out documentary analysis on effects of force between charged objects</li> </ul> |
|                      | 4.2 Electrical Energy  | <ul style="list-style-type: none"> <li>• Written Test</li> <li>• Assessment Rubrics</li> <li>• Checklist</li> <li>• Anecdotal Records</li> <li>• Practical Work</li> </ul>  | <ul style="list-style-type: none"> <li>• Basic Laboratory Apparatus, equipment and selected specimens</li> <li>• Course book</li> </ul> | <ul style="list-style-type: none"> <li>• Initiating projects on how to set up simple electrical circuits in series and parallel using dry cells, bulbs, ammeters and voltmeters.</li> <li>• Writing articles in</li> </ul>  |



|  |               |   |   |   |
|--|---------------|---|---|---|
|  |               | <ul style="list-style-type: none"> <li>● Observation Schedule</li> </ul>  |   | <p>school magazines on safety measures when handling electrical appliances</p>  |
|  | 4.3 Magnetism | <ul style="list-style-type: none"> <li>● Portfolio</li> <li>● Written Test</li> <li>● Observation Schedule</li> <li>● Assessment Rubrics</li> <li>● Checklist</li> <li>● Anecdotal Records</li> <li>● Practical Work</li> </ul> | <ul style="list-style-type: none"> <li>● Basic Laboratory Apparatus, equipment and selected specimens</li> <li>● Course book</li> </ul> | <ul style="list-style-type: none"> <li>● Engaging resource persons to discuss uses of magnets in day-to-day life</li> <li>● Organising and participating in exchange programmes to identify force between like and unlike poles of magnets</li> </ul> |

