REPUBLIC OF KENYA

MINISTRY OF EDUCATION

JUNIOR SECONDARY SCHOOL CURRICULUM DESIGN

GRADE 7

INTEGRATED SCIENCE

KENYA INSTITUTE OF CURRICULUM DEVELOPMENT
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FOREWORD

Curriculum is a tool which a country employs to empower its citizens. The Kenya Institute of Curriculum Development in meeting its core mandate *'to develop curriculum and curriculum support materials'* has spearheaded curriculum reforms in the education sector. The reforms are based on rigorous research, monitoring and evaluation activities conducted on the 8-4-4 system of education to inform the Competency Based Curriculum through a phase-in phase-out model. The reforms were informed by the Summative Evaluation Survey (2009), Needs Assessment Study (2016) and the Task Force Report on Re-alignment of Education Sector (2012), 21st century learning and approaches, the East Africa Protocol on harmonisation of education, among many others.

The curriculum reforms aim at meeting the needs of the Kenyan society by aligning the curriculum to the Constitution of Kenya 2010, the Kenya Vision 2030 and the East African Protocol, among other policy requirements as documented by the Sessional Paper No. 1 of 2019 on 'Reforming Education and Training in Kenya for Sustainable Development'. The reforms adopted the Competency Based Curriculum (CBC) to achieve development of requisite knowledge, skills, values and attitudes that will drive the country's future generations as documented by the Basic Education Curriculum Framework (BECF). Towards achieving the mission of the Basic Education, the Ministry of Education has successfully and progressively rolled out curriculum implementation for Early Years Education, Grades 4 and 5. The roll out for Grade 6 and Junior Secondary (Grade 7-9) will subsequently follow.

It is my hope that the curriculum designs for Grade 7 will guide the teachers, among other educational stakeholders, for progressive achievement of the curriculum vision which seeks to have engaged, empowered and ethical citizens.

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PREFACE

The Government of Kenya embarked on the national implementation of the Competency Based Curriculum in January, 2019 for Early Years Education (Pre-Primary 1 and 2, and Lower Primary Grade 1, 2 and 3). The implementation progressed to Upper Primary (Grade 4, 5 and 6) based on the reorganization of the Basic Education structure. Grade 7 curriculum furthers implementation of the Competency Based curriculum to Junior Secondary education level. This level marks the zenith of Middle School education whose main feature is to offer a broad opportunity for the learner to explore talents, interests and abilities before selection of pathways and tracks in Senior Secondary education level.

The Grade 7 curriculum designs for the respective learning areas will enable the development of twenty first century competencies. Ultimately, this will lead to the realization of the vision and mission of the Competency Based curriculum as documented in the Basic Education Curriculum Framework (KICD, 2017).

It is my hope that all government agencies among other stakeholders in education will use the designs to guide effective and efficient implementation of the learning activities as well as provide relevant feedback on various aspects of the curriculum. Successful implementation of the Grade 7 curriculum will be a significant milestone towards realization of the curriculum mission 'Nurturing Every Learner's Potential'.

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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, below the university. The curriculum development process for any level involves thorough research, international benchmarking, and robust stakeholder engagement. Through this systematic and consultative process, KICD conceptualised the Competency Based Curriculum (CBC) as captured in the Basic Education Curriculum Framework (BECF). The CBC responds to the demands of the 21st Century and the aspirations captured in the Constitution of Kenya 2010, Kenya Vision 2030, East African Commission Protocol and the United Nations Sustainable Development Goals.

The Kenya Institute of Curriculum Development has developed the Grade 7 curriculum designs taking cognisance of the tenets of the CBC, key among them being the need to ensure that learners are provided with learning experiences that call for higher order thinking, thereby ensuring they become engaged, empowered and ethical citizens as articulated in the BECF Vision. The Grade 7 designs also provide opportunities for learners to develop the core competencies as well as engage in Community Service Learning. The designs present assessment rubrics linked to sub strands in the individual subjects. Teachers are encouraged to use varied assessment tools when assessing learners.

KICD obtains its funding from the Government of Kenya to enable the achievement of its 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. The Institute is grateful for the support accorded to the process by the Government of Kenya, through the MoE and the development partners for the policy, resource, and logistical support.

I acknowledge the KICD curriculum developers and other staff, teachers and all the educators who participated, as panelists, in the development of the designs. I also appreciate the contribution of the Semi-Autonomous Government

Agencies (SAGAs) and representatives of various stakeholders for their various roles in the development of the Grade 7 curriculum designs.

My special thanks to the Cabinet Secretary, Ministry of Education; the Principal Secretary State Department of Early Learning and Basic Education; the Secretary, Teachers' Service Commission (TSC) and the Chief Executive Officer, Kenya National Examinations Council (KNEC) for their support in the process. Finally, I am grateful to the KICD Governing Council for their consistent guidance during the development of the curriculum designs. The Institute assures all curriculum implementers, parents, and other stakeholders that the designs will ensure effective implementation of the CBC at Grade 7.

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TABLE OF CONTENTS

TIME ALLOCATION

	Subject	**Number of Lessons Per Week (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 and Pre-Career	5
7.	Social Studies	3
8.	Religious Education (CRE/IRE/HRE)	2
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
	Total	**45**

NATIONAL GOALS OF EDUCATION

Education in Kenya should:

i) Foster nationalism and patriotism and promote national unity.

Kenya's people belong to different communities, races and religions, but these differences need not divide them. They must be able to live and interact as Kenyans. It is a paramount duty of education to help young people acquire this sense of nationhood by removing conflicts and promoting positive attitudes of mutual respect which enable them to live together in harmony and foster patriotism in order to make a positive contribution to the life of the nation.

ii) Promote the social, economic, technological and industrial needs for national development.

Education should prepare the youth of the country to play an effective and productive role in the life of the nation.

a) Social Needs

Education in Kenya must prepare children for changes in attitudes and relationships which are necessary for the smooth progress of a rapidly developing modern economy. There is bound to be a silent social revolution following in the wake of rapid modernization. Education should assist our youth to adapt to this change.

b) Economic Needs

Education in Kenya should produce citizens with the skills, knowledge, expertise and personal qualities that are required to support a growing economy. Kenya is building up a modern and independent economy which is in need of an adequate and relevant domestic workforce.

c) Technological and Industrial Needs

Education in Kenya should provide learners with the necessary skills and attitudes for industrial development. Kenya recognizes the rapid industrial and technological changes taking place, especially in the developed world. We can only be part of this development if our education system is deliberately focused on the knowledge, skills and attitudes that will prepare our young people for these changing global trends.

iii) Promote individual development and self-fulfillment

Education should provide opportunities for the fullest development of individual talents and personality. It should help children to develop their potential interests and abilities. A vital aspect of individual development is the building of character.

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 the 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, 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 behaviour 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 endeavor 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 analyzing 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 industrialization, 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." The same is further underscored in both Sessional Paper No. 14 of 2012 and

Sessional Paper 1 of 2019 which equally stresses the need for sustainable basic and higher education, with an emphasis on Science, Technology and Innovation.

Integrated Science learning area is therefore expected to create a scientific culture among learners that inculcates scientific literacy to enable them 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. The integrated science learning area is therefore a deliberate effort to enhance the level of scientific literacy of all learners and equip them 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 specialization in pure sciences (Physics, Chemistry, and Biology), applied sciences, Careers and Technology Studies (CTS) and Technical and Engineering subjects 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 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. Practice 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
1.0 Scientific Investigation	**1.1 Introduction to Integrated Science** **4 Lessons**	By the end of the sub-strand the learner should be able to: a) identify the components of Integrated Science as a field of study. b) relate knowledge and skills gained in Integrated Science to career opportunities. c) appreciate the importance of Integrated Science in daily life.	The learner is guided to: • discuss the meaning and components of Integrated Science with peers. • discuss in a group, career opportunities related to knowledge and skills gained in Integrated Science. • identify pathways related to Integrated Science at Senior school. • Search for information on importance of Integrated Science from other sources like the internet among others. • discuss in a group, the importance of scientific knowledge in daily life.	How is the knowledge acquired in Integrated Science useful in daily life?
Core competences to be developed: • Communication and collaboration: promoted as learners discuss the importance of scientific knowledge in daily life. • Citizenship: promoted as learners search on local and international career opportunities related to Integrated Science. • Digital literacy: developed as learners use digital devices to search for information on the application of Integrated				

Science.
- Self-efficacy: promoted as learners discuss confidently the pathways and career opportunities associated with Integrated Science.

Pertinent and Contemporary Issues (PCIs)
- Poverty eradication: learners discuss how scientific knowledge is applied in solving problems within their environment and generating income.
- Safety and security: skills are acquired as learners search for information on the internet using the digital devices in observing cyber security regulations.

Links to other subjects:
- Computer studies: learners search for information from the internet using digital devices.

Values:
- Respect: promoted as learners respect opinions of others during the discussions.

Assessment Rubric

Indicator	**Exceeds expectation**	**Meets expectation**	**Approaches expectation**	**Below expectation**
Ability to identify the components of Integrated Science	Correctly and consistently identifies components of Integrated Science	Correctly identifies components of Integrated Science	Identifies some components of Integrated Science	With assistance, identifies some components of Integrated Science
Ability to relate knowledge and skills gained in Integrated Science to career opportunities	Consistently and correctly 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	With assistance, relates some 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** **8 Lessons**	By the end of the sub-strand the learner should be able to: a) identify common hazards and their symbols in the laboratory b) analyse causes of common accidents in the laboratory c) demonstrate first aid safety measures for common laboratory accidents. d) appreciate the importance of safety in the and access to a healthy working environment.	The learner is guided to: • identify common hazards and accidents in the laboratory • interpret common hazard symbols, including but not limited to flammable, corrossive, toxic, carcinogenic, radioactive substances among others • discuss in groups, causes of common laboratory accidents and related first aid measures (burns and scalds, cuts, and ingestion of harmful substances) • role-play some first aid procedures for common accidents in the laboratory. • practice safety measures in the laboratory and the general school learning environment. • discuss the importance of safety measures in the laboratory • search for laboratory safety procedures from other sources	1. How do accidents happen in the laboratory? 2. What safety measures should be considered while constructing a laboratory?

			(internet, e-libraries among others).	

Core competencies to be developed:

- Communication and collaboration: enhanced as learners work in groups during discussions and practice laboratory safety measures.
- Imagination and Creativity is promoted as learners prepare and role-play on first aid procedures.
- Digital literacy: developed as learners use digital devices to access and study content on First Aid procedures.
- Citizenship: enhanced learners adhere to laboratory safety measures for self and others.

Pertinent and Contemporary Issues (PCIs)

- Disaster Risk Reduction: enhanced as learners practice safety precautions in the laboratory.
- Citizenship: promoted as learners use knowledge and skills gained in safety and first aid to assist peers and community.

Values:

- Respect is promoted as learners become considerate of opinion of others while working in groups, discussing and role playing.
- Responsibility**:** learners become responsible for 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 is promoted as learners practice safety and first aid.
- Home Science is promoted as learners role-play first aid procedures to demonstrate safety.

Assessment Rubric

Indicator	**Exceeds expectation**	**Meets expectation**	**Approaches expectation**	**Below expectation**
Ability to identify common hazards and	Correctly and consistently identifies	Correctly identifies hazards and accidents	Correctly identifies some hazards and	With help, identifies hazards and accidents

their symbols in the laboratory	hazards and accidents in the laboratory.	in the laboratory.	accidents in the laboratory.	in the laboratory.
Ability to analyse causes of common accidents in the laboratory.	Correctly and critically 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.	With help, analyses 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.	With help, demonstrates 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** **10 Lessons**	By the end of the sub strand the learner should be able to: a) Identify basic skills in science. b) use the International System of Units (SI) for basic and derived quantities in science. c) appreciate the application of Basic skills in science.	The learner is guided to: • identify basic skills in science (manipulative, observation, measurement, classification, prediction, communication and conclusion skills). • brainstorm on the importance of reading packing labels on quantities/products. • apply the International System of Units (SI) to determine temperature, length, mass, time, electric current, area, volume and density • search for information on science skills from the internet.	1. How are basic skills in science important in daily life? 2. How is Science information communicated?
Core Competencies • Communication and Collaboration is enhanced as learners work in groups to identify methods of communicating information in science.				

- Citizenship is promoted as learners identify and state the SI units for basic and derived quantities for international awareness.
- **Self-efficacy** is promoted as learners practice presenting science information appropriately.

Values

- Respect is enhanced as learners learn how to value each other's views in the process of applying Science skills in their learning.
- Unity is strengthened as learners work in groups applying Science skills.

Links to other subjects

- All subjects as learners apply science skills in their daily life and learning

Assessment Rubric

Indicator/Level	Exceeds expectation	Meets expectation	Approaches expectation	Below expectation
Ability to identify basic skills in science.	Correctly and comprehensively identifies basic Science skills.	Correctly identifies basic science skills.	Correctly identifies some basic Science skills.	With help, identifies basic Science skills.
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.	Correctly uses the SI units for basic and derived quantities.	Correctly uses some SI units for basic and derived quantities.	With help, uses the SI units for basic and derived quantities.
Ability to apply methods of communicating Science information.	Correctly and creatively applies methods of communicating Science information.	Correctly applies methods of communicating Science information.	Correctly applies some methods of communicating Science information	With help, applies 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** **10 Lessons**	By the end of the sub-strand the learner should be able to: a) identify apparatus and instruments used in the laboratory. b) handle and care for the apparatus and instruments in laboratory. c) appreciate the importance of consumer protection when handling different apparatus and chemicals in the laboratory	The learner is guided to: • identify apparatus and instrumnets in the laboratory (for heating, measuring mass, temperature, length, volume, weight, magnification and time) (include parts and functions of a microscope and burnsen burner) • handle and use apparatus and instruments in the laboratory • search for information from the internet on safety precautions to take when handling apparattus and instrumnets in the laboratory • practice safety precautions when handling chemicals, apparatus and instruments in the laboratory.	1. What are the uses of different laboratory apparatus and instruments? 2. What are the basic measures that should be considered when storing different laboratory apparatus?
Core competences to be developed: • Communication and Collaboration are enhanced as learners work together in using different apparatus and equipment				

to carry out laboratory experiments and activities
- Citizenship is promoted as learners observe their own safety and others when handling apparatus and instruments.
- Digital literacy is developed as learners use digital devices to search for content on safety precautions to observe when handling apparatus and instruments.

Pertinent and Contemporary Issues (PCIs)
- Environmental Education is promoted as learners learn how to care for the environment as they appropriately dispose of the consumables and any broken equipment as they use laboratory equipment and apparatus to do experiments,
- Disaster Risk Reduction is promoted as learners observe safety precautions when handling apparatus and instruments in the laboratory.

Values:
- Respect is promoted as learners respect others' opinions while working in groups.
- Responsibility is promoted as learners care for apparatus, chemicals and specimen, as they handle laboratory equipment and apparatus during experimental work.

Links to other subjects:
- Home Science as learners carry out measurements of ingredients when preparing meals.
- Mathematics as learners carry out measurements of various quantities of substances.

Assessment Rubric

Indicator	**Exceeds expectation**	**Meets expectation**	**Approaches expectation**	**Below expectation**
Ability to identify apparatus and instruments used in the laboratory.	Correctly and exhaustively 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.	With help identifies apparatus and instruments used in the laboratory.

Ability to handle apparatus and instruments laboratory.	Correctly and consistently handles laboratory apparatus and instruments appropriately.	Correctly handles apparatus and instruments appropriately.	Correctly handles some apparatus and instruments appropriately.	With help, handles apparatus and instruments appropriately.

STRAND 2.0: MIXTURES

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
2.0 Mixtures, Elements and Compounds	**2.1 Mixtures 14 Lessons**	By the end of the sub strand the learner should be able to: a) classify different types of mixtures as homogeneous or heterogeneous b) distinguish between pure and impure substances using melting and boiling points c) separate mixtures using different methods d) appreciate the use of different methods of separating mixtures in day-to-day life	The learner is guided to: • categorize different mixures as homogeneous (uniform) and heterogeneous (non-uniform); (solid-solid, solid- liquid, liquid-liquid and gas- gas mixtures). • carry out, in groups, simple experiments to determine the boiling and melting points of pure and impure substances (ice, candle wax, water, salty water). • search for, and watch videos and animations on determining melting and boiling points of substances. • separate, in a group, different types of mixtures (simple distillation, filtration, decantation, use of a magnet, sublimation, paper chromatography, solvent extraction, crystalization). • discuss with peers, the applications of separating mixtures in day to day life (crude oil refining, fractional distillation	1. How can you classify mixtures? 2. What should be considered when separating various mixtures?

			of liquefied air, extracton of oil from nuts).	

Core competences to be developed:

- Communication and collaboration as learners work together in carrying out simple experiments to determine the boiling and melting points of substances.
- Digital literacy as learners search, watch and discuss videos and animations on mixtures.
- Learning to learn as learners search for more content and apply the same on mixtures.

Pertinent and Contemporary Issues (PCIs)

- Social cohesion as learners work in groups to separate mixtures.
- Safety as learners observe safety precautions while carrying out experiments on mixtures.

Values:

- Respect and love as learners work harmoniously in groups while carrying out simple experiments on mixtures.
- Integrity as learners separate mixtures and report findings honestly.

Links to other subjects:

- Home Science as they handle different recipes.
- Agriculture as learners apply the knowledge on separating mixtures in agricultural processes like straining milk, winnowing grains and straining honey among others.
- History as learners relate traditional methods of separating mixtures to modern methods.

Assessment Rubric

Indicator	Exceeds expectation	Meets expectation	Approaches expectation	Below expectation
Ability to classify different types of mixtures as	Correctly and excellently classifies different types of	Correctly classifies different types of mixtures.	Correctly classifies some types of mixtures.	Requires assistance to classify different types of mixtures.

homogeneous and heterogeneous.	mixtures.			
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.	Can only distinguish between some pure and impure substances using melting and boiling points.	Requires assistance to distinguish 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 mixtures using different methods.	Requires assistance to separate mixtures using different methods.

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
2.0 Mixtures, Elements and Compounds	**2.2 Acids, bases and indicators** **15 Lessons**	By the end of the sub strand the learner should be able to: a) use plant extracts as acid-base indicator b) categorize different house-hold solutions as either acidic or basic using indicators. c) determine the strength of acids and bases using universal indicator d) outline applications of acids, bases and indicators in real life e) appreciate the applications of acids and bases in real life	The learner is guided to: • Prepare and use plant extract indicator to classify common house hold solutions as either acidic or basic, in a group. • classify different house-hold solutions as either acidic or basic using indicators (use methyl orange, litmus or phenolphthalein), in a group). • search, watch videos and animations showing different colours of acid-base indicators in different solutions. • classify acidic or basic solutions as either strong or weak, in a group. (use universal indicator, pH scale and pH chart) • .explore applications of acids and bases (include antacid tablets, common fruits in the locality, fertilizers, liming of soil, detergents).	1. How can you identify a substance as being acidic or basic? 2. What is the significance of acids and bases?

Core competences to be developed:

- Critical thinking and problem solving as learners explore applications of acids and bases.
- Creativity and imagination as learners work in groups to classify acidic or basic solutions as either strong or weak.
- Learning to learn as learners classify different house-hold solutions as either acidic or basic.

Pertinent and Contemporary Issues (PCIs)

- Citizenship as learners test for the acidity or alkalinity of soil samples for food security.
- Life skills as learners acquire knowledge on applications of acids and bases and apply it in day-to-day life.
- Safety as learners carefully handle acids and bases in the laboratory.
- Environmental conservation as learners carefully extracts plant indicators and dispose of the waste appropriately.

Values:

- Peace, love and unity as learners classify house hold solutions as either acidic or basic.
- Responsibility as learners carefully pick flowers from the environment.
- Respect as learners in groups classify acidic or basic solutions as either strong or weak.
- **Integrity** as learners apply proper laboratory waste disposal measures.

Links to other subjects:

- Agriculture as learners use 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 learners acquire knowledge on the use of antacid to relieve stomach upsets.

Assessment Rubric

Indicator	Exceeds expectation	Meets expectation	Approaches expectation	Below expectation
Ability to use plant extracts as acid-base indicators.	Correctly consistently uses plant extracts as acid-base indicators.	Correctly uses plant extracts as acid-base indicators.	Sometimes correctly uses plant extracts as acid-base indicators.	Requires assistance to use plant extracts as acid-base indicators.

Ability to categorize different house hold solutions as either acidic or basic.	Correctly and creatively categorizes different house hold solutions as either acidic or basic.	Correctly categorizes different house hold solutions as either acidic or basic.	Categorizes some house hold solutions as either acidic or basic.	Requires assistance to categorize different house hold 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.	Requires assistance to determine the strength of acids and bases.
Ability to outline the applications of acids and bases.	Correctly and critically outlines the applications of acids and bases.	Correctly outlines the applications of acids and bases.	Correctly outlines some applications of acids and bases.	Requires assistance to outline the applications of acids and bases.

COMMUNITY SERVICE LEARNING (CSL) PROJECT

Project Title: Water Purification

The CSL project is meant to promote care for the family. This has been planned for in the sub strand, Solid – Liquid Mixture separation. The project should enable the learner acquire skills required in water purification. The concept of mixture separation will be assessed during the project as the learner gets an opportunity to practice hands-on activities by applying acquired knowledge and skills in separation of mixtures.

The learner requires guidance and facilitation in order to implement the project. The learner should be taken through proper planning and actualization processes involved in the project activities. The learners should carry out the project in groups where possible, especially when there are limited resources.

Resources Required

The learner needs plastic soda bottle, drinking straw, gravel or small stones, clean sand, charcoal, cotton balls or small cloth or coffee filter, garden dirt, water, scissor, or knife. *The learner should be guided to use or improvise locally available materials for this project.*

Integration of Learning and Community Service

About 70% of the earth is covered with water. However, only about 3% can be used for drinking. Most people around the world do not have access to clean water and must boil or filter it first. One of the mixture separation methods is filtration involving solid liquid mixture. The learner will grasp the concept of filtration by passing dirty water through 2 inch layers of cotton wool, cloth, charcoal, gravel or small stones each in that order from bottom and 4 inch clean sand at the top. Layers of gravel or small stones are used to filter out large sediments like leaves or insects while sand is used to remove

fine impurities. Layer of charcoal removes contaminants and impurities through chemical absorption. Making a homemade water filter is a simple hands-on activity learners can carry out using locally available materials. This is how natural soil of the ground filters impurities out of water as part of the infiltration process of water cycle. The water may be used for cleaning household items and for animals to drink; filtered water through this process should not be used by humans as drinking water unless boiled well. This is because of water pollution through chemicals, fertilizers among other pollutants making the water unsafe for human drinking. Leaners will address the need for accessibility to clean water through this project at school and in the community and raise the standards of hygiene which is one of the pertinent and contemporary issues in the 21st Century.

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Question
2.0. Mixtures, Elements and Compounds	**2.3. Solid – Liquid Mixture separation (Water Purification).** **CSL Project** (4 Lessons)	by the end of the sub strand the learner should be able to: a) identify nearby sources of water in the community b) categorise water from different sources into clean and dirty water c) identify appropriate materials for separating clean water from solid in the dirty water d) make homemade water filter using locally available materials e) use homemade water filter to separate clean water from solid in the dirty water f) explore sustainable long-term strategies of making river water clean for use	In groups, learners are guided to: • visit the nearby rivers or other sources of water to collect samples of different waters • identify and use appropriate locally available materials to make homemade water filter that can be sued to separate clean water from dirty • demonstrate water filtration using the homemade water filter • brainstorm on appropriate long term sustainable strategies of making river water clean for use within the community • create a portfolio and file the findings from the research. • collect information on human activities that make clean water sources dirty	1. What causes clean river water from the source to become dirty? 2. How can cleanliness of river water from the source be maintained?

		in the community g) carry out research in the community on factors that make communal water dirty h) appreciate the need to sensitize the community on importance of cleanliness of river water	• Search for information in the internet on factors that make clean water dirty with solids • form learning platforms for example in social media, where they communicate to all parents about their findings on human activities and other factors that make river water dirty and how to maintain clean water from the source	

The Key Component of CSL Developed: Science process skills, practical skills and Life skills

Importance of Basic Science Process Skills in the community

a) The learner will be able to apply measuring skills to identify the quantity of solid particle in dirty water
b) The learner will be able to apply predicting skills to categorise water from different sources into clean and dirty water. The learner can use predicting skills to identify appropriate materials for separating clean water from solid in the dirty water and to explore sustainable long-term strategies of making river water clean for use in the community.
c) The learner will be able to apply observation, recording, inferring and communication skills to observe difference between dirty and clean water, record and sensitise the community on sustainable long-term strategies of making river water clean for use in the community

Importance of Practical skills in the community

a) The learner will be able to apply practical skills necessary in making appropriate water filter and manipulate it to filter water depending on the quantity.

Life Skill: Importance of Life Skill in the Community

The learner will be able to apply scientific problem sourcing process to solve the problem of dirty water, reduction of infections and improvement of sanitation in school and at home.

Core Competencies to be developed:

- Communication and collaboration as learners brainstorm appropriate long term sustainable strategies of making river water clean in the community.
- Digital literacy as the learner interacts with a digital device to identify and record other factors that make clean water dirty with solids.
- Critical thinking and problem solving as the learner brainstorms appropriate long term sustainable strategies of making river water clean in the community.
- Imagination and creativity as learners create social media platforms connecting with parents to learn how clean water can be maintained from the source.

Pertinent and Contemporary Issues (PCIs):

- Environmental Management as learners learn how to maintain cleanliness of river water from the source or other waters from other sources.
- Health Education as learners sensitize the community through social media on how clean water can be maintained from the source.
- Citizenship as learners create a social media platform connecting parents to communicate how clean water can be maintained from the source.

Values:

- Responsibility as the learners take care of clean river water from the source since others may need to use the same water as it flows down the stream.
- Patriotism as the learners sensitize the community to consider other human beings and animals by promoting taking

care of clean river water from the source since other people and animals may need to use the same water as it flows down the stream.

Links to other subjects:

- Home Science as learners learn to maintain clean water starting at the source; clean water is used at home for hygienic home environment.

Assessment Rubric

Indicators	**Exceeds expectation**	**Meets expectation**	**Approaches expectation**	**Below expectation**
Ability to identify nearby sources of water within community.	Correctly and consistently identifies nearby rivers and other sources of water within the community.	Correctly identifies nearby rivers and other sources of water within the community.	Correctly identifies some nearby rivers and other sources of water within the community.	With help, identifies nearby rivers and other sources of water within the community.
Ability to categorise water from different sources into clean and dirty.	Correctly and consistently categorizes water from different sources into clean and dirty.	Correctly categorizes water from different sources into clean and dirty.	Correctly categorizes water from some different sources into clean and dirty.	With assistance, categorizes water from different sources into clean and dirty.
Ability to identify appropriate materials for separating clean water from solid in the dirty water.	Correctly and creatively identifies appropriate materials for separating clean water from solid in the dirty water.	Correctly identifies appropriate materials for separating clean water from solid in the dirty water.	Correctly identifies some materials for separating clean water from solid in the dirty water.	With help, identifies appropriate materials for separating clean water from solid in the dirty water.

Ability to make homemade water filter using locally available materials	Correctly and accurately makes homemade water filter using locally available materials	Correctly makes homemade water filter using locally available materials	To some extent makes homemade water filter using locally available materials	With help, makes homemade water filter using locally available materials
Ability to use homemade water filter to separate clean water from solid in the dirty water	Correctly and accurately uses homemade water filter to separate clean water from solid in the dirty water	Correctly uses homemade water filter to separate clean water from solid in the dirty water	Somehow uses homemade water filter to separate clean water from solid in the dirty water	With assistance, uses homemade water filter to separate clean water from solid in the dirty water
Ability to explore sustainable long-term strategies of making river water clean in the community.	Correctly and extensively explores long term sustainable strategies of making river water clean in the community.	Correctly explores long term sustainable strategies of making river water clean in the community.	Correctly explores some of the long-term sustainable strategies of making river water clean in the community.	With help, explores long term sustainable strategies of making river water clean in the community.
Ability to carry out research in the community on factors that makes communal clean water dirty from the source.	Accurately and competently carries out research in the community on factors that makes communal clean water dirty from the source.	Carries out research in the community on factors that makes communal clean water dirty from the source.	Carries out research in the community on some factors that makes communal clean water dirty from the source.	With help, carries out research in the community on factors that makes communal clean water dirty from the source.

STRAND 3.0: LIVING THINGS AND THEIR ENVIRONMENT

Strand	Sub Strand	Learning Outcomes	Learning Experiences	Key Inquiry Question(s)
3.0 Living Things and their Environment	**3.1 Reproduction in human beings** **(16 Lessons)**	By the end of the sub strand the learner should be able to: a) describe the menstrual cycle in human beings b) describe challenges related to the menstrual cycle c) describe the process of fertilization and implantation. d) appreciate the existence of sex-related challenges.	The learner is guided to: • discuss human menstrual cycle • discuss various challenges related to the menstrual cycle • use illustrations,charts and digital devices to observe animations showing fertilization and implantation (movement of the sperm, fusion with the egg, formation of zygote and its implantation on uterus).	1. How does reproduction occur in human beings? 2. What challenges are associated with the menstruation in human beings? 3. How best can we manage issues related to the menstrual cycle?
Core competences to be developed: • Creativity and imagination is enhanced as learners make sanitary towels using locally available materilas and sensitize the community on sex-related disorders. • Citizenship is promoted as learners appreciate the significance of protecting life from inception to birth. • Digital literacy is developed as learners use various digital devices in the learning of reproductive process. • Critical thinking and problem solving are promoted as learners make improvised sanitary towels.				

- Self-efficacy is promoted as learners share experiences and discuss the management of challenges intersex condition and to menstriation.
- Learning to learn is enhanced as learners work in groups to search for information and develop capacity to continue learning while doing projects.

Pertinent and Contemporary Issues (PCIs):

- Social cohesion is promoted as the learners collaborate during project work in their groups.
- Life skills/Human sexuality are developed as learners develop self-awareness and skills to guard against early pregnancies

Values:

- Respect is enhanced as learners embrace those with menstrual disorders and sex-related disorders. They also learn to respect others opinions during discussions.
- Responsibility is developed as learners take up various tasks assigned and sharing the same fairly
- Social justice is promoted as learners prcatise equity, equality and gender consideration in distribution of learning resources as well as assigning responsibilities during the learning process and as they appreciate sex-related challenges.

Links to other subjects:

- Health education as learners learn about healthy living during pregnancy.
- Homescience as learners learn about proper nutrition for healthy expectant mothers and babies.

Assessment Rubric

Indicator	**Exceeds expectation**	**Meets expectation**	**Approaches expectation**	**Below expectation**
Ability to describe the menstrual cycle in human beings.	Consistently describes menstrual cycle in human beings.	Correctly describes the menstrual cycle in human beings.	Partly describes the menstrual cycle in human beings.	With guidance describes the menstrual cycle in human beings.

Ability to describe challenges related to the menstrual cycle.	Correctly and exhaustively describes challenges related to the menstrual cycle	Correctly describes challenges related to the menstrual cycle.	Partly describes challenges related to the menstrual cycle.	With help, describes the 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.	Partly describes the process of fertilization and implantation.	With help, describes the process of fertilization and implantation.

Strand	Sub- Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
3.0 Living Things and their Environment	**3.2 Human Excretory System- Skin and Kidneys** **11 Lessons**	By the end of the sub-strand the learner should be able to: a) identify the external parts of the human skin and their functions. b) identify the external parts of the kidney and their functions. c) describe causes of kidney disorders d) adopt a healthy lifestyle to promote kidney and skin health. e) appreciate the importance of proper use of cosmetics for consumer protection.	Learners are guided to: • use a chart/model, in groups to brainstorm on the external parts and functions of human skin (cover,hair, sweat glands and epidermis –avoid homeostatic functions of the skin). • discuss the waste products excreted through the skin (salts and water) and kidneys (urine). • in groups use hand lens to observe the external parts of the skin (hair and sweat pores). • search for information and brainstorm on examples of cosmetics and their health effects on human body (e.g skin lightening creams and lotions).	1. Why is the skin important in humans? 2. Why is excretion important to the human body? 3. Why is proper use of cosmetics important?

			• learners in groups using a chart brainstorm on the external parts and functions of the human kidney (Avoid details of the nephron and osmoregulation). • search for information on the causes and prevention of kidney disorders. • learners are guided to discuss healthy lifestyles that promote kidney and skin health, for instance, adequate hydration. **Project** **Model of the excretory system.**	

Core competencies to be developed:

- Citizenship is promoted as learners sensitize the community on proper use of cosmetics and promote use of locally made cosmetics.
- Digital literacy is developed as learners use various digital devices in the learning process (eg search and watch videos showing the structure of the skin and kidney as excretory organs).
- Imagination and Creativity are promoted as learners develop and carry out projects on cosmetics from available materials.
- Critical thinking and problem solving are enhanced when learners use locally available materials to make cosmetics which are not harmful to the skin.

- Self-efficacy is developed when learners associate with others and work on activities that assist them discover their areas of strength and weaknesses thus enhancing scientific skills development. Learners understand and appreciate their unique skin characteristics.
- Learning to learn is enhanced as learners develop 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 is developed as learners develop self-awareness while learning the effects of cosmetics on the skin.
- Environmental education as earners discuss the effects of cosmetics on the environment.
- Financial literacy as learners **i**mprovise the teaching and learning resources using locally available materials.
    - Economical use of available resources.
    - Planning of projects.

Values:

- Respect is promoted while learners are working with others in groups on projects and activities. They also learn to respect others opinion.
- Responsibility is promoted as learners practise taking care of equipment and apparatus.
    - Taking care of their skin and the environment.
    - Observing a correct diet.
- Peace and Unity are promoted by assigning specific tasks to individuals for the benefit of the whole group while carrying out project work and activities.
- Integrity is promoted by learners reporting true findings from activities and projects.

Links to other subjects:

- Health education as learners learn about lifestyle diseases, taking care of the skin
- Homescience as learners learn about nutrition for healthy skin and kidney

Assessment Rubric				
Indicator	**Exceeds expectation**	**Meets expectation**	**Approaches expectation**	**Below expectation**
Ability to identify external parts of the human skin and stating their functions.	Consistently and correctly identifies the external parts of the human skin and states their functions.	Correctly identifies the external parts of the human skin and states their functions.	Partly identifies the external parts of the human skin and states their functions.	With guidance identifies some external parts of the human skin and states their functions.
Ability to identify external parts of the kidney and their functions.	Consistently and correctly identifies the external parts of the kidney and states their functions.	Correctly identifies the external parts of the kidney and states their functions.	Correctly identifies some external parts of the kidney and states some of their functions.	With assistance correctly identifies some external parts of kidney and states their functions.
Ability to describe causes of kidney disorders	Consistently and correctly describes causes of kidney disorders.	Correctly describes causes of kidney disorders.	Partly describes causes of kidney disorders.	With guidance describes causes of kidney disorders.

STRAND 4.0: FORCE AND ENERGY

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
4.0 Force and Energy	**4.1 Static Electricity** **10 Lessons**	By the end of the sub strand the learner should be able to: a) demonstrate the existence of static charges in objects b) charge objects using different methods c) demonstrate the effects of force between charged objects d) appreciate the use of static charges in daily life	The learner is guided to: • rub different objects to show the presence of static charges in objects • charge different objects by rubbing and induction • search for, play and watch videos showing types of charges • show attraction and repulsion between charged objects • discuss safety measures when dealing with static charges (include lightning).	1. How do materials get charged? 2. What are the dangers of static charges?
Core competencies to be developed: • Digital literacy is enhanced as the learners use digital devices to search, play and observe videos and animations. • Self-efficacy is promoted as learners learn how to deal with static electricity in day-to-day life. • Communication and collaboration is enhanced as learners work in groups to accomplish the tasks				
Pertinent and Contemporary Issues (PCIs) • Disaster Risk Reduction is promoted as learners learn about safety measures during lightning. • Safety and security are enhanced as learners avoid dangers associated with static electricity.				

Values:

- Responsibility is enhanced as learners perform their different roles during the experiment.
- Unity is enhanced as learners perform the activities in groups.

Links to other subjects:

- Pre-technical and pre career as learners learn about lightning arrestors installed in buildings

Assessment Rubric

Indicator	Exceeds expectation	Meets expectation	Approaches expectation	Below expectation
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 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 different methods	With assistance, charges objects using different methods
Ability to demonstrate the effects of force between charged objects.	Correctly and effectively 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 assistance, demonstrates the effects of force between charged objects.

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
4.0 Force and Energy	**4.2 Electrical Energy** **12 Lessons**	by the end of the sub strand the learner should be able to: a) identify various sources of electricity in their environment b) set up simple electrical circuits in series and parallel using dry cells, bulbs, ammeters and voltmeters c) classify materials as conductors and non-conductors of electricity d) identify electrical appliances in their locality e) identify safety measures when handling electrical appliances f) appreciate the use of electricity in their daily life	The learner is guided to: • discuss and identify sources of electricity (hydro-electric power, geothermal, solar, wind power) • search for and observe videos and photographs on sources of electricity • Set up simple electrical circuits. (Series and parallel arrangement of cells and bulbs), in a group • search for and observe videos and animations showing how to set-up simple electrical circuits, in a group • carry out experiments to classify materials as conductors and non-conductors of electricity • discuss and identify various electrical appliances in their locality. • identify safety measures to observe when using electrical appliances • explore uses of electricity in their	1. What are the sources of electricity? 2. What are the differences between conductors and non-conductors of electricity?

			environment	

Core competencies to be developed:

- **Learning to learn** is enhanced as learners apply the knowledge on electricity to safely use electrical appliances.
- **Digital Literacy** is promoted as learners use digital devices to search and observe videos and photographs on sources of electricity.
- **Citizenship** as learners observe 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 is promoted **is acquired** as the learners perform the activities in groups while setting up simple electrical circuits.
- **Responsibility** is promoted as learners perform their different roles when setting up simple electrical circuits.

Links to other subjects:

Pre-technical and pre-career as learners learn to set up simple electrical circuits

Assessment Rubric

Indicator	**Exceeds expectation**	**Meets expectation**	**Approaches expectation**	**Below expectation**
Ability to identify various sources of electricity.	Correctly and accurately identifies various sources of electricity.	Correctly identifies various sources of electricity.	Correctly identifies some sources of electricity.	With assistance, identifies 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 assistance classifies materials as conductors and non-conductors of electricity.
Ability to identify electrical appliances in the locality.	Correctly and exhaustively identifies electrical appliances in the locality.	Correctly identifies electrical appliances in the locality	Correctly identifies some electrical appliances in the locality.	With assistance, identifies electrical appliances in the locality.
Ability to identify safety measures when handling electrical appliances.	Correctly and exhaustively 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 help, identifies safety measures when handling electrical appliances.

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
4.0 Force and Energy	**4.3 Magnetism** **10 Lessons**	By the end of the sub strand, the learner should be able to: a) classify materials in the environment as magnetic or non-magnetic b) investigate the force between like and unlike poles of magnets c) identify the uses of magnets in day-to-day life d) appreciate the applications of magnets in day-to-day life	The learner is guided to: • identify and collect materials within their environment, sort and group them as magnetic and non-magnetic materials • carry out activities showing attraction between two unlike poles and repulsion between two like poles of magnets. • discuss the uses of magnets with peers • Search for and watch animations showing force between like and unlike poles of magnets.	1. How do we identify magnetic materials in our environment ? 2. How are magnets used in day-to-day life?
Core competencies to be developed: • Communication and collaboration are enhanced as learners work in groups to carry out activities involving magnetism.				
Pertinent and Contemporary Issues (PCIs) • Environmental Education is enhanced as learners use magnets to collect and separate magnetic materials in the environment to reduce pollution.				
Values: • Responsibility is promoted as learners perform their different roles when carrying out activities showing the force				

between like and unlike poles of magnets.

- Unity is promoted as the learners work in groups to magnetize and demagnetize materials.
- **Respect:** As learners learn to respect and accept others' opinions during the discussion involving magnetism.

Links to other subjects:

- Pre- Technical and Pre-Career as learners use magnets to classify materials in the environment as magnetic and non-magnetic
- Social Studies as they determine direction using magnetic compass

Assessment Rubric

Indicator	Exceeds expectation	Meets expectation	Approaches expectation	Below expectation
Ability to classify materials into magnetic and non-magnetic.	Correctly and accurately classifies all materials into magnetic and non-magnetic.	Correctly classifies all materials into magnetic and non-magnetic.	Correctly classifies some materials into magnetic and non-magnetic.	With help classifies a few materials into magnetic and non-magnetic.
Ability to carry out activities showing action between like and unlike poles of magnets.	Correctly and skillfully 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 exhaustively identifies the uses of magnets	Correctly identifies the uses of magnets	Partly identifies the uses of magnets.	With help identifies the uses of magnets.

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

Strand	Sub Strand	Suggested Assessment Methods	Suggested Learning Resources	Suggested Non-Formal Activities
1. Scientific Investigation	**2.** Introduction to Integrated Science	• Observation • Practical Work • Assessment Rubrics • Checklist • Anecdotal Records • Written Test • Oral Questions and Answers	Course book Library	• Watching video tapes on components of Integrated Science as a field of study • Oral Speeches on importance of Integrated Science in daily life
	1.2. Laboratory Safety	• Practical Work • Observation Schedule • Checklist	• Science Kit • Basic Laboratory Apparatus, equipment and selected specimens • SEPU Kit • First Aid Kit • Internet • Library	• Interacting actively with resource persons to understand issues to do with common hazards and their symbols in the laboratory. • Preparing charts, posters and slogans first aid safety measures for common laboratory accidents

	1.3. Basic Science skills	• Assessment Rubric • Practical Work • Observation Schedule • Checklist	• Basic Laboratory Apparatus, equipment and selected specimens • SEPU Kit • Course book	• Writing articles in school magazines on Units (SI) for basic and derived quantities in science. • Engaging in resource persons discussing basic science process skills
	1.4. Laboratory apparatus and instruments	• Practical Work • Observation Schedule • Checklist	• Course book • SEPU Kit • Basic Laboratory Apparatus, equipment and selected specimens (including Microscope)	• Engaging in resource persons to talk about how to safely handle and use apparatus and instruments in the laboratory
2.0. Mixtures, Elements and Compounds	2.1 Mixtures	• Written Test • Assessment Rubrics Checklist • Anecdotal Records • Oral Questions and Answers	• Course book • Basic Laboratory Apparatus, equipment and selected specimens • Ice • candle wax • water/salty water. • Sieve • magnet	• Organizing and participating in exchange programmes / field trips to distinguish between pure and impure substances using melting and boiling points
	2.2 Acids, bases and	• Assessment Rubrics	• Course book	• Engaging actively with

	indicators	• Checklist • Oral Questions and Answers • Written Test	• Basic Laboratory Apparatus, equipment and selected specimens • universal indicator, pH scale and pH chart • antacid tablets, common fruits in the locality, fertilizers, liming of soil, detergents	resource persons on how to use plant extracts as acid-base indicator.
	2.3. Solid – Liquid Mixture separation	• Practical Work • Observation Schedule • Checklist	• Basic Laboratory Apparatus, equipment and selected specimens • portfolio and file • Course book	• Invites a resource person to talk about different methods of separating mixtures in day-to-day life • Conducting debates during club meetings on separate mixtures using different methods
3.0 Living Things and their Environment	3.1 Reproduction in human beings	• Observation • Practical Work • Assessment Rubrics • Checklist • Anecdotal Records	• Charts • Course book • Basic Laboratory Apparatus, equipment and	• Engaging in straight talk on reproduction in human beings. • Engaging a resource person to talk about on

		• Written Test • Oral Questions and Answers	selected specimens	reproduction in human beings
	3.2 Human Excretory System-Skin and Kidneys	• Practical Work • Observation • Oral Questions and Answers • Assessment Rubrics • Checklist • Anecdotal Records • Written Test	• Basic Laboratory Apparatus, equipment and selected specimens • Charts • salts and water • Course book	• Conducting document analysis on human Excretory System-Skin and Kidneys • Holding discussions on causes of kidney disorders • Inviting a resource person to talk about how to adopt healthy lifestyle to promote kidney and skin health.
4.0 Force and Energy	4.1 Static Electricity	• Assessment Rubrics • Checklist • Anecdotal Records • Written Test • Practical Work • Observation Schedule • Portfolio	• Basic Laboratory Apparatus, equipment and selected specimens • Course book	• Watching animations on existence of static charges in objects • Taking part in symposia on charging objects using different methods • Carrying out documentary analysis on effects of force between charged objects

	4.2 Electrical Energy	• Written Test • Assessment Rubrics • Checklist • Anecdotal Records • Practical Work • Observation Schedule	• Basic Laboratory Apparatus, equipment and selected specimens • Course book	• Initiating projects on how to set up simple electrical circuits in series and parallel using dry cells, bulbs, ammeters and voltmeters. • Writing articles in school magazines on safety measures when handling electrical appliances
	4.3 Magnetism	• Portfolio • Written Test • Observation Schedule • Assessment Rubrics • Checklist • Anecdotal Records • Practical Work	• Basic Laboratory Apparatus, equipment and selected specimens • Course book	• Engaging in resource persons to discuss uses of magnets in day-to-day life • Organizing and participating in exchange programmes to identify force between like and unlike poles of magnets