



**REPUBLIC OF KENYA  
MINISTRY OF EDUCATION**

## **JUNIOR SECONDARY SCHOOL CURRICULUM DESIGN**

**INTEGRATED SCIENCE FOR LEARNERS WITH PHYSICAL IMPAIRMENT**

**GRADE 7**



**KENYA INSTITUTE OF CURRICULUM DEVELOPMENT**

**First Published in 2022**

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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), 21<sup>st</sup> 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 and Foundation level, Grades 4, 5 and Intermediate Level. The roll out for Grade 6, Junior Secondary (Grade 7-9), and Prevocational Level will subsequently follow.

It is my hope that the curriculum designs for learners with Physical Impairment in 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) and Foundation Level. The implementation progressed to Upper Primary (Grade 4, 5 and 6) and Intermediate Level 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. This is similar to the Pre-vocational and Vocational Level.

The Grade 7 curriculum designs for learners with Physical Impairment in the respective learning areas will enable the development of 21<sup>st</sup> 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 for learners with Physical Impairment will be a significant milestone towards realization of the curriculum mission ‘Nurturing Every Learner’s Potential.

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## **ACKNOWLEDGEMENTS**

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 21<sup>st</sup> 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 and adapted the Grade 7 curriculum designs for learners with Physical Impairment 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 for learners with Physical Impairment also provide opportunities for learners to develop the core competencies as well as engage in Community Service Learning. The designs present assessment rubric 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 and adapted 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 and adaption 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 and adaptation 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 and adaptation 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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## TIME ALLOCATION

	<b>Subject</b>	<b>Number of Lessons Per Week (40 minutes per lesson)</b>
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 (CRE/IRE/HRE)	3
9.	Business Studies	3
10.	Agriculture	3
11.	Life Skills Education	1
12.	Physical Education and Sports	2
13.	Optional Subject including Braille skills	3
14.	Optional Subject	3
	<b>Total</b>	<b>45</b>



## **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. Practice 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 with physical impairment 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 with physical impairment 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 physical impairment 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
<b>1.0 Scientific Investigation</b>	<b>1.1 Introduction to Integrated Science</b>  <b>(4 Lessons)</b>	<p><b>By the end of the sub strand the learner should be able to:</b></p> <ol style="list-style-type: none"> <li>identify the components of Integrated Science as a field of study</li> <li>relate knowledge and skills gained in Integrated Science to career opportunities</li> <li>appreciate the importance of Integrated Science in daily life.</li> </ol>	<p><b>The learner is guided individually, in purposive pairs or groups to:</b></p> <ul style="list-style-type: none"> <li>Discuss the meaning and components of Integrated Science with peers. Learners with speech difficulties could use residual speech, sign, multi-purpose communication board, be lip-read or mime to give their responses. (Apply this adaptation to all the subsequent activities where speech is required under this sub strand)</li> <li>Discuss 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 different sources like the internet, magazines, journals among others and give feedback. Learners with manipulation or fine motor difficulties could use alternative functional part of the body or use appropriate assistive devices such as universal cuffs, adapted computers with expanded keyboards, sticky keys and appropriate software or be assisted by peers, learner support assistant or teacher to carry out the activities. Learners with photophobia</li> </ul>	<p>How is the knowledge acquired in Integrated Science useful in daily life?</p>



			<p>such as those with epilepsy and those with visual difficulties could be supported by adjusting the screen resolution or light intensity/glare when using the digital devices. Learners with short stature and those on wheelchairs could be supported by positioning them appropriately during such activities.</p> <ul style="list-style-type: none"> <li>• Discuss the importance of scientific knowledge in daily life and take notes.</li> </ul>	
<p><b>Core Competencies to be Developed:</b></p> <ul style="list-style-type: none"> <li>• Communication and collaboration as learners discuss the importance of scientific knowledge in daily life.</li> <li>• Citizenship as learners search for local and international career opportunities related to Integrated Science.</li> <li>• Digital literacy as learners use digital devices to search for information on the application of Integrated Science.</li> <li>• Self-efficacy as learners discuss confidently the pathways and career opportunities associated with Integrated Science.</li> </ul>				
<p><b>Pertinent and Contemporary Issues (PCIs):</b></p> <ul style="list-style-type: none"> <li>• Poverty eradication as learners discuss how scientific knowledge is applied in solving problems within their environment and generating income.</li> <li>• Safety and security as learners search for information on the internet using the digital devices in observing cyber security regulations.</li> </ul>			<p><b>Values:</b></p> <ul style="list-style-type: none"> <li>• Respect as learners respect others' opinions during the discussions.</li> <li>• Responsibility as learners take care of the digital devices.</li> </ul>	
<p><b>Link to other Subjects:</b></p> <ul style="list-style-type: none"> <li>• Computer studies as learners search for information from the internet using digital devices.</li> </ul> <p>English as learners discuss components of integrated science.</p>				
<p><b>Non formal Activities to support Learning:</b></p> <ul style="list-style-type: none"> <li>• Guidance and counselling as learners discuss career opportunities related to integrated science.</li> </ul>			<p><b>Suggested Modes of Assessment:</b></p> <ul style="list-style-type: none"> <li>• Observation</li> <li>• Oral question and answer</li> <li>• Written tests</li> </ul>	



<b>Suggested Learning Resources:</b>				
<ul style="list-style-type: none"> <li>• Journals and magazines, adapted digital devices, internet connection, reference materials, flip charts, mark pens, universal communication boards, universal cuffs</li> <li>• Other related service providers: laboratory technician, physiotherapist, occupational therapist, speech therapist</li> </ul>				
<b>Suggested Assessment Rubric</b>				
<b>Criteria</b>	<b>Exceeds expectation</b>	<b>Meets expectation</b>	<b>Approaches expectation</b>	<b>Below expectation</b>
Identifying the components of Integrated Science.	Describes components of Integrated Science.	Identifies the components of Integrated Science.	Outlines the components of Integrated Science.	Lists the component of Integrated Science.
Relating knowledge and skills gained in Integrated Science to career opportunities.	Applies knowledge and skills gained in Integrated Science to career opportunities.	Relates knowledge and skills gained in Integrated Science to career opportunities.	Outlines knowledge and skills gained in Integrated Science.	States knowledge and skills gained in Integrated Science.

<b>Strand</b>	<b>Sub-Strand</b>	<b>Specific Learning Outcomes</b>	<b>Suggested Learning Experiences</b>	<b>Key Inquiry Questions</b>
<b>1.0 Scientific Investigation</b>	<b>1.2 Laboratory Safety</b>  <b>(8 Lessons)</b>	<b>By the end of the sub strand the learner should be able to:</b> 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 laboratory and access to a healthy working environment.	<b>The learner is guided individually, in purposive pairs or groups to:</b> <ul style="list-style-type: none"> <li>• Do a library search on common hazards and accidents in laboratory and present findings. Learners with speech difficulties could use residual speech or alternative communication modes to give their views. Learners with mobility difficulties and those with manipulation difficulties such as those with cerebral palsy and those with missing limbs(amputees) could use alternative functional part of the body, appropriate assistive technology, be assisted by peers, learner support assistant or teacher to carry out the activity. (Apply this adaptation to all subsequent activities involving</li> </ul>	1. How do accidents happen in the laboratory? 2. What safety measures should be considered while constructing a laboratory?



			<p>speech, mobility and manipulation under this sub strand)</p> <ul style="list-style-type: none"> <li>● Interpret common hazard symbols, including but not limited to flammable, corrosive, toxic, carcinogenic, radioactive substances among others.</li> <li>● Discuss in groups, causes of common laboratory accidents and related first aid measures (burns and scalds, cuts, and ingestion of harmful substances) and do a class presentation.</li> <li>● Role-play some first aid procedures for common accidents in the laboratory and critique.</li> <li>● Practice safety measures in the laboratory and the general school learning environment. Safety precautions should be observed as learners carry out the activities.</li> <li>● Discuss the importance of safety measures in the laboratory.</li> <li>● Search for laboratory safety procedures from other sources (internet, e-libraries, magazines, journals among others) and share findings with peers. Learners with manipulation difficulties such as those with missing upper limbs (Amputees) and those with cerebral palsy could use alternative functional part of the body, appropriate assistive technology, be assisted by peers, learner support assistant or teacher to search the internet.</li> </ul>	
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<p><b>Core competencies to be developed:</b></p> <ul style="list-style-type: none"> <li>• Communication and collaboration as learners work in groups during discussions and practice laboratory safety measures.</li> <li>• Imagination and Creativity as learners prepare and role-play on first aid procedures.</li> <li>• Digital literacy as learners use digital devices to access and study content on first aid procedures.</li> <li>• Citizenship as learners adhere to laboratory safety measures for self and others.</li> </ul>				
<p><b>Pertinent and Contemporary Issues (PCIs):</b></p> <ul style="list-style-type: none"> <li>• Disaster Risk Reduction as learners practice safety precautions in the laboratory.</li> <li>• Social cohesion as learners use 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>• Respect as learners become considerate of others' opinion while working in groups, discussing and role playing.</li> <li>• Responsibility as learners practice their own safety and the safety of others when working in the laboratory; responsible and prudent usage of laboratory materials and proper disposal of waste.</li> </ul>		
<p><b>Link to other subjects:</b></p> <ul style="list-style-type: none"> <li>• Health Education as learners practice safety and first aid.</li> <li>• Home Science as learners role-play first aid procedures to demonstrate safety.</li> </ul>				
<p><b>Non formal Activities to support Learning:</b></p> <ul style="list-style-type: none"> <li>• Preparing charts and posters on safety measures of common accidents in school.</li> <li>• Watch videos on first aid procedures for common accidents.</li> </ul>		<p><b>Suggested Modes of Assessment:</b></p> <ul style="list-style-type: none"> <li>• Oral questions</li> <li>• Observation</li> <li>• Written tests</li> <li>• Self and peer assessment</li> </ul>		
<p><b>Suggested Learning Resources:</b> First aid kit, charts and posters, manila papers, adapted pens/pencils, adapted basic laboratory apparatus and equipment</p>				
<p><b>Suggested Assessment Rubric</b></p>				
<b>Criteria</b>	<b>Exceeds expectation</b>	<b>Meets expectation</b>	<b>Approaches expectation</b>	<b>Below expectation</b>
Identifying common hazards and their symbols in the laboratory	Describes common hazards and their symbols in the laboratory.	Identifies common hazards and their symbols in the laboratory.	Outlines common hazards and their symbols in the laboratory.	States common hazards and their symbols in the laboratory.
Analysing causes of common accidents in the laboratory.	Explain causes of common accidents in the laboratory.	Analyses causes of common accidents in the laboratory.	Outlines causes of common accidents in the laboratory.	Mentions causes of common accidents in the laboratory.



Demonstrating procedures of first aid safety measures for common accidents in the laboratory.	Formulates procedures of first aid safety measures for common accidents in the laboratory.	Demonstrates procedures of first aid safety measures for common accidents in the laboratory.	Outlines procedures of first aid safety measures for common accidents in the laboratory.	States procedures of first aid safety measures for common accidents in the laboratory.
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Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
<b>1.0 Scientific Investigation</b>	<b>1.3 Basic Science skills</b>  <b>(10 Lessons)</b>	<b>By the end of the sub strand the learner should be able to:</b> 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.	<b>The learner is guided individually, in purposive pairs or groups to:</b> <ul style="list-style-type: none"> <li>● Discuss basic skills in science (manipulative, observation, measurement, classification, prediction, communication and conclusion skills) and do a class presentation. Learners with speech difficulties could use residual speech or alternative communication modes to give their views. (Apply this adaptation to all subsequent activities involving speech under this sub strand)</li> <li>● Brainstorm on the importance of reading packing labels on quantities/products and take notes.</li> <li>● Apply the International System of Units (SI) to determine temperature, length, mass, time, electric current, area, volume and density.</li> <li>● Do a library search for information on science skills and do a presentation. Learners with manipulation difficulties such as those with missing upper limbs (amputees) and those with cerebral palsy could use alternative functional part of the body, appropriate assistive technology, be assisted by peers, learner support assistant or</li> </ul>	<ol style="list-style-type: none"> <li>1. How are basic skills in science important in daily life?</li> <li>2. How is Science information communicated?</li> </ol>



			teacher.	
<b>Core Competencies to be Developed:</b> <ul style="list-style-type: none"> <li>• Communication and Collaboration as learners work in groups to identify methods of communicating information in science.</li> <li>• Citizenship as learners identify and state the SI units for basic and derived quantities for international awareness.</li> <li>• Self-efficacy as learners practice presenting science information appropriately.</li> </ul>				
<b>Pertinent and Contemporary Issues (PCIs):</b> <ul style="list-style-type: none"> <li>• Safety as learners use apparatus in carrying out experiments in the laboratory.</li> <li>• Disaster risk reduction as they manipulate the apparatus and chemical reagents</li> </ul>			<b>Values:</b> <ul style="list-style-type: none"> <li>• Respect as learners learn how to value each other's views in the process of applying Science skills in their learning.</li> <li>• Unity as learners work in groups applying Science skills.</li> </ul>	
<b>Link to other Subjects:</b> All learning areas as learners apply science skills in their daily life and learning.				
<b>Non formal Activities to support Learning:</b> <ul style="list-style-type: none"> <li>• Science clubs and societies as learners demonstrate science skills during club time.</li> </ul>			<b>Suggested Modes of Assessment:</b> <ul style="list-style-type: none"> <li>• Oral questions</li> <li>• Observation</li> <li>• Written tests</li> <li>• Self and peer assessment</li> </ul>	
<b>Suggested Learning Resources:</b> <ul style="list-style-type: none"> <li>• Adapted digital devices like computers, tablets, internet connection, adapted basic laboratory apparatus, SEPU kit</li> <li>• Other related service providers: laboratory technician, occupational therapist, physiotherapist</li> </ul>				
<b>Suggested Assessment Rubric</b>				
<b>Criteria</b>	<b>Exceeds expectation</b>	<b>Meets expectation</b>	<b>Approaches expectation</b>	<b>Below expectation</b>
Identifying basic skills in science.	Describes basic skills in science.	Identifies basic skills in science.	Outlines basic skills in science.	Recalls basic skills in science.
Using the SI units for basic and derived quantities in science.	Applies the SI units for basic and derived quantities in science.	Uses the SI units for basic and derived quantities in science.	Outlines the SI units for basic and derived quantities in science.	Mentions the SI units for basic and derived quantities in science.



Strand	Sub-Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Question(s)
<b>1.0 Scientific Investigation</b>	<b>1.4 Laboratory apparatus and instruments</b>  <b>(11 Lessons)</b>	<b>By the end of the sub strand the learner should be able to:</b> a) identify apparatus and instruments used in the laboratory b) handle and care for the apparatus and instruments in the laboratory c) appreciate the importance of consumer protection when handling different apparatus and chemicals in the laboratory.	<b>The learner is guided individually, in purposive pairs or groups to:</b> <ul style="list-style-type: none"> <li>● Identify apparatus and instruments in the laboratory (for heating, measuring mass, temperature, length, volume, weight, magnification and time) (include parts and functions of a microscope and bunsen burner).</li> <li>● Handle and use apparatus and instruments in the laboratory. Learners with mobility difficulties and those with manipulation difficulties such as those with missing limbs (amputees) and those with cerebral palsy could use alternative functional part of the body, appropriate assistive technology , be assisted by peers, learner support assistant or teacher. Safety precautions should be observed as they carry out the activities. (Apply this adaptation to all subsequent activities involving manipulation under this sub strand).</li> <li>● Search for information on safety precautions to take when handling apparatus and instruments in the laboratory from computers, the internet, magazines journals among others. Learners with epilepsy and those with visual difficulties could be supported by</li> </ul>	<ol style="list-style-type: none"> <li>1. How are the different laboratory apparatus and Instruments used?</li> <li>2. Which basic measures should be considered when storing different laboratory apparatus?</li> </ol>



			<p>adjusting light intensity/glare when using the digital devices. Learners with short stature and those on wheelchairs could be supported by positioning them appropriately during such activities.</p> <ul style="list-style-type: none"> <li>● Practice safety precautions when handling chemicals, apparatus and instruments in the laboratory.</li> </ul>	
<p><b>Core Competencies to be Developed:</b></p> <ul style="list-style-type: none"> <li>● Communication and Collaboration as learners work together using different apparatus and equipment to carry out laboratory experiments and activities.</li> <li>● Citizenship as learners observe their own safety and others when handling apparatus and instruments.</li> <li>● Digital literacy as learners use digital devices to search for content on safety precautions.</li> </ul>				
<p><b>Pertinent and Contemporary Issues (PCIs):</b></p> <ul style="list-style-type: none"> <li>● Environmental Education 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.</li> <li>● Disaster Risk Reduction as learners observe safety precautions when handling apparatus and instruments in the laboratory.</li> </ul>			<p><b>Values:</b></p> <ul style="list-style-type: none"> <li>● Respect as learners respect others' opinions while working in groups.</li> <li>● Responsibility as learners care for apparatus, chemicals and specimens, as they handle laboratory equipment and apparatus during experimental work.</li> </ul>	
<p><b>Link to other Subjects:</b></p> <ul style="list-style-type: none"> <li>● Home Science as learners carry out measurements of ingredients when preparing meals.</li> <li>● Mathematics as learners carry out measurements of various quantities of substances.</li> <li>● Computer science as learners search for information using ICT devices.</li> </ul>				
<p><b>Non formal Activities to support Learning:</b></p> <ul style="list-style-type: none"> <li>● Engage resource persons to talk about how to safely handle and use apparatus and instruments in the laboratory.</li> <li>● Appropriately dispose of organic waste and use it in the school garden.</li> </ul>			<p><b>Suggested Modes of Assessment:</b></p> <ul style="list-style-type: none"> <li>● Observation</li> <li>● Oral questions</li> <li>● Written test</li> <li>● Project work</li> </ul>	



**Suggested Learning Resources:**

- Measuring apparatus, heating apparatus, microscope, adapted digital devices, internet connection, adapted basic laboratory apparatus relevant to the activity
- Other related service providers: occupational therapist, physiotherapist, laboratory technician

**Suggested Assessment Rubric**

<b>Criteria</b>	<b>Exceeds expectation</b>	<b>Meets expectation</b>	<b>Approaches expectation</b>	<b>Below expectation</b>
Identifying apparatus and instruments used in the laboratory.	Describes apparatus and instruments used in the laboratory.	Identifies apparatus and instruments used in the laboratory.	Names apparatus and instruments used in the laboratory.	Names apparatus and instruments used in the laboratory with prompts.
Handling apparatus and Instruments in the laboratory.	Handles and cares for apparatus and instruments in the laboratory	Handles apparatus and Instruments in the laboratory.	Handles some apparatus and instruments in the laboratory.	Names 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><b>By the end of the sub strand the learner should be able to:</b></p> <ul style="list-style-type: none"> <li>a) classify different types of mixtures as homogeneous or heterogeneous</li> <li>b) distinguish between pure and impure substances using melting and boiling points</li> <li>c) separate mixtures using different methods</li> <li>d) appreciate the use of different methods of separating mixtures in day-to-day life.</li> </ul>	<p><b>The learner is guided individually, in purposive pairs or groups to:</b></p> <ul style="list-style-type: none"> <li>• Categorize different mixtures as homogeneous (uniform) and heterogeneous (non-uniform); (solid- solid, solid- liquid, liquid-liquid and gas-gas mixtures).</li> <li>• Carry out, in groups, simple experiments to determine the boiling and melting points of pure and impure substances (ice, candle wax, water, salty water). Learners with manipulation difficulties such as those with cerebral palsy and those with missing upper limbs (amputees) could be supported by grouping them purposively, use alternative functional part of the body, be assisted by peers, learner support assistant or teacher to carry out the activities. (Apply this adaptation to all subsequent activities where manipulation is involved under this sub strand).</li> <li>• Search for, and watch videos and animations on determining melting and boiling points of substances. Learners with photophobia such as those with epilepsy and those with visual difficulties could be supported by adjusting the screen resolution or light intensity/glare when using digital devices. Those with short stature and those on wheel chair could be supported by positioning them appropriately during such activities. (Apply this adaptation to all subsequent</li> </ul>	<ol style="list-style-type: none"> <li>1. How can you classify mixtures?</li> <li>2. Which properties should be considered when separating various mixtures?</li> </ol>



			<p>activities where manipulation and lighting is involved under this sub strand).</p> <ul style="list-style-type: none"> <li>• In groups, separate different types of mixtures (simple distillation, filtration, decantation, use of a magnet, sublimation, paper chromatography, solvent extraction, crystallisation) and do a presentation. Learners with speech difficulties could use residual speech or alternative communication modes to give their views (Apply this adaptation to the activity below).</li> <li>• Discuss with peers, the applications on separating mixtures in day to day life (crude oil refining, fractional distillation of liquefied air, extraction of oil from nuts).</li> </ul>	
<p><b>Core Competencies to be Developed:</b></p> <ul style="list-style-type: none"> <li>• Communication and collaboration as learners work together in carrying out simple experiments to determine the boiling and melting points of substances.</li> <li>• Digital literacy as learners search, watch and discuss videos and animations on mixtures.</li> <li>• Learning to learn as learners search for more content and apply the same on mixtures.</li> </ul>				
<p><b>Pertinent and Contemporary Issues (PCIs):</b></p> <ul style="list-style-type: none"> <li>• Social cohesion as learners work in groups to separate mixtures.</li> <li>• Safety as learners observe safety precautions while carrying out experiments on mixtures.</li> </ul>			<p><b>Values:</b></p> <ul style="list-style-type: none"> <li>• Respect and love as learners work harmoniously in groups while carrying out simple experiments on mixtures.</li> <li>• Integrity as learners separate mixtures and report findings honestly.</li> </ul>	
<p><b>Link to other Subjects:</b></p> <ul style="list-style-type: none"> <li>• Home Science as learners handle different recipes.</li> <li>• Agriculture as learners apply the knowledge on separating mixtures in agricultural processes like straining milk, winnowing grains and straining honey among others.</li> <li>• History as learners relate traditional methods of separating mixtures to modern methods.</li> </ul>				
<p><b>Non formal Activities to support Learning:</b></p> <ul style="list-style-type: none"> <li>• Home science club as separate mixtures during cooking in home science club.</li> </ul>			<p><b>Suggested Modes of Assessment:</b></p> <ul style="list-style-type: none"> <li>• Observation</li> <li>• Question and answer</li> </ul>	



- Written test
- Project work

**Suggested Learning Resources:**

- Adapted digital devices, internet connection, adapted basic laboratory apparatus relevant to the activity, ice, candle wax, water, salty water, chromatography paper, sources of heat, magnet
- Other related service providers; laboratory technician, occupational therapist

**Suggested Assessment Rubric**

<b>Criteria</b>	<b>Exceeds expectation</b>	<b>Meets expectation</b>	<b>Approaches expectation</b>	<b>Below expectation</b>
Classifying different types of mixtures as homogeneous and heterogeneous.	Analyses different types of mixtures as homogeneous and heterogeneous.	Classifies different types of mixtures as homogeneous and heterogeneous.	Outlines different types of mixtures as homogeneous and heterogeneous.	States different types of mixtures as homogeneous and heterogeneous.
Distinguishing between pure and impure substances using melting and boiling points.	Experiments with various substances to distinguish between pure and impure substances using melting and boiling points.	Distinguishes between pure and impure substances using melting and boiling points.	Differentiates between pure and impure substances.	States properties of pure or impure substances.
Separating mixtures using different methods.	Categorises and separates mixtures using different methods.	Separates mixtures using different methods.	Separates some mixtures.	Separates some mixtures with prompts.



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>  <b>(16 Lessons)</b>	<b>By the end of the sub strand the learner should be able to:</b> <ol style="list-style-type: none"> <li>prepare and use simple acid-base indicators from plants</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>	<b>The learner is guided individually, in purposive pairs or groups to:</b> <ul style="list-style-type: none"> <li>Prepare and use plant extract indicators to classify common household solutions as either acidic or basic, in a group. Learners with manipulation or fine motor difficulties could use alternative functional part of the body, use appropriate assistive devices such as universal cuffs, adapted computers with expanded keyboards, sticky keys, appropriate software, be assisted by peers, learner support assistant or teacher to carry out the activities. (Apply this adaptation to all subsequent activities where manipulation is involved in this sub strand).</li> <li>In groups classify different house-hold solutions as either acidic or basic using indicators (use methyl orange, litmus or phenolphthalein).</li> <li>Search, watch videos and animations showing different colors of acid-base indicators in different solutions and discuss with peers. Learners with photophobia such as those with visual difficulties could be supported by adjusting the screen resolution or light intensity/glare when using the digital devices. Learners with short stature and those on wheelchairs could be supported by positioning them appropriately during such activities.</li> <li>Classify acidic or basic solutions as either</li> </ul>	<ol style="list-style-type: none"> <li>How can you identify a substance as being acidic or basic?</li> <li>What is the significance of acids and bases?</li> </ol>



			<p>strong or weak (use universal indicator, pH scale and pH chart) and record findings.</p> <ul style="list-style-type: none"> <li>● Explore applications of acids and bases (include antacid tablets, common fruits in the locality, fertilisers, liming of soil, detergents) and record findings.</li> </ul>	
<p><b>Core competencies to be developed:</b></p> <ul style="list-style-type: none"> <li>● Critical thinking and problem solving as learners explore applications of acids and bases.</li> <li>● Creativity and imagination as learners work in groups to classify acidic or basic solutions as either strong or weak.</li> <li>● Learning to learn as learners classify different house-hold solutions as either acidic or basic.</li> <li>● Communication and collaboration as learners work in groups.</li> </ul>				
<p><b>Pertinent and Contemporary Issues (PCIs):</b></p> <ul style="list-style-type: none"> <li>● Social cohesion as learners test for the acidity or alkalinity of soil samples for food security.</li> <li>● Critical thinking as learners acquire knowledge on applications of acids and bases and apply it in day-to-day life.</li> <li>● Safety as learners carefully handle acids and bases in the laboratory.</li> <li>● Environmental conservation as learners extract plant indicators and dispose of the waste appropriately.</li> </ul>			<p><b>Values:</b></p> <ul style="list-style-type: none"> <li>● Peace, love and unity as learners classify house hold solutions as either acidic or basic as a family.</li> <li>● Responsibility as learners carefully pick flowers from the environment.</li> <li>● Respect as learners work in groups to classify acidic or basic solutions as either strong or weak.</li> <li>● Integrity as learners apply proper laboratory waste disposal measures.</li> </ul>	
<p><b>Link to other subjects:</b></p> <ul style="list-style-type: none"> <li>● Agriculture as learners use lime and fertilisers to improve soil fertility in day-to-day life and learn how to test for the level of acidity in the soil.</li> <li>● Health Education as learners acquire knowledge on the use of antacid to relieve stomach upsets.</li> </ul> <p>Home science as learners use acids and bases in cooking and cleaning.</p>				
<p><b>Non formal Activities to support Learning:</b></p> <ul style="list-style-type: none"> <li>● Science clubs and societies as learners test the pH of various substances and soils in the environment.</li> </ul>			<p><b>Suggested Mode of Assessment:</b></p> <ul style="list-style-type: none"> <li>● Observation</li> <li>● Oral questions</li> <li>● Written tests</li> <li>● Self and peer assesment</li> </ul>	



**Suggested Learning Resources:**

- Selected specimens from the environment, adapted basic laboratory apparatus and equipment, acid base indicators, antacids, relevant improvised learning resources from the environment, protective gear (gloves, lab coats), assistive technology , adapted digital devices, internet connection
- Other related service providers: occupational therapist, laboratory technician, physiotherapist

**Suggested Assessment Rubric**

<b>Criteria</b>	<b>Exceeds expectation</b>	<b>Meets expectation</b>	<b>Approaches expectation</b>	<b>Below expectation</b>
Preparing and using simple acid-base indicators from plants.	Prepares simple acid-base indicators from plants and uses them to differentiate between acids and bases.	Prepares and uses simple acid-base indicators from plants.	Prepares simple acid-base indicators from plants	Prepares simple acid-base indicators from plants with prompts.
Categorising different house hold solutions as either acidic or basic.	Categorises different house hold solutions and other common substances as either acidic or basic.	Categorises different house hold solutions as either acidic or basic.	Outlines house hold solutions as either acidic or basic.	States which house hold solutions are acidic or basic with.
Determining the strength of acids and bases.	Determines the strength of acids and bases and ranks them according to the pH scale.	Determines the strength of acids and bases.	Determines the strength of some acids and bases.	Determines the strength of acids and bases with prompts.
Outlining the applications of acids and bases.	Describes the applications of acids and bases.	Outlines the applications of acids and bases.	States the applications of acids and bases.	States the applications of acids and bases with cues.



### 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)	<p><b>By the end of the sub strand the learner should be able to:</b></p> <ul style="list-style-type: none"> <li>a) describe the menstrual cycle in human beings</li> <li>b) describe challenges related to the menstrual cycle</li> <li>c) describe the process of fertilization and implantation</li> <li>d) appreciate the existence of sex-related challenges.</li> </ul>	<p><b>The learner is guided individually, in purposive pairs or groups to:</b></p> <ul style="list-style-type: none"> <li>a) Discuss human menstrual cycle (details of hormonal control not required; only mention) and give feedback. Learners with speech difficulties could be lip read by peers, use residual speech, mime, write/type, sign, point, use assistive technology such as; universal communication board, text to speech software, alternative communication modes, be assisted by peers, learner support assistant or teacher to give their views. (Apply this adaptation to the activities below that require speech).</li> <li>b) Discuss various challenges related to the menstrual cycle (Include irregular periods, irregular bleeding, pains, among other common challenges).</li> <li>c) 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). Learners with manipulation or fine motor difficulties could use alternative</li> </ul>	<ul style="list-style-type: none"> <li>1. How does reproduction occur in human beings?</li> <li>2. What challenges are associated with the menstruation in human beings?</li> <li>3. How best can we manage issues related to the menstrual cycle?</li> </ul>



			<p>functional part of the body, appropriate assistive devices such as universal cuff, adapted computers with expanded key boards, sticky keys, appropriate software, be assisted by peers, learner support assistant or teacher to carry out the activities.</p> <p>Learners with photophobia such as those with epilepsy and those with visual difficulties could be supported by adjusting the screen resolution or light intensity/glare when using the digital devices. Learners with short stature and those on wheelchairs could be supported by positioning them appropriately during such activities.</p>	
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**Core competences to be developed:**

- Creativity and Imagination as learners make sanitary towels using locally available materials and sensitize the community on sex-related disorders.
- Citizenship as learners appreciate the significance of protecting life from conception to birth.
- Digital Literacy as learners use various digital devices in the learning of the reproductive process.
- Critical thinking and problem solving as learners make improvised sanitary towels.
- Self-efficacy as learners share experiences and discuss the management of challenges intersex condition and to menstruation.
- Learning to learn as learners work in groups to search for information and develop capacity to continue learning while doing projects.



<p><b>Pertinent and Contemporary Issues (PCIs):</b></p> <ul style="list-style-type: none"> <li>• Social cohesion as the learners collaborate during project work in their groups.</li> <li>• Self-Management Skills as learners develop self-awareness and skills to guard against early pregnancies.</li> <li>• Self-esteem as learners work in groups while discussing the menstrual cycle which is viewed as a taboo in some cultures.</li> <li>• Personal hygiene as learners comprehend occurrences during menstruation and pregnancy.</li> </ul>	<p><b>Values:</b></p> <ul style="list-style-type: none"> <li>• Respect as learners embrace those with menstrual disorders and sex-related disorders. They also learn to respect others' opinions during discussions.</li> <li>• Responsibility as learners take up various tasks assigned and sharing the same fairly.</li> <li>• Social justice as learners practice 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.</li> </ul>
<p><b>Links to other subjects:</b></p> <ul style="list-style-type: none"> <li>• Health education as learners learn about healthy living during menses and pregnancy.</li> <li>• Home science as learners learn about proper nutrition for healthy expectant mothers and babies.</li> </ul> <p>English as learners communicate during the group activities.</p>	
<p><b>Non formal Activities to support Learning:</b></p> <ul style="list-style-type: none"> <li>• Health club as learners make sanitary towels from locally available materials.</li> <li>• Guidance and counselling during peer support group activities.</li> <li>• Poems and songs relating to reproductive health.</li> </ul>	<p><b>Suggested Modes of Assessment:</b></p> <ul style="list-style-type: none"> <li>• Oral questions</li> <li>• Observation</li> <li>• Written tests</li> <li>• Self and peer assessment</li> <li>• Project work.</li> </ul>
<p><b>Suggested Learning Resources:</b></p> <ul style="list-style-type: none"> <li>• Reference materials, charts, universal cuffs, communication board, locally available materials, weighted pencils, health facility, sanitary towel, first aid kit, adapted digital devices, internet connection; key guard, filter keys</li> <li>• Other related service providers such as nurse, gynaecologist, learner support assistant</li> </ul>	



<b>Suggested Assessment Rubric</b>				
<b>Criteria</b>	<b>Exceeds expectation</b>	<b>Meets expectation</b>	<b>Approaches expectation</b>	<b>Below expectation</b>
Describing the menstrual cycle in human beings.	With illustrations, describes menstrual cycle in human beings.	Describes the menstrual cycle in human beings.	States aspects of menstrual cycle in human beings.	States aspects of menstrual cycle in human beings with prompts.
Describing challenges related to the menstrual cycle.	Explains the challenges related to the menstrual cycle	Describes challenges related to the menstrual cycle.	Outlines challenges related to the menstrual cycle.	States challenges related to the menstrual cycle.
Describing the process of fertilization and implantation.	Analyses the process of fertilization and implantation.	Describes the process of fertilization and implantation.	Outlines stages of the fertilization and implantation process.	Mentions stages of the fertilization and implantation process with prompts.

<b>Strand</b>	<b>Sub- Strand</b>	<b>Specific Learning Outcomes</b>	<b>Suggested Learning Experiences</b>	<b>Key Inquiry Questions</b>
<b>3.0 Living Things and their Environment</b>	<b>3.2 Human Excretory System - Skin and Urinary System</b>  (12 Lessons)	<b>By the end of the sub-strand the learner should be able to:</b> a) identify parts of the human skin and their functions b) identify parts of the urinary system 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 a healthy skin.	<b>The learner is guided individually, in purposive pairs or groups to:</b> <ul style="list-style-type: none"> <li>Use a chart/model, in groups to brainstorm on parts and functions of human skin (hair, sweat glands and epidermis –avoid homeostatic functions of the skin) and do a presentation. Learners with speech difficulties could use residual speech or alternative communication modes to give their views. (Apply this adaptation to all subsequent activities where use of speech is involved under this sub strand)</li> <li>Discuss parts of the urinary system (external appearance of the kidney and</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>vessels serving kidney, ureter, bladder and urethra).</p> <ul style="list-style-type: none"> <li>• Discuss the waste products excreted through the skin (salts and water) and kidneys (urine). Use a hand lens to observe the external parts of the skin (hair and sweat pores). Learners with manipulation difficulties could use alternative functional part of the body to hold in place the adapted hand lens with padded handle or have it positioned on a stand, held by peer, learner support assistant or teacher. (Apply this adaptation to all subsequent activities where manipulation is involved under this sub strand)</li> <li>• Search for information and brainstorm on examples of cosmetics and their health effects on human body (e.g skin lightening creams and lotions).Learners with manipulation or fine motor difficulties could use alternative functional part of the body , appropriate assistive devices such as universal cuff, adapted computers with expanded keyboards, sticky keys , appropriate software , be assisted by peers, learner support assistant or teacher to carry out the activities. (Apply this adaptation to all subsequent activities where manipulation is involved under this sub</li> </ul>	
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			strand) <ul style="list-style-type: none"> <li>• Learners brainstorm on the external parts and functions of the human kidney using a chart (avoid details of the nephron and osmoregulation).</li> <li>• Search for information on the causes and prevention of kidney disorders.</li> <li>• Learners discuss healthy lifestyles that promote kidney and skin health, for instance, adequate hydration.</li> </ul> <b>Project:</b> Model of the urinary system.	
<b>Core competencies to be developed:</b> <ul style="list-style-type: none"> <li>• Citizenship as learners sensitise the community on proper use of cosmetics and promote use of locally made cosmetics.</li> <li>• Digital literacy as learners use 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>• Imagination and Creativity as learners develop and carry out projects on cosmetics from available materials.</li> <li>• Critical thinking and problem solving as learners use locally available materials to make cosmetics which are not harmful to the skin.</li> <li>• Self-efficacy as 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.</li> <li>• Learning to learn as learners develop self-awareness on healthy living to keep their skins and kidneys healthy and promote the same amongst peers and community.</li> </ul>				
<b>Pertinent and Contemporary Issues (PCIs);</b> <ul style="list-style-type: none"> <li>• Self-management skills as learners develop self-awareness while learning the effects of cosmetics on the skin.</li> <li>• Environmental education as learners discuss the effects of cosmetics on the environment.</li> <li>• Financial literacy as learners improvise teaching and learning resources using locally available materials, economical use of available resources and planning of projects.</li> </ul>			<b>Values:</b> <ul style="list-style-type: none"> <li>• Respect as learners are working with others in groups on projects and activities. They also learn to respect others' opinions.</li> <li>• Responsibility as learners practice taking care of equipment and apparatus, taking care of their skin and the environment and observing a correct diet.</li> <li>• Peace and Unity as learners are assigned specific tasks for the benefit of the whole group while carrying out project work and activities.</li> <li>• Integrity as learners report true findings from activities and projects.</li> </ul>	



<p><b>Link to other subjects:</b></p> <ul style="list-style-type: none"> <li>Health education as learners learn about lifestyle diseases and taking care of the skin.</li> </ul> <p>Home science as learners learn about nutrition for healthy skin and kidneys</p>	
<p><b>Non formal Activities to support Learning:</b></p> <ul style="list-style-type: none"> <li>Project work as learners make a model of the urinary system.</li> <li>Science fair exhibitions as learners showcase locally made cosmetic products.</li> </ul>	<p><b>Suggested Modes of Assessment:</b></p> <ul style="list-style-type: none"> <li>Observation</li> <li>Oral questions</li> <li>Written tests</li> <li>Project work</li> </ul>
<p><b>Suggested Learning Resources:</b></p> <ul style="list-style-type: none"> <li>Journals, magazines, adapted digital devices, internet connection, charts, magnifying glass/hand lens, project materials</li> <li>Other related service providers; dermatologist, nutritionist</li> </ul>	

<b>Suggested Assessment Rubric</b>				
<b>Criteria</b>	<b>Exceeds expectation</b>	<b>Meets expectation</b>	<b>Approaches expectation</b>	<b>Below expectation</b>
Identifying parts of the human skin and stating their functions.	Describes the parts of the human skin and states their functions.	Identifies parts of the human skin and states their functions.	States parts of the human skin and states their functions.	States parts of the human skin.
Identifying parts of the urinary system and their functions.	Describes the parts of the urinary system and their functions.	Identifies parts of the urinary system and their functions.	States parts of the urinary system and their functions.	States parts of the urinary system.
Describing causes of kidney disorders	Describes causes and prevention of kidney disorders.	Describes causes of kidney disorders.	Outlines causes of kidney disorders.	States 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  (12 Lessons)	<p><b>By the end of the sub strand the learner should be able to:</b></p> <ul style="list-style-type: none"> <li>a) demonstrate the existence of static charges in objects</li> <li>b) charge objects using different methods</li> <li>c) demonstrate the effects of force between charged objects</li> <li>d) appreciate the use of static charges in daily life.</li> </ul>	<p><b>The learner is guided individually, in purposive pairs or groups to:</b></p> <ul style="list-style-type: none"> <li>● Rub different objects to show the presence of static charges in objects. Learners with manipulation difficulties such as those with cerebral palsy and those with missing upper limbs (amputees) could be supported by grouping them purposively, use alternative functional part of the body, be assisted by peers, learner support assistant or teacher to carry out the activities (apply this adaptation to all subsequent activities where manipulation is involved under this sub strand).</li> <li>● Charge different objects by rubbing and induction and discuss the observations. Learners with speech difficulties could use residual speech or alternative communication modes to give their views. (Apply this adaptation to all subsequent activities where speech is involved under this sub strand).</li> <li>● Search for, play and watch videos showing types of charges and brainstorm. Learners with photophobia such as those with epilepsy and those with visual difficulties could be supported by adjusting the screen resolution or light intensity/glare when using digital devices. Learners with short stature and those on</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>



			wheelchair could be supported by positioning them appropriately during such activities. <ul style="list-style-type: none"> <li>● Experiment to show attraction and repulsion between charged objects</li> <li>● Discuss safety measures when dealing with static charges (include lightning) and take notes.</li> </ul>	
<b>Core competencies to be developed:</b> <ul style="list-style-type: none"> <li>● Digital literacy as learners use digital devices to search, play and observe videos and animations.</li> <li>● Self-efficacy as learners learn how to deal with static electricity in day-to-day life.</li> <li>● Communication and collaboration as learners work in groups to accomplish the given tasks.</li> </ul>				
<b>Pertinent and Contemporary Issues (PCIs):</b> <ul style="list-style-type: none"> <li>● Disaster Risk Reduction as learners learn about safety measures during lightning.</li> <li>● Safety and security as learners avoid dangers associated with static electricity.</li> </ul>			<b>Values:</b> <ul style="list-style-type: none"> <li>● Responsibility as learners perform their different roles during experiments.</li> <li>● Unity as learners perform the activities in groups.</li> </ul>	
<b>Link to other subjects:</b> <ul style="list-style-type: none"> <li>● Pre-Technical Studies as learners learn about lightning arrestors installed in buildings.</li> <li>● English language as learners discuss various activities.</li> </ul>				
<b>Non formal Activities to support Learning:</b> <ul style="list-style-type: none"> <li>● Project as learners model a sample of lightning arresters.</li> </ul>			<b>Suggested Modes of Assessment:</b> <ul style="list-style-type: none"> <li>● Observation</li> <li>● Oral questions</li> <li>● Self and peer assessment</li> <li>● Project work</li> </ul>	
<b>Suggested Learning Resources:</b> <ul style="list-style-type: none"> <li>● Plastic rulers, aluminium cans, balloons, nails, wires, wire cutters, wood, papers, pieces of cotton cloth, cotton wool</li> <li>● Other related service providers; laboratory technician, occupational therapist</li> </ul>				



<b>Suggested Assessment Rubric</b>				
<b>Criteria</b>	<b>Exceeds expectation</b>	<b>Meets expectation</b>	<b>Approaches expectation</b>	<b>Below expectation</b>
Demonstrating the existence of static charges in objects.	Uses various experiments to demonstrate and explain the existence of static charges in objects.	Demonstrates the existence of static charges in objects.	Outlines experiments on the existence of static charges in objects.	States experiments on the existence of static charges in objects.
Charging objects using different methods.	Demonstrates charging of objects using different methods.	Charges objects using different methods.	Charges objects using rubbing method.	Charges objects using rubbing method with prompts.
Demonstrating the effects of force between charged objects.	Explains the effects of force between charged objects and assists peers.	Demonstrates the effects of force between charged objects.	Mentions the effect of force between charged objects.	Mentions the effect of force between charged objects with prompts.

<b>Strand</b>	<b>Sub Strand</b>	<b>Specific Learning Outcomes</b>	<b>Suggested Learning Experiences</b>	<b>Key Inquiry Questions</b>
<b>4.0 Force and Energy</b>	<b>4.2 Electrical Energy</b>  <b>(12 Lessons)</b>	<b>By the end of the sub strand the learner should be able to:</b> 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	<b>The learner is guided individually, in purposive pairs or groups to:</b> <ul style="list-style-type: none"> <li>Discuss and identify sources of electricity (hydro-electric power, geothermal, solar, wind power, chemical cell) Learners with speech difficulties could use residual speech or alternative communication modes to give their views.(Apply this adaptation to all subsequent activities involving speech under this sub strand)</li> <li>Search for and observe videos and photographs on sources of electricity. Learners with photophobia such as those with epilepsy and</li> </ul>	<ol style="list-style-type: none"> <li>What are the sources of electricity?</li> <li>What are the differences between conductors and non-conductors of electricity?</li> <li>What safety measures should be exercised</li> </ol>



		<p>handling electrical appliances</p> <p>f) appreciate the use of electricity in their daily life.</p>	<p>those with visual difficulties could be supported by adjusting the screen resolution or light intensity/glare when using digital devices. Learners with short stature and those on wheelchairs could be supported by positioning them appropriately during such activities (Apply this adaptation to all subsequent activities involving the use of digital devices under this sub strand).</p> <ul style="list-style-type: none"> <li>● Set up simple electrical circuits (series and parallel arrangement of cells and bulbs) in a group and record their observations. Learners with manipulation difficulties such as those with missing upper limbs (amputees) and those with cerebral palsy could be supported by grouping them purposively, use alternative functional part of the body, be assisted by peers, learner support assistant or teacher to carry out the activity.</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. Learners with speech difficulties could use residual speech or alternative communication modes to give their views. (Apply this adaptation to all subsequent activities that require speech under this sub strand).</li> <li>● Identify safety measures to observe when using electrical appliances</li> </ul>	<p>when handling electrical appliances?</p>
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			<ul style="list-style-type: none"> <li>Explore uses of electricity in their environment and take notes.</li> </ul>	
<b>Core competencies to be developed:</b> <ul style="list-style-type: none"> <li>Learning to learn as learners apply the knowledge on electricity to safely use electrical appliances.</li> <li>Digital Literacy as learners use digital devices to search and observe videos and photographs on sources of electricity.</li> <li>Citizenship as learners observe safety measures for self and others as they use electrical appliances.</li> </ul>				
<b>Pertinent and Contemporary Issues (PCIs):</b> <ul style="list-style-type: none"> <li>Disaster Risk Reduction as learners observe safety measures when using electrical appliances.</li> </ul>		<b>Values:</b> <ul style="list-style-type: none"> <li>Unity as learners perform the activities in groups while setting up simple electrical circuits.</li> <li>Responsibility as learners perform their different roles when setting up simple electrical circuits.</li> </ul>		
<b>Link to other Subjects:</b> <ul style="list-style-type: none"> <li>Pre-Technical Studies as learners learn to set up simple electrical circuits.</li> <li>English language as learners discuss ways of setting up simple circuits and safe handling of electrical appliances.</li> </ul>				
<b>Non formal Activities to support Learning:</b> <ul style="list-style-type: none"> <li>Science club as learners make a simple electrical circuit to test conductors and non-conductors of electricity.</li> </ul>		<b>Suggested Modes of Assessment:</b> <ul style="list-style-type: none"> <li>Observation</li> <li>Self and peer assessment</li> <li>Written tests</li> <li>Oral questions</li> </ul>		
<b>Suggested Learning Resources:</b> <ul style="list-style-type: none"> <li>Adapted digital devices, dry cells, wires, solar cells, wood, plastics, bulbs, ammeters, voltmeters</li> <li>Related service providers; electrician, laboratory technician</li> </ul>				
<b>Suggested Assessment Rubric</b>				
<b>Criteria</b>	<b>Exceeds expectation</b>	<b>Meets expectation</b>	<b>Approaches expectation</b>	<b>Below expectation</b>
Identifying various sources of electricity.	Describe various sources of electricity.	Identifies various sources of electricity.	Outlines sources of electricity.	Names source of electricity.



Setting up simple electrical circuits.	Sets up simple electrical circuits with ammeter and voltmeter.	Sets up simple electrical circuits.	Sets up a simple electrical circuits with prompts.	Identifies components of simple electrical circuits.
Classifying materials as conductors and non-conductors of electricity.	Categorises materials as conductors and non-conductors of electricity.	Classifies materials as conductors and non-conductors of electricity.	Outlines materials as conductors and non-conductors of electricity.	Outlines materials as conductors and non-conductors of electricity with prompts.
Identifying electrical appliances in the locality.	Describes electrical appliances in the locality.	Identifies electrical appliances in the locality	Names electrical appliances in the locality.	Names electrical appliances in the locality with prompts.
Identifying safety measures when handling electrical appliances.	Describes safety measures when handling electrical appliances.	Identifies safety measures when handling electrical appliances.	Outlines safety measures when handling electrical appliances.	States safety measures when handling electrical appliances.

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
4. Force and Energy	4.3 Magnetism (10 Lessons)	<p><b>By the end of the sub strand, the learner should be able to:</b></p> <p>a) classify materials in the environment as magnetic or non-magnetic</p> <p>b) investigate the force between like and unlike poles of magnets</p> <p>c) identify the uses of magnets in day-to-day life</p> <p>d) appreciate the applications of magnets in day-to-day life.</p>	<p><b>The learner is guided individually, in purposive pairs or groups to:</b></p> <ul style="list-style-type: none"> <li>Identify and collect materials within their environment, sort and group them as magnetic and non-magnetic materials. Learners with mobility difficulties and those with manipulation difficulties such as those with cerebral palsy and those with missing limbs (amputees) could use alternative functional part of the body, appropriate assistive technology, be assisted by peers, learner support assistant or teacher to carry out the activity. (Apply this adaptation to all subsequent activities where</li> </ul>	<ol style="list-style-type: none"> <li>How do we identify magnetic materials in our environment?</li> <li>How are magnets used in day-to-day life?</li> </ol>



			<p>mobility and manipulation are involved under this sub strand).</p> <ul style="list-style-type: none"> <li>• Carry out activities showing attraction between two unlike poles and repulsion between two like poles of magnets and take notes.</li> <li>• Discuss the uses of magnets with peers. Learners with speech difficulties could use residual speech or alternative communication modes to give their views.</li> <li>• Search for and watch video and animations showing force between like and unlike poles of magnets and do a class presentation. Learners with visual difficulties could be supported by adjusting the screen resolution or light intensity/glare when using digital devices. Learners with short stature and those on wheelchairs could be supported by positioning them appropriately during such activities.</li> </ul>	
<p><b>Core competencies to be developed:</b></p> <ul style="list-style-type: none"> <li>• Communication and collaboration as learners work in groups to carry out activities involving magnetism.</li> <li>• Digital Literacy as learners use digital devices to search for information.</li> <li>• Imagination and Creativity as learners do their projects on magnetism.</li> </ul>				
<p><b>Pertinent and Contemporary Issues (PCIs):</b></p> <ul style="list-style-type: none"> <li>• Environmental Education as learners use magnets to collect and separate magnetic materials in the environment to reduce pollution.</li> <li>• Disaster Risk Reduction as learners take safety precautions while working with iron filings.</li> </ul>			<p><b>Values:</b></p> <ul style="list-style-type: none"> <li>• Responsibility as learners perform their different roles when carrying out activities showing the force between like and unlike poles of magnets.</li> <li>• Unity as learners work in groups to magnetise and demagnetize materials.</li> <li>• Respect as learners learn to respect and accept others' opinions during</li> </ul>	



	the discussion involving magnetism.
<b>Link to other subjects:</b> <ul style="list-style-type: none"> <li>Pre-Technical Studies as learners use magnets to classify materials in the environment as magnetic and non-magnetic.</li> </ul> Social Studies as they determine direction using magnetic compass.	
<b>Non formal activities to support learning:</b> <ul style="list-style-type: none"> <li>Red Cross and health club as learners use magnets to remove iron specks from the eye as they give first aid.</li> </ul>	<b>Suggested Modes of assessment:</b> <ul style="list-style-type: none"> <li>Practical work</li> <li>Observation</li> <li>Written tests</li> <li>Self and peer assessment.</li> </ul>
<b>Suggested Learning Resources:</b> <ul style="list-style-type: none"> <li>Magnets of different shapes, magnetic compasses/compass needles, plastics, glass materials, wood, rubber, coins, nails, iron fillings, flour</li> <li>Other related service providers; laboratory technician, occupational therapist</li> </ul>	

<b>Suggested Assessment Rubric</b>				
<b>Criteria</b>	<b>Exceeds expectation</b>	<b>Meets expectation</b>	<b>Approaches expectation</b>	<b>Below expectation</b>
Classifying materials into magnetic and non-magnetic materials.	Categorises materials into magnetic and non-magnetic materials.	Classifies materials into magnetic and non-magnetic materials.	Outlines some magnetic and non-magnetic materials.	List magnetic and non-magnetic materials
Carrying out activities showing the action between like and unlike poles of magnets.	Explains the action between like and unlike poles of magnets.	Carries out activities showing the action between like and unlike poles of magnets.	States the action between like and unlike poles of magnets	States the action between like and unlike poles of magnets with cues.
Identifying the uses of magnets	Demonstrates the uses of magnets	Identifies the uses of magnets	States the uses of magnets.	States the uses of magnets with prompts.



## COMMUNITY SERVICE-LEARNING CLASS ACTIVITY

Community Service Learning (CSL) is an experiential learning strategy that integrates classroom learning and community service to enable learners reflect, experience and learn from the community. The CSL project 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 with physical impairment in Grade 7 will be expected to participate in a 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 where learners with physical impairment will be purposively grouped to complement each other. Learners will be expected to apply the steps provided to carry out the CSL project.

The activity 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 with physical impairment to execute a simple school based CSL class activity. This activity can be done in 4 to 6 weeks outside the classroom time. The duration may be adjusted accordingly to accommodate learners with physical impairment who may require more time to implement the CSL project.

### CSL Skills to be covered

- i) **Research:** Learners will develop research skills as they investigate PCIs to address, ways and tools to use in collecting data, analysing information and presenting 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, and presentation skills using varied modes.
- iii) **Citizenship:** Learners will be able to explore opportunities for engagement as members of the school community and provide a service for the common good.
- iv) **Leadership:** Learners will develop leadership skills as they take up various roles within the CSL activity.
- v) **Financial Literacy Skills:** Learners will consider how to source and utilise resources effectively and efficiently.
- vi) **Entrepreneurship:** Learners will consider ways of generating income through innovation for the CSL class activity.



Suggested PCIs	Specific Learning Outcomes	Suggested Learning Experiences (Customise to the focus of the grade)	Key Inquiry Questions
<p>Learners will be guided to consider the various PCIs provided in the subject 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>develop a plan to solve the identified problem in the community</li> <li>design solutions to the identified problem</li> <li>implement solution to the identified problem</li> <li>share the findings to relevant actors</li> <li>reflect on own learning and relevance of the project</li> <li>appreciate the need to belong to a community.</li> </ol>	<p><b>The learners are guided in purposive pairs or groups to:</b></p> <ul style="list-style-type: none"> <li>brainstorm on pertinent and contemporary issues in the community that need attention and share in class. Learners with speech difficulties could be lip-read by peers, teacher, learner support assistant as they use residual speech or sign, point, write, use multipurpose communication board, speech generating device, eye tracking device or be allowed extra time to express their views. (<i>Apply this adaptation to subsequent learning experiences involving use of speech</i>).</li> <li>discuss various PCIs within the school community and identify the one that requires immediate attention giving reasons for their choice.</li> <li>discuss possible solutions to the identified issue and propose the most appropriate solution to the problem.</li> <li>brainstorm on the resources needed for the activity and source for them.</li> <li>discuss different methods and tools of collecting data and determine the ones suitable for the selected project.</li> <li>develop appropriate tools (<i>Questionnaires, interview schedule, observation checklist</i>) for collecting data with the guidance of the teacher. Learners with manipulation difficulties could be provided with adapted writing materials such as pen/pencils with grip, weighted pens/pencils or writing claws. They could type on tablet or be assisted by a scribe or learner support assistant to develop their tools.</li> <li>collect data and record findings. Learners with mobility difficulties could collect data remotely or be supported by peers and learner support assistant during data collection.</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> </ol>



		<p>Apply the adaptation on manipulation above here.</p> <ul style="list-style-type: none"> <li>● discuss their findings, develop various reporting documents and use them to report on their findings. <i>Apply adaptation on the use of speech and manipulation in this experience.</i></li> <li>● implement a project to get solutions to the identified problem based on the research report. <i>Apply adaptation on the use of speech, manipulation and mobility in this experience. Ensure the safety of the learners as they manipulate the tools, materials, equipment and as they explore the environment.</i></li> <li>● use feedback from peers and the school community to improve on the implementation of the project.</li> <li>● discuss the successes, challenges faced while implementing the project activities and lessons learnt; write a report and share through various media to peers and the school community. <i>Apply adaptation on the use of speech and writing above.</i> Learners with manipulation difficulties could be provided with adapted digital resources with appropriate accessibility features or be supported by peers, learner support assistant or teacher to manipulate the digital resources. Light intensity should be controlled for learners with epilepsy and those with visual impairment.</li> <li>● reflect on how the project enhanced learning while at the same time facilitating service to the school by providing solutions to the identified issue(s).</li> </ul>	
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<b>Assessment Rubric</b>				
<b>Criteria</b>	<b>Exceeds Expectation</b>	<b>Meets Expectation</b>	<b>Approaches Expectation</b>	<b>Below Expectation</b>
Identifying a pertinent issue in school the community to be addressed.	Gives Justification for the identified pertinent issue in the school community to be addressed.	Identifies a pertinent issue in the school community to be addressed.	States a pertinent issue in the school community to be addressed.	Recalls a pertinent issue discussed in class.
Planning to solve the identified issue.	Designs and develops a step-by-step plan of the activities to be carried out in the process of solving the problem.	Plans to solve the identified issue.	Outlines a plan to solve the identified problem.	States activities to be included in a plan to solve the identified problem.
Designing and implementing solutions to the identified problem.	Designs, analyses and implements solutions to the identified problem.	Designs and implements solutions to the identified problem.	Designs solutions to the identified problem.	Suggests solutions to the identified problem.

