REPUBLIC OF KENYA

MINISTRY OF EDUCATION

UPPER PRIMARY LEVEL DESIGNS FOR LEARNERS WITH HEARING IMPAIRMENT

SCIENCE AND TECHNOLOGY

GRADE 6

KENYA INSTITUTE OF CURRICULUM DEVELOPMENT

A Skilled and Ethical Society

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FOREWORD

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

The implementation of Competency Based Curriculum involves monitoring and evaluation to determine its success. After the five-year implementation cycle, a summative evaluation of the primary education cycle was undertaken to establish the achievement of learning outcomes as envisaged in the Basic Education Curriculum Framework. The Government of Kenya constituted a Presidential working Party on Education Reforms (PWPER) in 2022 to address salient issues affecting the education sector. PWPER made far reaching recommendations for basic education that necessitated curriculum review. The recommendations of the PWPER, monitoring reports, summative evaluation, feedback from curriculum implementers and other stakeholders led to rationalisation and review of the basic education curriculum.

The reviewed Grade six curriculum designs for learners with Hearing impairment build on competencies attained by learners at Grade 5. Emphasis at this grade is the development of basic literacy, numeracy and skills for interaction with the environment.

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

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

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PREFACE

The Ministry of Education (MoE) nationally implemented Competency Based Curriculum (CBC) in 2019. Grade one is the first grade of Primary education level while Grade 6 is the final grade of the level in the reformed education structure.

The reviewed Grade six curriculum furthers implementation of the CBC from Grade 5. The curriculum provides opportunities for learners to focus in a field of their choice to form a foundation for further education and training and/or gain employable skills. This is very critical in the realisation of the Vision and Mission of the on-going curriculum reforms as enshrined in the Sessional Paper No. I of 2019 whose title is: *Towards Realizing Quality, Relevant and Inclusive Education and Training for Sustainable Development* in Kenya. The Sessional Paper explains the shift from a content-focused curriculum to a focus on **nurturing every learner's potential.**

Therefore, the Grade six curriculum designs for learners with Hearing Impairment are intended to enhance the learners' development in the CBC core competencies, namely: Communication and Collaboration, Critical Thinking and Problem Solving, Creativity and Imagination, Citizenship, Digital Literacy, learning to Learn and Self-efficacy.

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

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ACKNOWLEDGEMENT

The Kenya Institute of Curriculum Development (KICD) Act Number 4 of 2013 (Revised 2019) mandates the Institute to develop and review (*SNE adapt*) curricula and curriculum support materials for basic and tertiary education and training. The curriculum development process for any level of education involves thorough research, international benchmarking and robust stakeholder engagement. Through a systematic and consultative process, the KICD conceptualised the Competency Based Curriculum (CBC) as captured in the Basic Education Curriculum Framework (BECF)2017, that responds to the demands of the 21st Century and the aspirations captured in the Constitution of Kenya 2010, the Kenya Vision 2030, East African Community Protocol, International Bureau of Education Guidelines and the United Nations Sustainable Development Goals (SDGs).

KICD receives its funding from the Government of Kenya to facilitate successful achievement of the stipulated mandate and implementation of the Government and Sector (Ministry of Education (MoE) plans. The Institute also receives support from development partners targeting specific programmes. The revised Grade six curriculum designs for learners with Hearing Impairment were developed and adapted with the support of the World Bank through the Kenya Primary Education Equity in Learning Programme (KPEELP); a project coordinated by MoE. Therefore, the Institute is very grateful for the support of the Government of Kenya, through the MoE and the development partners for policy, resource and logistical support. Specifically, special thanks to the Cabinet Secretary-MoE and the Principal Secretary – State Department of Basic Education,
I also wish to acknowledge the KICD curriculum developers and other staff, all teachers, educators who took part as panellists; the Semi-Autonomous Government Agencies (SAGAs) and representatives of various stakeholders for their roles in the development and adaptation of the Grade six curriculum designs for learners with Hearing Impairment . In relation to this, I acknowledge the support of the Chief Executive Officers of the Teachers Service Commission (TSC) and the Kenya National Examinations Council (KNEC) for their support in the process of developing and adapting these designs. Finally, I am very grateful to the KICD Council Chairperson and other members of the Council for very consistent guidance in the process.

I assure all teachers, parents and other stakeholders that this curriculum design will effectively guide the implementation of the CBC at Grade six and preparation of learners with Hearing Impairment for transition to Junior school.

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LEVEL LEARNING OUTCOMES FOR PRIMARY SCHOOL

By the end of the Primary Education level, the learner should be able to:

a) Communicate appropriately using verbal and or non-verbal modes in a variety of contexts,
b) Demonstrate mastery of number concepts to solve problems in day-to-day life,
c) Demonstrate social skills, moral and religious values for positive contribution to society,
d) Develop one's interests and talents for personal fulfilment,
e) Make informed decisions as local and global citizens of a diverse, democratic society in an interdependent world,
f) Explore, manipulate, manage and conserve the environment effectively for learning and sustainable development,
g) Acquire digital literacy skills for learning and enjoyment,
h) Appreciate the country's rich, diverse cultural heritage for harmonious living.

Essence Statement

Science and Technology is a learning area which engages in the human pursuit to understand the relationships between the living and non-living universe. Science is a discipline that deals with explanations and predictions about nature and the universe while Technology is the application of science to create devices that can solve problems and do tasks.

The achievement of Vision 2030 greatly depends on Science, Technology and Innovation. Sessional Paper No.1 of 2005 highlights the fact that for a breakthrough towards industrialisation, achievement of the desired economic growth targets and social development, a high priority needs to be placed on the development of human capital through education and training by promoting the teaching of sciences and information technology. This is also highlighted in the Sessional Paper 14, 2012 which stresses the need for sustainable basic and higher education, with an emphasis on Science, Technology and Innovation (ST&I). This makes it necessary for Science and Technology to be taught in Upper Primary Education level.

This learning area builds on the competencies introduced at the lower primary under the learning area of Environmental Activities and equips the learner with pre-requisite skills which are required in Integrated Science and Pre-technical and Pre-career studies at the lower secondary level. These enable learners to prepare for Science, Technology, Engineering and Mathematics (STEM) in subsequent levels of the education cycle. Inquiry based learning (IBL), Project based learning (PBL), Problem based learning (PBL) and Social Scientific Issue learning (SSI) approaches will be employed throughout the learning experiences in this area as advocated for by John Dewey's social constructivist theory which emphasises the learner should be given an opportunity to learn through hands-on activities. Engineering design shall be used as a pedagogical strategy to bridge science concepts with other learning areas to solve simple open-ended problems, develop creative thinking and analytical skills among learners, make decisions, and consider alternative solutions to address a variety of situations.

The design suggests the use of visual cues such as pictures, animations, models, captioned video clips, simulations, charts, and illustrations to simplify the abstract concepts. Additional assessment methods suitable for learners with Hearing Impairment, such as the use of signed questions and observation, are included. Science and Engineering Fair has also been included as part of

non-formal activities. Teachers are encouraged to come up with signs for various concepts and terminologies that could be missing in the science-specific dictionary, and to provide short and clear signed instructions or procedures when conducting experiments, demonstrations, and projects. To cater well for both categories of learners, those who are Hard of Hearing and those who are Deaf, the teacher should use proper articulation of signs with correct mouth movement when facilitating learning.

SCIENCE AND TECHNOLOGY LEARNING OUTCOMES

- Interact with the environment for learning and sustainable development.
- Apply digital literacy skills appropriately for communication, learning and enjoyment.
- Appreciate the contribution of science and technology in the provision of innovative solutions.
- Use scientific knowledge to observe and explain the natural world.
- Make functional discoveries that impact individuals and the wider society.
- Use innovative approaches as well as critical thinking and problem-solving skills to stimulate scientific inquiry, at the local, national and global levels for lifelong learning.

SUMMARY OF STRANDS AND SUB STRANDS

Strands	Sub Strands	Suggested Number of Lessons
1.0 Living things and their Environment	1.1.Fungi	12
	1.2. Invertebrates	14
	1.3. Human circulatory system	16
2.0. Matter	2.1. Change of state	18
	2.2. Composition of air	16
3.0. Force and energy	3.1. Light	16
	3.2. Levers as simple machines	14
	3.3. Slopes as simple machines	14
	Total Number of Lessons	**120**

NOTE:

The suggested number of lessons per Sub Strand may be less or more depending on the context.

Strand 1.0 Living things and their Environment

Strand	Sub Strand	Specific learning outcomes	Suggested learning experiences	Suggested Key Inquiry Questions
1.0 Living things and their Environment	**1.1 Fungi** • Common Fungi *(Mushrooms, toadstool, puff balls, yeast and moulds)* • Importance of Fungi *(Food, fermentation, health and medicine)* **Note:** Scientific names and details on application of fungi in food	By the end of the sub strand, the learner should be able to: a) sign words related to common fungi in the environment, b) identify common fungi in the environment, c) describe the importance of fungi in nature, d) appreciate the importance of fungi in the economy.	• in groups, learners are guided to search for the meaning and sign of the words related to fungi in the environment. ensure learners observe proper cyber ethics while conducting online searches, • in purposive groups, learners are guided to fingerspell and sign words related to common fungi in the environment for learning. • in groups, learners are guided to use print and non-print materials to search for	1. How are fungi important? 2. Why do we study fungi?

	processing not required **(12 lessons)**		information and images of common fungi such as puffballs, toadstool, mushroom, bread and fruit moulds. • in purposive groups, learners are guided to tour the school compound to collect common fungi found within the school environment. • learners develop a catalogue displaying images of common fungi found in the environment and present for peer assessment. • in purposive groups, learners are guided to use print and non-print materials to search for information on the economic importance of moulds, yeast and mushrooms.	

			• in groups, learners are guided to discuss and write summary notes on the economic importance of moulds, yeast and mushrooms. ensure a proper sitting arrangement to allow bilingual communication. • in purposive groups, learners are guided to grow moulds on available food materials *(such as fruits, bread, ugali)*, and display for peer assessment. • in groups, learners are guided to practise safe disposal of wastes generated from growing fungi. **Note:** *Learners are guided to observe precautions and safe disposal of wastes when handling fungi.*	

Core competencies to be developed: • Communication and collaboration: The learner develops observation and signing skills as they fingerspell and sign terms related to common fungi in the environment for learning. • Self-efficacy: The learner successfully grows moulds on food materials, observe, draw and display for peer review.
Values: **Responsibility**: The learner observes safety measures when handling fungi such as bread moulds and toadstools.
PCIs: • Financial Literacy: The learner understands the economic importance of moulds, yeast and mushrooms. • Environmental education: The learner practises safe disposal of wastes generated from growing Fungi. • Safety and security: The learner observes precautions when handling Fungi.
Links to other learning areas: • The information on the economic importance of Fungi is linked to food production in Agriculture and Nutrition. • The information on growing Fungi is linked to appreciation of God's creation in Religious Education.
Suggested learning resources: • Digital devices. • Realia (Puffballs, toadstool, mushroom, bread and fruit moulds). • Sign language dictionary. • Charts.

Strand	Sub Strand	Specific learning outcomes	Suggested learning experiences	Suggested Key Inquiry Questions
1.0 Living things and the Environment	**1.2 Invertebrates** (14 lessons) • Common Invertebrates: *(insects; spiders, ticks and mites; millipedes and centipedes; snails and slugs; worms; Sea invertebrates - octopus, starfish and crabs)*	By the end of the sub strand, the learner should be able to: a) sign words related to invertebrates for learning, b) practise precautions in handling invertebrates, c) identify common invertebrates in the environment, d) describe the general characteristics of invertebrates,	• In groups, learners are guided to search for the meaning and sign of the words related to invertebrates for learning. Ensure learners observe proper cyber ethics while conducting online searches. • In pairs, learners practise to fingerspell and to sign words related to invertebrates. • In groups, learners are guided to use print and non-print media to search for common invertebrates in the environment. • In groups, learners observe simulated demonstrations by the teacher on precautionary	How do invertebr live in the environment?

	• Importance of invertebrates *(Food, pollination, soil aeration, pests, transmission of diseases)* ***Note: scientific names not required***	e) outline the economic importance of invertebrates, f) appreciate the importance of invertebrates in the economy.	measures while handling various invertebrates. • In groups, learners are guided to watch captioned videos on images of invertebrates found in the environment.To enhance comprehension, the video is occasionally paused, allowing learners to take notes and internalise the presented information. • In purposive groups, learners are guided to tour around the school to collect some of the invertebrates within the school. • In purposive groups, learners are guided to observe and record the general characteristics of the invertebrates collected. • In groups, learners are guided to use print and non-print media to search for information on the	

			economic importance of insects, ticks and worms and present them to plenary. • In purposive groups, learners are guided to make a portfolio of different invertebrates and present for peer assessment. • In groups, learners are guided to discuss the economic importance of invertebrates.	

Core competencies to be developed:

- **Critical thinking and problem solving:** The learner displays open mindedness as they discuss the economic importance of invertebrates.
- **Creativity and Imagination:** The learner develops the skill of decision making as the learner makes thoughtful choices of the best ways of designing a portfolio of invertebrates.

Values:

- **Love:** The learner shows empathy as they portray a caring attitude by caring for invertebrates as they explore the school compound and neighbourhood.

PCIs:

- **Safety and security**: The learner observes safety precautions in handling various invertebrates.
- **Health issues:** The learner discusses the economic importance of insects, ticks and worms.

Links to other subjects: • The information on transmission of diseases is linked to communicable diseases in Agriculture and Nutrition.
Suggested Learning Resources ● Digital devices. ● Sign language dictionary. ● Realia. ● Print and captioned nonprint media.

Strand	Sub Strand	Specific learning outcomes	Suggested learning experiences	Suggested Key Inquiry Questions
1.0 Living things and the Environment	**1.3 Human Circulatory system** (16 lessons) • Parts of the human circulatory system *(heart, blood vessels and blood),* **Note:** details of different blood vessels and parts of the body not needed. • Parts of the heart and their functions • Major blood vessels and their functions • Components of blood and their functions	By the end of the sub strand, the learner should be able to: a) sign key words related to parts of the human circulatory system for learning, b) identify main parts of the human circulatory system, c) describe functions of main parts of the human circulatory system, d) outline the symptoms and prevention of common health	• in groups, learners are guided to search for the meaning and sign of the words related to parts of the human circulatory system for learning. ensure learners observe proper cyber ethics while conducting online searches, • in pairs, learners practise to fingerspell and sign words related to the human circulatory system. • in groups, learners are guided to study charts, models, images/watch captioned video clips on parts of the human circulatory system. • in pairs, learners are guided to draw and label the parts of human circulatory system,	1. How does blood circulate in the body? 2. Why is blood important to the body?

	• symptoms and prevention of common health conditions of the human circulatory system, *(hardening of arteries, high blood pressure and heart attack)*	conditions of the human circulatory system, e) develop a routine plan for maintaining a healthy circulatory system, f) appreciate the importance of a healthy circulatory system.	• in purposive groups, learners are guided to use print and non-print media to search for information on the functions of the parts of the human circulatory system. • in pairs, learners write an essay on the functions of the main parts of the human circulatory system. • in pairs, learners are guided to use print and non-print media to search for information on the functions of the main blood vessels in the human body (arteries, veins and capillaries). • in groups, learners are guided to use digital devices and watch simulated or captioned / signed videos on the components of blood and their functions.	

			• in groups, learners are guided to draw and label the components of blood. • in groups, learners are guided to engage a resource person or watch captioned video clips/animated presentations on common conditions of the human circulatory system, their symptoms and ways of maintaining a healthy human circulatory system. learners are provided with supplementary notes on components of the blood vessels and guided to make summary notes on the same. • in groups, learners are guided to discuss and record ways of maintaining a healthy human circulatory system.	

			• in groups, learners develop a routine plan for maintaining a healthy circulatory system, *(drinking plenty of water, physical activities and healthy eating)*	

Core competencies to be developed:

- Self-Efficacy: The learner is aware of their needs therefore successfully designs a criterion for maintaining a healthy circulatory system.
- Digital literacy - interacting with digital technology: The learner uses new digital technology such as simulation software, online interactive platforms or digital images to illustrate the human circulatory system.
- Learning to learn - independent learning**:** The learner independently interacts with digital technology and successfully searches for information on the layout of the human circulatory system and common conditions of the human circulatory system

Values:

- Responsibility - accountability: The learner observes safety precautions by showing resilience and consistency in practicing ways for maintaining a healthy circulatory system.
- Unity- equality: The learner embraces others by respecting their opinions as they collaboratively discuss ways of maintaining a healthy human circulatory system.

PCIs:

Health promotion issues- Prevention of non-communicable diseases: Learner adopts a routine for maintaining a healthy circulatory system.

Links to other subjects:

- The information on common health conditions of the human circulatory system is linked to lifestyle diseases in Agriculture and Nutrition.
- The modelling of the human circulatory system is linked to modelling in Creative arts and Sports.

Suggested Learning Resources

- digital devices
- charts
- models
- Sign language dictionary

Suggested Assessment Rubric				
Levels / Indicators	**Exceeds Expectations**	**Meets Expectations**	**Approaches Expectations**	**Below expectations**
Ability to sign words related to living things and their environment.	The learner signs words related to living things and their environment with great level of accuracy and fluency in the production of signs.	The learner signs words related to living things and their environment with accuracy and clear production of signs.	The learner signs words related to living things and their environment with inconsistency and shows basic level of fluency in the production of signs	The learner signs words related to living things and their environment with significant errors in articulation and fluency in the production of signs.
Ability to describe the importance of fungi.	The learner describes the importance of fungi comprehensively.	The learner describes the importance of fungi correctly.	The learner describes most of the importance of fungi.	The learner partially describes a few importance of fungi.
Ability to practise precautions in handling invertebrates.	The learner all practises precautions in handling invertebrates giving illustrations.	The learner all practises precautions in handling invertebrates.	The learner practises most of the precautions in handling invertebrates.	The learner practises a few precautions in handling invertebrates.
Ability to outline the economic importance of invertebrates.	The learner outlines the economic importance of invertebrates giving example(s) from the locality.	The learner all outlines the economic importance of invertebrates correctly.	The learner outlines most of the economic importance of invertebrates correctly.	The learner outlines a few economic importance of invertebrates.
Ability to describe functions of main parts of the human	The learner describes all functions of main parts of	The learner describes all functions of main	The learner describes most of the functions of	The learner describes a few functions of main

circulatory system.	the human circulatory system comprehensively.	parts of the human circulatory system.	main parts of the human circulatory system.	parts of the human circulatory system.
Ability to develop a routine plan for maintaining a healthy circulatory system.	The learner develops a comprehensive routine plan for maintaining a healthy circulatory system.	The learner develops a routine plan for maintaining a healthy circulatory system.	The learner develops a simple routine plan for maintaining a healthy circulatory system.	The learner develops an incomplete routine plan for maintaining a healthy circulatory system.

Strand 2.0 Matter

Strand	Sub Strand	Specific learning outcomes	Suggested learning experiences	Suggested Key Inquiry Questions
2.0 Matter	**2.1 Change of state** (18 lessons**)** • Changes of state of matter. *(melting evaporation, sublimation, deposition, condensation and freezing)* Application of change of state of matter	By the end of the sub strand the learner should be able to: a) sign words related to the processes of change of state of matter in day-to-day life, b) identify the changes of state when substances are heated or cooled, c) describe the applications of	• in groups, learners are guided to search for the meaning and sign of the words related to change of state of matter. ensure learners observe proper cyber ethics while conducting online searches, • in purposive groups, learners practise to fingerspell and sign terms related to change of state of matter. • in groups, guide learners to watch captioned video clips showing changes of state of matter (melting, evaporation, sublimation, condensation, freezing, deposition) and identify different changes of	1. Why is the change of state of matter important in day-to-day life? 2. How does matter change from one state to another?

		the change of state of matter in everyday life, d) appreciate the applications of change of state in day-to-day life.	states of matter from the video clips. • in purposive groups, learners are guided to watch captioned video clips demonstrating melting, evaporation, sublimation, condensation, freezing and deposition. • in groups, learners perform simple experiment to demonstrate change of state when substances are heated or cooled and present for peer assessment. • in groups, learners are guided to use print and non-print media to search for the information on the applications of change of state of matter. • in purposive groups, learners are guided to obtain clean water from salty water solution by distillation.	

			Project: 1. Learners to make candles using waste candle wax or beeswax, 2. Learners to repair broken plastic containers.	

Core competencies to be developed:

- Communication and collaboration: The learner develops observation and Signing skills as the learner fingerspell and sign terms related to change of state of matter.
- Learning to learn: The learner develops relationships as they share resources available to make candles from waste candle wax or beeswax

Values

- Respect - etiquette is exhibited when the learner appreciates diverse opinions of others when working in groups while discussing the application of change of state of matter in everyday life.
- Responsibility: The learner's accountability skills are enhanced as the learner offers leadership and guidance to others when collaboratively carrying out activities to demonstrate melting, evaporation, sublimation, condensation, freezing and deposition.

Pertinent and contemporary Issues

Socio-economic issues (Environmental Education**)**: The learners make candles using waste candle wax or beeswax and repairing broken plastic.

Linkage to other learning areas:

Agriculture and Nutrition: The learners appreciate evaporation as they dry cloths and cereals.

Suggested Learning Resources

- Digital devices
- Realia (ice cube, butter, cloths)
- Charts
- Laboratory equipment

Strand	Sub Strand	Specific learning outcomes	Suggested learning experiences	Suggested Key Inquiry Questions
2.0 Matter	**2.2 Composition of air** (16 lessons**)** • *Composition of air in the atmosphere* • *Uses of different components of air* • *Air pollution*	By the end of the Sub Strand, the learner should be able to: a) sign words related to components of air for learning, b) identify the components of air, c) outline uses of the different components of air, d) explain the effects of air pollution in the environment, e) describe methods of reducing air	• in groups, learners are guided to search for the meaning and sign of the words related to composition of air in the atmosphere. ensure learners observe proper cyber ethics while conducting online searches, • in purposive groups, learners are practised to fingerspell and sign words related to the component of air. • in purposive groups, learners are guided to use print and non-print materials to search for information on air and its constituents and make notes. • in purposive groups, learners are guided to use digital devices to watch charts/diagrams/captioned	1. How does air pollution affect the environment? 2. Why is clean air important?

		pollution in the environment, f) appreciate the need for clean air in day-to-day life.	videos showing the components of air and make summary notes. • in purposive groups, learners are guided to develop a well labelled pie chart showing percentage composition of components of air. • in purposive groups, guide learners to watch captioned video clips on the uses of the different components of air, discuss and present in class. • in purposive groups learners are guided to use print and non-print media to search for information on causes of air pollution. • in purposive groups, learners are guided to explore the school and neighbourhood to identify and record air pollutants found in the community. • in purposive groups, learners are guided to watch captioned video clips of the effects of air pollution to the environment and write their	

			findings on a manilla paper for class presentation. • in purposive groups, learners are guided to write a summary report on the effect of air pollution in the environment and present to plenary. • in *p*urposive groups, learners are guided to use print and non-print media to explore methods of reducing air pollution in groups. **project:** learners are guided to make posters on common air pollutants, dangers of air pollution and ways of controlling air pollution.	

Core competencies to be developed:

- Critical thinking and problem solving: The learner engages in critical and constructive dialogue as they discuss on air pollutants and come up with ways of reducing air pollution in the environment.
- Learning to learn: The learner develops relationships with peers when sharing information as they discuss and do class presentations on the uses of the different components of air.

Values:

- Responsibility- accountability: The learner observes safety precautions in an air polluted environment.

• Patriotism -citizenship: The learner serves the community by making posters on common air pollutants, dangers of air pollution and ways of controlling air pollution to educate members of the community.
Pertinent and Contemporary Issues: • Socio-economic and environmental issues (Environmental education and climate change): The learner practices methods of reducing air pollution.
Link to other learning areas: • Mathematics: The learner draws a pie chart showing the percentage composition of components of air.
Suggested Learning Resources • Digital devices. • Print and captioned non print media. • Charts.

Assessment Rubric				
Level / **Indicators**	**Exceeds Expectations**	**Meets Expectations**	**Approaches Expectations**	**Below expectations**
Ability to sign words related to matter.	The learner signs words related to matter with great level of accuracy and fluency in the production of signs.	The learner signs words related to matter with accuracy and clear production of signs.	The learner signs words related to matter with inconsistency and shows basic level of fluency in the production of signs	The learner signs words related to matter with significant errors in articulation and fluency in the production of signs.
Ability to identify the changes of state when substances are heated or cooled.	The learner identifies the changes of state when substances are heated or cooled exhaustively.	The learner identifies at least four changes of state when substances are heated or cooled.	The learner identifies at least two changes of state when substances are heated or cooled.	The learner identifies less than two changes of state when substances are heated or cooled.
Ability to identify the components of air.	The learner identifies the major components of air exhaustively.	The learner identifies the four major components of air.	The learner identifies at least two major components of air.	The learner correctly identifies less than two major components of air.
Ability to explain the effects of air pollution to the environment.	The learner explains effects of air pollution to the environment in detail comprehensively.	The learner explains all the common effects of air pollution to the environment.	The learner explains most of the effects of air pollution to the environment.	The learner explains a few effects of air pollution to the environment.

STRAND 3.0 FORCE AND ENERGY

Strand	Sub Strand	Specific learning outcomes	Suggested learning experiences	Suggested Key Inquiry Questions
3.0 Force and energy	**3.1 Light** (16 lessons) • *Movement of light through materials* • *Ray diagrams of images in plane mirrors* • *Formation of shadows and eclipses* • *Reflection of light at plane surfaces* • *Image formation*	By the end of the sub strand, the learner should be able to: a) sign words related to light as a form of energy, b) demonstrate the movement of light through materials, c) draw ray diagrams of images formed on plane mirrors, d) illustrate the formation of shadows and eclipses in nature, e) describe the formation of rainbow in nature, f) Appreciate the importance of movement light in everyday life.	• in groups, learners are guided to search for the meaning and sign of the words related to light. ensure learners observe proper cyber ethics while conducting online searches, • in purposive groups, learners practice to fingerspell and sign words related to light as a form of energy. *(transparent, translucent, ray, mirror, reflection, rainbow)* • in purposive groups, learners are guided to use digital devices to search for and watch signed/captioned video clips or animations showing movement of light in different materials and discuss the observations made.	1. How does light travel? 2. How are light images formed?

	in plane mirrors • *Rainbow formation*		• in purposive groups, learners are guided to perform simple experiments to demonstrate the movement of light in different materials. (*passing light through glass - transparent, greased/oiled paper- translucent and a book- opaque)* • in purposive groups, learners are guided to brainstorm the meaning of plane mirror and share with peers. • in purposive groups, learners are guided to watch captioned video clips, animations or signed demonstrations showing ray diagrams of images formed in plane mirrors. • in purposive groups, learners are guided to draw ray diagrams of images formed in plane mirrors • in purposive groups, learners are guided to perform an experiment	

			to show reflection of light on plane mirrors and present their finding for peer assessment • in purposive groups, learners are guided to use plane mirrors to perform experiments to demonstrate image formation and describe the characteristics of images formed. • in purposive groups, learners are guided to carry out activities to demonstrate and illustrate the formation of shadows and eclipses *(lighting a candle in a dark room and placing any opaque object along its path)* • in purposive groups, learners are guided to use digital devices to watch captioned/animated videos on the formation of rainbows. • in purposive groups, learners are guided to use print and non-print	

			media to explore the applications of movement of light in different media *(mirrors, periscope, kaleidoscope, lenses, magnifying glass, hand lens, mirage, rainbow).* **Project:** Learner uses locally available resources to make a functional periscope.	
Core competencies to be developed: • Digital literacy- The learner develops the skills of interacting with digital technology as they use digital devices to watch captioned/animated videos on the formation of rainbows. • Communication and Collaboration: The learner develops observation and signing skills as they fingerspell and sign key words related to light as a form of energy.				
Values: Unity- Inclusion: The learner embraces others as they use locally available resources to make a functional periscope.				
PCIs: Socio-economic issues: The learner observes safety and security as they use plane mirrors to perform experiments to demonstrate image formation and describe the characteristics of images formed.				
Links to other Learning areas: Agriculture and Nutrition: the learner applies the concept when lighting up the home.				

Suggested Learning Resources

- Digital devices
- Realia such as plane mirrors, hand lens, greased paper etc
- Science Specific Signs Dictionary
- Print Media

Strand	Sub Strand	Specific learning outcomes	Suggested learning experiences	Suggested Key Inquiry Questions
3.0 Force and energy	**3.2 Levers as simple machines** (14 lessons) • *Examples of levers* • *Parts of levers* • *Classification of levers* • *uses of levers in day-to-day life*	By the end of the sub strand the learner should be able to: a) sign words related to levers as simple machines used in the work environment, *b)* identify common levers used in day-to-day life, c) describe parts of a lever as used in making work easier, d) classify levers into the three classes, e) demonstrate the use of levers in making work easier, f) appreciate the use of levers in making work easier. g) appreciate the use of levers in making work easier.	• in groups, learners are guided to search for the meaning and sign of the words related to levers as simple machines. ensure learners observe proper cyber ethics while conducting online searches, • in purposive groups, the learner practices to fingerspell and sign words related to levers as simple machines. *(fulcrum/pivot, effort, and load).* • in purposive groups, learners are guided to use print and non-print media to search for the meaning	1. How are levers used in our everyday life? 2. Why do we use levers?

			and types of levers used in day-to-day activities. • in purposive groups, learners are guided to observe and identify parts of a lever from realia /labelled diagrams/ images/ models or captioned video clips. • in purposive groups, learners are guided to use print and non-print media to search for information on the three classes of levers and discuss the characteristics of each class. *(first, second, third class levers).* • in purposive groups, learners are guided to watch captioned video clips/animations or observe signed	

			demonstrations by the teacher on experiments to demonstrate the use of common levers as simple machines • in purposive groups, learners are guided to perform different tasks using a lever. *(a hole punch, pliers, scissors, and a see-saw, wheelbarrow, bottle openers, nail clippers, and a nutcracker, shovel, fishing rod, cooking tongs, and tweezers.)* • in purposive groups, learners are guided to discuss the safety precautions to observe when carrying out activities when using levers.	

			Project: Learners are guided to make and use a beam balance from locally available materials.	

Core competencies to be developed:

- Creativity and imagination: The learner makes connections while making and using a functional beam balance using locally available materials.
- Learning to learn: The learner develops relationships as they carry out activities with peers when using simulation applications to demonstrate how levers make work easier in daily life.
- Digital literacy- digital citizenship: The learner observes safety precautions and practices when using digital devices to demonstrate how levers make work easier in daily life.

Values:

- Respect - human dignity: The learner displays positive regard for self and others as they work together to carry out activities of grouping levers into the three classes.
- Unity- cooperation: The learner displays team spirit as they work with peers in grouping levers into the three classes. (First, second- and third-class levers)

PCIs:

Citizenship education: The learner exercises care and protection for one another while performing experiments to demonstrate the use of common levers as simple machines.

Link to other learning areas:

- Agriculture and Nutrition: The learner connects the concept to use of farm tools, cutlery; spoons, bottle openers.
- Creative Arts: Learner applies the principle of simple leavers as they play on a seesaw.

Suggested Learning Resources

- Print and captioned nonprint media.
- Realia such as pliers, and scissors.
- Charts.
- Models
- Digital devices.

Strand	Sub Strand	Specific learning outcomes	Suggested learning experiences	Suggested Key Inquiry Questions
3.0 Force and energy	**3.3 Slopes as simple machines** (14 lessons) • Types of slopes • Uses of slopes **(12 lessons)**	By the end of the sub strand, the learner should be able to: a) sign words related to slopes for learning, b) identify types of slopes used as machines, c) demonstrate how a slope makes work easier in life, d) appreciate the use of slopes in everyday life.	• in groups, learners are guided to search for the meaning and sign of the words related to slopes as simple machines. ensure learners observe proper cyber ethics while conducting online searches, • in purposive groups, learners are guided to fingerspell and sign words related to slopes. (slope, inclined plane, stair case, ladder, cableways, ramps, road winding up-hill, wedge, roofs). • in purposive groups, learners are guided to use	1. How are slopes used in everyday life? 2. Why do we need slopes?

			digital devices to search for and observe signed/ captioned video clips or animations showing examples of slopes. • in purposive groups, learners are guided to tour around the school and identify examples of slopes in their locality. • in purposive groups, learners are guided to explore ways in which the slopes identified in school can be used to make work easier. • in purposive groups, learners are guided to use print and captioned non print media to search and discuss more ways on how slopes make work easier.	

			• in purposive groups, learners are guided to perform simple tasks on slopes such as elevators/lifts, escalators/moving stares, stair case, ladders, cableways, ramps, road winding up-hill, wedge, roofs, loading a lorry. • in purposive groups, learners are guided to discuss how ramps help the physically challenged to move with ease. **Project:** make a simple slope for use in school or at home using locally available materials.	
Core competencies to be developed: • Citizenship: The learner exercises ethical responsibility as they appreciate the use of ramps in caring for the physically challenged. • Critical thinking and problem solving: The learner thinks clearly as they make a simple slope for use in school or at home				

using locally available materials.
Values: • Integrity: The learner's accountability skills are developed as the learner utilises resources prudently while making a simple slope for use in school or at home. • Peace: The learner shows empathy as they discuss how ramps help the physically challenged to move with ease.
PCIs: Socio economic issues: The learner exercises safety and security as they walk around the school and neighbourhood to observe and identify areas where slopes have been used to make work easier.
Links to other Learning areas: Agriculture and Nutrition: The learner connects the concept to the use of tools, equipment and machinery to carry out the projects.
Suggested Learning Resources • Realia such as ladders, ramps, staircase, road winding up-hill, wedge, roofs, • Digital devices. • Print and non-print media. • Science specific sign dictionary • Print media • Course book

Assessment Rubric				
Level / Indicators	**Exceeds Expectations**	**Meets Expectations**	**Approaches Expectations**	**Below expectations**
Ability to sign words related to force and energy.	The learner signs words related to force and energy with great level of accuracy and fluency in the production of signs.	The learner signs words related to force and energy with accuracy and clear production of signs.	The learner signs words related to force and energy with inconsistency and shows basic level of fluency in the production of signs	The learner signs words related to force and energy with significant errors in articulation and fluency in the production of signs.
Ability to illustrate the formation of shadows and eclipses in nature.	The learner illustrates the formation of shadows and eclipses in nature correctly and labels.	The learner illustrates the formation of shadows and eclipses in nature correctly.	The learner illustrates the formation of shadows and eclipses in nature omitting some basic details.	The learner illustrates the formation of shadows or eclipses in nature with minor details.
Ability to demonstrate the use of levers to make work easier.	The learner demonstrates the use of levers to make work easier innovatively.	The learner demonstrates the use of levers to make work easier.	The learner partially demonstrates the use of levers to make work easier.	The learner too partially demonstrates the use of levers to make work easier, omitting some process.
Ability to demonstrate how a slope makes work easier in day to day life	The learner innovatively demonstrates how a slope makes work easier in day to day life giving illustrations.	The learner demonstrates how a slope makes work easier in day to day life.	The learner partially demonstrates how a slope makes work easier in day to day life.	The learner partially demonstrates how a slope makes work easier in day to day life omitting some stages.

APPENDIX: LIST OF ASSESSMENT METHODS AND NON-FORMAL ACTIVITIES

Strand	Suggested Assessment Methods	Suggested Non-Formal Activities
1. LIVING THINGS AND THEIR ENVIRONMENT	• Observation. • Practical Work. • Assessment Rubrics. • Checklist. • Anecdotal Records. • Written Test. • Oral/signed Questions and Answers.	• Clubs and societies. • Exhibitions. • Drama festivals. • Music Festivals. • Park visits. • Field trips • Debates
2. MIXTURES, ELEMENTS AND COMPOUNDS	• Observation. • Practical Work. • Assessment Rubrics. • Checklist. • Written Test. • Oral/signed Questions and Answers.	• Clubs and societies. • Exhibitions. • Drama festivals. • Music Festivals. • Park visits. • Field trips • Debates
3. FORCE AND ENERGY	• Checklist / Observation. • Practical Work. • Assessment Rubrics. • Checklist. • Written Test. • Oral/signed Questions and Answers.	• Clubs and societies. • Exhibitions. • Drama festivals. • Music Festivals. • Park visits /Field trips • Debates