REPUBLIC OF KENYA

MINISTRY OF EDUCATION

UPPER PRIMARY LEVEL DESIGNS

LEARNING AREA: SCIENCE AND TECHNOLOGY

GRADE 5

NOVEMBER 2019

KENYA INSTITUTE OF CURRICULUM DEVELOPMENT

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 prepare for Science, Technology, Engineering and Mathematics (STEM) in subsequent levels of 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 emphasizes 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.

General learning outcomes

By the end of upper primary the learner should be able to:

- 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, 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

Strand	Sub Strand	Specific learning outcomes	Suggested learning experiences	Key inquiry question
1.1 LIVING THINGS	**1.2 Plants** **1.1.1 Classification of plants**	By the end of the sub strand the learner should be able to: a) classify plants into	• Learners are guided to collect green plants in their locality. • Learners are guided to take excursion to identify	1. What is the main difference between flowering plants

	(8 lessons)	flowering and non-flowering b) demonstrate precautions taken when handling harmful plants in the environment. c) specify the importance of flowering plants. d) develop interest in classifying plants	and classify flowering and non-flowering plants in their locality • Learners are guided to use digital devices such as camera phones and tablets to take photos of flowering and non-flowering plants in their locality • In groups learners discuss the precautions taken when handling harmful plants. • In groups learners discuss the importance of flowering plant.	and non-flowering plants.
Core competences to be developed: • Communication and collaboration as they work in groups with specific roles • Self-efficacy as they carry out tasks • Digital literacy and learning to learn as they search for information using digital devices				
PCIs: • Environmental Conservation as they collect plants and parts of plants in controlled quantities • Safety as they identify and collect plants and avoid collecting poisonous plants.			**Values**: • Respect and unity as they carry out activities together in groups • Responsibility as they carefully without destroying the environment and harming themselves collect the plants.	
Links to other learning areas: • Agriculture (food production) • Religious education to appreciate God's creation.			**Community Service Learning**: Caring for plants in the community.	

ASSESSMENT RUBRICS

Indicators	**Exceeds expectation**	**Meets expectation**	**Approaching expectation**	**Below expectation**
Classify plants into flowering and non-	Correctly classifies plants into flowering and non-	Correctly classifies plants into flowering and non-	Sometimes classifies plants into flowering and non-	With guidance classifies plants into

flowering	flowering and assist others	flowering	flowering	flowering and non-flowering
Demonstrate precautions taken when handling harmful plants	Correctly demonstrate the precautions taken when handling harmful plants and assist others	Correctly demonstrate precautions taken when handling harmful plants	Sometime demonstrate the precautions taken when handling harmful plants	With guidance demonstrate the precautions taken when handling harmful plants
Specify the importance of flowering plants.	Correctly Specifies the importance of flowering plants and assist others.	Correctly Specifies the importance of flowering plants.	Sometimes specifies the importance of flowering plants.	With guidance specifies the importance of flowering plants.

Strand	**Sub Strand**	**Specific learning outcomes**	**Suggested learning experiences**	**Key inquiry question**

1.0 LIVING THINGS	**1.1.2 Fungi (6 lessons)**	By the end of the sub strand, the learner should be able to: a) identify fungi in their locality b) state the importance of fungi to human beings. c) state the precautions to take when handling fungi. d) appreciate the economic importance of fungi in the environment	• Learners are guided to collect fungi such as bread moulds, puffballs, yeast and mushroom. • Learners are guided to search for more examples of fungi using digital devices. • Learners re guided to discuss precaution to take when handling fungi such as bread moulds • Learners are guided to discuss the economic importance of moulds(yeast and mushroom) **Hint** -Avoid handling toadstools - Scientific names and process of making food not required	1. What is the economic importance of fungi?
Core competences to be developed: • Communication and collaboration as they work in groups with specific roles • Self-efficacy as they carry out tasks • Digital literacy and learning to learn as they search for information using digital devices				
PCIs: • Environmental Conservation as they handle fungi in controlled quantities; Safety as they identify and handle fungi			**Values**: • Respect and unity as they carry out activities together in groups • Responsibility as they carefully without destroying the environment and harming themselves collect the fungi.	
Links to other learning areas: • Agriculture (food production) • Religious education to appreciate God's creation.			**Community Service Learning:** protecting foods from moulds.	

ASSESSMENT RUBRICS

Indicators	Exceeds expectation	Meets expectation	Approaching expectation	Below expectation
Identify fungi in their locality	Correctly identifies fungi in their locality and assist others	Correctly identifies fungi in their locality	Correctly identify some fungi in their locality	Need assistance to identify fungi in their locality
State the importance of fungi	Citing examples states the importance of fungi	Correctly states the importance of fungi	Correctly states some importance of fungi	With assistance correctly states the importance of fungi
State the precaution when handling fungi.	Correctly states and demonstrate precaution when handling fungi.	Correctly states the precaution when handling fungi.	Correctly states some of the precaution when handling fungi.	With guidance state the precaution when handling fungi.

Strand	Sub Strand	Specific learning outcomes	Suggested learning experiences	Key inquiry question
1.0 LIVING THINGS	**1.2 Animals** **1.2.1 Vertebrates** **(10 lessons)**	By the end of the sub strand the learner should be able to: a) explain what is a vertebrate in the group of animals. b) groups vertebrates into mammals, birds, reptiles fish and amphibians c) identify major characteristics of each group of vertebrates. d) Make a portfolio on the different classes of vertebrates e) develop interest in characteristics of vertebrates in their locality.	• Learners are guided on safety precaution when handling different animals in their locality • In groups, learners to explore the school and neighbourhood to observe and identify different vertebrates • Use digital devices to access, observe and identify different vertebrates • In groups learners to discuss major characteristics of mammals. • In groups learners to discuss major characteristics of birds. • In groups learners to discuss major characteristics of fish. • In groups learners to discuss major characteristics of reptiles • In groups learners to discuss major characteristics of amphibians. • Use digital devices to learn more about vertebrates. **Project 1:** making a photo album of categories of different animals different animals in the locality	1. What differentiates mammals from birds? 2. What are the differences between mammals and reptiles?

Core competences to be developed:

- Digital literacy as they use digital devices to access and observe vertebrates
- Communication and collaboration as they work in groups
- Critical thinking and problem solving as they group vertebrates according to different characteristics;
- Imagination and creativity as they make photo albums of vertebrates

PCIs: • Environmental Conservation as learners maintain the habits of the vertebrates as they explore. • Safety as they avoid dangerous animals • Animal welfare by taking care of animals	**Values:** Responsibility by showing commitment to taking care of animals.
Links to other subjects: • Agriculture (livestock), • Art and Craft (as they make photo album) • Home science as they clean their hands after handling animals	**Community Service Learning:** Caring for animals in the community by helping to feed them and ensuring they are in a clean environment.

ASSESSMENT RUBRICS

Indicators	Exceeds expectation	Meets expectation	Approaching expectation	Below expectation
Grouping the vertebrates into mammals, birds, reptiles, fish and amphibians	Consistently and correctly groups the vertebrates.	Correctly groups the vertebrates into mammals, birds, reptiles, fish and amphibians	Sometimes groups the vertebrates into mammals, birds, reptiles, fish and amphibians	Rarely Groups the vertebrates into mammals, birds, reptiles, fish and amphibians
Identify characteristics of different groups of vertebrates.	Consistently and correctly identifies characteristics of different groups of vertebrates.	Correctly identifies characteristics of different groups of vertebrates.	Sometimes identifies characteristics of different groups of vertebrates.	Rarely identifies characteristics of different groups of vertebrates.

Strand	Sub Strand Sub-Sub strand	Specific learning outcomes	Suggested learning experiences	Key inquiry question
1.0 LIVING THINGS	**1.3 Human Body** **1.3.1 Sense Organs (6 lessons)**	By the end of the sub strand the learner should be able to: a) Identify the various sense organs in a human being. b) Explain functions of sense organs in a human being. c) Demonstrate the care of the various sense organs.	• In groups learners are guided to identify sense organs in their bodies (Nose, ears, eyes, skin and tongue). NB: Details of internal structure not required. • Learners are guided to watch a video to showing functions of sense organs. • In groups learners are guided to fill crosswords on sense organs. • Learners in groups observe the skin, nose and ears using the hand lens. Learners record their findings and explain observations. • In groups learners are guided to discuss how to care for their sensory organs.	1. What role do sense organs play in human beings? 2. Why is it important to care for the body sense organs?

Core competences to be developed: Communication and collaboration as they work in groups with specific roles; Self efficacy as they carry out tasks; Digital literacy and learning to learn as they watch video using digital devices	
PCIs: Social cohesion as they work in groups	Values: Respect and unity as they carry out activities together in groups; Responsibility as they take care of sense organs
Links to other learning areas: Home science as they take care of sense organs	Community Service Learning: Sensitize the community on how to take care of sense organs.

ASSESMENT RUBRICS

Indicators	Exceeds expectation	Meets expectation	Approaching expectation	Below expectation
Types of sense organs.	Consistently and correctly states all types of sense organs	Correctly states all types of sense organs.	Correctly states some types of sense organs.	With help correctly states some types of sense organs.
Functions of sense organs.	Consistently and correctly explains all functions of sense organs	Correctly explains all functions of sense organs.	Correctly explains some functions of sense organs.	Correctly explains some functions of sense organs with assistance
Care for sense organs.	Consistently and correctly explains care for sense organs.	Correctly explains care for sense organs.	Correctly explains care for some sense organs.	With guidance correctly explains care for sense organs.

Strand	Sub Strand Sub-Sub strand	Specific learning outcomes	Suggested learning experiences	Key inquiry question
1.1 LIVING THINGS	**1.3.1 Skeleton and Muscles** **(8 lessons)**	By the end of the sub strand the learner should be able to: (a) state the parts of human skeleton. (b) describe the functions of the skeleton in human beings. (c) state the functions of skeletal muscles in a human being.	• Learners are guided to watch a video to observe the parts of human skeleton (Skull, backbone, ribcage, limb bones). NB: Detailed structure not required • Learners are guided to discuss the functions of human skeleton (Skull, backbone, ribcage, limb bones). • Learners are guided to watch a video on types of muscles. • Learners in groups discuss the functions of skeletal muscles.	1. What is the main function of the human skeleton?
Core competences to be developed: Communication and collaboration as they work in groups with specific roles; Self efficacy as they carry out tasks; Digital literacy and learning to learn as they watch videos of the skeleton and muscles using digital devices				
PCIs: Social cohesion as they work in groups			Values: Respect and unity as they carry out activities together in groups; Responsibility as they take care of the skeletal muscles and bones.	
Links to other learning areas: Physical education as they care for muscles; Health education as they learn about First Aid			Community Service Learning: Sensitize the community on how to take care of bones and muscles.	

ASSESSMENT RUBRICS				
Indicators	**Exceeds expectation**	**Meets expectation**	**Approaching expectation**	**Below expectation**
State the parts of human skeleton.	Consistently and correctly states the parts of human skeleton.	Correctly states the parts of human skeleton.	Correctly states some parts of the human skeleton.	With help correctly states some parts of the human skeleton.
Functions of human skeleton.	Consistently and Correctly describes all functions of the human skeleton.	Correctly describes functions of the human skeleton.	Correctly describes some functions of the human skeleton.	Correctly describes some functions of the human skeleton with guidance.
Functions of skeletal muscles.	Consistently and correctly states all functions of skeletal muscles.	Correctly states functions of skeletal muscles.	Correctly states some functions of skeletal muscles.	Correctly states some functions of skeletal muscles with aid.

Strand	Sub Strand	Specific learning outcomes	Suggested learning experiences	Key inquiry question
1.0 LIVING THINGS	**1.3.2 The Breathing system (12 lessons)**	By the end of the sub strand, the learner should be able to: a) identify parts of the human breathing system b) state the functions of major parts of the human breathing system c) draw and label the parts the human breathing system d) discuss the cause, signs and symptoms and prevention of illnesses that affect the breathing system. e) Model the major parts of the breathing system in a human. f) develop interest in protecting the breathing system.	• In groups, learners use visual aids and digital devices to observe, identify and record parts of the human breathing system (nose, trachea, lungs, diaphragm) • Learners draw and label the parts of the human breathing system • In groups, learners discuss the functions of each part of the human breathing system (Nose, trachea, lungs, diaphragm.) • Learners discuss causes, signs, symptoms and prevention of diseases that affect the human breathing system (Colds, influenza, tuberculosis, pneumonia, asthma, coughs). **Project:** Learners work in groups to make models of the human breathing system using locally available materials. **Note: -** Mechanisms of breathing in and out not required.	1. How can we prevent most of the illnesses of the breathing system?
Core competences to be developed: • Digital literacy as they use devices to identify the parts of the human breathing system • Self-efficacy as learners make a model of the human breathing system.				
PCIs: Health related issues as they identify how the human breathing system works • Parental support in acquisition of materials to make the model			**Values:** Responsibility as learners work in groups; Respect for self and others as they carry out tasks together.	
Links to other Learning areas: • Home science (hygiene)			**Community Service Learning:** • Learners engage with peers to brainstorm on the importance of caring for the breathing system	

ASSESSMENT RUBRICS

Indicators	**Exceeds expectation**	**Meets expectation**	**Approaches expectation**	**Below expectation**
Identify parts of the human breathing system	Correctly and accurately identify all parts of the human breathing system.	Correctly identifies all parts of the human breathing system.	Identifies some parts of the human breathing system.	Tried but was unable to identify parts of the human breathing system.
Draw and label the parts the human breathing system	Correctly and accurately draw and label all parts the human breathing system	**Correctly draw** and label all parts the human breathing system	Inaccurately draw and label some of the parts the human breathing system	Tried but was unable draw and label the parts the human breathing system
State the function the human breathing system	State all the function of the parts of the human breathing system	State two of the function of the parts of the human breathing system	State one of the function of the parts of the human breathing system	Tried but unable to correctly state any of the function of the parts of the human breathing system

Strand	Sub Strand	Specific learning outcomes	Suggested learning experiences	Key inquiry question
2.1 HEALTH EDUCATION	**2.2 Diseases** **2.1.1 Water borne** **2.1.2 External body parasite** **2.1.3 Internal body parasites** **(10 lessons)**	By the end of the sub strand the learner should be able to: a) explain what is water borne diseases b) discuss the cause, signs, symptoms, prevention and management of some water borne diseases c) discuss the signs & symptoms, preventions and management of some common external parasites d) discuss the cause ,signs and symptoms ,prevention and management of some common internal parasites e) Draw a chart showing the cause, signs and symptoms of the water borne diseases, the internal and external parasites. **Hint: biological names of causative agents of specific diseases not required**	• Discuss the meaning of water borne and soil transmitted diseases. • Learners are guided to identify the causes of (Typhoid, Bilharzia, Cholera and dysentery) • Learners are guided to discuss the signs and symptoms of (scabies, lice and jiggers) • Learners are guided to discuss cause, signs, symptoms and preventive measures of typhoid, bilharzia, cholera • Learners are guided to discuss cause, signs and symptoms of common internal parasites (round worms, pinworms, tape worms, hook worms). • Learners to the digital devices to learn more about waterborne diseases, internal and external parasites.	1. How do water borne diseases spread? 2. How can typhoid, bilharzia dysentery and cholera be prevented?

Assessment Rubrics

Indicators	Exceeds expectation	Meets expectation	Approaches expectation	Below expectation
The meaning of water borne diseases.	Correctly and consistently gives the meaning of water borne diseases.	Correctly gives the meaning of water borne diseases.	Tries to give the meaning of water borne diseases.	Unable to give the meaning of water borne diseases.
Signs & symptoms of of typhoid, bilharzia and cholera, tape worms, roundworms and jiggers	Correctly and consistently give all signs & symptoms of typhoid, bilharzia and cholera, tape worms, roundworms and jiggers	Correctly give all signs & symptoms of typhoid, bilharzia and cholera, tape worms, roundworms and jiggers	Gives most of the signs & symptoms of typhoid, bilharzia and cholera, tape worms, roundworms and jiggers	Gives a few or no signs & symptoms of typhoid, bilharzia and cholera, tape worms, roundworms and jiggers
The spread of typhoid, bilharzia and cholera, tape worms, roundworms and jiggers are spread	Correctly and consistently Explains how typhoid, bilharzia and cholera, tape worms, roundworms and jiggers are spread	Correctly Explains how typhoid, bilharzia and cholera, tape worms, roundworms and jiggers are spread	Can explain how some of the diseases are spread but cannot explain how the remaining are spread**.**	Tried but was unable to explain how the diseases are spread.
Prevention measures for typhoid, bilharzia and cholera	Correctly and consistently gives all prevention measures for typhoid, bilharzia and cholera	Correctly gives all prevention measures for typhoid, bilharzia and cholera	Gives most prevention measures for typhoid, bilharzia and cholera	Gives a few or none of prevention measures for typhoid, bilharzia and cholera
Interest in prevention of water borne diseases.	Consistently shows Interest in prevention of water borne diseases.	Shows Interest in prevention of water borne diseases.	Rarely show Interest in prevention of water borne diseases.	Does not show Interest in prevention of water borne diseases.

Strand	Sub Strand	Specific learning outcomes	Suggested learning experiences	Key inquiry

				question
3.0 ENVIRONMENT	**3.1 Solid waste management (7 lessons)**	By the end of the sub strand the learner should be able to: a) differentiate between waste that decompose easily and waste that does not decompose. b) classify waste into that which decompose easily and one that which does not decomposes c) identify ways of managing solid waste in their locality. d) use proper safety measures in solid waste management. e) appreciate the need for proper management of solid waste in the environment. f) collect waste in the school and dispose it off appropriately.	• Learners are guided to identify solid waste • Learners are guided to sort sample waste into that which decompose and that which does not decompose • In groups, learners are guided to discuss ways of managing different types of waste in their locality (To *include Re-using, Re-cycling and Reducing).* **Hint:** Include common waste in school and environment such as kitchen, animal waste, plastics, e-waste, metals and glasses • Learners to use digital devices access and observe ways of managing different types solid of waste. • Learners are guided on safety measures in solid waste management in their locality **Precaution**: Learners to use protective gear and tools when handling waste **Project**: 1. Learners to make dust bins for safe disposal of waste at home and in school using locally available materials. 2. *making of toys or ornaments from solid waste*	1. How should solid waste be disposed?
Core competences to be developed: • Self-efficacy when they learn ways of disposing wastes in their locality • Digital literacy as they use digital devices to learn ways of managing waste				
PCIs: • Life skills – decision making on how to manage waste • Health Education – Ensuring their surrounding is clean by properly managing waste.			**Values:** • Responsibility as they manage waste in their environment; • Patriotism when managing waste in the locality • Respect for rules and others as they manage waste.	
Links to other Learning areas: • Home science (managing domestic waste) • Art and craft (making dustbins) • Agriculture (Managing farm waste)			**Community Service Learning:** Making dustbins to be used at home	

ASSESSMENT RUBRICS

Indicators	Exceeds expectation	Meets expectation	Approaches expectation	Below expectation
Differentiate between waste that rots and waste that does not rot.	Consistently and Accurately differentiates between waste that rots and waste that does not rot.	Accurately differentiates between waste that rots and waste that does not rot.	At a times able and at a times unable to differentiate between wastes that rots and waste that does not rot.	Unable to differentiate between waste that rots and waste that does not rot.
Classification into waste that rots and waste that does not rot.	Consistently and Accurately classifies all wastes.	Accurately classifies all wastes.	Able to classify most of the waste correctly.	Capable of classifying a few or none of the wastes correctly.
Identification of ways of managing solid waste in the locality	Consistently and correctly identify ways of managing all solid waste in the locality	Correctly identify ways of managing all solid waste in their locality	Identifies ways of managing most of solid waste in their locality	Identifies ways of managing a few of solid waste in their locality.
Safety measures in solid waste management.	Consistently and correctly identifies Safety measures for all solid wastes.	Correctly identifies all Safety measures in all solid wastes	Identifies Safety measures in most solid wastes.	Identifies Safety measures in a few of the solid wastes
Appreciate the need for managing waste in the environment	Consistently appreciates the need for managing waste in the environment	Appreciates the need for managing waste in the environment	Sometimes appreciates the need for waste management	**Never** shows the appreciation for the need for waste management.

Strand	Sub Strand Sub-Sub strand	Specific learning outcomes	Suggested learning experiences	Key inquiry question

4.0 COMPUTING DEVICES	**4.1 Handling data; Word processing** (7 **lessons)**	By the end of the sub strand the learner should be able to: a) create a Word document b) Edit a Word document c) save and retrieve a document from a computing device d) create a personal journal in word. e) observe safety when using computing devices in their locality f) appreciate the use of Word documents in their everyday life	• Using computing devices, learners to practice how to create Word documents and key in information. • Using computing devices, learners to practice how to edit Word document. • Learners to practice how to save and retrieve documents stored in different locations of their computing devices • In groups, learners to discuss and observe safety precautions when using computing devices. **Project:** Create and maintain a personal journal covering one term in word.	1. How can you save and retrieve a document stored in your computing device? 2. What are some of the safety measures to be observed when using a computing device?

Core competences to be developed:

- Digital literacy when using digital devices
- Learning to learn – when learning how to save and retrieve information from a computing device
- Creativity and imagination - creating a Word document personal journal
- Problem solving – using word to assist in documentation and record keeping

PCIs: • Safety – observing safety as they avoid misuse of information when using a computing device • Disaster risk reduction – by using the computing devices and their accessories safely.	**Values:** • Love and respect for each other as they work in groups; Unity – teamwork as learners work together in groups • Responsibility – learners showing dedication and commitment in their activities
Links to other Learning areas: • English – typing of English words as they use word processor • Mathematics – using numerals as they create documents in word	**Community Service Learning:** • Learners discussing with their family members to learn about word documents.

ASSESSMENT RUBRICS

Indicators	Exceeds expectation	Meets expectation	Approaches expectation	Below expectation
Create a Word document	Correctly and consistently Create a Word document	Correctly create a Word document	Sometimes create a Word document	Tried but unable to create a Word document
Edit a Word document	Correctly and consistently edit a Word document	Correctly edit a Word document	Sometimes edit a Word document	Tried but unable to edit a Word document
Save document on a computing device	Correctly and consistently Save document on a computing device	Correctly Save document on a computing device	Sometimes save document on a computing device	Tried but unable to save document on a computing device
Retrieve a document from a computing device	Correctly and consistently retrieve a document from a computing device	Correctly retrieve a document from a computing device	Sometimes retrieve a document from a computing device	Tried but unable to retrieve a document from a computing device
Observe safety when using computing devices in their locality	Correctly and consistently observe safety when using computing devices in their locality	Correctly observe safety when using computing devices in their locality	Sometimes observe safety when using computing devices in their locality	Tried but unable to observe safety when using computing devices in their locality
Appreciate for the use of Word documents in their everyday life	Strongly demonstrates appreciation for the use of Word documents in their everyday life	Demonstrate appreciation for the use of Word documents in their everyday life	Tried to demonstrate appreciation for the use of Word documents in their everyday life	Rarely demonstrates appreciation for the use of Word documents in their everyday life
Create a Word document personal journal	Correctly and consistently create a Word document personal journal	Correctly create a Word document personal journal	Sometimes create a Word document personal journal	Tried but unable to create a Word document personal journal

Strand	Sub Strand Sub-Sub strand	Specific learning outcomes	Suggested learning experiences	Key inquiry question
4.0 COMPUTING DEVICES	**4.2 Coding (8 lessons)**	By the end of the sub strand, the learner should be able to; a) identify the features of learning applications which imitate simple programming b) Interact with patterns and games using available learning applications which mimic simple programming. c) Identify a learning platform for creating stories, games and animations d) create simple animations using applications which mimic simple programming e) create simple games and graphics for enjoyment f) use available learning applications to find solutions to problems in the local environment g) appreciate the role of available learning applications like scratch in their everyday life	• In groups, learners are guided to interact with patterns and games using computing devices • Learners are guided to interact with an application which simulates simple programming such as 'scratch' in order to identify features of its interface • Using computing devices, learners practice the basics of arranging pre-programmed blocks together to create a logical action. • In groups, learners use online video tutorials to find out how to create simple games and discover how to create their own graphics. • **Project:** Use scratch or any other simple programming simulation tool to generate some animated graphics.	1. What coding skills can be applied in solving day to day problems?
h) **Core competences to be developed**: Critical thinking and problem solving as they interact with games and graphics in applications which simulate simple programming Communication and collaboration as they work in groups and hold discussions, Creativity and Imagination as they interact with animations Digital Literacy as they use computing devices				
PCIs: Safety as they protect themselves and others while using computing devices, Disaster risk reduction – by using the computing devices and their accessories safely.			**Values:** Respect as they work in groups, Unity, brought about by team work, Responsibility – learners showing dedication and commitment in their activities	

Links to other learning areas: Mathematics – using scratch to arrange blocks (numbers), English – learning new terms while doing scratch	**Community Service Learning:** Learners discussing with their family members to learn and generate games and animations using computing devices.

ASSESSMENT RUBRICS

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Indicators	**Exceeds expectation**	**Meets expectation**	**Approaches expectation**	**Below expectation**
Identify the features of learning applications which simulate simple programming	Correctly and consistently identifies all features of learning applications which simulate simple programming	Correctly identifies all features of learning applications which simulate simple programming	Correctly identifies few features of learning applications which simulate simple programming	Correctly identifies few features of learning applications which simulate simple programming with assistance
Interact with patterns and games using available learning applications which imitate simple programming (e.g. scratch)	Accurately Interact with all patterns and games using available learning applications which imitate simple programming (e.g. scratch)	Accurately Interact with some patterns and games using available learning applications which imitate simple programming (e.g. scratch)	Accurately Interact with few patterns and games using available learning applications which imitate simple programming (e.g. scratch)	Hardly Interacts with patterns and games using available learning applications which imitate simple programming (e.g. scratch)
Identify a learning platform for creating stories, games and animations (e.g. scratch)	Accurately Identifies a learning platform for creating stories, games and animations (e.g. scratch)	Identifies a learning platform for creating stories, games and animations (e.g. scratch)	Sometimes Identifies a learning platform for creating stories, games and animations (e.g. scratch)	Rarely Identifies a learning platform for creating stories, games and animations (e.g. scratch)
Create simple animations using applications which mimic simple programming	Accurately creates simple animations using applications which mimic simple programming	Creates simple animations using applications which mimic simple programming	Sometimes creates simple animations using applications which mimic simple programming	Rarely creates simple animations using applications which mimic simple programming
Create simple games and graphics.	Accurately creates simple games and graphics.	Creates simple games and graphics.	Sometimes creates simple games and graphics.	Rarely creates simple games and graphics.
Use available learning applications (such as	Accurately uses available learning applications (such as	Uses available learning applications (such as scratch)	Sometimes uses available learning applications (such as	Rarely uses available learning applications (such as scratch)

scratch) to find solutions to problems in the local environment	scratch) to find solutions to problems in the local environment	to find solutions to problems in the local environment	scratch) to find solutions to problems in the local environment	to find solutions to problems in the local environment
Appreciate the role of available learning applications like scratch in their everyday life	Accurately appreciates the role of available learning applications like scratch in their everyday life	Appreciates the role of available learning applications like scratch in their everyday life	Sometimes appreciates the role of available learning applications like scratch in their everyday life	Rarely appreciates the role of available learning applications like scratch in their everyday life

Strand	**Sub Strand**	**Specific learning outcomes**	**Suggested learning experiences**	**Key inquiry questions**
5.0 MATTER	**5.1 Change of state (8 lessons)**	By the end of the sub strand the learner should be able to: a) observe and record the change of state when common substances are heated b) state the change of state when substances are heated c) observe and record the change of state when substances are cooled d) state the application of the change of state of matter in everyday life e) state the change of state when substances are cooled f) describe the changes that takes place in the water cycle. g) appreciate that matter changes state when heated or cooled.	• Learners to observe, record and discuss what happens to different solids when heated (Cooking fat or ice or candle wax, naphthalene (moth ball) • Learners to observe, record and discuss what happens to different liquids when heated (water) • Learners to observe, record and discuss what happens to water vapour when it cools. • Learners to observe, record and discuss what happens to liquids when cooled (cooling melted wax or melted fat) • Learners to observe, record and discuss what happens when vapour from naphthalene (moth) balls is cooled. • Learners use digital devices to access videos, observe and record what happens when matter is heated or cooled • Learners to discuss application of change of state of matter in everyday life in their locality (drying grains and clothes, making ice cubes) • In groups learners are guided to discuss the water cycle • In groups learners watch a video clip on the water cycle and record the different changes of state of matter involved. **Project**: Learners to make candles using candle wax or bee wax	1. What is the effect of heating matter? 2. What is the effect of cooling matter? 3. What is the importance of change of state of matter in day to day life?

Core competences to be developed:

- Communication and collaboration as they work in groups when carrying out activities on change of state of matter
- Critical thinking as they discuss the application of change of state of matter
- Digital literacy when using digital devices
- Problem solving as they repair plastics.

PCIs: Safety as they work with different objects and heat; Conserving environment as they repair plastic containers	**Values:** • Responsibility as they work with different materials • Unity as they work in groups • Respect for rules as they work with heat to change state of matter. • Respect for each other as they share materials.
Link to other Learning areas: • Home science – drying cloth, • Hygiene as they wash their hands after handling the materials.	**Community service learning:** with the guidance of their parents, learners identify activities involving change of state of matter at home and in their locality.

ASSESSMENT RUBRICS

Indicators	Exceeds expectation	Meets expectation	Approaches expectation	Below expectation
State the change of state when common substances are heated	Correctly and consistently identifies the change of state in all the substances heated.	Correctly identifies the change of state in all substances heated	Identifies some change state when different substances were heated.	Unable to identify the change of state in substances heated.
Observe and record the change of state when common substances are heated	Consistently and correctly observe and correctly record the change of state when common substances are heated	Correctly observe and record the change of state when common substances are heated	Observe and record some changes of state when common substances are heated	Unable to observe and record the change of state when common substances are heated
State the change of state when substances are cooled	Consistently and correctly identify the change of state when substances are	Correctly identifies the change of state in all substances cooled	State some of the changes of state when substances are cooled	Rarely state the change of state

	cooled with more examples			when substances are cooled
Observe and record the change of state when common substances are cooled	Consistently and correctly observe and correctly record the change of state when common substances are cooled	Correctly observe and record the change of state when common substances are cooled	Observe and record some changes of state when common substances are cooled	Unable to observe and record the change of state when common substances are cooled
State the application of the change of state of matter in everyday life.	Consistently and correctly state the application of the change of state of matter in everyday life.	Correctly state the application of the change of state of matter in everyday life.	State some of the application of the change of state of matter in everyday life.	Rarely state the application of the change of state of matter in everyday life.
Changes that takes place in the water cycle.	Consistently identifies all the changes that takes place in the water cycle	Identifies all changes that takes place in the water cycle	Identifies most of the changes that takes place in the water cycle	Un able to identify changes that takes place in the water cycle.

STRAND	SUB-STRAND	SPECIFIC LEARNING OUTCOMES	SUGGESTED LEARNING EXPERIENCES	KEY INQUIRY QUESTIONS
5.0 MATTER	**5.2 Acids and Bases (6 lessons)**	By the end of this strand, the learner should be able to: a) use litmus paper to identify acids and bases b) classify commonly used substances as acids and bases c) state physical properties of acids and bases d) state the uses of acids and bases in daily life e) apply safety precautions when handling acids and bases	• In groups, learners are guided to use litmus paper to identify acids and bases *(lemon juice, wood ash solution)* • In groups, learners are guided to carry out activities to classify commonly used substances as acids and bases using litmus papers *(lemon juice, orange juice, grape juice, bar soap, wood ash, baking powder, anti-acid tablets, sour milk)* • In groups, learners to be guided to watch videos on the physical properties of acids and bases • In groups, learners are guided to discuss physical properties of acids and bases • In groups, learners are guided to discuss the uses of acids and bases • In groups, learners are guided to observe safety precautions when handling acids and bases	1. What is the importance of acids and bases in the society? 2. What it safety precautions must be observed when handling corrosive acids and bases?
Core competences to be developed: • Communication and collaboration as they work in groups • Critical thinking and problem solving as they classify different substances as acids or bases • Learning to learn as they gain knowledge, scientific and manipulative skills as they carry out activities				
Pertinent and Contemporary Issues (PCIs)			**Values:**	

• Social cohesion as they collaborate during group work • Life skill as they apply the safety precautions on handling acids and bases	• Respect and love as they work in groups • Responsibility as they care of materials during the tasks • Integrity as they generate their own genuine results
Links to other subjects: • Home science as they identify and use acids and bases	**Community Service-learning activities** • Learners sensitize the society on common uses of acids and bases

Strand	Sub Strand	Specific learning outcomes	Suggested learning experiences	Key inquiry question
6.0 **FORCE AND ENERGY**	6.1 **Gravity (6 lessons)**	By the end of the sub strand the learner should be able to: a) state the meaning of gravity as force acting on objects b) identify the effect of gravity on an object. c) demonstrate the effect of gravity on objects d) appreciate effects of gravity in everyday life.	• In groups, learners to demonstrate the effect of gravity on objects (throwing a ball up, stones raised and released to fall, books tipped to fall from the table.). • Learners are guided to define the term gravity. • In groups, learners are guided to discuss the application of gravity • In groups, learners to use digital devices to observe and record the effect of gravity on objects.	1. How does gravity affect objects?
Values: • Responsibility during making of a liquid siphoning equipment • Respect and love when carrying out activities together.				
Suggested Community Service Learning Activities: Learners to explore and observe areas where liquid siphoning equipment is used in everyday life.				

ASSESSMENT RUBRICS

Indicators	Exceeds expectation	Meets expectation	Approaches expectation	Below expectation
The meaning of gravity as force	Correctly and consistently identify gravitational force on an object.	Correctly identify gravitational force on an object.	To some extent identify gravitational force on an object.	Needs assistance to identify gravitational force on an object
Identification the effect of gravity on objects	Correctly and consistently identifies the effect of gravity on objects.	Correctly identifies the effects of gravity on objects.	Needs some assistance to identify the effects of gravity on objects.	Needs full assistance to identify the effect of gravity on objects
Effects of gravity in everyday life.	Consistently appreciates of the effects of gravitational force in everyday life.	Appreciates the effects of gravity in everyday life.	To some extent appreciates the effects of gravity in everyday life	Does not appreciate the effect of gravity on day to day life

Strand	Sub Strand	Specific learning outcomes	Suggested learning experiences	Key inquiry question
6.0 FORCE AND ENERGY	**6.1 Sound Energy (6 Lessons)**	By the end of the sub strand, the learner should be able to: a) differentiate between loud and soft sounds produced by objects b) explain what is sound pollution in the environment c) identify effects of loud sounds on health d) employ measures to protect self from sound pollution e) develop interest in protecting self against sound pollution.	• Learners to produce sounds using different objects in their locality (Examples: bells, drum, plucking a ruler, plucking strings). • Learners to discuss and classify the sounds produced as loud and soft sound • Learners to identify areas with loud sound in their locality. • Learners to be guided to discuss the meaning of the term sound pollution • In groups, learners to discuss effects of sound pollution on health and behaviors of human being (hearing loss, lack of concentration, irritability, sleep disturbances, interference with communication) • Learner to take precautionary measures to protect self from loud sound (turn down loud music, using hearing protection, avoid areas with loud sound, sound proof walls) **Project**: Learners to make sound cone sound amplifier or ear muffs from locally available materials	1. How do we produce loud and soft sound? 2. What are the effects of sound pollution? How do you protect yourself from sound pollution?

Core competences to be developed: • Communication and Collaboration as they carry out activities in groups • Imagination and Creativity as they construct ear muffs in the project	
PCIs: Education for sustainable development as they come up with ways minimizing noise in the locality	**Values:** Responsibility as they think of how to reduce effect of noise in their locality
Links to other subjects: Music as they learn they learn about the difference between music and noise	**Suggested CSL :** Learners to identify sources of noise and take an active role in minimizing effect of noise with parental guidance

ASSESSMENT RUBRICS

Indicators	**Exceeds expectation**	**Meets expectation**	**Approaches expectation**	**Below expectation**
Identification of properties of sound. (loud and soft)	Correctly and consistently identify the two properties of sound;	Correctly identify the two properties of sound	Identifies one of the two properties of sound;	Unable to identify the two properties of sound
Identify effects of loud sound	Consistently identify all effects of loud sound.	Correctly identifies all the effects of loud sound	Correctly identifies some of the effects of loud sound	Unable to identify the effects of loud sound
Employ measures to protect self from sound pollution	Consistently employs measures to protect self from sound loud sound	Employs measures to protect self from loud sound.	Sometimes employ measures to protect self from loud sound.	Does not employ any measure to protect self from loud sound

Strand	Sub Strand	Specific learning outcomes	Suggested learning experiences	Key inquiry question
6.0 FORCE AND ENERGY	**6.2 Heat transfer (8 Lessons)**	By the end of the sub strand the learner should be able to: a) demonstrate transfer of heat in liquids and gases. b) identify the applications of convection in day to day life. c) demonstrate heat transfer by radiation d) identify applications of radiation in day to day life. e) develop interest in finding out more about convection and radiation.	a) Learners to perform experiment to demonstrate convection in liquids and gases and record the observation b) In groups learners are guided to find the meaning of convection. c) In groups learners discuss the application convection in day to day life. d) Learners to perform experiment to demonstrate radiation and record the observation e) In groups learners are guided to find the meaning of radiation f) In groups learners discuss the applications of radiation in day to day life. **Project:** make improvised solar heater.	1. How is heat transferred in liquids and gases? 2. How is heat transferred where there is no matter?
Core competences to be developed: • Critical thinking, Imagination and Creativity when making the solar heater • Communication and Collaboration as learners work in groups • Digital literacy in the use of digital media in demonstrating and observing different methods of heat transfer.				
PCIs: • Safety in the use of personal protective equipment (PPE) and taking care when using various objects during their demonstrations of heat transfer methods; • Life skills: decision making and problem solving as they perform the projects for local use.			**Values:** • Unity, Cooperation and teamwork as they work in groups • Respect for self and others as they perform the experiments • Responsibility by being careful and diligent while carrying out experiments • Honesty and Integrity as they make the cooler and solar heater.	
Links to other Learning areas • Agriculture in the use tools and equipment to carry out the projects • Home Science use the heater and cooler at home as well as observing hygiene while working.			**Suggested CSL** • Collaboration with the community as they make simple coolers and solar heaters for use • Financial literacy through sale of coolers and heaters; Simple research in the area of heat transfer and its applications.	

ASSESSMENT RUBRICS

Indicators	**Exceeds expectation**	**Meets expectation**	**Approaches expectation**	**Below expectation**
Demonstrate convection of heat in liquids and gases	Correctly and consistently demonstrates the concept of convection in liquids and gases.	Correctly demonstrates the concept of convection in liquids and gases.	Needs little help to demonstrate the concept of convection in liquids and gases.	Need help demonstrates that convection takes place in liquids and gases.
Identify the applications convection in day to day life.	Identifies the applications convection in complicated scenarios in day to day life.	Identifies all the applications convection in day to day life.	Identifies most of the applications of convection in day to day life.	Identifies a few or no application convection in day to day life.
Demonstrate radiation of heat	Correctly and consistently demonstrates the concept of radiation of heat	Correctly demonstrates the concept of radiation of heat.	Needs little help to demonstrate the concept of radiation of heat	Need help demonstrates that radiation of heat takes place
Identify the applications radiation in day to day life.	Identifies the applications radiation in complicated scenarios in day to day life.	Identifies all the applications radiation in day to day life.	Identifies most of the applications of radiation in day to day life.	Identifies a few or no application radiation in day to day life.

Strand	Sub Strand	Specific learning outcomes	Suggested learning experiences	Key inquiry question
7.0 EARTH AND SPACE	**7.1 Moon** **(4 Lessons)**	By the end of the sub strand, the learner should be able to: a) identify different phases of the moon. b) Observe and record the different phases of the moon. c) show curiosity in observing the phases of the moon	• Learners are guided to observe and record the different phases of the moon. • Learners to use visual aids and digital devices to observe the different phases of the moon. • Learners to use visual aids to identify different phases of the moon. • With guidance of the parents learners are observe and record different phases of the moon. • Learners to mount and display different phases of the moon based on their observation for other to see.	1. How does the appearance of the moon change from time to time?
Core competences to be developed: Digital literacy as learners use digital device to observe the phases of the moon.				
PCIs : • Environmental awareness about the phases of the moon • Safety and security to be observed when learners view the moon at night.			**Values**: • Responsibility by showing dedication and commitment when observing the sky at night • Respect for different religious faiths	
Links to other Learning areas: • Religious education (using phases of the moon to determine the length of the month			**Community service learning:** • Learn how phases of the moon are associated with natural occurrences (tides waves, religious festivals)	

ASSESSMENT RUBRICS

Indicators	**Exceeds expectation**	**Meets expectation**	**Approaches expectation**	**Below expectation**
Identify the different phases of the moon	Correctly and accurately identify the different phases of the moon	Correctly identify the different phases of the moon	Identify some different phases of the moon	Rarely identify the different phases of the moon
Record the different phases of the moon	Correctly and accurately record the different phases of the moon	Correctly record the different phases of the moon	Occasionally record the different phases of the moon	Rarely record the different phases of the moon
curiosity on phases of the moon	Shows very high level curiosity in all phases of the moon	Shows curiosity in all phases of the moon.	Showed curiosity in some phases of the moon	Showed no curiosity in the phases of the moon.

STRAND	SUB STRAND	SUGGESTED ASSESSMENT METHODS	SUGGESTED LEARNING RESOURCES	SUGGESTED NON FORMAL ACTIVITIES
1. Living things 2. Health Education 3. Environment 4. Matter 5. Force and Energy		a) question and answer method, b) class quizzes c) individual performance assessment and d) project work	• conventional laboratory resources and • Improvised resources from the environment	1. Excursions 2. Field work 3. Science Clubs and societies 4. Games
7 Earth and Space	Moon	a) question and answer method, b) class quizzes c) individual performance assessment and project work	• conventional laboratory resources and • Improvised resources from the environment	1. Excursions 2. Field work 3. Observation of under Parental guidance
4. Computing devices	Handling data	(a) Word practical tasks (b) Typing (c)Document formatting	• Computer device • Microsoft Word	1. Identify the various word processing 2. identify use of word in community