MINISTRY
OF
EDUCATION, YOUTH & INFORMATION
Every Child Can Learn, Every Child Must Learn

NATIONAL STANDARDS CURRICULUM

THE EXPLORATORY CORE:

Language Arts • Mathematics • Science • Social Studies

GRADE 5

NATIONAL STANDARDS CURRICULUM GUIDE

GRADE 5

THE EXPLORATORY CORE:

Language Arts, Mathematics, Science & Social Studies

Ministry of Education, Youth and Information, Jamaica. 2018

ACKNOWLEDGEMENT

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- All others whose names do not appear, but who contributed to the production of the NSC

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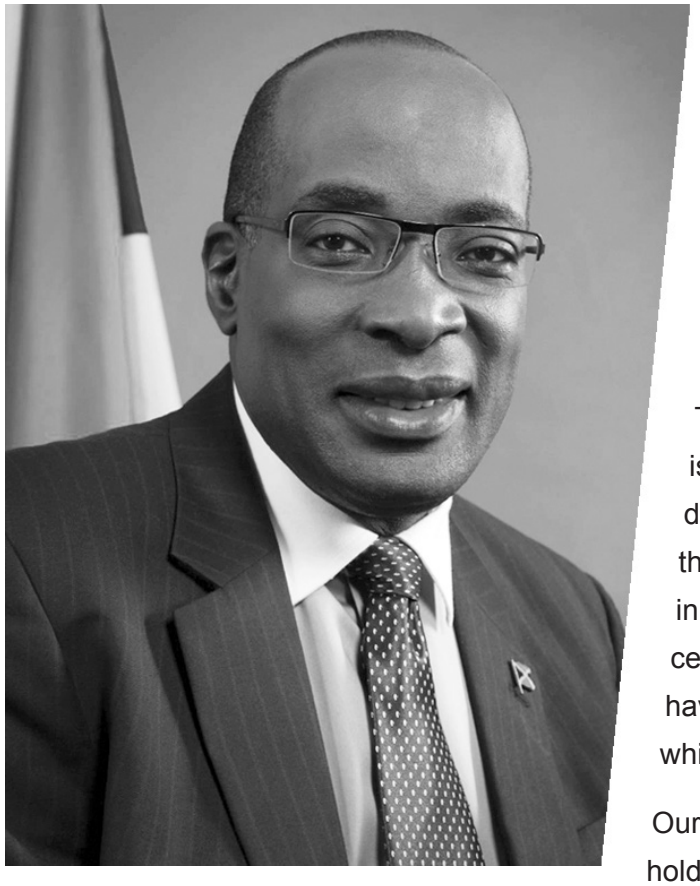

Education has always been pivotal to societal and economic development. It is for this reason that Jamaica remains unshaken and hopeful of a realized vision to be “the place of choice to live, work, raise families and do business.” The assurance of the possibility of all that such a vision entails comes from the recognition that Jamaica is endowed with tremendous God-given talent and creative potential and as a people of strong faith in spiritual principles and resilience; we are able to harness our capabilities, to make significant influence on the world. It is through this new National Standards Curriculum (NSC) that we hope to propel this vision of the education system whilst becoming more relevant, current and dynamic.

The team at the Ministry of Education Youth and Information is cognizant of the fact that the curriculum is the heart and mind of education and remains the most powerful means by which any country can develop and be sustainable. It is for this reason that the NSC has been designed with the understanding that people, learning and national development are at the core of our existence in a time of rapid change in the physical, social, economic and other dimensions of the global landscape. As a consequence, we celebrate the wisdom of the developers who through the engagement of numerous stakeholder groups, have responded favourably to the need for that kind of education that prepares our young people for life; while challenging our more mature to join in this lifelong journey of learning to learn.

Our commitment to the development of each learner and our support and appreciation of the various stakeholder groups that are partnering with us in providing quality education, remain at the forefront of our efforts in ensuring that this journey transforms education. This commitment is conveyed through our adoption of a Pathway Approach to learning that demands of us to provide customized programmes, differentiated learning experiences and specialized support for our learners. Our actions have been fruitful as is evident by the systems and conditions we have put in place for successful implementation.

Like the rest of Jamaica, I look forward to the testimonials of students, parents, teachers and other stakeholders of the empowering effect of this learner- centred curriculum and remain confident that it will contribute to make Jamaica renown.

The Honourable, Senator Ruel Reid,CD

Minister of Education, Youth & Information

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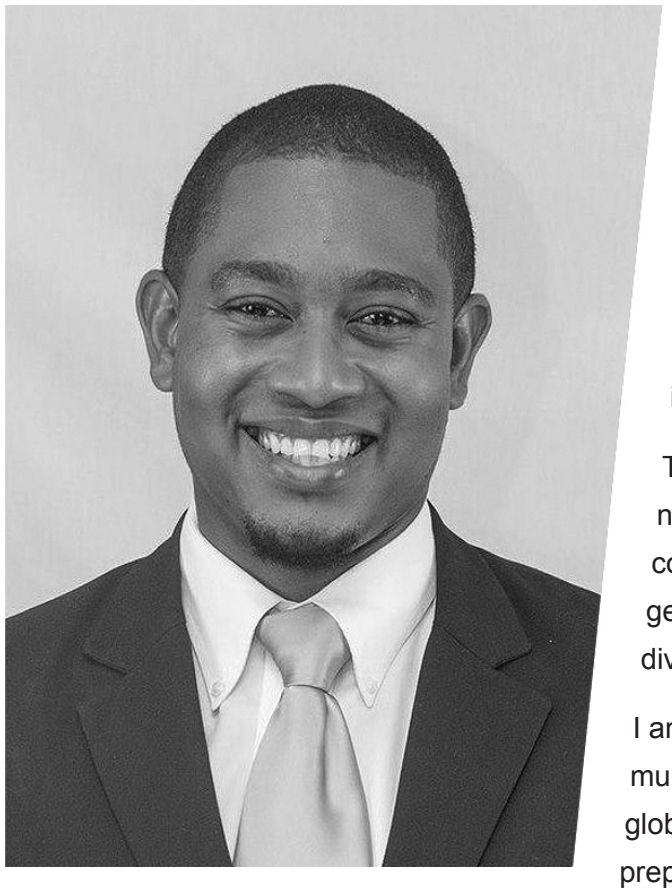

Building a modern society where young people can prosper and achieve their aspirations is paramount on the Ministry of Education, Youth and Information's (MOEYI) agenda. In its bid to advance this agenda the team at the MOEYI has developed the National Standards Curriculum (NSC) on a clear set of values that will permeate learning and become embedded in young people's approach to life. Young people need to be clear about their Jamaican identity. Justice, democracy, tolerance and respect need to be more than mere words; they need to become an essential part of people's lives. Young people's understanding of, and commitment to, sustainable development is critical to the future of Jamaica and of the world. These values that permeate the new curriculum and more importantly, will by its use, be ingrained in the fabric of the Jamaican society.

The development of a new curriculum is a major achievement in the life of any country. It is even more noteworthy because this curriculum embodies the set of knowledge, skills, values and attitudes that our country deems relevant at this particular time. It is intended that these attributes be conveyed to the next generation as a means of cultural continuity in preparation to cope with the future, both nationally and individually.

I am particularly excited about the prospects of the NSC honing key twenty-first century skills such as communication, collaboration, critical thinking and creativity in our youth as they prepare to take on their roles as global citizens. I encourage parents, students, teachers and indeed the community to partner with us as we prepare our young people not just for today, but for the rapidly changing times ahead.

The Honourable, Floyd Green, MP

State Minister in the Ministry of Education, Youth & Information

MESSAGE

In responding to the challenges confronting education in Jamaica, The Ministry of Education Youth and Information has taken strategic measures to address the need for a national curriculum that is relevant for the 21st century, the dynamics of the Jamaican context and the profile of the learners at the pre-primary, primary and secondary levels. One major output of these strategic actions is the National Standards Curriculum. This curriculum is intended to be one of the means by which the Jamaican child is able to gain access to the kind of education that is based on developmentally-appropriate practice and the supporting systems and conditions that are associated with high quality education.

This curriculum has the potential to inspire and provide challenges in the form of problem situations that all our learners can handle in ways that are developmentally appropriate. It compels us to move beyond the traditional functional perspectives of being literate to a focus on the physical and physiological as well as the ethical, social and spiritual.

I invite all our stakeholders to fully embrace this new curriculum which promises to excite imaginations, raise aspirations and widen horizons. Learners will become critical and creative thinkers with the mindset required for them to be confident and productive Jamaicans who are able to thrive in global settings as they take their place in the world of uninhibited change.

Mr. Dean Roy Bernard

Permanent Secretary , Ministry of Education, Youth & Information

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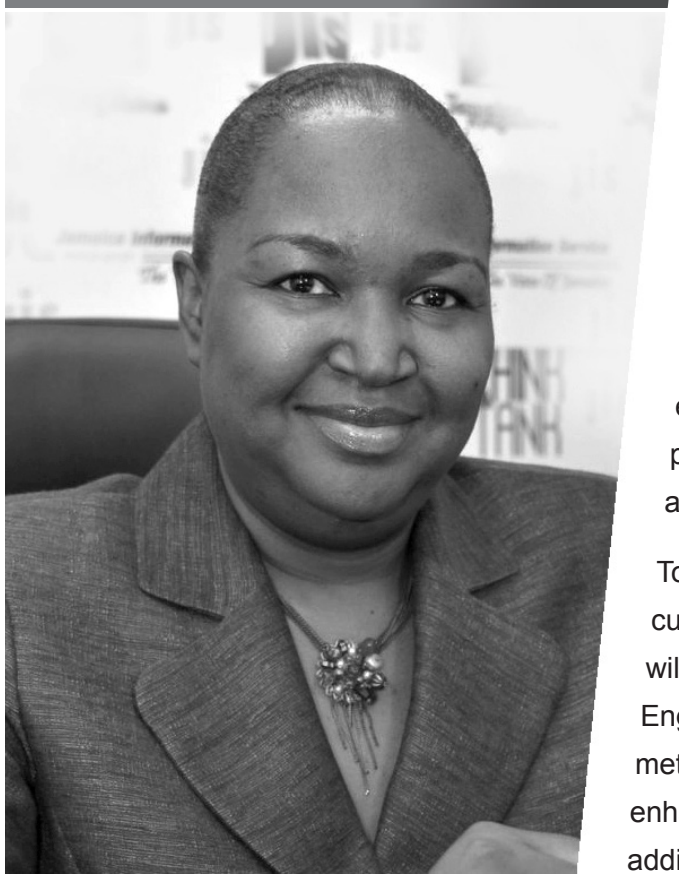

It was the mandate of the Curriculum Units of the Ministry of Education, Youth and Information to spearhead the crafting of a new curriculum for the nation, in keeping with international standards, global trends in the educational landscape and societal goals and aspirations. The mandate had several facets: to establish clear standards for each grade, thereby establishing a smooth line of progression between Grades 1 and 9; to reduce the scope, complexity and amount of content; to build in generic competencies such as critical thinking across the subjects; to ensure that the curriculum is rooted in Jamaica's heritage and culture; to make the primary curriculum more relevant and more focused on skills development, and to ensure articulation between primary and secondary curricula, especially between Grades 6 and 7. To achieve this, the MoEYI embarked on an extensive process of panel evaluations of the existing curricula, consultation with stakeholders, (re)writing where necessary and external reviews of the end products.

Today, we are indeed proud that, the curriculum development teams have succeeded in crafting a curriculum which has met these expectations. Under the National Standards Curriculum (NSC) focus will be given to project-based and problem-solving learning, with an integration of Science, Technology, Engineering and Mathematics/Science, Technology, Engineering, Arts and Mathematics (STEM/STEAM) methodologies across the system. Learners will benefit from more hands-on experiences which should enhance the overall learning experience and cater to the different kinds of learners in our classroom. In addition, they will be exposed to work-based learning opportunities that will help them become productive citizens of Jamaica and the world at large.

It is anticipated that as school administrators and teachers system-wide implement the National Standards Curriculum that improvements will be evident in the general academic performance, attitude and behaviour of our students.

We anticipate the participation of all our stakeholders in this process as we work together to improve the quality of life and prospects for all the children of Jamaica and to realize our mantra that *every child can, and must, learn.*

Dr. Grace McLean

Chief Education Officer, Ministry of Education, Youth & Information

M E S S A G E

The Ministry of Education Youth and Information (MoEYI) is committed to providing high quality education to all Jamaican children. We have heard the cries from the various sectors of the Jamaican society about the level of preparedness/readiness of our students for life in the 21st century; and we are taking the necessary steps to ensure that our students graduate with marketable skills. The MoEYI has reviewed and redesigned the Grades 1-9 curricula around the principles of Vision 2030 Goal number one; “Jamaicans are empowered to achieve their fullest potential”.

The National Standards Curriculum (NSC) will lay the foundation for students by preparing them for working lives that may span a range of occupations, many of which do not currently exist. This has been done by way of designers carefully integrating the theoretical principles of Science, Technology, Engineering and Mathematics/Science, Technology, Engineering, Arts and Mathematics (STEM/STEAM) methodologies into the curricula at all grade levels. The NSC illustrates that in order to make education effective for our 21st century children; we need to change how we teach, and what we teach.

We are satisfied that the curriculum designers and writers have produced a curriculum that is indeed fitting for the 21st century. The NSC was designed to develop students’ understandings of subject matter and their ability to apply what is learnt; it fosters their ability to communicate and solve problems collaboratively, think critically and create novel solutions.

The success of our children is dependent on the participation of all stakeholders in the learning process. We encourage you all to be our committed partners in education as the true impact of this curriculum will only be felt when we have all hands on board. I am indeed proud to be associated with the development and implementation of this curriculum; it will inspire hope in our nation and future generations; kudos to the various teams that contributed to its development.

Mrs Lena Buckle Scott
Deputy Chief Education Officer,
Curriculum and Support Services, Ministry of Education, Youth & Information

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MESSAGE

The National Standards Curriculum (NSC) rests on the belief that all learners are endowed with the capabilities, gifts and talents to fulfil their divine purpose. These attributes are to be further enhanced or improved in a nurturing, inspiring and inclusive environment; one that caters to the whole person (soul, spirit and body - spiritual, emotional, social, physical and mental). As learners assume their roles and responsibilities individually and as communities of learning in such an environment, they become critical-reflexive thinkers, creative problem solvers, effective communicators and natural collaborators.

A curriculum design of this nature, calls for transformative change at the societal level (Elkind, 2004)[1] and not just at the school and classroom levels. This is a call for all stakeholders, as users of the curriculum, to adopt a critical -reflective and reflexive stance and join learners in the quest for meaning, purpose and stability as they help to shape the world. By integrating principles from various disciplines and their related methodologies, learners who interact with the curriculum are provided with enriching experiences, opportunities for creative expressions and authentic exploration of problems from a classical standpoint as well as in the context of workplace learning. This is due to the fact that the NSC recognizes the importance of each discipline in the problem solving process and in development.

Assessment as an element of the curriculum becomes primarily a learning process for charting progress through self-corrective measures that are informed by feedback from peers and teacher-facilitator. By providing assessment criteria statements in the curriculum, teachers are encouraged to facilitate learners functioning as self and peer assessors. This approach should see the learner developing self-direction with the support of mentors and coaches and forming an intrinsic desire to succeed. These attributes prepare them to face high stakes assessment as problems to be confronted with courage, a sense of readiness, insight and creative prowess.

These features of the NSC have the potential to influence learners' profile as Jamaicans who are gratified by an identity of cultural excellence that embodies moral obligations, intellectual rigour, innovativeness, environmental stewardship and productivity. The curriculum echoes the sentiments of our National Anthem, National Song and Pledge and serves as rich and credible source of the values and virtues that are woven together to convey the Jamaican identity. I wish for our school administrators, teachers, students and other stakeholders much success as they work with the document.

Dr Clover Hamilton Flowers

Assistant Chief Education Officer, Core Curriculum Unit, Ministry of Education, Youth & Information

[1] Elkind, D. (2004). The problem with constructivism. The Educational Forum, 68(4), 306–12.

TERMS	DEFINITIONS/MEANINGS
Range of Content	Provides an overview of the concepts, knowledge, skills and attitudes that will be developed in a unit of study.
About the Unit	Gives a brief overview of the content, skills that are covered in the unit and the methodologies that are used. As well as the attitudes to be developed.
Standards	Statements that explain what all students are expected to know and be able to do in different content areas by the end of a course of study e.g. by the end of period spanning grades 4 – 9.
Attainment Targets	An attainment target is a desired or expected level of performance at the end of a course of work, within a given/specified teaching- learning period. Attainment targets identify the knowledge, skills and understanding which students of different abilities and maturities are expected to have by the end of each Grade. It is the standard that we expect the majority of children to achieve by the end of the grade.
Benchmarks	Behaviours students are expected to exhibit at different stages of development and age/ grade levels.
Theme/Strands	Unifying idea that recurs throughout a course of study and around which content, concepts and skills are developed.
Prior Learning	It is what students are expected to already know through learning and experience about a topic or a kind of text.
Specific Objectives	Specific objectives state what the student is expected to know or understand as a result of the learning experience. The specific objective is usually framed in the areas of the knowledge, skills and attitudes that the students are expected to achieve. Specific objectives tell us what the children will learn or will be taught.
Suggested Teaching/Learning Activities	A teaching/learning activity is an organised doing of things towards achieving the stated objectives. They are suggested activities that are crafted in a way to be an efficient vehicle which can move the student between what is to be learnt (objective) and what the student is to become (outcome).

TERMS	DEFINITIONS/MEANINGS
Key Skills	Indicate the important skills that students should develop duringthe course of a unit. Key skills are aligned to the suggested teaching and learning activities in the unit which are intended to develop the skill to which it is aligned. Included in the key skills are the 21st century skills such as critical thinking and problem solving, collaboration, communication and ICT.
Assessment	An assessment is a determination of whether intended results have been achieved. This section of the curriculum speaks to both the product that will be judged as well as the criteria against which it will be judged. It must be noted that this section does not introduce new activities. Instead, it speaks to the judging of the suggested teaching and learning activities. Formal assessment may be conducted with the aid of instruments (e.g. via writen test, portfolio) or by requiring students to complete assigned tasks (e.g. performance), and is usually recorded against a predetermined scale of grading. Informal assessment (e.g. via observation or spontaneous student expression) may also reveal important evidence of learning.
Points to Note	This section provides technical information that must be considered in delivering the unit. It may also include information that provides additional explanation of key concepts that may be unfamiliar to the teacher as well as suggestions for infusion within the unit.
Extended Learning	These are opportunities for students to utilise the knowledge and skills they would have acquired in the unit in authentic situations/experiences.
Learning Outcomes	A learning outcome is a demonstration/ behavioural evidence that an intended result has been achieved at the end of a course of study. The learning outcome tells us if pupils have understood and grasped what they have been learning.
Links to other Subjects	Suggests opportunities for integration and transfer of learning across and within different subject areas.
Key Vocabulary	This section consists of a number of words/phrases that addresses the skills, topics and content that must be covered in the unit.

NSC

LANGUAGE ARTS

Grade 5 UNITS

LANGUAGE ARTS PHILOSOPHICAL STATEMENT

The Language Arts programme developed for the National Standards Curriculum (NSC) is underpinned by the general theory of learner-centredness which is specified in the National Education Strategic Plan (2011-2020). This plan clearly outlines the following objective: "Develop learner-centred and competency-based curricula at all levels." (pg. 44). The learner is, therefore, at the core of all teaching/learning experiences and the objectives, skills, activities, assessment criteria and learning outcomes of all units are written from the learner's perspective. The learner's full engagement and differences are taken into account and the dimensions of ability levels, interests, learning styles and gender are critical factors that were given great consideration during the development of the teaching units. This means that the traditional text-centred and teacher-centred approaches to English Language teaching/learning are now given far less focus (aspects of which are not totally eliminated) and learning through authentic real life contexts is being promoted. Learners now, for example, will engage in simulations in order to develop targeted skills; analyze and respond critically to literature; use different language/literature media to respond to given scenarios; create original products and use a replicable process to develop written pieces.

Language Arts teaching in the NSC embraces the integration of learning which is promoted by the existing primary and secondary curricula. As students learn Language skills related to the various strands and sub-strands, they will interface with content and methodologies from a range of disciplines including Science, Social Studies, Information Technology, Drama, Food and Nutrition, Guidance and Counselling to name a few. These disciplines, which are termed 'cross-curricula links,' are the avenues through which the Language content/skills are learnt and applied in authentic contexts.

The 21st century skills of communication, collaboration, critical thinking and creativity are also fully embraced and are promoted through the methodologies of simulations, group/peer-work, problem-based tasks and adequate allowance for exploration and innovation. The affective dimension is also foregrounded through specific objectives which when met, will help to facilitate the development of the aforementioned 21st century skills. Other values and attitudes, besides those exemplified through effective communication and cooperativeness in collaboration, are also developed through the inclusion of the affective dimension. Additionally, the themes selected, especially at the grades 7-9 level, are meant to help in shaping students to face the 21st century as rounded individuals. It is the hoped that students will benefit from the learning contexts of these themes as they learn language and literature skills that will shape/guide them in becoming life-long learners who will make intelligent and wise choices.

Aspects of the Science, Technology, Engineering and Mathematics (STEM) methodology are embedded within the language programme but will not be explicitly reflected as in other disciplines which are the pillars of the methodology, such as Science, Mathematics and Technology. In Language Arts, STEM is reflected through the processes of learning and manipulating the language, such as the writing process; the communication and collaboration which help to drive processes and the responses of the Language learner to real-life issues through effective oral and written communication. It is also that aspect of creativity that enriches life's experiences and solves problems. The STEM methodology is used as the general approach to language application. It provides opportunities for learners to use their knowledge of the English Language to solve problems and function as valuable citizens.

In an attempt to achieve the objectives of true integration, the STEM methodology and foster the development of skills necessary for the 21st century learner, the Progressive Language Teaching model was used as the basis for the development of the Language programme from Grades 1-9. Progressive language teaching is task oriented, student-centred and provides opportunities for students to negotiate meaning and interact meaningfully with the language, rather than participating in activities that demand accurate repetition and memorization of sentences and grammatical patterns. It is believed that with this underpinning philosophy, learners will become more rounded users of the language and will be better able to negotiate meaning, expand their language resources, analyse how language is used, and take part in meaningful social interactions.

INTRODUCTION TO THE UNIT

The activities in this unit are based on information related to the theme “Energy and Matter” and surround the focus question, “How do I construct meaning from information about forces and machines?” Through deep engagement with texts surrounding the theme and sub-theme, students will be guided to think critically and independently as they explore the theme and seek to make connections with the content being learnt and the requisite language arts skills that will assist them in manipulating the content fully.

Students’ speaking and listening skills will be sharpened as they are guided in listening and speaking with a purpose to suit different audiences and fulfil different purposes. Emphasis will also be placed on expanding their sight vocabulary and using a variety of word structure elements and clues to manipulate and decipher unfamiliar vocabulary to arrive at both pronunciation and meaning. This will be utilised as students’ comprehension skills continue to develop and they are assisted in identifying main ideas and supporting details that will help to establish the author’s purpose as they explore and seek to comprehend texts.

As students continue to explore the unit, they will be exposed to the use of simple and complete subjects and predicates in forming different sentence types as they use the process writing approach to compose expository paragraphs on a range of topics.

Overall, this unit will generally reinforce prerequisite skills and set the foundation for the skills to be acquired for the remainder of Grade 5.

Prior Learning
Check that students:

- Can listen with a purpose
- Know grade level sight words
- Can identify some text features
- Know the purpose of the exclamation mark
- know and understand the subject and predicate of a sentence
- have been introduced to the writing process

UNIT OF WORK GRADE 5 – TERM 1 UNIT 1 – 7 WEEKS

Focus Question: "How do I construct meaning from information about forces and machines?"	
SPEAKING & LISTENING	
ATTAINMENT TARGETS	**OBJECTIVES**
• Listen to, recall, understand and respond to speakers' messages, whether implicit or explicit • Recognise, value and make distinctions between home language and SJE to improve/acquire language and literacy competencies	**Students should be able to:** • Listen to recall / recount specific information • Listen to and communicate understanding of intended messages • Translate common JC phrases to SJE • Participate in discussions and react sensitively to other speakers • Use ICT tools to research and communicate information
ICT ATTAINMENT TARGET(S):	
• ICT ATT COMMUNICATION AND COLLABORATION-use technology to communicate ideas , information and understanding for a variety of purposes • RESEARCH, CRITICAL THINKING, PROBLEM SOLVING AND DECISION MAKING students will use technology to develop a logical process for decision making and problem solving • DIGITAL CITIZENSHIP students recognize the ethical, social and legal issues and implications surrounding the use of technology	

SUGGESTED TEACHING AND LEARNING ACTIVITIES	KEY SKILLS	ASSESSMENT CRITERIA
Students will:		
View a montage comprised of pictures of machines (simple and/or complex). The first student to respond will orally identify one of the machines. The second student to respond will remember and present the named machine then, name one of his/her own. Continue this until all machines have been identified and all the students have participated. Use ICT tools to locate pictures of simple or complex machines and create a portfolio containing selected machines and a description of each machine. The portfolio can be displayed in a section of the class for all to see.	• Listen for information • Recount details • Locating online and offline data	Information on simple/complex machines accurately recounted and students engage in effective turn taking
Listen to a sound file (computer or tape recorded). Isolate, from a number of sounds one particular sound. Engage in a quick write (for one minute) to make a note of everything he/she knows about the sound. E.g. - Its description- a squeak, a clang, a bang, grinding, etc. - Its source i.e. the name of the machine producing it, where such a machine would normally be found- kitchen, garage, construction site etc. Then present information noted to the class and teacher to check for accuracy. Listen to a podcast about simple or complex machines write simple description of the machine based on the podcast	• Listen for information • Listen to understand • Present information	Presentations demonstrate active listening and provide accurate and concise information regarding the different machines identified.
Take a sample machine to school (where the real machine is not available, the students may take a model-bought or made) students will do a show and tell as well as a simple demonstration of its usage. Then respond to their classmates' questions about the presentation made. Be guided by the teacher's instructions regarding how to pay attention to details and make presentations using various graphic aids and note taking strategies. Work in groups use digital tools to create a video recording a machine in action. This video recording can be played back for the class and the different video clips discussed	• Speak to inform • Question to seek clarity • Use visual aids • Take notes	Visuals and presentations exemplify accurate and concise information about the various machines. Responses provide clarity to the listener based on information requested in the questions asked.

SUGGESTED TEACHING AND LEARNING ACTIVITIES	KEY SKILLS	ASSESSMENT CRITERIA
Students will:		
Work in two groups to write and translate common JC phrases that include information about machines, to SJE. Share responses with the class.	• Translate JC to SJE	Phrases translated from JC to SJE conveying the conventions and principles of both grammatical structures
Select common JC phrases from a mystery bag. Compete with their classmate to translate the phrase to SJE. Write selected phrases and translation on chart and mount in classroom	• Translate JC to SJE	Phrases accurately translated

READING WITH FLUENCY AND RECOGNITION (WORD RECOGNITION)	
Focus Question: "How do I construct meaning from information about forces and machines?"	
ATTAINMENT TARGETS	**OBJECTIVES**
• Use a range of word recognition clues to identify new words • Automatically recognise words (including basic sight word lists) through repeated exposure and mnemonic devices	**Students should be able to:** • Improve sight vocabulary through the use of/development of a variety of games and activities • Apply appropriate word structure clues such as prefixes, suffixes and inflectional endings to decipher meaning. • Use knowledge of letter clusters, syllables to spell unfamiliar/grade level words • Use a dictionary to verify the inferred meaning of words • Identify strategies found most helpful before, during and after reading • Use ICT tools to source new words

ICT ATTAINMENT TARGET(S):

- ICT ATT COMMUNICATION AND COLLABORATION use technology to communicate ideas , information and understanding for a variety of purposes
- RESEARCH, CRITICAL THINKING, PROBLEM SOLVING AND DECISION MAKING students will use technology to develop a logical process for decision making and problem solving
- DIGITAL CITIZENSHIP students recognize the ethical, social and legal issues and implications surrounding the use of technology

SUGGESTED TEACHING AND LEARNING ACTIVITIES	KEY SKILLS	ASSESSMENT CRITERIA
Students will:		
Examine the montage again. Identify from the pictures those machines which are named with compound words. Make a list. OR select four machines from the montage and create a table, labelling each column with the name of the machines. Write five compound words relating to each of the machines selected. Create a digital story of simple/complex machines and use compound words to describe each picture in the story	• Use Compound words • Locate information • Communicate information	List or Table completed with the names of machines and related compound words accurately represented.
Examine sight word game and listen keenly as teacher explains the steps involved in selecting sight words, creating the game and using the game for word study. Then work in groups to use knowledge and information garnered to source/create a variety of word study games to practice and study grade level sight words encountered when studying machines. Share and use games for word study.	• Study sight words • Locate information	Games meaningfully constructed and used to study grade level sight words.
Work in pairs to think about, design and create a variety of games for the purpose of sight word study. Share games with class for use.	• Study sight words	Games accurately constructed to develop targeted skill and words

SUGGESTED TEACHING AND LEARNING ACTIVITIES	KEY SKILLS	ASSESSMENT CRITERIA
Students will:		
Observe as teacher models the use of the semantic feature analysis grid and how word structure clues may be used to decipher meaning. Read texts related to machines, select unfamiliar words. Use a semantic feature analysis grid to identify the word structure clue (prefix, suffix etc.) that may be used to facilitate pronunciation and deciphering meaning. Select one example and present to classmates in small groups explaining how the particular word structure aids meaning derivation. Create an online word bank with new words (which include sight word, and compound words) and their meaning.	• Use knowledge of word structure • Locate information	Sematic Feature Analysis map correctly completed. Presentations include rationale for selecting the appropriate structural element to decipher meaning.
Work in small groups to engage in a spelling activity that provides an opportunity to utilise their knowledge of letter clusters and syllables to spell unfamiliar words relating to forces and machines. Use lines or strokes to identify the letter clusters and syllables in each word spelt	• Spell words • Use letter clusters and syllables	Words accurately spelt and letter clusters and syllables identified
Observe as teacher models using grade level text and dictionary to decipher and confirm intended meanings of targeted words related to forces and machines during and after reading. Engage in a discussion to reflect on the processes engaged in by the teacher	• Observe teacher model • Use dictionary	Discussion provides clarity on the processes engaged in by the teacher and aids students in understanding in making connection between the dictionary meaning of a word and the context based meaning
Read grade level text and decipher meanings of unfamiliar or targeted vocabulary relating to forces and machines based on context. Use a dictionary to confirm or refute the interpreted meaning of these words	• Decipher meaning • Use dictionary	Word meanings accurately deciphered. Dictionary meaning accurately interpreted to fit in the context of the reading material

SUGGESTED TEACHING AND LEARNING ACTIVITIES	KEY SKILLS	ASSESSMENT CRITERIA
Students will:		
Work collaboratively with their teacher to host a Class or Grade Word Recognition Conference to identify and explain the decoding and encoding strategies found most helpful before, during and after reading and writing about information regarding forces and machines	• Engage in reflection • Identify and explain strategies	Conference focused on students' identification of strategies employed before, during or after reading and their effectiveness

READING FOR MEANING AND ENJOYMENT (COMPREHENSION)	
Focus Question: "How do I construct meaning from information about forces and machines?"	
ATTAINMENT TARGETS	**OBJECTIVES**
• Read for meaning, fluency and enjoyment of texts, using a variety of clues to gain information and identify ideas and events • Use deduction and inference to interpret information and ideas and to predict outcomes • Read fluently and with appreciation	**Students should be able to:** • Identify authors' purpose when reading texts • Apply appropriate elements of fluency (accuracy, speed and prosody) to decipher meaning • Develop an understanding of text organization and structure to assist in comprehension (topic sentence and supporting sentences) • Identify their strengths as readers as well as areas for improvement • Use ICT tools to source information for enjoyable reading
ICT ATTAINMENT TARGET(S): • COMMUNICATION AND COLLABORATION use technology to communicate ideas , information and understanding for a variety of purposes • RESEARCH, CRITICAL THINKING, PROBLEM SOLVING AND DECISION MAKING students will use technology to develop a logical process for decision making and problem solving • DIGITAL CITIZENSHIP students recognize the ethical, social and legal issues and implications surrounding the use of technology	

SUGGESTED TEACHING AND LEARNING ACTIVITIES	KEY SKILLS	ASSESSMENT CRITERIA
Students will:		
Students will engage in a discussion focused on identifying author's purpose; finding phrases and expressions that hints at the author's purpose. Read several pieces of texts about machines provided by the teacher– stories, material from the text book, comics, etc. Identify words, phrases, expressions in the material which provide a clue of the author's purpose. E.g. material intended **to entertain** would include amusing/funny graphics, would be fiction, makes the reader laugh while material intended **to inform** would give the reader facts, would contain many diagrams and would have definitions. In order **to persuade** the author would contain facts and opinions, try to convince the reader of something, tell how the author feels about something.	• Identify author's purpose	Author's purpose and evidence correctly identified and documented.
Work in small groups to use their knowledge of the author's purpose to design posters with information about topics specified by the teacher, intended for different purposes to include inform, entertain, persuade, etc. Use ICT tools to create a comic trip to illustrate the author's purpose from a document or documents read	• Use knowledge of author's purpose	Posters include pictures, words and phrase that clearly indicate and support the specified purposes.
Work in pairs to read selected hand-out or text explaining the position and characteristics of a topic sentence. Observe and engage in a discussion as teacher demonstrates, using a projector or enlarged text, how to identify the topic/main idea sentence and corresponding supporting sentences.	• Identify main ideas and supporting details	Discussions demonstrates or evidences students' understanding of the concept
Read a passage related to machines. Underline one sentence in each paragraph that is the topic sentence/main idea sentence. Write two ideas from the paragraph to support each main idea sentence.	• Identify main ideas and supporting details	Underlined sentences reflect the topic sentences. Written sentences capture ideas that adequately support the main idea.

SUGGESTED TEACHING AND LEARNING ACTIVITIES	KEY SKILLS	ASSESSMENT CRITERIA
Students will:		
Use their journals to make at least three entries regarding their strengths as readers. Outline the strengths identified as well as the indicators of these strengths and how they have been using same in the reading process. Share and discuss entries with selected peers	• Identify strengths • Write journal entries • Engage in discussion	Journal entries and discussions focused on identify strengths identified, indicators of these strengths as well as how learners have been and or plan to capitalise on the strengths identified

READING FOR INFORMATION (RESEARCH/STUDY SKILLS)	
Focus Question: "How do I construct meaning from information about forces and machines?"	
ATTAINMENT TARGETS	**OBJECTIVES**
Research activities on issues and interests by generating ideas and exploring texts using a range of strategies Identify and use text features to support navigation of texts, retrieving and synthesise information gained from a range of sources	Students should be able to: • Use external and internal text features to locate information • Comment on the function of external and internal text features in texts • Identify important details related to research activity • Begin to assume responsibility for specific tasks in the basic research process • Use online sources to access and present information • Use ICT tools to , recreate and communicate information

ICT ATTAINMENT TARGET(S):

- COMMUNICATION AND COLLABORATION use technology to communicate ideas , information and understanding for a variety of purposes
- RESEARCH, CRITICAL THINKING, PROBLEM SOLVING AND DECISION MAKING students will use technology to develop a logical process for decision making and problem solving
- DIGITAL CITIZENSHIP students recognize the ethical, social and legal issues and implications surrounding the use of technology

SUGGESTED TEACHING AND LEARNING ACTIVITIES	KEY SKILLS	ASSESSMENT CRITERIA
Students will:		
Work in groups to read a chart (each group will focus on one feature) Pay attention to the different text features as well as their functions in texts. Find suitable examples of how the feature carries out its function in one of their content area texts. Share information in a whole class setting.	• Identify text features and their functions	Participation in group evidently meaningful. Examples identified are aligned to the targeted text feature. Explanations adequately capture the major functions of the text features and how it is used.
Conduct a mini research project on forces and machines based on guided questions issued by the teacher. Work in pairs to identify which text feature may be used to find and present the answers for each question. Use ICT tools to locate information about machines based on guiding questions provided by the teacher. Present their findings in the form of a book using a variety of text features to enhance presentation and ensure clarity. Book may be created manually or using word processing application	• Use text features	Book presented with accurate content and correct use of text features to organise and present information.
Collaborate with their teacher to identify and write simple questions that may be used to solicit answers regarding the details related to conducting research activities. Work in pairs to seek answers to these questions from their peers, parents, teachers, etc. share responses gotten with their class. Engage in a discussion to finalise a list of research related activities	• Engage in discussion • Identify research activities	Questions and activities identified are directly related to the research process. List populated exemplifies basic research related activities

SUGGESTED TEACHING AND LEARNING ACTIVITIES	KEY SKILLS	ASSESSMENT CRITERIA
Students will:		
Engage in an oral discussion focused on identifying and sharing their roles and responsibilities in simple research related activities.	• Engage in discussion • Identify roles and responsibilities	Discussion focused on establishing students' roles and responsibilities in the basic research process

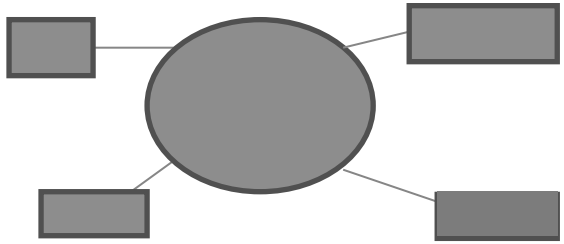
LANGUAGE STRUCTURE (GRAMMAR & CONVENTIONS)	
Focus Question: "How do I construct meaning from information about forces and machines?"	
ATTAINMENT TARGETS	**OBJECTIVES**
• Write sentences which are grammatically accurate and correctly punctuated, using SJE and JC appropriately • Use and adapt a range of sentence structures according to context, distinguishing between SJE and JC	**Students should be able to:** • Distinguish between the simple and complete subject of a sentence • Distinguish between the simple and complete predicate of a sentence • Use interjections and exclamation mark appropriately • Use appropriate transitional words in oral and written communication • Exercise tolerance as their peers attempt to use the language effectively in oral and written forms • Use ICT tools to locate and communicate sentences which contain complete subject, and predicate.
ICT ATTAINMENT TARGET(S): • COMMUNICATION AND COLLABORATION use technology to communicate ideas , information and understanding for a variety of purposes • RESEARCH, CRITICAL THINKING, PROBLEM SOLVING AND DECISION MAKING students will use technology to develop a logical process for decision making and problem solving • DIGITAL CITIZENSHIP students recognize the ethical, social and legal issues and implications surrounding the use of technology	

SUGGESTED TEACHING AND LEARNING ACTIVITIES	KEY SKILLS	ASSESSMENT CRITERIA
Students will:		
Review subject and predicate in sentences. Engage in a discussion based on a hand-out or PowerPoint presentation based on simple and complete subject and predicate. Work in pairs to complete a worksheet that will require that they identify simple and complete subjects and predicates. Use digital tools to locate sentences which contain complete subject and predicate	• identify simple and complete subjects • identify simple and complete predicates • locate and communicate information	Discussions are meaningful and focused on developing understanding of subject and predicates in sentences Worksheet with simple and complete subject and predicate completed correctly
Work in small groups to write sentences about simple and complex machines on sentence strips. Cut each sentence between its complete subject and complete predicate. Place the parts face down on a desk/shuffle the parts. Exchange seats with another group and reconstruct the sentences that their classmates have shuffled. *Share reconstructed sentences with complete subject and predicate with the rest of the class using ICT tool.*	• Use complete subject and predicate • Reconstruct sentences	Sentences depict the correct use of the complete subject and predicate to convey messages. Reconstructed sentences have the complete subject and predicate correctly placed and grouped.
Create an oral / digital story about a real or imaginary machine/force that was found in their community (exercising tolerance as their peers attempt to use the conventions of language). Go around the group asking one student to make up a complete subject and another student to finish the sentence with a complete predicate. Continue until all students have provided a sentence part or the story reaches a suitable conclusion.	• Use complete subject and predicate • Exercise tolerance	Oral story meaningfully utilises simple and complete subjects and predicates in sentences to convey varying messages
Review with teacher's guidance; the use of the exclamation mark and be introduced to interjections. Discuss examples provided by the teacher and provide examples of their own. Then do a word-hunt in newspapers and or texts from the class library to identify at least ten interjections. Share with the class and comment on the purpose of the interjection	• Identify interjections • identify the purpose of interjections	Active participation in discussion. Interjections correctly identified Use of wholesome comment on their purpose.

SUGGESTED TEACHING AND LEARNING ACTIVITIES	KEY SKILLS	ASSESSMENT CRITERIA
Students will:		
Use appropriate software where available OR traditional paper and pencil to create a comic strip entitled "Machines Rule." Draw each picture to show something unusual happening to a machine - that would/could amount to an accident e.g. a car crashing into an obstacle, etc. Each machine will "utter" / or "think" an interjection as a result of the accident. Select from a list provided by the teacher, the interjection that would match each scenario. e.g. a car being scratched by a child may utter "ouch!" Where possible, use ICT tools to share comic strips created with the rest of the class	• Use interjections and exclamation marks	Comic strips that exemplify the correct use of interjections and exclamation to achieve desired outcomes
Work in small groups to read text on transitional words or phrases that hints at cause and effect relationship in texts. Prepare a dramatization showcasing one way in which people may harm the environment. Utilise the words learnt to effectively demonstrate cause and effect relationship in the skit. Present their skits to the class (exercising tolerance as their peers attempt to use the conventions of language)	• Use transitional words • Exercise tolerance	Dramatization correctly utilises transitional words that aid in understanding cause and effect relationship

COMMUNICATION (WRITING)	
Focus Question: "How do I construct meaning from information about forces and machines?"	
ATTAINMENT TARGETS	**OBJECTIVES**
• Develop approaches to the writing process to enable them to organise their ideas into a coherent structure including, layout, sections and paragraphs • Write well-constructed paragraphs which have linking sentences within and between them	**Students should be able to:** • Identify and use onomatopoeia for impact • Use knowledge of the writing process to prepare drafts • Compose simple expository pieces • Identify and discuss their strengths and weaknesses as writers • Locate and organise information to create well-constructed paragraphs
ICT ATTAINMENT TARGET(S): • COMMUNICATION AND COLLABORATION use technology to communicate ideas , information and understanding for a variety of purposes • RESEARCH, CRITICAL THINKING, PROBLEM SOLVING AND DECISION MAKING students will use technology to develop a logical process for decision making and problem solving • DIGITAL CITIZENSHIP students recognize the ethical, social and legal issues and implications surrounding the use of technology	

SUGGESTED TEACHING AND LEARNING ACTIVITIES	KEY SKILLS	ASSESSMENT CRITERIA
Students will:		
Examine comics provided by the teacher and engage in a discussion designed to identify instances of the use of onomatopoeia. Discuss onomatopoeic words which relate to machines e.g. ***boom, puff, crash etc.***  Create a podcast using onomatopoeic words to describe a comic strip or picture provided by the teacher	• Identify onomatopoeic words and expressions	Onomatopoeic words related to machines are correctly identified
Create a list of onomatopoeic words that are related to machines (this will be developed from the discussion and sharing in the above activity). Select a machine or topic related to forces and machines and use at least ten of the words from their list to compose a poem or story.	• Use onomatopoeic words and expressions	Story/poem that meaningfully utilises onomatopoeic words and or expressions

SUGGESTED TEACHING AND LEARNING ACTIVITIES	KEY SKILLS	ASSESSMENT CRITERIA
Students will:		
Use the name of a category of simple machines to brainstorm ideas for writing about it e.g. L: Light bulbs E: engines V: vehicles E : energy R: reverse Select one idea to write about. E.g. Light Bulbs conduct a mini research on the idea (using their in class content text, the library or internet sources) Then use a web to organize the information they will write about e.g. 	• Use writing process	Information researched is accurate and related to the focus topic. Completed web that demonstrates good organisation of the information to be written in paragraphs
Use the information from the web to create two draft paragraphs ensuring that each has a main idea/topic sentence and supporting sentences Discuss teacher provided topic (machines) on a class blog. The discussion should contain onomatopoeic words that are related to machines	• Compose expository pieces	Paragraphs contain clear topic and supporting sentences that meaningfully demonstrates connection with the information organised in the web Blog discussions that contain clear topic and supporting sentences that meaningfully demonstrates connection with the information organised in the web

SUGGESTED TEACHING AND LEARNING ACTIVITIES	KEY SKILLS	ASSESSMENT CRITERIA
Students will:		
Engage in journal writing to capture their strengths and weaknesses as writers. Share their entries with the class citing relevant pieces of writing to support their claims	• Engage in reflective writing • Engage in discussion	Journal entries capture students' personal thoughts on their development as writers; identifying both their strengths and weaknesses
Create a digital story/movie OR a physical story board with pictures and narration depicting their growth and development as writers.	• Engage in reflection	Digital story/story board presents pictures, narration and samples of written work to support students' claims

Learning Outcomes:

- ✓ Apply a wide range of skills to the reading process
- ✓ Use a range of skills to decode unfamiliar words
- ✓ Use knowledge of simple and complete subjects alongside the writing process to develop expository paragraphs that are engaging
- ✓ Use knowledge of text features to manipulate and develop texts for research and presentation purposes
- ✓ Identify main ideas, supporting details and authors' purpose in an attempt to comprehend texts

Points to Note	Extended Learning
• The teacher is required to model the strategies for students and to scaffold them in their efforts**.** • Where students are asked to do independent research and make presentation, the teacher should scaffold the process and actively check for accuracy and appropriateness in content	**Encourage students to :** • Using a word processing programme such as Microsoft word, develop a study sheet for students in a lower grade, listing the three types of compound words – **Closed** e.g. keyboard, **Hyphenated** e.g. over-the -counter and **Open** e.g. post office. Use it to assist students in a lower grade or siblings with homework on compound words. • Conduct a mini research on a machine of their choice. Use different text features to present the information to a group of classmates or friends

Resources	**Key vocabulary**
• passages from grade level reader(s)which make reference to machines • content area text(s) • graphic organizers • sentence strips • photographs of machines • comic strips with examples of onomatopoeia • computers and related technology • word lists • poem employing onomatopoeia • post- it notes	• author's purpose • onomatopoeia • simple machines • complex machines • montage • text features • simple and complete subjects • simple and complete predicates • compound words • interjections • exclamation
Links to Other Subjects: • Information Technology – Using the Internet and Word processing applications • Science – Studying forces and machines	

UNITS OF WORK GRADE 5 TERM 1 UNIT 2

Unit Introduction

The activities in this unit are based on the theme "Diversity, Sustainability and Interdependence" and surround the focus question" How do I glean meaning from information about the ways in which people interact with the environment?" The sub-theme is "Habitats." This unit is designed to increase students' ability to understand and respond to a variety of literature for different purposes.

As students continue to develop their language skills, this unit provides an opportunity for them to demonstrate increasing competence in speaking and listening. They will begin to make oral presentations that are targeted and focused based on topics related to interacting with the environment. Students will be introduced to more complex grade level words and as such will be guided in using word structure and context clues to decode unfamiliar vocabulary. This will prove crucial as students read and analyse more complex materials and expand their understanding of literature. This will be done as they pay close attention to text structure focussing specifically on cause and effect relationships.

As the unit seeks to improve students' writing and comprehension skills, they will be exposed to the use of direct speech and transitional words as they read and write texts that are increasingly challenging. The unit will continue exploring text features and guide students in preparing written drafts as they conduct mini-research and explore a variety of texts.

Generally, this unit seeks to continue developing students' skills and knowledge in all Language Arts strand through exposure to more complex use of skills and exploration of more challenging materials as they strive to become independent learners.

Prior Learning

Check that students:

- Can listen with a purpose
- Know grade level sight words
- Can identify some text features
- Know punctuation marks and their uses
- have been introduced to the writing process
- have been introduced to text structures
- know story elements
- understand tenses

Focus Question: "How do I glean meaning from information about the ways in which people interact with the environment?"	
SPEAKING AND LISTENING	
ATTAINMENT TARGETS	**OBJECTIVES**
• Listen to, recall, understand and respond to speakers' messages, whether implicit or explicit • Recognise, value and make distinctions between home language and SJE to improve/acquire language and literacy competencies	**Students should be able to:** • Listen to recall/recount specific information • Prepare and deliver narrative presentations that establish point of view and relate events in an effective sequence • Translate common JC phrases to SJE • Selectively use JC or SJE depending on audience and context • Actively participates in discussion and react sensitively to other speakers • Use ICT tools to research and communicate information

ICT ATTAINMENT TARGET(S):

DESIGNING & PRODUCING- students use technology to design multimedia products to demonstrate their critical thinking.

SUGGESTED TEACHING AND LEARNING ACTIVITIES	KEY SKILLS	ASSESSMENT CRITERIA
Students will:		
Make or find recordings captured at a park, church, school or any community activity where persons are interacting with the environment. Share recordings with their classmates. Orally recount the main ideas from the recordings shared.	• Listen to recall/recount details	Oral presentations present specific information from the audio shared.
Stand in a circle and respond to the questions from a story shared orally by their classmate.	• Listen to recount details	Responses to questions asked accurately aligned to the story listened to
Watch a video/movie clipping or view pictures of children and adults in a park setting. Then work in small groups to prepare a presentation based on guided questions provided by the teacher. E.g. What is your understanding of how the people are relating to their environment? In what sequence did the events occur? Make presentations to the class	• Make presentations	Presentations establish personal point of view and presents events in a sequential manner
Work in groups to do a nature walk around the school yard or community. Use reporting template provided by the teacher to present an oral report of the activities seen as they observe how different people operate in a given space. Listen to each other's presentation and ask appropriate questions and provide meaningful comments	• Present oral reports • Listen for details	Authentic oral reports engage the audience and provide appropriate details and accurate information
Listen to recordings captured and extract common JC phrases. Work in pairs to analyse phrases and translate them to SJE. Prepare a T chart showing the phrases in JC and the translated form in SJE	• Listen for information • Translate phrases	Chart depicts JC phrases extracted from recording as well as the translated version in SJE.

SUGGESTED TEACHING AND LEARNING ACTIVITIES	KEY SKILLS	ASSESSMENT CRITERIA
Students will:		
Work in pairs to visit different areas of the school at different times (break, lunch, after school) and listen and speak to their classmates. Make notes to capture appropriate or inappropriate ways in which both JC and SJE was used. Engage in a discussion to rationalise for the decisions taken.	• Use JC and SJE • Engage in discussion	Notes reflect both appropriate and inappropriate usage of the JC and SJE in oral conversation

READING WITH FLUENCY AND RECOGNITION (WORD RECOGNITION)	
ATTAINMENT TARGETS	**OBJECTIVES**
• Use a range of word recognition clues to identify new words • Automatically recognise words (including basic sight word lists) through repeated exposure and mnemonic devices • Build vocabulary using arrange of strategies	**Students should be able to:** • Use knowledge of words, roots, derivations and spelling patterns to read and understand unknown words • Use knowledge of letter clusters, syllables to spell unfamiliar/grade level words • Use a dictionary to verify the inferred meaning of words • Identify strategies found most useful before, during and after reading
ICT ATTAINMENT TARGET(S): 💻 DESIGNING & PRODUCING students use technology to design multimedia products to demonstrate their critical thinking.	

SUGGESTED TEACHING AND LEARNING ACTIVITIES Students will:	KEY SKILLS	ASSESSMENT CRITERIA
Observe while the teacher demonstrates a Think Aloud session demonstrating how they may use word structure to construct the meaning of words in context. Then work with a partner to engage in a similar Think Aloud session in order to decode unknown words in a text from the class library. Use digital tools to record a think aloud session with another person and playback this session for the class	• Use word structure cues • Use context clues	Think aloud activity demonstrates the use of structural clues to decode and construct meaning. Think Aloud demonstration meaningfully utilises knowledge of word structure to decipher meaning
Peruse and discuss a hand-out containing spelling patterns and roots to be studied. Use a table and engage in a word hunt activity to find words that fit each pattern and root and place under the appropriate column. Then work in pairs to create a puzzle OR use online tools to create a cross word or find a word puzzle relating to habitats to practice decoding. Students can ask their peers to complete puzzles. Use ICT tools to locate and share puzzles so as to create a reference point for creating their own	• Identify spelling and root patterns • Use spelling and root pattern	Discussion focused on analysing the information shared in the hand out. Table completed with words exemplifying targeted spelling and root patterns Puzzles require students to apply knowledge of spelling and root patterns in order to aid pronunciation and decipher meaning.
Engage in walking a "word maze" created by the teacher reflecting the theme – habitats – and containing words frequently used at the Grade 5 level. Be required to accurately apply knowledge of word roots, spelling patterns	• Use word structure	Maze completed accurately and efficiently using word structure cues to aid pronunciation and meaning

and word structure cues in order to complete maze successfully		
Participate in a game of "Dictionary in hand" where they will have their dictionary in hand and compete to find the meanings of unfamiliar and familiar vocabulary extracted from texts students have read. Share meaning and explain understanding of the word; citing sentences where possible to depict meaning and usage of words in contexts.	• Use dictionary	Words located within specified time. Meaning and explanation shared provides clarity and helps other students to understand the meaning of the words. Sentences shared depict accurate use of the words in context.

READING FOR MEANING AND ENJOYMENT (COMPREHENSION)

ATTAINMENT TARGETS	**OBJECTIVES**
▪ Read for meaning, fluency and enjoyment of texts, using a variety of clues to gain information and identify ideas and events ▪ Use deduction and inference to interpret information and ideas and to predict outcomes	Students should be able to: • Identify author's purpose when reading texts • Develop an understanding of text organisation and structure to assist in comprehension • Extend and expand comprehension by relating the text to other texts, experiences, and events • Demonstrate awareness of varying interpretations of the same text • Use ICT tools to source information for enjoyable reading

ICT ATTAINMENT TARGET(S):

💻 DESIGNING & PRODUCING students use technology to design multimedia products to demonstrate their critical thinking.

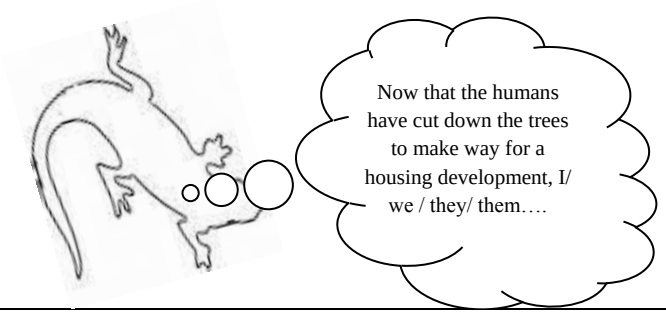
SUGGESTED TEACHING AND LEARNING ACTIVITIES **Students will:**	**KEY SKILLS**	**ASSESSMENT CRITERIA**

Observe as teacher models text comparison using Venn diagram and other graphic organisers through whole class discussion and engagement. Pay keen attention to how ideas and events in one text are compared and contrasted with those in another text.	• Relate texts to other texts	Discussions are vibrant and engaging. Students' level of participation exemplify meaningful knowledge construction and understanding of how the graphic organiser is used to compare ideas in texts
Collaborate with teacher to compile a text set from the class/school library etc. related to "people and the environment". Select and read two or more texts from the set. Compare the experiences and events in one text with that in another to identify similarities and differences. Present their work to the class for critique and discussion (demonstrate appreciation for the interpretations presented by their peers)	• Compare and contrast ideas	Presentations that demonstrates evidence of comparison and contrast between and among texts
Work in small groups to review and add to a list of transitional words that hint at cause and effect relationship. Prepare chart with words and examples of sentences/paragraphs that utilises the transitional words.	• Identify transitional words • Use transitional words	Chart showing an accurate list of transitional words that prompts cause and effect relationship as well as sample sentences and paragraphs that depicts accurate use of the words.
Work in small groups to read text on transitional words or phrases that hints at cause and effect relationship in texts. Prepare a dramatization showcasing one way in which people may harm the environment. Utilise the words learnt to effectively demonstrate cause and effect relationship in the skit. Present their skits to the class.	• Use transitional words	Dramatization correctly utilises transitional words that aid in understanding cause and effect relationship
Analyse pictures depicting different species of living things interacting with the environment. Work in small groups to infer cause and effect relationship. Complete a "cause and effect" graphic organizer by cutting portions of the pictures that represents the causes and the effects and paste them under the appropriate columns.	• infer cause and effect relationship	Graphic organiser accurately completed. With pictures appropriately matched with cause and effects.

READING FOR INFORMATION (RESEARCH/STUDY SKILLS)		
ATTAINMENT TARGETS	**OBJECTIVES**	
▪ research activities on issues and interests by generating ideas and exploring texts using a range of strategies • identify and use text features to support navigation of texts, retrieving and synthesise information gained from a range of sources	Students should be able to: • Use information from illustrations, tables of contents, glossaries, indexes, headings, graphs, charts, diagrams, and/or tables to assist in comprehension of text. • Show greater responsibility for specific tasks in the basic research process • Express appreciation for the contribution of their peers during collaborative activities • Use online sources to access and present information	
ICT ATTAINMENT TARGET(S): DESIGNING & PRODUCING students use technology to design multimedia products to demonstrate their critical thinking.		
SUGGESTED TEACHING AND LEARNING ACTIVITIES STUDENTS WILL:	**KEY SKILLS**	**ASSESSMENT CRITERIA**
Watch a video clip summarising text features and their purposes / functions. Engage in a discussion focused on the features highlighted. Use think clouds to explain how they could effectively use the features discussed in carrying out a research / preparing a research project.	• review text features • comment on text features • express appreciation	Discussions provide opportunities for students to demonstrate their understanding / misunderstandings of the text features based on what is shared in the video. Explanations present students' intent to use the text features as they do research
Use a variety of text features (table of contents, glossaries etc.) to locate information from a variety of sources to research information about habitats in different conditions	• Use text features	Presentations should give evidence of detailed and accurate research that employs a variety of sources

and for different creatures. Use finger puppets to be the "fly on the wall" and provide audiences with the information researched. This activity can be recorded and played back in class for discussion and enrichment.		
Use text editing software to create a T – chart. Examine text related to habitats to identify text-features used by the authors. Write down, in the left-hand column, features noticed and, in the right-hand column, how they are used and how you think they can help them learn. Save file in a folder for retrieval later.	• Comment on text feature	T-Charts completed with accuracy, outlining text features and related usage. T-Charts should demonstrate students' metacognition.
Work collaboratively with their classmates to engage in a reflective discussion to discuss the basic research process engaged in. Demonstrate tolerance for the ideas and interpretations of others.	• Engage in reflective discussion	Discussion highlights students' involvement in the basic research process and highlights their strengths and weaknesses as young researchers

LANGUAGE STRUCTURE (GRAMMAR & CONVENTIONS)		
ATTAINMENT TARGETS	**OBJECTIVES**	
• Write sentences which are grammatically accurate and correctly punctuated, using SJE and JC appropriately • Use and adapt a range of sentence structures according to context, distinguishing between SJE and JC	Students should be able to: • Convert statements into direct speech • Use appropriately, capital letters, question marks and quotation marks • Use correctly verb tenses and agreement rules • Use the most appropriate noun phrase to complete sentences • Use adverbs correctly to modify simple sentences • Use transitional words and phrases to effectively convey ideas • Exercise tolerance as their peers attempt to use the language effectively in oral and written forms	
ICT ATTAINMENT TARGET(S): DESIGNING & PRODUCING students use technology to design multimedia products to demonstrate their critical thinking.		
SUGGESTED TEACHING AND LEARNING ACTIVITIES STUDENTS WILL:	**KEY SKILLS**	**ASSESSMENT CRITERIA**
Participate in a demonstration and discussion related to direct speech and how it is represented in writing (exercise tolerance in language usage) . Work collaboratively with their teacher to peruse various texts and identify examples of direct speech and comment on how it is represented.	• Identify direct speech	Discussion and engagement in the activity provides an opportunity for students to develop understanding of direct speech and how it is used. Examples identified in texts are accurate

Work in pairs to engage in a game of "Speech Conversion" where one students will make a statement and the other will visually present it as a direct speech. Share with the class for verification and discussion	• Convert statements	Direct speeches accurately captured and maintain original / intended meaning
Use text editing or graphic software to insert pictures of creatures such as lizard, mouse, bird, human etc. or draw/download outlines of creatures and use speech bubbles to capture their thoughts. Pretend to be the person/animal or plant and write then present their "thoughts" about a catastrophic event impacting the habitat – assume what they think would be the speaking voice of the "creature". This activity can be recorded and played back in class for discussion and enrichment.  	• Use direct speech • Use punctuation marks • Insert text • Do video / voice recording	Dialogue depicts correct use of open and closed quotation marks for setting off direct speech by using the information from the speech bubbles Accuracy in inserting colons, capital letters, question marks and quotation marks where necessary
Review the use of capital letter, question and quotation marks to represent direct speech.	• Review capital letters and punctuation marks	Revision demonstrates accuracy in students' knowledge of capital letters and questions and quotation marks
Read (text editing software may be used) text, related to caring for the environment, in which direct speech is incorrectly represented. Rewrite text to show correct use of speech marks (question and quotation marks) and capital letters	• Use punctuation marks • Insert text	Text rewritten with punctuation marks accurately used to indicate direct speech

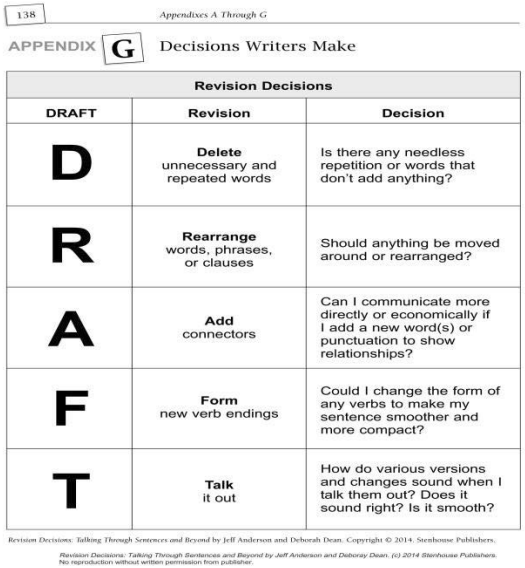
Work in small groups to conduct research online or offline on three to five subject verb agreement rules. Prepare a concept chart with the rules research as well as examples of correct and incorrect use of the rules.	• Identify subject verb agreement rules	Concept charts include 3-5 rules that are accurately stated with correct examples referenced
Complete cloze passage focused on reinforcing knowledge of verb tenses and subject verb agreement.	• Use subject verb agreement	Cloze passages completed with correct subject-verb agreement
Work in small groups to analyse a variety of text (newspaper articles, texts, peer work etc.) to examine the use of capital letters and punctuation marks. Share responses with the class and engage in discussion	• Use punctuation marks • Engage in discussion	Discussion facilitates students interpretation and analysis of the document examined and the use of the punctuation marks
Engage in a discussion focused on explaining the use of adverbs to enhance sentences and the position in which adverbs can be placed. Discuss examples of the use of a particular adverb in different positions. E.g. *I feed my dog **daily**.* ***Daily** I feed my dog.* *I **daily** feed my dog.* *I have **daily** fed my dog.*	• Engage in discussion • Identify position of adverbs	Discussion focused on developing understanding of how and when adverbs can be used in a variety of position based on the context of the sentence.
Complete a worksheet that requires that they extract sentences with adverbs from a variety of texts. Rewrite those sentences so that the adverb is reflected in a different position.	• Modify sentences • Use adverbs	Rewritten pieces display correct placement of adverbs in different position among sentences that communicate a similar idea.

Collaborate with their teacher to review a list of nouns and noun phrases and the meaning they communicate. Identify the noun in each phrase.	• Identify nouns • Identify noun phrases	Discussion helps students to develop an understanding of noun phrases and how they are used as well as provide opportunities for them to ask and answer questions to clarify their understanding
Select from a list the correct noun phrase to complete sentences. Discuss the reason for their responses	• Use noun phrases • Engage in discussion	Sentences completed using the correct noun phrase that maintains meaning and context
Review cause and effect transitional words and write a script to reflect a dramatization showcasing the topic "Taking care of the Environment" select a problem and ensure that both the causes and effects are depicted in the script. Dialogue may be used. (scripts can be written using a word processor)	• Use transitional words in writing	Written scripts exemplify the correct use of transitional words to depict cause and effect relationship as well as sound grammar and appropriate representation of direct speech

COMMUNICATION (WRITING)

ATTAINMENT TARGETS	**OBJECTIVES**
• Develop approaches to the writing process to enable them to organise their ideas into a coherent structure including, layout, sections and paragraphs • Write well-constructed paragraphs which have linking sentences within and between them	Students should be able to: • Sort and classify ideas for writing in a variety of ways • Develop several linked paragraphs using a variety of strategies and organisational patterns • Produce revised drafts based on content, organisation, style and use of conventions • Identify and order main ideas and supporting details • Write longer and more complex texts using a number of forms • Identify and discuss their strengths and weaknesses as writers • Identify and interpret similes and metaphors • Use ICT tools to locate information to create well constructed paragraphs

ICT ATTAINMENT TARGET(S): DESIGNING & PRODUCING students use technology to design multimedia products to demonstrate their critical thinking.		
SUGGESTED TEACHING AND LEARNING ACTIVITIES **Students will:**	**KEY SKILLS**	**ASSESSMENT CRITERIA**
Collaborate with teacher to discuss items that may be written on an editing checklist. Then review sample checklists provided by the teacher (checklists may be sourced online). Work collaboratively to develop an editing checklist for their class/grade online or offline	• Compose editing checklist	Checklist completed accurately and covers all areas of writing to be revised: content, organisation, language usage etc. checklist may be placed on class/school website/blog
Use editing checklist developed to revise each other's written work and make simple comments where necessary. Use the checklist as well as written feedback to compose revised drafts.	• Revise written work • compose revised drafts	Revised drafts showcase evidence of correction based on feedback given
Use herringbone strategy to identify elements of a story about the environment, that has been read to them or one they read. Use the information in the herringbone as a guide generate and organise new ideas, then create their own story.	• use story elements • Generate and organise ideas • Compose short story	Completed herringbone represents story read or heard Story composed with new ideas; accurately represents all elements and are appropriately organised and grammatically sound
View PowerPoint presentation on Similes and metaphors. Engage in discussion to review the meanings and examples. Then supply known examples and explain the comparison being made.	• Explain similes and metaphors	Discussion focused on developing understanding of similes and metaphors and relevant examples. Explanation accurately outlines the comparisons being made in each example.

Complete worksheet with similes and metaphors (include comparison of things related to the environment. Say whether the comparison is a metaphor or simile and identify the elements being compared and the interpretation of the comparison	• Identify similes and metaphors • Interpret similes and metaphors	Worksheet completed with similes and metaphors accurately identified and interpreted
Use DRAFT strategy poster to revise drafts. See below 	• Revise drafts	Second drafts evidently revised using the guidelines in the DRAFT strategy posters.
Continue to journal and reflect on their own strengths and weaknesses as writers	• Journaling • Engage in reflective discussion	Journal entries reflect the students' personal understanding and reflections on their own growth and development as writers
Use guided questions/headings provided by the teacher to make journal or class blog entries reflecting on themselves as writers and reviewers.	• Write to reflect	Written reflections demonstrate metacognition as well as correct understanding of their roles as writers and reviewers and how they are learning from the process

138 *Appendixes A Through G*

APPENDIX **G** Decisions Writers Make

Revision Decisions

DRAFT	Revision	Decision
D	**Delete** unnecessary and repeated words	Is there any needless repetition or words that don't add anything?
R	**Rearrange** words, phrases, or clauses	Should anything be moved around or rearranged?
A	**Add** connectors	Can I communicate more directly or economically if I add a new word(s) or punctuation to show relationships?
F	**Form** new verb endings	Could I change the form of any verbs to make my sentence smoother and more compact?
T	**Talk** it out	How do various versions and changes sound when I talk them out? Does it sound right? Is it smooth?

Learning Outcomes:

- ✓ Apply a wide range of skills to the reading process
- ✓ Use a range of skills to decode unfamiliar words
- ✓ Use knowledge of direct speech to prepare dialogues and add creativity and vibrancy to stories and other forms of writing
- ✓ Use knowledge of text features to manipulate and develop texts for research and presentation purposes
- ✓ Demonstrate an understanding of cause and effect relationship in texts.
- ✓ Use transitional words and direct speech to write for a variety of purposes

Points to Note:	**Extended Learning:**
• Students need a good experiential background if they are to develop as good writers and speakers. Teachers must ensure that students gain experiences- real and vicarious through fieldtrips, pictures, educational videos and movies • Texts may be sourced online or from students' texts or any other authentic available text. • In some instances texts may have to be physical composed or created by the teacher to suit a particular topic/skill to be taught/reinforced • Writing/ word journals may also be established and maintained online	• Create an annotated list of books about habitats that they think their classmates will enjoy. • Create dioramas of the 7 habitats with descriptive text about each – Grasslands, Temperate Forests, Tropical Rain Forests, Deserts, Oceans, Wetlands, Polar Regions • Create a written plan or labelled diagram for the construction a model of a local /regional habitat. Ensure that the model is realistic, including representative populations and the components necessary for the populations to live. • Start an environment club in their class or school
Resources:	**Key Vocabulary:**
• Graphic organizers - Photographs showing desert, grassland, forest and rainforest habitats from around the world • Outlines of various plants and animals existing in the various habitats • Pictures of various plants and animals • Video/movie clippings • Reporting templates • Think aloud clouds • Teacher-prepared hand-outs and texts • Cross word puzzles	Habitat Inhabitants Environment Word structure Context clues Cause and effect Text structure Transitional words Text features Direct speech Editing checklists

• Computers and related technology • Desktop publishing software • Text editing software • Graphic software • Internet • Recording device	Blog Text editing software
Links to other Subjects: Science – looking at living things and their habitats, caring for the environment Social Studies – Pollution and how it affects the environment Information Technology – Using and manipulating the internet	

UNITS OF WORK GRADE 5 TERM 2 - UNIT 1

Unit Introduction:

This unit seeks to build on the skills taught in Term 1 via the theme 'Health and Well-Being and the sub-theme 'Nutrition' It facilitates the development of active and appropriate listening skills through discussion of current events and national issues. It also attempts to develop reading fluency through application of grade appropriate word recognition strategies of sight words, and structural elements such as inflectional endings and affixes. Students are given the opportunity to reinforce and extend their knowledge of identifying main ideas, summarizing information and making inferences. They are also able to conduct basic knowledge search/research by effectively utilizing parts of books and a range of sources, including online sources. Students are also given the opportunity to practise the use of persuasive techniques and to compose creative pieces such as theatre scripts. In this unit, they also continue to practise the use of stages of the writing process in an attempt to produce well-written pieces.

Most of the activities give students an opportunity to practise specific language skills. However in some cases the teacher may need to explicitly teach rules, structures and strategies prior to these activities. The content outline for grade 4 must therefore be consulted for details on the scope of content/skills to be delivered.

Prior Learning

Check that students:

- Know and can use basic communication skills
- Know sight words appropriate to the grade level
- Are able to identify and use structural analysis skills to aid word recognition
- Know basic skills of comprehension – recalling and recognizing ideas, inferring details etc.
- Know how to use major parts of a book and text features to aid research or the location of information
- Understand the basic steps in the writing process

UNIT OF WORK – GRADE 5 – TERM 2 UNIT 1 – 7 WEEKS

<table>
<tr><td colspan="3">Focus Question: How do I effectively communicate my understanding about matters related to nutrition?</td></tr>
<tr><td colspan="3">SPEAKING AND LISTENING</td></tr>
<tr><td>ATTAINMENT TARGETS</td><td colspan="2">OBJECTIVES</td></tr>
<tr><td>▪ Communicate with confidence and competence for different purposes and audiences, using SJE and JC appropriately and creatively</td><td colspan="2">Students should be able to:
• Listen to extract details and provide feedback while observing and adhering to communication protocols
• Assess the use of JC/SJE for various purposes/situations and discuss attitudes towards its use in the society.
• Prepare and present talks and oral reports to engage and inform audience
• Demonstrate respect for the opinion of others during discussions and other collaborative activities</td></tr>
<tr><td colspan="3">ICT ATTAINMENT TARGET(S):
▪ COMMUNICATION AND COLLABORATION - Use technology to communicate ideas, information and understandings for a variety of purposes.
RESEARCH, CRITICAL THINKING, PROBLEM SOLVING AND DECISION MAKING – use technology to develop a logical process for decision making and problem solving.</td></tr>
<tr><td>SUGGESTED TEACHING AND LEARNING ACTIVITIES
Students will:</td><td>KEY SKILLS</td><td>ASSESSMENT CRITERIA</td></tr>
<tr><td>Do a vox pop in which a student plays the role of host and asks his/her classmates to share their views on whether or not the meals served at the canteen are balanced. They will indicate reasons for their answers. Students should select and use language forms appropriately or code switch; listen to provide logical responses and must speak fluently and confidently. This activity can be recorded and later played back in class for discussion and enrichment.</td><td>• use language forms
• Listen for details
• Speak fluently and confidently</td><td>Discussions focused on students' ability to assume roles, select and use language forms appropriately, and listen to provide logical responses and speak fluently</td></tr>
<tr><td></td><td></td><td>Panel discussion/debate exemplifies accurate use of both JC/SJE to respond to questions asked as well as</td></tr>
</table>

Have a panel discussion/debate on healthy food choices. Respond to questions asked and comment on points raised during the discussion, to indicate whether or not they are in agreement with what was said or if they want to expound on a point raised. Adhere to the communication protocol as they participate in this activity – waiting turns, respectfully share their opinions, ask properly- phrased clarifying and/or probing questions, extend ideas	• Share opinions • Extract details • Wait turns in conversation • Ask questions • Extend ideas	demonstrates students' observation of communication protocols
Using all the senses, work in pairs to describe using all the senses, their favourite dish/fruit without saying what it is. Say what appeals to them about the dish/fruit. Guess what dish/fruit it is - the roles of describing/guessing will then be reversed. Use the Five Senses Chart to guide the activity (Chart has each of the five senses in separate columns and guiding questions under each.	• Give descriptions • Present information • Use SJE	Descriptive clues are vivid and employ the correct use of SJE to communicate ideas.
Work in three groups. Group 1 will visit a restaurant in their community, group 2 will visit the vending area/canteen at the school and group 3 will visit a fast food restaurant. Each group will do a 2 minutes recording highlighting language usage at their designated site. In class, the recordings will be played while students listen to comment on the use and appropriateness of the language employed. Engage in a teacher led discussion focused on establishing society's attitude towards the use of JC.	• assess the use of JC and SJE • Give comments	Recordings highlight the use of JC in various settings. Discussions focused on society's attitude towards the use of JC as well as the appropriateness of its use in different contexts.
READING WITH FLUENCY & RECOGNITION (WORD RECOGNITION &VOCABULARY DEVELOPMENT)		
Focus Question: How do I effectively communicate my understanding about matters related to nutrition?		

ATTAINMENT TARGETS	OBJECTIVES
• Use a range of word recognition clues to identify new words • Automatically recognise words (including basic sight word lists) through repeated exposure and mnemonic devices	Students should be able to: • Identify and use sight words appropriate to grade level • Recognise how common prefixes and suffixes change a word's meaning • Use mnemonics to remember spelling of tricky words that do not follow the spelling rules • Find known clusters, syllables and smaller words in bigger words for the purposes of encoding and decoding • Identify strategies found most helpful before, during and after reading
ICT ATTAINMENT TARGET(S): • **COMMUNICATION AND COLLABORATION - Use technology to communicate ideas, information and understandings for a variety of purposes.** **RESEARCH, CRITICAL THINKING, PROBLEM SOLVING AND DECISION MAKING – use technology to develop a logical process for decision making and problem solving.**	

SUGGESTED TEACHING AND LEARNING ACTIVITIES STUDENTS WILL:	KEY SKILLS	ASSESSMENT CRITERIA
Create a sight word box with words related to the unit theme and drawn from grade appropriate texts; for example, *healthy, nutritious, nourish, calorie, favourite, delicious, delectable, appealing, cholesterol, sodium, carbohydrates,* etc. Use knowledge of these words in a variety of sight word games (e.g. wordo, snake and ladder, hopscotch) use knowledge of these words in completing cloze passages and to enable reading fluency.	• Identify sight words • Use sight words	Sight word box contains grade level appropriate words that are related to the theme. Cloze passages completed with accuracy and read with fluency.
Students listen to recordings/audio clips of syllabication rules being applied to words. In pairs, discuss rules learnt and apply knowledge to decoding multisyllabic words through read aloud and dictation activities.	• Examine syllabication rules and examples • apply rules of syllabication	Read aloud and dictation activities that exemplifies accurate application of the rules of syllabication

<table>
<tr>
<td>Read aloud grade level texts or other materials related to food and use syllabication rules to assist in the accurate pronunciation of unfamiliar words. Request teacher support in the form of modelling pronunciation where challenges exist or use online dictionary word pronunciation feature.</td>
<td>• Apply syllabication rules</td>
<td>Accurately apply syllabication rules, while reading</td>
</tr>
<tr>
<td>Engage in a discussion focused on explaining what affixes are and the two types – prefix and suffix. Work in two groups to conduct research on prefixes and suffixes. Each group will take to class a chart with a number of prefixes and suffixes and their meanings. Identify words that exemplify the use of the prefixes and suffixes. Mount charts in class for further study and reinforcement

Play card games such as Go Fish or Memory with cards that contain affixes. Match the prefix or suffix with its meaning or the prefix or suffix with the appropriate root.</td>
<td>• Identify affixes and their meanings
• Match affixes with the correct meaning
• Use affixes to extend vocabulary</td>
<td>Charts completed with prefixes and suffixes identified with their correct meanings and examples.

Prefix and suffix accurately matched with appropriate root words.</td>
</tr>
<tr>
<td>Select 12-15 words related to nutrition from students' text or any other text. In parentheses write the page or paragraph # where the word is located. Work in groups to examine the sentence or paragraph in which the word is used and write down a working definition based on the context. Each group will then share their definition with the whole class. The other groups will say if they agree or disagree with the definition. Groups that disagree can provide their own definition.
<table>
<tr><th>Words</th><th>Sentence/Paragraph</th><th>Definition</th></tr>
<tr><td>balanced</td><td></td><td></td></tr>
<tr><td>healthy</td><td></td><td></td></tr>
</table>
Chart can then be mounted in classroom for reference</td>
<td>• Identify and use context clues</td>
<td>Chart accurately completed to show students' understanding of how to use context clues to derive meaning.</td>
</tr>
</table>

Use rhymes and catch phrases or compose jingles to help them remember how to spell difficult words e.g. • **RECEIPT-** I before E, except after C. this does not apply to "weird" as it is just weird. • **COMMITTEE -** Double *m, t* and *e* • **COUNCIL** – 'cou' as in count,'cil' as in pencil	• Use mnemonics to spell	Mnemonics used provide accurate and useful help in spelling difficult words
READING FOR MEANING AND ENJOYMENT (COMPREHENSION)		
Focus Question: How do I effectively communicate my understanding about matters related to nutrition?		
ATTAINMENT TARGETS	**OBJECTIVES**	
▪ Read for meaning, fluency and enjoyment of texts, using a variety of clues to gain information and identify ideas and events ▪ Read fluently and with appreciation ▪ Use deduction and inference to interpret information and ideas and to predict outcomes	Students should be able to: • Use stated and implied ideas in texts to make inferences and construct meaning • Summarize important ideas and cite supporting details • Read grade level texts with expression and confidence, adjusting reading strategies and reading rate to match the form and purpose • Extend texts by relating them to ideas, events, situations and/or opinions • Identify their strengths as readers as well as areas for improvement	
ICT Attainment target(s): COMMUNICATION AND COLLABORATION – Use technology to communicate ideas, information and understandings for a variety of purposes. RESEARCH, CRITICAL THINKING, PROBLEM SOLVING AND DECISION MAKING – use technology to develop a logical process for decision making and problem solving.		

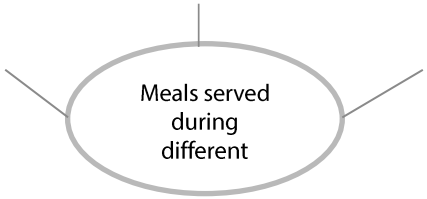
SUGGESTED TEACHING AND LEARNING ACTIVITIES **Students will:**	KEY SKILLS	ASSESSMENT CRITERIA
Peruse a profile outlining the nutritional needs of a primary aged child diagnosed with diabetes, obesity etc. work in small groups to collect food labels from various food items or view food labels online to get information such as: (a) calorie count, ingredients, expiry dates, manufacturer's name and address, net weight, net content (b) Storage and preservation of food. Infer the extent to which the food items for which labels were collected would be appropriate for the specified child. Present their work on a chart or PowerPoint presentation (with the aid of their teacher or an adult)	• Summarise information • Make inferences	Chart or PowerPoint presentation accurately extracts information from labels. Chart or PowerPoint reflects accurate inferences re the appropriateness/safety of the food items for which labels were collected – food items should be based on the needs of the child/children outlined in the profile given.
Read extracts from different types of texts – expository, narrative and descriptive - Work in groups to make inferences about how lifestyles of different career groups link to nutrition (e.g. an athlete, a farmer etc.) affect food choices. Plan and present inferences made to the whole class.	• Make inferences	Presentations clearly outline the inferences made as well as evidence the sources/reasons that influenced the inferences.
View/listen to a video/audio clip about the importance of having a balanced diet. Engage in a teacher-led discussion focused on getting students to identify and understand the main idea of the clip. Work in small groups to create a strategy poster outlining the strategy they used to identify the main idea of the clip. Share with the whole class.	• Summarise important ideas • Identify main ideas	Discussion highlights students' understanding of the main ideas. Strategy poster accurately highlight strategy/strategies for identifying main ideas
Read a variety of online or offline literature such- e.g. magazines, labels, cookbooks, advertisements that are food related from the text sets in the class and extract/determine the main ideas and at least two supporting details. Present this on a graphic organiser.	• Extract main ideas • Cite supporting details	Graphic organiser outlines the main ideas and at least two supporting details

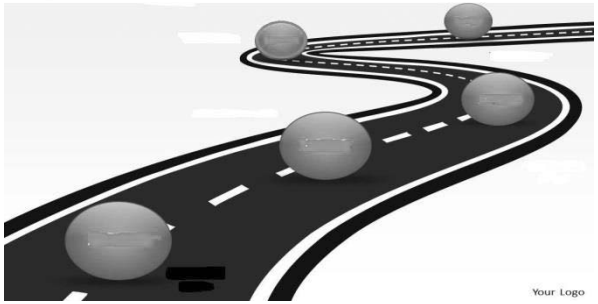
Listen or view two different readings of the same text for the same purpose (two different rates, one with expression and one without). Engage in a discussion focused on analysing/comparing the two readings to elicit the effects of reading rate, expression, confidence etc.	• Compare the effects of reading rates • Analyse the effects of expression	Discussion focused on comparing and analysing the effects of reading with expression and confidence and how reading rates contributes to meaning making.
Work with teacher to develop a rubric to be used to assess the reading of their peers. Be randomly selected by the teacher to read different portions of a grade level text utilising the *Pass the Read* strategy. The reading will be assessed by both the teacher and the rest of the class who will utilise the rubric developed. Feedback will be provided at the end of the reading.	• Read with expression and confidence • Read fluently	Reading exemplifies the use of expression and confidence while adjusting reading rate and strategies to suit the material and purpose
View and discuss samples of written extension for familiar texts (these could have been written by other students from other grades)	• Engage in discussion • Extend ideas in texts	Discussion focused on the extent to which the extensions written are aligned to the original text
Read grade level text and write an additional paragraph to extend the ideas in text	• Extend ideas in texts	Paragraphs written provide meaningful extension of the ideas outlined in the original text
Create a poster or flyer highlighting / promoting their strength (s) as a reader and how they have used that strength to improve their comprehension. Mount selected pieces in the class' motivational corner.	• Engage in reflection • Identify strengths	Poster or flyer clearly outlines the strength or strengths identified and provides at least one way in which such strength is capitalised on during the reading process
READING FOR INFORMATION (RESEARCH & STUDY SKILLS)		
Focus Question: How do I effectively communicate my understanding about matters related to nutrition?		
ATTAINMENT TARGETS	**OBJECTIVES**	
▪ Research activities on issues and interests by generating ideas and exploring texts using a range of strategies	Students should be able to: ▪ Generate ideas for research using graphic organises	

▪ Identify and use text features to support navigation of texts, retrieving and synthesize information gained from a range of sources	▪ Identify a variety of media and on-line sources of information ▪ Begin to organize ideas generated into meaningful segments of research ▪ Begin to organise information located from various sources ▪ Express appreciation for the contribution of their peers during collaborative activities

ICT ATTAINMENT TARGET(S):

COMMUNICATION AND COLLABORATION - Use technology to communicate ideas, information and understandings for a variety of purposes.
RESEARCH, CRITICAL THINKING, PROBLEM SOLVING AND DECISION MAKING – use technology to develop a logical process for decision making and problem solving.

SUGGESTED TEACHING AND LEARNING ACTIVITIES **Students will:**	**KEY SKILLS**	**ASSESSMENT CRITERIA**
Use library and/or other media/internet sources to research healthy/unhealthy food choices. Skim and scan the texts found for main ideas/details, using text features such as *headings, sub-headings, graphs and textboxes*. Present this information in report form, using text features to lay out information	• Generate ideas for research • Skim and scan • Use text features	Reports present information located online and from other sources and employs basic use of text features to summarise and present ideas
Look up in the library - using sections of texts (e.g. table of contents, index), pictures, maps, graphs, and on-line sources to find information in different genres (writing styles) relating to food e.g. poems, recipes, Bible, newspapers etc;. Work in groups to compile and prepare a display	• Identify sources of information • Use sources of information	Displays outline information, pictures, maps, graphs etc relating to food, identified or developed during research.
Use a graphic organiser to engage in a brainstorming activity to generate research ideas based on "meals that are served during different seasons" 	• Generate ideas	Graphic organiser accurately completed with meaningful research ideas related to the main topic

Work in small groups to generate a research idea based on the central topic. These will be written on the map and discussed as a class	• Identify sources of information • Organise information	Completed Path Finder outlines useful sources of information necessary to support the topic of focus
Work in small groups to breakdown their topics and outline the possible sources from which information can be located using the "Path Finder" strategy. Use the graphic organiser below to record the topics and source of information for their research.  	•	
Engage in an oral discussion about the importance of each other's contribution to the research process as well as the impact of valuing each other's contribution	• Engage in discussion	Discussion focused on providing opportunities for students to share their personal opinions on the importance of each other in the research process and how this can be valued

LANGUAGE STRUCTURE (GRAMMAR & CONVENTIONS)		
Focus Question: How do I effectively communicate my understanding about matters related to nutrition?		
ATTAINMENT TARGETS	**OBJECTIVES**	
▪ Write sentences which are grammatically accurate and correctly punctuated, using SJE and JC appropriately ▪ Use and adapt a range of sentence structures according to context, distinguishing between SJE and JC	Students should be able to: • Use adverbs and prepositions of time • Use accurate subject / verb agreement – intervening/attached phrases and singular subjects • Distinguish between direct and reported speech • Reflect and comment on their use of grammar and conventions in oral and written communication	
ICT ATTAINMENT TARGET(S): COMMUNICATION AND COLLABORATION Use technology to communicate ideas, information and understandings for a variety of purposes. RESEARCH, CRITICAL THINKING, PROBLEM SOLVING AND DECISION MAKING – use technology to develop a logical process for decision making and problem solving.		
SUGGESTED TEACHING AND LEARNING ACTIVITIES **Students will:**	**KEY SKILLS**	**ASSESSMENT CRITERIA**
Discuss PowerPoint presentation on the use of adverbs and prepositions of time. Collaborate with teacher to discuss examples and clarify understandings.	• Engage in discussion • Use adverbs and prepositions	Discussion focused on helping students to develop conceptual understanding of adverbs and prepositions with specific emphasis on those that speaks to time.
Work in small groups to create simple strategy posters that outline "what are adverbs and prepositions of time, examples of same and sentences/paragraphs demonstrating how they may be used (Examples used should include content relating to nutrition).	• Use adverbs and prepositions of time • Create strategy poster	Strategy posters outlining correct definition for adverbs and preposition of time, examples of each as well as sentences/paragraphs depicting their usage.
Discuss the function of adverbs and prepositions of time (when an action is done). Read sample of passages and sentences with adverbs and prepositions of time and compose sentences/ passages using adverbs and prepositions of time	• Use adverbs and prepositions of time	Adverbs and prepositions of time accurately used in sentences

Using teacher model, identify intervening phrases in given sentences; for example, • Our community members, <u>together with people from other towns,</u> are demanding properly- treated water. • The mayor, <u>along with his councillors,</u> pays a visit to our community. • The parish council, <u>as well as the Urban development Corporation</u>, has approved the new business development.	• Identify intervening phrases	Intervening phrases accurately identified
Identify present, past, continuous and future tenses from different sources/text (poem, stories, books etc.). Discuss how these parts of speech function in the texts	• Use verb tenses	Tenses used in texts and their functions accurately identified and shared
Look at examples and discuss with the teacher the use of commas to separate adjectival phrases and other intervening phrases e.g. *The girl, along with her family, went to have dinner at the new restaurant.*	• Use commas	Commas accurately used to punctuate sentences with intervening phrases or adjectival clauses
Discuss the difference between direct speech and reported speech, with particular reference to the use of quotation marks in indicating direct speech. Examine and discuss grade-appropriate samples in written sentences and extended writing related to the theme of food,	• Distinguish direct and indirect speech • use quotation marks	direct and reported speech accurately distinguished; with emphasis on the use of quotation marks in direct speech

Rewrite direct speech in comic strip - as in the comic strip below- into full sentences, using punctuation marks, then write the matching indirect/reported speech  	• Use quotation marks • Convert conversations	Comic strip dialogue accurately rewritten as complete sentences reflecting direct speech and appropriately using quotation marks.
Use different parts of speech to create different kinds of poems/jingles related to nutrition and health. Present poems, conveying meaning clearly (Give attention to rhythm, pace, emphasis and accurate pronunciation of words)	• Create poems/jingles • Use parts of speech • Read to convey meaning	Poems/Jingles effectively developed using different parts of speech and fluently read/presented to convey meaning.
Formulate interrogative sentences e.g. What career do you prefer- a nutritionist or a chef?	• Formulate interrogative sentences	Interrogative sentences accurately composed with appropriate punctuation mark
Change sentences to negative forms. E.g. Why are you eating now? *Why aren't you eating now?* They had to ask the teacher to assist them with their project. *They didn't have to ask the teacher to assist them with their project.*	• Use negatives	Accurate conversion of given sentences to negative forms

Convert a readers' theatre script to a narrative piece, writing the information to show the different roles of the narrator and characters; for example, consumers shopping at a supermarket. Use quotation marks to show actual words spoken by the characters. **OR** Make up dialogue using quotation marks, to show direct speech in which a buyer and a vendor argue over the quality of some goods about to be purchased. Indicate whether it is the SJE or JC would most likely be used by each party in the conversation.	• Convert readers' theatre scripts to narrative pieces • Use quotation marks • Write dialogue • Use quotation marks appropriately • Interpret tasks • Select and use appropriate language form	Appropriate conversion of readers' theatre script to narrative Accurate use of quotation marks in narrative to indicate direct speech Meaningful dialogue containing appropriate use of language forms and quotation marks
Work in groups to compose simple poems/songs that speak to their ability to use the conventions of the language in oral and written form. Share these with the class during form time or any other class gathering.	• Engage in reflection • Monitor their own progress	Poems/songs outline students' personal reflection on how they have used the grammar and conventions of the language in both its oral and written forms

COMMUNICATION (WRITING)

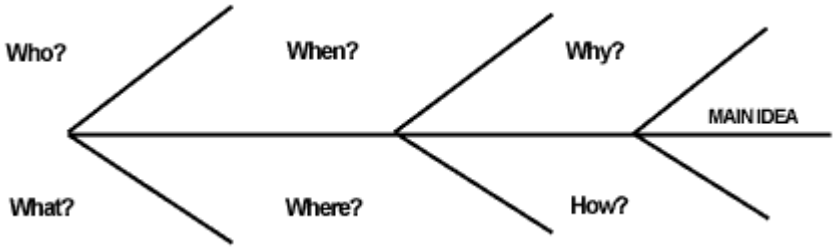
Focus Question: How do I effectively communicate my understanding about matters related to nutrition?

ATTAINMENT TARGETS	**OBJECTIVES**
▪ Develop approaches to the writing process to enable them to organise their ideas into a coherent structure including, layout, sections and paragraphs ▪ Write well-constructed paragraphs which have linking sentences within and between them	Students should be able to: • Compose similes and metaphors to add impact to writing • Produce revised written drafts by modifying details • Compose narratives which include the basic story elements • Use adjectives to describe people, places and things in narratives • Select pieces of writing that reflect their growth and competence as writers and explain the reasons for their choices

<table>
<tr><td>▪ Write to narrate, to persuade and for a range of transactional purposes, using SJE and JC appropriately and incorporating multi -media approaches to their writing</td><td></td><td></td></tr>
<tr><td colspan="3">ICT ATTAINMENT TARGET(S):

COMMUNICATION AND COLLABORATION Use technology to communicate ideas, information and understandings for a variety of purposes.

RESEARCH, CRITICAL THINKING, PROBLEM SOLVING AND DECISION MAKING – use technology to develop a logical process for decision making and problem solving.</td></tr>
<tr><td>SUGGESTED TEACHING AND LEARNING ACTIVITIES
Students will:</td><td>KEY SKILLS</td><td>ASSESSMENT CRITERIA</td></tr>
<tr><td>Watch video explaining similes and metaphors OR read hand-out/notes on same. Engage in discussion focused on ensuring understanding and appropriate use of both similes and metaphors. Examine various examples of similes and metaphors.</td><td>• Engage in discussion
• Identify similes and metaphors</td><td>Discussion focused on developing understanding of similes and metaphors</td></tr>
<tr><td>Individually create a figures of speech book with examples of similes and metaphors sourced from a variety of texts as well as those they have created regarded nutrition. Additionally, the book should include 2 written pieces (poem, short story , report etc.) showcasing use of a minimum of four similes and metaphors highlighted in the book. Share their completed books with their classmates.</td><td>• Use similar and metaphors</td><td>Figures of speech book accurately outlines sourced and personally composed examples of similes and metaphors as well as two written pieces employing the use of four or more similes and metaphors.</td></tr>
<tr><td>Write a letter inviting a nutritionist to be guest speaker at the class ‘Food Fair’. Be sure to include the time, date, venue and the name of the event. Students will use the RAFTS strategy to interpret the task and the Herringbone Technique to generate ideas for the content of the letter.
<table>
<tr><th>Role</th><th>Audience</th><th>Format</th><th>Topic</th><th>Strong verb</th></tr>
<tr><td>students</td><td>nutritionist</td><td>letter</td><td>Invitation to food fair</td><td>invite</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td></tr>
</table></td><td>• Interpret the task using RAFTS strategy
• Generate ideas using Herringbone Technique
• Compose letters
• Revise draft</td><td>Effective use of RAFTS strategy and Herringbone Technique to interpret the writing task and to generate ideas in order to compose meaningful letters</td></tr>
</table>

 Then use information from graphic organiser to compose their first draft.		
Work in pairs to revise first draft of a piece of writing assigned. Use revision information to modify first draft and present a second draft	• Revise draft writing	Revised first draft depicts meaningful markings and or notations to be used to improve the piece of writing
In groups, create a story about food. Students should include story elements (plot, setting, characters, problem, and resolution) in their food story with the foods from the different groups being characters.	• Write story • Use story elements	Story written to include all relevant elements of story writing and contain relevant information for the food selected
In groups, write Readers' Theatre scripts about market day and the kinds of foods the vendors sell. Assign different roles such as narrator and other characters.	• Write scripts • Portray characters • Write narration	Scripts written to depict the roles and lines for each character as well as the necessary narration
Using the writing process, develop a short article for the school's Notice Board recommending healthy food choices. Article should have a catchy title, include relevant and useful content and should be written in an interesting way.	• Generate ideas • Draft and revise article • Use editing checklist	Effectively composed articles , exemplifies use of the writing process and contain relevant and meaningful details
Compose short paragraphs about all the different forms of cooking e.g. baking, frying and grilling. Each paragraph should focus on a main idea which in this case is the specific form of cooking. They will write clear instructions (in correct sequence) on how to make their	• Write paragraphs • Maintain paragraph focus • Sequence ideas	Paragraphs written using appropriate signal words to indicate sequence

favourite meals using one form of cooking. Use signal words of sequence such as first, next, then, after, while.		
Compose simple narratives which focus on an aspect of food (e.g. food nutrients). Give special attention to the appropriate use of punctuation for dialogue and general sentence construction, and paragraph development	• Compose narrative pieces	Narratives demonstrate good use of punctuation, dialogue, varying sentence types and paragraph development
In groups, imagine that the meals at school canteen do not reflect a balanced diet. A decision has been taken to create healthier menu options. Write or type two paragraphs supporting this decision. Ensure main focus in each paragraph.	• Develop paragraphs • Support position	Paragraphs are clearly focused and contain ideas to support the position outlined
View samples of effective advertisements online and/or in other sources including magazines and newspapers. Discuss the elements of advertisements such as content, persuasive techniques and lay-out using text features. Students will then create an advertisement for a Food Fair. Advertisement should include a logo, date, time, and venue of the event, a tagline for the event, and some of the major activities. Advertisement should use language effectively to persuade (E.g. a question, repetition, descriptive words/phrases) Advertisement may be in the form of a poster created using text editing or graphic software.	• Use elements of advertisements • Create advertisements • Use adjectives	Elements of advertisements examined and discussed Original advertisements contain relevant details such as a logo, date, time, and venue of the event, a tagline for the event, and some of the major activities; may also include picture. Advertisement uses persuasive language effectively
Write letters or email (using school or class account) to friends abroad (real or imaginary), sharing details about the results of the tests they carried out on different food samples in Science class. Give special attention to the following: • Use of the writing process to ensure high quality pieces • Use of appropriate format • Inclusion of content relevant to the task given	• Write letters • Use the writing process	Letters written to include relevant content; use appropriate format and employs use of the writing process

Prepare a writing portfolio to showcase pieces of writing that highlight either their strengths or weaknesses as writers accompanied with commentary to explain the reasons for their selection	• Engage in reflection • Select pieces of writing	Portfolio outlines students personal pieces of writing accompanied by commentary providing rationale for the selection of the pieces

Learning Outcomes:

Students will be able to:

- ✓ Demonstrate active listening and appropriate speaking techniques when communicating with their peers and others
- ✓ Build word recognition skills by reading grade appropriate sight words and using word structure to aid decoding
- ✓ Extend vocabulary by using different structural elements – compound words, affixes
- ✓ Apply techniques of summarizing and inference to determine meaning from texts
- ✓ Demonstrate competence in the use of the structures and conventions of Standard Jamaican English
- ✓ Improve the quality of their writing by applying stages of the writing process

Points to Note	**Extended Learning**
The use of the Communication Protocol should become part of the daily drill for students and may be applied in a range of communication contexts. Students should be carefully supervised as they use the Internet.	Students should practise the Communication Protocol at home and in the wider community. They should also practise the use of grammatical structures learnt - interrogatives, negatives, etc. - in these contexts. Students should apply correct eating habits and food choices
Resources	**Key vocabulary**
• Science text(s) • Class reader(s) with stories, poems, expository pieces related to the physical landscape • Supplementary reading materials – books related to health and nutrition, advertisements, pamphlets, posters • Observation Checklist • Food labels and packages • 5 Senses Chart	Communication Protocol Skim Scan Landscape Adverbs Prepositions Prefixes Suffixes Environmental

• RAFT chart • Video/audio recording device and any other available technologies • Computer • Internet • Text editing software	Compound subjects Compound predicates Writing process Calorie Storage Preservation
Links to Other Subjects The unit contains links to the following subjects: Drama - role play Science - Food groups, food safety Food & Nutrition – Nutrition for special groups	

UNIT OF WORK GRADE 5 TERM 2 UNIT 2

Unit Introduction

This unit seeks to build on the skills taught in Term 1 via the theme of 'Institutions and political decisions" and the focus question, 'What are parish councils and how does this system of governance operate in Jamaica?' How do I effectively communicate my understanding about the Parish Council and how this system of governance operates in the Jamaican context? It facilitates the development of active listening and speaking skills through discussion of current events and national issues. It also attempts at developing reading fluency through the application of the grade appropriate word recognition strategies of sight words, phonics and structural elements such as affixes/morphemes. While these skills have also been addressed in other grades and terms, an attempt has been made to reinforce them within the context of grade-appropriate content. Students are given the opportunity to reinforce and extend their knowledge of identifying main ideas, summarizing information and making inferences. They are also given the opportunity to study the meanings of words by looking at morphemes (the smallest units of meaning). They conduct basic research by using parts of books and a range of sources, including the internet. In this unit, they also continue to practise the use of the writing process in order to produce well-written pieces.

Most of the activities give students an opportunity to practise specific language skills. The teacher may need, however, in some cases to explicitly teach rules, structures and strategies prior to these activities. The content outline for grade 4 must therefore be consulted for details on the scope of content/skills to be delivered.

Prior Learning

Check that students:

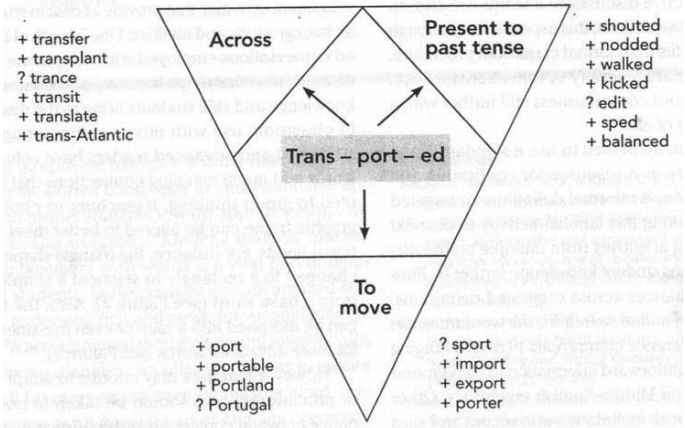
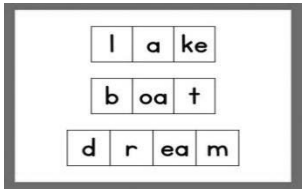
- Have begun to work with the Communication Protocol
- Know sight words appropriate to the grade level
- Are able to identify and use structural analysis skills to aid word recognition
- Know basic skills of comprehension – recalling and recognizing ideas, inferring details
- Know how to use major parts of a book and text features to aid research or the location of information
- Understand the basic steps in the writing process
- Are able to write to narrate, persuade and inform

UNIT OF WORK – GRADE 5 – TERM 2 UNIT 2 – (7 WEEKS)

Focus Question: How do I effectively communicate my understanding about the Parish Council and how this system of governance operates in the Jamaican context?		
SPEAKING AND LISTENING		
ATTAINMENT TARGETS	**OBJECTIVES**	
• Listen to, recall, understand and respond to speakers' messages, whether implicit or explicit • Communicate with confidence and competence for different purposes and audiences, using SJE and JC appropriately and creatively • Recognise, value and make distinctions between home language and SJE to improve/acquire language and literacy competencies	Students should be able to: • Take notes from presentations • Practise effective listening skills • Use various expressions and vocabulary to suit purpose and audience • Listen critically to speech delivered and respond accordingly • Demonstrate respect for the opinions of others during discussions and other collaborative activities	
ICT ATTAINMENT TARGETS • COMMUNICATION AND COLLABORATION – Use technology to communicate ideas, information and understandings for a variety of purposes. • DESIGNING AND PRODUCING – use technology to design and produce multimedia presentations to demonstrate their creative thinking. • DIGITAL CITIZENSHIP – Use technology to design and produce multimedia products to demonstrate their creative thinking. • RESEARCH, CRITICAL THINKING, PROBLEM SOLVING AND DECISION MAKING – use technology to develop a logical process for decision making and problem solving.		
SUGGESTED TEACHING AND LEARNING ACTIVITIES **Students will:**	**KEY SKILLS**	**ASSESSMENT CRITERIA**
Listen to debating arguments put forward by both opposing and proposing team members and do rebuttals after each team presents. Students who are members of the audience will take notes to ask questions at the end of the presentations.	• Present arguments • Listen for information • Take notes • Ask questions	Notes taken and questions asked must be relevant to the presentation made and the arguments presented

Invite the mayor for the division in which their school is located to address them on what the parish council is, as well as its roles and functions. A student will introduce the mayor and the class will ask previously prepared questions. After the presentation, a student will move the vote of thanks.	• Use formal register • Listen for information • Formulate and ask questions	Introduction written using the grammar and conventions aligned to SJE. Questions asked are aligned to the idea or content being presented by the speaker. Vote of thanks highlights critical points from the presentation using the SJE accurately
OR Go on a field trip to the major town in their parish; look at and take pictures of the important buildings that are managed by the parish council e.g. market, bus park etc. The trip will end in the mayor's chamber where they ask pre-prepared questions of the mayor, as to roles and functions of the council as it relates to the important buildings they saw in the town. Students should take brief notes and ask clarifying and probing questions. Use image capturing device to take photos of field trip then import them into presentation software for class viewing and discussion and to complete other class related activities Observe Communication Protocol – waiting their turn, avoiding side conversations, asking clarifying probing questions, etc	• Listen for information • Take notes • Ask clarifying/probing questions • Wait turn • Avoid side conversations • Operate electronic device	Interaction exemplifies accuracy in asking and responding to questions as well as depicts students understanding and appreciation for the communication protocols
Engage in a reflective discussion to highlight good and bad examples of listening skills portrayed by their classmates during presentation. Rationalise for the examples given in both categories.	• Engage in discussion • Engage in reflection • Show respect • Accept opinions of others	Reflective discussion highlights students'' perspectives on whether or not their classmates practised good listening skills, observed the communication protocols and demonstrated respect for the opinions of others.

READING WITH FLUENCY AND RECOGNITION (WORD RECOGNITION & VOCABULARY DEVELOPMENT		
ATTAINMENT TARGETS	**OBJECTIVES**	
• Automatically recognise words (including basic sight word lists) through repeated exposure and mnemonic devices • Use a range of word recognition clues to identify new words • Build vocabulary through various strategies	Students should be able to: • Determine multiple meanings of words by applying knowledge of context clues Learn and use compound words in order to extend vocabulary • Find known clusters, syllables and smaller words in bigger words for the purposes of encoding and decoding • Use knowledge of synonyms and antonyms to construct meaning • Reflect on how the strategies employed for decoding and encoding help them to improve as readers and writers	
ICT ATTAINMENT TARGETS • COMMUNICATION AND COLLABORATION - Use technology to communicate ideas, information and understandings for a variety of purposes. • DESIGNING AND PRODUCING - use technology to design and produce multimedia presentations to demonstrate their creative thinking. • DIGITAL CITIZENSHIP Use technology to design and produce multimedia products to demonstrate their creative thinking. RESEARCH, CRITICAL THINKING, PROBLEM SOLVING AND DECISION MAKING use technology to develop a logical process for decision making and problem solving.		
SUGGESTED TEACHING AND LEARNING ACTIVITIES **Students will:**	**KEY SKILLS**	**ASSESSMENT CRITERIA**
Pretend to be word detectives and find and use clues of phonic elements such as blends, clusters, digraphs in initial, medial and final positions to accurately decode and pronounce words **pr**epare, ef**fl**uent, **phy**sical, rec**ei**ve, br**ea**ch, b**ui**lding	• Identify and use phonic elements to decode and pronounce words	Words decoded using phonic elements accurately

Look at a target word with at least 3 morphemes from the text to be read; for example, *environmental, subdivisions, developments.* Use graphic frame such as a morpheme triangle to analyse and discuss the words. The triangle has three workspaces as depicted below: the centre of the triangle, the outside of each corner, and the inside of each corner. Think aloud, breaking the word apart and discuss the meanings of the parts. Link analysed words to other words sharing the same morphemes, e.g. words with the suffix/morpheme –ment.  	• Analyse and discuss the morphemic structure of targeted words	Morphemic structure of words accurately analysed in order to determine their meanings
Show phoneme-grapheme correspondence by completing Elkonin boxes worksheets to show groups of letters that represent politically related words with blends, clusters, digraphs diphthongs etc. For example, **cl**erk, **str**eet pari**sh,** , abatt**oi**rs  	• Establish phoneme-grapheme correspondence among related words with blends, clusters , diphthongs, digraphs, etc,	Elkonin boxes completed to showcase accuracy in the Phoneme-grapheme correspondence

<table>
<tr>
<td>Cut morpheme grid in blocks and use the morphemes to create as many words as possible. Use the match-up guide to assist them in creating words
Morpheme Match-Ups
<table><tr><td>sub</td><td>mobile</td><td>micro</td></tr><tr><td>scope</td><td>vision</td><td>re</td></tr><tr><td>tele</td><td>auto</td><td>graph</td></tr></table>
Morpheme match-ups Guide
<table><tr><td>Morpheme</td><td>Meaning</td></tr><tr><td>Auto</td><td>Self</td></tr><tr><td>Scope</td><td>See</td></tr><tr><td>Vision</td><td>See</td></tr><tr><td>Tele</td><td>Distance</td></tr><tr><td>Sub</td><td>Under</td></tr><tr><td>Moblie</td><td>Move</td></tr><tr><td>Re</td><td>Again</td></tr><tr><td>Graph</td><td>Write</td></tr><tr><td>micro</td><td>Small</td></tr></table></td>
<td>• Create words using given morphemes</td>
<td>Morpheme match up guide completed with words correctly spelt using given morphemes</td>
</tr>
<tr>
<td>Work out the meanings of compound words related to parish council – e.g. courthouse, supermarket, wastewater etc.- in pairs, based on the idea that the meaning of each word part contributes to its overall meaning, Following this activity, look up words in dictionary, including online sources, to check on the accuracy of projected meanings.</td>
<td>• Determine word meanings
• Use dictionaries</td>
<td>Appropriate projections made regarding meanings of compound words and meanings verified by using dictionaries</td>
</tr>
<tr>
<td>Students listen to recordings/audio clips of syllabication rules being applied to words and share rules learnt with peers</td>
<td>• Use syllabication rules</td>
<td>Syllabication rules accurately communicated and interpreted</td>
</tr>
<tr>
<td>Read aloud content area texts or other materials related to parish councils and use syllabication rules to assist in the accurate pronunciation of unfamiliar words. Request teacher support in the form of modelling pronunciation where</td>
<td>• Apply syllabication rules</td>
<td>Syllabication accurately applied to decode unfamiliar vocabulary during reading</td>
</tr>
</table>

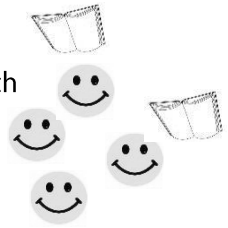
challenges exist or use online dictionaries with pronunciation feature.		
In pairs, students will copy a list of 20 words selected from the literature on the work of the parish council; e.g. *site, permit, requirement, sewage, regulations, committee, control, management, supervise, approval, breach, license, licence, authority, environment, sanitation, etc.* Use context clues to determine the meanings of the words and verify meaning by using a dictionary, including on-line options, then add words to personal bank of sight words and learn to automatically recognise them.	• Use context clues • Use dictionary • Use sight words	Word meanings appropriately and contextually deciphered using the clues provided in the context of the text.
With reference to a learning Tip of the Day (to help them apply a vocabulary building strategy), use the Think Aloud strategy to analyse targeted multiple meaning words in given passages in order to determine their contextual meanings	• Apply vocabulary strategies • Analyse multiple meaning words	Contextual meaning of words accurately and appropriately deciphered to maintain the meaning of the whole text
READ FOR MEANING & ENJOYMENT (COMPREHENSION)		
ATTAINMENT TARGETS	**OBJECTIVES**	
• Read for meaning, fluency and enjoyment of texts, using a variety of clues to gain information and identify ideas and events • Use deduction and inference to interpret information and ideas and to predict outcomes • Identify and comment on the structure of texts and on the language choices, grammar and techniques writers use to create an impact	Students should be able to: • Use the QAR strategy to locate information in the book and in their heads. • Identify and use information at the literal, inferential and critical levels • Do self-selected reading of texts representing different genres and make connections to self, other texts and the world • Establish cause and effect relationships • Identify problem and solution text structure • Apply appropriate elements of fluency (accuracy, speed and prosody) during reading to aid comprehension	

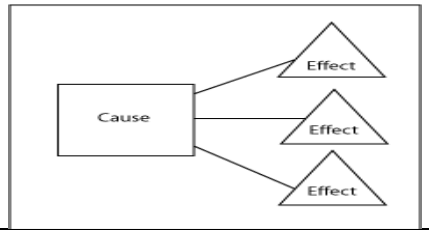
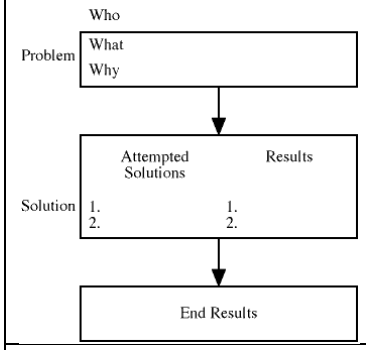
	• Independently select and read grade level texts for varying purposes

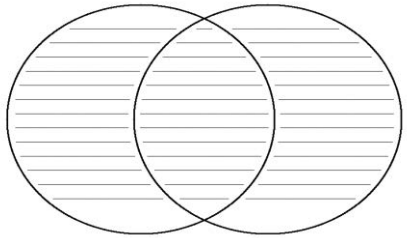
ICT ATTAINMENT TARGETS

- COMMUNICATION AND COLLABORATION - Use technology to communicate ideas, information and understandings for a variety of purposes.
- DESIGNING AND PRODUCING – use technology to design and produce multimedia presentations to demonstrate their creative thinking.
- DIGITAL CITIZENSHIP - Use technology to design and produce multimedia products to demonstrate their creative thinking.

RESEARCH, CRITICAL THINKING, PROBLEM SOLVING AND DECISION MAKING - use technology to develop a logical process for decision making and problem solving.

SUGGESTED TEACHING AND LEARNING ACTIVITIES STUDENTS WILL:	KEY SKILLS	ASSESSMENT CRITERIA
Use question-answer relationship to identify/infer information presented in content area passages on the parish council of Jamaica. They will use symbols to represent the level of questions: Right there Think and search Author and me On my own 	• Use QAR strategy	QAR strategy effectively used to locate/ formulate suitable responses to questions at different levels of the taxonomy
Read excerpts from content area material or supplementary texts on the Parish Council of Jamaica, extract the main ideas in the form of topic sentences and record on Main Idea Response Chart. Use main ideas to develop short paragraphs	• Extract main ideas • Formulate summaries	Main ideas extracted and used to compose summaries
Select and read literature from text sets of different reading levels, genres and media that offer different perspectives on the theme. These will range from fiction, nonfiction, charts, maps, historical documents, photographs, songs, paintings that depict different systems of governance.	• Do self-selection of texts • Read independently	Texts appropriately selected to suit the needs and purpose of the reader based on context provided

Students will read article from suitable online sources on the roles and functions of the parish council. They will complete a cause and effect ograniizer to show what will happen to the entities that fall under its portfolio if they are not utilize by the memebrs of the public  	• Establish cause and effect	Cause and effect organiser depicting the relationships between the causes and effects assigned and identified
View picture of a major town that is in a deplorable condition. Make inferences about the nature of the problem and offer possible solutions for these problems .e.g. persons selling on the streets and not utilizing the market, failure of public passenger vehicles to utilize the bus park  	• Make inferences • Link problems and solutions	Inferences regarding problems accurately made and appropriate solutions provided
Summarize an article on the role, structure and function of the local authority by reducing it to its essentials, the key points worth noting, without examples and details. should Show an ability to change the specific form, the sentence structure and the vocabulary, without losing the main ideas	• summarize information	Summaries written depicting the main ideas and supporting details of the text read

Read about the system of governance in Jamaica (parish council) and use online sources to research on the local government of another Caribbean country and use a Venn diagram to compare both systems of governance at the local level. The Venn diagram could be drawn using a suitable application. 	• Use Venn diagram	Venn diagram used to compare systems of governance showing similarities and differences
Complete graphic organizer to show similarities and differences between the administrative and political arms of the local/national parish council	• Use graphic organiser to compare /contrast aspects of parish council	Graphic organizer outlines the similarities and differences between different aspects of the parish council

READ FOR INFORMATION (RESEARCH AND STUDY SKILLS)	
ATTAINMENT TARGETS	**OBJECTIVES**
• Research activities on issues and interests by generating ideas and exploring texts using a range of strategies • Identify and use text features to support navigation of texts, retrieving and synthesize information gained from a range of sources	Students should be able to: • Skim and scan for information using basic text features (table of contents, glossary, index) • Use headings, titles, subheadings to locate information in texts • examine graphs, charts, tables to extract information • Use dictionary and encyclopaedia to locate information

	• Formulate questions and construct basic research plan • Evaluate basic research plans in order to provide feedback • Express appreciation for the contribution of their peers during collaborative activities • Use online sources effectively to locate information

ICT ATTAINMENT TARGETS

- COMMUNICATION AND COLLABORATION – Use technology to communicate ideas, information and understandings for a variety of purposes.
- DESIGNING AND PRODUCING – use technology to design and produce multimedia presentations to demonstrate their creative thinking.
- DIGITAL CITIZENSHIP Use technology to design and produce multimedia products to demonstrate their creative thinking.
- RESEARCH, CRITICAL THINKING, PROBLEM SOLVING AND DECISION MAKING use technology to develop a logical process for decision making and problem solving.

SUGGESTED TEACHING AND LEARNING ACTIVITIES STUDENTS WILL:	**KEY SKILLS**	**ASSESSMENT CRITERIA**
Watch audio/visual material explaining the use of headings, subheadings and titles to locate information. Engage in discussion regarding the importance of these elements in texts and their use	• Examine text features	Discussion focused on helping students develop understanding and appreciation for the use of the targeted internal text features
Engage in a game of sword in hand, where teacher or team leader will name a topic and students will use the title, headings and subheadings (use Social Studies text or other material related to Parish councils) to determine which book/section of the book will contain the information. Continue playing the game until all students have gotten a chance.	• Use internal text features (title, headings, subheadings)	Headings, subheadings and titles accurately aligned to the topic/areas of research outlined by the teacher/team leader
Work in small groups to utilise the dictionary and encyclopaedia to locate different kinds of information related to Parish councils. Then write "We Think" statements to reflect on the engagement.	• Use dictionary • Use encyclopaedia	We think statements reflect students use of the dictionary and encyclopaedia to locate different kinds of information
Review a list of tasks outlined by the teacher and categorise them under dictionary and encyclopaedia (in a tabular format) based on which one they would use to gather the information. For example: meaning of the term Parish Council, composition of a Parish council etc.)	• Use dictionary and encyclopaedia	Tables completed with tasks accurately categorised

Locate and read information online from suitable sources to have an understanding about the Parish Council of Jamaica or about their local Parish Council	• Use search engine	Search engines used appropriately to locate information
Using text features (headings, sub- headings, signal words and phrases , textbox information, etc.) skim and scan information presented in non-fiction texts about the Jamaican parish council and make journal entries on new information found Or Use suitable word processing software to type and present information. Including formatting features such as heading, sub heading, header and footer.	• Use text features • Skim and scan • Use word processing software	Text features used to skim and scan for information Word processing software appropriately used
Engage in discussion regarding engaging in research and steps involved in developing a research plan. Examine sample research plan sourced by the teacher and identify the different components. Comment on what they think is good or not good about the plan.	• Engage in discussion • Critique research plan	Discussion focused on developing understanding of a research plan and the different components.
Work in groups to select a topic from a list (topics regarding the Parish council and its operation) provided by the teacher or developed in collaboration with the teacher. Observe as teacher uses the 5Ws strategy to develop questions from a topic. Use the 5Ws strategy in their group to formulate questions based on the topic they previously selected	• Observe teacher model • questions	Questions formulated using the 5Ws strategy and shows to the topic selected
Use the topic and questions formulated as well as the components established earlier to develop a research plan. Critique each other's research plan and provide feedback. For e.g.	• Develop research plan • Critique research plan	Research plan outlines all the elements/components identified in the diagram based on the topic selected and the questions formulated

Research Topic Research Questions Data Collection Instrument Data Collection Sources Research Participants		

LANGUAGE STRUCTURE (GRAMMAR & CONVENTIONS)	
ATTAINMENT TARGETS	**OBJECTIVES**
• Use and adapt a range of sentence structures according to context, distinguishing between SJE and JC • Write sentences, paragraphs and extended pieces which are grammatically accurate and correctly punctuated, using SJE and JC appropriately • Use a range of punctuation correctly	Students should be able to: • Use connectives/transitional words and phrases to show relationships between ideas • Use correctly, grammatical structures for tense agreement and subject/verb agreement • Use punctuation to create effects in written work • Identify the use of the apostrophe in contractions and possessives and apply appropriately • Show correct agreement of pronouns and antecedents • Work collaboratively with peers to effectively complete pair or team activities

ICT ATTAINMENT TARGETS

- COMMUNICATION AND COLLABORATION – Use technology to communicate ideas, information and understandings for a variety of purposes.
- DESIGNING AND PRODUCING – use technology to design and produce multimedia presentations to demonstrate their creative thinking.
- DIGITAL CITIZENSHIP – Use technology to design and produce multimedia products to demonstrate their creative thinking.
- RESEARCH, CRITICAL THINKING, PROBLEM SOLVING AND DECISION MAKING – use technology to develop a logical process for decision making and problem solving.

SUGGESTED TEACHING AND LEARNING ACTIVITIES **Students will:**	**KEY SKILLS**	**ASSESSMENT CRITERIA**
Practise the accurate application of grammatical rules by practising activities online or in texts, including workbooks – basic agreement rules (singular/plural Subjects + singular/plural verbs), Singular/Plural subjects + intervening phrases+ singular/ plural verbs and present, past, continuous and future tenses	• Apply subject/verb agreement and tense rules	Online/workbook activities correctly completed to show understanding of the subject verb agreement and verb tenses rules
Read teacher sourced/prepared hand-out on connectives and transitional words. Engage in discussion to review the information presented and examine familiar and unfamiliar examples.	• Engage in discussion • Identify transition words	Discussion of hand-out focused on examining the use and importance of transition words/connectives. Information shared and questions asked are indicative of students' ability to process and interpret information presented.
Rewrite given text utilising transition words to connect ideas, sentences and paragraphs. Presented work to class and rationalise for the use of the transition words employed.	• Use transition words	Rewritten texts exemplifies effective use of the transition words to connect ideas, sentences and paragraphs
With teacher guidance, examine excerpt relating to the roles of the parish council in order to identify and comment on the function of connectives/transitional words and phrases (for example, *because, but, so, also, therefore, similarly, however, in addition to)* in paragraphs and for transition from one paragraph to the next.	• Comment on function of connectives	Comments on the function of connectives/transitional words and phrases within paragraphs and for transitions from one paragraph to the next effectively communicated and demonstrated
Review and practise the use of punctuation marks – comma, full stop, apostrophe (contractions, possession) – in sentences , using online sources and grade-appropriate texts	• Identify and use punctuation marks	Punctuation marks accurately identified and appropriately used

In pairs, read given sentences and short paragraphs on the parish council, paying special attention to special punctuation marks – comma, full stop , semi- colon – in order to modify the pace of reading and better communicate meaning of text	• Modify pace of reading, using punctuation marks as cues	Pace of reading appropriately modified, using punctuation marks as cues.
Work collaboratively with their teacher to review the apostrophe and its varying uses. Then write two sentences demonstrating the use of the apostrophe.	• Review the apostrophe • Use the apostrophe	Sentences written demonstrate correct use of the apostrophe to satisfy a variety of reasons (plural possessive, contraction etc.)
Engage in an apostrophe hunt. Look through various genres/types of texts in the classroom to identify the words that employ the use of an apostrophe and say whether it is being used as a contraction or possessive and explain its meaning.	• Identify apostrophe • Use the apostrophe	Explanations accurately accounts for selection of sentences/words that utilise the apostrophe and aligned meaning
Engage in discussion focused on developing understanding of the terms pronouns and antecedents and the alignment between the two.	• Define pronoun and antecedent • Identify pronoun and antecedent	Discussion focused on helping students to develop understanding of the terms antecedent and pronoun and cite relevant examples
Complete worksheet that requires that they select correct pronouns to complete sentences based on given antecedents	• Align pronoun and antecedent	Worksheet completed with accurate alignment of pronouns and antecedents
Compose written pieces to demonstrate correct use of agreement between pronoun and antecedent	• Use pronouns	Written pieces showcase correct agreement with pronoun and antecedent

COMMUNICATION (WRITING)	
ATTAINMENT TARGETS	**OBJECTIVES**
• Develop approaches to the writing process to enable them to organise their ideas into a coherent structure including, layout, sections and paragraphs • Write to narrate, to persuade and for a range of transactional purposes, using SJE and JC appropriately and incorporating multi -media approaches to their writing • Write well-constructed paragraphs which have linking sentences within and between them	Students should be able to: • Generate and organize ideas for writing using a variety of stimuli • Contribute to and use simple checklists to revise and review drafts • Write in different forms producing more complex narratives, poems and reports and transactional pieces securing cohesiveness • Use content area vocabulary effectively in letters and reports • Use connectives to link sentences, ideas and paragraphs • Select pieces of writing that reflect their growth and competence as writers and explain the reason for their choices
ICT ATTAINMENT TARGETS • COMMUNICATION AND COLLABORATION Use technology to communicate ideas, information and understandings for a variety of purposes. • DESIGNING AND PRODUCING use technology to design and produce multimedia presentations to demonstrate their creative thinking. • DIGITAL CITIZENSHIP Use technology to design and produce multimedia products to demonstrate their creative thinking. • RESEARCH, CRITICAL THINKING, PROBLEM SOLVING AND DECISION MAKING use technology to develop a logical process for decision making and problem solving.	

<table>
<tr><th>SUGGESTED TEACHING AND LEARNING ACTIVITIES students will:</th><th>KEY SKILLS</th><th>ASSESSMENT CRITERIA</th></tr>
<tr><td>Use a graphic organizer for example the RAFTS strategy to interpret writing tasks
<table>
<tr><td>Role</td><td>Audience</td><td>Format</td><td>Topic</td><td>Strong verb</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td></tr>
</table></td><td>• Use graphic organizer to interpret writing task</td><td>Graphic organiser effectively used to interpret/analyse writing task</td></tr>
<tr><td>Use of the writing process (generating ideas, drafting, revising, editing) to ensure well-developed pieces, giving special attention to the following while writing all pieces and for revising/editing:
• Use of appropriate format
• Inclusion of content relevant to the task given
• Use of a checklist to guide the process
 
</td><td>• Use writing process effectively</td><td>Samples of writing showcases the use of the Writing process to generate reports and letters based on assigned task</td></tr>
<tr><td>Write letters/send emails to friends abroad, sharing details about their trip to the major town in their parish and the parish council. They are to tell them about the roles and functions of the Jamaican Parish Council. Use appropriate format, tone and include relevant details gleaned from other activities. Use language structures – subject/verb agreement, tense, grammar, punctuation- appropriately</td><td>• Use appropriate format and tone
• Use language structures and conventions</td><td>Letters written in alignment with the conventions and criteria outlined</td></tr>
</table>

Write or email letters to parish council representatives, requesting their intervention in specific community challenges/issues. Include the use of cause and effect and problem/solution associations to make case important. Use language structures and conventions, as well as connectives/.transitional words and phrases effectively	• Establish relationships • Use language structures and conventions	Letters of request accurately written to satisfy the requirements of a formal letter as well as explicitly states the request and its conditions
Using samples from online and other sources write or type introductions for the mayor who will be visiting the class. Include appropriate title, name, relevant personal background information (work organization, job function, experience) _and a polite request for audience to acknowledge the mayor.	• Examine elements of good models of introductions • Compose introductions	Introductions accurately written to include appropriate title, name, relevant personal background information (work organization, job function, experience
Engage in discussion to review the purpose of the revision step in the writing process and comment on the importance of editing their written work.	• Utilise aspects of the writing process	
Work collaboratively with the teacher to review sample checklist (previously developed checklist may be sourced online or offline). Engage in an elimination process to select areas that will be represented on a revision checklist for the class. Mount same in the class for further reference.	• Develop revision checklist	Checklist developed to reflect the needs, tasks and preferences for the written assignments for the class
Use revision checklist developed to revise their written work. Attach completed checklist to draft work or writing portfolio previously established	• Use revision checklist	Revised draft shows alignment to completed revision checklist
Write or type reports on field trips to a major town/ the mayor's chamber. Include objective details and use connectives/transitional words/phrases effectively	• Use language structures and conventions • Compose reports • Use connectives/transitional words and phrases • Use appropriate format	Reports written to include specific details of time, dates and actions based on the field trip embarked on

Learning Outcomes

Students will be able to:

- ✓ Demonstrate active listening and appropriate speaking techniques when communicating with their peers and others
- ✓ Communicate appropriately, using formal register and by asking relevant questions
- ✓ Build word recognition skills by exploring various strategies including morpheme analysis, use of phonic clues, sight word approaches and syllabication rules
- ✓ Build and meaning vocabulary through use of context clues, words with multiple meanings and compound words
- ✓ Apply techniques of summarizing and inference to determine meaning from texts
- ✓ Establish cause and effect and problem and solution relationships in order to organise and interpret information extracted from texts
- ✓ Use graphic organisers to compare and contrast ideas
- ✓ Efficiently locate information by using text feature sand by exploring a range of sources , including online options
- ✓ Use technological software /devices to record and replay activities in order to supply meaningful feedback on same feedback
- ✓ Learn, review and apply specific rules of grammar and conventions, including those related to subject/verb agreement, tenses(present, past, continuous and future)and punctuation (comma, full stop, apostrophe, semi-colon)
- ✓ Improve the quality of their writing by applying stages of the writing process
- ✓ Apply the use of connectives/transitional words and phrases to sentence/ paragraph development and for transition/cohesion among paragraphs
- ✓ Compose different forms of writing including letters (friendly, business - invitation, request and thanks), introductions, vote of thanks and reports

Points to Note	**Extended Learning**
The use of the Communication Protocol should become part of the daily drill for students and may be applied in a range of communication contexts. Teachers should carefully model strategies and provide guidance practise before students attempt individual or group work Students should be given opportunities to read and write daily. Students should be carefully supervised as they use the Internet.	Students should practise the Communication Protocol at home and in the wider community. They also practise the use of grammatical structures learnt - interrogatives, negatives, etc. - in these contexts. Students should engage in independent research as they can interview persons living in their communities to gather additional information e.g. the impact of the parish council in their communities

Resources	Key Vocabulary
• Social Studies text(s) • Class reader(s) with stories, poems, expository pieces related to the Jamaican parish council • Supplementary reading materials – books related to the parish council, advertisements, pamphlets, posters • Communication Protocol Chart • Observation Checklist • Multimedia projector and laptop or overhead projector • Posters • Internet • Computer • Digital camera	parish council mayor councillors governance authority regulations permission breach penalties environmental communities communication Protocol mnemonics digraph blend cluster syllabication connectives/transitional words and phrases compound words morpheme writing process vote of thanks

Links to other subjects

This unit has links to the following subjects:

- Social Studies – Institutions and Political Decisions (Parish Councils)
- ICT - Online sources and technological devices

UNITS OF WORK GRADE 5 TERM 3 UNIT 1

Unit Introduction

In this unit students are allowed opportunities to further build on skills and apply strategies to which they were introduced in previous grades and units. The theme for this unit is 'Living Things and Life Processes' and is taken from the area of Science. The sub-theme is 'Health and wellbeing – Understanding Air Pollution'. Activities are geared toward the development of language skills including listening and speaking, word recognition, vocabulary development, fluency, study skills, comprehension and the conventions.

Most of the activities give students an opportunity to practise specific language skills. However, in some cases the teacher may need to explicitly teach rules, structures and strategies prior to these activities. The content outline for Grade 5 must therefore be consulted for details on the scope of content/skills to be delivered.

Prior Learning

Check that students:

- Have awareness of basic listening and speaking skills
- Know sight words appropriate to the grade level
- Are able to identify and use structural analysis skills to aid word recognition
- Know basic skills of comprehension – recalling and recognizing ideas, , identifying main ideas and supporting details, inferring details
- Know how to use major parts of a book and text features to aid research or the location of information
- Understand the basic steps in the writing process

UNIT OF WORK – GRADE 5 – TERM 3 (9 Weeks)

<table>
<tr><td colspan="3">Focus Question: How do I read, find and share information about air pollution?</td></tr>
<tr><td colspan="3">SPEAKING AND LISTENING</td></tr>
<tr><td>ATTAINMENT TARGETS</td><td colspan="2">OBJECTIVES</td></tr>
<tr><td>• Communicate with confidence and competence for different purposes and audiences, using SJE and JC appropriately and creatively

• Recognise, value and make distinctions between home language and SJE to improve/acquire language and literacy competencies

• Explain and comment on speakers' use of language, including use of SJE and JC, and their use of vocabulary, grammar and other features</td><td colspan="2">Students should be able to:

• Formulate relevant questions and answers in groups
• Prepare and present oral reports using verbal and non-verbal communication
• Paraphrase and summarize the content from information heard
• Use code-switching techniques appropriately in making oral presentations
• Listen to others with courtesy and respect for others' point of view</td></tr>
<tr><td colspan="3">ICT ATTAINMENT TARGETS:
COMMUNICATION AND COLLABORATION – Use technology to communicate ideas, information and understandings for a variety of purposes.
RESEARCH, CRITICAL THINKING AND DECISION MAKING – Use technology to develop a logical process for decision making and problem solving.
DESIGNING AND PRODUCING – Use technology to design and produce multimedia products to demonstrate their creative thinking.</td></tr>
<tr><td>SUGGESTED TEACHING AND LEARNING ACTIVITIES STUDENTS WILL:</td><td>KEY SKILLS</td><td>ASSESSMENT CRITERIA</td></tr>
<tr><td>Observe as teacher models the formulation of 5Ws questions using headings and subheadings from content area text. Note steps observed on sticky note sheets and discuss in their groups</td><td>• Observation
• Take notes
• Engage in discussion</td><td>Steps noted are detailed and reflective of the process engaged in by the teacher.

Discussions are meaningful and focused on both the information noted on the sheets as well as teacher modelling.</td></tr>
</table>

Work in small groups to use the 5Ws to formulate questions using headings and subheadings from content area text (Social Studies) relating to air pollution.	• Formulate questions	5Ws questions are accurately formulated using headings and subheadings as a guide.
Be placed in groups. They will prepare for and do a panel discussion in similar format to those they see on television. Students will research the NEPA, ODPEM AND NSWMA websites and use information from these websites to prepare for panel discussion. One student will be the host while other members of the group will be panellists or specially invited guests from organizations such as National Environment and Planning Agency (NEPA), Office of Disaster Preparedness and Emergency Management (ODPEM), and National Solid Waste Management Authority (NSWMA). Make their presentations including intermissions, during which they will share their commercials/jingles that they created previously. *E.g.* Commercial *Air pollution, there must be a solution;* *Come let's do our portion, What's the notion?* With the assistance of the teacher, students could capture the panel discussion using a recording device and play back discussion for critique and class discussion.	• Work cooperatively • formulate and answer questions based on a topic or issue • Navigate digital content on websites	Information presented is accurate and coherent. Panel discussions are focused on highlighting issues regarding the various agencies and air pollution.
Engage in a teacher led discussion relating to the importance of respecting the opinions of others during discussions. Work in groups to role play or dramatize instances of respect or disregard for the opinions of others. Present their pieces to the class	• Discuss communication tips • Show respect during discussions	Discussions are focused on highlighting the importance of listening to others with courtesy and respect for others' points of view Role plays or dramatizations that exemplify respect or disregard for the opinions of others

<table>
<tr>
<td>Read chapter relating to air pollution in grade level text and prepare and present oral reports using verbal and nonverbal communication paying attention to:
"Three important ideas/things from the chapter are ---, ---, and ---, but the most important thing I learned is ---"</td>
<td>• Prepare oral reports
• Present oral reports</td>
<td>Oral reports are presented using verbal and non-verbal communication highlighting the important things learnt from reading the chapter</td>
</tr>
<tr>
<td>Take turns in listening to a speech, story or informational text relating to air pollution. Stand in a circle/semicircle to use the 3-2-1 summarising strategy to paraphrase and summarise the piece heard using the following as a guide;

<table>
<tr><th colspan="2">3-2-1 Strategy</th></tr>
<tr><td>3</td><td>Three main points from the material heard</td></tr>
<tr><td>2</td><td>Two new concepts learnt</td></tr>
<tr><td>1</td><td>A single word that gives the main idea</td></tr>
</table>

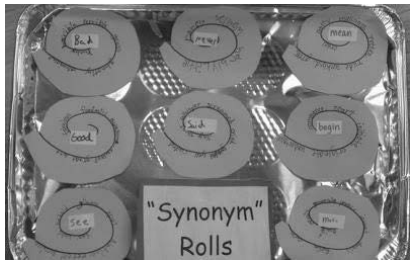
Be encouraged to desist from copying or restating the ideas of their peers.</td>
<td>• Paraphrase and summarise information</td>
<td>Summaries are properly aligned to the material listened to and is presented using the 3-2-1 approach</td>
</tr>
<tr>
<td>Watch YouTube video depicting the use of code-switching technique. Engage in a class discussion regarding the purpose and effectiveness of this technique. Take turns to practice the use of the code-switching technique for a variety of purposes.</td>
<td>• Engage in discussion
• Show respect during discussions</td>
<td>Discussion highlights the processes involved as well as purpose and effectiveness of the code-switching technique. Examples demonstrate the correct use of code-switching based on the purpose chosen</td>
</tr>
<tr>
<td>Work in small groups to research a topic relating to air pollution. Use role play to demonstrate various ways of preventing and treating air pollution in their community. Utilise code-switching techniques for emphasis and clarity</td>
<td>• Use code-switching
• make presentation
• Show respect for others</td>
<td>Presentations demonstrate students' understanding of the code-switching techniques to achieve clarity and emphasis</td>
</tr>
</table>

READING WITH FLUENCY & RECOGNITION (WORD RECOGNITION)	
ATTAINMENT TARGETS	**OBJECTIVES**
• Use a range of word recognition clues to identify new words • Automatically recognise words (including basic sight word lists) through repeated exposure and mnemonic devices • Build vocabulary through various strategies	Students should be able to… • Use explanation and example context clues to decipher word meaning • Consult reference materials to locate and clarify meaning of unfamiliar / grade level vocabulary • Find known clusters, syllables, and smaller words in bigger words for the purposes of encoding and decoding • Use knowledge of synonyms and antonyms to construct meaning • Identify and use common homophones and homonyms in context • Reflect on how the strategies employed may help them to improve as readers
ICT ATTAINMENT TARGETS: COMMUNICATION AND COLLABORATION Use technology to communicate ideas, information and understandings for a variety of purposes. RESEARCH, CRITICAL THINKING AND DECISION MAKING Use technology to develop a logical process for decision making and problem solving. DESIGNING AND PRODUCING Use technology to design and produce multimedia products to demonstrate their creative thinking.	

SUGGESTED TEACHING AND LEARNING ACTIVITIES **Students will:**	**KEY SKILLS**	**ASSESSMENT CRITERIA**
Watch YouTube video/tutorial (sourced by the teacher) relating to the use of context clues to unlock the meaning of unfamiliar words during reading. Engage in a teacher guided discussion focused on interpreting and analysing the information presented in the video/tutorial. Respond to guided questions prepared and asked by the teacher.	• Examine tutorial/video • Analyse information • Interpret information • Engage in discussion	Discussions reflect careful and meaningful analysis and interpretation of the information presented in the video/tutorial. Responses to teacher guided questions are meaningful and accurate based on information garnered from video/tutorial.

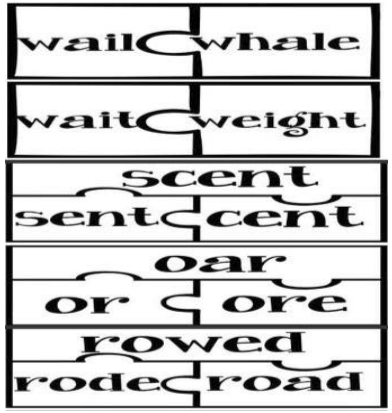
Observe as teacher models using context clues within sentences and paragraph to decipher meaning of unknown words. Ask and answer questions based on demonstration done by the teacher.	• Observe teacher modelling • Participate in discussion	Discussions focused on highlighting and developing an understanding of the use of context clues to unlock the meaning of unfamiliar words.
Read and interpret sample short paragraphs provided by the teacher. Identify the meaning of the underlined word based on the clues provided in the text. E.g. *"Tommy likes to eat cheese **sneitoo** for lunch. His brother prefers his **sneitoo** to have sausage and pepperoni on it. For dinner, their mom took a frozen **sneitoo** out of the freezer and cooked it for dinner. It was yummy!"* **What is a sneitoo? (a) milk (b) pizza (c) apple** Share their answers highlighting the clues within the passage that helped them to unlock the meaning of the unknown word.	• Identify context clue • Use context clue	Responses and context clues accurately identified and explained during discussion.
Write at least three sentences with a riddle for a word relating to air pollution. Give at least three clues so that their friends can figure it out.	• Use clues within paragraph	Riddles written contain at least three cues that will assist in unlocking the meaning of the unfamiliar word.
Complete a teacher prepared worksheet requiring them to provide the meaning of an unfamiliar word relating to air pollution as well as identify the context clue that helped them to decipher the meaning. E.g.	• Identify context clues • Use context clues	Worksheets completed with definition and context clues accurately identified.

The boy showed courage when he stood up to the school bully on the playground. **Definition:** _____ **Context Clue(s)**:_____ Work in pairs to review each other's work.		
Observe as teacher models the use of cue/signal words to assist in identifying synonyms and antonyms to construct meaning. ***E.g.*** *"Jamal's room was <u>immaculate</u> unlike Jefferey's room which was <u>messy</u>"* Discuss with their elbow partner, the cues/signal words that assisted the teacher in identifying the synonyms/antonyms in the sentences. ***(this activity may be used in two separate lessons – one focusing on antonyms and the other on synonyms)***	• identify cue/signal words • use cue/signal words	Teacher demonstration that highlights and foster development of an understanding of how cue/signal words hint at synonyms/antonyms in sentences. Discussions focused on identifying and commenting on how the cue/signal words aid the reader in identifying synonyms and antonyms.
Rewrite a teacher prepared/sourced story relating to the theme. Replace each underlined word with a synonym ensuring that the meaning of the text is maintained. Draw a picture/plan a role play to illustrate the story.	• Use synonyms	Rewritten stories reflect correct synonyms based on the context of the story. Picture/role play accurately depicts the story and reflects the synonyms supplied.

<table>
<tr>
<td>Select a list of 5 words (overused/boring/common words) from a story read in class. Cut rolls (similar to the one in the example below) from cardboard/chipboard. Write each word in the centre of a roll. Collaborate with their partner or group members to identify and write synonyms or antonyms along the spiral for the word in the centre of the roll. Work in their groups to mount the completed Synonym Rolls on a large cartridge paper or chipboard. Mount their completed work in the class for further study/use during reading and writing activities.
E.g.
 
</td>
<td>Identify synonyms</td>
<td>Synonyms Rolls depict accurate synonyms for the words in the centre of the roll.</td>
</tr>
<tr>
<td>Use their dictionary, internet sources, thesaurus etc. to confirm the meaning of a variety of words encountered during reading. Compare the meanings to that which they decipher using the context in which the words are presented</td>
<td>• Consult reference materials
• Verify word meaning
• Decipher meaning</td>
<td>Comparisons evidence use of context clues to decipher meaning and reference materials to confirm/clarify or provide multiple meanings of unfamiliar vocabulary</td>
</tr>
<tr>
<td>Use vocabulary strategy to learn words encountered E.g. contextual redefinition, definition word map, vocabulary word map, the Frayer Model, K.I.M (See example below)

<table><tr><td>Key idea</td><td>Information</td><td>Memory Clue</td></tr><tr><td>extinguish</td><td>put out</td><td>  </td></tr></table></td>
<td>• Apply knowledge of spelling rules, root words and affixes

• Identify homonyms, synonyms and antonyms</td>
<td>Words decoded using accurate application of the vocabulary strategy employed</td>
</tr>
</table>

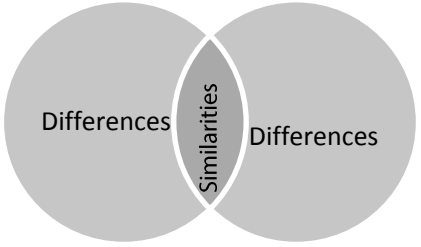
Play word games, do word scramble and puzzles with the words learnt		
Watch a YouTube/teacher-prepared video that highlights what are homophones and examples of homophones. Engage in a teacher guided discussion to respond to questions relating to the video watched.	• Engage in discussion • Identify homophones	Discussions focused on highlighting and developing an understanding of what are homophones and identify examples of same.
Listen as the teacher reads a story containing homophones. Recall/note the words heard more than once and explain whether or not the meanings of the word heard remained the same throughout the story. Share their words with the class and engage in a discussion focused on highlighting the different meanings and spellings for the homophones heard.	• Engage in discussion • Identify homophones	Homophones, their meanings and spellings accurately identified. Discussions focused on highlighting and and explaining the different meanings and spellings of the homophones heard in the story.
Work in small groups to complete a teacher prepared/sourced jigsaw puzzle that will require them to match homophones. E.g.  	• Complete jigsaw puzzle • Match homophones	Jigsaw puzzle accurately completed and demonstrates understanding of homophones.

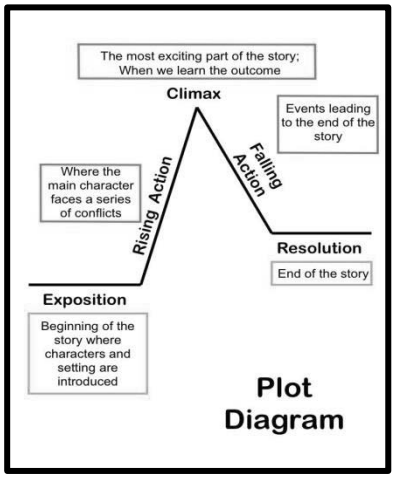
The first group to accurately complete their puzzle wins. Store puzzles in reading/activity corner for further study.		
Cut scoops and cones from cardboard/chipboard. Write the homophones/homonyms on the cone and the different meanings associated with them on the scoops. Collaborate with teacher to create "ice-cream shop" using newsprint mounted on a section of the classroom wall or chalkboard. Place the completed cones in the shop for further reference. E.g. 	• Match homophones/ homonyms with their meanings	Ice-cream cones created with homophones/homonyms and their meanings accurately matched.
Work in groups to design a crossword puzzle that will evidence their understanding of homonyms/homophones. Ensure that puzzle shows creativity, evidence of research, and clear understanding of the topic.	• Use homonyms/ homophones	Crossword puzzles designed to solicit knowledge of homophones/homonyms.
Select and use homonyms and homophones to complete given passage.	• Use homonyms and homophones	Passage completed using the correct homonyms and homophones to maintain meaning and intent
Collaborate with their teacher to establish a "Word Recognition Cool Down Spot" equip the spot with cushions, rest mat/rug, think clouds, writing pads, timer and some entrance stickers. Set the timer and use the time to, select a	• Engage in reflection • Identify strengths • Identify challenges	Word Recognition Cool Down Spot facilitated in a conducive, relaxing and calming atmosphere that allows for reflection.

Think Cloud to reflect on strategies they used and how they can use them differently in the future. Then use the Writing Pad to draw a picture or write about what they will do better next time. Then select an Entrance Sticker to re-join the class.  ***(utilise the cool down spot on an on-going basis)***	• Analyse strategies used	Think Clouds that reflect students' use of strategies and how they intend to utilise them differently in the future. Writing Pad notes contain picture or information depicting what they intend to do better in future situations/instances.
Talk about and write down ideas on the effectiveness of the strategies used to decode and encode words during reading. Share ideas with their classmates.	• Engage in reflection • Show appreciation	Ideas shared speak specifically to the strategies used and how they proved helpful

READING FOR MEANING AND ENJOYMENT (COMPREHENSION)	
ATTAINMENT TARGETS	**OBJECTIVES**
• Read for meaning, fluency and enjoyment of texts, using a variety of clues to gain information and identify ideas and events • Use deduction and inference to interpret information and ideas and to predict outcomes • Identify and comment on the structure of texts and on the language choices, grammar and techniques writers use to create an impact • Reflect on and critically respond to literature and other texts, on paper and on screen	Students should be able to… • Use main idea and supporting details to produce oral and written retellings • Compare and contrast the content and organization of texts • Discuss and analyse plots from stories read • Analyse the use of poetic devices to enhance understanding • Apply appropriate elements of fluency (accuracy, speed and prosody)during reading to aid comprehension • Critique texts using personal reflections and response
ICT ATTAINMENT TARGETS: COMMUNICATION AND COLLABORATION – Use technology to communicate ideas, information and understandings for a variety of purposes. RESEARCH, CRITICAL THINKING AND DECISION MAKING Use technology to develop a logical process for decision making and problem solving. DESIGNING AND PRODUCING – Use technology to design and produce multimedia products to demonstrate their creative thinking.	

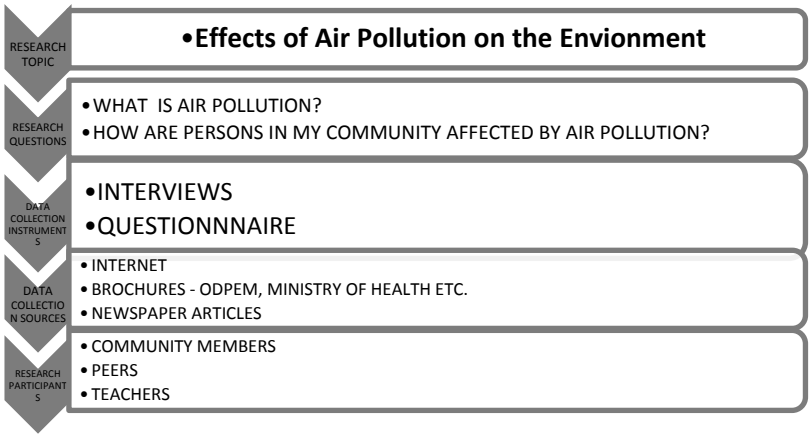
SUGGESTED TEACHING AND LEARNING ACTIVITIES **Students will:**	**KEY SKILLS**	**ASSESSMENT CRITERIA**
Read/listen to grade level text about air pollution (narrative or expository). Be reminded by teacher that they will need to retell the text as if telling it to a friend. Review with their teacher a list of words that may be useful in doing their retellings. Present their retellings that will be recorded by the teacher.	• Produce oral retellings	Oral retellings highlight the main idea and at least three supporting details from the text read/heard.
Observe and participate in a discussion as teacher models and explain the use of the 5 fingers chart to guide written retellings of narrative texts.	• Participate in discussion	Discussions are focused on explaining and developing understanding of the 5 fingers retelling chart.

		
Use the 5 fingers retelling chart to produce a written retelling of a story relating to air pollution. Post retellings in the writing corner OR use Author's chair to present their pieces.	• Produce written retellings	Retelling charts provide responses to the 5 questions on the 5 Fingers retelling chart based on the story read/heard. Responses are presented in a logical/sequential manner.
Engage in a teacher led discussion focused on establishing an understanding of compare and contrast. Write definition for compare and contrast based on information garnered from class discussion.	• Participate in discussions	Discussions are focused on establishing a common understanding of the terms compare and contrast. Definitions accurately captures the meaning of compare and contrast based on discussion and students' experiences
Orally retell, during class discussion, the features of fiction and non-fiction texts. Use Venn diagram to show similarities and differences between fiction and nonfiction texts (what to look for when reading these texts) E.g. 	• Compare and contrast texts	Venn diagram accurately outlines the similarities and differences between fiction and non-fiction texts

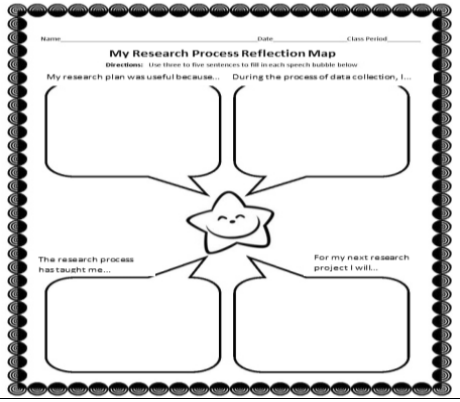
Select two items/objects/persons in their class, school or community relating to air pollution and orally compare and contrast based on their understanding of comparing and contrasting.	• Compare and contrast	Responses highlight the similarities and differences between the two items/objects/persons being compared.
Work in pairs to read grade level text and use graphic organisers of choice to show similarities and differences. Present and explain graphic organisers to the class.	• Compare and contrast content	Graphic organisers demonstrate accurate comparison of the texts read. Oral presentations provide clarity and evidence of the comparisons made.
Engage in a teacher led discussion focused on explaining and developing an understanding of story plots using the Plot diagram below: 	• Identify components of a plot • Discuss story plots	Discussion focused on highlighting the elements of story plots as well as helping students to develop an understanding of plot structure.

Work with their teacher to identify a story title relating to air pollution. E.g. "The 2015 Riverton Fire" or "Dana's Jamalco Mud Pit". Work in small groups to develop a plot based on parts assigned by the teacher (Grp 1 – Exposition, Grp 2 – Rising Action, Grp 3-Climax, Grp 4 – Falling Action, Grp 5-Resolution). Collaborate with teacher to combine different parts of the plot to create complete plot. Work in groups to present their part in a dramatic format.	• Create plot • Analyse plot	Plot highlights the various components studied (exposition, rising action, climax, falling action, resolution) and evidence the story title. Dramatic presentations depict clear understanding of the plot.
Read grade level text and identify the different parts of the plot using plot diagram as a guide. Work with their peer to analyse the plot in parts and as a whole make comments on sticky note pads. Share their findings with the class.	• Analyse plot in text • Comment on story plot	Sticky note pads reflect accurate identification of the plot components and comments that demonstrate clear understanding of the plot of the story read.
Work in small groups to research and present on various poetic devices (metaphor, similie, alliteration, onomatopoeia) assigned by the teacher. Present their findings citing appropriate examples.	• Explain poetic devices	Presentations show evidence of research, accurate content, and appropriate examples.
Use reader response journal to record and comment on the use of poetic devices in the poems read/heard. E.g.	• Analyse poetic devices	Reader response journal conveys thorough understanding of the use of various poetic devices to enhance understanding.
Select and reflect on grade level text read/herad during the unit. Use reflective journal to document personal reflection and responses to the text.	• Reflect on text read/heard • Critique text read/heard	Written reflections depict personal responses and reactions to the text based on students' experiences.

READING FOR INFORMATION (RESEARCH & STUDY SKILLS)		
ATTAINMENT TARGETS	**OBJECTIVES**	
• Research activities on issues and interests by generating ideas and exploring texts using a range of strategies • Identify and use text features to support navigation of texts, retrieving and synthesize information gained from a range of sources	Students should be able to… • Use text features learnt for a variety of purposes • summarize and synthesize information from various sources • Prepare a simple bibliography (include: title, author, copyright, and publisher) • Use information obtained to design, produce and present completed research projects • Work collaboratively with peers to complete research process • Reflect on and identify their strengths and weaknesses as researchers	
ICT ATTAINMENT TARGETS: COMMUNICATION AND COLLABORATION – Use technology to communicate ideas, information and understandings for a variety of purposes. RESEARCH, CRITICAL THINKING AND DECISION MAKING Use technology to develop a logical process for decision making and problem solving. DESIGNING AND PRODUCING – Use technology to design and produce multimedia products to demonstrate their creative thinking.		
SUGGESTED TEACHING AND LEARNING ACTIVITIES **Students will:**	**KEY SKILLS**	**ASSESSMENT CRITERIA**
Observe and take notes as teacher models using *Think Aloud* to generate subheadings from a main research topic. Participate in a teacher guided discussion to reflect on the processes engaged in by the teacher during the demonstration.	• Observe and take notes • Participate in discussion	Notes taken are relevant to the demonstration and the processes engaged in by the teacher. Discussions focused on highlighting and developing an understanding of the processes engaged in during the demonstration.
Work in small groups to select research topic relating to air pollution from a basket prepared by the teacher. Work in their groups to use graphic organisers to break down the topic in subheadings. Collaborate with the teacher to turn the subheadings into questions.	• Simplify research topics • Formulate research questions •	Subheadings that reflect the research topic selected. Questions accurately formulated using subheadings generated

Work in group to review text features previously learnt. Engage in whole class discussion to share information.	• Review text features • Engage in discussion • Work collaboratively	Discussion highlights text features previously learnt and how they may be effectively used in the research process as well as the kinds of information they provide
Examine a sample research plan prepared /sourced by the teacher. Engage in a teacher led discussion focused on the elements *(research questions, data collection instrument, data collection sources, research participants, presentation format etc.)* included in the sample plan. Work in their small groups to develop a research plan using the sample plan as well as information garnered from the discussion as a guide. 	• Examine research plan • Comment on research plan • Construct research plan	Discussions focused on highlighting and developing an understanding of the elements to be included in a research plan. Research plan accurately completed and reflects elements taught (*research questions, data collection instrument, data collection sources, research participants, presentation format etc.)*
Use summary writing techniques previously learnt to summarise information from sources consulted during data collection	• Summarize information	Summaries written demonstrate alignment with the research topic and highlight the main idea and supporting details garnered from the research.
Apply the SQ3R method when consulting and extracting information from various sources	• Use study skills technique	Information accurately synthesized and presented in a coherent manner.

Survey- scan/look at the text structures **Q**uestion- while surveying **R**ead- look for answers to the questions; pay more attention to text structures **R**ecite- ask yourself further questions, reproduce information in your own words **R**eview- recall the information, add more notes, tell it to someone	• Synthesize information gathered	
Source articles from various newspaper clippings and magazines relating to the research topic. Organize them in an appendix to support their research findings.	• Extract information • Summarize information	Articles extracted reflect an alignment with the research topic and is presented in a structured way.
Work in groups to examine teacher prepared/sourced sample bibliographies (*each group will be assigned citation for a different type of source, e.g. internet, newspaper etc.*) depicting principles (type of information included, how author's name is written, where specific details are written etc) for citing different sources of information. Continue working in their groups to plan and present their findings in a creative way based on the source they were assigned.	• Examine bibliography • Comment on elements of a bibliography	Presentations reflect clear and accurate understanding of how to cite different sources in a bibliography.
Work in their groups to prepare bibliography to reflect sources consulted for their group research project. Add to their completed research project.	• Prepare bibliography	Bibliographies are accurately written to reflect all sources consulted during the research process.
Combine all elements of the research to design, produce and present a completed research project using presentation format originally chosen. Publish completed research project in community library, school library, class library and or present findings during school PTA.	• Produce and present completed research	Completed research project reflect the research process as well as all research concepts taught *(research plan, data collection, evaluating sources, synthesizing information, bibliography etc.)*
Use double entry journal to reflect on the research process engaged in, highlighting challenges encountered and how they were addressed as well as what they have learnt from the process.	• Engage in reflective practice	Journal entries capture students reflection on the research process and what they have learnt

Use Research Process Reflection Map to reflect on the research process engaged in, highlighting challenges encountered and how they were addressed as well as what they have learnt from the process.  	• Engage in reflective practice	Reflection map evidences students' engagement in critical reflection on the research process.

LANGUAGE STRUCTURE (GRAMMAR & CONVENTIONS)	
ATTAINMENT TARGETS	**OBJECTIVES**
• Write sentences, paragraphs and extended pieces which are grammatically accurate and correctly punctuated, using SJE and JC appropriately • Use and adapt a range of sentence structures according to context, distinguishing between SJE and JC	• Use subject verb agreement with collective nouns • Use verb tenses correctly in a variety of written forms • Apply correct use of semi-colon and quotation marks • Show correct agreement of pronouns and antecedents (noun it replaces) • Use pronouns correctly as the first, second and third person (nominative, objective, possessive) • work collaboratively with peers to effectively complete pair/team
ICT ATTAINMENT TARGETS: • COMMUNICATION AND COLLABORATION - Use technology to communicate ideas, information and understandings for a variety of purposes.	

- RESEARCH, CRITICAL THINKING AND DECISION MAKING Use technology to develop a logical process for decision making and problem solving.
- DESIGNING AND PRODUCING – Use technology to design and produce multimedia products to demonstrate their creative thinking.

SUGGESTED TEACHING AND LEARNING ACTIVITIES **Students will:**	**KEY SKILLS**	**ASSESSMENT CRITERIA**
Work In small groups to review collective nouns and coin a definition based on their understanding then make oral presentation to class.	• Review collective Nouns	Accurately demonstrates understanding of collective nouns.
View a teacher prepared/sourced poem/dub on air pollution [projected on a screen or hand-out]. Observe the use of collective nouns in the poem/dub and engage in a discussion about how collective nouns agree with verb in a sentence [*Collective nouns represent the singular form of a subject].* Example: The <u>crowd</u> of people <u>was</u> watching as the smoke went up in the air. *[**Crowd** represents the singular form of the subject and **was** represents the singular form of the verb.]*	• Analyse the use of subject verb agreement with collective nouns • Discuss the use of subject verb agreement with collective nouns	Discussion reflects clear understanding of the use of collective nouns and subject verb agreement.
Rewrite poem/dub previously sourced by the teacher replacing a phrase/group of words with collective nouns. Example: <u>*A number*</u> of soldiers patrolled the Riverton landfill each day. <u>*An army*</u> of soldiers patrolled the Riverton landfill each day. Review sentences from the passage to ensure that the verbs agree with the collective noun.	• Apply knowledge of collective nouns	Collective nouns accurately positioned in sentences.

Use collective nouns from previous lesson to create a song or jingle of four lines. Pay attention to the agreement of subject and verb. Example: *A fleet of ship is sailing* *As a school of fishes Mary was scaling.* Make oral presentation to class and have students critiquing and identify the agreement between the collective noun and the verb.	• Use subject verb agreement with collective nouns	Song /jingle reflect accurate use of subject verb agreement with collective nouns.
Review verb tense by observing sentences on sentence strips. Identify what tense the sentences are written in. Example: The mountains <u>are</u> tall and white. The hurricane season <u>ended</u> in the month of June. The speaker of the House <u>will finish</u> her term in May of 2016. Each verb is used in a different tense. • Are- present tense • Ended- past tense • Will finish- future tense Note: • Present tense expresses an unchanging, repeated, or reoccurring action or situation that exists only now. • Past tense expresses an action or situation that was started and finished in the past.	• Review Verb Tense • Identify verb tense	Discussion echoes a clear understanding of the correct use of verb tense.

• Future tense expresses an action or situation that will occur in the future Engage in discussion which establishes the reasons why they identified the sentences as being present, past or future tense. Then listen as teacher reads a number of sentences aloud to identify the tense verb heard in each sentence.		
Listen to an audio clip of teacher prepared story to point out the past tense verbs heard by snapping fingers/stomping feet. Select verb cards to accurately complete sentences on board *Ex. We _____ the garbage in the correct bin.* *[place/ placed]* Then engage in a teacher led discussion about the fact that the past tense is signalled using the "ed". Review the rules for making a verb past tense.	• Review past tense verbs • Use past tense verbs	Past tense verbs accurately identified. Sentences completed with the correct verb tense card. Discussion focused on the use of past tense verbs.
Write an expository/narrative paragraph about an instance of air pollution they might have experienced or read about in the past. Proof read pieces paying close attention to use of the correct verb tense [Past tense]. Then critique the pieces previously recorded by teacher as they are played back to the class.	• Use past tense verbs • Critique writing pieces	Expository/narrative paragraph reflects the correct use of past tense verbs.

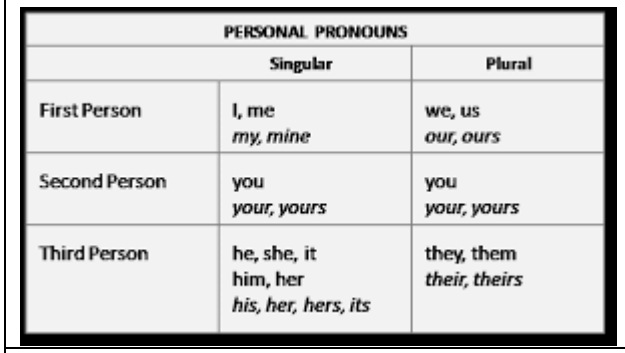
Work in pairs, to interview their classmates for a minute about each of the following: • Your arrangements for this evening. • Your intentions for the rest of the year. • Your predictions for the planet for 2020. Report on the content of the interview focusing on the future tense. Whole class will listen carefully to point out future tenses heard in each report. Participate in whole class discussion paying close attention to helping verbs used to identify future tense.	• Review future tense verbs • Record information in future tense	Report correctly demonstrates the correct use of future tense.
Change past tense sentence to future tense on teacher prepared hand-out /flip chart/ projected from multimedia.	• Use future tense verbs	Correct use of future tense to complete sentences.
Review with the guidance of your teacher the importance of punctuation mark. Discuss the rules which govern the use of semicolon with the use of examples provided by teacher. Provide their own examples and comment on the sentences of that of their classmates.	• Review of importance of punctuation mark • Comment on use of semicolon	Meaningful discussion that highlights the understanding of the correct use of punctuation especially semicolon.
Work in groups of 5 or 6 to connect sentences {first half [Column A] of a sentences to second half [Column B] of a sentence}. Rewrite sentences and insert semicolon accurately in each. *Column A* *Column B* *Donna was close to home* *however, I don't like dark ones* *I like chocolate* *She has travelled a long way* *Eg. Donna was close to home; she has travelled a long way.*	• Rewrite sentences • Comment on use of semicolon.	Sentences accurately paired and demonstrate the correct use of the semicolon.

I like chocolate; however, I don't like dark ones. Share answers with class and comment on how the semicolon is used.		
Proofread a teacher sourced article looking for missing and out of place semicolons, and commas used instead of semicolons. Eg. Call me tomorrow, you can give me an answer then. **Incorrect** Call me tomorrow; you can give me an answer then. **Correct** Complete sentences from chalkboard by placing the semicolon in the accurate place. Eg. You tried your best. Second place is a good finish.	• Proofread for correct use of semicolons.	Sentences accurately mirror the use of the semicolon.
Watch an interview on YouTube relating to air pollution focussing on the exact words of the speaker. Record sentences containing the direct words spoken using the quotation marks accurately. Then read aloud the sentences. Proof read sentences to check the correct use of the quotation marks. **OR** Work in pairs to read sentences from a teacher sourced hand-out. Report on what his/her partner read stating direct and indirect words [emphasize direct words].	• Record direct quotes of speaker • Use quotation marks	Sentences reflect the correct use of quotation marks. Discussion reflects accurate understanding of the use of quotation marks

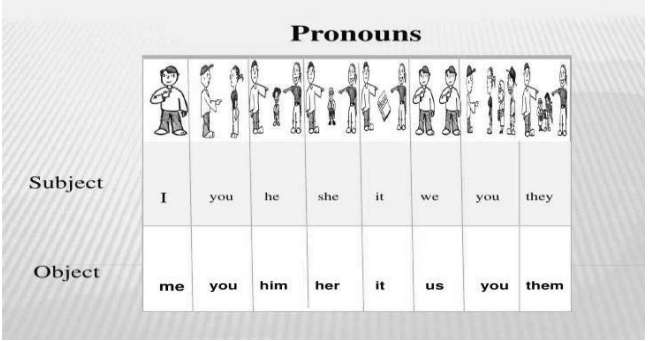
Example: *Sentence: Global warming is increasing in our society rapidly.* *Report: Sarah reported, "Global warming is increasing in our society rapidly."* Participate in teacher led discussion relating to the use of quotation marks in separating the exact words of a speaker using inverted commas [""].		
Search resource materials such as Children's Own, Observer, comic strips for sentences containing quotations to show the correct use of quotation marks. Read the quotations and discuss the use of the quotation marks with or without intervening phrases. Example: "Be Quiet," said Mother, "an exam is in progress." Cut out the quotations and use them to create a quotation poster.	• Search for quotations.	Meaningful discussion on the correct use of quotations in sentences.
In small groups, pretend you are having a dialogue with resident of a community that has experienced air pollution. Record the dialogue in their note books paying special attention to the correct use of quotation marks.	• Writing dialogue	Dialogue demonstrates the correct use of quotation marks.
Complete teacher prepared hand-out inserting quotation marks correctly in sentences. Eg. "Why was the media not allowed to video the site?" asked the reporter.	• Use quotation marks correctly.	Quotation marks correctly inserted in sentences.
Use Quick Write Strategy for students to record what they know about pronouns. Share with class in the form of a rhyme/jingle.	• Review pronouns	Rhyme/jingle reflects the clear understanding of pronouns.

<table>
<tr><td></td><td></td><td></td></tr>
<tr><td>Hunt for word cards with pronouns placed in disclosed areas in the classroom. Asked to make sentences with cards they have found. Whole class will critique sentences heard focusing on the correct position of the pronouns in each sentence.

Mount cards on a flip chart containing column headings; Singular and Plural.
Engage in whole class discussion led by teacher focusing on categorizing singular and plural pronouns as first, second and third person pronouns.

 
<table>
<tr><th colspan="3">PERSONAL PRONOUNS</th></tr>
<tr><th></th><th>Singular</th><th>Plural</th></tr>
<tr><td>First Person</td><td>I, me
my, mine</td><td>we, us
our, ours</td></tr>
<tr><td>Second Person</td><td>you
your, yours</td><td>you
your, yours</td></tr>
<tr><td>Third Person</td><td>he, she, it
him, her
his, her, hers, its</td><td>they, them
their, theirs</td></tr>
</table></td><td>• Construct own sentences
• Critiques sentences
• Categorize pronouns
• Use the correct pronoun as first, second and third person</td><td>Sentences constructed to reflect accurate use of pronouns.

Discussion demonstrates a clear understanding of pronouns in the first, second and third person both singular and plurals.</td></tr>
<tr><td>Complete teacher prepared worksheet identifying the pronouns used in each sentence [first, second and third person].
Eg. He walked to the grocery store. <u>third person singular</u></td><td>• Complete word sheet.
• Create sentences suing first, second and third person pronoun</td><td>Completed worksheet accurately reflects an understanding of</td></tr>
</table>

Then make three sentences of their own using first, second and third person pronouns.		first, second and third person pronouns. Sentences constructed demonstrate the correct use of first, second and third person pronouns.
Examine sentences on teacher prepared charts by supplying the pronouns which may be used to replace the nouns. *Examples:* *Mary gave Peter a present.* ***She** gave **him** a present* Engage in a teacher led discussion about pronouns being used as subject or object within a sentence [*Subject pronouns will be in place of the subject of the sentence, while object pronouns will be in place of the predicate*].  	• Analyse sentences • Supplying pronouns • Replace nouns with pronouns. • Discuss the use of pronouns	Sentences demonstrate the correct pronouns used to replace the nouns. Meaningful discussion reflects the understanding of the use of subject and object pronouns in sentences.

Circle all the pronouns on a teacher sourced passage or newspaper articles [expository/narrative]. Then comment on how pronouns are used [Object or Subject]. *Eg: **I** will never go on holiday with **you** again!*	• Identify subject or object pronouns	Pronouns accurately identified. Comments made regarding the use of object/subject in article is meaningful and appropriate.
Fold a sheet of brightly coloured copy paper in half lengthwise (hot-dog style). Then cut the top layer to the fold to make two flaps. On one, they print "Subject Pronouns," and they write "Object Pronouns" on the other. Under the flaps, students will list the appropriate examples and add sentences using each correctly. Share sentences with class.	• List subject and object pronouns • Use subject and object pronouns	Sentences reflect the correct use of subject and object pronouns.
Work in pairs or small groups to insert appropriate pronouns on sets of cards with printed sentences. Then use the cards with a board game of their choice by answering the question correctly before spinning, rolling dice, or otherwise taking a turn by the game rules.	• Insert pronouns into sentences.	Pronouns correctly inserted in sentences.

COMMUNICATION (WRITING)	
ATTAINMENT TARGETS	**OBJECTIVES**
• Develop approaches to the writing process to enable them to organise their ideas into a coherent structure including, layout, sections and paragraphs	Students should be able to… • Analyse and differentiate between the statement and the instruction in writing prompts

• Write well-constructed paragraphs which have linking sentences within and between them • Use language and text forms appropriately and with imagination to create vibrant and engaging texts	• Apply the stages of the writing process in composing various forms of writing (journals, stories, friendly letters, poetry, etc….) • Write cohesively with attention to organization, support, and elaboration • Use figures of speech – simile, metaphor, personification and onomatopoeia to enhance writing style • Select and justify pieces of writing that they think reflect their growth and competence as writers

ICT ATTAINMENT TARGETS:

- COMMUNICATION AND COLLABORATION – Use technology to communicate ideas, information and understandings for a variety of purposes.
- RESEARCH, CRITICAL THINKING AND DECISION MAKING- Use technology to develop a logical process for decision making and problem solving.
- DESIGNING AND PRODUCING – Use technology to design and produce multimedia products to demonstrate their creative thinking.

SUGGESTED TEACHING AND LEARNING ACTIVITIES **Students will:**	**KEY SKILLS**	**ASSESSMENT CRITERIA**
Engage in a teacher led discussion focused on highlighting and developing understanding of the difference between a statement and an instruction. Collaborate with their teacher to examine a Writing Prompt to select and rationalise for the portion that they identified as the statement and that which was identified as the instruction. E.g. *"Your aunt who lives abroad has promised you a birthday gift. Write a letter to her telling her the gift you would like, describe the gift and say why you would like that gift."* *Statement – red* *Instruction - purple*	• Participate in discussion • Examine writing prompts	Discussions focused on guiding students to develop an understanding of the difference between a statement and an instruction as outlined in a Writing Prompt.
Be randomly selected by the teacher to select a writing prompt from a bag. Read it aloud to the class and identify the statement and the instruction. Engage in class discussion to explain the process of identifying the two components.	• Differentiate between statement and instruction	Statement and instruction components of the Writing Prompts accurately identified.

Work in small groups to review the stages of the writing process. Use any creative method to present their work to the class *(students do not necessarily need to label the processes. These labels may be provided by the teacher)*	• Review writing process	Presentations are meaningful and focused on highlighting and explaining the stages of the writing process.
Engage in a teacher led discussion focused on reviewing and refreshing students' memory of the writing process. Peruse a teacher prepared/sourced chart to examine the stages as well as activities that may be engaged in at different stages of the process.	• Participate in discussion • Review the writing process	Discussion focused on reviewing the stages of the writing process as well as activities/materials that may be utilised at the different stages.
Work in small groups to conduct a mini research to identify and present on different forms of writing (poems, stories, friendly letter etc.) studied throughout the year. Select examples of the form assigned to their group and make a list of the elements that are specific to that particular form. Present their findings along with at least two grade level appropriate examples.	• Conduct research • Explain forms of writing • Cite examples of forms of writing	Presentations focused on explaining the form of writing assigned as well as outline the elements and examples specific to that form. Explanations provide accurate information relating to the specific form assigned.
Work in pairs to select a Writing Prompt from a bank established by the teacher. Analyse the prompt to identify the statement and instruction components as well as the form of writing that is required (story, journal entry, poem, friendly letters etc.). Use the stages of the writing process as a guide to composing their written pieces. Record/track their progress in a portfolio, ensuring all materials used at	• Analyse writing prompts • Apply the writing process	Statement and instruction components of the Writing Prompts accurately identified.

the different stages are recorded. ***(This activity may be extended outside of the regular contact time and may span a number of weeks based on students' ability).***		Written pieces reflect use of the writing process as well as the form and content outlined in the Writing Prompt. Portfolios track/record students' actions and progress from the beginning stage (pre-writing) to the production stage (publishing). Portfolio also includes all materials used/consulted throughout the process.
Work in small groups to research and present information and examples of similes, metaphors, onomatopoeia and personifications.	• Review figures of speech	Presentations result in the sharing of correct information and examples of the targeted figures of speech
Work in groups to identify a variety of texts with examples of the targeted figures of speech and compile in a booklet format. Exchange booklets in groups and engage in a figures of speech scavenger hunt. Use the time limit given by the teacher or group leader to hunt for examples of the figures of speech and categorise them. The groups that was able to find the most examples wins the game	• Identify figures of speech • Categorise figures of speech	Figures of speech correctly identified and categorised

Compose short poems (cinquain, end rhymes , free verse etc.) and stories that employs the use of figures of speech to add vibrancy to the text. Examine written work to ensure that at least 3 figures of speech studied are utilised. Mount completed work in the class for further study and reference.	• Use figures of speech	Composed pieces demonstrate good use of figures of speech to add vibrancy and clarity to written work
Participate in a Young Writers' Day activity for the class, organised by the teacher. Showcase pieces of their writing that reflect their growth and competence as writers. Conference with their peers, teacher, visiting - parents, students and teachers explaining reasons for their choices.	• Engage in reflection • Comment on choices made	Written pieces selected exemplify students' growth and competence as writers. Explanations sufficiently satisfy students' reasons for choosing selected pieces.

Learning Outcomes:

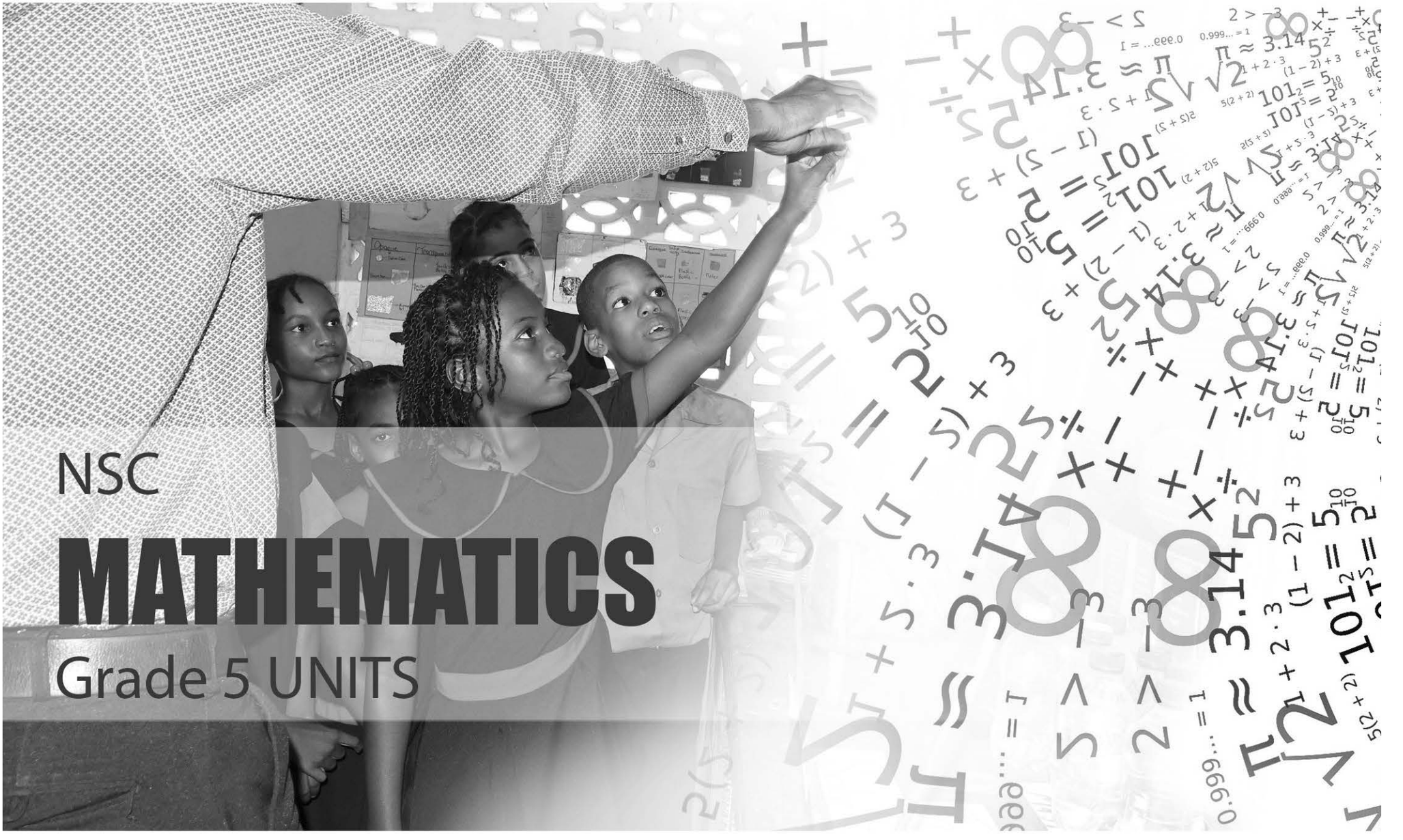
Students will be able to:

- ✓ Demonstrate active listening and appropriate speaking techniques when communicating with their peers and others
- ✓ Build word recognition skills by reading grade appropriate sight words and using word structure and context clues to aid decoding
- ✓ Demonstrate improvement in the quality of their writing by applying stages of the writing process
- ✓ Apply techniques of summarizing and inference to determine meaning from texts
- ✓ Utilise various research techniques and strategies to conduct mini research
- ✓ Demonstrate competence in the use of the structures and conventions of Standard Jamaican English

Points to Note:	**Extended Learning**
• When introducing a strategy to students, teacher should first model, give them guided practice, then allow them to practice the strategy independently (I do, We do, You do).	Have students utilise reflection maps and activities to reflect on and improve their performance and attitude in other subject areas.

▸ For the research and communication strands some activities may be extended outside of the regular contact time and may span a number of weeks based on students' ability and availability of resources ▸ Resources (charts, PowerPoint etc.) referred to may be sourced or prepared by the teacher ▸ All reflection activities should be emphasised and utilised throughout the term on an on-going basis	Utilise the writing process in composing written pieces in other subject areas. Engage in using the speaking and listening skills learnt during public speaking and presentation exercises Practice the use of grammatical structures learnt in everyday authentic speaking and writing situations Conduct mini research in Social Studies and Science utilising all the research elements learnt – research plan, summarising and synthesizing information and composing bibliographies Make use of word recognition strategies and skills when reading content area texts.
Resources:	**Key Vocabulary:**
• Science text(s) • Social Studies texts • Class reader(s) with stories, poems, expository pieces related to air pollution • Supplementary reading materials • Multimedia projector and laptop or overhead projector • 5 fingers retelling chart • Brochures – ODPEM, NSWMA, NEPA • 3-2-1 strategy poster • Newspaper and magazine articles • Sample writing prompts • Double entry journal templates • Reader response journal template • Research reflection map • Story plot diagram • Sample research plan	• Verbal and non-verbal communication • Paraphrase • Summarise • Air pollution • Pollution • Retellings- written and oral • Plots • Poetic devices • Bibliography • Synthesize • Collective nouns • Subject/verb agreement • Semi-colon • Quotation marks • Pronouns

• Sample bibliography • Chipboard/cardboard • Newsprint • Puzzles – crossword and jigsaw • Graphic organisers	• Antecedents • Statement • Instruction • Writing process
Links to other Subjects: The unit allows links to other subject such as • Science (pollution) – Caring for the environment - Preventing Air Pollution - • Social Studies (people, organizations etc.) – How they help to prevent Air Pollution • Health and Family Life Education – Managing / Coping with Air Pollution • Physical Education – Awareness of the Effects of Air Pollution • Information Technology – Using and manipulating the Internet	



NSC

MATHEMATICS

Grade 5 UNITS

MATHEMATICS PHILOSOPHICAL STATEMENT

Internet access has so changed the information landscape, and technological developments have so revolutionized the means available to either create or solve problems, that mathematical literacy is today as important as the ability to read text. All students must possess understanding of basic computation, statistics and geometry in order to make an informed response to the global environment of the twenty first century in which they live.

Mathematics contributes to the process of inquiry as a means of solving problems. It provides the opportunity for learners to be creative and inventive and in doing so, empowers them to construct their own mathematical knowledge to make sense of the physical, social, technological aspects of their environment.

The Mathematics Curriculum serves as a real life context for learners and teachers to engage in meaningful activities that are relevant to life, including their languages, cultures and everyday experiences beyond the walls of school. The Mathematics Curriculum from Grades 1-9 challenges and inspires learners to:

a) Use mathematical concepts and processes to interpret the world
b) Make connection between their previous mathematical knowledge to new situations
c) Communicate mathematical ideas and processes that have helped them to understand their experiences and refine their problem solving skills
d) Explore in a variety of ways, the application of mathematics to problems in their everyday life
e) Reflect on their experiences and decisions and make adjustments to their prior conceptions or meanings of situations
f) Develop attitudes such as perseverance, honesty and courage as they manipulate mathematical concepts and skills and engage in critical reflective thought

OVERVIEW OF SUBJECT CONTENT GRADE 5 MATHEMATICS

TERM 1	TERM 2	TERM 3
Number (5 weeks) ● Representation of Sets ● Number value ● Types of numbers	**Number (4 weeks)** ● Computing with fractional numbers: addition, subtraction and multiplication. ● Approximation, estimation and mental calculation. ● Computing with whole numbers: division of five digit numbers by up to three digit numbers.	**Number (3 weeks)** ● Use of calculator (four operations) ● Roles of Financial Institutions ● Problem Solving Procedures
Measurement (4 weeks) Units of measurement: length, mass, temperature and liquid Conversion between units of measurement (time, length, liquid and mass).	**Measurement (2 weeks)** Relationship between units of measurement. Perimeter Units of area. Volume	**Geometry (4 weeks)** Make and explore Geometric shapes: pentagon, hexagon, heptagon and octagon. Lines of symmetry
Geometry (2 weeks) Types of lines and angles	**Geometry (3 weeks)** Make and explore Geometric shapes: triangles and Quadrilaterals. Lines of symmetry	**Algebra (2 weeks)** Using variables: application of Algebra
Statistics and Probability (3 weeks) Sampling/population Display and interpret information	**Algebra (2 weeks)** Using variables: number sentences. Using variables: substitution.	**Statistics and Probability (2 weeks)** Measures of central tendency. Outcomes of an event.

Aims

The study of Mathematics should enable students to:

- Acquire the necessary mathematical skills and learn concepts that will be used in real life situations and related disciplines.
- Develop the necessary processes for the acquisition and application of mathematical concepts and skills.
- Recognise and integrate mathematical ideas with other disciplines.
- Develop positive attitudes toward mathematics.
- Make effective use of a variety of mathematical tools (including information and communication technology) in the learning and application of mathematical concepts and skills
- Produce imaginative and creative products arising from mathematical concepts and skills.
- Develop the abilities to reason logically, communicate mathematically, learn independently and cooperatively.

The role of Mathematics in the curriculum

Students need to develop the necessary mathematical competence to function in society. This includes the ability to count, measure, handle money and do straightforward calculations with confidence. Students will also be able to conceptualize spatial properties, gather and graphically represent data in different ways, manipulate mathematical ideas or apply mathematical knowledge to new situations and to communicate these effectively. Competence within Mathematics contributes to learning in all other subjects.

Contribution to the competencies

Mathematics contributes to the three Framework competencies: knowledge, skills and attitude. The subject is an ideal context for the development of critical thinking and problem solving skills, and for making judgments. It should provide opportunity to work independently and in teams.

Range of activities

Students should be involved in a range of practical activities through which they can explore mathematical properties and relationships, where they plan their own investigations and explore different ways of solving problems. By learning mathematics in a practical way, students should be able to relate its operations and principles to real life situations. Wherever possible, students should explore the mathematical uses of a range of ICT equipment.

Standards

There are five Strands with distinct Standards within them.

STRANDS					
Number		**Measurement**	**Geometry**	**Algebra**	**Statistics and Probability**
STANDARDS					
Number Representation Know the value of numerals, associate them with their names, numbers, ordinals and use concrete objects to model patterns, expressions and numbers.	**Number Operation and Application** Use the basic operations, number relationships, patterns, number facts, calculators and appropriate software to compute and estimate in order to solve real world problems involving fractions, percentages and decimals.	Use the correct units, tools and attributes to estimate, compare and carry out the processes of measurement to given degree of accuracy.	Explore paths, geometric shapes and space and make generalization about geometric relationships within the environment.	Employ algebraic reasoning through the use of expressions, equations and formulae to interpret, model and solve problems involving unknown quantities.	Collect, organise, interpret and represent data and make inferences by applying knowledge of statistics and probability.

Strand: Number			
Standards	**Grade 4**	**Grade 5**	**Grade 6**
	Attainment Targets • Know and use the values of numerals and associate them with their names, numbers and ordinals. • Operate with numbers and number patterns. • Understand and apply fractional ideas. • Explain the processes of the basic operations, use estimation appropriately, and demonstrate proficiency with basic facts.	***Attainment Targets*** • Model patterns, expressions and number relationships using concrete objects. • Make and interpret Venn diagrams. • Use computation, estimation and calculators appropriately to solve real world problems including problems with fractions and decimals.	***Attainment Targets*** • Use models to explain their conceptual understanding of rational numbers (fractions). • Make and interpret Venn diagrams. • Use computation, estimation and calculators appropriately to solve real world problems including problems with fractions and decimals. • Know the value of numbers and associate them with their names and numbers. • Use ratio to solve real world problems.
	Benchmarks	**Benchmarks**	**Benchmarks**
Number Representation Know the value of numerals, associate them	Use knowledge of sets to describe the set, name and list their elements/members.	Describe a set and differentiate between the set of real numbers.	Identify members of a set and associate same with the property of the given set.

with their names, numbers, ordinals and use concrete objects to model patterns, expressions and numbers.	Read and write number names, and numerals using the Hindu – Arabic Place Value System up to 7 digits.	Read and write number names, and numerals using the Hindu – Arabic Place Value System up to 8 digits.	Read and write number names, and numerals using the Hindu – Arabic Place Value System to include exponential form.
Number Operation and Application Use the basic operations, number relationships, patterns, number facts, calculators and dynamic software to compute and estimate in order to solve real world problems involving fractions, percentages and decimals.		Demonstrate an understanding of the use of numbers and types of numbers to include; prime, composite and fractional numbers.	Demonstrate an understanding of the use of numbers; number properties and types of numbers; prime factors and fractional numbers.
	Compute with whole numbers accurately and fluently; use these skills to find answers in realistic problem situations. *Model the number operations: addition and subtraction of two digit numbers.* *Model the number operations: multiplication of four digit numbers by up to two digit numbers.* *Model the number operation: Division of five digit numbers by up to two digit numbers*	Compute with whole numbers accurately and fluently; use these skills to find answers to realistic problem situations. *Model the number operations: division of five digit numbers by up to three digit numbers.*	
	Compute with fractional numbers quickly and accurately; use these skills to find answers in realistic problem situations. *Model the number operations: addition and subtraction.*	Compute with fractional numbers quickly and accurately; use these skills to find answers in realistic problem situations. *Model the number operations: addition, subtraction and multiplication.*	Compute with fractional numbers quickly and accurately; use these skills to find answers in realistic problem situations. *Model the number operations: addition, subtraction, multiplication and division.*
	Use approximation and estimation with numbers involving division.	Use approximation and estimation with numbers up to the nearest thousand.	Demonstrate the understanding of percentages in realistic situations. Use ratio as comparison in problem solving and decision making.
	Apply and justify the use of a variety of problem solving strategies in two step problems.	Apply and justify the use of a variety of problem solving steps in identifying missing facts.	Apply and justify the use of a variety of problem solving steps involving decimals and percentages.

	Use mathematical tools to reinforce proof and aid computation.		
		Know and use terms associated with financial institutions.	Demonstrate an understanding of financial institutions and their functions.

Strand: Measurement			
Standard	**Grade 4**	**Grade 5**	**Grade 6**
	Attainment Target • Explain and carry out the processes of estimation and measurement, including the selection of appropriately precise units.	***Attainment Target*** • Select appropriate units and tools to measure to the desired degree of accuracy.	***Attainment Target*** • Select appropriate units and tools to measure to the desired degree of accuracy. • Derive informally, and use formulae for measurement activities/situations.
	Benchmarks	**Benchmarks**	**Benchmarks**
Use the correct units, tools and attributes to estimate, compare and carry out the processes of measurement to given degree of accuracy.	Estimate and measure distances, and use these to solve related problems involving conversion between millimetres, centimetres, metres and kilometres.	Estimate and measure distances, and use these to solve related problems involving conversion between millimetres, centimetres, decimeters, metres and kilometres.	Use measurements in the environment.
	Read and write time and know the relationships between units of time.	Read and write time and know the relationships and compute with units of time.	
	Estimate and measure liquid capacity or volume, while converting between millilitres and litres.	Know, use and interpret relationships between units of measurement: liquid capacity or volume.	
	Estimate and measure mass while converting between kilograms and tonne.	Know, use and interpret relationships between units of measurement: mass.	Understand the concept of area; estimate and measure to solve related everyday problems.
	Understand the concept of temperature; estimate and measure using standard units.	Estimate and measure temperature in given situations.	Investigate, estimate and compute the volume of rectangular solids.

	Know the meaning of milli, centi, deci and kilo; choose and use appropriate units of measure.	Associate the measurement of a quantity (distance, volume/capacity, mass, temperature) with the units and instruments best used. Estimate and measure perimeter.	Associate the measurement of a quantity (distance, time, volume/capacity, mass) with the units and instruments best used.
	Estimate and measure distance and area using standard metric units.	Use the formula for area of a rectangle to compute the area of rectangular region; estimate the area of an irregular shape by counting squares.	Investigate the parts of a circle and identify the relationships that exist between them.

Strand: Geometry			
Standard	**Grade 4**	**Grade 5**	**Grade 6**
	Attainment Target • Identify, describe, compare and classify geometric figures and their properties.	***Attainment Target*** • Describe the relationships between and among geometric figures and explain spatial relationships. • Select appropriate units and tools to measure angles to the desired degree of accuracy.	***Attainment Target*** • Make generalizations about geometric relations and explore geometrical transformations.
	Benchmarks	**Benchmarks**	**Benchmarks**
Explore paths, geometric shapes and space and make generalization about geometric relationships within the environment.	Know that angles are measured in degrees and that one whole turn is 360°; compare and order angles less than, greater than or equal to 90° from different orientations.	Recognize horizontal, vertical and intersecting line segments. Estimate and draw acute, right, obtuse or reflex angles; use a protractor to measure and draw an angle to a suitable degree of accuracy.	Explore concepts of angle formation, naming and measuring.
	Explore the ideas of symmetry in geometric figures and shapes.	Identify common shapes and objects, and classify them by noting their properties; including their line symmetry.	Explore the ideas of symmetry in geometric figures and shapes found in the environment.
	Describe the location and properties of geometric shapes after a slide, flip or turn.	Describe positions using cardinal points and understand the concept of reflection.	Understand and use the concept of reflection within the Cartesian plane.

	Make and explore geometric shapes: polygons, non-polygons and compound shapes; and apply knowledge of their properties to problem solving situations.	Make and explore geometric shapes: non-polygons and polygons not exceeding 8 sides; and apply knowledge of their properties to problem solving situations.	Make and explore geometric shapes and solids, and apply knowledge of their properties to problem solving situations.
	Model and explore prisms (cubes and cuboids) by noting their properties and nets.	Model and explore pyramids (triangular and square base) by noting their properties and nets.	Model and explore polyhedron (tetrahedron and octahedron) by noting their properties and nets.

Strand: Algebra			
Standard	**Grade 4**	**Grade 5**	**Grade 6**
	Attainment Target • Explain the meaning and use of simple formulae. • Use open sentence to express relationships among quantities, model and explain the solution of simple equations, using diagrams and concrete materials.	***Attainment Target*** • Identify and explain basic algebraic concepts. • Use open sentences to express relationships among quantities, model and explain the solution of simple equations, using diagrams and concrete materials.	***Attainment Target*** • Interpret expressions and equations involving variables.
	Benchmarks	**Benchmarks**	**Benchmarks**
Employ algebraic reasoning through the use of expressions, equations and formulae to interpret, model and solve problems involving unknown quantities.	Generate and describe patterns and develop rules associated with them.	Investigate, describe and represent patterns; and develop generalization.	Investigate patterns, create algebraic expressions and make predictions.
	Represent and analyse algebraic expressions and equations.	Use operation symbols to complete number sentences; identify the order of operations given algebraic expressions.	
	Find the number that the symbol (a letter of the English alphabet or other pictures) represents to make a mathematical sentence true.	Substitute a number for a variable in a simple mathematical sentence.	Use substitution in formulae, algebraic sentences and inequalities in problem solving with up to two variables.
		Investigate changes in variables in algebraic expressions and equations.	Use arithmetic operations to solve simple equations and word problems.
		Understand and apply algebraic thinking in problem situations.	

Strand: Statistics and Probability			
Standard	**Grade 4**	**Grade 5**	**Grade 6**
	Attainment Target • Collect, organize, graph, describe and interpret data in a problem-solving context. • Identify and apply the mean averages as a measure of central tendency. • Explore the concept of chance.	***Attainment Target*** • Explore complex problems by gathering statistics from real-world situations. • Make and interpret a variety of graphs, charts and tables. • Distinguish among and apply the appropriate measures of central tendency (mean, median, mode) and dispersion (range). • Explore the concept of chance.	***Attainment Target*** • Make and interpret a variety of graphs, charts and tables. • Explain the relationship between a probability and the event that gives rise to this number.
	Benchmarks	**Benchmarks**	**Benchmarks**
Collect, organise, interpret and represent data and make inferences by applying knowledge of statistics and probability.	Distinguish between and identify a population and a sample.	Identify the characteristics of sampling techniques.	Identify patterns, describe and predict outcomes from data collected.
	Collect, organize, represent and present data.		
	Find and interpret the mean and median of a set of discrete data.	Discuss the uses of tables and graphs; draw simple graphs and interpret data represented in these graphs.	Discuss the uses of tables and graphs and solve related problems using data
	Interpret data presented in bar graphs, line graphs, pictographs and pie charts.	Estimate, calculate and interpret the mean, mode, median and range of a set of discrete data.	
	Understand and apply probability concepts when making predictions.	Understand and apply probability concepts; identifying possible outcomes of an experiment.	Understand and apply probability concepts; identifying all possible outcomes of an experiment.

UNIT OF WORK GRADE 5 TERM 1 Unit 1

Strand: Number

Suggested Time: 5 weeks

About the Unit

In this unit, students will:

- Describe and differentiate among subsets of real numbers.
- Read and write number names, and numerals using Roman Numerals and the Hindu-Arabic Place Value System up to 8 digits.
- Demonstrate an understanding of the use of numbers; number properties and types of numbers; whole, counting, prime, composite and fractional numbers.

Prior Learning

Check that students:

- Understand the concepts- of a set.
- Describe a set.
- Name and list members of any given set.
- Understand types of numbers.
- Name any set using braces.

Focus Question 1: In what ways are sets represented?	**BENCHMARK**: • Describe a set and differentiate between the set of real numbers.
Standard-Number Representation: Know the value of numerals, associate them with their names, numbers, ordinals and use concrete objects to model patterns, expressions and numbers. **ICT ATTAINMENT TARGET(S):** COMMUNICATION AND COLLABORATION – Students use technology to communicate ideas and information, work collaboratively to support individual needs, and contribute to the learning of others.	**OBJECTIVES:** • Describe a set as being finite, infinite or empty set. • Differentiate between sets of counting, whole, odd, even, prime, composite and fractional numbers.

SUGGESTED TEACHING AND LEARNING ACTIVITIES – Focus Question 1	KEY SKILLS	ASSESSMENT CRITERIA
Students will: • As a whole class, group living things in a variety of ways. • Name, describe and differentiate each group of living things based on types of sets e.g. empty, sub-, Universal, intersecting etc. • Apply the concept of types of sets to differentiate between counting, whole, odd, even, prime, composite and fractional numbers. • Display an array of items found in the classroom. Select some of the objects then identify the similarities of objects chosen. State the purpose or use of the set of things selected. Repeat with other objects. • In groups, be guided in writing an explanation on what was done during the class activity and share same with class. Write a definition for the term "set" and share same with class Teacher will guide discussion on set is a collection of items in no particular order that have something in common. • Collect group of items within the environment. Form their own sets based on objects assembled. Describe each set formed. • View a presentation on: "Types of Sets" i.e. finite, infinite, jointed, disjointed, null/empty. Note and define each type of set with examples. • Apply knowledge of types of sets to differentiate between types of numbers i.e. whole, odd, even, fractional, prime, counting, and composite. • Engage in a reading session on: "Venn Diagram". Be guided in representing types of numbers in Venn diagram through discussions and pictures. Represent list of numbers on Venn diagrams	Classify, develop logical reasoning, investigate/research, make observations, apply concepts, analyse, draw, critique, organize, collect, match, separate, problem-solve • Create/display sets • Describe sets • Define terms • Collect items • Apply types of sets to number type • Differentiate between types of sets • Classify types of sets • List number types on Venn diagram • Show set relationships • Participate in group	• Accurately define terms • Accurate display of sets • Correctly classify sets or subsets • Correct definition of key terms • Correctly represent sets of numbers on Venn Diagram • Work cooperatively in group

appropriately. ● Be guided in representing each set from Venn diagram using curly brackets/braces. Show set relationships using appropriate symbols (i.e. is a member of; is not a member of, is a subset of, is not a subset of) through discussion and visuals.	● Navigate digital content	
LEARNING OUTCOMES Students will be able to: ● Collect and classify sets ● Show the differences between sets ● Represent sets on Venn diagram ● Work cooperatively in groups		

POINTS TO NOTE:	**EXTENDED LEARNING:**
● The universal set is the set of every member under discussion. This would include members in the given subsets as well as members that are not in these sets ● A null set is an empty set ● A Venn diagram is a graphical representation of information ● An element can belong to more than one set	● Allow students to research further on Venn diagrams and John Venn. ● Have students use polygons with different attributes to demonstrate concept of sets. **Encourage** students to put together a portfolio on the various groups of living things. **Allow** students to use electronic devices to carry out further research on the various levels of the classifications of living things e.g. phylum, genus, species etc. **Challenge** students to represent groups of living things using one of each type of set being explored.

	Allow students to make entries in/on their journals/blogs based on the experiences gained on sets. **Challenge** students to design a flowchart depicting the classification of a group of living things using the concept of set.
RESOURCES Resource persons, strips of paper, markers, container, multimedia projector, electronic devices e.g. smart phones, laptop, tablets etc., teacher-generated worksheet/rubric *Website:* www.softschools.com/science/biology/classification_of_living_thing/ ● Laptop / Projector ● Accessories / Objects / Pictures	**KEY VOCABULARY** whole, counting, odd, even, composite, prime, fraction, null/empty finite/infinite jointed/disjointed, sets, Venn diagrams, grouping, collecting, subsets, empty/null sets, element, member, intersection, universal, disjoint, **LINKS TO OTHER SUBJECTS** Sciences: Biology Social Studies Information Technology

Prior Learning
Check that students:

- Distinguish between value, place value and face value of a number.
- Identify the value of whole numbers up to seven digits.
- Read and write whole numbers up to seven digits.

Focus Question 2: How do I manipulate decimals, fractions and other types of numbers?	**BENCHMARK:** Read and write number names, and numerals using the Hindu – Arabic Place Value System up to eight digits.
Standard-Number Representation: Know the value of numerals, associate them with their names, numbers, ordinals and use concrete objects to model patterns, expressions and numbers.	**OBJECTIVES:** ● Read and write whole numbers up to eight digits. ● Identify the place values of thousand, hundred, ten, tenth, hundredth or thousandth in numbers.
ICT ATTAINMENT TARGET(S): COMMUNICATION AND COLLABORATION – Students use technology to communicate ideas and information, and work collaboratively to support individual needs and contribute to the learning of others.	

SUGGESTED TEACHING AND LEARNING ACTIVITIES – Focus Question 2	KEY SKILLS	ASSESSMENT CRITERIA
Students will: • As a class or in groups, investigate the concept of a million by working with smaller numerical units, such as blocks of 10 or 100, and then expanding the idea by multiplication or repeated addition until a million is reached. Additionally, apply critical thinking to analyse situations and identify mathematical patterns that will enable the development of the concept of very large numbers.	● Tabulate information ● Write numbers in standard and expanded forms	● Correctly record information in table form ● Correctly distinguish between

• In groups, play games using counters and a place value chart to practice and reinforce place value concepts in base 10. Then repeat the game in base 5 and other bases to increase their understanding of regrouping. • In groups, create number cards from 0-9. Take turns selecting cards at random. Form 4-digit numbers from their selection. Tabulate numbers formed in numerals and in words. Read aloud numerals. Repeat process up to eight digits. • Indicate on Place Value chart the place and value of digits in each number created in the above. Then write numbers in standard and expanded forms. Share and compare results with members in other groups. • In groups, using Base Ten blocks (rods and units), represent the number 54. Show 54 in another way with blocks. Discuss among themselves how many different ways the number 54 can be shown using blocks. Draw a picture or write about what they did. Repeat process to represent numbers in hundred, thousand or use "digital abacus". With the teacher's assistance, students will manipulate the digital abacus for reinforcement. • In pairs, with sets of 255 popsicle sticks make as many groups of ten as possible. Put together 10 groups of ten in 1 pile. Write numerals to show how many piles, how many groups of 10, and how many ones. • Work with a partner, using base Ten blocks, show 96 (9 tens and 6 units). Now show 106. Tell their partners what they did. (added another 10) Now show 118. Tell their partners what they did. (added a 10 and 2 units) Repeat process using hundred flats and thousand cubes. • In groups, using Popsicle sticks in bundles of ten and singles show 35 with the sticks. Then add sticks to count up to 67. Record what was done (35 + 10 + 10 + 10 + + 2 = 67) Show and record different numbers using the same method.	• Share and compare results • Represent numbers concretely • Illustrate numbers • Work cooperatively • **operate electronic devices** • communicate ideas • develop logical arguments • collect and display • investigate • compute • critique • analyse • apply concepts • draw conclusions • make observations • identify • arrange • organize	standard and expanded forms • Correctly represent a given number in Standard and expanded forms • Active participation in group work

LEARNING OUTCOMES Students will be able to: • Record information in table • Show numbers in various forms • Cooperatively work in groups • Use selected ICT to explore place value principles		
POINTS TO NOTE	**EXTENDED LEARNING**	
• The purpose of the decimal point is to separate the whole number part of a number from the decimal part. • A decimal fraction is a number less than 1. Example 0.4, 0.28, 0.147 • A decimal number has a whole number part and a decimal part. Examples: -Decimal fraction 0.4; the value of the whole number part is four tenth -Decimal number 3.014; the value of the whole number part is three and the value of the decimal part is fourteen thousandth. • The decimal number 12.0 is read as twelve point zero and NOT twelve point '**O'- in other words it is the number 0 and NOT the letter O**	• Allow students to make their own place value chart up to eight places including whole and decimal numbers. • Encourage students to expand numbers up to eight digits. • Encourage students to make their own Base Ten manipulative. **Allow** students to explore the number pi, the constant ratio of the circumference to the diameter of a circle, has been calculated by super computers to many millions of decimal places. How many pages of printer paper would be needed to print out the first 1 million digits of pi? In 1874, William Shanks calculated pi to 707 decimal places by hand. How long might this task have taken? Discuss ways to find out. **Challenge** students on how long would it take to write the 707 places? Remember, Shanks was not only writing the digits but calculating them as well. Estimates by historians suggest that he spent years doing these calculations. Sadly, he made a mistake in the 527th place. A contemporary computer takes only a few seconds to match Shanks' output, without the mistake.	

	Challenge students to choose to play the game in many different bases. Usually, the smaller the base the more challenging the game, because sometimes students will need to make two or more trades in a single turn. Stop the students during the game and ask them which base they are using and how much their chips are worth. **Allow** students to write out a set of rules for how to play, "Land of Six." Students can then share their rules with the class. Offer time after each student's presentation for either verbal feedback or written feedback. **Allow** students to play in Land of 5, but the first player to reach a value of 100 chips wins. How will they know when someone has won? [4 reds will win the game since blues now have a value of 5 and reds now have a value of $5 \times 5 = 25$.] Allow them to play in different bases, but each time the winner must have 100 chips, and students have to determine how many chips of each colour are needed. **Challenge** students represent one base 10 numbers in two different bases and compare the results. What patterns do they observe between the representations in say base 4 compared to base 8? What is the greatest digit in base 4 and what is the greatest digit in base 8? Are more columns needed for one base than the other to represent the same base 10 number? If so, which base requires more columns and why?

RESOURCES	KEY VOCABULARY
Base ten blocks, Place value chart Popsicle sticks Hundred flats Thousand cubes Calculators One roll of transparent tape Scissors Making Your First Million Activity Sheet (https://illuminations.nctm.org/uploadedFiles/Content/Lessons/Resources/6-8/CountOnMath-AS-Million.pdf) A stopwatch, digital watch, or clock with second hand Internet-generated devices e.g. laptop, smart phones, tablets etc. Multimedia projector Chip Trading Activity sheet (https://illuminations.nctm.org/uploadedFiles/Content/Lessons/Resources/3-5/Chip%20Trading%20AS.pdf) Chip Trading Answer Key (https://illuminations.nctm.org/uploadedFiles/Content/Lessons/Resources/3-5/ChipTrading%20AK.pdf) Chip Trading Game Board (https://illuminations.nctm.org/uploadedFiles/Content/Lessons/Resources/3-5/Chip%20Trading%20Game%20Board.pdf) Yellow, blue, red, and green chips Six-sided or ten-sided dice Bowls with 10 chips of different colours Document camera	Million, tenth, hundredth, thousandth, digits, patterns, place value, value decimal number, decimal fraction, increase, decrease, compare, greater than less than, equal to, greater than or equal to, less than or equal to

Internet-generated devices e.g. tablets, laptops, smart phones etc. ● Computer / multimedia projector ● speakers and any other available technologies **LINK TO OTHER SUBJECTS** Sciences: Physics Information Technology Technical Vocational	

Prior Learning
Check that students:

- Know what are: whole, counting, odd, even, prime, composite and fractional numbers.
- List factors, common factors of a number.
- Write the multiples and common multiples of two or more numbers.

Focus Question 3: What relationships are there between numbers?	**Benchmark:** Demonstrate an understanding of the use of numbers and types of numbers to include; prime, composite and fractional numbers.
Standard - Number Representation: Know the value of numerals, associate them with their names, numbers, ordinals and use concrete objects to model patterns, expressions and numbers. **ICT ATTAINMENT TARGET(S):** 💻 COMMUNICATION AND COLLABORATION – Students use technology to communicate ideas and information, and work collaboratively to support individual needs and contribute to the learning of others. 💻 RESEARCH, CRITICAL THINKING, PROBLEM SOLVING AND DECISION MAKING – Students use appropriate digital tools and resources to plan and conduct research, aid critical thinking, manage projects, solve problems and make informed decisions. 💻 DIGITAL CITIZENSHIP – Students recognise the human, ethical, social, cultural and legal issues and implications surrounding the use of technology and practice online safety and ethical behaviour.	**Objectives:** ● Identify and distinguish between counting, whole, odd, even, prime, composite and fractional numbers. ● Identify the factors of a number. ● Identify common factors of two given numbers. ● Identify multiples of a number and the common multiples of two or more numbers.

SUGGESTED TEACHING AND LEARNING ACTIVITIES – Focus Question 3	KEY SKILLS	ASSESSMENT CRITERIA
Students will: In pairs, design and create their own game boards by experimenting and by making mistakes about what factors and products (alternate game to bring out multiples and types of numbers i.e. odd, even, prime, composite) to include in a game. In groups, design and make cartons to package eggs. Determine all of the possible ways to arrange eggs into rectangular packages. • Recall, note and define the key terms: whole, counting, even, odd, fractional, prime and composite numbers. Practise the time table of prime numbers (e.g. 2, 3, 5, 7...). Engage in a "Bean Bag" activity. Throw a bean bag to a student. Call a multiplication fact using prime numbers. Take turns catching the bean bag calling a similar multiplication fact using prime numbers correctly. Continue process until everyone has had a turn. • Practise counting everyday things around the classroom. Be further encouraged to identify different types of numbers in newspapers, books, and items such as phones and computers. • Be guided in identifying number patterns in the above items. Look at other patterns and sequences besides numbers, for example, ask to complete sequences i.e. A, F, K, ...; or 0, 1, 4, 9,.. • Explore and discuss situations in real life when it is necessary to round off mixed numbers/decimals to the nearest whole number and decimals to the nearest tenth, hundredth or thousandth (e.g. in the absence of some Jamaican coins). • Be encouraged to give other real life examples of fractions.	• Design • Create • Analyse • Synthesize • Apply concepts • Critique • Develop logical argument • Deduce • Differentiate • Draw conclusions • Make observation • Tabulate • Infer • Categorize • Display • Identify patterns • Classify • Organize • Summarize • Categorize • Recall key terms Practise counting • Identify types of numbers • Detect number patterns	• Correctly define key terms with examples • Correctly complete number patterns • Correctly list factors and multiples of a given number

• View an interactive website on prime and composite numbers to revise prime and composite numbers. Be Encourage to come to the board and write examples. • Be reminded by teacher that a product is the result of two or more multiplicands and that a factor is a number that divides exactly into another number. Identify products of given pairs of numbers. Repeat process with common factors and then do the same with multiplication, multiples and common multiples.	• Discuss real life situations in rounding decimal numbers/fractions • Observe moral principles when using digital material	
LEARNING OUTCOMES Students will be able to: • Define key terms with examples • Identify patterns and sequence • List factors and multiples • Conduct safe browsing or research to find information on prime and common multiples		

Points to Note:	**Extended Learning:**
• Counting numbers start at one and whole numbers start at zero. • The Factor tree is a graphic representation of factorizing numbers and can be used to help students develop a deeper understanding of the concept of factors. • A prime number has only two distinct factors, one and itself. • A composite number has more than 2 factors. • 2 is the only even number that is a prime factor. • The counting number one, is neither prime nor composite •	**Challenge** students to create a model for an egg container made in a different shape, such as a triangle or rectangle. Include the number of eggs that are possible for each shape. Ask if the total number of eggs can be found using multiplication. **Allow** students to look for patterns in arrays of numbers that are multiples of each other (ex: 6, 12, 18, and 24). An example of such a

	pattern would be that all arrays of 24 can be arrived at by doubling one side of an array of 12. **Encourage** students to carry out research on the economical, engineering and preservation of packaging of eggs. Present findings in creative ways. **Allow** students to reflect on the experiences gained throughout various aspects of the teaching/learning process in their journals or on blogs. **Allow** students to consider how a decimal fraction uses place value to show the size of the fraction. **Encourage** students in putting together a scrap book of different types of numbers in real life situation. **Challenge** students to write down prime numbers up to 100 and the prime factors of the composite numbers up to 20.
Resources: Internet-generated devices e.g. laptops, smart phones, tablets etc. Website: http://www.wikihow.com/Make-Your-Own-Board-Game Website for "Product Game": http://illuminations.nctm.org/Activity.aspx?id=4213 Website on Packaging Eggs: http://www.fao.org/docrep/005/y4628e/y4628e05.htm American Egg Board's web site ● Graph paper (or to create, use Dynamic Paper)	**Key vocabulary:** ● Patterns ● Sequence ● Factors ● Multiples ● Whole ● Odd ● Even ● Fractional ● Prime ● Composite ● Counting ● Game ● Array

• Egg cartons, various sizes • Plastic eggs or eggs made Paper Mache • Counters • Buckets/containers • Poster board • Markers • Bean bags • Newspaper • Magazines • Text books • Computer • Phones • Classroom • Internet • multimedia projector • prime and composite number song/rap LINKS TO OTHER SUBJECT: Sciences: Physics Information Technology Technical Vocational Social Studies Language	• Cartons • Design • Rectangle • Whole

UNIT OF WORK GRADE 5 TERM 1 Unit 2

Strand: Measurement

Suggested Time: 4 weeks

About the Unit

In this unit, students will:

- Estimate and measure distances, and use these to solve related problems involving conversion between millimetres, centimetres, decimetres, metres and kilometers;
- Read and write time and know the relationships and compute with units of time;
- Know, use and interpret relationships between units of measurement: mass, time, temperature, capacity, length, volume;
- Estimate and measure temperature in given situations;
- Associate the measurement of a quantity (distance, volume/capacity, mass, temperature) with the units and instruments best used.

Prior Learning

Check that students can:

- Read and write time;
- Show the relationships among units of time;
- Understand the concept of temperature;
- Estimate and measure using standard units.

Focus Question 1:	**Benchmark:**
Which units do I use when measuring various quantities?	• Read and write time, and know the relationships and compute with units of time. • Estimate and measure temperature in given situations.
Standard - Measurement: Use the correct units, tools and attributes to estimate, compare and carry out the processes of measurement to given degree of accuracy. **ICT ATTAINMENT TARGET:** COMMUNICATION & COLLABORATION - use technology to communicate ideas, information and understanding for a variety of purposes RESEARCH, CRITICAL THINKING, PROBLEM SOLVING AND DECISION MAKING – Students use appropriate digital tools and resources to plan and conduct research, aid critical thinking, manage projects, solve problems and make informed decisions.	**Objectives:** • Determine the decade/century in which an event took place given the year of the event. • Interpret and use the letters A.D. and B.C. after a year. • Calculate the time interval between two events. • Perform the four operations on units of time. • Record temperatures above or below zero. • Tell the difference between two temperatures when one or both is below zero.

💻 DIGITAL CITIZENSHIP – Students recognise the human, ethical, social, cultural and legal issues and implications surrounding the use of technology and practice online safety and ethical behaviour **Sub-Title**: Working with time and temperature		
SUGGESTED TEACHING AND LEARNING ACTIVITIES – Focus Question 1	**KEY SKILLS**	**ASSESSMENT CRITERIA**
Students will: • In groups, calculate elapsed time by using a timeline in completing various real life/daily activities. • In pairs, use various resources to choose travel dates, compare temperatures, estimate and calculate distances to a particular location. • Use the Jamaica Information Service (J. I. S.) Events Calendar web page to research and make an historical time line of major events in the history of Jamaica and the world. Then identify the decade/centuries in which they occurred. I. Timeline involving centuries may include Jamaica's independence, emancipation, adult suffrage, Christopher Columbus' arrival in Jamaica, the flood in Noah's days World War II) II. Timelines including decades may include Natural disasters (Sandy, Gilbert, Charlie, Ivan, Port Royal Earthquake, Japan Tsunami etc.) • Calculate the interval of times between any two of the events noted on the timelines. Focus on short and long time intervals. • Create various time schedules (homework, chores etc.) and then use them to solve problems involving the four operations. • Use calendar as a point of reference to solve problems involving time (how many years/weeks/days/hour/ to a special event).	Research dates of historical events Create and read time lines Calculate time Create schedule Solve problems Read/create stories with time Work in groups Browse and Search Navigate digital content Use search engine safely	Accuracy observed in displayed Time line usage Times schedule recorded accurately Correctly calculate Time intervals Temperature read and calculated Actively/cooperatively work in group Safely use search engine to navigate and search digital content

<table><tr><th>M</th><th>T</th><th>W</th><th>T</th><th>F</th><th>Sa</th><th>Su</th></tr><tr><td>-</td><td>-</td><td>-</td><td>-</td><td>1</td><td>2</td><td>3</td></tr><tr><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr><tr><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td></tr><tr><td>18</td><td>19</td><td>20</td><td>21</td><td>22</td><td>23</td><td>24</td></tr><tr><td>25</td><td>26</td><td>27</td><td>28</td><td>-</td><td>-</td><td>-</td></tr></table> • Read then create stories involving temperature including those below 0^0. Show these times on a thermometer. Then find differences between pairs of temperature recorded.	Record Tabulate Make observations Organize, represent and interpret data Develop logical argument Differentiate Estimate measurements Make decision	Use heuristics to correctly make observation, representation and create logical arguments
LEARNING OUTCOMES Students will be able to: Create and read time lines; Create time schedule; Calculate time; Solve problem involving the calculation of time and temperature; Work cooperatively in groups. Plan and conduct research, to generate information about measurement.		

Points to Note	**Extended Learning**
• Time is measured in appropriate units (seconds, minutes, hours, day, week, month & year …) • Time transpired between an event is called Elapse Time • B.C. refers to the abbreviated used with a date, indicating the number of years prior Christ Birth	**Encourage** students to research the instruments used to measure time long ago: sun, sundial, hourglass, shadow stick etc. Research to find out how the days of the week got their names.

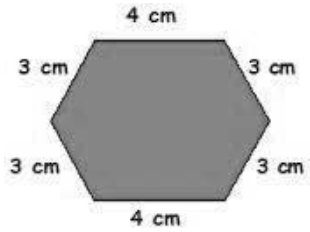
• A.D. refers to the abbreviate used with a date, indicating the number of years after Christ Birth	**Allow** students to do one of the activities by starting at the end of the day and working backwards. This way, students will need to subtract the time to find the start time for each activity. Students should be able to subtract along the timeline using the same techniques. Ask students when this would be a helpful way to determine elapsed time. **Allow** students to make line graphs of the daily temperature (highs, averages, or highs and lows) in their town/city over the next 5-7 days. Students can compare this data to temperatures in other parish capital **Encourage** students to team up with another pair of students to discuss what they will pack for their trip. Students should calculate how much they think their bags will weigh. Students can check various airline websites for weight restrictions and size requirements of luggage.
Resources: Elapsed Time Timelines Activity Sheet Elapsed Time Circus Manager Activity Sheet Elapsed Time My Day Activity Sheet	**Key vocabulary:** A.D. (After Christ) B. C. (Before Christ) Decade Century

Elapsed Time Class Schedule Activity Sheet Pencils (for spinners) Paper clips (for spinners) Internet-generated devices e.g. laptop, smart phone, tablet etc. Website on "Weather Patterns": http://theweatherprediction.com/habyhints2/450/ Computer with internet connection e.g. smart phone, tablet, laptop etc. (1 for each pair) Traveler Consent Form (1 copy per pair) Where in the World is Belize? Activity Sheet (1 copy per pair) Manila folders (1 per pair) World map, atlas, globe, and/or the following: www.indo.com/distance/ (an online distance calculator) www.nationalgeographic.com/xpeditions/atlas/ (an online atlas) Thermometer (°F and °C) 12-month or 16-month calendar that includes the current school year Stop watch or clock Literature books about Santa Clause, Antarctica, polar bears etc. Clocks Thermometers Calendar Computer, Internet, Multimedia projector and any other available technologies.	Time interval Lapse Elapse Time line Schedule Travel Temperature Distance Destination Calendar Period Weather Patterns Meteorologist Satellite Thermometer Degree Celsius Degree Fahrenheit Links to other Subjects: Science: Physics Social Studies Information Technology History Language Geography Technical Vocational

Prior Learning
Check that students can:

- Choose and use appropriate units of measure for length;
- Estimate and measure mass;
- Convert between kilograms and tonne.

Focus Question 2: How do I manipulate units that I use in measuring?	**Benchmark:** • Know, use and interpret relationships between units of measurement. • Associate the measurement of a quantity (distance, volume/capacity, mass, temperature) with the units and instruments best used.
Standard - Measurement: Use the correct units, tools and attributes to estimate, compare and carry out the processes of measurement to given degree of accuracy. **Sub-Theme: Units of measurements** **ICT ATTAINMENT TARGET(S):** RESEARCH, CRITICAL THINKING, PROBLEM SOLVING AND DECISION MAKING Students use appropriate digital tools and resources to plan and conduct research, aid critical thinking, manage projects, solve problems and make informed decisions.	**Objectives:** • Differentiate between the use of the millimetre, centimetre, decimetre, metre and kilometre in measurement situations; • Recognise and use the relationships among the millimetre, centimetre, decimetre, metre and kilometre; • Recognise and use the relationships among the gram, kilogram and tonne; • Choose and use the most appropriate metric units and their abbreviations in a given measurement situation.

SUGGESTED TEACHING AND LEARNING ACTIVITIES – Focus Question 2	KEY SKILLS	ASSESSMENT CRITERIA
Students will: • In groups, use historical nonstandard units (e.g. digits, hand, cubit, yard, foot, pace, fathom) to estimate the lengths of common objects and then measure using modern standard units. Hence, discover the usefulness of standardized measurement units and tools. • In small/large groups, compare the amount of water used in daily life with the amount allotted for each person each day on a Space Shuttle. Estimate and measure mass and the amount of space occupied by various containers of water. Collect, organize, graph, analyze, and interpret data from investigations. • In pairs, use appropriate attributes of measurements to design containers for water. • Use a metre ruler as a reference to estimate the length, width and perimeter of their classroom and record their predictions in a journal. They will then be required to measure the same dimensions using the metre ruler and record their findings in the same journal. Compare both sets of recorded measurements and tell whether their estimations were close to the actual measurements. If they were not close, then give a reason why they may not have been close and make suggestions of how to make more accurate estimations. or investigate using selected software geometry (eg geogebra, Geometry Sketch Pad etc) the Perimeter and area of different Polygons. • In pairs, estimate and measure the perimeters of various polygons. Discuss how to calculate the perimeter of a regular polygon and simple shapes such as the rectangle. Move on to problem solving where the perimeter is given.  	Estimate Measure Draw conclusions Make observations Participate in group Deduce Create Design Develop logical argument Summarize Safely manipulate instruments/apparatus Apply concepts Analyze Collect Graph Differentiate Report Interpret Compare Discuss Infer Organize Estimate and measure distances and perimeter Calculate perimeter of regular polygons	Actively work in groups to measure accurately length, perimeter and distances Accurately Solve problems using standard and none-standard units Actively participate in group activities to collect, analyse, interpret and report on information Safely manipulate instrument eg. Geogebra to accurately calculate the perimeter and area of different polygon Use appropriate units to estimate and measure

• In groups, create problems involving the four operations and any of the measurement units designed to give a very large or a very small answer requiring a change of unit. Consider and solve problems involving a mixture of units with different prefixes.	Problem-Solve Work in groups	distance and perimeter Calculate accurately perimeters of regular polygon Suitable explanations and accurate solutions identified for problems involving distance/length, perimeter and area
LEARNING OUTCOMES Students will be able to: • Estimate and measure length, perimeter and distances; • Measure perimeter of regular polygons; • Solve measurement problems involving the four operations; • Complete activities cooperatively in groups. • Use selected ICT to investigate perimeter and area		

Points to Note	**Extended Learning**
	Allow students to research attributes related to length and present findings in creative ways. **Challenge** students to design and create their own version of an instrument used to measure length.

	Encourage students to make up a song/poem based on their experience in designing and creating their instruments on length. *Water-Consumption Investigation*: **Allow** students to revisit the chart created by the class to record the ways they use water, and add additional ideas. Ask the class to brainstorm ideas about water consumption that they would like to investigate. Possible suggestions follow: o How much water do we drink each day? o How much water is used in food preparation? o How much water goes down the drain while we are waiting for the warm water to come? *Central Tendency*: **Encourage** students to discuss the term statistics. Students may know about the mode (most frequent), the median (middle number), and the mean (the sum of the values divided by the number of students). Talk about which statistic is most appropriate for their study. *Make a Model:* **Challenge** students to record how much water they use in a day and make a physical model of the volume for this amount.

	Conservation Plan: **Allow** students to make a plan for conserving water in their daily lives or think of ways in which astronauts can conserve water in space. *Algebraic Thinking*: **Challenge** students to use their models to create a formula that gives the mass of the water each astronaut would need for a mission. For example, let n represent the number of days. Then mass $= n \times 6$ gallons a day $\times 8$ pounds per gallon. Have students use the formula to make a table to show the mass of water for different numbers of days in the mission. Encourage students to create simple measuring instruments as a project for a "Math kit" i.e. balance scales, clock, measuring cups, thermometer etc. Research and note the uses of each instrument giving examples of real-life activities. Allow students to create poems/songs on the different units of measurement in their journals. Encourage students to put together a scrapbook of pictures depicting examples of measuring instruments as being used in real-life activities. Label each instrument appropriately with its correct name. Allow students to investigate the conversion of units between measurements e.g. $1cm^3 = 1$ millilitre $= 1$ gram etc.
Resources: String, ribbon, adding machine tape, interlocking cubes Tools for measuring length (rulers, yardsticks, retractable and folding measuring tapes, trundle wheels) Construction paper *How Big Is a Foot?* by Rolf Myller Body Parts Activity Sheet	**Key vocabulary:** Measurement, length, historical, imperial, digits, units, tools, instruments, millimetre, decimetre, metric Mass, water, astronauts/cosmonauts, relationships, milli-, centi-, kilo-, gram, tonne, containers, instruments, units, statistics,

Internet-generated devices e.g. laptop, smart phone, tablet Website on "Length": http://www.si-units-explained.info/length/ 1 plastic gallon jug with top cut off and one-pint containers for each group 1-inch cubes (231 per group) Yardsticks for each group Cardboard, scissors, colored pencils, and tape for each group Scale calibrated to the ounce Graph Paper 1 blank sheet of paper per group, 11 inches × 14 inches or larger Rectangular containers that could hold 1 gallon of water Internet-generated devices e.g. smart phone, laptops, tablets etc. Multimedia projector Journals Blogs Teacher-generated worksheets Rubric to evaluate students/teachers during the teaching/learning experiences Ruler Measuring stick/tape Metre rule Trundle wheel / Journal , "Math kit", Scrapbook , Grid , Portfolio	Central Tendency, mean, mode, median, volume, capacity, metric, Imperial, gallon, pint, inch, feet Perimeter, Measurement, Centimetre, Metre, Kilometre, Lengths, Distance, Polygons **Links to other Subjects:** Sciences: Physics, Chemistry, Biology, Astrology Social Studies History Technical Vocational Information Technology Language Geography

UNIT OF WORK GRADE 5 TERM 1 UNIT 3

Strand: GEOMETRY

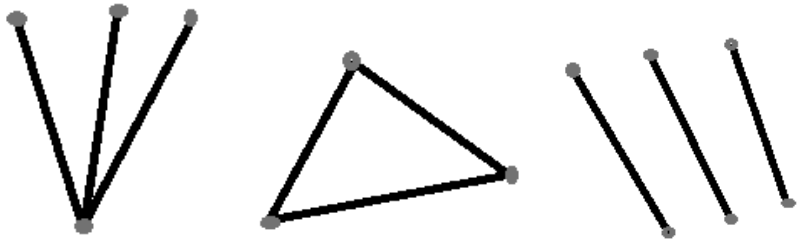
Suggested Time: 2 weeks

Prior Learning
Check that students can:
- Explain the relationship between lines and angles.

About the Unit

In this unit students will:
- **recognize horizontal, vertical and intersecting line segments.**

Focus Question 1. What happens when we explore points and lines?	**Benchmark:** Recognize horizontal, vertical and intersecting line segments.
Standard - Geometry: Explore paths, geometric shapes and space and make generalization about geometric relationships within the environment. **Sub-title**: Types of lines and angles **ICT ATTAINMENT TARGET(S):** DESIGNING AND PRODUCING – Students use digital tools to design and produce creative multimedia products to demonstrate their learning and understanding of basic technology operations. RESEARCH, CRITICAL THINKING, PROBLEM SOLVING AND DECISION MAKING Students use appropriate digital tools and resources to plan and conduct research, aid critical thinking, manage projects, solve problems and make informed decisions.	**Objectives:** • Describe and draw parallel, perpendicular and intersecting line segments within the environment. • Differentiate between models of parallel and perpendicular line segments when drawn or seen in the environment.

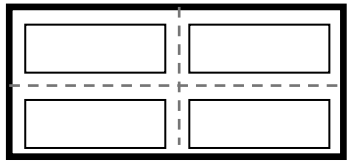
SUGGESTED TEACHING AND LEARNING ACTIVITIES	KEY SKILLS	ASSESSMENT CRITERIA
Students will: In groups, use previous knowledge of geometric figures and terms as seen in real life to describe and differentiate types of lines. In pairs, explore geometric concepts by modelling on the geo-board. • discuss and define the terms – parallel, perpendicular and intersect; and use their bodies to represent the different lines or view teacher-created presentation on lines and angles and have class discussion. Use drawing tools in world processing software or geometry software to explore the concepts of line. Use a series of points to construct lines. • glue fudge sticks or pieces of cord on paper to visually represent line segments. Make guesses as to whether these segments are parallel, perpendicular or intersecting and label accordingly. Contrast between parallel and non-parallel line segments. • draw and investigate points and line segments (Play-dough and match sticks can be used as an alternative to drawing). For example, what number of end points do you need to form 3 line segments? Is there a maximum number of points that we can get? Is there a minimum? Repeat with other amounts of line segments – 4, 5, 6, 7, etc. Record findings in a table and create a general rule for the outcome. Possible student drawings. 	Make observations Summarize Distinguish Work in groups Apply concepts Create Critique Identify Design Analyze Compare Reflect • Writing definitions • Reporting findings • Forming conclusions • Solve problems • Browse and search	• Lines correctly drawn and labelled • Form suitable conclusions for parallel/perpendicular and intersecting line segments. • Problems solved

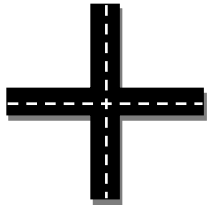
SUGGESTED TEACHING AND LEARNING ACTIVITIES	KEY SKILLS	ASSESSMENT CRITERIA

Number of line segments	Maximum number of end points.	Minimum number of end points
3	6	3
4	8	4
5	10	5

- connect capital /upper case letters so that they show intersecting, parallel lines etc on sheets of paper.(use various shapes) . Continue the activity so that all lines are represented. (The shapes must be arranged in a way so that when they are connected they form the lines that are intended.) For example,

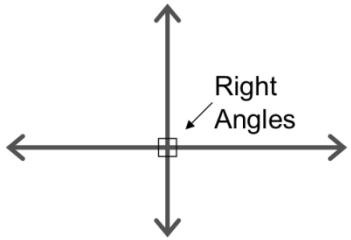
- investigate arrangements of line segments.(e.g. parallel line segments for a railway track, perpendicular line segments at the corners of a football, tennis or netball court). Identify and list different representations of types of lines in the environment, for example, road intersections, train lines, French windows and roofs. Make representations of these is a scrap book.





- draw and label accurately line segments showing that they are intersecting, perpendicular and parallel. (Draw squares at the intersection of perpendicular lines. This is used to indicate that two lines are crossing each other at right angles). Include in a scrap book. For example,

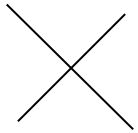
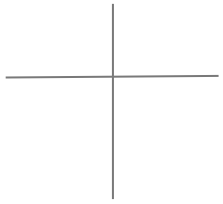
- Operate electronic devices

SUGGESTED TEACHING AND LEARNING ACTIVITIES	KEY SKILLS	ASSESSMENT CRITERIA
		

LEARNING OUTCOMES

Students will be able to:

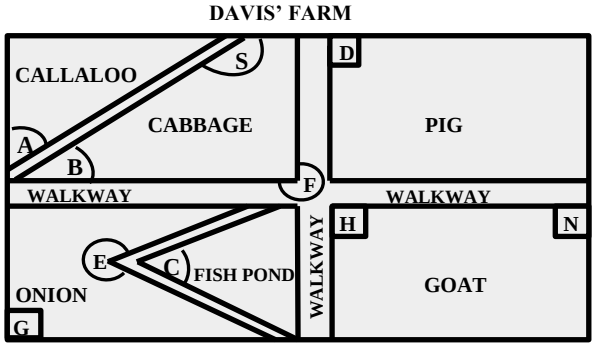
- draw intersecting lines and identify where angles are formed.
- use their bodies to make the different kinds of lines.
- recognize and create parallel and perpendicular lines.
- use word processing software to demonstrate an understanding of the concepts of lines

Points to Note	Extended Learning
• Lines are perpendicular when the angle formed where they meet is 90 degrees. Ensure that you expose students to perpendicular lines in a number of orientations so that they do not form the conclusion that one line should be horizontal and the other vertical  	**Encourage** students to make simple musical instruments using the types of lines being explored **Allow** students to make a scrapbook of fabric designs outlined with the various types of lines being explored. **Allow** students to reflect on their experiences gained throughout the teaching/learning activities. **Allow** students to research the importance of lines in movies, art, architecture etc. and present findings in creative ways.
Resources:	**Key vocabulary:**

SUGGESTED TEACHING AND LEARNING ACTIVITIES	KEY SKILLS	ASSESSMENT CRITERIA
Online art encyclopedia, such as Artcyclopedia Scavenger Hunt Activity Sheet *Shapes, Shapes, Shapes* by Tana Hoban or *The Greedy Triangle* by Marilyn Burns Internet-generated devices e.g. smart phones, laptops, tablets etc. Website on; "Environmental Art": http://en.wikipedia.org/wiki/Environmental_art Websites: Concentration activity Virtual Geoboard Dot Paper KWL Chart Internet-generated devices e.g. laptops, smart phones, tablets etc. Scrapbooks Portfolios Journals Multimedia projector **Cord ,fudge sticks, Geo-strips, computer, internet, digital journal created via presentation software, multimedia projector and any other available technologies**	Perpendicular, intersecting, line segment , parallel lines, art, environment, lines, dots, patterns, geometric shapes/figures **Links to other Subjects**: Visual Arts Geography History Sciences: Physics, Biology Social Studies Language Information Technology Technology Vocational	

Prior Learning
Check that students can:
- ✓ draw straight lines;

Focus Question 2: How can I describe and measure angles?	**Benchmark:** Estimate and draw acute, right, obtuse or reflex angles; use a protractor to measure and draw an angle to a suitable degree of accuracy.
Standard - Geometry: Explore paths, geometric shapes and space and make generalization about geometric relationships within the environment. **ICT ATTAINMENT TARGET(S):** - DESIGNING AND PRODUCING – Students use digital tools to design and produce creative multimedia products to demonstrate their learning and understanding of basic technology operations. - RESEARCH, CRITICAL THINKING, PROBLEM SOLVING AND DECISION MAKING – Students use appropriate digital tools and resources to plan and conduct research, aid critical thinking, manage projects, solve problems and make informed decisions.	**Mathematics Objectives:** i). Identify an angle as being acute, right, obtuse or reflex. ii). Use 45°, 90° and 180° as benchmarks to estimate the size of angles. iii). Use a protractor to measure to the nearest degree the size of angles.

SUGGESTED TEACHING AND LEARNING ACTIVITIES – Focus Question 2	KEY SKILLS	ASSESSMENT CRITERIA
Pupils will: • use the words: "*measure, amount, turn, between, two, point*" in a sentence to define the term "angle". Allow students to use their dictionaries or any appropriate device to search for other meanings of the term angle. Compare meanings and make adjustments, where necessary to their original definition. Discuss with the students the importance of angles in a career, for example, architecture. • read description for different angles. Examine examples of each then draw three (3) other examples to suit each description. • draw at least 8 clocks showing particular times and record what two types of angles are formed in each case. • investigate whether the following statements are true or false about the angles formed by the hands of a clock: 1) Where there is a right angle there is always a reflex angle. 2) The sum of an acute angle and a reflex is always 360^0. 3) Any acute angle added to any obtuse angle is always less than 180^0. 4) The sum of two acute angles is never more than 90^0. 5) Two acute angles can form a reflex angle. Pupils may use any material or tool they deem important for them to carry out their investigation. Example: paper, pencil, protractor, etc. • Examine picture of farmer Davis' farm to classify angles labelled as acute, obtuse, right or reflex.  	• generate and compare definitions • draw representations of angles • investigate • create 2-D models • discuss • estimate • measure angles • compare • identify and correct errors • classify	• Accurately formulate definition of key term • angles drawn accurately

SUGGESTED TEACHING AND LEARNING ACTIVITIES – Focus Question 2	KEY SKILLS	ASSESSMENT CRITERIA
• Create 2-D models of objects, buildings, or animals with target angles- acute, reflex, obtuse, right. Mark off angles and use the following colour code to identify different types: acute angle - black; right angle - green; obtuse angle - gold/yellow; reflex angle - orange. • In groups, draw and label diagrams depicting angles between various body parts. • Compete in ***angles model search***, where each competitor must strike at least two poses depicting any two of these angles - right angle, obtuse angle, reflex, and acute angle. Each competitor must state what angles are being formed and where they are formed. Assign a student photographer to take pictures of the competitors. Print and collate pictures to create an album for the Mathematics corner. • Watch demonstration videos of how to measure angles. Discuss errors people can make when measuring angles and how these may be corrected. • Estimate the size of angles formed at specific areas on a variety of objects such as a sealed juice box, geometric solids, or any other suitable material. Match some angles drawn on cards to a second set of cards containing the size of angles. • Use a protractor to measure given angles and check if for accuracy in earlier predictionMeasures should be recorded to the nearest degree.		

LEARNING OUTCOMES

Students will be able to:

- ✓ define, describe and identify angles [acute, right, reflex and obtuse] accurately;
- ✓ make valid statements about the relations between angles;
- ✓ measure the size of angles with a reasonable degree of accuracy;
- ✓ use appropriate tools to draw and measure angles accurately.

Points to Note	Extending Learning
Students should be given angles in a variety of positions.	Pupils can be allowed to research farm or construction tools used to make angles, example L - square, straightedge, etc. Have carpenter do demonstration lesson on how to use squares or other tools to form different types of angles in designs.
Resources Ruler, protractor, dictionary, computer, carpenter, geometric solids, objects, demonstration video	**Key vocabulary** vertex, acute angle, right angle, obtuse angle, reflex angle, degree, protractor,

UNIT OF WORK GRADE 5 TERM 1 UNIT 4

Strand: STATISTICS AND PROBABILITY

Suggested Time: 3 weeks

Prior Learning

Check that students can:-

- Distinguish between sample and population
- Construct and interpret simple bar graph.

About the Unit

In this unit students will

- Identify the characteristics of sampling techniques.
- Discuss the uses of tables and graphs; draw simple graphs and interpret data represented in these graphs.

Focus Question 1: How do I use sampling to provide information about a population?	**Benchmark:** Identify the characteristics of sampling techniques.
Standard - Statistics and Probability: Collect, organise, interpret and represent data and make inferences by applying knowledge of statistics and probability. **Sub-title:** Sampling **ICT ATTAINMENT TARGET(S):** DESIGNING AND PRODUCING – Students use digital tools to design and produce creative multimedia products to demonstrate their learning and understanding of basic technology operations	**Objectives:** • Discover that a sample may be too small and why. • Develop the concept of fair and bias in sampling. • Use a given sample to make claims about a larger population. • Develop questionnaire and use them to collect data. • Use technology (where available) to facilitate data retrieval and organization.

SUGGESTED TEACHING AND LEARNING ACTIVITIES	KEY SKILLS	ASSESSMENT CRITERIA
Students will: • listen to scenario- In an effort to satisfy students' needs, a school conducted a survey to determine the most preferred snacks to sell in the tuck shop. The entire population of the school was 1200 students. The sample surveyed consisted of 45 students. The school decided to sell the favourite snacks based on the most popular responses in a survey conducted. Discuss this issue as it relates to size of the sample selected and the school's population and .the decision made. • create other scenarios where the sample size is appropriate to for? the selected population • discuss the implications of using very large sample sizes when the population is of a great number. E.g. Time taken to gather information, cost of materials used; analysis of data. Guide students to realize that for a small population, say of 20 participants, it is advisable to use the population as the sample. • conduct mini survey with each group assigned to particular samples selected by the teacher. Sample Question: "Which subject offered in grades 4 to 6 here at school is most interesting?" Group A will be sent to the Math club; group B sent to the 4H club; group C sent to the school gate at the beginning of school to ask students and group D sent to the vendors. Examine and discuss the results presented by each group to highlight the concepts of fair and bias samples. Lead students to understand that not every sample is suitable to make a claim about the wider population. • develop simple survey questionnaires . • use available video capturing devices, such as (tablets, smart phones, digital cameras) to record interviews done by "roving reporters". Critically analyse these interviews after they are presented to the class.	Listen to scenario Discuss advantages and disadvantages of small/large samples Create scenarios and questionnaires operate electronic device	Determining what is an appropriate sample size based on a given population
Learning Outcomes Students will be able to: • determine suitable samples • conduct surveys • write questionnaires • Use selected ICT to aid in data collection		

Points to Note	Extended Learning
It is important to emphasize the difference between the population and the sample. Students should have an appreciation of how to select an acceptable sample. A good sample size is about $\frac{1}{10}$ of the population.	Discuss which scenario is best for developing the sample : ○ The 45 students are selected from across all six grade levels or ○ The 45 students are selected from one grade five class .
Resources Samples of questionnaires, multimedia projector tablets, smart phones, digital cameras and any other available technologies	**Key vocabulary** Sample, population, surveys, questionnaires, polls, fair, bias

Prior Learning:
Check that students can:
- Collect and record information

Focus Question 2:	Benchmark:
How do I display and interpret information collected?	Discuss the uses of tables and graphs; draw simple graphs and interpret data represented in these graphs.
Standard - Statistics and Probability: Collect, organise, interpret and represent data and make inferences by applying knowledge of statistics and probability. **Sub-title:** Graphs **ICT ATTAINMENT TARGET(S):** DESIGNING & PRODUCING- Use technology to design and produce media products to demonstrate their creative thinking	**Objectives:** • Discuss the appropriate uses of various tables and graphs. • Draw pictographs, line graphs, bar graphs, to show given data and interpret such graphs. • Report on the mathematical content and interpretation of data. • Represent data using bar graphs, double bar graphs, pictographs, pie chart and line graphs.

<table>
<tr><th>SUGGESTED TEACHING AND LEARNING ACTIVITIES</th><th>KEY SKILLS</th><th>ASSESSMENT CRITERIA</th></tr>
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Students will:

discuss various types of graphs collected from the newspaper. Discussion should be held in terms of types of graphs used and presentation of information Discuss the suitability of graphs selected to represent the information.
Conduct a survey in their school/grade to find out activities that students are interested in. Present these results to the principal in a bid to create more clubs and societies in the school. Use data collected during any survey activity, and represent these on bar graphs. Teacher will guide students to label the axes as well as to determine a suitable title. Highlight various trends/patterns as shown and make predictions or use spreadsheet software to represent data collected and create bar graph with suitable labels and title.

be given results obtained from 16 participants who were asked to identify their favourite colour from a list of four colours. E.g.
<table>
<tr><th>Colour</th><th>Frequency</th></tr>
<tr><td>Blue</td><td>3</td></tr>
<tr><td>Red</td><td>8</td></tr>
<tr><td>Yellow</td><td>4</td></tr>
<tr><td>Green</td><td>1</td></tr>
</table>
They will make pie chart by folding circular paper in halves, then fourths, then eighths then sixteenths. Colour the number of sectors for each colour (keep same colours together). Write a legend for the chart drawn.
answer questions based on the pie chart created, e.g. What fraction of the number of students like red? What fraction of the number of students like yellow and green? What type of angle is formed by the colour yellow?
discuss the purpose of pie chart as a diagram that is used to compare parts to the whole.

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<td>
Discuss types of graphs

Collect data

Report findings

Analyse data

Predict outcomes

Forming conclusions

Operate electronic device
</td>
<td>
Identify appropriate methods to representation data

Make predictions based on information represented on bar graph

Represent a suitable data set on a pie chart

Read and interpret a pie chart

Determine the most appropriate graph to represent a data set.
</td>
</tr>
</table>

• use information given to draw simple pie charts to a reasonably degree of accuracy. • examine pie chart placed/projected on the board. Give students a printed copy of a pie chart along with corresponding data in a table. Link data in the table with sections of the pie chart and make notes on their paper copies or use excel to create and present simple pie charts. They should then be encouraged to orally analyse the information presented. • discuss the various strategies that they used which may include, observing the largest and smallest sections and match with number etc. • use what they know about angles to discuss with a partner an *estimate* of the size of angles at the centre for each sector in a pie chart and hence the total section for each colour. • interpret and answer questions in regards to commercially available or teacher made graphs or use graphs made by students using spreadsheet software from previously collected data. • discuss the most appropriate type of graph to draw in each situation and why or use data collected in spreadsheet to create and compare different graphs from the same data. • cut the letters of their names from printed paper (Given/ Family/ Given and Family) then collectively sort by grouping like letters- Done in groups with of the number of groups on one colour and the other half done on another colour. a) They will use the information and construct a bar graph which will represent the information. b) Two groups of students using different coloured paper will represent both sets of information on a double bar graph. Comparison may be done.		

Learning Outcomes

Students will be able to:

- Determine the most appropriate graph to be used given necessary information.
- Create tables and other graphs based on data collected from activity done.
- Draw and interpret pictograph, bar graph, double bar graph and pie chart.
- Use selected ICT tool to represent statistical data

Points to Note	**Extended Learning**
Link with other subject area such as Social Studies (population)and Science Ensure that students understand the importance of labelling axes. Ensure that students are aware that when constructing a bar graph, bars should be of same width and should have equal intervals in between them .	Conduct a survey in community , develop the research question , determine the data to be collected. Collect, represent and analyse the data set The report should be presented to the class with justifications for the various decisions made.
Resources Simple questionnaires, Computer and any other available technologies Paper (circular) for pie chart Newspaper Magazines Projector and computer Readily available pie chart and corresponding data in table	**Key vocabulary** Pictograph, circle graph, bar graph, double bar graph, questionnaire, sample, population, data

UNIT OF WORK GRADE 5 TERM 2 Unit 1

Strand: Number

Suggested Time: 4 weeks

Prior Learning
Check that students can:

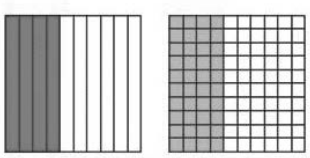
- Express fractional numbers with denominators 10 or 100 in decimal form and vice versa.
- Write money in decimal form
- Complete sequence of fractional numbers in decimal form counting by tenths or hundredths.
- Compute with decimals, including dollars and cents, using the four basic operations.
- Investigate base ten place value system when it is extended to show tenths and hundredths.
- Add and subtract decimal fractions (including money).
- Name whole numbers as fractions.
- Solve real world problems involving addition or subtraction of fractions with like denominators.
- Add or subtract mixed numbers, improper fractions and proper fractions with like denominators.

About the Unit
In this unit, students will:

- Compute with fractional numbers quickly and accurately; use these skills to find answers in realistic problem situations.
- Model number operations: addition, subtraction and multiplication.
- Use approximation and estimation with numbers up to the nearest thousand.

Focus Question 1:	**Benchmark:**
How can I apply fraction ideas to the solution of practical ideas?	Compute with fractional numbers quickly and accurately; use these skills to find answers in realistic problem situations. • Model the number operations: addition, subtraction and multiplication.

Standard - Number Operation and Application: Use the basic operations, number relationships, patterns, number facts, calculators and dynamic software to compute and estimate in order to solve real world problems involving fractions, percentages and decimals.	**Objectives:** • Express fractional numbers in decimal form beginning with those having denominators of 10, 100, and 1000. • Determine the value of each digit in a decimal number up to thousandths. • Place in serial order any set of decimal fractions. • Round a decimal number to the nearer whole number, tenth or hundredth. • Add or subtract decimal numbers to three decimal places. • Round a mixed number to the nearer whole number. • Find the product of a whole number and a decimal number to three places of decimals. • Solve problems (including worded problems and money) requiring addition/ subtraction of decimal numbers. • Estimate products when one factor is a decimal number less than 1. • Multiply a decimal number by 10, 100 and 1000. • Rename two or more fractional numbers with unlike denominators to show the same denominator. • Compare fractional numbers in any form. • Add or subtract unlike fractions including mixed numbers with or without renaming. • Write story problems to generate the sum and difference of decimals and compute the answers. • Write and solve (worded) problems which require decimal computations. • Solve problems which require operations on fractional numbers. • Find the product of two proper fractions.
ICT ATTAINMENT TARGET(S): COMMUNICATION AND COLLABORATION – Students use technology to communicate ideas and information, and work collaboratively to support individual needs and contribute to the learning of others.	

SUGGESTED TEACHING AND LEARNING ACTIVITIES – Focus Question	KEY SKILLS	ASSESSMENT CRITERIA
Students will: • in pairs, draw 10 x 10 grids. Shade various areas on the grid. Name fractional parts shaded with denominators of 10, 100 or 1000. Be guided by teacher in writing fractional numbers as decimals using place value chart. Tabulate/sketch information i.e. 1/10 = 10/100 = 0.1. • in groups, use decimal squares (1 x 10 and 10 x 10 grids) to show tenths and hundredths: colour some squares red on the 1x 10 grid to show tenths and some squares green on the 10 x 10 grid to show hundredths or use grid created with presentation or spreadsheet software to show fractional presentation of tenths, hundredths and thousandths (decimal). Select a red square grid then find a green square grid with the same amount shaded. Write a statement about the two numbers. Find other pairs of decimal squares grids that show the same number shaded and write a statement about the pairs of decimal fractions  • Select two decimal square cards. After careful examination of each card, write a statement about the two decimal fractions E.g. three-hundredths is less than one-tenth (0.03 is less than 0.1). Compare other pairs of decimal fractions and write statements in words and in symbolic form. • In groups, read prices of various items with whole and decimal numbers from magazines, newspapers, brochures, price lists etc. In tabular form, record prices in at least two ways. Discuss and share findings with the entire class. • In pairs, draw horizontal lines on sheets of paper with 10 divisions. Be led in counting on in tenths from a small decimal number with one decimal place i.e. 3.2; 3.3; 3.4 and so on and then count back again. Repeat the process counting on in hundredths from a small decimal number with two decimal places. E.g. 1.25; 1.35; 1.45 and so on and then count back again.	• Name/write fractions with denominators of 10, 100, 1000 • Write fractional sentences • Tabulate information • Read prices • Draw horizontal lines • Record information • Order decimals • Add and subtract money • Write number sentences • Use calculator • Measure heights of students • Round decimals • Multiply decimals	• Accurately represent numbers in various forms • Correctly and appropriately name decimal fractions • Write appropriate statements to represent decimal numbers • Correctly ordering of decimal numbers • Actively participation in class discussions • Correctly and appropriately record prices in various ways • Correctly carry out addition and subtraction of decimals including money

• In groups, make four small cards for each person. Write 0 on one card, 1 on another card, 2 on another card and a decimal point (.) on the final card. Arrange cards to show as many different decimal numbers as possible i.e. 0.12, 1.02 etc. Discuss with class whether numerals such as 012. or .120 are allowed. Record each number as shown. Students will make as many numbers as possible with the cards, after which they will, order all numbers from least to greatest. • Give each student five small cards, one with a decimal point and the other four with the digits 0, 1, 2, 3. Students will be working in small groups using the cards to show at least 5 decimal numbers that are less than one. They will also write the decimal number each time. Next, students will order from least to greatest, the five numbers that they made. Allow students to explore further and use the cards to now show at least 5 decimals that are more than one-tenth. Once again, allow students to write each decimal number as it is made and then order the set of numbers from least to greatest. • Students will be working in pairs to add and subtract monetary values between $1.00 and $199.99(with two decimal places) without regrouping. They will first express each problem as a number sentence, then determine whether they need to add or subtract to solve the problem. Explore further by having the students doing addition and subtraction of decimals, this time with regrouping. • Students will work in groups to measure and record each person's height to two decimal places, in metres. Find the difference in height between pairs of students in the group and then the sum of the heights for each pair as well. Use a calculator to check answers. • In pairs, use sets of 0 to 9 digit cards to generate pairs of numbers with two decimal places. Calculate the difference and total for each pair of numbers. Use calculator to check results. • Students will work in pairs and follow teacher's instructions using a chart with 100 equal squares. Have an open discussion about the connections between proper fractions and decimal fractions. Ask students to name each shaded part as a fraction and also as a decimal. For example, if half of the chart is shaded it is equivalent to 0.5. Work with your partner, take turns shading various portions of your chart and ask your partner to name them as a proper fraction and also as a decimal fraction. Tabulate results e.g. ¼ = 0.25; 1/10 = 0.1 etc. Use 100 grid squares created with spreadsheet or software to explore the relationship between proper fractions and decimal fractions and also to show pictorial presentation of hundredths. Students will use fill colour feature to fill squares representing given fractions.	• Multiply fractions • Investigate problems • Solve real life problems • Convert types of fractions • Illustrate types of fractions • Demonstrate types of fractions • Calculate fractions • Represent decimal fractions • Solve worded problems • Communicate information using productivity tools	• Use instruments appropriately to measure height • Calculator used appropriately to explore or to solve problems involving decimals • Make reasonable and appropriate conclusions when making comparison between simple fractions and decimals • Correct representation of decimal fractions. • Correct or appropriate rounding off of decimal fractions

• In groups, draw a number of shapes and divide them into 10 equal parts, then colour a fraction of each shape. Exchange shapes with group members and write down what fraction has been shaded each time and what each represents as a decimal. • In pairs, make 10 x 10 grids and colour in various parts. Exchange grids with your partner. Each person then writes down the amount of space occupied by each colour as a decimal fraction and as a proper fraction in its simplest form. • Students will practise rounding decimals to whole numbers by playing a game. In small groups, stand and toss bean bag to one another. The person with the bag ask aspects of "Time Table" then throw the bag to the next person to answer. The game ends when everyone has had a chance. Keep the pace as fast as possible and vary the level of difficulty. The teacher will be the judge. • Have an open discussion about the nine times table. Ask students what happens when the number nine is multiplied by various numbers. For example, one i.e. 9 x 1 = 9. Then explore what happens when a number is being multiplied by more than one i.e. 9 x 4 = 36. Students will be guided into discussion on what happens when a number is being multiplied by less than one i.e. 9 x 0.4 =? Talk with a partner about what the answer will be. Discuss predictions. Be led into a discussion that the answer to 9 x 0.4 is 10 times less than the answer to 9 x 4. • In pairs, student will make up their own multiplication problems using decimal numbers and 10 i.e. 2.3 x 10 = ? ; 4.4 x 10 = ?. Then exchange with other pairs and examine the answers. Students share and compare results, then use calculator to check answers. • Have an open discussion on the use of multiplication of decimals in real life, for example, when dealing with money. Then investigate in their groups, solutions to examples of real life problems involving multiplication with decimals, for example, multiplying mass by price. • in groups, cut out fractional shapes showing ½, ¼, 1/3 and so on. Discuss the difference between types of fractions i.e. proper fractions, improper fractions and mixed number. Write fractions of a given type based on instruction given by teacher. Then share and compare answers.		

• draw fraction diagrams showing mixed numbers with their fractional parts expressed in halves or quarters, for example, 2 ½. Then express these fractions as improper fractions i.e. 5/2. • in pairs, draw three rectangles of the same size. Draw thirds on the first rectangle. Draw sixths on the second rectangle. Draw twelfths on the third rectangle. Write equality statements about what they observed in their figures. Discuss written statements i.e. 2 thirds = 4 sixths. in groups and using sets of 18 chips, 6 of one colour and 12 of another colour, show the fractions: 2 thirds, 1 sixth, 6 eighteenth. Draw pictures to illustrate how the chips were grouped to show each fraction. Discuss each fraction drawn. • use multiplication table to illustrate equivalent fractions. • revise the term 'factor'. In pairs, write one- or two-digit numbers then list all the factors of numbers written. Then repeat process with pairs of numbers and list their factors, and identify the common factors. Find the highest common factor of each pair of numbers. • be led into discussion with teacher that simplifying or reducing fraction means to make the fraction as simple as possible. • in groups, sketch diagrams of fractional circles illustrating equivalence i.e. 4/16 = 2/8 = 1/4. Discuss whether or not the equivalent fraction part of each circle has been shaded. Repeat process with fractional sets. • revise the term 'multiple' by reviewing tables. In groups, find the lowest common multiple of pairs of numbers. Repeat process to find the lowest common multiple of three numbers. • use fraction bars to help add different fractions. Record addition sentences made. Then use fraction bars to find two fractions that equal to 1. • create sentences using fraction bars that add up to 1 with more than two fraction addends i.e. 1 fourth + 1 third + 1 sixth + 3 twelfth is the same as 1 bar (or equal 1). Then use bars to add ½ + ⅕. Write addition sentences with a sum of 15 sixteenths, 10 nineteenths etc. Repeat process with different-sized fractions with 11 twelfths as the sum.		

• use fraction families (equivalent fractions) to add ¾ + 1/5 = 15 twentieths + 4 twentieths = 19 twentieths or 19/20 etc. Repeat process by finding the lowest common denominator (LCD) to find the sum of 2/5 + 1/6= 12 thirtieths + 5 thirtieths = 17 thirtieths. Repeat process with subtraction of fractions. • In groups, make fraction circles to represent pizzas and cut them in thirds. Take 1/3 of a pizza. Take twice as much pizza. Teacher asks students how much is 2 times 1/3; 3 times 2/3? How much pizza is this? How much is 4 times 2/3? Write multiplication sentences for their findings. • Watch various types of programmes on the television. In tabular form, make note of how long each programme lasts and the length of each commercial shown during each programme. Next, calculate the time spent on commercials in each type of programme as a fraction of the time allocated for that programme. Discuss which type of programme has the most of commercials and also the programme that has the greatest fraction of time used for commercials. • In pairs, students will write their own fraction problems using multiplication, then exchange their problems with another pair and solve them. Share and compare results as a whole class.		
Learning Outcomes Students will be able to: • Represent numbers in various forms • Identify decimal fractions • Write statements about decimal fractions • Show numbers in various forms • Identify decimal fractions • Write statements • Order decimal numbers • Participate in class activities • Record prices in various ways • Add and subtract decimals including money • Measure heights accurately • Use calculators effectively • Make comparison between fractions and decimals		

• Represent decimal fractions concretely and pictorially • Round off decimal fractions to nearest whole numbers • Communicate information about fraction with the aid of ICT tools.	

Points to Note:	**Extended Learning:**
• It is of great importance that students develop an understanding of the increase/decrease in the value of a digit as it is being moved to the left or right on a place value chart. ***IT IS THE DIGIT THAT MOVES AND NOT THE DECIMAL POINT.*** • A decimal fraction is one that can be represented on a Place Value chart. • • A decimal fraction is a fraction whose denominator is a power of 10. The number of digits to the right of the decimal point indicates the number of zeroes in the denominator of the fraction. • Vinculum is the dividing line or bar line in a fraction. • A recurring fraction is one that does not divide exactly. • A number multiplied by one, results in the same number. • Remind students that to divide by 10 (makes a number 10 times less); we move its digits one place to the right in the place value chart. • A proper fraction is less than a whole and its denominator is more than its numerator. • An improper fraction is more than a whole and its denominator is less than its numerator. • A mixed number includes a fraction with a whole number. • A fraction can be simplified by dividing the numerator and denominator until you cannot go any further or divide the top and the bottom of the fraction by the highest common factor (**HCF – which has to be worked out first**).	• Encourage students to make "Place Value Slider" to help them see that only the digits in a number moves and not the place values or the decimal point. • Give each student three slips of paper. Ask students to write on each slip of paper a different decimal number between 0 and 10. Each number should have three decimal places. In pairs, arrange their set of six numbers in ascending order. Then pairs join to form groups of four. Each group should then order their set of twelve numbers. • Give students pair of decimal numbers and allow them to compare them using the symbols <, > and =. • Encourage students to make up their own word problems involving addition and subtraction of decimals. Then exchange them with partners to solve. • Get students to think about what the line in a fraction means with examples. • Encourage students to create a fraction to decimal table that can be used to help in the conversion of decimals to fractions and vice-versa. • Allow students to develop their own word problems that involve multiplying decimals by powers of 10 for a partner to answer. • Challenge students to multiply pairs of decimals with just one significant digit (e.g. 0.6, 0.03, 0.09, 0.5, 0.004 etc.) by each other mentally. Then check their answers using a calculator. • Investigate how "***quarter***" is used in real life. • Using the "Seven Piece" Tangram, allow students to find out what fraction of the Tangram each piece represents. • Let students tell when we use whole or sets to represent fractional parts. • Students can be encouraged to record activities that they complete on Saturday from the time they wake until they go to bed. Then calculate the fraction of the day spent doing different activities. • Allow students to investigate how much pizza is a share 4 times as large as 2/3, 1/5, 3/7 etc.... Write multiplication sentences for their findings.

	• Encourage students to write their own worded fraction problems using multiplication. Swap with a partner and solve.
Resources: • Squared sheets / Markers • 10 x 10 grids • Number cards /Decimal cards • Numeral cards • Chart with 100 equal divisions /Markers • Charts with types of fractions • Items to demonstrate fractional parts • Chips with assorted colours • Fraction Bars • Fraction circles to represent pizza	**Key vocabulary:** • Decimal • Decimal fraction • Addition • Subtraction • Multiplication • Ascending • Descending • Ordering • Rounding • Equivalent

UNIT OF WORK GRADE 5 TERM 2 Unit 2

Prior Learning
Check that students can:
- Differentiate between area and perimeter.
- Use the appropriate units for perimeter and area.

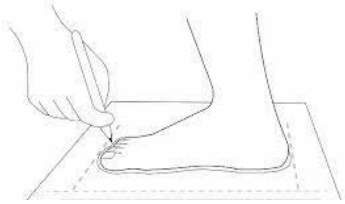
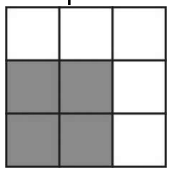
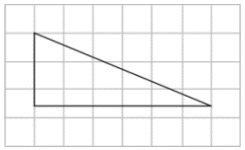
Strand: Measurement

Suggested Time: 2 weeks

About the Unit
In this unit, students will:
- Estimate and measure perimeter.
- Use the formula for area of a rectangle to compute the area of a rectangular region; estimate the area of an irregular shape by counting squares.

Focus Question 1: When do I use different units of length and area?	**Benchmark:** • Estimate and measure perimeter. • Use the formula for area of a rectangle to compute the area of rectangular region; estimate the area of an irregular shape by counting squares.
Standard - Measurement: Use the correct units, tools and attributes to estimate, compare and carry out the processes of measurement to given degree of accuracy. **ICT ATTAINMENT TARGET(S):** 💻 DESIGNING AND PRODUCING – Students use digital tools to design and produce creative multimedia products to demonstrate their learning and understanding of basic technology operations. 💻 DIGITAL CITIZENSHIP – Students recognise the human, ethical, social, cultural and legal issues and implications surrounding the use of technology and practice online safety and ethical behaviour.	**Objective(s): Students should be able to** • Estimate, measure and record distances including the perimeter of polygons in millimetres and/or centimetres and metres. • Solve problems requiring the calculation of : i). Perimeter. ii). Length of one side. • Number of sides of a regular polygon, given the other two measures. • Develop relationship(s) between units of length and units of area. • Differentiate between the use of square centimetre, square metre and hectare in measurement situations • Compute the area of rectangular regions using square centimetre or square metre as unit. • Investigate then determine the largest/ smallest perimeter that can be obtained given a specified area.

Sub-Theme: Working with perimeter and area	• Solve problems based on computing the measurement of the area of a rectangular region. Should this be, solve problems by computing the area of rectangular regions?

SUGGESTED TEACHING AND LEARNING ACTIVITIES – Focus Question 1	**KEY SKILLS**	**ASSESSMENT CRITERIA**
Students will: • View a presentation in which workmen use tiles or other types of floor coverings to cover the floor of a room. • view an interactive website or listen to poems online or use teacher-created audio recording of a song about area and perimeter. • review the concept of area using activities such as "Foot Activities" in which they trace their feet on squared centimetre paper and estimate, compare, then find the area of their feet.  • explore area/perimeter of polygons by counting squares and using information in real world problems or use teacher created spread sheet grid template or drawing tools in word processing software to insert different shapes and finding their area/perimeter by counting squares.   • Discuss any pattern seen, involving the lengths of sides, in finding perimeter and area of rectangles, triangles and squares. • Discuss and compare areas of small regions (e.g. in diagrams) with large regions in the real world or browse online or offline materials to view and compare areas of different regions of the real world. • Research and report on units which could be used for very large areas, such as, area of a farmer's land, to bring out the use of the square metres and hectares.	• Estimate, approximate and measure areas • Explore area concept • Compute areas • Investigate patterns for finding areas • Reason from information given in worded problems • Work in groups • operate electronic device • use illustrations • observe moral principles when viewing digital contents	• Estimate then measure accurately area and perimeter of given squares, rectangles and triangles • Correctly use units in area and perimeter .Report on the use of units used • Solve problems using suitable techniques

- Solve real life problems (composed by teacher/classmates) involving areas of three basic shapes: rectangle, square and triangle. With teacher, develop/use problem solving skills such as sketches, picking out relevant information and applying knowledge of patterns or with the assistance of the teacher use online interactive world map to create shapes from one place to another which will in turn give real measurements for each side and calculate the perimeter of these shapes.
- Be given a set of at least three index cards 5 cm by 3 cm. They will be required to rule index card horizontally and vertically to form unit squares. Instruct students to count unit square to derive area and count unit around to derive perimeter. Record the perimeter and area.
- Let students explore different layouts (vertically, horizontally and diagonally) and compare area and perimeter of each. Discuss as a class their strategies for finding these.
- Explore the layout that can be made that has the smallest/largest perimeter.

- Group participation

Learning Outcomes

Students will be able to:

- Estimate and find area/perimeter?
- Discover patterns in finding area/perimeter/
- Use the unit hectare and squared meter, squared centimetre? correctly
- work cooperatively in groups to complete tasks
- Use word Spread Sheet/ word processing software to explore areas of shapes

Points to Note	**Extended Learning**
• A regular polygon has sides of equal length and angles of equal measure. • Find area of polygons by counting square units accurately	• Trace the outline of several shapes made with Tangram pieces. Students will decide which shapes are the same sizes (area), larger/smaller.

• Develop the relationship between units of length and units of area • Differentiate between the different square units in various measurement situation **LINKS TO OTHER SUBJECTS** Sciences: Engineering , physics Modern Language Business Basics Social Studies Information Technology	• Design floor plans for home using appropriate units. Calculate areas to be tiled. • Research history of floor covering • Research types of floor coverings and environment best suited for.
Resources: • Tangram pieces • Rulers • Squared papers • Polygons • Computer • Presentation software - area grid • Multimedia projector and any other available resources Internet • Index Cards • Audio recording of song about perimeter and area • Rulers • Pencils	**Key vocabulary:** • Hectares • Square centimetre (cm^2) • Squared metre (m^2) • Hectare • Polygons • Triangle • Rectangle • Square • Floor coverings • Tiling

UNIT OF WORK GRADE 5 TERM 2 UNIT 3

Strand: GEOMETRY

Suggested Time: 3 weeks

Prior Learning

Check that students can:

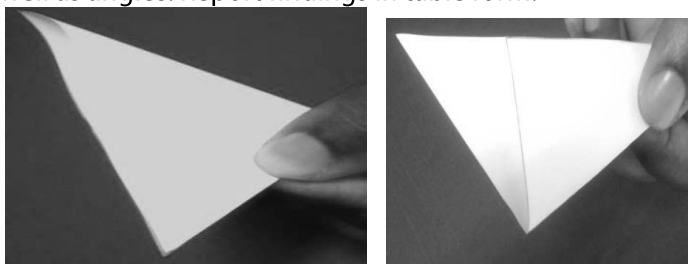
- Differentiate between polygons and non-polygons
- Recognize and draw triangle, square, rectangle and irregular quadrilaterals
- Draw polygons to a reasonable degree of accuracy given the lengths of its sides.

About the Unit

In this unit students will:

- make and explore geometric shapes: non-polygons and polygons not exceeding 4 sides; and apply knowledge of their properties to problem solving situations.
- Identify common shapes and objects, and classify them by noting their properties; including their line symmetry.

Focus Question 1: What are the relationships between the properties of geometric shapes?	**Benchmark:** Make and explore geometric shapes: non-polygons and polygons not exceeding 4 sides; and apply knowledge of their properties to problem solving situations.
Standard_Geometry: Explore paths, geometric shapes and space and make generalization about geometric relationships within the environment. **Sub-title**: Make and explore geometric shapes: triangles and quadrilaterals **ICT ATTAINMENT TARGET(S):** COMMUNICATION AND COLLABORATION – Students use technology to communicate ideas and information, and work collaboratively to support individual needs and contribute to the learning of others. DIGITAL CITIZENSHIP – Students recognise the human, ethical, social, cultural and legal issues and implications surrounding the use of technology and practice online safety and ethical behaviour.	**Objectives:** • Model regular/irregular polygons (with up to 4 sides). • Draw pictures of polygons from a given description. • Identify conditions which make a triangle right, equilateral, isosceles or scalene. • Identify opposite and adjacent sides of a quadrilateral.

SUGGESTED TEACHING AND LEARNING ACTIVITIES	KEY SKILLS	ASSESSMENT CRITERIA
Students will: • Be given a set of assorted shapes, to sort giving reasons for how the sorting done. Distinguish between shapes which are polygons and those which are non-polygons, regular and irregular. Write findings and description in a table. • Use geo-boards and elastic bands to form various examples of regular as well as irregular shapes. Identify examples of shapes within the environment or use an online interactive geo-board to create various shapes and find the area of each. • Examine various polygons and record their properties in terms of : a. Sides- number, length, position b. Angles- number and size c. Diagonals- number • Explore the characteristics of various types of triangles, using paper folding activities. For example, fold to verify sides which are equal, angles which are equal etc. From discussion, group triangles according to sides as well as angles. Report findings in table form.  Two angles equal • Cut out assorted triangles that were given by teacher. Copies of triangles may be found in the Backline Masters (accessible online). Include examples of right, acute and obtuse; examples of equilateral, isosceles and scalene. The task is to sort the entire collection into three groups so that no triangle belongs to two groups. Write description of groupings. Challenge students to find a second criterion for creating three different groupings.	Classify shapes Construct shapes Draw polygons Determine characteristics Develop spatial sense Identify and compare shapes Tabulate ideas Observe moral principles when using materials online	• properties of polygons identified • Create various shapes on geo board • Draw accurately various polygons • Sort polygons according to their properties

<table>
<tr><th>SUGGESTED TEACHING AND LEARNING ACTIVITIES</th><th>KEY SKILLS</th><th>ASSESSMENT CRITERIA</th></tr>
<tr><td>

- Make a chart as shown. Sketch a triangle in each cell and tell which of the nine cells are impossible to fill.

<table>
<tr><td></td><td>Equilateral</td><td>isosceles</td><td>scalene</td></tr>
<tr><td>Right</td><td></td><td></td><td></td></tr>
<tr><td>Acute</td><td></td><td></td><td></td></tr>
<tr><td>Obtuse</td><td></td><td></td><td></td></tr>
</table>

- Cut assorted quadrilaterals from print. Using paper folding activities, determine the sides which are opposite and those which are adjacent. Name sides using letters and colour code the sides
- Llisten to detailed description of any polygon and choose from a given selection the shape described.
- Form shapes using the polygons discussed. E.g. shapes made using tangram shapes.
- From a set of shapes (models, drawings or real objects) select those which have the same shape (are similar) then from a set of similar shapes, group those which are congruent.

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Learning Outcomes
Students will be able to:

- draw and model regular and irregular polygons, and identify sides which are opposite or adjacent to each other.
- name triangles as either right, equilateral, isosceles or scalene.
- identify congruent shapes
- use online material safely to explore concepts of polygons

</td></tr>
</table>

Points to Note	Extended Learning
Integrate across strands such as measurement (perimeter and area) of shapes as well as across subjects such as Visual arts. Shapes are generally classified according to common features about their sides or angles or their diagonals.	Examine geometric solids faces and draw the polygons that are shown on each face. Use polygons to make nets of solids which are polyhedral and discuss how these solids are used in everyday life.
Resources Paper to be used to cut out representations of various polygons Right angle tester, computer and any other available technologies, internet, geo boards, elastic bands	**Key vocabulary** Right triangle, isosceles, scalene, equilateral, aadjacent, opposite

Prior Learning
Check that students can:

- Identify the mirror line as being a line of symmetry.
- Identify the possible lines of symmetry in other geometric shapes and objects.

Focus Question 2: What are the properties of the various plane figures around us?	**Benchmark:** Identify common shapes and objects, and classify them by noting their properties; including their line symmetry.
Standard - Geometry: Explore paths, geometric shapes and space and make generalization about geometric relationships within the environment. **Sub-title**: Lines of symmetry **ICT ATTAINMENT TARGET(S):** **COMMUNICATION & COLLABORATION -** use technology to communicate ideas, information and understanding for a variety of purposes.	**Objectives:** • Identify and count the number of lines of symmetry in plane figures. • Create shapes given; a) line of symmetry b) half the shape and the line of symmetry.

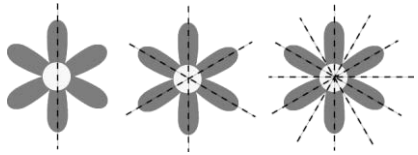
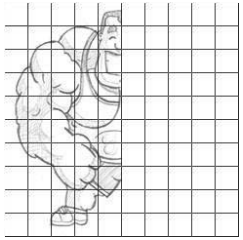
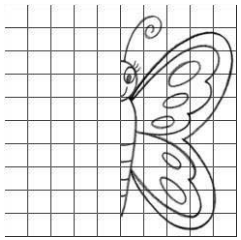
SUGGESTED TEACHING AND LEARNING ACTIVITIES	**KEY SKILLS**	**ASSESSMENT CRITERIA**
Students will: • cut out and label (name) plane shapes. • sort plane shapes and tell criteria used for sorting. • fold shapes individually noting the lines of symmetry in each (if any) • investigate the number of lines of symmetry in regular shapes . Complete table and make generalizations. 	• Label shapes • Make generalizations	• Correctly state the number of symmetry lines in polygons

Name of shape	Number of equal sides	Number of equal angles	Number of lines of symmetry
Equilateral Triangle			

- observe and investigate the beauty of butterflies as it relates to symmetry.
- examine cut-out shapes to determine the number of lines of symmetry.

- further examine other pictures as set out below to determine their lines of symmetry.




- complete shapes, given the line of symmetry and half the shape.
- in groups, using pattern blocks and sets of triangles and squares, select a triangle and surround it with triangles and squares. How many lines of symmetry does the figure have? Now select a square and surround it with triangles. How many lines of symmetry does the figure have? Then select one of the blocks and surround it with other blocks to make regular figures. Count the line of symmetry each figure has or use online resources on symmetry games such as counting the lines of symmetry in given shapes.

- Examine shapes
- Identify lines of symmetry
- Label lines of symmetry
- Create patterns
- Write in journals
- Work in groups
- operate electronic devices

- Correctly complete table
- Draw suitable lines of symmetry
- Correctly labeled lines of symmetry
- Accurately create patterns
- Record journal entries
- Participate cooperatively in groups

• in pairs, draw 3-by-3 squares on graph paper. Shade three of the unit squares so that the figure created has one line of symmetry. How many different patterns with one line of symmetry can be made by shading three unit squares? Can patterns be made with two lines of symmetry? Now shade in four unit squares and make figures with one line of symmetry; with two lines of symmetry. Can figures be made with two lines of symmetry? Compare lines of symmetry, patterns, and figures with other pairs. Make journal entry explaining the process throughout each activity. Share with the entire class.		
Learning Outcomes Students will be able to: ✓ identify all line of symmetry in given shapes. ✓ sort shapes ✓ label line of symmetry neatly and accurately. ✓ create patterns using line of symmetry. ✓ make journal entries on each activity done on line of symmetry. ✓ participate in group activities cooperatively.		

Points to Note	**Extended Learning**
• Symmetry is the beauty of shapes and figures. • Figures can be classified according to the number of ***line of symmetry*** in each. • A line of symmetry separates a figure into two congruent parts such that each point in one part is reflected in the other part (this can be tested using a mirror). • A creased line on paper is the line of symmetry/axis of symmetry or mirror line. •	• Design tessellations using regular shapes • Challenge students to explore a cube using questions as guide. ○ How many horizontal line of symmetry does a cube have? ○ How many vertical line of symmetry does a cube have? ○ How many planes of symmetry pass through each pair of opposite edges? ○ How many planes of symmetry can you find for a cube? • Consider other solids.

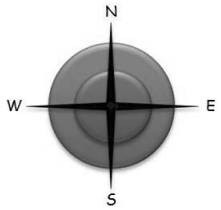
	○ Does the tetrahedron have the same number of planes of symmetry as the cube? ○ Does an octahedron, an icosahedron, or a dodecahedron have the same number of planes of symmetry? ● Record their findings on a chart. Compare their findings with those of some classmates. ● Encourage students to use a mirror to investigate the lines of symmetry in figures. Record findings in scrapbooks. ● Challenge students to find symmetrical words. Capital letters with horizontal lines of symmetry are: B, C, D, E, H, I, K, O, and X. A symmetrical word can be made using a combination of these letters: for example: DECODED, COOK, ICEBOX or HIKED.
Resources: ● Plane shapes ● sorting tray ● pattern blocks ● graph paper ● cube ● sets of triangles and squares ● mirror ● scrapbooks ● journals ● computer and any other available technologies ● picture of butterflies ● paint ● blank paper	**Key vocabulary:** ● symmetry ● lines of symmetry ● plane of symmetry ● axis of symmetry ● mirror line ● beauty ● butterfly ● Regular shapes

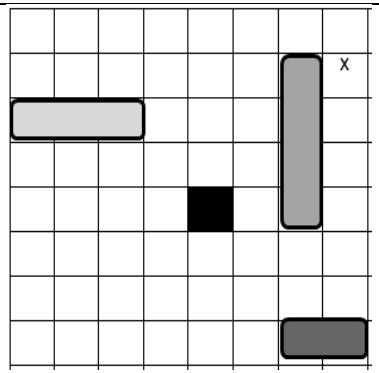
Prior Learning
Check that students can:
- Identify the four cardinal points; north, south, east and west.
- Recognize congruent shapes.

About the Unit

In this unit, students will:
- Describe positions using cardinal points and understand the concept of reflection.

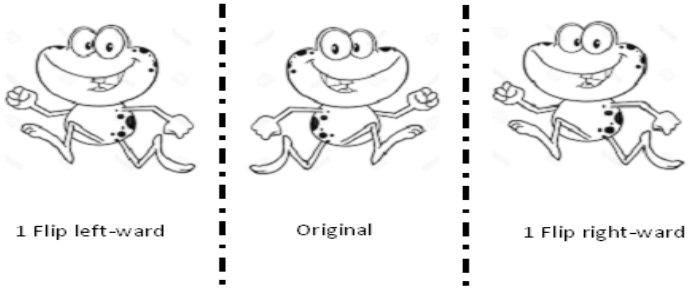
Focus Question 3: How are geometric shapes affected by movements?	**Benchmark:** Describe positions using cardinal points and understand the concept of reflection.
Standard_Geometry: Explore paths, geometric shapes and space and make generalization about geometric relationships within the environment. **Sub-theme:** Transformations **ICT ATTAINMENT TARGET(S):** DESIGNING AND PRODUCING - use digital tools to design and produce creative multimedia products to demonstrate their learning and understanding of basic technology operations. RESEARCH, CRITICAL THINKING, PROBLEM SOLVING AND DECISION MAKING - recognise the human, ethical, social, cultural and legal issues and implications surrounding the use of technology and practice online safety and ethical behaviour.	**Mathematics Objectives:** • Associate the 4 major cardinal points with quarter, half, three-quarter and full turns. • Describe movement on a grid using a magnitude and the cardinal directions. • Use a grid system to describe the location of one point relative to another using the four major cardinal points. • Predict how a simple plane shape or design will look after a series of rightward or leftward flips, or, after a reflection. • Identify designs and shapes – drawn in different orientations – that are the same.

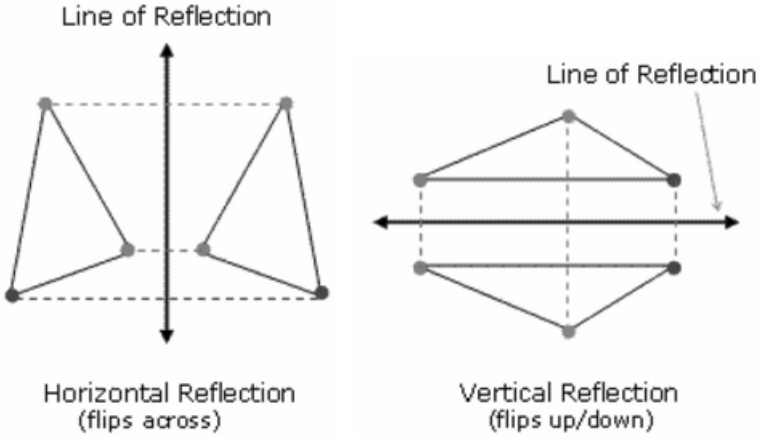
SUGGESTED TEACHING AND LEARNING ACTIVITIES – Focus Question 1	KEY SKILLS	ASSESSMENT CRITERIA
Students will: • Examine the scenario below. o All of Peter's movements are in a clockwise direction. If Peter is facing North and makes a quarter turn, in which direction will he be facing? o If Peter is facing South and makes a half turn, in which direction will he be facing? o If Peter is facing North and wants to make a three-quarter turn, how many degrees must he turn and which direction will he be facing? From this position, how many degrees must he travel through to face North again?  • Play the game Battleship in pairs or at teachers' discretion. Place ships horizontally or vertically on the white board so that they fit within the grids (do not place diagonal). The same reference point should be placed on all grids. Players will take shots alternately by calling the cell which they mark. For example, shot "X" from the reference point (black cell) is three units east and three units north. If there is a hit, the player must call out "Hit". Both players must mark the cells called. The winner is declared when all his opponents' ships are sunk.	• association • Predicting • Describing • Generalizing • Plotting	• Accurately associating quarter, half, three quarters and full turns with corresponding degrees. • Accurately locating points by following instructions. • Make generalizations about properties of objects following a flip or slide.



- Use number **25** as the first starting point. Teacher will determine the number of instructions to be given. Students will make horizontal then vertical movements based on the instructions given, for example move **four units west and two units north** and mark the new position. This position will be used as the starting point for instruction that follows. At the end of these instructions, the teacher will reveal the numbers for student to check their answers.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

• Flip a given object, a number of times right-ward **and** left-ward, comparing each flip with the original orientation.  Discussions should bring out, how many right or left flip would give back the original. Guided questions • When the original is given 2 flip left-wards what is the orientation of the figure in relation to 1 flip left-ward? • How would you compare the orientation of 2 flips right-ward with 1 flip left-ward? • How many left-ward flips will reproduce the original orientation? • How would you describe the orientation of 9 right-ward flip? • How many right-ward flips reproduce the original orientation? • What would the orientation looks like after 6 left-ward flips? • What do you noticed about the size of the object after each flip?		
Learning Outcomes Students will be able to: Make generalization on the properties of objects under translation and reflection Associate quarter, half, three quarters and full turns with the corresponding degrees Locate points using horizontal and vertical movements		

Points to Note	Extended Learning
 • After any of those transformations (turn, flip or slide), the shape still has **the same size**, **area**, **angles** and **line lengths.** • When one shape can become another using only Turns, Flips and/or Slides, then the two shapes are congruent.	• **Encourage** students to put together a folder on rightward or leftward flips, or, after a reflection. • **Allow** students to make meaningful entries in math Journals on each learning experience gained throughout each lesson. • **Encourage** students to carry out mini research on the use of rightward or leftward flips, or, after a reflection in real life situations. • **Allow** students to create a PowerPoint presentation or slides-hare of researched information on the use of rightward or leftward flips, or a reflection in daily life. • **Encourage** students to use concepts of rightward or leftward flips, or, after a reflection to design and create marketable products for: quilts, table mats etc.
Resources: • Battle ship game board, compass, hundred grid, picture of object, multimedia projector, internet-generated devices (laptop, smartphones, tablets, etc)	**Key vocabulary:** • Orientation, Congruency, Flip(reflection), Slide (translation), transformation, Similarity, Difference
Links to other subjects • Geography (cardinal points) • Language Arts (Journal entries) • Integrated Science (Movements)	

UNIT OF WORK GRADE 5 TERM 2 Unit 4

STRAND: Algebra

Suggested Time: 2 weeks

Prior Learning
Check that students can:

- Write word and number sentences.
- Identify fractional numbers.
- Use correct number operations.
- Use substitution principles when using value(s) for variables.

About the Unit

In this unit, students will:

- Investigate, describe and represent patterns; and develop generalization.

Focus Question 1: How do I generate rules from patterns?	**Benchmark:** Investigate, describe and represent patterns; and develop generalization.
Standard_Algebra: Employ algebraic reasoning through the use of expressions, equations and formulae to interpret, model and solve problems involving unknown quantities. **Sub-theme:** Algebraic sentences **ICT ATTAINMENT TARGET(S):** RESEARCH, CRITICAL THINKING, PROBLEM SOLVING AND DECISION MAKING - recognise the human, ethical, social, cultural and legal issues and implications surrounding the use of technology and practice online safety and ethical behaviour.	**Mathematics Objectives:** • Investigate patterns and create tables of values to show relationship between two variables. • Use tables of values to make predictions and to develop general statements about patterns.

<table>
<tr><th>SUGGESTED TEACHING AND LEARNING ACTIVITIES – Focus Question 1</th><th>KEY SKILLS</th><th>ASSESSMENT CRITERIA</th></tr>
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Students will:

- **Play games which involve more than one operation** in the writing of algebraic statements, sentences and/or expressions.
- Investigate the order of operations when evaluating algebraic expressions
- Think of a number, multiply by 2, add 3, multiply by 2, subtract 2, divide by 4, subtract 1 and you get back to the same number that you with

<table>
<tr><th>Operations</th><th>Arithmetical</th><th>N – sentences</th><th>Concrete form</th></tr>
<tr><td>Think of a number</td><td>12</td><td>n</td><td>  </td></tr>
<tr><td>Multiply by 2</td><td>24</td><td>2n</td><td>  </td></tr>
<tr><td>Add 3</td><td>27</td><td>2n + 3</td><td>  </td></tr>
<tr><td>Multiply by 2</td><td>54</td><td>2(2n + 3) = 4n + 6</td><td>  </td></tr>
<tr><td>Subtract 2</td><td>52</td><td>4n + 6 – 2 = 4n + 4</td><td>  </td></tr>
<tr><td>Divide by 4</td><td>13</td><td>(4n + 4)/4 = n + 1</td><td>  </td></tr>
<tr><td>Subtract 1</td><td>12</td><td>n</td><td></td></tr>
</table>

- Experiment with finding results of numerical problems involving at least two operations (with or without brackets) involving fractional numbers including mixed numbers, for example,

  $2\times 9+6$, 3(4 + 7), $5\frac{1}{2}-3+4.$
- Discuss various answers and method and note situations in which the same result is obtained for a given problem by different methods.
- Be encouraged to generalize so as to arrive at rules for order of operations.
- Apply these rules to algebraic expressions.

</td><td>

- Simplifying expressions
- Reasoning through problem solving processes
- Exploring rules
- Substituting values for letters

</td><td>

- Written statements accurately showing algebraic sentences/ statements
- Make accurate generalizations

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Learning Outcomes

Students will be able to:

- Write algebraic sentences/expressions from a given situation

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SUGGESTED TEACHING AND LEARNING ACTIVITIES – Focus Question 1	KEY SKILLS	ASSESSMENT CRITERIA
• Interpret word problems using algebraic expressions and sentences • State/explain the order of operations in a given expression		

Points to Note	Extended Learning
• Students should be given ample time to think through and respond to the questions or tasks. • As much as possible incorporate the use of tables and other graphic organizers. These will aid algebraic modelling and better develop students' understanding of algebra.	 • Each animal above represents a single digit number and the box represents either addition or subtraction. Replace each animal with an appropriate number and the box with an appropriate operation to make the equation true. • Show students 5 counters and an opaque bag with no more than 6 counters. Ask students to represent the total number of counters using an equation, example $5 + \blacktriangle = \blacksquare$. Since there are no more than 6 counters in the bag, what are some possible numbers that can be used to represent $\blacktriangle$? Give the possible total in each case. • A bag originally had 17 counters in it, but it was discovered that a hole was in the bag and some fell out. Write an equation to represent the amount left in the bag? Example, $17 - \heartsuit = \bigstar$. If there are more than 4 counters in the bag, which numbers could represent $\heartsuit$? Give the possible remainder in each case? Which numbers could not be used to represent $\heartsuit$ and why?
Resources: • Number cards • Charts/Tables	**Key vocabulary:** • algebraic statements • expressions

• Multi-media projector	• sentences • order of operations • general rule
Links to other subjects This may be linked to social studies and science.	

Prior Learning
Check that students can:

- Write algebraic sentences for problems.
- Write one- or two- step problems based on information given in a story; then write the correct algebraic sentence and solve the problem.
- Express simple sentences and word problems as algebraic expressions.

About the Unit

In this unit, students will:

- Use operation symbols to complete number sentences; identify the order of operations in given algebraic expressions.
- Substitute a number for a variable in a simple mathematical sentence.

Focus Question 2: How do I write and interpret expressions involving variables?	**Benchmark:** Use operation symbols to complete number sentences; identify the order of operations in given algebraic expressions.
Standard Algebra: Employ algebraic reasoning through the use of expressions, equations and formulae to interpret, model and solve problems involving unknown quantities. **Sub-theme:** Algebraic sentences **ICT ATTAINMENT TARGET(S):** RESEARCH, CRITICAL THINKING, PROBLEM SOLVING AND DECISION MAKING – Students use appropriate digital tools and resources to plan and conduct research, aid critical thinking, manage projects, solve problems and make informed decisions.	**Objectives:** • Investigate the order of operations when evaluating algebraic expressions. • Use symbols <,>, =, ≠ in number sentences.

SUGGESTED TEACHING AND LEARNING ACTIVITIES	KEY SKILLS	ASSESSMENT CRITERIA
Students will: • solve a variety of number sentences with missing numbers involving all four operations. For example: **i. 23 + ☐ = 69** **ii. ☐ - 16 = 51** **iii. 48 ÷ ☐ = 4** **iv. ☐ × 12 = 108** • revise order of operations. Practise problems that involve working with order of operations. • discuss the use of variables (letters) to represent unknown quantities. Recall terms such as sum, difference, product and quotient in order to know which operation to use. • discuss ways in which variables are written to form algebraic expressions. Practise writing algebraic expressions in the correct way i.e. (p +3); (9 – *x*); (5 x t); 5t; 4 ÷ r; 4/r etc. • in groups, given sets of cards with matching word expressions and algebraic expressions, shuffle cards and deal at least 7 cards to each player. Take it in turn to: • Draw a card • Place two matching cards face up on the table (if they have them) • Discard a card Note: Player may choose to draw a card from the discarded pile instead of the deck. The winner is the first person to have no more cards in his/her hand. • in pairs, using numbers 9 to 20, take turns selecting a number from set. Name the number in as many ways using two or more numbers and one or more operations (e.g. 12 = 6 + 6; 12 = 15 – 3; 12 = 4 x 3 x 1 etc.) • investigate the order of operations when evaluating algebraic expressions. • find ***'n'*** in an open mathematical sentence using addition or subtraction with or without the use of brackets. • find ***'n'*** when ***'n'*** represents an addend or sum in a mathematical sentence with fractional numbers including mixed numbers e.g. (n + 5 ½ = 12); (32 ÷ ¾ = n) etc. • use the symbols >, <, =, ≠ in number sentences i.e. (23 + n = 23); (23 -- n ≠ 32); (23 + n < 32) etc. • use algebraic sentences to solve word problems. • manipulate presentation software "Algebra on a ladda"(This was created).	• Solve number sentences • Investigate order of operations • Use algebraic sentences • Use variables • Use symbols • Identify variables • Form expressions • Work in groups • Operate electronic devices • Navigate digital content	• Complete accurately number sentences • Solve problems accurately using the order of operations • Written statements accurately showing algebraic sentences/ statements • Use of appropriate symbols • Create algebraic expressions • Work cooperatively in groups

Learning Outcomes

Students will be able to:

- Complete number sentences correctly
- Order operations
- Appropriately use symbols to complete algebraic expression
- Form algebraic statements
- Form expressions
- Participate in group activities cooperatively
- Navigate digital content in order to explore concepts of algebra.

Points to Note	**Extended Learning**
• Integrate algebraic skills in other subject areas. For example Science, Social Studies, and Religious Education etc. • Algebra deals with the incorporation of integers and variables to represent algebraic statements i.e. expressions and equations. • A variable is a symbol representing an unknown quantity. • An expression is a written or numeric statement. • Order of operations refers to the use and application of the four basic operations i.e. addition, subtraction, multiplication and division. • Discuss various answers and methods. • Note situations in which the same result is obtained for a given problem by different methods. • Be encouraged to generalize so as to arrive at the rules for the order of operations.	• Using four 4s each time, make expressions for each value from 0 through 10 i.e. $(4 + 4) \div 4 + 4 = 6$. Do the same with at least five more numbers. • Experiment with finding the results of numerical problems involving at least two operations (with or without brackets) involving fractional numbers – include mixed numbers e.g. $5(6 + 2)$; $3\ 1/3 + 4 - 2$; $5 \times 6 - 7$. • Make entry in their journals explaining the methods they used in the above activity. • Allow students to write their own algebraic expressions on cards. Exchange with partners for them to solve using substitution. Add cards with expressions to their "Math kit".
Resources • Sets of cards with word expressions and matching algebraic expressions • Cards with numbers/symbols • Journal / "Math kit" • Computer and any other available technologies, Speakers	**Key vocabulary** • Algebra/algebraic • Expression • Variable • N-sentence/Statement

Focus Question 3: How do I find the unknown in a mathematical statement/equation?	**Benchmark:** Substitute a number for a variable in a simple mathematical sentence.
Standard_Algebra: Employ algebraic reasoning through the use of expressions, equations and formulae to interpret, model and solve problems involving unknown quantities. **Sub-theme:** Algebraic sentences	**Objective:** • Use substitution in formulae to solve worded problems.

SUGGESTED TEACHING AND LEARNING ACTIVITIES – Focus Question 2	**KEY SKILLS**	**ASSESSMENT CRITERIA**
Students will: • play a game of "Think of a number". Carry out the following instructions: *I. Think of a number. Write this number down (You will need to remember it later!)* *II. Add 4.* *III. Double the answer.* *IV. Subtract seven.* *V. Add 5.* *VI. Subtract two times the number you first thought of.* *VII. Add 4.* *VIII. The answer is 10.* • compare starting number with one another to show that no matter what the starting number, and final answer is 10. • be engaged in a discussion that substitution means replacing the variables in an equation with number values. Emphasize the importance of using the order of operations if the expressions have more than one operation i.e. (a + b × c) = ?, when a = 3, b = 4 and c = 2, therefore: 3 + 4 × 2 = 11. • substitute values for variables to review the use of the symbols: >, <, =, ≠. Make statements true e.g. If d = 2, e = 4, f = 10 and g = 6, use the symbols listed to make the following statements true. *I.* $d + e = g$ II. $f \div d \neq g \div d$ *III.* $e \times f < d \times e$	• Investigate order of operations • Use substitution method • Use algebraic sentences • Share results • Compare numbers • Work in groups	• Solve problems accurately using the order of operations • Accurate use of the substitution method • Create algebraic sentences • • Work cooperatively in groups

• in groups, create cards with numbers and symbols (i.e. +, --, ÷, x, =). Use cads and symbols to form algebraic expressions to solve for ***'n'***. Exchange with other groups and let them solve for 'n'. Share results with entire class. • in pairs, create own algebraic expressions in which ***'n'*** is being solved. Exchange with peers for them to find ***'n'***. Share results with entire class.		

Learning Outcomes

Students will be able to:

- Order operations correctly
- Use substitution method in formulae to solve word problems
- Form algebraic sentences
- Participate in group activities cooperatively

Points to Note	**Extended Learning**
• Substitution refers to the replacement of variables with numeric values. • Formulae in algebra are linked to the understanding of those being developed in Science experiments.	• Allow students to carry out research on the use of substitution in algebraic expressions in real-life experiences. Make journal entry on the importance of substituting in algebraic expressions. • Create own algebraic expressions on cards for their "Math Kit".
Resources: • Cards with numbers and symbols • Cards with algebraic expressions • "Math Kit" • Journals, Computer • Speakers and any other available resources • Internet	**Key vocabulary:** • Substitution • Algebraic expression • Order of operations

UNIT OF WORK GRADE 5 TERM 3 Unit 1

Strand: Number

Suggested Time: 3 weeks

Prior Learning
Check that students can:
- Define and use the terms dividend, quotient, divisor, remainder in sentences requiring division.
- Divide numbers of up to five digits by numbers up to two digits, with or without remainder.
- Divide so that zero is the quotient.
- Divide a 3, 4, or 5 digit number so that zero is a digit in the tens and/or hundreds place in the quotient.
- Test for divisibility by 2, 3 or 4.
- Express, as a mixed number, the answer to a division problem with a remainder.
- Identify and correct (wrong answers) incorrect responses in problems involving division.
- Discover, memorize and recall all division facts up to at least $100 \div 10 = 10$.

About the Unit
In this unit, students will:
- Compute with whole numbers accurately and fluently; use these skills to find answers in realistic problem situations.
- Model number operations: division of five digit numbers by up to three digit numbers.
- Apply and justify the use of a variety of problem solving steps in identifying missing facts.
- Use mathematical tools to carry out one step and two step calculations involving all four operations

Focus Question 1: How do I apply multiplication and division to larger numbers?	**Benchmark:** Compute with whole numbers accurately and fluently; use these skills to find answers in realistic problem situations. • *Model number operations: division of five digit numbers by up to three digit numbers.*
Standard - Number Operation: Use the basic operations, number relationships, patterns, number facts, calculators and dynamic software to compute and estimate in order to solve real world problems involving fractions, percentages and decimals.	**Objectives:** • Divide a five digit number by a one, two or three digit number, including instances where zero is a digit in the quotient. • Solve problems requiring division, writing answers in mixed form where necessary. • Estimate answers to division problems and judge the reasonableness of computed answers. • Apply inverse relationship between multiplication and division.

ICT ATTAINMENT TARGET(S):	• Use number patterns to explore multiplication facts and divisibility rules for multiples of 5, 8 and 9. • Test for divisibility by 5, 8 or 9.
COMMUNICATION AND COLLABORATION - Students use technology to communicate ideas and information, and work collaboratively to support individual needs and contribute to the learning of others.	

SUGGESTED TEACHING AND LEARNING ACTIVITIES – Focus Question 1	KEY SKILLS	ASSESSMENT CRITERIA
Students will: • In pairs, review division using flash cards and multiplication tables e.g. 64 ÷ 8 = 8 as 8 x 8 = 64. Repeat process, increasing speed or manipulate an interactive online multiplication game to reinforce the concept of multiplication. • Demonstrate how sets of objects are shared among group members. Discuss the shared amount (dividend), how much each member would have received (quotient), number of persons (divisor) and how much is left if any (remainder). Estimate for results. i.e. If 60 ÷ 10 = 6, 60 ÷ 9 is approximately 6 etc. • In groups, work with sets of 1-10 number cards. Form two- and four-digit numbers. Create division sentences. Students should take turns giving their answers using their knowledge of the divisibility tests. Repeat process and increase speed to develop competence e.g. 4 864 ÷ 16 = 304; 8 060 ÷ 20 = 403 etc. • Write division sentences on cards. In teams, give each student a card. Allow teams at least a minute to work the answer on each card. E.g. 7 296 ÷ 12. Exchange cards with other teams. Critique teams methods of working. • Revise division facts by playing games. • In groups, determine how many boxes of orange juice can be produced from 5 672 oranges if it takes eight oranges to make one box of orange juice. Develop logical arguments to help solve the situation. Share their results with the entire class. Repeat process with 2- and 3-digit divisors or use online resources (games, puzzles or worksheet) on worded multiplication and division problems to assess concepts taught. • In pairs, create similar real life situations with division of whole numbers. Exchange with partners for them to solve. Share results with other pairs.	• Divide numbers • Solve real life problems • Estimate numbers • Check answers • Test for divisibility • Navigate digital content • Observe moral principles when using online material	• Divide accurately whole numbers • Solve accurately real life problems • Ability to estimate • Use accurately divisibility tests

LEARNING OUTCOMES

Students will be able to:

- ✓ Divide whole numbers
- ✓ Solve real life problems involving division
- ✓ Make estimates
- ✓ Check answers accurately
- ✓ Test for divisibility
- ✓ Navigate digital content in order to revise concepts of division and multiplication

POINTS TO NOTE:	**EXTENDED LEARNING:**
• Students need to know the division basic facts. Also, they need to be able to multiply and subtract efficiently. • Always begin with a real life problem when introducing division. • Emphasize the importance of zero in numbers. • In division, the part is left over after dividing is the remainder which is a fraction. • Allow students to use calculator to check results after dividing.	• Encourage students to extend their division facts beyond 12. • Let them generate their own real life problems using division. Exchange with partners for them to solve. Share results collectively as a whole class. • Allow students to make journal entries on what they think about division and why it is quicker to arrive at solutions using division rather than repeated subtraction, especially when working with large numbers. • Encourage students to make sets of flash cards with division sentences and word problems on division to add to their "Math Kit".
RESOURCES: • Flash cards, Time tables • Journals, Math kit • Internet, Computer and any other available technologies • Cartridge paper • Marker • Scissors, Glue	**KEY VOCABULARY:** • Division, Divisibility • Estimate, compute • Quotient, Pattern **LINKS TO OTHER SUBJECTS:** Social Studies Information Technology Science, Business Basics

Prior Learning
Check that students can:

- Differentiate between the use of addition and multiplication, subtraction and division in problem situations involving whole numbers.
- Select data relevant to a problem when finding its solution.
- Identify the 'hidden question' in a two-step problem.
- Write mathematical sentences for a two-step problem.
- Estimate and check answers to computations/problems.
- Identify and use the keys on a pocket calculator.
- Use the calculator to check answers.
- Investigate number patterns using the calculator.

Focus Question 2: What are the roles of financial institutions?	**Benchmark:** • Apply and justify the use of a variety of problem solving steps in identifying missing facts. • Know and use terms associated with financial institutions.
Standard - Number Operation: Use the basic operations, number relationships, patterns, number facts, calculators and dynamic software to compute and estimate in order to solve real world problems involving fractions, percentages and decimals. **ICT ATTAINMENT TARGET(S):** COMMUNICATION AND COLLABORATION - Students use technology to communicate ideas and information, and work collaboratively to support individual needs and contribute to the learning of others.	**Objectives:** • Write and solve mathematical sentences for a two-step problem. • Analyze data for problems to discover missing facts essential to their solution. • Solve worded problems involving the use of any one or two basic operations. • Determine the operations to be used to solve worded problems when no numbers are given. • Identify the 'hidden question' in a two-step problem. • Use estimates when multiplying to judge the reasonableness of products. • Use a calculator to perform calculations and check answers. • Identify types of financial institutions and their roles/functions. • Explain terms used in savings and loans. • Tell the importance of being honest.

SUGGESTED TEACHING AND LEARNING ACTIVITIES – Focus Question 2	KEY SKILLS	ASSESSMENT CRITERIA
Students will: • Discuss the following question. **Question:** *Carol has written a number pattern that begins with 1, 3, 6, 10, 15. If she continues this pattern, what are the next four numbers in her pattern?* Be guided by teacher in applying the "Three-step" problem solving approach i.e. i). **UNDERSTAND:** What do you need to find? You need to find 4 numbers after 15. ii). **PLAN:** How can you solve the problem? You can **find a pattern**. Look at the numbers. The new number depends upon the number before it. iii). **SOLVE:** Look at the numbers in the pattern. 3 = 1 + 2 (starting number is 1, add 2 to make 3) 6 = 3 + 3 (starting number is 3, add 3 to make 6) 10 = 6 + 4 (starting number is 6, add 4 to make 10) 15 = 10 + 5 (starting number is 10, add 5 to make 15) New numbers will be: 15 + 6 = 21; 21 + 7 = 28; 28 + 8 = 36 and 36 + 9 = 45. • Generate logical reasoning in solving the following. **Question:** *You save $3 on Monday. Each day after that you save twice as much as you saved the day before. If this pattern continues, how much would you save on Friday?* i). **UNDERSTAND:** You need to know that you save $3 on Monday. Then you need to know that you always save twice as much as you find the day before. ii). **PLAN:** How can you solve the problem? You can **make a table** like the one below. List the amount of money you save each day. Remember to double the number each day.	• Discuss real life situations. • Generate logical reasons • Formulate plans • Use appropriate strategies • Think critically • Apply logical reasoning to situations • Apply strategies • Detect patterns • Judge situations • Solve problems • Participate in groups • Work backwards • Guess and check • Draw picture • Make lists • Write number sentences • Estimate numbers • Use calculator	• Solve accurately real life problems Work cooperatively in groups • Ability to estimate • Write accurately number sentences

Dav	Amount of Monev Saved
Monday	$3
Tuesday	$6
Wednesday	$12
Thursday	$24
Friday	

Solution: You save 2 X $24 = $48 on Friday.

- Think of ways to arrive at solutions to the following situation.
  Question: *Jack walked from Santa Clara to Palo Alto. It took 1 hour 25 minutes to walk from Santa Clara to Los Altos. Then it took 25 minutes to walk from Los Altos to Palo Alto. He arrived in Palo Alto at 2:45 P.M. At what time did he leave Santa Clara?*

  i). **UNDERSTAND:**
  What do you need to find?
  You need to find, what time Jack left Santa Clara?

  ii). **PLAN:**
  How can you solve the problem?
  You can **work backwards** from the time Jack reached Palo Alto. Subtract the time it took to walk from Los Altos to Palo Alto. Then subtract the time it took to walk from Santa Clara to Los Altos.

  iii). **SOLVE:**
  Start at 2:45. This is the time Jack reached Palo Alto.
  Subtract 25 minutes. This is the time it took to get from Los Altos to Palo Alto.
  Time is: 2:20 P.M.
  Subtract: 1 hour 25 minutes. This is the time it took to get from Santa Clara to Los Altos.
  Jack left Santa Clara at 12:55 P.M.

- Determine ways in which the following can be solved.
  Question: *Amy and Judy sold 12 movie tickets altogether. Amy sold 2 more tickets than Judy. How many tickets did each girl sell?*

  i). **UNDERSTAND:**
  What do you need to find?
  You need to know that 12 tickets were sold in all. You also need to know that Amy sold 2 more tickets than Judy.

  ii). **PLAN:**
  How can you solve the problem?
  You can **guess and check** to find two numbers with a sum of 12 and a difference of 2. If your first guess does not work, try two different numbers.

  iii). **SOLVE:**

First Guess:	Second Guess:
Amy = 8 tickets	Amy = 7 tickets
Judy = 4 tickets	Judy = 5 tickets
Check	Check
8 + 4 = 12	7 + 5 = 12
8 - 4 = 4 (Amy sold 4 more tickets)	7- 5 = 2 (Amy sold 2 more tickets)
These numbers **do not** work!	These numbers do work!
	Amy sold 7 tickets and Judy sold 5 tickets.

- Generate ideas on how to arrive at a solution for the following.
  Question: *Laura has 3 green chips, 4 blue chips and 1 red chip in her bag. What fractional part of the bag of chips is green?*

  i). **UNDERSTAND:**
  What do you need to find?
  You need to find the total number of chips in the bag. Then you need to find how many of the chips are green.

ii). **PLAN:**
How can you solve the problem?
You can **<u>draw a picture</u>** to show the information. Then you can use the picture to find the answer.

iii). **SOLVE:** Draw 8 chips

3/8 of the chips are green.

- Develop logical reasoning on how to solve the following.
Question: *Judy is taking pictures of Jim, Karen and Mike. She asks them, "How many different ways could you three children stand in a line?"*

i). **UNDERSTAND:**
What do you need to know?
You need to know that any of the students can be first, second or third.

ii). **PLAN:**
How can you solve the problem?
You can **<u>make a list</u>** to help you find all the different ways. Choose one student to be first, and another to be second. The last one will be third.

iii). **SOLVE:**
When you make your list, you will notice that there are 2 ways for Jim to be first, 2 ways for Karen to be first and 2 ways for Mike to be first.

First	Second	Third
Jim	Karen	Mike
Jim	Mike	Karen
Karen	Jim	Mike
Karen	Mike	Jim
Mike	Karen	Jim
Mike	Jim	Karen

So, there are 6 ways that the children could stand in line. • Devise ways in which the following can be solved. ***Question:*** *Sam placed 18 pencils in 3 equal groups. How many pencils are in each group?* i). **UNDERSTAND:** What do you need to know? You need to know that there are 18 pencils and they are divided into 3 equal groups. ii). **PLAN:** How can you solve the problem? You can **write a number sentence** to solve the problem. Write a division sentence to divide the pencils in 3 equal groups. iii). **SOLVE:** 18 ÷ 3 = 6. There are 6 pencils in each group. • Discuss the various functions of the basic keys on simple calculator. As a whole class, model series of operations on calculator (addition, subtraction, multiplication and division). Repeat process with fractional numbers. • In pairs/groups estimate first, then use calculator to arrive at the solution to given problems. Write number sentences and tabulate findings. • Select three- and four-digit numbers. Use calculator to multiply each by 99 or/and 999 etc. Record and compare results. Investigate for patterns or relationships, and then use them to predict other results. Describe the pattern detected. • work in groups/pairs and be assigned a calculator. Agree on a series of numbers, and tabulate them. Enter any number into calculator, and then press the multiplication (×) key. Within 5 seconds enter another number that will give a product close to the target number, and then press the equal (=) key. Play at least ten more rounds. Repeat the procedure using the division (÷) key. Record the information in table form e.g. 356 × ___ = 22 428. • observe a video presentation on some of the activities being carried out in a financial institution. In groups, discuss the content of the video and then list as many activities being done in the institution that is related to money. Share findings with the entire class. • say why it is important to be honest when working in any financial institution and dealing with investors' money. Make journal entry on their understanding of why it is important to be honest with people's money.		

LEARNING OUTCOMES Students will be able to: ✓ Relate real life situations to solving problems ✓ Generate logical reasons through group and class discussions ✓ Formulate plans to solve word problems ✓ Use appropriate strategies to solve problems ✓ Think critically in an attempt to solve real life situations ✓ Apply logical reasoning to problem solving situations ✓ Apply strategies appropriately ✓ Detect patterns in series of numbers ✓ Judge situations accurately ✓ Solve problems effectively ✓ Participate in groups cooperatively ✓ Work backwards to solve word problems ✓ Guess and check effectively to solve word problems ✓ Draw picture to aid in solving a word problem ✓ Make lists to solve word problem ✓ Write number sentences to help solve word problem ✓ Estimate numbers mentally ✓ Use calculator efficiently to check results ✓ Show by their actions the importance to be honest ✓ Observe presentations		

POINTS TO NOTE	**EXTENDED LEARNING**
MONEY MATTERS • Financial institutions are those that engage in banking services such as loans and savings. Examples of these are commercial banks, credit unions, cambios, building societies etc. • Activities may be done as whole class, groups or pair activities • There are numerous approaches to problem solving. Some of which are: draw a picture, look for pattern, guess and check, make a systematic list, logical reasoning and work backwards.	• Encourage students to create PowerPoint Presentations in groups on financial institutions and their functions. Then make journal entries on the importance of financial institutions. • Encourage students to create word problems on real life situations involving the various operations (including money). Challenge their friends to devise strategies to solve their problems. Share results with entire class.

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- The calculator and its various functions ought to be a regular input in the daily activities of every student – in and out of the classroom setting.
- Estimation is another way of approximating or rounding of a value.

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- Challenge students to role-play some of the activities being done in a financial institution by setting up a bank or cambio scene with possible scenarios.
- Allow students to research the various currencies that are commonly used in financial institutions
- Challenge students to put together their budget in managing their monthly allowances or weekly or daily lunch money.
- Take students on an excursion to a financial institution.

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RESOURCES

- Calculator
- Chips
- Video
- Audio/visual set
- DVD
- Flash drive
- PowerPoint Presentation
- Make believe Money/Currencies
- Computer/laptop
- Accessories
- Financial magazines, newspapers, articles
- Props for role-play
- Journals
- Scrapbooks
- Portfolios

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KEY VOCABULARY

- Pattern, Calculator
- Financial institutions
- Currencies
- Insurance company
- Partner scheme
- Savings account
- Current account
- Principal, Deposit
- Withdrawal, Interest
- Problem solving
- Savings, Loans
- Money, Commercial Banks
- Credit union
- Friendly society
- Building society
- Honesty/trustworthiness

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LINKS TO OTHER SUBJECTS

Business Basics
Visual Arts
Language Arts

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UNIT OF WORK GRADE 5 TERM 3 Unit 2

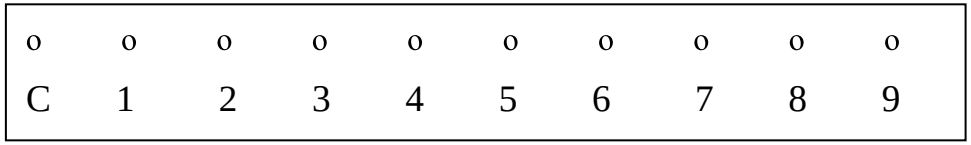
Prior Learning
Check that students:
- Identify the circle.
- Recognize the parts of a circle.

Strand: Geometry

Suggested Time: 4 weeks

About the Unit
In this unit, students will
- Make and explore geometric shapes and solids, and apply knowledge of their properties to problem solving situations

Focus Question 1: How do I recognize different parts of a circle?	**Benchmark**: Make and explore geometric shapes: non-polygons and polygon not exceeding 8 sides; and apply knowledge of their properties to problem solving situations.
Standard - Geometry: Explore paths, geometric shapes and space and make generalization about geometric relationships within the environment. **ICT ATTAINMENT TARGET(S):** DESIGNING AND PRODUCING - Students use digital tools to design and produce creative multimedia products to demonstrate their learning and understanding of basic technology operations.	**Objectives:** ● Contrast the meaning of a circle as a curve, and a circle as a two dimensional region. ● Describe and compare the parts of a circle (circumference, radius, diameter, chord, arc, segment and sector).

SUGGESTED TEACHING AND LEARNING ACTIVITIES	KEY SKILLS	ASSESSMENT CRITERIA
Students will: • Investigate the colour wheel as it relates to the circle theory • Cut a piece of cardboard like the shape below and label it in the same way. The dots are 1 cm apart. Punch holes C, 1, 2, 3, 4 ... 9. Hold point C fixed for the centre of a circle and place a pencil at hole #6 to draw a circle of 6 cm. Place the pencil at various holes and make curves which are particular distances from the centre C. Practise making circles with different radii. **Compass**  • Engage in discussions to examine the circle as a closed figure and a curve as a part of a circle. • Further examine letters such as C, S, G, J, O and see whether or not they have curves on them which can be taken to make circles. • Work in groups to examine/measure and describe a specimen of a given part of a circle. Share descriptions with the whole class. Critique each other's descriptions and hence arrive at a common description of different parts of the circle. • Discuss the difference between the parts of the circle a) Diameter / radius /chord b) Sector / segment / quadrant/ semi-circle c) Arc / circumference	• Label • Drawing circles • Make curves • Discussion • Label parts of the circle • Comparing parts of a circle • Calculate length of radius and diameter • Work in groups	• Accurately use the compass to make circles. • Make designs from various parts of the circle. • Calculate the length of a radius and a diameter. • Participate cooperatively in groups

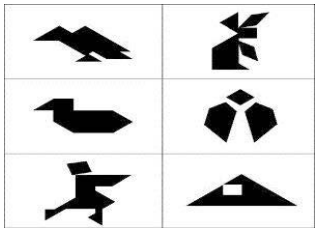
• Determine the length of a radius given the length of the diameter and vice versa. • Draw and label diagrams showing parts of the circle. • In groups, using a number of differently coloured paper, cut out circles. Then create patterns using shape and colour. • Use given parts of the circle to make designs.		
Learning Outcomes Students will be able to: ✓ Draw circles of various sizes. ✓ Label parts of the circle correctly. ✓ Recognize curves in a diagram. ✓ Make different designs/patterns. ✓ Participate in group activities cooperatively.		

POINTS TO NOTE	**EXTENDED LEARNING**
• *A **circle** is a plane figure that has all its points the same distance from a fixed point, called the **centre** of the circle.* • *The distance from the centre to the edge of the circle is called a **radius**, and a line segment connecting two points on the edge of the circle is a **chord**. A chord passing through the centre of the circle is called a **diameter** and the length of the circle (distance around) is the **circumference**.*	• *Mini research on Isaac Newton's contribution to the colour wheel.* • *Investigate why they are able to see colours as oppose to black and white* • *Create a design for a table mat using circles* • Research designs made from parts of a circle. • Encourage students to investigate a circle to determine its diameter, radius and circumference. Then research and explore other parts of the circle: sector, tangent, arc, chord, segment etc. • Give students more practice in identifying simple and complex closed curves. Draw examples of their own

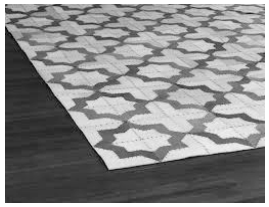
	with a partner. Exchange them with another pair to examine. ● Allow students to draw their own circles and then exchange them with a partner. The partner has to measure the circumference and diameter of each circle. ● Make other patterns with parts of the circle. ● Challenge students to make patterns using their compasses. Then make other patterns that involve dividing circles into an equal number of parts.
RESOURCES Compasses, Cartridge paper, Paste, Ruler, Coloured paper, Patterns/designs , Circular objects, pieces of string of various lengths, crayons, paints, scissors, containers for mixing paint	**KEY VOCABULARY** Curve, Sector , Segment , Chord , Radius , Diameter, Arc, colour wheel, spectrum, primary colour, intermediate colour, complementary **LINKS TO OTHER SUBJECTS** Engineering Visual Arts Biology Chemistry Industrial Arts

Focus Question 2: What happens when I manipulate polygons?	**Benchmark**: Make and explore geometric shapes: non-polygons and polygons not exceeding 8 sides; and apply knowledge of their properties to problem solving situations.
Standard - Geometry: Explore paths, geometric shapes and space and make generalization about geometric relationships within the environment. **ICT ATTAINMENT TARGET(S):** DESIGNING AND PRODUCING - Students use digital tools to design and produce creative multimedia products to demonstrate their learning and understanding of basic technology operations.	**OBJECTIVES:** • Compose regular/irregular polygons (five to eight sides) using combinations of triangles and quadrilaterals. • Create polygons (five to eight sides).

SUGGESTED TEACHING AND LEARNING ACTIVITIES	KEY SKILLS	ASSESSMENT CRITERIA
Students will: • create patterns using a variety of shapes i.e. polygons. • in groups, examine a puzzle to identify all the polygons that can be recognized. Label the vertices and write the names of the polygons which can be identified. • examine and use a set of cut-out shapes to make various polygons indicating those which are regular and those which are irregular. • mount a display of these newly created polygons highlighting each shape in a different colour. • use the seven piece tangram to make other polygons, such as birds, buildings, animals as well as numerals and letters of the alphabet.	• Identify polygons • Create polygons • Mount display • Create patterns with shapes	• Accurately make patterns from tangram pieces • Polygons created



- select designs from patterns made and identify shapes according to the number of sides. Record pattern in a table form.



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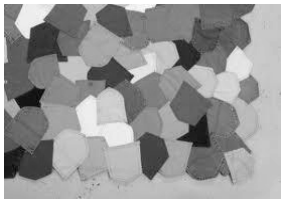

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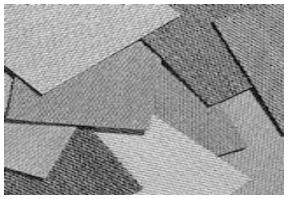


C

- examine patterns on rugs as shown in pictures above, identifying the various shapes used to make them.
- in pairs, draw a variety of polygons (i.e. five to eight sides) on a sheet of paper . Take turns describing one of the polygons using descriptors such as: number of lines of symmetry; number of equal sides; size of its angles. Then identify polygon described.
- in groups, use geo-boards and elastic bands to form as many polygons as possible. Sketch each polygon formed in their notebooks. Then name each polygon based on number of sides. Share and compare findings with other groups.
- discuss the definition of a polygon with teacher based on the number of sides, angles and straight lines. In journals write a definition for the word polygon. Share their understanding of polygons with the entire class.

- Work in groups
- Operating electronic devices
- browse and search
- design and produce

correctly

- Correctly design and explore patterns
- Work cooperatively in groups

• in groups create digital story based on assigned polygons. Each group will present their findings.		

LEARNING OUTCOMES

Students will be able to:

- ✓ Make designs using tangram pieces.
- ✓ Create polygons
- ✓ Make patterns with polygons
- ✓ Participate in group activities cooperatively
- ✓ Use selected ICT to explore polygons

POINTS TO NOTE

- Polygons can be described as two-dimensional figures with straight-line segments that are closed.
- Triangles, quadrilaterals, pentagons, hexagons, heptagons/septagons, octagons, nonagons and decagons are some examples of polygons.
- Polygons can be ***convex*** or ***concave***. A convex polygon has each of its interior angles less than 180˚, and is named according to the number of sides.

  A non-convex polygonal region is concave.

EXTENDED LEARNING

- Use the 7 piece tangram to make a variety of other designs.
- Encourage students to create a scrapbook of different types of polygons using match or fudge sticks or plastic straws. Label each polygon with its correct name. Engage in "Show & Tell" of their scrapbook of polygons with the entire class.
- Encourage students to create their own charts showing types of angles, polygons, triangles and quadrilaterals on cartridge paper – in groups of fours. Further allow students to learn how to create polygons in word processing or graphics programmes.
- Guide students in putting together a portfolio on how different types of polygons are used in patterns and designs of things around them i.e. in construction, art forms etc.
- Make their own set of polygons (5 to 8 sides).
- Make a toy using polygons.

RESOURCES

- Compasses
- Cartridge paper
- Paste
- paint, crayons, markers, scissors, rulers, motifs for design Portfolios
- Match/fudge sticks
- Plastic straws

KEY VOCABULARY

- Polygons
- Symmetry
- Hexagons
- Heptagons/septagons
- Octagons

• Chart with polygons • Cut out shapes • Journals • Scrapbooks • internet generated devices e.g. tablets, i-pad, laptops etc	• Geo-board • Tangram sets • Multimedia projector and any other available technologies	• Quadrilaterals • Triangles • Pentagons • design • motifs • elements • design art	• Decagons **LINKS TO OTHER SUBJECTS** Industrial Arts Visual Arts Information Technology Sciences: Engineering and Physics Modern Language

Prior Learning
Check that students can:
Identify and name plane shapes

About the Unit

In this unit, students will:

- Identity, describe, compare, classify and explore pyramids (triangular and square based) using their properties in real life situations.

Focus Question 3: What are the properties of pyramids?	**Benchmark: Model and explore pyramids (triangular and square based) by noting their properties and nets.**
Standard - Geometry: Explore paths, geometric shapes and space and make generalization about geometric relationships within the environment. **Sub-theme: Solids** **ICT ATTAINMENT TARGET (S):** COMMUNICATION AND COLLABORATION - use technology to communicate ideas and information, and work collaboratively to support individual needs and contribute to the learning of others. DESIGNING AND PRODUCING - use digital tools to design and produce creative multimedia products to demonstrate their learning and understanding of basic technology operations.	**Mathematics Objectives:** • Draw and describe nets of pyramids: triangular and square based. • Construct solids from given nets (pyramids: triangular and square based) • Identify and explore the properties of pyramids: triangular and square based. • Identify pyramids from their nets: triangular and square based.

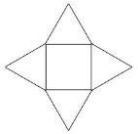
SUGGESTED TEACHING AND LEARNING ACTIVITIES – Focus Question 1	**KEY SKILLS**	**ASSESSMENT CRITERIA**
Students will: Describe the properties of triangular and square based pyramids presented with their nets and solids using the following categories. • Number of edges • Number of vertices • Number of faces • Shape of faces **Discussion should bring out the shape of their base**	• Make observations • Create 3-D models • Critique	• Accurately state the Properties of pyramids: triangular and square base

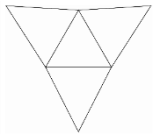
Pyramid	Nets	Number of edges	Number of vertices	Number of faces	Shape of faces
 Triangular pyramid					
 Square pyramid					

Compare the pair

What is similar?	What is different?

Be given nets of square based pyramids and triangle based pyramids to trace on plain paper, cut along edges and fold to form solid objects.

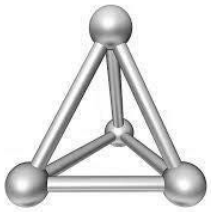
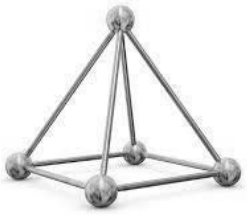
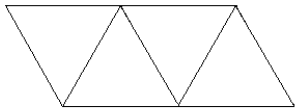
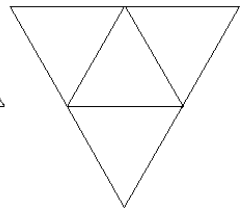
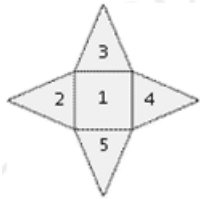
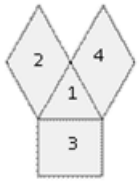
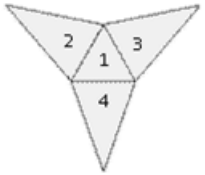
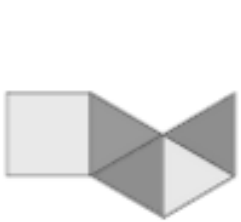
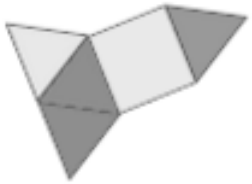
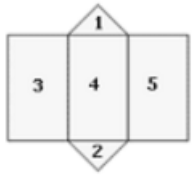
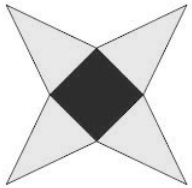




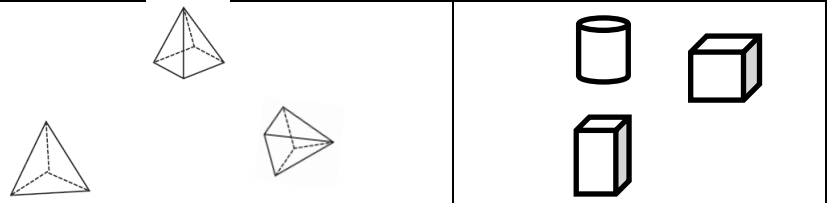
- Create frames of solids using match sticks, fudge sticks, pipe cleaners or tooth picks along with other materials.

- Identify faces, edges, vertices and cross-section of pyramids: triangular and square base
- Compare
- Draw and make representations of pyramids: triangular and square base
- Measure angles
- Estimate
- Discuss
- Investigate
- Classify
- Sketch designs
- Construct solids
- Examine pyramids: triangular and square base

- Correctly count the number of faces, edges, vertices and shape of faces of solids
- Correctly create Pyramids: triangular and square base
- Construct accurately geometric solids
- Complete designs and model buildings with geometric solids
- Work cooperatively in groups

  • Identify and explain which of the nets below can be folded to a triangular based pyramid.      • Identify and explain which of these nets below can be folded to a square based pyramid.       • Cut and paste design of buildings depicting geometric solids being explored. • Create models of buildings using geometric shapes.	• Explore geometric properties • Identify geometric properties • Participate in groups	

• Sketch designs of models of buildings on cartridge paper. • Organize group portfolios of designs sketched.		
LEARNING OUTCOMES Students will be able to: ✓ Identify all the differences between pyramids and their respective nets. ✓ State all the similarities between pyramids and their respective nets. ✓ Construct, draw and model pyramids: triangular and squared base. ✓ Identify edges, vertices and faces ✓ Create models of buildings using solids ✓ Sketch designs of models		

POINTS TO NOTE	**EXTENDED LEARNING**
• Use models of examples and non-examples to aid students' mental representation and understanding. • Provide students with ample opportunities to explore solids and create their own lists of properties.	• Have students roll and trace pyramids on paper to create different nets of the same solids. Each face of the solid is to be numbered so that students can accurately track their rolls. Ask students to describe the nets they produce, stating why these nets may look different but produce the same solid. • Provide students with examples and non-examples of square and triangular based pyramids. Allow them to discuss and categorize shapes or objects based their observations. Triangular and square based pyramid | Non- Examples 

	• Place prisms and non-prisms in a bag. Have students place one hand in the bag to feel one of the solids. Students must describe the solid, stating its vertices, faces (number of and shape) and edges, to the class and determine which prism it is or if it is not a prism. Student must show each solid to the class and then replace it in the bag. • Encourage students to research on the most effective designs to model the construction of buildings in the near future. Bear in mind safety, protection and sustainability of the environment and natural hazards. • Have students present their designs of models of buildings as prospective architects. • Allow students to superimpose their building designs on computer software for editing. • Challenge students to sell their ideas to the Ministry of Education Youth and Information in the construction of school plants in the near future. • Have students make journal entries based on experiences gained from each activity being explored.
RESOURCES • Nets of solids • Multi-media projector • Charts/tables • Models of pyramids • Internet-generated device • Materials for making geometric solids	**KEY VOCABULARY** • Pyramids • Vertices • Faces • Edges
LINKS TO OTHER SUBJECTS This may be linked to science, visual arts and social studies.	

UNIT OF WORK GRADE 5 TERM 3 Unit 3

Prior Learning
Check that students can:
- Substitute a number for a variable in simple mathematical sentences.
- Write algebraic sentences from a worded problem.

STRAND: Algebra

Suggested Time: 2 weeks

About the Unit

In this unit, students will:
- Investigate changes in variables in algebraic expressions and equations.

Focus Question 1: How do I write and interpret expressions and equations involving variables?	**Benchmark:** Investigate changes in variables in algebraic expressions and equations.
Standard Algebra: Employ algebraic reasoning through the use of expressions, equations and formulae to interpret, model and solve problems involving unknown quantities **Sub-theme:** Algebraic Expressions and Equations **ICT ATTAINMENT TARGET(S):** RESEARCH, CRITICAL THINKING, PROBLEM SOLVING AND DECISION MAKING - recognise the human, ethical, social, cultural and legal issues and implications surrounding the use of technology and practice online safety and ethical behaviour.	**Mathematics Objectives:** • Investigate the meaning of a variable in an equation as ▪ a changing quantity ▪ an unknown quantity. • Write algebraic expressions to represent situations where a quantity increases or decreases by an unknown amount.

<table>
<tr><th>SUGGESTED TEACHING AND LEARNING ACTIVITIES – Focus Question 1</th><th>KEY SKILLS</th><th>ASSESSMENT CRITERIA</th></tr>
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Students will:

- Use the scenario below to determine the possible dimensions:
  You want to create a goat pen with an area of 36m^2 for farmer Brown. What dimensions would give him the lowest cost for fencing providing that each meter of fencing cost $100?

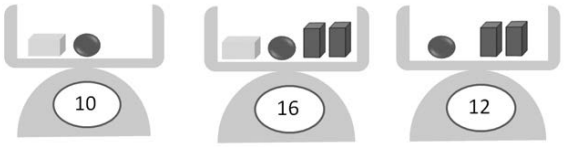
- Illustrate the possible dimensions using the table below:

Length (l)	Width (w)	Area	Fencing (Perimeter)	Cost
1m	36m	36m^2	74m	$7400
2m	18m	36m^2	40m	$4000
		36m^2		
		36m^2		
		36m^2		

Guided Questions

1. What do you notice about the lengths and widths throughout the table?
2. What do you notice about the perimeter and area throughout the table?
3. Which dimension yielded the lowest cost in fencing?

- Find the value of each solid shape on the scales below:



- Use the scenario below to write expressions:
  On Monday, Susan has $350 in her saving pan. On Tuesday she puts $y into her saving pan. On Wednesday she puts another $y into her saving pan. She continues putting in $y every day.

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- Inferring
- Communicating
- Analysing
- Problem solving
- Observing

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- Oral responses accurately stated
- Ability to interpret information from problem situation
- Write accurately algebraic expressions

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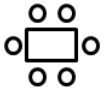
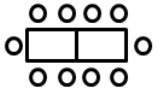
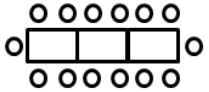
SUGGESTED TEACHING AND LEARNING ACTIVITIES – Focus Question 1	KEY SKILLS	ASSESSMENT CRITERIA
- Write an algebraic expression to represent the amount of money she has saved after 3 days. - Write an algebraic expression to represent the amount of money she has saved after 5 days. - Write an algebraic expression for working out the amount of money in the saving pan on any given day.		
LEARNING OUTCOMES Students will be able to: • Formulate algebraic expressions • Work cooperatively in groups • Interpret the meaning of a variable in an equation.		

POINTS TO NOTE

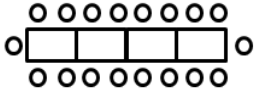
- Try as best as possible to integrate Algebra with other strands of mathematics.
- Algebraic expressions are not equations thus they cannot be solved.
- Algebraic equations are solved for the unknown value which makes the statement true.
- Allow students to extend and apply their knowledge of arithmetic in creating algebraic expressions and equations.

EXTENDED LEARNING

- Mr. Jones is setting up a room for some wedding guests. He is setting the 20 tables joined in a line and needs to know the number of chairs to add for each table. Help Mr. Jones determine the number of chairs he needs without setting out all the tables.
  This is what Mr. Jones has done so far.

Number of Tables	Arrangement	Number of Chairs
1		6
2		10
3		14

SUGGESTED TEACHING AND LEARNING ACTIVITIES – Focus Question 1	KEY SKILLS	ASSESSMENT CRITERIA

4		18

How many chairs will be needed if there are 5 tables?
How many chairs will be needed for 7 tables?
What do you notice about the number of chairs needed each time a table is added?
Write an algebraic expression to determine the number of chairs needed each time a table is added. How many chairs are needed for the 20 tables?

- Do the 'Who has, I have' activity. Example

I have $4n + 1$.. Who has a number n less than 8?	I have $9n$. Who has 10 less than a number n?
I have $n - 10$. Who has 4 times a number n increased by 1?	I have $8 - n$. Who has 9 times a number n?

RESOURCES

- Multi-media projector
- Tables/Charts
- Real things for modelling

KEY VOCABULARY

- Changing quantity
- Unknown quantity
- Increase
- Decrease
- Expression

SUGGESTED TEACHING AND LEARNING ACTIVITIES – Focus Question 1	KEY SKILLS	ASSESSMENT CRITERIA
LINKS TO OTHER SUBJECTS Business Basics (Money Management) Language Arts (Writing simple worded expressions)		

About the Unit

In this unit, students will:

- Understand and apply algebraic thinking in problem situations.

Prior Learning

Check that students can:

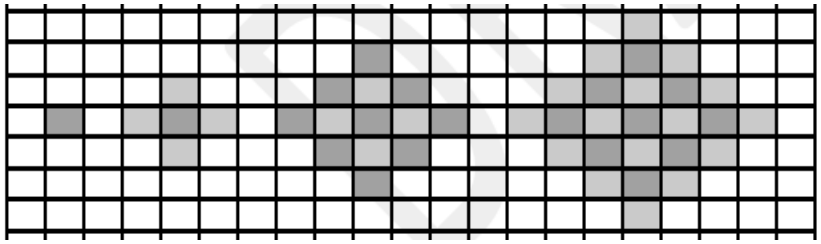
- Identify the correct operation to be used in solving a problem.
- Solve worded problems using algebraic expressions.
- Demonstrate the principle of substitution in simple formulae.

Focus Question 2: How do I use algebra to solve real world problems?	**Benchmark:** Understand and apply algebraic thinking in problem situations.
Standard - Algebra: Employ algebraic reasoning through the use of expressions, equations and formulae to interpret, model and solve problems involving unknown quantities. **Sub-theme:** Algebraic sentences **ICT ATTAINMENT TARGET(S):** RESEARCH, CRITICAL THINKING, PROBLEM SOLVING AND DECISION MAKING - Students use appropriate digital tools and resources to plan and conduct research, aid critical thinking, manage projects, solve problems and make informed decisions.	**Objectives:** ● Solve for the variable in an open mathematical sentence using addition or subtraction with or without the use of brackets. ● Solve for the variable when it represents an addend or sum in a mathematical sentence with fractional numbers including mixed numbers. ● Use algebraic sentences in solving worded problems.

SUGGESTED TEACHING AND LEARNING ACTIVITIES – Focus Question 1	KEY SKILLS	ASSESSMENT CRITERIA

Students will:

- in groups, model and investigate the growth of a design using small squared tiles, square paper or any other suitable materials. Record their findings at each stage of the pattern and make generalization.



Stage	Blue tile	Gold tile	Total
1	1	0	1
2	1	4	5
3	9	4	13
4	9	16	25
5			
6			
n			

Possible questions: What is the relationship between the blue tiles and the gold tiles at each stage? What is the relationship between the stages and each group of coloured tiles? Without modelling, can you complete the table up to stage 10? Can you create a general rule and use it to determine the total number of tiles at any stage of the pattern?

- write algebraic expressions from story problem and vice-versa. For example, Robert has 30 elastic bands in his collection. He receives ***'r'*** more elastic bands from his friend Andrew. He then gave '***t***' amount to Samantha. Write an algebraic expression to represent the amount of elastic bands Robert

- create and model patterns
- reasoning through problem solving process
- making generalization
- exploring rules
- navigate digital content

- Accurately create and model patterns
- Oral and written responses accurately stated
- Make accurate generalizations

now has.

- be presented with word problem for them to create an input-output table. For example, Peter is paid $300 for every hour he works. How much is Peter paid if he works for 2 hrs? 3 hrs? 4 hrs? 5 hrs? 6hrs? Etc. Students will create an algebraic equation describing the relationship between hours worked and payment.

Hours (h)	Pay (p)
1	$300
2	$600
3	$900
4	$1200
5	$1500
6	$1800

$p = \$300 \times h$

- Have students work in groups to create a written description of the relationship.
- Complete activities on operations of whole numbers and/or fractions to determine the precise numbers of three types of dried beans needed to make salads to determine unknown variables. (**Bean Salad Recipes**)

• With teacher's assistance use online resources on algebra concepts such as worksheets, puzzles or games to solve problems created and explain to the class the steps that were taken to obtain their answers.		
LEARNING OUTCOMES Students will be able to: ✓ Interpret word problems using algebraic expressions and sentences ✓ Deduce general rules from patterns. ✓ Identifying variables. ✓ Create equations with variables and symbols. ✓ Navigate online content to develop an understanding of simple algebraic concepts.		

POINTS TO NOTE	**EXTENDED LEARNING**
• Substitution refers to the replacement of variables with numeric values. Formulae in algebra are linked to the understanding of those being developed in Science • Patterns can be used to solve problems. It is a means through which students basic understanding of mathematics can be enhanced. • Students should be allowed to make to make and extend patterns	• Allow students to use place value patterns to extend understanding of the representation of numbers to millions. For example ÷10 = 876.5 8765 x 0.1=876.5 8765 ÷100 = 87.65 8765 x 0.01 = 87.65 8765 ÷1000 = 8.765 8765 x 0.001 =8.765 • Allow students to carry out research on the use of substitution in algebraic expressions in real-life experiences. • Make journal entry on the importance of substituting in algebraic expressions.

RESOURCES	KEY VOCABULARY
• square tiles/blocks • square paper • computer and any other available technologies • internet • online worksheet, puzzle, or games • variety of beans • containers Bean Salad Recipes with Whole Numbers Activity Sheet Bean Salad Recipes with Fractions Activity Sheet Bean Salad Recipes with Whole Numbers Answer Key Bean Salad Recipes with Fractions Answer Key	• square numbers • diagonal • pattern • general rule • relationship • *variables* • *whole numbers* • *fractional numbers* • *legumes* **LINKS TO OTHER SUBJECTS** Science- Biology Business Basics

UNIT OF WORK GRADE 5 TERM 3 Unit 4

Strand: STATISTICS AND PROBABILITY

Suggested Time: 2 weeks

Prior Learning

Check that students can:-

- Apply probability concepts;
- Identify possible outcomes of an experiment.
- Make predictions regarding the outcomes of experiments
- Explain differences between predictions and results of experiments
- List possible expected values of an experiment

About the Unit

In this unit students will

- **Estimate, calculate and interpret the mean, mode, median and range of a set of discrete data.**

Focus Question 1: How do I findaverages?	**Benchmark:** Estimate, calculate and interpret the mean, mode, median and range of a set of discrete data.
Standard_Statistics and Probability: Collect, organise, interpret and represent data and make inferences by applying knowledge of statistics and probability. **Sub-title**: Measures of central tendency **ICT ATTAINMENT TARGET(S):** 💻 COMMUNICATION AND COLLABORATION - Students use technology to communicate ideas and information, and work collaboratively to support individual needs and contribute to the learning of others. 💻 DESIGNING AND PRODUCING - Students use digital tools to design and produce creative multimedia products to demonstrate their learning and understanding of basic technology operations.	**OBJECTIVES:** • Estimate and calculate the mean of a set of data. • Find the modal value of a set of data. • Find the median value of a set of data. • Find the range of a set of data.

💻 DIGITAL CITIZENSHIP - Students recognise the human, ethical, social, cultural and legal issues and implications surrounding the use of technology and practice online safety and ethical behaviour.	

SUGGESTED TEACHING AND LEARNING ACTIVITIES	KEY SKILLS	ASSESSMENT CRITERIA
Students will: • be given various activities where they will be required to generate and record data. For example 'Paper Plane.' o Students make paper plane from template provided by teacher (one per group) o Each student takes turn to fly plane o Use string and measuring tape to measure and record distances flown by each. (Record to the nearest whole centimetre) o Determine by estimation, the average distance flown by each group. Teacher should discourage students from using the add- them-all-up- and- divide- by- the- number approach. Instead, allow students to realize whether or not the data is clustered around a few values, or are spread out. Other activities that may be used include : o The score/scores which tell(s) how well the class performed in a particular test o The time at which most students in the class arrive at school. o Use an online survey tool to collect class data such as favourite foods, fruits colours etc. such data could be then use represent various graphs. • develop a line plot as shown, based on the number of siblings that each student has and or use a spreadsheet software to enter this data, generating a line plot for analysing and interpreting. 0 1 2 3 4 5 6 7 8 9 10 11 12	• Organize data examples • Estimate • Measure • Read • interpret graphs • Compute averages • Compare averages • Navigate digital content • Enter data into column and row	• Calculate correctly the range of a data set. • Determine when it is appropriate to use mean, median or mode as an average • Calculate or identify the mean, mode and median of a data set

Number of siblings a) Teacher asks questions for example ○ What do you notice about the data? ○ Which number /numbers of siblings do most students have? ○ What is theaverage number of siblings that children in this class has? ○ What statistical measure do you think this represent and why? b) Use information on the graph to calculate the mean, median and mode. Discuss how they would calculate these scores. c) Discuss when the mean, median and mode are used. d) How do the calculated values correspond with the values previously discussed? • be guided by the teacher to use the mean, median and mode and suggest one example of when to use each. • be introduced to terms such as *range* and *outlier* as observed on the graph. • examine and calculate the range of a set of scores. • discuss how arithmetic mean relates to the data it represents.		
LEARNING OUTCOMES Students will be able to: ✓ Estimate to a reasonable degree of accuracy, the mean of a set of given data ✓ Determine the median, mean and mode of a set of data ✓ Explain how statistical averages relate to the data they represent		

POINTS TO NOTE	EXTENDED LEARNING
• Through discussion highlight the critical differences between the measures of central tendency (mean, median and mode, mean and median). • Due to the characteristics of each measure of central tendency they are appropriate for different contexts. Students should also get an opportunity to determine the most appropriate measure of central tendency for a particular data set (for example avoid using the mean when a data set has outliers)	Engage students in exploring what are outliers and how outliers affect the mean of a data set.
RESOURCES • Paper for making planes, String • Linear measuring tools • Computer and any other available technologies • Internet • Every Beat of Your Heart Activity Sheet (http://illuminations.nctm.org/uploadedFiles/Content/Lessons/Resources/3-5/BeatHeart-AS-EveryBeat.pdf) • Timing devices e.g. stop watch, timer etc • Teacher generated recording sheet • Download pulse rate app. on phone or tablet	**KEY VOCABULARY** Mean/average, Ascending order Descending order, Median, Mode Range, Estimate, Pulse, Heart beat **LINKS TO OTHER SUBJECTS** Science- Biology, Physics, Information Technology Physical Education Social Studies Modern Languages

Focus Question 2.Why do I need to make predictions?	**Benchmark:** Understand and apply probability concepts; identifying possible outcomes of an experiment.
Standard - Statistics and Probability: Collect, organise, interpret and represent data and make inferences by	**Objectives:** • List the possible outcomes of simple experiment.

applying knowledge of statistics and probability. **Sub-title**: Outcomes of an event	• Determine the probabilities of all possible outcomes of a simple event. • Identify least likely/most likely/equally likely outcome(s) of an experiment. • Perform and report on a variety of given probability experiments. • Make inferences and draw conclusions from a variety of experiments.

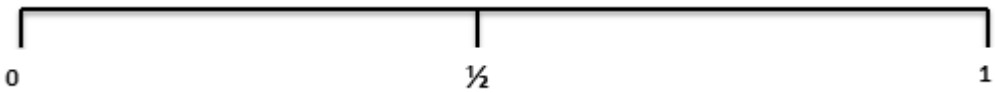
SUGGESTED TEACHING AND LEARNING ACTIVITIES	KEY SKILLS	ASSESSMENT CRITERIA

Students will:
 	
• play a game to learn about the four forces of flight: lift, drag, thrust, and weight.
• conduct a probability experiment with spinners and record their results in tally tables.
• use the findings to select spinners with the greatest probability of winning the game.
 	
• discuss and list all possible outcomes of various events such as:
  o The different numbers one could get if a die is rolled.
  o The number of ways in which they could select two balls from five balls in a bag.
  o The number of these ways in which two balls selected would both be red if the bag contained three red and two blue marbles.
 	
• give examples of events which have:
  o Two possible outcomes
  o Three possible outcomes
  o Six possible outcomes
 	
• tell the number of different ways to get a total score of six if two dice are rolled. Conduct simple experiments and record results. Make comparison with results obtained and the possible outcomes generated in table form.
	• Sampling data
	
	• Organising data
	
	• Conducting experiments
	
	• Make predictions
	
	• Reporting on experiments
	
	• Displaying information
	
	• Writing argumentatively
		• List some of the possible outcomes from an experiment
		•
		• Calculate the theoretical probability of an experiment
		
		•

For example:

	1	2	3	4	5	6
1	1,1	1,2	1,3	1,4	1,5	1,6
2	2,1	2,2	2,3	2,4	2,5	2,6
3	3,1	3,2	3,3	3,4	3,5	3,6
4	4,1	4,2	4,3	4,4	4,5	4,6
5	5,1	5,2	5,3	5,4	5,5	5,6
6	6,1	6,2	6,3	6,4	6,5	6,6

- talk about everyday events, what is likely or unlikely, and what factors might influence or change the likelihood. Example:
    - Is it more likely to rain in April than in July?
    - How certain is it that an egg will break when it falls?
    - How many students are likely to take lunch to school next week?
- on a number line from 0 to 1, shown below, place the following words at the most appropriate place after discussion: possible, impossible, certain, uncertain, likely, unlikely, very likely, even chance, never, always. Give real life examples to match each word given.



- discuss, giving examples of outcomes which are impossible (probability of zero), and those which are certain (probability of one). Establish that probability is measured on a scale of zero (0) to one (1). Examples which are neither impossible nor certain are expressed as a proper fraction. This is derived by placing the number of favourable outcomes over the number of possible outcomes.

• in groups conduct experiments and record their results as fractions. For example,
  o toss a coin 100 or more times and tally each result. Realize that the chance of getting a head is ½ and the chance of getting a tail is also ½.
 	
  o Roll a die 100 or more times and record the result. Realize that
  ▪ the chance of getting any number (1, 2, 3, 4, 5, 6) is each 1/6
  ▪ the chance of getting an even number is ½
  ▪ the chance of getting an odd number is ½.
 	
• discuss events for which there is:
 	
  o A greater chance/ probability of happening
  o A lesser chance/probability of happening
 	
• write letters to persons stating the reason why people should always calculate their risk before gambling. Use the language of probability to support argument.		

LEARNING OUTCOMES
 	
Students will be able to:
  ✓ List the sample space of any given event
  ✓ Complete an experiment and express the probability of an event as 0, 1, between 0 and 1
  ✓ Make informed decision about events which are probable.		

POINTS TO NOTE	EXTENDED LEARNING
• The probability of any given event **DOES NOT** exceed 1 • If an event is certain, the probability is 1 • If an event is impossible, the probability is 0.	Students may make spinners and perform probability activities. • Make a new board game that favours other spinners. Let students examine their findings for each spinner and decide which spinner will help them reach the new goal fastest. Then have them play the game to test their predictions. • Make up a new spinner. Have students make a new game board that would best suit this spinner. Have them play a game to test their hypothesis. • Present this problem: Suppose that a helicopter uses three gallons of fuel for each turn needed to rescue the hikers. Calculate and graph the amounts of fuel used in each game played. For discussion Some people say it is harder to throw a six on a die. Is this true? How could you test this?
RESOURCES Dice Coins Balls Crayons Paper clips and pencils (to use as pointers" for the spinners Graph paper	**KEY VOCABULARY** Possible, impossible, certain, uncertain, likely, unlikely, very likely, even chance, never, always, chance, sample space, outcome, event , probability, lift , drag , thrust , weight, tally, scores

	LINKS TO OTHER SUBJECTS Geography Science: Physics, Engineering Modern Language Information Technology Social Studies

NSC

SCIENCE

Grade 5 UNITS

Introduction to the Science Curriculum

The New Standards Curriculum (NSC) is predicated on the science process skills and science practices. It is designed so that students develop these skills while learning the prescribed content. The process skills and science practices are addressed each year, with a particular focus at each grade level. Students use the process skills and practices of science to develop an understanding of the scientific concepts (see figure 1). The scientific attitudes and practices enable students to work like scientists.

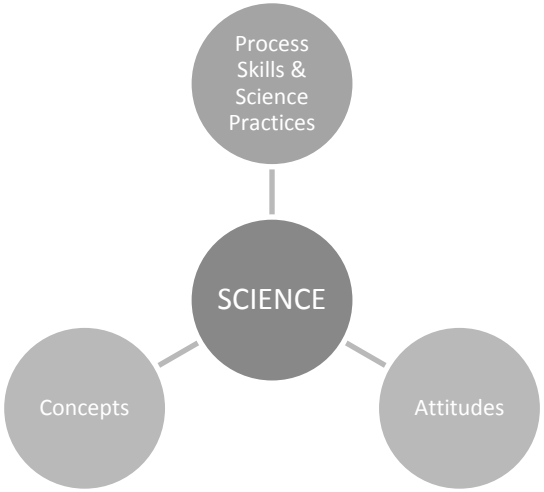


Figure 1: Elements of Science

The NSC design is based on education of the whole child and provides a well-rounded and enriching experience. Since science is about asking questions and finding answers to questions, the **Process skills** are actually the same skills that we all use in our daily lives as we try to figure out everyday questions. These skills include:

- Observing
- Communicating
- Measuring
- Classifying
- Predicting
- Inferring
- Identifying and controlling variables
- Define operationally
- Formulating hypotheses
- Interpreting data
- Experimenting
- Creating models

When we teach students to use these skills in science, we are also teaching them skills that they will use in the future in every area of their lives.

Content is easy to forget but the process skills remain forever/for longer periods.

Scientific competences do not develop incidentally - they must be deliberately and systematically included in students' educational experiences. Laboratory/practical activities positively influence the development of process skills.

The NSC emphasizes the teaching of science using process/inquiry skills in order that students:

- acquire content
- develop the ability to recognise problems
- think critically about how to solve problems
- follow logical, sequential and analytical steps in arriving at solutions

These are achieved in the NSC through the use of student-centred approaches such as inquiry-based, project-based, and problem-based learning, which are utilised in the integrative STEM/STEAM approach. From these, the science and engineering practices are fostered. The science and engineering practices, as identified by the Next Generation Science Standards (NGSS), are:

- Asking Questions or Defining Problems
- Developing and Using Models
- Planning and Carrying Out Investigations
- Analysing and Interpreting Data
- Using Mathematics and Computational Thinking
- Constructing Explanations or Designing Solutions
- Engaging in Argument From Evidence
- Obtaining, Evaluating, and Communicating Information

Activities in the NSC are investigative in nature and encourage the exploration of the natural environment. Emphases on real-world applications foster the development of the key 21st century skills commonly called the 4Cs (critical thinking, creativity, collaboration and communication) as well as scientific attitudes such as curiosity, objectivity, critical mindedness, open mindedness, inventiveness, intellectual honesty, humility and perseverance.

Assessment in the Science Curriculum

In the science learner-centred classroom, assessment is done by the teachers and students. The key aim of science at this stage, in addition to garnering knowledge and understanding about certain science phenomena considered crucial for students at this level, is to enable children to develop twenty-first century competencies through active and real life experiences which train them to 'work scientifically' and solve problems through inquiry and the engineering design process. Such an aim cannot be effectively achieved by the administration of external written tests.

Explicit links between what is intended to be learned and what is assessed have been created in the science teaching and learning units. Each science unit within a grade level outlines the assessment criteria to be used in determining the skills, knowledge and understanding students are expected to achieve, after their learning encounters within that unit. However, the teacher has the liberty to select the learner-centred assessment strategies and tools that will be most effective in measuring the targeted learning outcomes. Scientific vocabulary and factual knowledge can be assessed by using well-structured short open-ended and multiple choice tests or quizzes given at appropriate times.

Assessment of students' achievements gathered within the school is used for two main purposes.

1. Formative assessment (assessment for learning - to assist learning). These assessment activities are:
    - aligned with the learning objectives of the science curriculum;
    - realistic and manageable for pupils and teachers, with cited time demands;
    - for ascertaining and reporting the achievement of individual pupils, information is gathered by use of a variety of learner-centred strategies and tools; and
    - promote the active engagement of pupils in their learning and its assessment.

2. Summative assessment (assessment of learning - to summarize and report on what has been learned, at the end of each unit or at the end of each term).

Assessment should not be an after-thought, but is an integral part of the delivery of instruction.

	SCOPE AND SEQUENCE		
	TERM 1	**TERM 2**	**TERM 3**
GRADE 4	• **Introduction to Science** Science & How scientists work • **Living Things** Characteristics of living things Classifying things as living and non-living Identifying plants and animals Survival needs of plants and animals Investigating needs of plants Designing fair tests Constructing green/ shade houses • **Plants and Animals** Identifying and naming common plants Drawing main parts of the plant Functions of main parts of the plant Investigating functions of plant parts Comparing types of flowering plants Drawing main parts of the flower Functions of the flower Types and features of root systems Classifying plants based on root systems Functions of root system Basic structure of animals Functions of external features of animals Vertebrates and invertebrates Characteristics of vertebrates	• **Sense Organs** Relating sense organs to senses Functions and differences in sense organs in humans and other animals Investigating the senses Basic structure and drawing of sense organs Functions of selected parts and detection of stimuli by sense organs Limitations of the senses Instruments used to extend senses Caring and protecting sense organs Adapting to loss/ limitation of sense organs Sensitivity to sensory disabilities • **Materials: Introduction** Simple properties of materials Investigating material properties Classification of materials based on properties and uses Grouping solids, liquids and gases using observable characteristics Investigating properties of solids, liquids and gases Constructing toys from everyday Materials	• **Water and Air** Investigating properties and forms of water Importance of water to life Sources of water Modelling the water cycle Sources and ways of reducing water pollution Simple methods of purifying water Constructing water filters Ways of conserving water Identifying common water-borne diseases Investigating properties of air Components of air and their uses Sources and ways of reducing air pollution Constructing air filters Identifying common air-borne diseases

GRADE 5	• **Forces and Work** Investigating effects of forces Relating amount of force needed to mass of object Classifying forces as push, pull and turn Determining when work is done Identifying types of forces Constructing devices that apply force Investigating effects of friction Ways of reducing friction • **Energy Forms** Sun as main energy source Importance of energy Defining energy Sources of energy and the corresponding energy forms Changing energy forms from one form to the next Use of energy resources Simple ways of conserving energy Methods of heat transfer Investigations of heat transfer Comparing conductors and insulators Application of conductors and insulators in everyday life	• **Nutrition** Basic food groups Types of food nutrients Importance of each nutrient Relating foods to particular nutrient Performing food tests to identify fats and starch Defining a balanced diet Formulating meal plans to reflect a balanced diet Assessing nutritional information on food products Importance of plants in food chains Importance of light energy (Sun) to plants Constructing food chains Interdependence of plants and animals in food chains Ways of preserving and protecting plants • **Ways Food are Grown** Issue of food scarcity Varied food production methods Nature of organic and non-organic methods Advantages and disadvantages of food production methods Effects on health and the environment Design and implementation of selected food production methods	• **Simple and Complex Machines** Definitions of machines and simple machines Classification of simple machines Every day examples of simple machines How simple machines work Defining load, fulcrum and effort Types of levers Technological advances in machinery Differentiating simple and complex machines Human Body as a complex machine Impacts of machines on society and the environment Designing a machine for a specific need • **Weather Instruments** Relate weather instruments to the elements of weather Functions of selected weather instruments Design and construct functional models of weather instruments Collect information on observable elements of weather for a specified period Analyse samples of weather data for patterns and trends Make predictions (weather forecasts) based on trends Compare predictions to national weather forecasts

GRADE 6	• **Environment** Defining the environment Investigating features/ soils of different environments Conserving the natural environment Effects of human activities on the environment Adaptations of organisms to their environment Defining climate change Evidence of climate change Causes and effects of climate change Ways of reducing factors causing climate change Solid waste disposal practices Defining and reducing solid waste pollution Effects of improper solid waste disposal Causes and ways of preventing soil degradation Effects of environmental problems on humans • **Energy: Light and Sound** Distinguishing luminous and non-luminous objects Investigating properties of light Interactions of light with different materials, lenses, mirrors Reflection/ refraction in daily life Investigating properties of sound Relating sound to type of material used Effects of loud sounds Sources and ways of reducing noise pollution Conducting fair tests	• **Materials: Properties and Uses** Properties and uses of selected materials Relate properties to uses Classifying materials based on properties Storage, handling and disposal of materials Environmental impact of improper disposal Designing materials for specific functions based on properties Reversible and Irreversible changes Investigating processes that lead to reversible and irreversible changes Investigating changes of state through heating and cooling Every day examples of reversible and irreversible changes • **Human Body Systems** Defining 'systems' Identification and functions of organ systems Importance of systems working together Identifying selected organs in each system Path travelled by food in digestive system Investigating movement Modelling human body systems • **Mixtures** Investigating mixtures Defining mixtures Classifying mixtures as solutions, suspensions and colloids Properties of materials used in separating mixtures Simple separation techniques	• **Diet and Drugs** Consequences of unbalanced diets Causes of obesity, diabetes and malnutrition Measures to prevent life style diseases Importance of eating healthy Examples of nutritional diseases Defining 'drugs' Classifying drugs Distinguishing 'over the counter' and 'prescription' drugs Examining information provided on medicinal drugs Beneficial and harmful drugs Effects of drugs on the body

SCIENCE UNITS OF WORK GRADE 5 TERM 1 UNIT 1: FORCES AND WORK

About the Unit

In this unit, students will learn about forces and their effects on various objects. They will be able to identify forces at work in everyday life and apply the knowledge of forces to construct and operate simple working devices.

Range of Content

- A force can be classified as push, pull or turn
- Forces can either affect the size, shape or motion of an object
- When a force causes motion, work is done
- Some types of forces are friction, gravity, magnetic, air resistance and upthrust
- Friction is the force that opposes the motion of one object against another. Friction reduces motion by slowing down the object or causing it to stop.
- Friction can be useful in daily life, seen in everyday tasks such as walking, driving and writing. Friction can also cause machines to be less efficient as more energy is needed to operate while energy can also be lost as heat
- The effects of friction can be reduced by using lubricants (oils) and grease on machine parts (e.g. brake fluids in cars)

Prior Learning
Check that students:
Know that a force is a push or pull and that a force is needed for movement.

Focus Question 1: How can I change the motion of an object?

THEME: Energy, Forces and Matter

Attainment Target(s):

- Recognise the importance of energy to life processes, everyday life, and the relationship between energy and matter
- Gain an understanding of and apply the engineering design process
- Gain an understanding of and apply aspects of the scientific method
- Begin to appreciate the influence and limitations of science
- Demonstrate a positive attitude towards the use of scientific language
- Demonstrate positive interpersonal skills in order to foster good working relationships

Benchmark(s):

- Understand the effects of forces and the concept of work.
- Make predictions of what will happen based on scientific knowledge and understanding. Suggest and communicate how to test these predictions. Interpret data and decide whether results support predictions, and are sufficient to draw conclusions.
- Generate and compare possible solutions to a problem based on how well each is likely to meet the criteria and limitations of the problem.
- Show concern for man's impact on the environment.
- Show concern for the need to conserve energy usage in our everyday life.
- Display curiosity, objectivity and perseverance in their approach to activities.

Objectives:

- Investigate the effects of forces (pushes/pulls/turns)
- Investigate the relationship between the mass of an object and the force needed to move it
- Classify the forces as push, pull or turn
- Infer that work is done when a force causes movement
- Deduce when work/no work is done, even with forces acting
- Make and repeat measurements to ensure accuracy of results
- Consider patterns in results in order to draw conclusions
- Show objectivity by using data and information to validate observations and explanations about forces
- Value individual effort and team work through investigations

Duration: 2 weeks/ 4 hours	
ICT Attainment Targets: • **COMMUNICATION AND COLLABORATION - Use technology to communicate ideas and information, and work collaboratively to support individual needs and contribute to the learning of others** • **DESIGNING AND PRODUCING –Use digital tools to design and develop creative products to demonstrate their learning and understanding of basic technology operations** • **RESEARCH, CRITICAL THINKING, PROBLEM SOLVING AND DECISION MAKING - Use appropriate digital tools and resources to plan and conduct research, aid critical thinking, manage projects, solve problems and make informed decisions** • **DIGITAL CITIZENSHIP - Recognise the human, ethical, social, cultural and legal issues and implications surrounding the use of technology and practice online safety and ethical behaviour**	

SUGGESTED TEACHING AND LEARNING ACTIVITIES – Focus Question 1	**KEY SKILLS**	**ASSESSMENT CRITERIA**
Students will: • In groups, cause an object(s) (marbles/balls/toy cars) to start moving, speed up, slow down, stop and change direction. Record what was done to achieve the desired results. Discuss the results and make inferences about forces. Explore the effect of forces on the size and shape of objects (e.g. crushing a drink can or a sheet of paper). Record their observations in different ways. Discuss the results and make inferences about forces and about the effect of forces on the size and shape of objects.	• Observe, communicate, collaborate, manipulate, record, think critically - infer, Investigate	• Correct inferences made about the effects of forces.
• In groups, explore the floating of various objects in water. Given a set of objects (such as cork, stone, marble, table tennis ball etc.), predict which will sink and which will float. Record their predictions in a table. Place the objects in water, observe and record what happens to the objects. Push	• Observe, record, communicate, collaborate, think critically - analyse,	• Accurate information on floating objects presented

SUGGESTED TEACHING AND LEARNING ACTIVITIES – Focus Question 1	KEY SKILLS	ASSESSMENT CRITERIA
each floating object under the water, then release, observe and record what happens in a variety of ways. Suggest possible reasons for their findings and present the information to the class. If possible, make video recordings of their investigations and use the video to aid the presentation of results to the class.	Investigate, predict manipulate • Do video recording • Insert video	
• In groups, explore the "force" needed to "flick" (flip) a coin to various heights. Record observations, discuss and explain their findings. Roll an object (marble/ball/toy car) a set distance across a table/the floor. Roll the object two more times the same distance each time ensuring that it moves faster. Discuss and suggest reason(s) for the object moving faster, and report findings to the class.	• Investigate, observe, record, communicate, collaborate	• Correct inferences given about the effects of forces for observations made
• Explore the force needed to move various objects of different mass. Record observations and discuss the relationship between the weight and the amount of force needed to move the objects.	• Record, communicate, manipulate, think critically - analyse, Investigate	• Relationship between mass and force correctly identified
• Explore what happens when opening a plastic soda bottle, drinking with a straw and inflating a balloon etc. Identify and record the forces involved in each case, and discuss findings. Explore situations in the home, school and community, where the effects of forces (pushes, pulls, and turns) are seen, e.g. a car going faster, slowing down, or changing direction, an elastic band being stretched etc. Identify and record the force in each case, then report to class.	• Observe, record, communicate, think critically - analyse, apply, evaluate, investigate	• Actions of forces correctly identified
• In groups, make predictions of what would happen if a book placed on a flat surface (e.g. table, desk) is pushed. Place the book on the surface, take turns to push it and record observations in a variety of ways. Compare their results with their predictions. Discuss and give reasons for the book moving different distances or not moving at all. (***At this point, through***	• Manipulate, observe, record, communicate, collaborate, think critically -analyse, predict	• Acceptable suggestions offered for movement/no movement of the book

SUGGESTED TEACHING AND LEARNING ACTIVITIES – Focus Question 1	KEY SKILLS	ASSESSMENT CRITERIA
class discussion, teacher should introduce the term work to the students: work is done when a force produces motion.) • Analyse various situations and determine whether work/no work occurred, e.g., riding a bicycle, pushing a wall. Record the information in a variety of ways. Share and discuss results.	• Communicate, record, think critically - analyse, draw conclusions	• Correct determinations of work/no work being done.
Learning Outcomes Students who demonstrate understanding can: ✓ Show that forces can make things start, speed up, slow down, stop, float, change shape, change size and direction ✓ Show that the greater the force applied to an object the greater the distance it moves and the faster it moves. ✓ Show that heavier objects need greater force to move them ✓ Determine when work is done in a given situation ✓ Browse and search Internet safely for video clips of a car slowing down, going faster, changing direction and use these media to explain the effects of forces		

Points to Note	Extended Learning
Forces can be exerted by one object on another through direct contact or from a distance. This should be emphasized at every opportunity.	Research forces in order to classify them as contact (friction, air resistance) and non-contact (e.g. magnetic force, gravity).
Resources Coins, Ruler or measuring tape, toy cars, marbles, small balls, crayons/markers/paint, plastic soda bottles with covers, devices with video recording capabilities, water, various objects (e.g. bicycle,	**Key vocabulary** Force, push, pull, turn, twist, contact, non-contact, speed up, slow down, turning force, mass/weight

brooms, brushes, oranges), paste or glue, appropriate cutting tools, measuring tape or ruler, buttons, string or thread Computer, Internet access, device to capture images or video e.g., digital camera and any other available technologies	

Focus Question 2: What are some types of forces and how do they act?	
THEME: Energy, Forces and Matter **Attainment Target(s):** • Recognise the importance of energy to life processes, everyday life, and the relationship between energy and matter • Gain an understanding of and apply the engineering design process • Gain an understanding of and apply aspects of the scientific method. • Begin to appreciate the influence and limitations of science • Demonstrate a positive attitude towards the use of scientific language. • Demonstrate positive interpersonal skills in order to foster good working relationships **Benchmark(s)**: • Understand the effects of forces and the concept of work. • Make predictions of what will happen based on scientific knowledge and understanding. Suggest and communicate how to test these predictions. Interpret data and decide whether results support predictions, and are sufficient to draw conclusions.	**Objectives:** • Construct devices that are powered by simple push, pull or turn • Identify some types of forces • Assess the effect of friction on daily life • Investigate the effects of friction and how these may be reduced • Show objectivity by using data and information to validate observations and explanations about forces • Value individual effort and team work through investigations on forces • Show curiosity in investigating forces

• Generate and compare possible solutions to a problem based on how well each is likely to meet the criteria and limitations of the problem. • Show concern for man's impact on the environment. • Show concern for the need to conserve energy usage in our everyday life. • Display curiosity, objectivity and perseverance in their approach to activities. **Duration:** 3 weeks/ 6 hours	
COMMUNICATION AND COLLABORATION - Use technology to communicate ideas and information, and work collaboratively to support individual needs and contribute to the learning of others **RESEARCH, CRITICAL THINKING, PROBLEM SOLVING AND DECISION MAKING - Use appropriate digital tools and resources to plan and conduct research, aid critical thinking, manage projects, solve problems and make informed decisions**	

SUGGESTED TEACHING AND LEARNING ACTIVITIES – Focus Question 2	**KEY SKILLS**	**ASSESSMENT CRITERIA**
Students will: • In groups, plan and design a device or toy that is powered by a simple push, pull or turn (e.g. a toy truck or doll's pram). Develop criteria for success and state constraints. Select appropriate materials and execute their designs. Record the steps in doing the task. Demonstrate how device works to the class. Based on feedback from the class, implement improvement to their devices where possible. If possible, make video recordings of the process and use in the presentation of their project.	• Record, manipulate, think critically - analyse, apply, evaluate, create, plan and design • Manipulate an electronic device e.g. a camera	• Object powered by push, pull or turn, i.e., meets criteria for success
• In groups, explore various situations in which forces are acting, then research and name the force(s) involved, e.g.: an object falling – gravity; a magnet attracting a nail – magnetic force; a parachute falling slowly to	• Collaborate, , communicate, think critically - analyse, evaluate, investigate	• Forces acting in each circumstance correctly identified

SUGGESTED TEACHING AND LEARNING ACTIVITIES – Focus Question 2	KEY SKILLS	ASSESSMENT CRITERIA
the ground – air resistance; an object floating in water – upthrust. (*Teacher should guide students in naming the forces involved in the various situations.*) Do online interactive activities on types of forces.		
• Explore the following actions: a) rubbing of hands together, b) rubbing of stones together, c) rubbing of sticks together. Make inferences from observations. Record the information in a variety of ways. Name the force that causes the change observed in these actions, and share with the class. (*Teacher should introduce the term friction at this point.*) As a class, discuss frictional forces.	• Communicate, observe, record, think critically - infer, investigate	• Acceptable inferences made • Correct force linked with observed change
• Explore the rolling of marbles/balls of different sizes on different surfaces e.g. sand, wood, metal, plastic, rubber. Record their observations. Discuss and make suggestions for their observations. Discuss what they think would be different if they rode a bicycle on a rough, then a smooth road, and if they drove in a car on a smooth, then a rough road. Roll an object down a rough surface, then shine or lubricate the surface. Discuss and give simple explanations for their observations. Share their observations and suggested explanations for all the activities with the class, in a variety of ways.	• Manipulate, observe, record, communicate, think critically - analyse, apply, Investigate	• Acceptable explanations given for observations
• Do online interactive activities on the effect of friction on moving objects for reinforcement. • Read information on forces and motion on teacher selected websites and record important points. Try online quizzes and activities on this topic.	• Browse and search safely Navigate digital content on websites	
Learning Outcomes Students who demonstrate understanding can:		

SUGGESTED TEACHING AND LEARNING ACTIVITIES – Focus Question 2	KEY SKILLS	ASSESSMENT CRITERIA
✓ Construct a simple force powered device ✓ Name some types of forces ✓ Show some effects of friction ✓ Employ methods to reduce friction ✓ show appreciation for how forces are used in different situations		

Points to Note	Extended Learning
Due safety precautions should be taken in all activities. Cross-curricular links: Technical Vocational Education (Grade 4 AT2, Grade 6, AT3)	Investigate the relationship between the speed of a car and the force needed to stop it, and suggest how this relates to road safety
Resources Appropriate cutting devices, materials for making device or toy Measuring tape or ruler, stones, sticks, marbles Balls of different shapes, toy cars, plastic bottles, soda cans, paper Different materials (plastic, wood, rubber, etc.) of similar dimensions Video recording device, internet, computer and any other available technologies	**Key vocabulary** friction, gravity, magnetic, air resistance, upthrust, rough, smooth, lubrication

SCIENCE UNITS OF WORK GRADE 5 TERM 1 UNIT 2: ENERGY FORMS

About the Unit

In this unit, students will learn about the various forms of energy and their sources. They will learn that the Sun is the main source of energy for the earth and its life forms. Through investigation they will understand the ways in which heat can be transferred, and give simple explanations of the effects of heat energy. They will also design devices that control the movement of heat.

Range of Content

- **The Sun is the main source of energy for the Earth and its life forms.**
- Energy is the ability to do work.
- Energy exists in various forms and can be obtained from different sources.
- Energy can neither be created nor destroyed but can be changed from one form to another.
- Heat is transferred by conduction, convection and radiation.
- Conductors and insulators are used in everyday life – conductors allow heat to pass through them easily while insulators prevent the flow of heat.

Prior Learning
Check that students:
Know that work is done when a force produces motion.

Focus Question 1: What are the forms of energy?	
THEME: Energy, Forces and Matter **Attainment Target(s):** • Recognise the importance of energy to life processes, everyday life, and the relationship between energy and matter • Gain an understanding of and apply the engineering design process • Gain an understanding of and apply aspects of the scientific method • Begin to appreciate the influence and limitations of science • Demonstrate a positive attitude towards the use of scientific language • Demonstrate positive interpersonal skills in order to foster good working relationships **Benchmark(s)**: • Be aware of energy forms, their sources, and how heat is transferred. • Make predictions of what will happen based on scientific knowledge and understanding. Suggest and communicate how to test these predictions. Interpret data and decide whether results support predictions, and are sufficient to draw conclusions. • Generate and compare possible solutions to a problem based on how well each is likely to meet the criteria and limitations of the problem. • Show concern for man's impact on the environment • Show concern for the need to conserve energy usage in our everyday life	**Objectives:** • Operationally define the term energy • Show an understanding that energy is required for all work • Relate selected sources of energy to their corresponding energy forms • Research for specified information on energy sources • Assess the impact of increased technology on energy use • Justify the need for energy conservation • Communicate scientific information on energy forms • Work cooperatively in groups • Make and record observations of energy forms • Make inferences from observations of energy forms • Suggest options for conserving energy

• Display curiosity, objectivity and perseverance in their approach to activities **Duration:** 4 weeks/ 8 Hours	
ICT Attainment Target(s) 💻 **COMMUNICATION AND COLLABORATION** - use technology to communicate ideas and information, and work collaboratively to support individual needs and contribute to the learning of others 💻 **DIGITAL CITIZENSHIP RESEARCH, CRITICAL THINKING AND DECISION MAKING**- use digital tools to design and develop creative products to demonstrate their learning and understanding of basic technology operations	

Suggested Teaching and Learning Activities – Focus Question 1	**Key Skills**	**Assessment Criteria**
Students will: • in groups, view video/pictures of human beings/other animals eating food, a car being refuelled, a battery being placed in a flashlight etc. Discuss the pictures to determine the reasons for each activity. Record and share thoughts with class in variety of ways. As a class, discuss the importance of energy. With guidance from the teacher, formulate a simple definition for energy. (*Teacher should guide the discussion to elicit a simple working definition for energy: energy is the ability to do work.*)	• Make inferences, communicate, collaborate, observe, think critically (analyse, draw conclusions, infer, define operationally)	• Logical reasons given for activities observed.
• in groups seek information on selected sources of energy. Create a presentation on energy sources (e.g. poster, collage, scrapbook, digital story). Share and discuss presentations with class.	• Collaborate, create, research, communicate	• Presentations contain accurate information on sources of energy
• individually examine the sources of energy on display (chart/picture, video, 3-D representation etc.). Research and identify the form(s) of energy related to each source and indicate findings in a table. Report	• Research, observe, communicate, construct table	• Forms of energy and sources correctly matched

Suggested Teaching and Learning Activities – Focus Question 1	Key Skills	Assessment Criteria
findings to class and discuss. In pairs, browse and search teacher-reviewed websites for interactive exercises on energy forms and sources of energy and do the exercises for reinforcement.	• Understand and use standard browser features • Use search engine safely • Navigate digital content on websites	
• Collect magazine pictures that illustrate the use of energy resources. Use the pictures to create a mobile for class display.	• Analyse, create, communicate	• Pictures on mobile correctly represent the use of energy resources
• In groups, cite examples of technologies in the home and the amounts of energy that are consumed (eg. appliances, phones and solar heaters). Discuss how using up large amounts of energy will affect daily life eg. Cost of electricity etc. Investigate how the energy use could be reduced. Create a project or presentation to report the findings. Participate in a class debate on the importance of conserving energy.	• Debate, collaborate, communicate, gather evidence and data, think critically – analyse, evaluate, justify, develop plans	• Valid arguments about energy conservation. • Plausible conservation options suggested • Collected data is correct
• Go on a field trip to/view video of a power generation plant e.g. Jamaica Public Service (including hydroelectric plant), a bauxite company, Jamaica Broilers, a wind farm etc. Write a report on the energy source and related energy forms. (*Reports should include drawings/pictures.*)	• Observe, communicate, collaborate	• Report contains correct information on energy sources and related forms. • Creative report done
Learning Outcomes Students who demonstrate understanding can: ✓ Appreciate that energy is needed to do work ✓ Identify some forms and sources of energy ✓ Suggest ways of conserving energy in the home		

Points to Note	Extended Learning
• The following energy forms should be addressed: heat, light, sound, electrical, chemical, mechanical – energy of movement. • Teachers should not focus only on the correct answers but should encourage full participation among students. • Teacher should reinforce safe use of ICT tools.	Watch a video on the types of energy resources and how their use impacts the environment.
Resources chart/picture, video, 3-D representation etc. of energy sources pictures illustrating energy forms, Internet access, computer, teacher-reviewed websites on energy forms and sources of energy	**Key vocabulary** Energy, light, heat, chemical, mechanical, fuel, work, sound, energy forms, energy sources

Focus Question 2: How is heat transmitted?	
THEME: Energy, Forces and Matter **Attainment Target(s):** • Recognise the importance of energy to life processes, everyday life, and the relationship between energy and matter • Gain an understanding of and apply the engineering design process • Gain an understanding of and apply aspects of the scientific method • Begin to appreciate the influence and limitations of science • Demonstrate a positive attitude towards the use of scientific language • Demonstrate positive interpersonal skills in order to foster good working relationships **Benchmark(s)**: • Be aware of energy forms, their sources, and how heat is transferred. • Make predictions of what will happen based on scientific knowledge and understanding. Suggest and communicate how to test these predictions. Interpret data and decide whether results support predictions, and are sufficient to draw conclusions • Generate and compare possible solutions to a problem based on how well each is likely to meet the criteria and limitations of the problem. • Show concern for man's impact on the environment • Show concern for the need to conserve energy usage in our everyday life • Display curiosity, objectivity and perseverance in their approach to activities **Duration:** 5 weeks/ 10 Hours	**Objectives:** • Operationally define the terms conduction, convection and radiation • Connect the flow of heat with differences in temperature • Investigate the ways in which heat is transferred • Differentiate between conductors and insulators • Assess the usefulness of conductors and insulators in everyday life • Plan, design and construct a device to control heat flow • Communicate scientific information on heat transfer • Work cooperatively in groups • Predict outcomes of investigations on heat transfer • Make and record observations of heat transfer • Analyse and compare data from investigations on heat transfer • Collect and display data from investigations on heat transfer • Use data from investigations on heat transfer to draw conclusions • Carry out investigations with due regard to safety • Make inferences from observations of heat transfer

COMMUNICATION AND COLLABORATION - use technology to communicate ideas and information, and work collaboratively to support individual needs and contribute to the learning of others **DESIGNING AND PRODUCING** – use appropriate digital tools and resources to plan and conduct research, aid critical thinking, manage projects, solve problems and make informed decisions	

Suggested Teaching and Learning Activities – Focus Question 2	**Key Skills**	**Assessment Criteria**
Students will: • hold a metal spoon in their hands for two minutes. Place one end of the spoon in a polystyrene cup of warm water for two minutes while holding the other end of the spoon. Record their observations in a variety of ways. Through questioning by the teacher, arrive at a simple explanation as to why the other end of the spoon became warm.	• Observe, manipulate, record, measure, think critically (analyse, draw conclusions)	• Accurate observations recorded • Logical explanations given
• observe teacher's display of wire hanger with affixed thumbtacks stuck in candle wax (**Refer to diagram 1**). Predict what will happen to the thumb tacks when heat is applied to one end of the hanger. In discussion with the teacher, students will arrive at a simple explanation for their predictions. Observe as teacher heats one end of the wire hanger. Record their observations in a table then give simple explanations. Compare their results with their predictions. (*Teacher should explain this method of heat transfer as being conduction.*)	• Observe, make inferences, compare, record, communicate, draw conclusions, create tables, make predictions	• Correct information recorded in table • Logical explanations given for observations
• observe teacher's demonstration of heating a Pyrex dish/beaker with water and small amount of sawdust (or other light material), noting the resultant motion of the sawdust particles (**Refer to diagram 2**). In a brief report, make inferences from their observations and give simple explanations. Share and discuss report findings with class. (*Teacher should introduce this method of heat transfer as being convection.*) As a class, formulate a simple definition for convection.	• Observe, analyse, collaborate, communicate, make inferences, define operationally	• Report contains logical explanations for observations

Suggested Teaching and Learning Activities – Focus Question 2	Key Skills	Assessment Criteria
• Place a transparent bottle containing cold colourless water on top of a transparent bottle containing warm coloured water so that the contents can mix. Repeat with the bottle containing the cold colourless water at the bottom. Describe how the water moves when one part is heated or cooled.	• Manipulate, observe, communicate, think critically (analyse, interpret, draw conclusions)	• Accurate description of the movement of heated water • Logical explanations given
• *(Note to teacher: Allow students to carry out both investigations outlined below prior to discussing findings.)*		
Investigation 1: Teacher switches on a light bulb and allows it to glow for five minutes. Students take turns to place their hands near to the bulb <u>without touching it</u> and record their observations in their notebooks.	• Observe, record	• Accurate observations recorded
Investigation 2: In groups place two 1 cm^3 of refrigerated butter of the same size on Petri dish or other small transparent dish. One container is placed on the desk and the other is placed outside in bright sunlight. Both are observed every five minutes for a period of twenty minutes. Observations are recorded at the end of each five-minute period in a table. Students may use an image capturing device (e.g., a digital camera) to take a photo of the dish at the end of each five-minute period and use these photos to aid in the presentation of their findings. Compare observations from both dishes.	• Observe, manipulate, record, collaborate • Capture image with an image capturing device. • Insert illustrations (pictures) Enter text	• Accurate observations recorded
Offer simple explanations for their observations and share findings with the class in a variety of ways. Participate in teacher-lead class discussions on how heat got from the bulb to their hands and how heat got to the butter. Discuss the heat source and the way heat travelled in each investigation. (*Teacher should introduce this method of heat transfer as being radiation.*) As a class, formulate a simple definition for radiation.	• Communicate, operationally define, analyse, think critically – analyse, draw conclusions, interpret, create	• Logical explanations given for observations.

Suggested Teaching and Learning Activities – Focus Question 2	Key Skills	Assessment Criteria
• in pairs, browse and search teacher-reviewed websites for interactive exercises on ways in which heat is transferred (conduction, convection and radiation) and do the exercises.	• Understand and use standard browser features • Use search engine safely • Navigate digital content on websites	
• Given simple mixed up written explanations of conduction, convection and radiation, sequence the words to describe each of the three processes.	• Analyse, synthesise	• Produce coherent statements explaining conduction, convection and radiation
• Place equal amounts of warm water (about 50°C) into two similar sized containers: one metal (e.g. milk tin) and one Styrofoam. Allow the containers to stand for two minutes then feel each and record observations. Discuss and offer simple explanations for their observations. Share findings with class. (*Teacher should use the class discussions to introduce the terms conductor and insulator.*) Based on the outcomes of the discussions, with the guidance of the teacher, develop simple working definitions for the terms conductor and insulator.	• manipulate, observe, record, communicate, collaborate	• Inference made that some materials conduct heat and others do not
• In groups, investigate other materials and create a table to classify the materials as conductors and insulators. Share information with class.	• classify, collaborate, create, communicate, manipulate, observe, record	• Correct classification of materials as conductors and insulators
• Research the uses of conductors and insulators in everyday life using a variety of sources (electronic/non-electronic). Create a blog/wiki/poster to display the information.	• research, create	• Blog/wiki/poster contains correct information on the uses of conductors and insulators in everyday life
• Discuss ways of keeping things warm/cold. In groups, plan and design and construct a device that can be used to keep something warm/cold using materials selected from resource table; outline constraints and criteria for success. As a class, compare the devices and select the best	• plan and design, manipulate, create, communicate, analyse, construct, evaluate, think critically	• Devices meet required criteria to function correctly • Application and transfer of knowledge evident

<table>
<tr><th>Suggested Teaching and Learning Activities – Focus Question 2</th><th>Key Skills</th><th>Assessment Criteria</th></tr>
<tr><td>one based on predetermined evaluation criteria developed by class. As a class discuss possible improvements to the devices. Display devices in a class exhibition.</td><td></td><td></td></tr>
<tr><td colspan="3">Learning Outcomes
Students who demonstrate understanding can:
✓ Give simple explanations about conduction, convection and radiation
✓ Describe how conductors and insulators are used in everyday life
✓ Create insulating devices for specific purposes
✓ Work collaboratively to share a range of ICT tools within groups to complete task on conduction, convection and radiation.</td></tr>
<tr><td colspan="2">Points to Note
Care must be taken to ensure that student do not touch the hot bulb and get burnt.
Pre-test experiments to ensure they work and to become familiar with the outcomes of the investigations.
Cross –curricular links: Technical Vocational Education (Grade 5 AT 2; Grade 6 AT 2, 3)
Ensure that students recognise and understand the importance of technology access for all Internet, computer, teacher-reviewed websites on energy forms and sources of energy, multimedia projector</td><td>Extended Learning
• Identify situations at home and school where conduction, convection and radiation occur</td></tr>
<tr><td colspan="2">Resources
• ½ inch cubes of refrigerated butter (2 per group) , Petri dishes/ other transparent containers (2 per group), light bulb, power supply, Pyrex dish/beaker with water, saw dust, thumb tacks, wire hanger, candle wax, computer with word processor or presentation software, multimedia projector, image capturing device and any other available resources, teacher-reviewed websites on conduction, convection and radiation</td><td>Key vocabulary
• Convection, radiation, conduction, heat, conductors, insulators</td></tr>
</table>

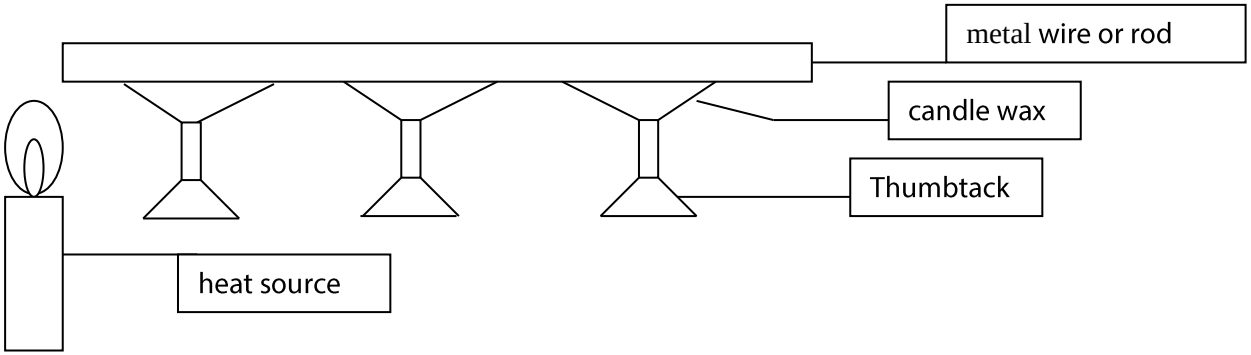


DIAGRAM 1

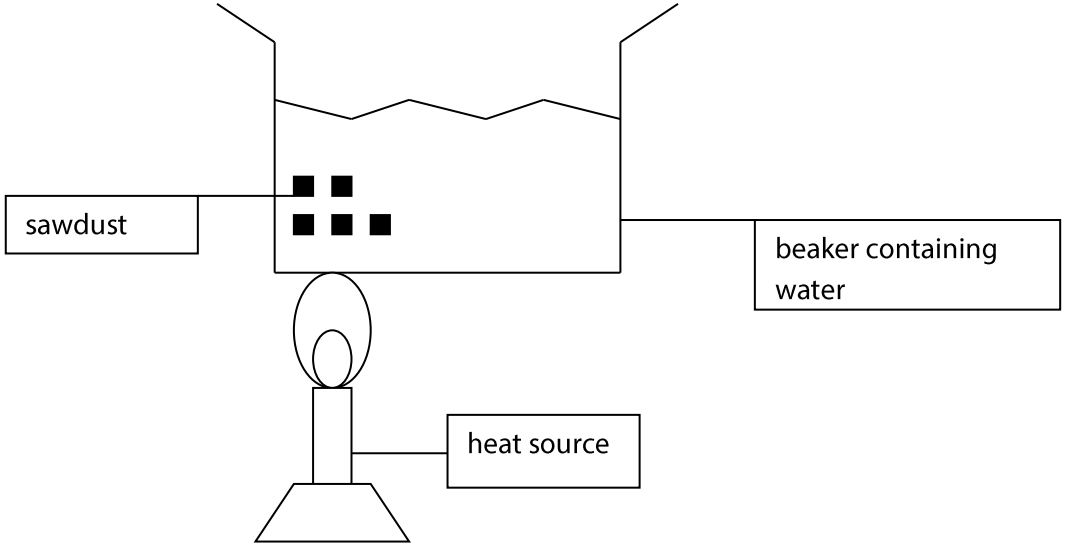


DIAGRAM 2

SCIENCE UNITS OF WORK GRADE 5 TERM 2, UNIT 1: NUTRITION

About the Unit

In this Unit, students will learn that a healthy diet contains the right balance of the different nutrients. They will analyse meals to demonstrate what constitutes a balanced diet and recognize the importance of this in maintaining a healthy lifestyle. They will carry out tests for fat and starch in food samples. Through investigation they will learn that plants make their food using energy from sunlight, and that all living organisms depend on plants for food. They will construct food chains to demonstrate the feeding relationships among organisms, starting with green plants, and distinguish between those that eat plants directly (herbivores) and indirectly (carnivores).

Range of Content

- Food nutrients are the components contained in foods which are necessary for the survival of organisms
- The nutrients are protein, carbohydrates, fats, vitamins and minerals. Each nutrient has a different purpose
- Foods are grouped together because they provide similar amounts of a particular kind of nutrient.
- In the Caribbean, foods are classified into six food groups for a healthy diet: Staples; Vegetables; Fruits; Food from animals; Legumes; Fats and oils.
- A balanced diet consists of all the food groups in their correct proportions.
- Plants make their own food and store the excess.
- Food tests can be used to identify nutrients (grease spot and emulsion test for fats; iodine solution test for starch).
- Green plants need sunlight to produce their food.
- All food chains begin with a plant (producer).
- Food chains represent feeding relationships and the flow of energy from plants through each feeding level/organism in the food chain.
- All living organisms are interdependent.

Prior Learning
Check that students know:
That humans need food for survival, energy and growth

Focus Question 1: What are food nutrients and why are they important to us?

THEME: Living things, Life Processes and the Environment

Attainment Target(s):

- Gain an understanding of some life processes in plants and animals, and how lifestyle choices impact health and well-being in humans
- Recognise the variety of living things, their interdependence and their inter-relationship with the environment
- Gain an understanding of and apply the engineering design process
- Gain an understanding of and apply aspects of the scientific method
- Begin to appreciate the influence and limitations of science
- Demonstrate a positive attitude towards the use of scientific language
- Demonstrate positive interpersonal skills in order to foster good working relationships

Benchmarks:

- Begin to understand the interdependence of living things in the environment
- Be aware of food nutrients and their importance to humans
- Make predictions of what will happen based on scientific knowledge and understanding. Suggest and communicate how to test these predictions. Interpret data and decide whether results support predictions, and are sufficient to draw conclusions
- Generate and compare possible solutions to a problem based on how well each is likely to meet the criteria and limitations of the problem.

Objectives:

- Identify the food nutrients
- Describe the importance of each nutrient to the body
- Identify foods that are rich in particular nutrients
- Relate food tests to specific nutrients
- Analyse meal plans to determine if they are balanced
- Formulate a meal plan reflecting the components of a balanced diet and justify their decisions
- Make sound judgements in the choice of foods they consume
- Work cooperatively in groups
- Infer how meal choices affect personal health

• Show concern for man's impact on the environment • Show concern for the need to conserve energy usage in our everyday life • Display curiosity, objectivity and perseverance in their approach to activities **Duration:** 3 weeks/ 6 Hours	
ICT Attainment Targets: **COMMUNICATION AND COLLABORATION** - use technology to communicate ideas and information, and work collaboratively to support individual needs and contribute to the learning of others **RESEARCH, CRITICAL THINKING AND DECISION MAKING**- use digital tools to design and develop creative products to demonstrate their learning and understanding of basic technology operations **DIGITAL CITIZENSHIP**- recognise the human, ethical, social, cultural and legal issues and implications surrounding the use of technology and practice online safety and ethical behaviour	

Suggested Teaching and Learning Activities – Focus Question 1	**Key Skills**	**Assessment Criteria**
Students will: • Use a true/false quiz to assess and revise pupils' knowledge and understanding of the importance of food to humans.	• communicate	• **Correct responses to the questions.**
• be asked by teacher; 'What guidelines do you bear in mind when shopping for food? (*Teacher records the responses.*) Discuss the responses identifying the most important guidelines. (*Teacher should focus the discussion to stress the importance of considering nutritional value of food when shopping.*)	• Communicate	• Students communicate their ideas freely
• use the nutritional information panel from some of their favourite packaged food items to identify and record the nutrients contained in the	• Make comparisons, record, collaborate, create, plan and	• Main nutrients identified

Suggested Teaching and Learning Activities – Focus Question 1	Key Skills	Assessment Criteria
foods. Compare the information recorded to identify the main nutrients found in food (*Teacher should establish that carbohydrates, proteins, fats, fibre and water form the bulk of food*). View a video (online or off-line) about nutrients and their importance to the body. Complete pre-prepared worksheet on importance of the nutrients. In groups develop a game about nutrients and their uses.	design, think critically, manipulate	• Worksheets correctly completed • Game works as intended
• Use Food Composition tables (electronic/non-electronic) to ascertain the nutritional content of a range of foods. Sort foods based on their richness in selected nutrients. In groups, with the aid of the teacher, use the results of their investigations to produce a summary leaflet about one type of food nutrient, including information about foods that are good sources of it and the role of this food nutrient in the diet. Bring together all the leaflets as a class booklet and establish the main role of each type of nutrient in the diet.	• Communicate, classify, manipulate, collaborate, investigate, create, analyse	• Foods that are good sources of each nutrient correctly identified and classified. • Leaflets contain accurate information. • Leaflets are visually appealing
• In groups, put a small amount of starch mixture into one container, and the same amount of water into a similar container, then add 1-2 drops of iodine to each container. (*Teacher should ensure that students avoid direct contact with the iodine solution on skin.*) Observe and record the colour change of the starch and water. Predict which food samples, provided by the teacher, contain starch. Then carry out the starch test (add iodine solution) on the samples, record their observations and make inferences about the presence of starch. Relate their predictions to their inferences. Report on presence or absence of starch using a table.	• Collaborate, manipulate, investigate, observe, record, communicate, make inferences, make predictions,	• Accurate observations and related inferences recorded in the table. • Logical inferences made
• In groups, spread a drop of oil on brown paper, and spread a drop of water on a similar piece of brown paper. Allow both drops to dry. Hold the paper up to light and record their observations. Predict the presence of fat in food samples (provided by the teacher) then rub each food sample on brown paper and allow to dry (fat test). Infer the	• Collaborate, manipulate, investigate, observe, record, communicate, make predictions, make inferences	• Accurate observations and related inferences recorded in the table.

Suggested Teaching and Learning Activities – Focus Question 1	Key Skills	Assessment Criteria
presence/absence of fat in the food samples. Tabulate findings and relate their predictions to their inferences.		• Logical inferences made
• In groups plan a meal they would like to have for breakfast, lunch or dinner. Record the meal plan in a variety of ways. Examine the "Eatwell Plate" and formulate a definition for 'balanced diet'. Share and discuss their definitions with the class to arrive at an acceptable meaning for the term. In groups, analyse the meals they planned to see if they are balanced, and if not make the necessary adjustments. Justify any changes made to the original meal plan. Present final meal plans to the class and explain why it is balanced.	• Plan, record, communicate, define operationally, collaborate, think critically (evaluate, justify, draw conclusions)	• Acceptable definition of balanced diet given. • Adjusted meal plans reflect a balanced diet. • Logical justifications given for adjustments made and the final meal plan
• Examine a list of lunch items sold at the school's canteen/tuck shop and discuss which they would have for lunch in light of their knowledge of a balanced diet. Develop alternative menu options and present their recommendations to the canteen/tuck shop manager for possible implementation.	• Gather evidence and data, communicate, create, think critically (analyse, critique, draw conclusions, develop plans)	• Alternative menus provide healthy balanced meal options. • Justifiable reasons given
• In groups, research possible effects on human health if meals are not balanced. Include questions such as "Why do I need fruits and vegetables?", "What can happen if I eat too many sweets?", "How can too much carbohydrates and fats affect me?" (***The idea is to simply show that nutrition choices affect human health***). Report findings in a variety of forms (oral, written, multimedia, through drama).	• Research, communicate, predict, make conclusions, collaborate, create	• Creative presentations • Correct information provided • Logical conclusions made

<table>
<tr><td colspan="2">Learning Outcomes
Students who demonstrate understanding can:
✓ Construct a meal plan that reflects a balanced diet
✓ Relate the importance of some nutrients found in food to the functioning of the body.
✓ Carry out simple tests to determine the presence of starch and fat in food samples.
✓ Make informed choices in selecting food for consumption.
✓ Use ICT tools to create table and do interactive activities on the nutrients found in foods</td></tr>
<tr><td>Points to Note</td><td>Extended Learning</td></tr>
<tr><td>A balanced diet contains all the nutrients in their correct proportions.
A meal with a wide range of nutrients is not necessarily balanced.
Water is NOT a nutrient but is one of the food substances.

Teacher should ensure that students avoid direct contact with the iodine solution on skin

Students should not eat the foods tested because of possible contamination.
Beware of foods containing nuts. If students with known allergies are present, follow appropriate procedures after risk assessment.</td><td>Generate an Eatwell Plate based on the foods they consume in a day, and display it in the class.
(N.B. Teacher must be aware of the need to ensure that students are sensitive to differences between each other's individual diets.)</td></tr>
<tr><td>Resources
Cartridge paper, computer, internet access and any other available technologies
Oil, brown paper, water, starch mixture, iodine, food items to be tested, small containers (2 per group), test tubes /small transparent bottles</td><td>Key vocabulary
Nutrients, balanced diet, protein, carbohydrates, fats, vitamins, minerals, iodine, starch, grease spot test</td></tr>
</table>

Prior Learning
Check that students can:
Describe the basic functions key structures of plants, e.g. leaf, root, stem, flower.

Focus Question 2: How do animals and plants interact?

THEME: Living things, Life Processes and the Environment

Attainment Target(s):

- Gain an understanding of some life processes in plants and animals, and how lifestyle choices impact health and well-being in humans.
- Recognise the variety of living things, their interdependence and their inter-relationship with the environment
- Gain an understanding of and apply the engineering design process
- Gain an understanding of and apply aspects of the scientific method.
- Begin to appreciate the influence and limitations of science
- Demonstrate a positive attitude towards the use of scientific language
- Demonstrate positive interpersonal skills in order to foster good working relationships

Benchmarks:

- Begin to understand the interdependence of living things in the environment
- Be aware of food nutrients and their importance to humans
- Make predictions of what will happen based on scientific knowledge and understanding. Suggest and communicate how to test these predictions. Interpret data and decide whether results support predictions, and are sufficient to draw conclusions

Objectives:

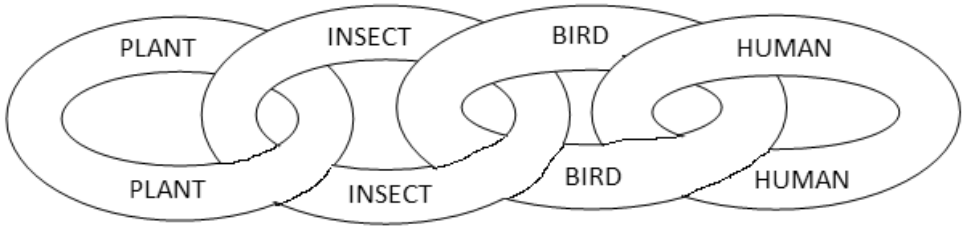
- Recognise the importance of plants as the food source at the start of all food chains
- Investigate the importance of light energy to plants
- Classify organisms in a food chain as producers and consumers
- Construct food chains involving producers, herbivores, carnivores and omnivores
- Appreciate that arrows in a food chain indicate the direction of energy flow from producers to consumers
- Explain how plants and animals are interdependent in relation to the food chain
- Appreciate the feeding relationships among living things
- Work cooperatively in groups
- Appreciate the importance of plants in the environment and the need to preserve and protect them
- Infer how environmental changes can affect organisms in a food chain
- Offer simple explanations based on observations (evidence)

• Generate and compare possible solutions to a problem based on how well each is likely to meet the criteria and limitations of the problem. • Show concern for man's impact on the environment • Show concern for the need to conserve energy usage in our everyday life • Display curiosity, objectivity and perseverance in their approach to activities **Duration:** 5 weeks/ 10 Hours	
ICT Attainment Targets: **COMMUNICATION AND COLLABORATION** - use technology to communicate ideas and information, and work collaboratively to support individual needs and contribute to the learning of others **DIGITAL CITIZENSHIP**- recognise the human, ethical, social, cultural and legal issues and implications surrounding the use of technology and practice online safety and ethical behaviour	

Suggested Teaching and Learning Activities – Focus Question 2	**Key Skills**	**Assessment Criteria**
Students will:		
• In groups, be provided with examples of food from plants (e.g. carrot, pea, potato, corn, lettuce, apple, rice, mango, soya bean, grape, coconut, onion) and asked to identify and record which parts of a plant each represents.	• Collaborate, communicate, observe, record	• Food samples correctly matched to parts of the plant.
• Review the types of food that supply their bodies with energy, and where these foods originate (*Teacher should guide students in tracing food from animals back to plants, e.g. beef -> grass, chicken -> corn or chicken -> worm -> cabbage*). In groups discuss why all food sources can be traced back to	• Collaborate, communicate, think critically (analyse, interpret)	• Reasonable statement given about food sources originating with plants.

Suggested Teaching and Learning Activities – Focus Question 2	Key Skills	Assessment Criteria
plants and share their ideas with the class. (*Teacher should guide students to the realisation that plants make their own food;* ***photosynthesis*** *and its word equation should* ***NOT*** *be mentioned or treated.*) **OR**		• Logical associations made
• Investigate the habitats in their school and community and record the animals and plants found there. Answer questions on what each animal eats. Analyse the information to discover that the food sources can be traced back to the plant.	• Observe, communicate, create, record, think critically (analyse, draw conclusions)	• Accurate information given • Correct deductions made
• In groups discuss and give reasons to support the statement: "Plants are producers and animals are always consumers." Share their ideas with the class to generate a simple working definition for the terms 'Producer' and 'Consumer' as it relates to feeding relationships among plants and animals.	• Collaborate, communicate, operationally define,	• Acceptable definitions given for consumers and producers
• in groups, take a picture of a patch of grass and then cover the grass with a cardboard box and leave undisturbed for about three days. Take a picture of the grass at the end of the period. Describe and offer a simple explanation about what has happened to the grass.	• Collaborate, investigate, observe, record, communicate, think critically (make comparisons, draw conclusions)	• Acceptable explanations offered for results obtained. • Accurate observations made
• In groups, place a healthy potted plant in dark cupboard overnight. Then, completely cover about three leaves with aluminium foil (to prevent exposure to light) and place the plant in the sun for about two hours. Observe as the teacher conducts the starch test on three covered and three uncovered leaves. Record and offer simple explanations for their observations.	• Collaborate, investigate, observe, record, communicate, think critically (make comparisons, carry out fair tests)	• Acceptable explanations offered for results obtained.
• In groups, use the information from the grass and leaf investigations to develop a presentation (electronic/non-electronic) and share with the class.	• Gather evidence and data, collaborate, create,	• Presentation accurately captures entire investigative

Suggested Teaching and Learning Activities – Focus Question 2	Key Skills	Assessment Criteria
As a class, discuss and summarise the importance of sunlight to plants. (*Teacher should ensure that light is identified as a necessity for the production of food in plants.*)	communicate, think critically (analyse, interpret, draw conclusions)	process including results obtained. • Logical conclusions made
• Investigate habitats around them to determine what each animal eats OR Be given pictures of different animals to research (online/off-line) what each animal eats. Make a flow diagram to illustrate the feeding relationships, beginning with plants and ending with an animal, e.g. grass -> worm -> bird. (*At this point, teacher should introduce the term 'Food Chain' as the scientific name for the flow diagrams that represent these feeding relationships.*)	• Research, communicate, think critically (analyse, draw conclusions)	• Flow diagrams correctly demonstrate feeding relationships
• In groups research and discuss the terms – herbivores, carnivores, omnivores and group a given set of animals into each category. Use examples from previous activities to construct food chains with the ultimate source of energy traced to the sun e.g. sun→grass (producer)→cow (herbivore)→human (omnivore).	• Collaborate, research, communicate, classify, synthesise	• Food chains correctly constructed
• Use stimulus material, e.g. a habitat poster such as mangrove swamp or forest, to make as many food chains as they can. Identify producers, consumers, herbivores and carnivores. (*Teacher should explain the direction of the arrows in the food chain and relate to energy transfer, with the Sun as the ultimate source of energy.*)	• Observe, think critically (analyse, synthesise)	• Producers, consumers, herbivores and carnivores correctly identified
• Use one of the food chains from the previous activity to make a food chain mobile by cutting links of the food chain from stiff cardboard, labelling each link with one part of the food chain, then putting the links together to make a chain, e.g.	• Create, manipulate, collaborate, communicate, think critically	• Food chain mobiles convey correct sequence • Acceptable explanations given about the feeding relationships among plants and animals

Suggested Teaching and Learning Activities – Focus Question 2	Key Skills	Assessment Criteria
 In groups and using the mobile, discuss and give explanations of how plants and animals depend on each other. Display the mobiles in the science corner. • In groups, use research skills to determine the importance of plants to the environment. Answer questions such as "Why do we need plants?", "What food products do we obtain directly or indirectly from plants?", "If there were no plants, which animals would be affected?", "How would humans be affected if plants were absent?" Present findings in a variety of forms (oral, written, multimedia). Produce concept maps showing the uses or importance of plants. • In groups, plant a tree or garden at school or home. Observe and record major growth changes along with measurements of length etc. Note the organisms found in the tree or garden and use this to discuss the interdependence of plants and animals.	• Research, create, communicate, think critically (evaluate, predict, make conclusions), collaborate • Collaborate, observe, gather data, measure, manipulate, interpret, communicate, make conclusions	• Accurate information presented • Creative presentations produced • Visually appealing concept maps with accurate information • Logical conclusions drawn • Accurate observations noted • Measurements correctly done

Learning Outcomes Students who demonstrate understanding can: ✓ Correctly sequence plants and animals in food chains using appropriate vocabulary ✓ Cite evidence of the significance of light energy to plants ✓ Explain the feeding relationships among plants and animals ✓ Defend the need for the preservation and protection of plants and animals ✓ Use a range of selected ICT tools effectively to complete task.	
Points to Note	**Extended Learning**
Teacher needs to solicit the assistance of students in the setting up and carrying out the experiment. Do NOT differentiate consumers, i.e. primary and secondary Cross-curricular links: Technical Vocational Education (Grade 6, AT3); Social Studies (Grade 6, AT2) Students should recognise and understand the importance of technology access to all	Research to find out the different parts of a plant that store food giving examples. Investigate food webs
Resources Multimedia materials on food chains, producers and consumers Pictures of animals and plants, charts, pamphlets and other written materials on food chains Stiff cardboard, Scissors, Paste, String/yarn etc., or other suitable material Plant, iodine solution, aluminium foil, paper clips or tape computer, internet access and any other available technologies	**Key vocabulary** Producer, consumer, herbivores, carnivores, omnivores, predator, interdependence, storage organs

SCIENCE UNITS OF WORK GRADE 5 TERM 2 UNIT 2: WAYS OF GROWING FOOD

About the Unit

In this unit, students will learn, through research and investigation, that food can be grown using organic and non-organic methods. They will be able to demonstrate these methods of growing food and discover for themselves similarities and differences in food grown under these conditions. They will be able to identify the pros and cons of growing food organically and non-organically.

Range of Content

- Food scarcity has led to an increase in varied food production methods.
- Foods can be grown using organic and non-organic methods.
- Organic foods are grown without the use of chemicals (such as pesticides and fertilizers) along with practices such as composting, mulching and crop rotation.
- Non-organic foods are grown with chemicals.
- Green houses, hydroponics and aquaponics are some methods used to grow crops.
- Organic methods build the soil and protect the environment.
- Chemicals washed from farms can pollute rivers and streams.

Prior Learning
Check that students:
Know that we get some food from plants.

Focus Question 1: what are the different ways in which foods are grown and how do these affect the environment?

THEME: Living things, Life Processes and the Environment

Attainment Target(s):

- Gain an understanding of some life processes in plants and animals, and how lifestyle choices impact health and well-being in humans
- Recognise the variety of living things, their interdependence and their inter-relationship with the environment
- Gain an understanding of and apply the engineering design process
- Gain an understanding of and apply aspects of the scientific method
- Begin to appreciate the influence and limitations of science
- Demonstrate a positive attitude towards the use of scientific language
- Demonstrate positive interpersonal skills in order to foster good working relationships

Benchmarks:

- Begin to understand the interdependence of living things in the environment.
- Know that foods are produced in different ways (organic, non-organic and genetically modified)
- Make predictions of what will happen based on scientific knowledge and understanding. Suggest and communicate how to test these predictions. Interpret data and decide whether results support predictions, and are sufficient to draw conclusions
- Generate and compare possible solutions to a problem based on how well each is likely to meet the criteria and limitations of the problem
- Show concern for man's impact on the environment
- Show concern for the need to conserve energy usage in our everyday life

Objectives:

- Identify some plants and animals that are grown to provide food for humans
- Cite evidence for the need to grow plants and animals for food
- Make predictions about the growth of plants in organic and non-organic media
- Investigate organic and non-organic methods of growing food
- Operationally define the terms organic and non-organic food production methods
- Assess the pros and cons of organic and non-organic methods of growing food
- Evaluate the impact of non-organic methods of growing food on the environment
- Draw conclusions from results of investigations on different food production methods
- Value individual and team work through 'hands-on' activities
- Conduct investigations with due regard to safety

• Display curiosity, objectivity and perseverance in their approach to activities **Duration:** 3 weeks/ 6 Hours	
ICT Attainment Targets: 💻 **COMMUNICATION AND COLLABORATION - Use technology to communicate ideas and information, and work collaboratively to support individual needs and contribute to the learning of others** 💻 **DESIGNING AND PRODUCING –Use digital tools to design and develop creative products to demonstrate their learning and understanding of basic technology operations** 💻 **RESEARCH, CRITICAL THINKING, PROBLEM SOLVING AND DECISION MAKING - Use appropriate digital tools and resources to plan and conduct research, aid critical thinking, manage projects, solve problems and make informed decisions** 💻 **DIGITAL CITIZENSHIP - Recognise the human, ethical, social, cultural and legal issues and implications surrounding the use of technology and practice online safety and ethical behaviour**	

Suggested Teaching and Learning Activities – Focus Question 1	**Key Skills**	**Assessment Criteria**
Students will: • Visit a market/farm/large supermarket or view a video/series of pictures to observe and record the range of plants and animals that are grown for food. In groups discuss what they have seen and why it is necessary to grow plants and animals. Make a poster (electronic/non-electronic) illustrating why we need to grow plants and animals for food. (*Teacher should guide the students in identifying key issues relating to food availability.*)	• Observe, record, communicate, create, think critically, collaborate	• Poster should reflect major concerns such as food availability and nutrition
• Research or visit farms where crops are grown in different ways, including Abbey Gardens (Mandeville), Grier Field Farms (St. Ann) and green houses. Observe and record the crops grown and the methods used at	• Observe, record, communicate, think critically	• Accurate observations • Methods correctly grouped • Justifiable reasons given

Suggested Teaching and Learning Activities – Focus Question 1	Key Skills	Assessment Criteria
each location. Group these methods based on whether chemicals are added or not. Suggest a definition for organic and non-organic foods. (Simple definition of organic foods as those grown without use of chemicals (eg. Pesticides and fertilizers) compared to non-organic foods which are grown with chemicals).	(classify, justify, analyse, define operationally	• Acceptable definition given
• Visit markets or supermarkets to identify foods that are labelled as organic foods. List ingredients or details of how these foods are made. Conduct interviews with farmers who use practices such as mulching, composting and crop rotation. Take pictures of these practices to be placed in scrap books or projects. Describe/ explain the practices depicted. Present findings to the class.	• Observe, record, gather evidence and data, formulate questions, communicate	• Correct information given • Accurate observations made • Properly constructed questions • Creative presentations done
• Arrange visits to large scale poultry farms and fish farms or view videos/ pictures. Investigate what these animals eat and the chemicals used in their growth. Participate in a discussion on how these chemicals affect the animals and those who eat them. Present the information in a variety of ways. • As a class, grow vegetables (pak choi/string bean/cucumber) organically and non-organically in three container gardens (organic: soil only, soil + organic fertilizer; non-organic: soil + chemical fertilizer). Predict which plant will grow better/more. Measure, observe and record results in a table, e.g. height of plant, size of leaves, number of leaves, etc. Compare the vegetables grown in both ways, using graphic organizers such as Venn Diagrams. Discuss the results giving reasons for the observed differences and draw conclusions, indicating whether or not their conclusions support their predictions. (*While this activity is in progress, the class should move on to the other activities. Monitoring of the plants should be on-going and summaries made at the end of the period.*)	• Gather data, communicate, investigate, think critically – analyse, drawing conclusions • Investigate, manipulate, observe, compare, communicate, make inferences, measure, record data, carry out fair tests, make predictions	• Accurate data collected • Justifiable conclusions drawn • Presentations are visually appealing and contains correct information • Correct information in table. • Credible reasons given for differences in results. • Conclusions supported by results from investigation.

Suggested Teaching and Learning Activities – Focus Question 1	Key Skills	Assessment Criteria
• View pictures/videos/samples of similar foods grown organically and non-organically. Discuss the similarities and differences, e.g. colour, size and texture. Construct a table showing the similarities and differences of food grown in different ways.	• Observe, compare, think critically (analyse), communicate	• Information accurately represented in acceptable table
• In groups, research (using a variety of materials, e.g. , encyclopaedias, educational CDs/DVDs, online library) organic and non-organic methods of growing food and the advantages and disadvantages of each method. Present their research findings in a variety of ways.	• collaborate, research, compare, communicate	• Research findings accurate and relevant
• In groups, use data from the research conducted in the previous activity to produce a report on the effects of chemicals (fertilisers/pesticides), used in non-organic methods of growing food, on the environment. Contribute conclusions to a class summary and indicate whether they think they should have confidence in what they found out.	• analyse, summarise, think critically – make conclusions, justify, collaborate, communicate	• Report contains accurate and sufficient information on the effects of fertilisers/pesticides on the environment. • Justifiable conclusions made
• In groups, use materials in their environment such as plastic bottles, broken pottery, hoses, plastic coverings etc. to plan and design a way to grow vegetables using one of the methods introduced (eg. hydroponics, green houses). As a class, choose the type of food to be grown and test the design. Compare which method was the best based on growth rate and amount of food grown. Discuss improvements that can be made to the design. Use the design as a school project to provide locally grown foods.	• collaborate, communicate, manipulate, plan and design, create, think critically – solve problems, analyse, draw conclusions, apply.	• Design worked as planned • Accurate theories represented • Application and transfer of knowledge observed
• Use research skills to determine how to make a compost heap. Design and construct the compost heap to use organic materials from the school canteen. Collect samples of organic waste materials such as food scraps, vegetable peels etc. Record what materials were used and how long it took to decompose. Present data in a scrap book or project. Use the compost to fertilize a school garden area. Record how the plants look	• Gather evidence and data, classify, create, plan and design, communicate, think critically (analyse, interpret, draw conclusions)	• Accurate observations made • Compost heap worked as intended • Logical explanations given • All steps adequately captured • Presentations are creative and visually appealing

Suggested Teaching and Learning Activities – Focus Question 1	Key Skills	Assessment Criteria
before and after the compost was added. Discuss results obtained. Take pictures and record all the steps of the project.		

Learning Outcomes

Students who demonstrate understanding can:

- ✓ Justify the need to grow plants and animals for food
- ✓ Grow foods organically and non-organically
- ✓ Relate advantages and disadvantages of growing foods organically and non-organically
- ✓ Give reasons why they have or do not have confidence in their conclusions
- ✓ Use selected ICT tools effectively to browse and search for information on the different ways in which foods are grown; and produce multimedia presentations.

Points to Note	Extended Learning
Collaborate with the Agriculture teacher/RADA office(r)/4-H officer/ farmer and the Resource and Technology Teacher. Some fertilisers may be harmful on contact. Eye protection should be worn. Proper safety procedures should be observed when handling fertilisers. Prescribed amount of non-organic fertilizers should be used. Suitable non-organic vegetable fertilizers should be used. Ensure that steps are taken to protect crops grown. **Teacher should ensure that non-organic production of food is not limited to the use of artificial fertilisers only but should include the use of pesticides, hormones and antibiotics.**	Research the use of genetically modified plants and animals to produce food.

The container garden activity should span a minimum of three weeks. After students have started the garden they may move unto the next topic. They should however care for the garden throughout the period and collect results weekly. Cross-curricular links: Mathematics (AT2 strand 1, strand 6)	
Resources Pictures/video/food samples, manure, fertilizer, seeds Agriculture specialist/farmer. Image capturing device (e.g. camera), Internet, educational science digital content on CD/DVD/online, computer with word processor or presentation software, multimedia projector	**Key vocabulary** Organic food, non-organic food, fertilizer, manure, chemical, compost

SCIENCE UNITS OF WORK GRADE 5 TERM 3 UNIT 1: SIMPLE & COMPLEX MACHINES

About the Unit

In this unit, students will investigate the effectiveness of simple machines and tools such as pulleys and levers, and how they can be used to solve everyday problems. They will appreciate the relationship between forces and their effects in relation to the properties of common materials, and how these determine the design and strength of relevant structures. Through observations, research and discussions, students will understand and appreciate the evolution of machines and how they make work easier.

Range of Content

- A machine is a device that makes work easier.
- Simple machines have few or no moving parts.
- Simple machines can be classified as levers, pulleys, wheels and axles, inclined planes, screws and wedges.
- The position of the fulcrum, effort and load changes depending on the type of lever being considered.
- Complex machines consist of combinations of simple machines.
- Advances in technology help to improve the way machines work.
- Complex machines are more effective than simple machines in carrying out some tasks.
- The human body is like a complex machine with the arms and legs operating like levers.

Prior Learning
Check that students:
Know the effects of forces.

Focus Question 1: What are machines and how do they help?

THEME: Energy, Forces and Matter

Attainment Target(s):

- Recognise the importance of energy to life processes, everyday life, and the relationship between energy and matter
- Gain an understanding of and apply the engineering design process
- Gain an understanding of and apply aspects of the scientific method.
- Begin to appreciate the influence and limitations of science
- Demonstrate a positive attitude towards the use of scientific language
- Demonstrate positive interpersonal skills in order to foster good working relationships

Benchmark(s):

- Understand how machines make work and life easier
- Make predictions of what will happen based on scientific knowledge and understanding. Suggest and communicate how to test these predictions. Interpret data and decide whether results support predictions, and are sufficient to draw conclusions
- Generate and compare possible solutions to a problem based on how well each is likely to meet the criteria and limitations of the problem.
- Show concern for man's impact on the environment

Objectives:

- Distinguish among the types of simple machines
- Explain how simple machines are used in various situations
- Relate how changes in technology have made simple machines more effective
- Communicate scientific information about simple machines
- Work cooperatively in groups
- Carry out fair tests through investigations
- Predict outcomes of investigations on simple machines
- Make and record observations of simple machines
- Analyse and compare data from investigations on simple machines
- Collect and display data from investigations on simple machines
- Use data from investigations to draw conclusions
- Compare predictions with conclusions
- Carry out investigations with due regard to safety
- Plan and design investigation to test prediction
- Make inferences from observations of machines
- Assess the impact of machines on daily life/ activities

• Show concern for the need to conserve energy usage in our everyday life • Display curiosity, objectivity and perseverance in their approach to activities **Duration:** 3 weeks/ 6 Hours	
Attainment Targets: **COMMUNICATION AND COLLABORATION** - use technology to communicate ideas and information, and work collaboratively to support individual needs and contribute to the learning of others **RESEARCH, CRITICAL THINKING AND DECISION MAKING**- use digital tools to design and develop creative products to demonstrate their learning and understanding of basic technology operations **DESIGNING AND PRODUCING** – use appropriate digital tools and resources to plan and conduct research, aid critical thinking, manage projects, solve problems and make informed decisions **DIGITAL CITIZENSHIP**- recognise the human, ethical, social, cultural and legal issues and implications surrounding the use of technology and practice online safety and ethical behaviour	

Suggested Teaching and Learning Activities – Focus Question 1	**Key Skills**	**Assessment Criteria**
Students will: • In groups, predict whether or not a juice box truck with wheels will carry load easier than one without wheels. Plan, design and execute an investigation to test your prediction. Record results in a variety of ways, then discuss, make inferences, and draw conclusions. Compare predictions to conclusions. Share findings with class. (*Teacher should*	• Record, communicate, collaborate, think critically (plan and design, predict, infer), manipulate, observe, draw conclusions, make comparisons	• Fair test designed. • Comparisons between prediction and results made

Suggested Teaching and Learning Activities – Focus Question 1	Key Skills	Assessment Criteria
introduce the concept of machines during class discussion: a machine is any device that makes work easier.) • With the aid of the teacher, explore the use of simple machines (scissors, pliers, hammer, can opener, crowbar, garden fork, wheel, single pulley, knife, axe, screw, car jack etc.). For each simple machine, indicate where the forces are applied. Describe how each machine makes work easier. (*Teacher should introduce the concept of simple machines in the discussions ensuing from the activity. Note: a simple machine has few or no moving parts.*) • In groups, search for information (online or offline) on the six types of simple machines and how they work. Do online interactive activities on simple machines to aid in understanding of concepts. Classify the machines explored in the preceding activity according to the types of simple machines. Document and present findings to class in various ways (e.g., prepare a multimedia presentation with text, tables, graphic organizers, illustrations; do demonstrations, etc.), giving two examples of each type of simple machine. (*Teacher should guide discussions and clarify misconceptions.*) • View videos/pictures depicting various situations, e.g. a flag being raised/lowered, an heavy object being placed in the back of a truck. In groups, discuss their observations and identify the type of simple machine that is being used. Describe how the simple machine is being used and how it makes the task easier. Share the results of their discussions with the class in a variety of ways • Browse and search a range of online and offline resources for pictures which depict old and new versions of some machines, such as sewing	• Manipulate, observe, communicate, think critically (analyse, predict, draw conclusions) • record, communicate, collaborate, report, think critically (classify, justify) • Use search engine safely • Design and produce a multimedia presentation – insert text, images, graphic organisers, tables • Observe, communicate, collaborate, analyse • Make comparisons, observe, record, communicate, infer, summarise, create	• Correct description given of how each simple machine makes work easier. • Logical responses given • Correct information presented in report. • Correct classification of simple machines. • Plausible reasons given for classification • Correct explanations given on how the simple machines made the tasks easier • Summary relates differences to improvement in effectiveness of the machines

Suggested Teaching and Learning Activities – Focus Question 1	Key Skills	Assessment Criteria
machines/ telephones/computers/cars, etc. Compare older models with modern models. Record differences observed and explain how the changes have improved the way the machines work. Write a summary of their findings and present them to class in the form of a multimedia presentation, digital story or any other appropriate format that captures findings. • In groups, examine examples of machines used in daily activities and discuss how they have helped humans eg. Wheelchair, ramp, skateboards, elevators, cranes. Explore how these have impacted the society through questions such as, "How have these machines made life easier?", "How do they help special group of persons?", How do they help in saving energy and time? Determine if there are any negative impacts of having machines do all the work for us. Share answers with the class in different ways.	• Navigate digital content on website • Design and produce multimedia presentation • Communicate, collaborate, think critically (analyse, evaluate, predict)	• Logical answers given • Plausible impacts suggested • Cause and effect adequately shown
Learning Outcomes Students who demonstrate understanding can: ✓ Differentiate between the types of simple machines and explain how each works ✓ Appreciate that technological advances have made machines more effective ✓ Use selected ICT tools to conduct research and communicate information to multiple audiences.		

Points to Note	Extended Learning
Teacher should provide students with, or guide students in finding out, the classes of simple machines: wheels and axles, levers, pulleys, inclined planes, wedges and screws. Children should be allowed to choose the way in which their results are recorded (e.g. tables, drawings, written, graphs). Where all types of simple machines are not available, pictures/videos may be used.	Classify the machines found at their homes into the appropriate categories

Teacher should remind students to follow guidelines to promote healthy use of ICT tools	
Resources Pictures of construction site or garment-factory establishment Various simple machines: scissors, pliers, hammer, can opener, crowbar, garden fork, wheel, pulley, knife, axe, screw, car jack etc. Magazines, Newspaper clippings, Pamphlets Internet access, multimedia projector, computer with word processor, story-creating, presentation and spreadsheet software and any other available technologies.	**Key vocabulary** simple machines, wheels and axles, levers, pulleys, inclined planes, wedges, screws, technology

Focus Question 2: How is a simple machine different from a complex one?

THEME: Energy, Forces and Matter

Attainment Target(s):

- Recognise the importance of energy to life processes, everyday life, and the relationship between energy and matter
- Gain an understanding of and apply the engineering design process
- Gain an understanding of and apply aspects of the scientific method.
- Begin to appreciate the influence and limitations of science
- Demonstrate a positive attitude towards the use of scientific language
- Demonstrate positive interpersonal skills in order to foster good working relationships

Benchmark(s):

- Understand how machines make work and life easier
- Make predictions of what will happen based on scientific knowledge and understanding. Suggest and communicate how to test these predictions. Interpret data and decide whether results support predictions, and are sufficient to draw conclusions
- Generate and compare possible solutions to a problem based on how well each is likely to meet the criteria and limitations of the problem.
- Show concern for man's impact on the environment
- Show concern for the need to conserve energy usage in our everyday life
- Display curiosity, objectivity and perseverance in their approach to activities

Duration: 5 weeks/ 10 Hours

Objectives:

- Explain how levers are involved in a variety of tools
- Explain how parts of the body work similar to levers
- Distinguish between simple and complex machines
- Infer that the body is a complex machine
- Analyse the operations of complex machines
- Compare the effectiveness of a simple and a complex machine in carrying out the same task
- Design and construct a complex machine for a particular purpose
- Communicate scientific information
- Work cooperatively in groups
- Make and record observations of machines
- Draw and label diagrams
- Analyse and compare data from investigations on machines
- Collect and display data from investigations on machines
- Use data from investigations to draw conclusions
- Carry out investigations with due regard to safety
- Make inferences from observations of machines
- Operationally define lever, effort, load, and fulcrum

ICT Attainment Targets: 💻 **COMMUNICATION AND COLLABORATION** - use technology to communicate ideas and information, and work collaboratively to support individual needs and contribute to the learning of others 💻 **RESEARCH, CRITICAL THINKING AND DECISION MAKING**- use digital tools to design and develop creative products to demonstrate their learning and understanding of basic technology operations 💻 **DESIGNING AND PRODUCING** – use appropriate digital tools and resources to plan and conduct research, aid critical thinking, manage projects, solve problems and make informed decisions 💻 **DIGITAL CITIZENSHIP**- recognise the human, ethical, social, cultural and legal issues and implications surrounding the use of technology and practice online safety and ethical behaviour	

Suggested Teaching and Learning Activities – Focus Question 2	**Key Skills**	**Assessment Criteria**
Students will: • balance a ruler across a pencil and mark this position on the ruler as the balance position (pivot/fulcrum). Place a coin at one end of the ruler and record what happens. Place another coin on the other end and record observations. Increase the number of coins on one end, observe what happens. Move pencil towards heavier end of ruler and record what happens. (*Teacher should demonstrate activity to reinforce/explain what happens. Cross-check with students as they carry out the activity. Introduce the terms: effort, load, pivot/fulcrum, balance; these should be clearly pointed out*). Make a labelled diagram of the set up. Write a few sentences about their understanding of the following: lever, load, effort and fulcrum/pivot. • record observations from the demonstrations done by resource person/ teacher using tools to illustrate use of common levers. (Career alignment -	• Observe, record, communicate, think critically - infer, draw conclusions, make comparisons, manipulate, define operationally, label, draw diagrams • Enter data in spreadsheet • Understand and use standard browser features • Navigate digital content on websites	• Diagram represents set up and is correctly labelled • Sentences contain correct information about lever, load, effort and fulcrum/pivot

Suggested Teaching and Learning Activities – Focus Question 2	Key Skills	Assessment Criteria
mechanics, carpenters, etc.) Draw diagrams of each tool in use, labelling the relevant lever components effort, load, and pivot/fulcrum. To ensure important details are captured, do video recording of the demonstrations and playback for review and discussion.	• Observe, record, communicate, label, draw diagrams, apply • video recording	• Lever parts accurately labelled on diagrams. Diagrams clearly represent tools • Application and transfer of knowledge evident
• kick a ball; make a big step; on one leg, throw and catch a ball; to illustrate levers in the body. Name the parts of the body that act as levers in these actions.	• manipulate, analyse, communicate	• Parts of body that act as levers correctly identified.
• demonstrate then draw and label the appropriate parts of the body that acts as a lever and compare against a mechanical device.	• analyse, label, draw diagrams, make comparisons	• Clear and accurate diagrams representing parts of the body. Accurate comparisons made between parts of the body and mechanical devices.
• examine parts of some common complex machines e.g. knob as wheel and antenna as lever on portable radio, the various parts of a mechanical can opener. Draw the simple machine as part of the complex machine. Write a simple explanation of how a complex machine operates. (*Teacher should emphasize that a complex machine is made up of two or more simple machines working together.*) If possible, do interactive online activities on complex machines.	• Analyse, draw and label diagrams, communicate, think critically – draw conclusions • Navigate digital content on websites	• Accurate explanation of how complex machines work
• collect pictures of simple and complex machines that do the same job, e.g. hand saw/power saw; machete/lawn mower; needle/sewing machine **OR** browse and search digital content for pictures. In groups, discuss the differences in how the machines get the job done. Record their findings on a chart or insert pictures and record findings in appropriate software and produce a presentation on the differences between simple and complex machines in getting the job done. Share findings with the class.	• Record, make comparisons, communicate, collaborate, classify • Navigate digital content on websites	• Chart provides accurate information on how the different machines get the same job done.

Suggested Teaching and Learning Activities – Focus Question 2	Key Skills	Assessment Criteria
• plan and design (individually or in groups) a device to meet a need; the device should consist of at least three simple machines. Generate several possible solutions, select the best one then construct the device using selected materials. Give reasons for the choice of materials, taking into account other constraints. Browse and search online and offline resources such as digital content and text books for information on complex machines to aid the planning and designing exercise. As a class, compare devices made and make suggestions for possible improvements.	• Record sources of information accurately • Design and produce a presentation • Plan and design, manipulate, think critically, research, make comparisons, analyse, evaluate • Use search engine safely • Navigate digital content on websites/CDs/DVDs	• Plan utilises at least three simple machines • Device meets identified need
Learning Outcomes Students who demonstrate understanding can: ✓ Identify levers at work in various tools and the human body ✓ Explain the roles of the simple machines that constitute a complex machine ✓ Make a complex machine to solve a problem ✓ Use selected ICT tools to browse and search for information, create spreadsheet and produce multimedia presentations on the differences between simple and complex machines		

Points to Note	Extended Learning
Ensure that the drawings done by students are not artistic. There should be no shading. Emphasize that drawings in science serve the purpose of accurately representing information. The classes of levers should NOT be introduced. Tools such as scissors, pliers, crowbars, tongs, fishing rods, can openers, and wheelbarrows may be used as examples of levers. Carefully manage the use of tools that may be dangerous, e.g. knives.	Create a scrapbook on complex machines in the home. For each complex machine, identify all the simple machines of which it is made.

Cross –curricular links: Technical Vocational Education (Grade 4, ATs 1-3; Grade 5 AT 2; Grade 6 AT 2,3) Teacher should remind students to practise safe use of ICT tools	
Resources Textbooks, Objects representing wheels, Rulers, Coins Computer software, Audio-visual aids Tools (scissors, pliers, tongs, crowbars, fishing rods, nut-crackers, wheelbarrows, body parts) Balls (lawn tennis, table tennis, football, cricket etc.) Chart showing lever principle and lever types, mechanical devices Multi-media materials on levers Complex machines e.g. car, portable radio Pictures of simple and complex machines Materials for making the device Internet access, multimedia projector, video recording device, and any other available technologies, computer with word processor, presentation and spreadsheet software	**Key vocabulary** Balance, pivot, fulcrum, complex machine, tools, load, effort, lever

SCIENCE UNITS OF WORK GRADE 5 TERM 3 UNIT 2: WEATHER INSTRUMENTS

About the Unit

Students will study the use and functions of particular weather instruments. They will construct functional models of some instruments examined and use these to collect weather data. Students will analyse the weather data they have gathered and use it to make simple short-term predictions about future weather. They will compare their predictions with national weather forecast information.

Range of Content

- Weather instruments are used to measure elements of weather
- Elements of weather include rainfall, sunshine, temperature, wind speed and air pressure
- The thermometer, rain gauge, wind gauge (anemometer), wind vane and barometer are some instruments used to collect weather information
- Data collected from weather instruments can be used to make weather forecasts based on patterns (trends) identified over a period
- Weather forecasts represent predictions of weather conditions

Prior Learning
Check that students: Know what weather is and the elements of weather (Grade 4 Social Studies)

Focus Question 1: What are some instruments used to measure the elements of weather and how do they function?	
THEME: Living things, Life Processes and the Environment **Attainment Target(s):** • Recognise the variety of living things, their interdependence and their inter-relationship with the environment • Gain an understanding of and apply the engineering design process • Gain an understanding of and apply aspects of the scientific method • Begin to appreciate the influence and limitations of science • Demonstrate a positive attitude towards the use of scientific language • Demonstrate positive interpersonal skills in order to foster good working relationships **Benchmarks**: • Be familiar with weather instruments. Use and share observations of local weather conditions to describe patterns overtime • Begin to understand the interdependence of living things in the environment • Make predictions of what will happen based on scientific knowledge and understanding. Suggest and communicate how to test these predictions. Interpret data and decide whether results support predictions, and are sufficient to draw conclusions • Generate and compare possible solutions to a problem based on how well each is likely to meet the criteria and limitations of the problem	**Objectives:** • Describe the functions of selected weather instruments (thermometer, barometer, wind vane, wind gauge/anemometer, rain gauge) • Construct models of some weather instruments (wind vane, wind gauge/anemometer, rain gauge) • Analyse weather data to identify patterns and make simple predictions • Work cooperatively in groups

• Show concern for man's impact on the environment • Show concern for the need to conserve energy usage in our everyday life • Display curiosity, objectivity and perseverance in their approach to activities **Duration:** 3 weeks/ 6 Hours	
Attainment Targets: **COMMUNICATION AND COLLABORATION** - use technology to communicate ideas and information, and work collaboratively to support individual needs and contribute to the learning of others **RESEARCH, CRITICAL THINKING AND DECISION MAKING**- use digital tools to design and develop creative products to demonstrate their learning and understanding of basic technology operations **DESIGNING AND PRODUCING** – use appropriate digital tools and resources to plan and conduct research, aid critical thinking, manage projects, solve problems and make informed decisions **DIGITAL CITIZENSHIP**- recognise the human, ethical, social, cultural and legal issues and implications surrounding the use of technology and practice online safety and ethical behaviour	

Suggested Teaching and Learning Activities – Focus Question 1	Key Skills	Assessment Criteria
Students will: • in groups, complete the Weather Instruments Web Quest (web/Power Point/paper version). Present findings to the class in a variety of ways	• collaborate, communicate, research	• Correct information presented on weather instruments and how they function • Weather instruments functional
• observe teacher's demonstration of how to use the a) thermometer, (b) rain gauge, (c) wind vane, (d) barometer, (e) anemometer, then discuss the use of each piece of equipment. In groups, plan, design and construct a functional model of a weather instrument, assigned by the teacher. Design with the aid of the teacher, a rating scale to assess instruments. Demonstrate the use of the instrument to the class. Based on feedback from the class, implement at least one modification to the instrument prototype. (*Information on the construction of weather instruments can be found online.*)	• plan and design, create, draw conclusions, evaluate, manipulate, communicate, think critically, collaborate, observe	
ICT Integration Browse and search teacher-reviewed websites for information on constructing a weather instrument.	• Navigate digital content on websites • Use search engine safely • Cite sources of information accurately	• Observations correctly recorded • Logical predictions of weather conditions based on data collected • Instruments correctly used
• in groups, use the instruments created to collect and record data on weather elements – wind speed/rainfall/temperature/wind direction/air pressure – at the same time each day for one week period (N.B. the rain gauge should be read immediately after it rains). Analyse the week's data and find the average daily wind speed/rainfall/temperature/air pressure. Write a report on the investigation, and include the photos taken, charts generated from the data, average readings and any other relevant information. Present findings to the class. Display the data on graphs, charts etc. Discuss their findings and predict the weather conditions for	• Manipulate, record, measure, collaborate, observe, predict, construct, communicate, compare, think critically Manipulate, gather evidence and data, report, communicate, collaborate, think critically (analyze, summarize, interpret, make conclusions, predict, justify)	• Functional weather station constructed • Creative data presentations with accurate information • Patterns and trends are based on evidence • Explanations are logical

Suggested Teaching and Learning Activities – Focus Question 1	Key Skills	Assessment Criteria

the following day/week. Compare their predictions with the weather forecast.
 	
• Construct a school/ class weather station with instruments created by the class. Collect and analyze the weather data collected over a month. Present data in several ways (e.g. graphs, charts) and prepare a report for the school. Determine patterns and trends in the summary data and provide explanations for results obtained.
 	
<u>ICT Integration</u>
Record data in notebook or spreadsheet each day (take appropriate steps to save work). Take photos of the area after measurements are taken.
	• Format charts in a spreadsheet
	• Enter data into columns and rows in a spreadsheet
	• Navigate digital content
	• Use search engine safely
	• Design and produce a report document
	  • Enter text
	  • Insert illustrations e.g. charts, pictures, tables in report document	

Learning Outcomes

Students who demonstrate understanding can:

- ✓ Construct and use various weather instruments to measure appropriate elements of weather
- ✓ Identify patterns in weather data samples
- ✓ Use weather data to make simple weather forecasts
- ✓ Use ICT tools effectively to enter data in spreadsheet.

Points to Note	Extended Learning
The daily weather forecast may be obtained on the Meteorological Service of Jamaica's website (http://www.metservice.gov.jm) or on broadcast media, newspapers or international weather websites. Encourage students to observe safety rules when browsing online.	Visit a weather station/meteorological office to observe weather instruments in use, or interact with resource person(s). Record and report findings. As a class, create a weather station.
Resources Materials for making instruments Weather instruments Textbooks Transparent plastic cups Waterproof material Resource person(s) Field trip site(s) Internet access Multimedia projector	**Key vocabulary** Thermometer, anemometer/wind gauge, rain gauge, wind vane, precipitation, barometer, weather, forecast, temperature, meteorology, atmospheric (air) pressure

Computer with word processing and spreadsheet software and any other available resources	

NSC

SOCIAL STUDIES

Grade 5 UNITS

Social Studies Philosophical Statement

Social Studies is primarily concerned with the study of the interaction of individuals and groups within societies and their relationship with their environment. The study of the relationships within societies and their interaction with the environment requires an interdisciplinary approach. Ergo, the essential knowledge, concepts and skills taught in Social Studies are drawn from a coordinated and systematic study of the Social Sciences; Geography, History, Sociology, Political Science, and Economics and where appropriate, content, concepts and skills from Mathematics and the natural sciences are infused.

The primary purpose of Social Studies is to create active participatory citizens who are able to make informed and reasoned decisions that are beneficial to a culturally diverse and democratic society in a changing and interdependent world. In order to create the type of citizen, the National Standards Curriculum (NSC) uses the tenets of constructivism which embraces the student centred approach to teaching and learning. Constructivists view students as thinkers who create, shape, re-form and internalize information. In the constructivist approach it is not about what students can repeat, but what they can generate, demonstrate and exhibit. To this end, Webb's Depth of Knowledge is used to write objectives with a focus on the complexity and depth of thinking.

"Tell me and I forget. Teach me and I remember. Involve me and I learn." Benjamin Franklin

The constructivist pedagogy demands that students work in collaborative groups to complete hands-on, minds-on activities which tackle real world problems. In the NSC the Science, Technology, Engineering, Arts and Mathematics (STEM/STEAM) methodologies, practices and principles are used to develop teaching and learning activities. In a rapidly evolving technological age, with new and emerging problems such as those associated with climate change, citizens must be able to evaluate situations, solve problems, create and innovate solutions. In the NSC Social Studies Units the teachers facilitate this process by engaging students in meaningful authentic activities which allow them to explore and interrogate information, explain their solutions and the processes used to arrive at a solution.

"*Learning results from what the student does and thinks. The teacher can advance learning only by influencing what the student does learn.*" Herbert Simon.

The awareness that only the learner can develop his or her own understanding is one of the fundamental pillars upon which this curriculum rests. Student learning is not directly visible, but may only be inferred through action. Thus to assess students learning teachers must constantly observe student actions/behaviours. In the NSC, assessment is both formative and summative. Self- assessment and peer evaluation are also encouraged. The students are required to provide evidence of learning by producing pieces of work which are assessed using specific criteria.

"If we teach today's students as we taught yesterday's, we rob them of tomorrow." John Dewey

STEM in the National Standards Curriculum

The 21st Century brings with it new challenges which we must face and overcome if we are to survive as a nation. The imperatives of the present and the future require that we create a nation of critical thinkers and problem solvers. To achieve this goal we must change the way we teach to using methods which are aligned with how students learn. It is vital that teaching and learning in the 21st Century embrace the principles, practices and methodology embedded in the STEM/STEAM approach.

STEM/STEAM (Science, Technology, Engineering, Arts and Mathematics) thinking is more than the content of the disciplines on which the methodology is based. It is a way of thinking that embraces and promotes multidisciplinary and interdisciplinary integration, collaboration, critical thinking and solving real world problems through hands-on and minds-on activities. The STEM/STEAM methodology was used in the development of teaching and learning activities in the NSC Social Studies Units. In instances where the content of the STEM/STEAM disciplines is evident it is incorporated and used in the teaching and learning activities. The scientific method, the engineering design process, mathematical thinking and technology in its various forms are used where the content of the STEM/STEAM disciplines is not overly apparent.

The Social Studies Units in the National Standards Curriculum are written using, inter alia, STEM/STEAM principles, practices and methodologies, such as:

- Project based learning
- Problem solving
- Developing and using models
- Planning and carrying out investigations
- Analysing and interpreting data
- Using mathematical and computational thinking
- Engaging in argument for evidence
- Obtaining, evaluating and communicating information

Students at the primary and secondary levels are required to design and make scaled models that meet specific criteria. Making a scaled model requires the application of mathematical content and principles such as knowing the units of measurement, converting units, and/or drawing a diagram to scale. Students will have to use the engineering design process to design and make the model to meet the given criteria. The design can be developed with the aid of computer technology or with pen and paper and may involve designing and redesigning until the model adequately meets all the criteria given. These activities are done collaboratively and the process and product are communicated to the rest of the class, school or community.

Using the scientific method, students are presented with or asked to identify problems at the class, school, community, or national level and are then guided through the problem solving methodology in an effort to solve the problem. The problem solving method involves gathering data related to the problem, interpreting and analysing the data, drawing conclusions, making recommendations and taking action to solve the problem.

STEM/STEAM in Social Studies therefore, requires students to apply the knowledge of scientific and mathematical principles, where relevant and applicable, and use available and emerging technologies to solve real world problems.

AIMS OF SOCIAL STUDIES

The study of Social Studies should enable students to:

- understand the facts, concepts, principles and perspectives that make up Social Studies
- acquire skills and competencies, which will enable them, to examine and analyze concepts related to culture and the physical environment as well as to appreciate the symbiotic nature of the relationship between man and his environment
- use a combination of technological and spatial skills to extract, analyze and use information to construct spatial patterns and understand processes that shape the human environment and decision-making
- become active and responsible citizens who are able to make informed and reasoned
- decisions in the interest of all citizens in a democratic society and a globalized world
- independently and collaboratively locate, analyze and evaluate information from a variety of sources and effectively use it in a variety of decision-making situations

AT1 **THEME:** The physical environment and its impact on human activities	AT 2 **THEME**: Diversity, interdependence and sustainability in nature and society	AT3 **THEME**: Living together	AT4 **THEME**: Our common heritage
Standard: Students should understand the processes and forces that have influenced the present landscape. They should understand how the landscape impacts on both the natural and built environments and influences the way people live. They should understand the factors that produce weather, and realize the effect that climate has on living things. They should be aware of the way the Earth's position and movement within the Solar System affects us all.	**Standard:** Students should appreciate and respect the diversity in nature and society and the need to protect and encourage this diversity. They should realize that people depend on each other and on the environment. They should be aware of and be engaged in activities to promote sustainable development.	**Standard:** Students should know the institutions that enable communities to organize themselves make decisions and live together in peace and harmony. They should recognize the patterned interactions within institutions and how these have changed and developed over time. Students should understand that institutions play an important role in national development, and in the promotion of regional integration and international cooperation.	**Standard**: Students should develop a sense of national and regional identity. They should know and appreciate the rich culture and heritage of Jamaica and understand the events and influences that have shaped its development over time. They should understand how this relates to broad movements of world history and to some of the key events and peoples who have shaped that history. They should understand the historical forces that have brought about changes within and across the periods of history that they study.

OVERVIEW OF SUBJECT CONTENT GRADE 5

SUBJECT	TERM 1	TERM 2	TERM 3
Social Studies	**Our Common Heritage** Europeans and Africans in Jamaica National Heroes –Nanny of the Maroons, Sam Sharpe, Paul Bogle and George William Gordon Caribbean Culture – dance, music, language, dress, religion, food	**The Physical Environment and its Impact on Human Activities** Erosion and how it affects the land Locating places in Jamaica and the Caribbean using cardinal, intermediate points and lines of latitude and longitude **Living Together** Municipal Corporations (Parish Councils)	**The Physical Environment and its Impact on Human Activities** Types of rainfall and associated hazards The features of the Solar System **Diversity, Interdependence and Sustainability in Nature and Society** The importance of plants to humans and the environment Water pollution

About the Unit

In this Unit, students will examine two ethnic groups in Jamaica and the Caribbean who have contributed to the diversity in our customs and traditions and which help to make the Caribbean a "melting pot" of cultures. They will develop an awareness of the origin of each ethnic group and begin to appreciate that these shared experiences help to make the Caribbean integrated. Students will also appreciate the importance of maintaining and preserving their Jamaican culture and heritage. They will be engaged in collaborative research activities and creative presentations as they continue to explore Caribbean culture and heritage.

Prior Learning:

Check that students can:

- Use an atlas
- Name the early inhabitants of Jamaica
- Identify the ethnic groups in the English speaking Caribbean

UNITS OF WORK GRADE 5 TERM 1 Unit 1 (4 Weeks)

Focus Question: Why did the Europeans come to the Caribbean and why were the Africans taken to the Caribbean?	
Attainment Target 4: Recognize the contribution of individuals and groups who have helped to shape Jamaica's development over time. **THEME:** Our Common Heritage	**Objectives:** • Define and use correctly the concepts/terms: ancestors, colonisation, Middle Passage, enslavement, plantation, emancipation • Recall the meaning of the term ethnic group • Identify the ethnic groups that came to the Caribbean. • Locate on a map of the world the countries of origin of the Europeans and Africans that came to the Caribbean • Explain the reasons for the coming of the Europeans to the Caribbean. • Compare the needs and wants of Europeans and Africans on the plantation and describe how these were met. • Use mathematical skills to construct a timeline illustrating when the different ethnic groups came to the Caribbean.

	• Propose ways to show the significance of emancipation in Caribbean history • Demonstrate awareness of the reasons for ethnic diversity among Caribbean people. • Compile and arrange in alphabetical order a list of sources including, author, type of source, title • Listen to others, respect their ideas and make contribution to collaborative tasks
ICT Attainment Targets: **COMMUNICATION AND COLLABORATION** - Use technology to communicate ideas and information, and work collaboratively to support individual needs and contribute to the learning of others. **RESEARCH, CRITICAL THINKING AND DECISION MAKING**- Use digital tools to design and develop creative products to demonstrate their learning and understanding of basic technology operations. **DESIGNING AND PRODUCING –** Use appropriate digital tools and resources to plan and conduct research, aid critical thinking, manage projects, solve problems and make informed decisions. **DIGITAL CITIZENSHIP**- Recognise the human, ethical, social, cultural and legal issues and implications surrounding the use of technology and practice online safety and ethical behaviour.	

SUGGESTED TEACHING AND LEARNING ACTIVITIES **Students will:**	**KEY SKILLS**	**ASSESSMENT CRITERIA**
Research and discuss the meaning of the concepts/terms below and create a glossary of these concepts/ terms: ancestors, colonization, enslavement, ethnic group, emancipation. Write sentences using the terms in the glossary.	Gathering information from credible sources	Glossary must include the correct meaning of terms from a named reliable source. Sentences must reflect clear understanding of concepts/terms

SUGGESTED TEACHING AND LEARNING ACTIVITIES Students will:	KEY SKILLS	ASSESSMENT CRITERIA
Work in collaborative groups to read and discuss online or offline stimulus materials on the reasons behind the coming of Europeans - Spanish and British, and capture and sale of the Africans. Then present findings to class using role play or other creative means.	Reading for meaning	Group presentation gives correct the reasons Europeans and Africans came to the Caribbean
Use a given scale e.g. 5cm=100years to create a timeline of the arrival of the different ethnic groups. Students can create the timeline in their notebooks or use a digital timeline creator.	Applying mathematical skills Navigating digital content	Scale used must be correct timeline. The date of arrival of each group must be correctly aligned to the name of the group or a picture of the group
Examine world map/ digital world map and identify and name the countries from which the various ethnic groups came to the Caribbean region. Use a blank map of the world to show the origin of the ethnic groups. Insert the names of the countries on the map and use a key to show the ethnic groups.	Map reading skills	Map of the world showing the origin of the Europeans and Africans that came to the Caribbean. Countries correctly identified.
Write dub poems/develop animated series about the experiences of the Africans that entered the Caribbean. Dub poems should emphasize life in Africa, capture, Middle Passage, sale and life on the plantation. Poems can be recorded and played back for class discussion.	Synthesizing information	Correct portrayal of experiences of the Africans that came to the Caribbean

SUGGESTED TEACHING AND LEARNING ACTIVITIES **Students will:**	KEY SKILLS	ASSESSMENT CRITERIA
Read online/offline about the interaction between Europeans and Africans on plantations. Use role play or other creative means to show the interaction between the Europeans and Africans and alternatives ways of resolving issues that arose between the two groups.	Communicating information Problem solving	Correctly displaying interaction between Europeans and Africans through role- play/creative means. Present feasible alternatives to resolving the issues.
Work in small groups with resource materials provided by teacher to create storybooks. Story should focus on emancipation. The story should include the various ways in which the Africans celebrated their freedom as well as when and why we still celebrate Emancipation Day. Use online software to create storybook	Working cooperatively Connecting ideas and using imagination to develop a product	Story must include descriptions of how the Africans celebrated emancipation, when and why we celebrate Emancipation Day.
Create a game using questions and answers to identify who came or were brought to the region, why they came to the region, and where they came from. These can be created using free online game processing software.	Generating imaginative ideas to create a new product	Game must include relevant questions and correct answers

Learning Outcomes

Students will be able to:

- ✓ Give the correct meaning of concepts in written or oral form
- ✓ Name the ethnic groups that came to the Caribbean
- ✓ Correctly locate on a map of the world the countries of origin of the Europeans and Africans
- ✓ Identify the dates of arrival of the Europeans and periods of the arrival of the Africans on a timeline
- ✓ Give simple description of the interaction between Europeans and Africans
- ✓ State reasons for the importance of emancipation of Africans in the Caribbean
- ✓ Put forward reasons for the ethnic diversity in the Caribbean
- ✓ Write a simple bibliography including author, title, type of source
- ✓ ICT tools effectively to create timelines, record poems and publish documents on the different ethnic groups who came to the region.

SUGGESTED TEACHING AND LEARNING ACTIVITIES Students will:	KEY SKILLS	ASSESSMENT CRITERIA
✓		

Points to Note	Extended Learning
• African enslavement can be a very sensitive/emotive issue. Please ensure that the materials selected are age appropriate and class discussions do not encourage racism. • Preparation for role-play must be done prior to the lesson. • Europe and Africa are not countries, rather both are made up of several countries • Students are to be encouraged to follow in their atlases when teacher is using a wall map. • Resource materials for teaching and learning activities are to be collected and prepared before the lesson. • Countries other than those in the English – speaking Caribbean should be mentioned with regard to their ethnic make-up. Spanish and French countries e.g. Cuba, Haiti. Remind students to: • Recognise some of the dangers associated with internet use and demonstrate safe online behaviours. • Follow guidelines to promote healthy use of ICT tools	Interview resource person from embassies and high commissions (Spain, Britain, Nigeria, and Ghana) to find why their nationals continue to come to the Caribbean and the activities they engage in while living in the Caribbean. Interview persons in their community about how the first Emancipation Day was celebrated and how it is celebrated today. Interview persons in their community about the significance of Emancipation Day.

Resources	Key vocabulary	
Atlases, globes, Maps – world, Jamaica & Caribbean Outline of maps of Jamaica, Caribbean & the World Resource persons from selected ethic group Visits to museums, Pictures of the different ethnic groups Video clips depicting the arrival of different ethnic groups Computer Timeline creator software printer	ancestors ethnic group Europeans, Africans, Timeline Enslavement Middle Passage	century Caribbean Christopher Columbus Admiral Penn and General Venables Discovery Bay Passage Fort Apprenticeship
Links to other subjects Drama and Language Arts/Literacy, Mathematics, Visual Arts		

About this unit

In this Unit, students will begin to examine the life and work of Nanny of the Maroons, Sam Sharpe, Paul Bogle and George William Gordon. They will be engaged in collaborative research and field activities where they investigate the contribution of our national heroes to Jamaica's development. Students should develop an appreciation for great sacrifice made by our national heroes in pursuit of advancement of the Jamaican people.

Prior Learning

Check that students can:

- Identify the different ethnic groups in the Caribbean
- Locate on a world map the countries of origin of the different ethnic groups in the Caribbean
- Explain how and why each ethnic group came to the Caribbean

UNITS OF WORK GRADE 5 TERM 1 Unit 2 (4 Weeks)

<table>
<tr><td colspan="2">Focus Question: Who are some of the important persons that have helped to shape Jamaica as a nation?</td></tr>
<tr><td>Attainment Target 3:
Recognize the contribution of individuals and groups who have helped to shape Jamaica's development over time

THEME: Our Common Heritage</td><td rowspan="2">Objectives:

• Define and use correctly the concepts/terms: rebellion, Maroon, descendants, nation builder, national hero, motto, emancipation
• Locate maroon communities on a map of Jamaica and put forward reasons for the sites selected by the Maroons
• Give a brief description of life of Nanny of the Maroons, Sam Sharpe, Paul Bogle and George William Gordon
• Examine the activities of Nanny of the Maroons and Sam Sharpe in the fight for freedom and draw conclusions about their roles in the fight for freedom</td></tr>
<tr><td>ICT Attainment Target(s):
💻 RESEARCH, CRITICAL THINKING, PROBLEM SOLVING AND DECISION MAKING – Use appropriate digital tools and resources to</td></tr>
</table>

plan and conduct research, aid critical thinking, manage projects, solve problems and make informed decisions. 💻 **DIGITAL CITIZENSHIP** – Recognise the human, ethical, social, cultural and legal issues and implications surrounding the use of technology and practice online safety and ethical behaviour.	• Research the activities Paul Bogle and George William Gordon and draw conclusions about their roles in bringing about change after emancipation • Use lessons learnt from the lives and activities of our national heroes to inform personal decisions • Identify the major changes in Jamaica after the Morant Bay Rebellion • Assume shared responsibility for collaborative work and value the contribution of individual members • Appreciate the contributions of our National heroes and heroine to nation building

SUGGESTED TEACHING AND LEARNING ACTIVITIES **Students will:**	**KEY SKILLS**	**ASSESSMENT CRITERIA**
Recap the arrival of the different ethnic groups in the Caribbean and explain what the Jamaican motto means to them	Interpreting	Interpretation should include meaning of "out of many" and "one people"

SUGGESTED TEACHING AND LEARNING ACTIVITIES **Students will:**	KEY SKILLS	ASSESSMENT CRITERIA
Conduct research/invite resource person/participate in field trip to find out the history of the maroons in Jamaica. Find out who the maroons are, how they lived during slavery and how they resisted enslavement by the British. Compile a report on their findings using pictures, drawings to enhance the presentation. .	Gathering information	Report must include concise explanation of who the maroons are, brief description of their lifestyle and resistance to slavery accompanied by drawings or pictures.
Examine a map of Jamaica showing maroon communities and then complete a blank map by inserting names of the maroon communities.	Mapping information	Completed map of Jamaica showing maroon communities in Jamaica must have a key and a title
Conduct research on the life of Nanny of the Maroons and Sam Sharpe. Work in collaborative groups to create a biography on the life and contribution role of Nanny and Sam Sharpe. Biography should include- how he/she became a slave, his life as a slave, her life as a maroon, his/her role in the fight for freedom	Communicating information	Brief biography of the life of Nanny of the Maroons and Sam Sharpe.
Design and create a poster/creative piece to show their understanding of emancipation	Designing and Creating	Creative piece showing accurate understanding of emancipation

SUGGESTED TEACHING AND LEARNING ACTIVITIES **Students will:**	KEY SKILLS	ASSESSMENT CRITERIA
Research and create a dramatic piece/dub poem/drawings/song/ on the life and work of George William Gordon and Paul Bogle. Mention should be made of the conditions in Jamaica in 1865, march to Spanish Town, their work in politics and religion, overall leadership role that they assumed in the parish, fate of leaders, changes that came about as result of the work of these two leaders.	Imaginative thinking	Creative piece should be historically correct
Write a letter to the editor of a newspaper in 1865 outlining the problems that Jamaicans faced before the Morant Bay Rebellion and suggest ways that these problems could have been addressed. Letter should also include lessons learnt from the rebellion.	Problem solving	Letter outlines the problems faced by Jamaicans in 1865, solutions to the problems and lessons learnt.

Learning Outcomes

Students will be able to:

- ✓ Give clear definitions of the concepts and terms in written or oral form
- ✓ Write sentences which show clear understanding of terms/concepts
- ✓ Accurately identify maroon communities on a map of Jamaica
- ✓ Give a concise outline of the life of Sam Sharpe
- ✓ Describe the role of Sam Sharpe and Nanny in bringing about freedom
- ✓ Give clear explanation of the role of Paul Bogle and George William Gordon in the Morant Bay Rebellion
- ✓ Outline the major changes in Jamaica after the Morant Bay Rebellion

SUGGESTED TEACHING AND LEARNING ACTIVITIES **Students will:**	**KEY SKILLS**	**ASSESSMENT CRITERIA**
Points to Note Remind students to: • Demonstrate safe, respectful, responsible and clear online communication • Follow guidelines to promote healthy use of ICT tool	**Extended Learning** Interview members of the community to find out their opinion/level of awareness about the contribution of the national heroes to nation building. Students develop questionnaire and administer to community members. Present their findings to the class including statistical charts.	
Resources World map/globe, atlases, blank world maps, crayons, markers,	**Key vocabulary** rebellion, maroon, descendants, nation builder, national hero	
Links to other subject areas: Language Arts, Civics		

About this unit

In this Unit, students will continue to explore the roots and diversity of Caribbean culture. They will study aspects of culture in selected Spanish and French speaking islands and compare their culture to culture in the English speaking Caribbean. Students will examine the cultural roots of and compare the features of Caribbean music, dance, religion, language, dress. They will investigate the economic and social value of Caribbean culture to the people and devise strategies to promote and preserve Caribbean culture.

Prior Learning

Check that students:

- Know about the shared experiences of enslavement and colonization of the Caribbean countries
- Can identify some of the cultural practices of the English speaking Caribbean

UNITS OF WORK GRADE 5 TERM 1 Unit 3 (2 weeks)

Focus Question: How has the culture of the ethnic groups in the region influenced the development of Caribbean culture?	
Attainment Target 3: Know and value the contributions of communities and institutions in fostering national development, regional integration, and international cooperation. **THEME:** Living Together	**Objectives:** • Define concepts/terms and use correctly: culture, heritage, Caribbean identity, cultural diversity, integration, cooperation • Outline major historical events that are associated with the arrival of the various ethnic groups • Categorise different aspects of Jamaican and Caribbean culture (dance, music, language, dress, religion, food) according to ethnic groups • Identify similarities and differences in the culture of the Caribbean people • Examine various sources and draw conclusions about the benefits of aspects of Caribbean culture to Jamaica and the rest of the region • Propose ways that can be used to preserve and promote Caribbean culture among Caribbean people

	• Gather information from various sources on the culture (music, food, language, dance)of a selected Spanish (Cuba) and French (Haiti) island and then compare the culture of these islands with Jamaican culture • Demonstrate an appreciation for the Jamaican and Caribbean culture • Compile and arrange alphabetically a list of sources including, author, title, type of source • Show tolerance for various cultural expressions • Exercise flexibility to achieve a common goal
ICT Attainment Target(s): 💻 **RESEARCH, CRITICAL THINKING, PROBLEM SOLVING AND DECISION MAKING** – Use appropriate digital tools and resources to plan and conduct research, aid critical thinking, manage projects, solve problems and make informed decisions. 💻 **DIGITAL CITIZENSHIP** – Recognise the human, ethical, social, cultural and legal issues and implications surrounding the use of technology and practice online safety and ethical behaviour.	

SUGGESTED TEACHING AND LEARNING ACTIVITIES **Students will:**	**KEY SKILLS**	**ASSESSMENT CRITERIA**
Create timeline showing the period of arrival of the different ethnic groups to the Caribbean. Timeline should include a picture of each ethnic group that came to the Caribbean, one thing that they have contributed to Caribbean and basic information about the group e.g. why they came, where they came from.	Sequencing events and organising information	Timeline should begin with the Tainos and end with the East Indians and Chinese, show correct time of arrival of each group, appropriate pictures of each group and their contribution to Caribbean culture
Brainstorm to identify characteristics that Caribbean people have in common and make them unique. Ideas may be recorded on a concept map with Caribbean identity at the centre. Students will then complete the statement- "You are Caribbean if you …… "with things that show Caribbean identity. Students can interview Caribbean nationals in Jamaica or ask relatives who live abroad in communities with many Caribbean nationals what are the similarities they know of.	Brainstorming	Statements "You are Caribbean if you….." must relate to aspects of Caribbean culture and identity e.g. food, language, customs, music, religion.

<table>
<tr><td></td><td></td><td></td></tr>
<tr><td>Work in collaborative groups to conduct online/offline research on the culture of a Caribbean island. One French speaking and one Spanish speaking island must be included. Research should be conducted on the following areas; dance, music, dress, religion, food. Students will present their findings in a variety of ways; pictures, playing music/singing songs, modelling dress, dramatizing religious ceremony. Students must identify the ethnic group associated with each aspect of culture – dance, music , dress, religion, food</td><td>Conducting research and communicating information</td><td>Rubric for this activity must include the social dimension of collaborative work. The input of each group member must be a part of the assessment. Each group must present on a separate Caribbean island. Presentations must include a variety of art forms</td></tr>
<tr><td>View video presentations/pictures/read online/offline on the culture of different Caribbean islands, including music, song, and dance from different Caribbean countries. They will then classify each aspect of the culture according to ethnic group that influenced the culture. Students will record information in a table.
<table>
<tr><th>Country</th><th>Aspect of culture</th><th>Ethnic origin</th></tr>
<tr><td>Trinidad</td><td>Music – calypso</td><td>African</td></tr>
<tr><td></td><td>Religion – Hinduism</td><td>East Indian</td></tr>
<tr><td></td><td></td><td></td></tr>
</table></td><td>Classifying</td><td>Table must include English, Spanish and French speaking islands.</td></tr>
</table>

Work in collaborative groups to plan and execute activities to promote Caribbean culture. Activities may include a magazine e.g. "Caribbean Links". Magazine should include stories, poems, riddles, proverbs, songs, puzzles, articles about Caribbean culture. Magazine may be published online or as hard copy. **OR** plan and participate in a concert that focuses on Caribbean culture. Items for the concert should include songs, dance, music, fashion, ring games, skits from Caribbean countries including the Spanish and French Caribbean. **OR** plan and execute a Caribbean Culture Day. Culture Day activities should include making maps of the selected country, making flags, preparing and displaying foods from the selected country, playing music, singing songs, performing dances from the selected country. Resource persons may be invited to speak to students about the culture of the selected country. Brainstorm about the economic benefits of cultural and creative activities. Work in collaborative groups to develop strategies to use creative and cultural forms for economic gain.	Organising activities Communicating information Developing strategies	Rubric for this activity must include marks for planning, organising and executing the activity, as well as the interpersonal/social dimension. Marks must also be awarded for the accuracy and relevance of the content presented. Strategies must be clearly outlined to show how they may be implemented and criteria for sucess.
Learning Outcomes **Students will be able to:** ✓ Give accurate definitions of the terms and concepts ✓ Write brief explanations about the major historical events that are associated with the arrival of various ethnic groups ✓ Classify aspects of Caribbean culture according to ethnic influence/origin ✓ Describe the culture of a selected Spanish and French Caribbean country ✓ Compare aspects of Caribbean culture among English, French and Spanish speaking islands ✓ Plan and execute activities to promote and preserve Caribbean culture ✓ Plan strategies to derive benefits from the creative and cultural industries ✓ Participate in activities to show appreciation and tolerance for different cultural expressions		

Resources Computer Internet Speakers Music from Caribbean countries	**Key Vocabulary** culture, heritage, Caribbean identity, cultural diversity, integration, cooperation,
Points to Note • Caribbean identity includes the shared historical experiences, beliefs, culture which is common to the region. • Cultural diversity refers to the range of people of different origin, religions and traditions all living and interacting together • Factors that have influenced Caribbean culture include migration, colonization, enslavement and indentureship Remind students to: • Recognise some of the dangers associated with internet use and demonstrate safe online behaviours. Follow guidelines to promote healthy use of ICT tools	**Extended Learning** Students interview members of the community on the cultural practices of their local communities and prepare a report which will be shared with classmates
Links to other subject areas: Language Arts, Civics, Music	

Social Studies

Grade 5

Term 2 Units

About the Unit

In this Unit, students will learn that erosion and deposition occurs all around us and that long-term erosion and deposition can reshape the landscape forming new features. They will also investigate the main causes of erosion and deposition that have led to changes in landforms. Students will explore how human activities contribute to erosion and deposition as well as how humans can reduce or prevent erosion. Students will observe their immediate or selected environment for evidence of erosion and deposition and propose strategies to deal with problems identified.

Prior Learning

Check that students can:

- Identify and describe the different landforms in Jamaica

UNITS OF WORK GRADE 5 TERM 2 Unit 1__ (2 Weeks)_

Focus Question: Why does erosion occur and how does it affect the land?	
Attainment Target 1: Understand the Processes and forces that have influenced the physical and built environment **THEME**: The physical environment and its impact on human activities	**Objectives:** • Define and use concepts/terms/ correctly: erosion, erode, sediment, topsoil, deposition • Distinguish between types of landforms e.g. plateau and hill/mountain, plain and valley • Gather information from a variety of sources and use it to write a simple explanation of how erosion and deposition take place • Explain the role of water and wind in erosion and deposition • Gather information from multiple sources and use it to explain the effects of erosion and deposition on the environment. • Examine different types of human activities that contribute to erosion and deposition and propose how these activities may be modified to reduce erosion

	• Examine methods used to reduce the adverse effects of erosion and deposition and design a method to control erosion or deposition in a known area • Contribute ideas and respect the contribution of others when completing assigned tasks • Be aware of the causes and effects of changes in the landscape in their community	
ICT Attainment Targets: **COMMUNICATION AND COLLABORATION** - use technology to communicate ideas and information, and work collaboratively to support individual needs and contribute to the learning of others. **RESEARCH, CRITICAL THINKING AND DECISION MAKING**- use digital tools to design and develop creative products to demonstrate their learning and understanding of basic technology operations. **DESIGNING AND PRODUCING** – use appropriate digital tools and resources to plan and conduct research, aid critical thinking, manage projects, solve problems and make informed decisions. **DIGITAL CITIZENSHIP**- recognise the human, ethical, social, cultural and legal issues and implications surrounding the use of technology and practice online safety and ethical behaviour.		
SUGGESTED TEACHING AND LEARNING ACTIVITIES **Students will:**	**KEY SKILLS**	**ASSESSMENT CRITERIA**
Conduct online/offline research for the meaning of the terms/concepts: landform, mountain, valley, plain, plateau, erosion, erode, sediment, topsoil, deposition, river. Create a chart or draw a picture of a landscape which includes all the terms. Annotate the picture or drawing	Demonstrating concepts	Picture or drawing must include a definition of each landforms and a description of process and product.

<table>
<tr>
<td>View/collect pictures of landforms and identify each. Then tell which landform can be found in their geographical location and other parts of Jamaica. Students will distinguish between landforms observed. Distinction should be support by pictures and sentences</td>
<td>Observing
environment to
gather information
making comparisons</td>
<td>Pictures of landforms must be clearly identified and sentences use words that indicate comparison</td>
</tr>
<tr>
<td>View video/pictorial presentation/read information (from online or offline sources) on different types of erosion (See points to note). In groups, create a 2-3 minutes presentation depicting the types of erosion and preventative measures :
1.digital- to include pictures and audio,
2. Dramatic presentation e.g. role play, poetry/dub,
Share presentation with class.</td>
<td>Problem solving
Creating multimedia
/dramatic presentation</td>
<td>Presentation must show erosion by wind or water (or both). Preventive measure must show how the removal of topsoil by wind/water is reduced or stopped.</td>
</tr>
<tr>
<td>View video/read information on areas affected by erosion and deposition and describe the ways by which topsoil is removed from one place and settles in another. They will also explain effect of the movement of soil on area.</td>
<td>Writing explanations
and descriptions</td>
<td>Description includes a simple explanation of how wind/water removes topsoil and evidence of the accumulation of deposits</td>
</tr>
<tr>
<td>Examine and then classify descriptions/ pictures under correct headings. E.g.
<table>
<tr><th>Erosion</th><th>Deposition</th></tr>
<tr><td>Wind blowing sand from a field that has been overgrazed</td><td>Ponds filling up with sediment and becoming marshes</td></tr>
<tr><td>River removing soil from its banks</td><td>Deltas forming at the mouths of rivers</td></tr>
</table>
</td>
<td>Classifying</td>
<td>Pictures or descriptions include words or images that clearly indicate that erosion or deposition is occurring</td>
</tr>
<tr>
<td>Use play dough or papier-mâché to construct a model depicting the effects of erosion or deposition on landscape</td>
<td>Making a model</td>
<td>Model should show the impact of wind or water on the landscape</td>
</tr>
</table>

Participate in field study on erosion and deposition. Students can be asked to and identify describe landforms in their environment such as mountains, hills, valleys, plains, coasts and report on evidence of erosion and deposition on hillsides, coastlines, river valleys, mountain slopes. OR analyse pictures showing how areas have changed because of erosion or deposition. Write report on changes observed.	Gathering information Writing reports	Report must include name of area observed, landforms seen and terms/words that indicate how the area has changed
Examine pictures/view video on human activities and identify human activities being carried out. Suggest the type of erosion that may be induced or aggravated by the human activity. Propose ways to modify the activity to reduce the impact.	Establishing cause effect relationship Making proposals	Proposal must identify the human activity, describe the method/strategy/technique and suggest why it would be effective
Examine pictures or videos of methods used to reduce erosion and then conduct experiments using different materials and/or techniques to reduce the effects of erosion by wind and water. Students will apply different materials/techniques to loose topsoil and simulate the effect of wind and water then record their observations. Draw conclusions about the effectiveness of materials/techniques used.	Making connections between actions and outcomes Problem solving	Conclusions drawn must be supported by evidence and must be clearly stated.
Learning Outcomes Students will be able to: ✓ Given pictures/descriptions identify and differentiate between landforms. ✓ Write simple explanation of how erosion and deposition occur ✓ Distinguish between erosion and deposition ✓ Use images/words to explain the impact of erosion and deposition on the landscape		

✓ Propose workable strategies/solution to prevent/reduce the effects of erosion ✓ Share with community members how human activities contribute to erosion and deposition ✓ Create digital/ pictorial/dramatic presentations on the types of erosion	
Points to Note	**Extended Learning**
Teacher : • Should allow students to continue Social Studies glossary started in Grade 4 • Should concentrate only on wind, water and human activities that cause erosion • Should focus on erosion and deposition along the coast, river, hillsides • Should liaise with local conservation authority and organize field trip to look at areas of erosion and deposition. • Prepare students for field trips by telling them the objectives of the trips and the activities they will participate in. • A landslide is not a type of erosion; it is a type of mass wasting. Remind students to: • Recognise some of the dangers associated with internet use and demonstrate safe online behaviours. • Follow guidelines to promote healthy use of ICT tools	Parents/ guardians can take children to visit areas with the different land forms. They can discuss with parents/members of the community how these landforms have changed overtime and the consequences of these changes. They can also conduct online research on the outcomes of **erosion and deposition** on the local landscape, and then report findings.
Resources **P**ictures of different landforms, Video clips, Reading materials, Cartridge paper, crayons, markers Relevant texts, clay/play dough, papier mache`, glue, newspaper Computer Internet Electronic dictionary Multimedia Projector Speakers	**Key vocabulary** landform, mountain , valley, plain, plateau, erosion, erode, sediment, topsoil, deposition, deposits

Links with other subjects: Mathematics, Science	

About the Unit:

In this Unit, students will explore different ways of finding location on maps. They will use compass points, parallels of latitude and meridians of longitude to locate places in Jamaica and the rest of the Caribbean. They will come to an understanding of grid systems and create their own grid system. Students will be engaged in various map activities to develop skills in locating places and calculating distances.

Prior Learning
Check that students:

- Know cardinal points

UNITS OF WORK GRADE 5 TERM 2 Unit 2 (2 weeks)

Focus Question: How do I locate Jamaica and other Caribbean territories on regional maps?	
Attainment Target 1 : Understand the process and forces that have formed the physical and built environment **THEME:** The physical environment and its impact on human activities	**Objectives:** • Define and use correctly the following words/terms: cardinal points, intermediate points/intercardinal points, secondary intercardinal points, latitude, longitude, grid system, hemisphere, scale, equator, Prime Meridian • Describe Jamaica's location in relation to other Caribbean territories using the eight point compass • Examine maps and globes and use observations to describe the characteristics of parallels of latitude and meridians of longitude • Examine maps and globes and name the major lines of latitude and longitude • Use lines of latitude and longitude to locate places in the Caribbean

	• Use an appropriate method of location to identify and name Jamaica's neighbours on a map of the Caribbean. • Calculate distance between places in neighbouring countries in the Caribbean. • Examine methods used to locate places, draw a sketch map and create a location system/grid to find places on it.	
ICT Attainment Targets: 💻 **COMMUNICATION AND COLLABORATION** - Use technology to communicate ideas and information, and work collaboratively to support individual needs and contribute to the learning of others. 💻 **DIGITAL CITIZENSHIP**- Recognise the human, ethical, social, cultural and legal issues and implications surrounding the use of technology and practice online safety and ethical behaviour.		
SUGGESTED TEACHING AND LEARNING ACTIVITIES **Students will:**	**KEY SKILLS**	**ASSESSMENT CRITERIA**
Make direction finders and use these to locate Jamaica in relation to other territories on the map of the Caribbean. (Direction finders should also show the secondary intercardinal points).	Locating places on a map using intercardinal points	Model of direction finder correctly made to include the following; N, S, E, W, NE, SE, NW, SW. The directions of named places in relation to Jamaica correctly given.
Conduct online/offline research and discuss definition of latitude and longitude. In collaborative groups write a song, poem or paragraph about latitude and longitude.	communicating information	Paragraph, poem or sentence must indicate that longitude/latitude is the angular distance measured in degrees from

		a reference point, Prime Meridian/Equator
Examine carefully the grid lines on map/globe/ digital map. Describe these lines (parallel, intersect, vertical, horizontal) and discuss the purpose these lines using real world examples. Examine globe and determine the way the lines of latitude and longitude are measured e.g. 0^0 at the Equator and 90^0 at the poles. Make a model of the Earth using an orange, ball, or play dough. Identify the major lines of latitude and longitude and draw them on the model. Label the angles of the major lines of latitude and longitude on the model.	Observing for details Making a model	Model should have lines of longitude meeting at the poles, lines of latitude parallel to each other. It should have the five main lines of latitude and their degrees, and at least four lines of longitude. Degrees must be on the Prime Meridian
Do interactive online activities to develop map skills Plot at least 5 points (given the grid address) and give the grid address of at least 5 points on a grid made by teacher/students Estimate the coordinates of the towns and cities in the Caribbean and then check for accuracy. Use digital maps/atlases/wall maps to help in finding locations.	Locating places on a map using coordinate system	The absolute position of major towns /cities in Jamaica and other named countries correctly written
Conduct online/offline search to find the meaning of term scale as used in map reading**.** View video or demonstration on how to measure distance in a straight line between two points. Use steps observed to calculate the distance between cities and towns in Jamaica's and cities and towns in neighbouring Caribbean countries with the use of standard and non-standard units of measurement. The linear scale must be used to calculate distance. Do online or offline interactive activities on Lines of Latitude and Longitude	Calculating straight line distances on maps Manipulate digital content	Calculation of distances between Jamaica and selected countries is correct

Learning Outcomes

Students will be able to:

- ✓ use correctly the following words, terms:, latitude, longitude, grid system, hemisphere
- ✓ describe Jamaica's location in relation to other Caribbean territories using cardinal, ordinal and/ or secondary intercardinal points
- ✓ locate places using cardinal, intercardinal and secondary intercardinal points
- ✓ identify Jamaica's Caribbean neighbours on a map
- ✓ determine the coordinates of places in Jamaica and other Caribbean territories
- ✓ calculate the straight line distance between Jamaica and other countries using linear scale on a given map
- ✓ develop a location system
- ✓ given a map or diagram name the major lines of latitude and longitude
- ✓ give the precise measurement in degrees of each major line of latitude and longitude
- ✓ work collaboratively to share a range of ICTs within groups to complete tasks

Points to Note	**Extended Learning**
• The use of a wall map and a globe would be effective during instruction. This will help students to understand that a grid can be transferred from a round object to a flat one. • Grid created on orange/ ball should be similar to the one on the globe. Lines of longitude meet at the poles. Vertical lines drawn on the orange or ball must also meet. • Absolute location describes the location of a place based on a fixed point on earth. The most common way is to identify the location using coordinates such as latitude and longitude. • When giving coordinates for a location, the latitude is given first. Remind students to: • Recognise some of the dangers associated with internet use and demonstrate safe online behaviours. • Follow guidelines to promote healthy use of ICT tools • Students should recognise and understand the importance of technology access for all	• Research the paths of the hurricanes that hit Jamaica and other Caribbean territories and track the path of each using coordinates. • Students could find out how these hurricanes impact these countries.

Resources	**Key vocabulary**
Atlas Maps Globe Map of Jamaica, Caribbean Ruler Compass Digital maps Computer Internet Orange/ball	Locate Title Key Symbols Boundary Scale Direction Relative position Cardinal points Intermediate / Intercardinal points Secondary Intercardinal points Absolute position Equator Meridians of longitude Neighbour Parallels of Latitude Prime Meridian
Links to other subjects Mathematics, Language Arts, Visual Arts	

About the Unit

In this Unit, students will investigate the functions of Municipal Corporations (Parish Councils) in Jamaica and begin to understand how some of the decisions made by the Municipal Corporation (Parish Council) can impact communities and individuals. Students will walk through their communities and identify areas for which municipal Corporations (Parish Councils) are responsible. They will interact with members of the Municipal Corporation (Parish Council) and share their ideas about improving their communities.

Prior Learning

Check that students:

- Can identify the fourteen parishes of Jamaica

UNITS OF WORK GRADE 5 TERM 2 Unit 3 (weeks)

Focus Question: What are parish councils and how does this system of governance operate in Jamaica?	
Attainment Target 3: Know and value the contribution of communities and institutions in fostering, national development, regional integration and international cooperation **THEME**: Living together	**Objectives:** • Define and use the following terms correctly: mayor, councillor, regulations, local government, Municipal Corporation (Parish Council), municipal, parochial • Identify the goods that are produced in different parishes and explain how goods that are not produced in the parish are obtained • Examine an organizational chart of a parish council describe and make deductions about members and relationships within the Council • Describe the functions/services of the parish council and draw conclusions about its importance to governing of the country • State the importance of property taxes to the services carried out by the parish council • Gather information about how parish council members are elected and discuss the election process

	• Describe how decisions are made by the parish council, cite evidence to show the impact of these on individuals and communities and assess the effectiveness of the decisions • Be aware of roles and responsibilities of leaders and activities at the parish level • Participate in discussions to address issues at the school, community and parish levels
ICT Attainment Targets: **COMMUNICATION AND COLLABORATION** - Use technology to communicate ideas and information, and work collaboratively to support individual needs and contribute to the learning of others. **RESEARCH, CRITICAL THINKING AND DECISION MAKING**- Use digital tools to design and develop creative products to demonstrate their learning and understanding of basic technology operations. **DESIGNING AND PRODUCING** – Use appropriate digital tools and resources to plan and conduct research, aid critical thinking, manage projects, solve problems and make informed decisions. **DIGITAL CITIZENSHIP**- Recognise the human, ethical, social, cultural and legal issues and implications surrounding the use of technology and practice online safety and ethical behaviour.	

SUGGESTED TEACHING AND LEARNING ACTIVITIES **Students will:**	**KEY SKILLS**	**ASSESSMENT CRITERIA**
Conduct online /offline research to find the meaning of terms/words which are compiled in a glossary. Pictures and/or examples may be added	Finding the meaning of words/terms	Glossary of terms should give simple definition of

		terms listed in the objectives
View a picture of the mayor in official dress then describe the outfit. Complete a table/blank map of Jamaica with pictures of mayors. Find a picture/name councillor that represents the division in which the school is situated and add his picture/name to the map in the correct location.	Organising information	Table / map completed associating parishes with their mayor and division with its councillor
Conduct online/offline research on the structure of the Municipal Corporation (Parish Council) and draw a diagram showing its structure. Diagram should include a simple description of the role of each member of the council.	Organising information	Structure must show administrative and political position, the relationship between positions along with a brief description of roles attached to positions
Participate in a field trip to the local Municipal Corporation (Parish Council) office to: observe a sitting of the Corporation. Conduct an interview on the functions of the Municipal Corporation with the mayor/town clerk/secretary. Students will use image capturing device to take pictures and recording device to record the interview. Use information gathered to write a report on the visit to the Municipal Corporation. (See points to note)	Formulating interview questions Report writing Capture images, audio with digital camera and other image capturing device	Report on their visit to the office of the parish council shows understanding of the functions of the parish council
Walk through the community to identify infrastructure/public facilities that require the attention of the Municipal Corporation. They will then suggest possible solutions or approaches to tackling the problem. In groups they will do estimates for the solutions or outline approaches and present same at a mock sitting of the parish council.	Observing the environment and collecting information	Mock sitting of the parish council meeting should be as close as possible to the actual sitting.

	Problem solving	Solutions and approaches must be feasible
Be given a scenario in which a decision was taken by the parish council e.g. the removal of vendors from sidewalk / squatter settlement, creation of transport centre etc. and will create a role play depicting how the decision taken affected individuals and communities. Teacher and students will critique presentations and discuss options that the parish council may explore. Students will write essay on the importance of the parish council.	Assessing options to determine effective solution	Essay identifies the functions of the parish council and assess how they have carried out these
Create brochure to promote functions of the parish council.	Creating multimedia presentation Creative and imaginative thinking	Brochure highlights functions of the parish council

Learning Outcomes

Students will be able to:

- ✓ Give simple clear definitions for terms
- ✓ Provide simple explanation of how members of the parish council are elected
- ✓ Given an organisational chart of the parish council, identify positions, and the relationship between positions
- ✓ Clearly describe the functions of parish councils in Jamaica
- ✓ Use evidence to judge how effectively functions are carried out by parish councils
- ✓ Describe the process used to make decisions at the parish council and explain how these decisions affect constituents
- ✓ Develop logical arguments to justify the existence of parish councils.
- ✓ Use selected ICT tools effectively to capture images and produce multimedia presentations.

Points to Note	**Extended Learning**
• Students should be exposed to the process of election of councillors from nomination to swearing in.	Conduct community survey to determine level of awareness of Local Government with reference to: participation in elections, developing,

• Students should create their own in class parties with no affiliation to established political parties • Estimates should include measurement of road, quantity of materials needed, cost etc. Remind students to: • Recognise some of the dangers associated with internet use and demonstrate safe online behaviours. • Follow guidelines to promote healthy use of ICT tools	managing and maintaining infrastructure and public facilities such as parochial roads, water supplies, drains and gullies, parks, street light, recreational centres, markets, abattoirs, pounds, cemeteries, transportation centres, public sanitary conveniences and public beaches.
Resources **http://www.localgovjamaica.gov.jm/localauthorities.aspx?c=function** **http://stthomaspc.gov.jm/history** **http://hanoverpc.gov.jm/about/roles-and-functions-hanover-parish-council** **http://stcatherinepc.gov.jm/history/local-government** **http://stannpc.gov.jm/** **http://ksac.gov.jm/** Picture of mayors and councillors, map of Jamaica Camera, computer, multimedia projector	**Key vocabulary** mayor, councillor, regulations, maintenance, local government, Municipal Corporation, municipal, abattoirs/slaughter houses, infrastructure
Links to other subjects: Civics, Language Arts, Mathematics, Visual Arts	

Social Studies

Grade 5

Term 3 Units

About the Unit

In this Unit, students will explore the elements of weather with special emphasis on rainfall. They will examine how these elements and some extreme weather events impact human activities and investigate how the actions of humans can aggravate these events. They will discover weather patterns by making and using weather instruments to collect and record data.

Prior Learning

Check that students are able to:

- Define weather
- Identify the weather patterns

UNITS OF WORK GRADE 5 TERM 3 Unit 1 (3 weeks)

Focus Question: What are the elements of weather and how does rainfall occur?	
Attainment Target 1 : Understand the process and forces that have influenced the physical and built environment **THEME**: The physical environment and its impact on human activities	**Objectives:** • Define and use correctly the following concepts/terms: weather pattern, natural hazard, drought, hurricane, storm, climate, precipitation • Distinguish between weather and climate • Examine weather reports and use geometric shapes to construct weather symbols • Describe weather conditions by interpreting weather symbols • Collect and record weather data, make simple weather forecasts and suggest how to prepare for the type of weather predicted • Examine multiple sources on the impact of the elements of weather on human activities, categorize the impact and propose methods to deal with negative effects • Identify the types of rainfall • Explain how each type of rainfall occurs

	• Use a variety of sources to identify natural hazards associated with weather, then compare and analyse the effects of natural hazards on human activities (drought, flood, storms, hurricanes) in different areas • Describe how human actions contribute to the effects of these hazards. • Propose ways to prepare for and cope with the effects of these hazards • Listen to and critique suggestion put forward by classmates	
ICT Attainment Targets: **COMMUNICATION AND COLLABORATION** - Use technology to communicate ideas and information, and work collaboratively to support individual needs and contribute to the learning of others. **RESEARCH, CRITICAL THINKING AND DECISION MAKING**- Use digital tools to design and develop creative products to demonstrate their learning and understanding of basic technology operations. **DESIGNING AND PRODUCING** – Use appropriate digital tools and resources to plan and conduct research, aid critical thinking, manage projects, solve problems and make informed decisions. **DIGITAL CITIZENSHIP**- Recognise the human, ethical, social, cultural and legal issues and implications surrounding the use of technology and practice online safety and ethical behaviour.		
SUGGESTED TEACHING AND LEARNING ACTIVITIES **Students will:**	**KEY SKILLS**	**ASSESSMENT CRITERIA**
Watch/listen to weather reports online or offline and name four places (locally, regionally or internationally) mentioned in the reports, then note the variation in the elements of weather for places named. Create a	Listening for information Isolating details	Concept map showing elements of weather with a brief description of each element

<table>
<tr>
<td>concept map on weather, which should name each element and give a brief description of each.</td>
<td>Creating concept map</td>
<td></td>
</tr>
<tr>
<td>Read information online/offline about weather and climate, discuss the information obtained. In groups, demonstrate the difference between weather and climate. This may be done using the aesthetics/arts</td>
<td>Differentiating
Expressing ideas creatively</td>
<td>Presentation must depict the differences between weather and climate</td>
</tr>
<tr>
<td>In collaborative groups, using geometric shapes, construct and label models of weather symbols (use online/offline assistance).Explain the meaning and/or value of each symbol to the class. Display symbols created (in an appropriate place in the classroom).
Draw conclusions about the weather pattern at the school
LOG OF WEATHER PATTERN
<table>
<tr><th>Date</th><th>Time</th><th>Wind direction and speed</th><th>Temperature</th><th>Cloud
(types- cumulus, stratus, cirrus, nimbostratus</th><th>Rainfall
(mm)</th></tr>
<tr><td>April 1</td><td>8:30</td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td>11:00</td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td>12:30</td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td>1:45</td><td></td><td></td><td></td><td></td></tr>
<tr><td>April 2</td><td>8:30</td><td></td><td></td><td></td><td></td></tr>
</table>
</td>
<td>Designing and constructing

Drawing conclusions</td>
<td>Display of organized logs showing weather patterns accumulated over a two week period</td>
</tr>
</table>

		11:00						
Use newspaper articles and other offline or online resources (including own experiences) to discuss how elements of weather affect life in their community and Jamaica. Make an observation schedule to describe how weather affects different people and activities in the community. Observation schedule Date: _____ Time: _____ Place: _____ Element / How are people affected / How are activities affected							Navigate digital content on the internet and other storage devices. Create and format document Observing and collecting data	Observation schedule includes names of places and how different elements of weather affect people and activities
Visit websites selected by the teacher or read handouts on types of rainfall. Examine diagrams or view animations showing the occurrence of Relief Rainfall and Convectional Rainfall. Write a series of short sentences explaining the occurrence of each type of rainfall.							Manipulate electronic content Sequencing events	Series of sentences showing clear understanding of how Relief Rainfall and Convectional Rainfall occur
Use various resources to find out about incidences of flooding, drought, storms and hurricanes. Collect pictures and make a scrapbook showing the effects of floods, droughts and hurricanes. Select one of these hazards and explain what causes it and its effect on people and the							Conducting research	Scrapbooks include organised pictures and information showing the effects of floods, droughts and hurricanes

environment. Suggest ways to reduce the impact of the hazard on humans.	Devising strategies	
Select a community that has been affected by a hurricane, flood or drought, and then formulate questions that they can ask residents in order to find out how they have been affected by the hazard(s). Students may also take pictures showing the impact of the hazard on the community. They may then devise plans to reduce further impact of the hazard on the community. The information gathered by students may be displayed in the class or in the school. Make pamphlets explaining how a family should prepare for and cope with one of the hazards. Be sure to describe actions to be taken before, during, and after the event. Students can use desktop publishing software to create pamphlets	Planning Organising information	Display on the effects of a selected/particular hazard on a community. Mounted in class or on school compound. Design/make pamphlets suggesting what should be done by family members before, during and after a selected hazard.
Learning Outcomes **Students will be able to:** ✓ State the meaning of terms and concepts and use them correctly in given situations ✓ Tell the differences between weather and climate ✓ Use geometric shapes to make symbols that describe weather conditions ✓ Use weather data to make simple weather predictions ✓ Identify weather conditions and categorize the impact of weather conditions on human and their social and economic activities ✓ Write simple explanations of how relief and convectional rainfall occurs ✓ Name natural disasters associated with weather ✓ Write simple descriptions and comparisons of the impact of weather related hazards on given areas ✓ Use well -reasoned arguments to explain the difference in impact of weather related hazards on any two areas ✓ Propose workable strategies to prepare for and cope with weather related hazards		

Points to Note	Extended Learning
• Weather conditions must be recorded daily in a log for one or two weeks • Carefully monitor students during activities. Remind students to: • Recognise some of the dangers associated with internet use and demonstrate safe online behaviours. • Follow guidelines to promote healthy use of ICT tools	Carry out research on the areas of solar and wind energy in Jamaica. Obtain information from sources such as JPSCO, Scientific Research Council and Munro College. Talk to some older persons in their community to find out if they remember any disasters caused by varying weather patterns in the last 40-50 years. Check the newspapers in the library to see if they can get additional information Use the information gathered to complete a timeline. Write the kind of disaster above the line, and the year and month it happened below the line
Resources **http://www.metservice.gov.jm/climate.asp?id=3** **http://www.weatherwizkids.com/weather-experiments.htm** Newspaper articles Diagrams/pictures showing aspects of Jamaican Climate Atlas Maps Pamphlets Photographs Computer, ,Internet, CD's	**Key Vocabulary** Weather Hurricane Cloud Cover Cold Front Precipitation Meteorologist Hazard Rainfall Storm Drought Wind Sunshine Relief Rainfall Convection Rainfall
Links to other subject areas: Science ,Mathematics, Language Arts, Visual Arts	

About the Unit

In this Unit, students will explore the elements of the Solar System. They will investigate the importance of the Sun to the system and examine the planets, especially planet Earth's unique ability to support life. They will develop creative and critical thinking skills through the making of scale models and developing stories based on the Solar System. Students will also contemplate how human actions are affecting Earth's ability to support life.

Prior Learning

Check that students:

- Know that Earth is a planet

UNITS OF WORK GRADE 5 TERM 3 Unit 2 (2 Weeks)

Focus Question: What are the features of the Solar System?	
Attainment Target 1: Understand the processes and forces that have influenced the physical and built environment **THEME:** The physical environment and its impact on human activities	**Objectives:** • Define and use correctly the following concepts: solar, planet, satellite/ moon, star, asteroid, meteor, meteorite, comet, orbit, galaxy, universe, system. • Describe the features of the Solar System • Use various sources to examine the characteristics of planets and classify them according to their characteristics • Arrange planets according to their size and distance from the Sun • Differentiate between moons and stars, meteors and meteorites • Compare the characteristics of planet Earth with the other planets in the Solar System and justify why planet Earth is able to support life • Examine multiple sources, gather evidence and use it to develop logical arguments which show how man's activities affect Earth's ability to support life • Discuss the importance of the Sun to the Solar System

	• Participate in making rules to govern collaborative activity and adhere to these rules
ICT Attainment Targets: 💻 **COMMUNICATION AND COLLABORATION** - use technology to communicate ideas and information, and work collaboratively to support individual needs and contribute to the learning of others. 💻 **RESEARCH, CRITICAL THINKING AND DECISION MAKING**- use digital tools to design and develop creative products to demonstrate their learning and understanding of basic technology operations. 💻 **DESIGNING AND PRODUCING** – use appropriate digital tools and resources to plan and conduct research, aid critical thinking, manage projects, solve problems and make informed decisions. 💻 **DIGITAL CITIZENSHIP**- recognise the human, ethical, social, cultural and legal issues and implications surrounding the use of technology and practice online safety and ethical behaviour.	

SUGGESTED TEACHING AND LEARNING ACTIVITIES **Students will:**	**KEY SKILLS**	**ASSESSMENT CRITERIA**
View online/offline presentation on the Solar System. Then create a story or comic strip using the Solar System as the setting. The story or comic strip should; o Demonstrate their knowledge and understanding of the various features of the Solar System. o Show the importance of the Sun to the Solar System o Show the impact of man's activities on Earth's ability to support life o Use an animation software to create story or comic strip	Creative and imaginative thinking	Story or comic strip should demonstrate students' knowledge and understanding of the features of the Solar System, importance of the Sun and Earth's unique ability to support life.

SUGGESTED TEACHING AND LEARNING ACTIVITIES **Students will:**	KEY SKILLS	ASSESSMENT CRITERIA
View a picture /video of the entry of a meteor into Earth's atmosphere. Engage in discussion on "meteors". Use a dictionary/glossary to find the meaning and distinguish between moon and stars, meteor and meteorite, comet and asteroid. In groups, use online or offline sources to research one of the following concepts: planet, moon, stars asteroid, meteor, meteoroid, comet, and orbit. Use information to compile a fact sheet and present findings to the class.	Differentiating	Fact sheet created should provide correct information on the features of the Solar System. Differences between features should be clear
Participate in a Mr and Miss Universe competition. Students will be placed in groups and each group will conduct research on a planet, comets, satellites, asteroids or meteors. The group will then select one member to represent the group in the finals. Each group will prepare questions for the contestants. Contestants will parade give a brief description of their planet, comet, asteroid, satellite or meteor. The class will develop a rubric for judging the contest. Use information gleaned from the contest and resource materials to complete a table on planets in the Solar System (distance from the Sun, number of moons, length of year, and length of day, diameter (size of planets).	Asking factual and exploratory questions Organise information	Questions must be clear and require factual responses or further exploration Table on planets completed with correct distances, number of moons, diameter, length of day and year.
Work in collaborative groups to create a model of the Solar System to show the composition and relative positions of the planets in relation to the sun. The model must be done to scale. The link below will help you to scale your model. http://www.exploratorium.edu/ronh/solar_system/ View online simulation of the Solar System and do quizzes for reinforcement.	Navigate digital content on websites and storage devices Applying mathematical concepts and principles Work cooperatively to complete ICT task	Model of the Solar System must have the Sun and planets in proportion to their actual sizes

SUGGESTED TEACHING AND LEARNING ACTIVITIES **Students will:**	KEY SKILLS	ASSESSMENT CRITERIA
Learning Outcomes Students will be able to: ✓ Give a brief description of the main components of the Solar System ✓ Write accurate definitions of key terms ✓ Use concepts correctly in given situations ✓ Clearly distinguish between moons and stars, asteroid and comets, meteor and meteorite ✓ Identify the planets and describe their characteristics ✓ Give clear explanation of the importance of the Sun to the Solar System ✓ Develop logical arguments to explain why Earth is able to support life ✓ Work collaboratively to share a range of ICTs within groups to complete task on features of the solar system		

Points to Note	Extended Learning
• Teachers must recap the aspects of Solar System taught in Grade 4 and build on previous learning. • Teacher must make a picture or a prototype of the model of the Solar System before asking students to make the model. This will help to guide students in making their model. • Students must understand mathematical concepts such as diameter and circumference and know how to use a ruler and tape measure. Remind students to: • Recognise some of the dangers associated with internet use and demonstrate safe online behaviours. • Follow guidelines to promote healthy use of ICT tools	Parent(s)/guardian(s)/other family members can assist children to find articles/news stories that relate to the Solar System. They should take these to class and share information with their classmates. Articles may be posted on the class notice board. Students should find cartoons/movies that are set in the Solar System and make connections with what they have learnt. They should name the cartoon or movie and compare the information to what they have learnt about the Solar System. They should also note new information.
Resources: Charts/diagrams of the Solar System, dictionary, video clips, pictures of planets, moons and stars, word cards, hand outs	**Key vocabulary** planet, moon, stars, asteroid, meteor, meteorite, comet, orbit, galaxy, universe, Solar, system.

Links to other subject areas: Science, Mathematics, Language Arts, Visual Arts	

About the Unit

In this Unit, students will know that plants are important to the survival of humans and the environment and that plants contribute significantly to the economy. They will become familiar with the location of forests and wetlands in Jamaica, Guyana, Trinidad and St. Lucia. Students will be encouraged to show an appreciation for all plants. They will be sensitized to the problems in the environment, caused by unsustainable human activities. Students will be involved in creative, critical and reflective thinking activities in order to develop respect for the environment.

Prior Learning

Check that students:

- Can state some uses of plants

UNIT OF WORK GRADE 5 TERM 3 Unit 3 (3 weeks)

Focus Question : Why are plants important to humans and the environment?	
Attainment Target 2: Develop an understanding of the interdependent relationship between humans and their environment. **THEME**: Diversity, interdependence and sustainability in nature and society	**Objectives:** • Define and use correctly the following concepts: plants, natural environment, interdependence, habitat, wetlands, forest/woodland, deforestation , reforestation • Examine various sources in order to describe different types of habitats (wetland, forest/woodland) • Use the map key to locate wetlands and forests on a map of Jamaica • Examine maps and identify forests and wetlands and describe their location relative to other natural and man-made features in selected Caribbean territories • Describe the uses/importance of wetlands and forests to humans and the environment and then use the information gathered to justify the conservation of these habitats • Examine multiple sources and draw conclusions about the negative impact of human activities on forests and wetlands • Propose solutions to reduce the negative impact of human activities on forests and wetlands

	• Demonstrate respect and show sensitivity for the environment • Contribute ideas to assigned collaborative tasks and show respect for the contribution of group members
▪ **ICT Attainment Targets: COMMUNICATION AND COLLABORATION** - Use technology to communicate ideas and information, and work collaboratively to support individual needs and contribute to the learning of others. ▪ **RESEARCH, CRITICAL THINKING AND DECISION MAKING**- Use digital tools to design and develop creative products to demonstrate their learning and understanding of basic technology operations. ▪ **DESIGNING AND PRODUCING –** Use appropriate digital tools and resources to plan and conduct research, aid critical thinking, manage projects, solve problems and make informed decisions. ▪ **DIGITAL CITIZENSHIP**- Recognise the human, ethical, social, cultural and legal issues and implications surrounding the use of technology and practice online safety and ethical behaviour.	

SUGGESTED TEACHING AND LEARNING ACTIVITIES **Students will:**	**KEY SKILLS**	**ASSESSMENT CRITERIA**
Use pictures/drawings and words to demonstrate their understanding of the following: plants, habitat, forest, wetland, deforestation, reforestation	Using concepts in the appropriate context	Creatively organised booklet or set of flashcards with information and pictures
View video presentation/teacher-created presentation about forests and wetlands and discuss the attributes of each or participate in a field trip to a forest or wetland. Students will take pictures and complete a field guide. They will work in collaborative groups to collate the	Observing for information Reporting	Simple field report with pictures and description of habitat

SUGGESTED TEACHING AND LEARNING ACTIVITIES **Students will:**	KEY SKILLS	ASSESSMENT CRITERIA
information and make presentation to class. Students can also use image capturing device to take pictures and use them to create a digital story for class presentation		
Use an atlas/online map to name and locate areas (parishes) in Jamaica and selected Caribbean territories where forests and wetlands are located. Use logical arguments to explain location forests and wetlands.	Map reading Reasoning	Map of Jamaica and selected Caribbean territories (Guyana, St. Lucia, Trinidad) showing wetlands and forests
Create a journal of pictures/drawings, samples (plants, leaves, paper, wood, fabric etc.) on the general and specific uses/importance of plants e.g., absorbing CO2, providing food, medicine, and habitat. The journal must include a reflective piece – song/poem/story/composition demonstrating their "new found" appreciation for plants	Collecting and organising information Creative writing	Journal creatively organised with pictures/drawings, song, poem or story, samples and reflective piece about plants.
Collect information from a variety of sources and then create individual posters and/or drama pieces about strategies/simple solutions to reduce the negative impact of human activities on plants.	Capture images, audio and video with a digital camera or other image capturing devices Gathering relevant information Problem solving	A poster or drama presentation depicting solutions/strategies to reduce the impact of negative activities
Establish a green area or set up container gardening on the school compound. Students will discuss the type of plants to be used. Plants should be selected based on need, cost, and availability. Students will decide on the location, shape and size of the garden plot or containers. They will purchase or acquire seeds, suckers or cuttings. Students will take turns caring for the garden. Use simple technology and organic farming practices to assist with the maintenance of the garden.	Applying mathematical principles and concepts	Green area or garden established and/or maintained by students. Two factors considered in determining location stated, size in area and perimeter

SUGGESTED TEACHING AND LEARNING ACTIVITIES **Students will:**	KEY SKILLS	ASSESSMENT CRITERIA
		stated, (volume if containers are used), reason for plants selected stated.
Conduct a simple case study (250-300 words) on "Deforestation in Haiti" or a selected community in Jamaica. The case study should include: i. the causes and effects of deforestation. ii. a reflective piece (one paragraph) on the lessons that they have learnt about deforestation **iii.** pictures to enhance presentation.	Conducting research Reflective and critical thinking	Case study on "Deforestation in Haiti" or a selected community in Jamaica identifies causes, one lesson learnt, at least two pictures

Learning Outcomes

Students will be able to:

- ✓ Give accurate meaning of key concepts
- ✓ Differentiate between of a forest/woodland and a wetland
- ✓ Demonstrate through action respect and sensitivity for the environment
- ✓ Demonstrate through oral, written and practical means a clear understanding and appreciation for the uses and importance of plants to the environment and humans
- ✓ Use creative means to present simple workable strategies/solutions to minimize the effects of undesirable human activities

Use ICT tools effectively to capture habitats and plants images and create digital story

Points to Note	Extended Learning
• Teachers should not ask students to draw a map of Jamaica or selected Caribbean territories. Students may be asked complete a printed map by inserting the names of wetlands and forests. • Teachers must provide students with a field guide whenever students are taken on a field trip	Parents / Guardians can assist students to explore the habitat/s of plants at home or in the community. Students should be encouraged to set up or care for a green area at home or in the community. They may enter their activities and feelings in their personal class journal.

• The case study must be the students' own work. The language used must reflect the age, grade level and ability of the students. Remind students to: • Recognise some of the dangers associated with internet use and demonstrate safe online behaviours. • Follow guidelines to promote healthy use of ICT tools	
Resources: Forestry Department, Hope Gardens, Castle Gardens, Bath Botanical Gardens, Hollywell, Camera or other image capturing device Computer Multimedia projector	**Key vocabulary:** habitat, forest, , wetland, deforestation, plant, natural environment
Links to other subjects: Civics, Language Arts, Science, Art, Drama.	

About the Unit

In this Unit, students will examine how some human activities negatively affect the environment. They will examine how improper disposal of waste negatively impacts our water bodies and land. They will observe and assess best practices in waste management. Students will appreciate and implement the "Reduce, Recycle, and Reuse practices". In carrying out their activities they will use critical thinking and decision-making skills to determine the causes and effects of water and land pollution.

Prior Learning

Check that students:

- Are able to outline how household garbage should be stored, if not readily disposed of
- Are aware of recycling and reusing materials

UNITS OF WORK GRADE 5 TERM 3 Unit 4 (2 weeks)

Focus Question: How do some human activities negatively affect the environment?

Attainment Target 2:

Develop an understanding of the interdependent relationship between humans and their environment

THEME: Diversity, interdependence and sustainability in nature and society

ICT Attainment Targets:

- **COMMUNICATION AND COLLABORATION** - Use technology to communicate ideas and information, and work collaboratively to support individual needs and contribute to the learning of others.
- **RESEARCH, CRITICAL THINKING AND DECISION MAKING**- Use digital tools to design and develop creative products to demonstrate their learning and understanding of basic technology operations.

Objectives:

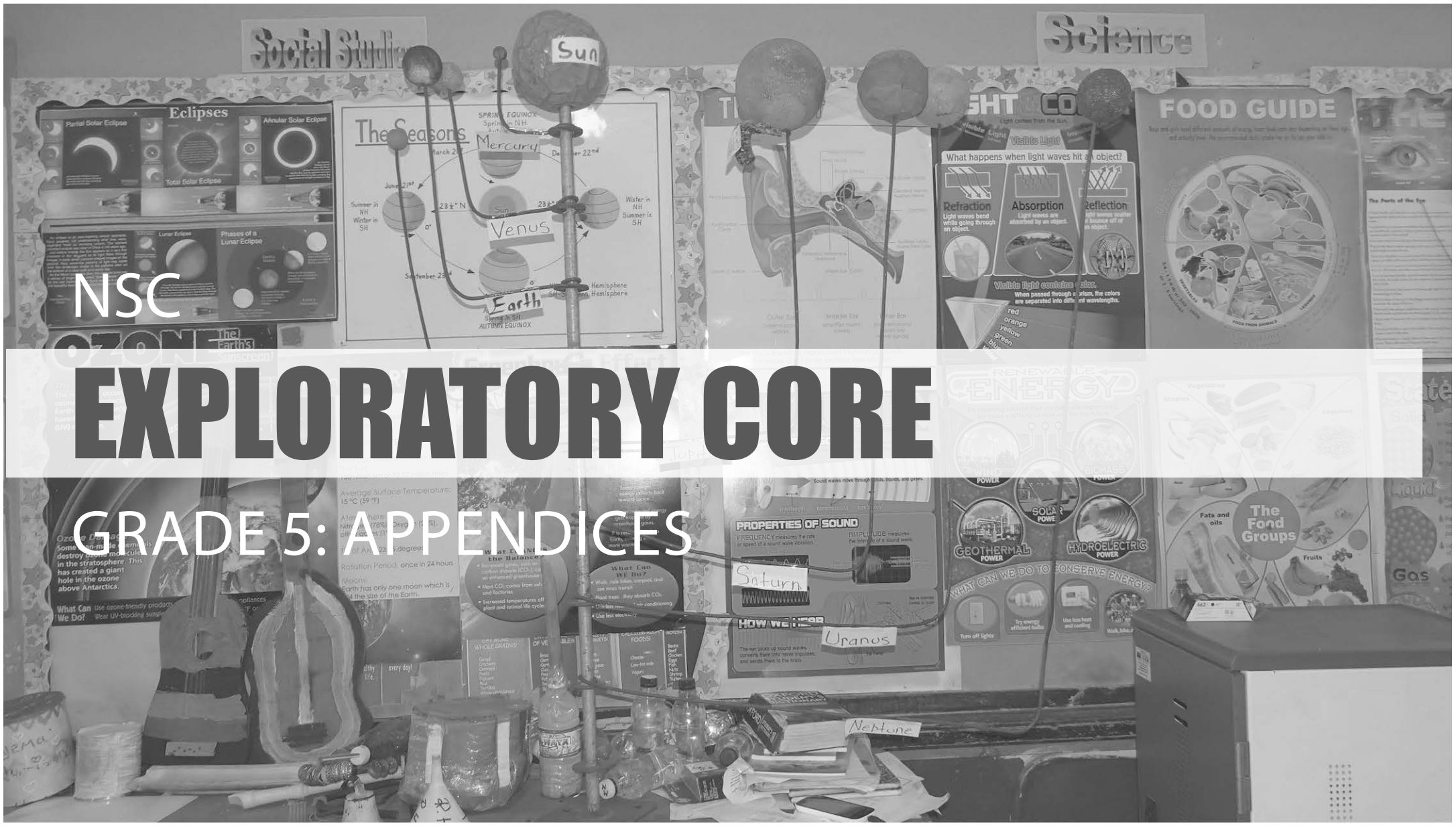
- Define and use correctly the following concepts: pollution, pollutant , pollute, waste/garbage disposal , reduce, recycle, reuse , resources, waste management
- List the uses of water and draw conclusions about its importance to humans
- Examine multiple sources to identify and explain the causes of water pollution
- Examine different water bodies to identify evidence of pollution and determine the ways in which pollution affects living things and human activities
- Design methods to reduce water pollution
- Demonstrate willingness to keep waste at a minimum and dispose of it in ways that are least harmful to the environment.

☐ **DESIGNING AND PRODUCING –** Use appropriate digital tools and resources to plan and conduct research, aid critical thinking, manage projects, solve problems and make informed decisions. ☐ **DIGITAL CITIZENSHIP**- Recognise the human, ethical, social, cultural and legal issues and implications surrounding the use of technology and practice online safety and ethical behaviour.		
SUGGESTED TEACHING AND LEARNING ACTIVITIES **Students will:**	**KEY SKILLS**	**ASSESSMENT CRITERIA**
Brainstorm to identify various types of waste and the areas where these are generated (e.g. kitchen, canteen classroom, human, industrial and vehicular). Use KWL chart to organise students' responses. Engage in discussion to define the concepts: waste, disposal, water pollution, resources. Write a definition of each concept and give an example of each in notebook.	Developing concepts Organising ideas	Types and sources of waste identified Definitions written correctly Information organised in KWL chart
Observe the school compound/community in small groups to see what people do with waste and: (a) Discuss the types of waste seen and the methods of disposal used. (b) Tabulate findings of various areas of the school compound/community in relation to methods of waste disposal and appearance (cleanliness, smell, beauty). (c) Write a paragraph highlighting what could happen to waste and the challenges of waste disposal if the number of pupils in the school was doubled. (d) Suggest ways to manage waste on the school compound and in the school community.	Observing for details Recording observations	Information organised in a table Paragraph with evidence of waste disposal challenges and solutions
Conduct online/offline research to identify some sources which contribute to water pollution. (Factories, farming, sewage etc.). Use graphic organisers to demonstrate how these pollute water bodies and identify how they affect humans (health, tourism, etc.) and marine/aquatic life.	Thinking critically Problem solving Writing reports	Graphic organisers show at least three sources of water pollution and one potential effect of each

In small groups, conduct a research by interviewing workers/owners in the hotel, factory or farm, with the aim of documenting best practices of waste disposal. Each group will be responsible for one of the sectors: agriculture, manufacturing, tourism. Use recording device to capture interview to assist with documentation. a. Write a report and make drawings or take pictures of the waste products identified and say how they are reused or disposed of. b. Consider and discuss what would happen to waste disposal, if the factory doubled production or the hotel had double the number of occupants staying there. Summarize the discussion.		Report on field visit is at least one page long and includes at least one drawing or picture showing how waste is reused or disposed of and at least a paragraph on what would happen if wasted doubled.
Conduct research on fertilizers and pesticides which are classified as toxic waste. With the teacher's help dramatize a scenario where a farmer sprayed his cabbage with pesticide and it rained heavily. This pesticide is washed into the river then flows into the sea. State how the pesticide may affect humans and living organisms in the river and sea. Record these answers. Discuss the effects of domestic activities on water bodies. Write sentences or make drawings about domestic activities and effects on the water bodies. Do online interactive activities on water pollution to enhance and expand learning	Conducting research Reporting Capture images, audio and video with a digital camera or other image capturing devices Demonstrating cause and effect relationships Making deductions Navigate digital content	Dramatization of unintentional pollution shows source of pollution and at least one effect on humans and or other living things Recorded answers show understanding of concepts learnt. At least four sentences or four drawings showing domestic activities and effects on water bodies
Learning Outcomes Students will be able to: ✓ State some substances which pollute the water		

- ✓ Evaluate the effects of waste on water
- ✓ Sensitize their peers on the impact of water pollution
- ✓ Design workable waste management strategies
- ✓ Practise and promote proper waste management
- ✓ Assess the impact of water pollution on humans
- ✓ Use ICT tools effectively to complete tasks on the types of pollution

Points to Note	**Extended Learning**
• Resource persons may be used to outline best practices currently used in different sectors. • Remind and encourage students to utilize designated areas/receptacles for specific garbage collection. Remind students to: • Recognise some of the dangers associated with internet use and demonstrate safe online behaviours. • Follow guidelines to promote healthy use of ICT tools	Investigate ways in which they can minimize/prevent pollution in their communities. Establish or join an environmental club in their school or community. They can then assist the club in identifying and undertaking environmental projects
Resources Cartridge Paper Scissors Markers/Crayons Maps Magazine Pictures Newspaper clippings YouTube – Waste Management and Recycling Computer Camera Internet Digital drawing tools	**Key vocabulary** Pollution, pollutant**,** water pollution**,** land pollution**,** waste disposal**,** resources Pesticide, waste management
Links to other subjects: Civics, Language Arts, Science	



NSC

EXPLORATORY CORE

GRADE 5: APPENDICES

PERSPECTIVES OF SCIENCE, TECHNOLOGY, ENGINEERING, MATHEMATICS & THE AESTHETICS (STEM/STEAM) IN RELATION TO THE NATIONAL STANDARD CURRICULUM (NSC)

INTRODUCTION & BACKGROUND

The integration of theoretical principles that relate to STEM/STEAM Education in the NSC began in June 2014. This move was influenced by recommendations of the STEM Steering Committee that emphasized the need to develop learners who are not just productive, but who would also be innovative Jamaicans. STEM integration was also regarded as one of the strategic long term means of addressing the economic challenges being faced by Jamaica using education as a primary vehicle for the implied transformational change to happen, beginning from short term efforts.

Initial discussions and deliberations promoted an emphasis on STEM rather than STEAM Education. However, critical analysis of the conversations conveyed the perspective of STEM as a collection of related disciplines that all learners should have the opportunity of pursuing, to develop the competencies they offer and as a consequence be able to gain employment or become employers in STEM related areas. As stakeholders from different backgrounds processed their understanding of STEM, new meanings of the concept emerged from the discussions. One was the perspective of STEM as a methodology. There was, however, concern about the exclusion of “A” in STEM. This “A” component however, brought to the discussion, multiple meanings. In some Aesthetics as a field and was considered an important component to be included if educators are serious about issues of discrimination, holistic learning and current research on the iterative function of the brain that warrants attention to brain based learning and the role of the Arts in promoting knowledge integration to cater to multiple domains of learning. There was also discontent about neglecting the Performing Arts when related creative industries contribute significantly to economic development. The concern was that the role of the Arts to economic development was being trivialized.

The call for the integration of the Aesthetics or Art forms became more pronounced as STEM took on more national significance. This was supported by research that indicates the importance of the Aesthetics in developing values and attitudes, in promoting holistic learning and in serving as drivers of innovations. By integrating principles from STEM with those from the Arts/Aesthetics, the approach to problem solving would encourage greater appreciation for and reliance on the interdependent nature of knowledge when science and arts intersect. Additionally, STEAM as a methodology encourages the harmonizing of the cognitive and the emotional domains in the problem-solving process.

The concept of STEAM was adopted in 2015, as an integrative approach to education and a methodology that pays attention to the benefits to be derived from the inclusion of the Arts or Aesthetics with STEM related principles. These collective benefits are supported by Jolly (2014), Sousa and Pilecki (2013) and include divergent thinking; differentiated learning; Arts integration; focus on intrinsic motivation and informed decision-making.

PERSPECTIVES OF STEM/STEAM IN THE CONTEXT OF THE NSC

In the context of the NSC, STEM/STEAM is used in a number of ways. These include:

STEM/STEAM as an integrative learning approach and methodology in facilitating learning. This perspective places emphasis on STEM/STEAM as a means of helping learners become creative or innovative problem solvers and lifelong learners who rely on scientific principles (laws and theories) to address issues/concerns or to deal with observed phenomenon that are puzzling for them or that inspire interest. As an approach, the focus is on solving problems based on principles. As methodology, the focus is on the system of practical procedures to be used to translate principles into the problem - solving processes or to choose from available problem- solving models.

STEM/STEAM as an Experiential-Vocational Learning Framework that is based on problem solving through the project-based approach. Emphasis is placed on solving real life problems in a context that requires learners and their facilitators to observe work-based principles. The primary purpose for this focus is for learners to: (i) become employable (ii) prepare for further education and/or for occupational or work readiness.

STEM as types of institutions in which learning is organized as a meta-discipline as described by Morrison and Bartlet (2009). Based on this perspective, STEM facilitates the demonstration of knowledge in a manner that removes the boundaries of each discipline for application to problem as would be practised in the real world.

IMPLICATIONS OF PERSPECTIVES OF STEM/STEAM IN LIGHT OF THE NSC

Since the NSC is based on Constructivism principles, STEM/STEAM as an approach and methodology, has to be established on post-positivistic thinking. From this position, STEM/STEAM influences the kind of practice that promotes collaboration, negotiation of meaning and openness to scrutiny.

The NSC developers selected a Constructivist approach that included the deliberation, designing and development stages of the curriculum process. Evidence of the influence of Constructivism can be seen the NSC Framework Document that conveys the following emphasis:

(i) The element of objectives is presented in two forms; firstly as Learning Objectives to focus attention on process and experience rather than product. Secondly as Learning Outcomes that serve as some of the outputs of the process. They include the basic understandings, skills and dispositions anticipated from learners' engagement in the planned experiences.

(ii) The element of content is treated as contexts for learners to think critically, solve problems creatively while developing their identity as Jamaicans. Content is not expected to be treated as disciplines to be mastered but as areas that contribute knowledge, skill sets and attitudes that form the composite of competencies to be acquired from their integration in the learning situations.

(iii) The element of learning experiences (method) is presented as a set of learning activities that serves as a source of problems to be addressed as a part of the learning process. These real-life activities provide the scope of knowledge, skills and required dispositions or character traits for learners to make sense of that aspect of life or the world that they represent. They are the threads that connect all the other elements of the curriculum and allow for the integration of STEM/STEAM in the following ways:

- Identification of activities that are presented as problems to be solved using the STEM/STEAM approach based on contextual factors that include the profile of the learner, the learning conditions and the anticipated impact.
- Integrating activities to form a real problem to be solved as a short, medium or long term project to which the project based learning would be applied.
- The examination of learning activities by learners and teachers as co-learners through multiplelenses using content of science, technology, mathematics and the humanities that they have already explored to engage in the problem identification and definition processes.
- Extending learning in the formal setting to the informal by connecting co-curricular initiatives that are STEM/STEAM based that learners are undertaking at the institutional level through clubs and societies, as whole school projects or in partner ship with external stakeholders.
- Using the learning activities to review STEM/STEAM initiatives that form a part of the informal curriculum to and for reflection on action.

- Using activities as springboards for reflecting on career or occupational interest in STEM/STEAM related areas.

(iv) The element of evaluation is communicated in two major ways; firstly as prior learning which serves diagnostic purpose and secondly as an on-going developmental process. This formative focus is indicated by the inclusion of explicitly stated assessment criteria that are to be used alongside the learning activities. The use of assessment criteria as counterparts of the learning activities also indicates that assessment is learner centred since it is serving developmental rather than promotional purpose and as a consequence, allows learners to self-correct as they use feedback to develop feed-forward capabilities. Evidence of learning, based on the learning outcomes, can be collected from various types of assessment methods that emphasize the learner centred constructivist orientation. This brings to the fore the need for serious consideration to be given to differentiation in assessment for fairness and credibility of claims about learners' capabilities and to inform decisions that will impact their educational journey.

In general, this integrated approach, which is the context of STEAM, is aimed at improving the quality of the educational experience for learners while influencing the achievement of the aims of education that relate to productivity and creativity as part of the profile of the Jamaican learner.

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The 5Es Overview: “The 5E Learning Cycle”

What is a 5E Learning Cycle?

This model describes an approach for facilitating learning that can be used for entire programmes, specific units and individual lessons. The NSC supports the 5E constructivist learning cycle, as it places emphasis on the processes that may be used to help students to be personally involved in the learning situation as they are guided to build their own understandings from experiences and new ideas.

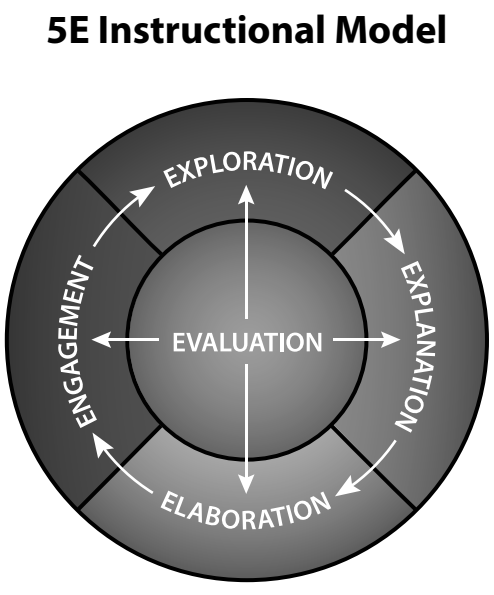

Figure 1. Illustrating one version of the 5E model that conveys the role of valuation as an interconnecting process that is at the core of the learning experience.

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Figure 2, illustrating a cyclical perspective of the model with each process being given similar emphasis in contributing to the learning experience on a whole.

EXPLANATION OF THE INSTRUCTIONAL MODEL

What are the 5Es?
The 5Es represent five key interrelated processes that provide the kind of learning experiences for learners to experience the curriculum or planned learning episodes: Engage, Explore, Explain, Extend (or Elaborate), and **Evaluate**.

ENGAGE: The purpose of the ENGAGEMENT dimension is to help students to be ready intellectually, socially, emotionally etc. for the session. Attention is given to the students' interests and to getting them personally involved in the lesson, while pre-assessing prior understandings, attitudes and/or skills. During the experience, students first encounter and identify the instructional task and their roles and responsibilities. During the ENGAGEMENT activity, students make connections between past and present learning experiences, setting the organizational groundwork for upcoming activities. The engagement activity may be used to (a) help student unearth prior knowledge (b) arouse their curiosity (c) encourage students to ask questions as a sign that they have wonderments or are puzzled.

EXPLORE: The purpose of the EXPLORATION dimension is to get students involved in solving a real problem that is based on a selected context. EXPLORATION provides them with a chance to build their own understanding of the phenomenon being investigated and the attitude and skills involved for arriving at a workable solution. In exploring the students have the opportunity to get directly involved with the phenomenon and materials. As they work together in learning teams or independently, the need to share and communicate becomes necessary from the experiences. The teacher functions as a facilitator, providing materials, guarding against obstacles to learning and guiding the students to operate based on agreements. The students become inquirers and co-owners of the learning process. In exploring, they also ask questions, formulate hypothesis, search for answers or information/ data, reflect with others, test their own predictions and draw conclusions.

EXPLAIN: The purpose of the EXPLANATORY dimension is to provide students with an opportunity to assess their thinking and to use intellectual standards as critical thinkers to communicate their perspectives and/or the meaning of the experiences. They rely on communication tools and their skills as Language users to: (a) organize their thoughts so that they are clear, relevant, significant, fair, accurate etc. (b) validate or affirm others (c) self-motivate. Reflection also occurs during the process and may cause students to adjust their perspective or justify their claims and summarise the lessons being learned. Providing explanations contributes to vocabulary building and self-corrective actions to deal with misconceptions that they become aware of from feedback of their peers and/or their facilitator.

EXTEND: The purpose of this dimension is to allow students to use their new knowledge and continue to explore its significance and implications. Students work independently or with others to expand on the concepts and principles they have learned, make connections to other related concepts and principles within and/or across disciplines, and apply their understandings in new ways to unfamiliar situations.

EVALUATE: The purpose of the EVALUATION dimension is for both students and facilitator to determine progress being made or the extent to which learning has taken place based on the stated objectives or emergent objectives. EVALUATION is treated primarily as an on-going diagnostic and developmental process that allows the learner to become aware of gaps to be treated and progress made from their efforts to acquire the competencies that were the focus of the session. Examples of competencies include understanding of concepts, principles and processes and demonstrating various skills. Evaluation and assessment can occur at different points during the learning episode. Some of the tools that assist in this diagnostic and formative process include rubrics, teacher observation log, self-inventories, peer critique, student interviews, reflective presentations, displays/expositions,

portfolios, performances, project and problem-based learning products. Analysis of reflections, video recordings are useful in helping students to determine the depth of their thinking and understanding and the objectives they have or have not achieved.

Who developed the 5E model?

The Biological Science Curriculum Study (BSCS), a team led by Principal Investigator Roger Bybee, developed the instructional model for constructivism, called the “Five Es”.

The Link between the 5E model and Types of Learning Activities

The five (5) types of Learning Activities purported by Yelon (1996) can be integrated with the 5E’s so as to enrich the teaching and learning process. He noted that every instructional plan should include the following learning activities

1. Motivation Activities: Intended to help learners to be ready for the session
2. Orientation Activities: Inform students of their roles and responsibilities based the purpose or objectives of a learning episode.
3. Information Activities: Allow students to manipulate current knowledge, access/retrieve and generate new ideas
4. Application Activities: Allow for the use of knowledge and skills in novel situations
5. Evaluation Activities: Allow for reflection, corrective actions and sourcing of evidence to confirm/refute claims about learning.

These activities can be planned to serve one of the purposes of each dimension of the 5E model. For example, ENGAGEMENT may be comprised a Motivation Activity and an Orientation Activity. EXPLORATION and EXPLANATION require an Information Activity, while EXTEND requires an Application Activity. EVALUATION requires the kind of activity that will contribute to the collection of data for assessing and arriving at a conclusion about performance based on stated or expected purpose for which learning is being facilitated.

REFERENCES

Meegan, G. (2017). *The Intellectual Standards.* Retrieved from https://theelementsofthought.org/the-intellectual-standards/

The 5 E Model (n.d.). Retrieved from http://tiny.cc/7ogijy

The 5 E Model (n.d.). Retrieved from http://tiny.cc/oogijy

Subject: Science

Grade: 5

Duration: 60 minutes

Resources: Video, pictures, vegetable seeds, water, soil, manure, plastic bottles, bamboo sticks/fudge sticks, wire, string, newspaper, water hyacinth/moss,

Lesson Topic: Food Production Methods

Attainment Target(s)

- Gain an understanding of some life processes in plants and animals, and how lifestyle choices impact health and well-being in humans
- Begin to appreciate the influence and limitations of science with consideration for ethical issues

Benchmarks

- Know that foods are produced in different ways (organic, non-organic and genetically modified)
- Begin to understand the interdependence of living things in the environment
- Display curiosity, objectivity and perseverance in their approach to activities

Objectives

By the end of the lesson students should be able to:

- Investigate different methods of growing food
- Compare traditional and modern food production methods
- Draw conclusions from results of investigations on different food production methods

Key Skills

Gather data, collaborate, communicate, manipulate, observe, investigate, infer, create

Key Vocabulary
organic, non-organic food, traditional and non-traditional farming, chemical, manure, food production

Content Outline: [*Brief notes on main points/concepts*]
Foods from animals and plants can be grown using both organic and non-organic methods. Organic methods do not involve the use of chemicals while non-organic methods use fertilizers and pesticides. Vertical farms, hydroponics, aquaponics and green houses are some of the methods used..

Prior Learning
Check that students can:
Identify examples of animals and plants used for food

Learning Outcome:
Students who demonstrate understanding can:
- Identify different food production methods
- Cite differences between traditional and modern food production methods
- Suggest solutions to identified food problems

Assessment Criteria:
- Presentation contains accurate information
- Designs are innovative and make use of everyday materials

Teaching Procedure

ENGAGE

How can I get students interested in this? **Use of an interesting picture, video, story etc. (5 min)**
- Students will be shown a video or a series of pictures on flooded and drought areas and asked to suggest what is happening and the problems that may arise. Food shortage will be identified as a possible problem that may arise. Students will discuss solutions to the world food problem. The need for different food production methods will be stressed.

EXPLORE

What tasks/questions can I offer to help students puzzle through this? **Use of a simple investigation. (10 min)**

- The traditional methods used by farmers to produce food from plants and animals will be listed. Students will research ways of growing food that differ from traditional methods of farming (using pictures or video clips).
- In groups, students will provide answers to the following questions:
  1. How were the foods grown in the video or pictures?
  2. Give examples of the foods grown.
  3. What are the names of the different methods explored?
  4. What are the advantages and disadvantages of these non-traditional methods?
  5. Can the methods be grouped as organic or inorganic?

Colour-coded tasks cards with different activities will be provided to each group.

EXPLAIN

How can I help students make sense of their observations? **Class presentation and discussions. (10 min)**

- Students will report on one or more of the identified methods (vertical farms, hydroponics, aquaponics, green houses etc.) based on colour-coded task cards. Yellow group – take or draw pictures of the varied food production methods and write a few sentences explaining the method. Green group – write lyrics to a tune of your choice about the different food production methods. Pink group – Present arguments supporting the use of traditional or other non-traditional methods over the other. Each group will answer questions posed by the class showing how the method works. Students will complete a table to show the information gathered for each method under the headings: name of method, crops grown, materials used, comparison with traditional method.

ELABORATE

How can my students apply their new knowledge to other situations? **Application of what was learned. (20 min)**

- Students will be given a scenario in which farmers in flood prone regions of Malaysia or Philippines are unable to grow crops using their traditional methods due to excessive flooding (from pictures). Students will discuss possible solutions to this problem with the floating garden identified as one solution. In groups, students will design a model of a floating garden or a greenhouse to increase food production. Instructions for making a floating garden will be provided. Students will choose from the materials provided and record a description of their design. (Materials provided include plastic bottles, organic soil, water, drinking straws, plastic covering, sticks, scissors, vegetable seeds, cow dung/ or compost, water plants, fudge sticks, glue, tape etc). Students

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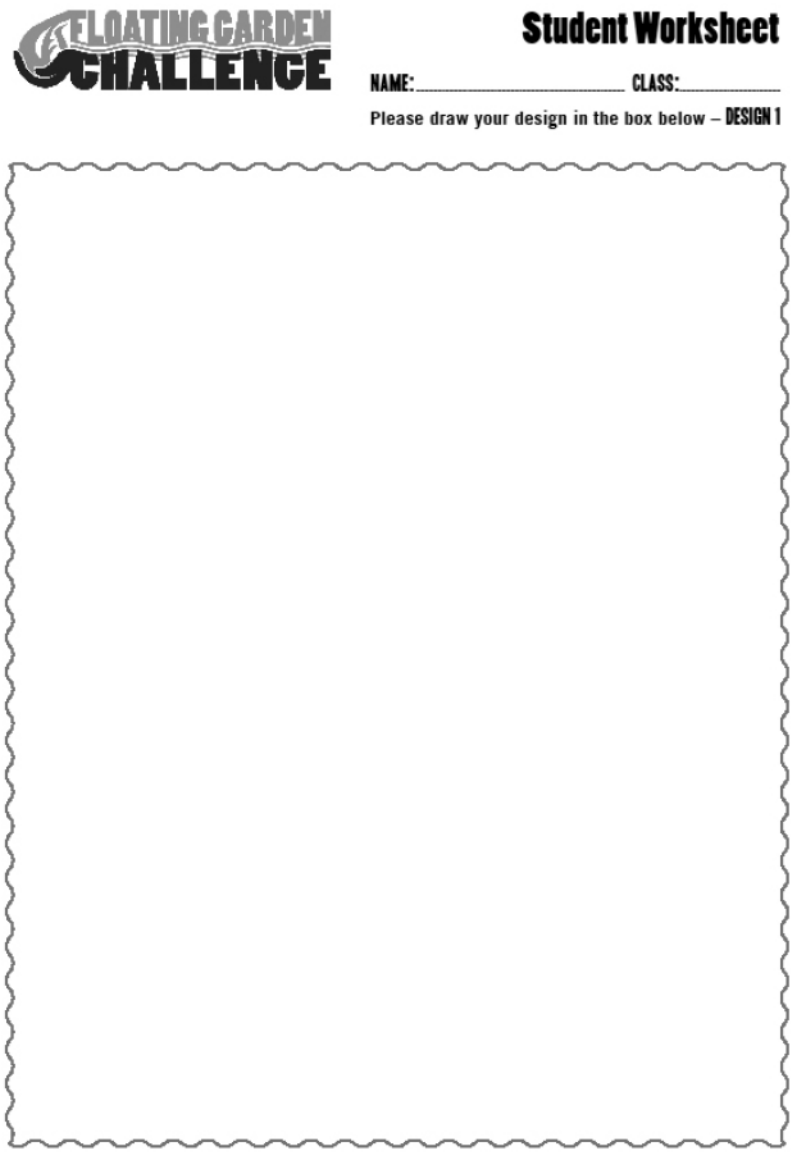
will use Science content on buoyancy (floating materials), Mathematics content on measurements (area and perimeter) and content on designing materials according to specifications (Engineering and technology) to design their floating garden. Students will be guided to use a rectangular design with an area less than 225 cm2.

The following questions will be used to guide the design process:

- From the materials given, which ones can float in water?
- How will the area be determined? What measurements of length and width are needed?
- How much weight can the materials take before they sink?
- How will my soil be able to remain on the float/ raft?
- What will be used to provide nutrients for the seeds/ plants?
- What will determine a successful design?
- The designs presented from each group will be discussed. Students will suggest how their method is expected to work. Improvements for each design will be provided by the class. The designs will be tested using a teacher-prepared rubric.



EVALUATE

How can I help my students self-evaluate and reflect on the teaching and learning, and how can I evaluate the students learning of concepts and skills? **Assessment (15 min)**

- Students will present their designs to the rest of the class for peer-evaluation using the Engineering Design Rubric (to assess design, presentation, collaboration and project completion time).
- Students will self-assess their design and how well it worked by answering questions attached on the Student worksheet.
- An Exit Slip will also check for understanding.

EXTEND LEARNING:

Research the growing of animals such as poultry and fish on a large scale.

LINKS TO OTHER SUBJECTS

Resource and Technology, Social Studies

POST-LESSON REFLECTION

Subject: Language Arts

Grade: 5

Duration: 60 minutes

Theme: Forces and Machines

Language Strand: Research Skills

Language Topic: Information Gathering

Resources: Projector and screen, cartridge papers and markers, graphic organizers, classroom computers (desktop and laptop), offline resources – books, hand-outs etc.

Lesson Topic: Food Production Methods

Language Objectives

By the end of the lesson students should be able to:

- Use online and offline sources to gather information.
- Begin to assume responsibility for specific tasks in the basic research process

Key Skills

- Identify online and offline sources
- Use offline and online sources

Key Vocabulary

organic, non-organic food, traditional and non-traditional farming, chemical, manure, food production

Teaching Procedure

ENGAGE

Students will work in groups to view a clip depicting students of their age group gathering information in a variety of ways. Engage in whole group discussion and share information on the clip; focusing on the different ways the characters gathered information.

EXPLORE

Students will work in groups to view a clip depicting students of their age group gathering information in a variety of ways. Engage

in whole group discussion and share information on the clip; focusing on the different ways the characters gathered information.

EXTEND/ ELABORATE

Use the graphic organizer to classify their information under the headings “Online Sources and Offline Sources”.

EXPLAIN

Students will present their graphic organizers and explain the reasons for their classifications. The rest of the class will agree or disagree with the information presented.

EXPLORE

Choose one source of gathering information (one per group). Then use the source selected to gather information on Simple Machines.

EVALUATE

Individually make a journal entry on what they have learnt about information gathering. Then present information in their journals as directed by the teacher (e.g. read aloud)

ASSESSMENT

1. Participation in group evidently meaningful
2. Information shared highlights at least 3 different ways of gathering information.
3. Strategy poster used to highlight the different ways of gathering information
4. Graphic organizers accurately classified as either Online and Offline sources
5. Information on simple machines reflects correct use of source.
6. Journal entries reflect at least 2 online and 2 offline sources.

POST-LESSON REFLECTION

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