REPUBLIC OF KENYA

MINISTRY OF EDUCATION

UPPER PRIMARY LEVEL DESIGNS

SUBJECT

MATHEMATICS

GRADE 6

KENYA INSTITUTE OF CURRICULUM DEVELOPMENT

JANUARY 2021

First Published in 2021

ISBN:000-0000-00-000-0

Published and printed by Kenya Institute of Curriculum Development

FOREWORD

The Government of Kenya is committed to ensuring that policy objectives for education, training and research meet the aspirations of the Kenya Constitution 2010, the Kenya Vision 2030, the United Nations Sustainable Development Goals (SDGs) and the Regional and Global conventions to which Kenya is a signatory. In relation to this, the Ministry of Education (MoE) embarked on curriculum reforms that culminated in the full implementation of the Competency Based Curriculum (CBC) in January, 2019 from the level of Early Years Education (Pre-Primary 1 and 2, and Lower Primary Grade 1, 2 and 3). This was followed by the roll out of the curriculum in Grade 4 in 2020. In readiness for the progression of the Grade 4 cohort, the curriculum designs for Grade 5 were developed.

Grade 6 designs have now been developed. These curriculum designs are intended to ensure that the core competencies attained by learners at Grade 5 are enhanced even as further opportunities are provided for identification and nurturing of every learner's potential as learners prepare to transit to Junior Secondary school.

The curriculum designs include the general and specific learning outcomes for the learning areas (subjects) as well as strands and sub - strands. The designs also outline suggested learning experiences, key inquiry questions, assessment rubric, pertinent and contemporary issues, values and Community Service Learning (CSL) activities.

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

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PREFACE

The Ministry of Education (MoE) is currently implementing the second phase of the curriculum reforms with the roll out of the Competency Based Curriculum (CBC) at Grade 4 in 2020. This is the first cohort of the Upper Primary level in the new education structure. Grade 5 and 6 designs have also been developed.

Grade 6 being the final stage of the upper primary level is very critical in the realization of the Vision and Mission of the on-going curriculum reforms as enshrined in the Sessional Paper No. I of 2019 whose title is: *Towards Realizing Quality, Relevant and Inclusive Education and Training for Sustainable Development* in Kenya. The Sessional Paper explains the shift from a Content - Focused Curriculum to a focus on **Nurturing every Learner's potential.**

Therefore, the Grade 6 curriculum designs are intended to enhance the learners' development in the CBC core competencies, namely: Communication and Collaboration, Critical Thinking and Problem Solving, Creativity and Imagination, Citizenship, Digital Literacy, Learning to Learn and Self-efficacy.

The curriculum designs also continue to link the activities in the main learning areas to the other aspects of the CBC including links to Pertinent and Contemporary Issues (PCIs), Values and Community Service Learning (CSL). The designs also offer several suggested interactive learning activities and variety of assessment techniques. It is expected that the curriculum designs will guide the teachers to enable learners attain the expected learning outcomes for Grade 6 and prepare them effectively for the next Grade.

It is my expectation that the teacher will use the designs to make learning interesting, exciting and enjoyable.

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ACKNOWLEDGEMENT

The Kenya Institute of Curriculum Development (KICD) Act Number 4 of 2013 (Revised 2018) mandates the Institute to develop curricula and curriculum support materials for basic and tertiary education and training, below the university. The curriculum development process for any level involves thorough research, international benchmarking and robust stakeholder engagement. Through this systematic and consultative process, the KICD conceptualised the Competency Based Curriculum (CBC) as captured in the Basic Education Curriculum Framework (BECF), that responds to the demands of the 21st Century and the aspirations captured in the Kenya Constitution 2010, Kenya and the Kenya Vision 2030, East African Commission Protocol and the United Nations Sustainable Development Goals.

KICD obtains its funding from the Government of Kenya to enable the successful achievement of the stipulated mandate and implantation of the Government and Sector (Ministry of Education (MoE) plans. The Institute also receives support from development partners targeting specific programmes. The Grade 6 curriculum designs have been developed with the support of the World Bank through the Kenya Secondary Education Quality Improvement Program (SEQIP) commissioned by the MoE. Therefore, the Institute is very grateful for the support of the Government of Kenya, through the MoE and the development partners for the policy, resource and logistical support. Specifically, special thanks to the Cabinet Secretary – MoE and the Principal Secretary – State Department of Early Learning and Basic Education,

We also wish to acknowledge the KICD curriculum developers and other staff, all teachers, educators who took part as panelists; the Semi-Autonomous Government Agencies (SAGAs) and representatives of various stakeholders for their various roles in the development of the Grade 6 curriculum designs. In relation to this, we acknowledge the support of the Secretary - Teachers Service Commission (TSC) and the Chief Executive Officer of the Kenya National Examinations Council (KNEC) for their support in the process of developing these designs.

Finally, we are very grateful to the KICD Council Chairperson Dr. Sara Ruto and other members of the Council for very consistent guidance in the process. We assure all teachers, parents and other stakeholders that these curriculum designs will effectively guide the implementation of the CBC at Grade 6 and preparation of learners for Grade 7.

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TABLE OF CONTENTS

FOREWORD.....iii

PREFACE.....iv

ACKNOWLEDGEMENT.....v

TABLE OF CONTENTS.....vii

NATIONAL GOALS OF EDUCATION.....viii

SUGGESTED TIME ALLOCATION.....x

GENERAL LEARNING OUTCOMES FOR MIDDLE SCHOOL.....xi

MATHEMATICS.....1

NATIONAL GOALS OF EDUCATION

1. **Foster nationalism, patriotism, and promote national unity**

   Kenya's people belong to different communities, races and religions and should be able to live and interact as one people. Education should enable the learner acquire a sense of nationhood and patriotism. It should also promote peace and mutual respect for harmonious co-existence.

2. **Promote social, economic, technological and industrial needs for national development**

   Education should prepare the learner to play an effective and productive role in the nation.

   a) **Social Needs**

      Education should instil social and adaptive skills in the learner for effective participation in community and national development.

   b) **Economic Needs**

      Education should prepare a learner with requisite competences that support a modern and independent growing economy. This should translate into high standards of living for every individual.

   c) **Technological and Industrial Needs**

      Education should provide the learner with necessary competences for technological and industrial development in tandem with changing global trends.

3. **Promote individual development and self-fulfilment**

   Education should provide opportunities for the learner to develop to the fullest potential. This includes development of one's interests, talents and character for positive contribution to the society.

4. **Promote sound moral and religious values**

   Education should promote acquisition of national values as enshrined in the Constitution. It should be geared towards developing a self- disciplined and ethical citizen with sound moral and religious values.

5. **Promote social equity and responsibility**

   Education should promote social equity and responsibility. It should provide inclusive and equitable access to quality and differentiated education; including learners with special educational needs and disabilities. Education should also provide the learner with opportunities for shared responsibility and accountability through service learning.

6. **Promote respect for and development of Kenya's rich and varied cultures**

   Education should instil in the learner appreciation of Kenya's rich and diverse cultural heritage. The learner should value own and respect other people's culture as well as embrace positive cultural practices in a dynamic society.

7. **Promote international consciousness and foster positive attitudes towards other nations**

   Kenya is part of the interdependent network of diverse peoples and nations. Education should therefore enable the learner to respect, appreciate and participate in the opportunities within the international community. Education should also facilitate the learner to operate within the international community with full

   knowledge of the obligations, responsibilities, rights and benefits that this membership entails.

8. **Good health and environmental protection**

   Education should inculcate in the learner the value of physical and psychological well-being for self and others. It should promote environmental preservation and conservation, including animal welfare for sustainable development.

SUGGESTED TIME ALLOCATION

#	Subject	Lessons Per Week
	Mathematics	5
	Physical and Health Education	5
	English language	4
	Kiswahili Language KSL for learners who are deaf	4
	Science and Technology	4
	Agriculture	3
	Creative Arts (Art and craft, Music)	3
	Home science	3
	Religious Education (CRE/IRE/ HRE)	3
	Social Studies (Citizenship, Geography, History)	3
	Other Languages	2

	Pastoral Programme and Instructions	1
	TOTAL	**40**

GENERAL LEARNING OUTCOMES FOR MIDDLE SCHOOL EDUCATION

By the end of Middle School, the learner should be able to:

1. Apply literacy, numeracy skills and logical thinking appropriately in self-expression,
2. Communicate effectively in diverse contexts,
3. Apply digital literacy skills appropriately for communication and learning in day-to-day life,
4. Practise hygiene, appropriate sanitation and nutrition to promote health,
5. Explore, manipulate, manage and conserve the environment effectively for learning and sustainable development,
6. Demonstrate ethical behaviour and exhibit good citizenship as a civic responsibility,
7. Demonstrate social skills, spiritual and moral values for peaceful co-existence,
8. Demonstrate appreciation of the country's rich, diverse cultural heritage for harmonious co-existence,
9. Manage pertinent and contemporary issues in society effectively.

Essence Statement

Mathematics is a vehicle of development and improvement of a country's economic development. By learning mathematics, learners develop an understanding of numbers, logical thinking skills and problem-solving skills. Mathematics is applied in business, social and political worlds. At this level, mathematics will build on the competencies acquired by the learner in the early years of education. Learning mathematics will also enhance the learner's competencies in numeracy as a foundation of STEM at the higher levels of education cycle. Mathematics is also a subject of enjoyment and excitement as it gives learners opportunities for creative work and fun.

Subject General Learning Outcomes

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

1. Demonstrate mastery of number concepts by working out problems in day to day life.
2. Apply measurement skills to find solutions to problems in a variety of contexts.
3. Describe properties of geometrical shapes and spatial relationships in real life experiences.
4. Collect, represent and analyse data to solve problems.
5. Analyse information using algebraic expressions in real life situations.

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
1.0 NUMBERS	1.1 Whole numbers **(20 Lessons)**	By the end of the Sub Strand, the learner should be able to; a) Use place value and total value of digits up to millions in real life, b) Use numbers up to millions in symbols in real life, c) Read, write and relate numbers up to 100,000 in words in real life, d) Order numbers up to 100,000 in real life situations, e) round off numbers up to 100,000 to the nearest thousand in different situations, f) Apply squares of whole numbers up to 100 in different situations,	• Learners in pairs/groups or as individuals to identify place value of digits up to millions using place value apparatus. • Learners in pairs/groups or as individuals to identify total value of digits up to millions using place value apparatus. • Learners in pairs/groups or as individuals to read numbers up to hundreds of thousands millions in symbols from number charts/ cards. • Learners in pairs/groups or as individuals to form different numbers by rearranging digits of a given number.	1. How can you work out squares of numbers? 2. How can you work out square roots of numbers? 3. Where are squares and square roots used in real life?

		g) Apply square roots of perfect squares up to 10,000 in different situations, h) Use it devices for learning more on whole numbers and for enjoyment, i) appreciate use of whole numbers in real life situations.	• Learners in pairs/groups thousand from number cards and share with other groups. • Learners in pairs/groups or as individuals to multiply a given number by itself and identify the answer as the square of the number. • Learners in pairs/groups or as individuals to identify the square root of a given number as a value which when multiplied by itself results in the given number. • Learners in pairs/groups or as individuals to play digital games involving whole numbers.	
Core competencies to be developed: Critical thinking and problem solving as learners identify place value, order and round off numbers. **Learning to learn** as learners read and write numbers, compute squares and square roots. **Digital literacy** as learners use IT devices to learn and play games.				

PCIs: Environmental education as learners establish the number of seedlings in seedbeds. **Career guidance** in banking, sales and purchasing.	**Values: Respect** for self and others as learners work in pairs/groups. **Unity** as learners work towards achieving set goals. **Social cohesion** as learners work in groups irrespective of backgrounds.
Links to other subjects: Language as they read and write numbers in words.	**Suggested Community Service Learning Activities:** Learners to assist in counting money and animals in the community.

Assessment Rubric

Indicators	**Exceeds Expectations**	**Meets Expectations**	**Approaches Expectations**	**Below Expectations**
Using place value and total value of digits up to millions	Uses place value and total value of digits up to millions correctly and with ease	Uses place value and total value of digits up to millions correctly	Inconsistently uses place value and total value of digits up to millions	Little evidence in using place value and total value of digits up to millions
Using numbers up to millions in symbols	Uses numbers up to millions in symbols correctly and with ease	Uses numbers up to millions in symbols correctly	Inconsistently uses numbers up to millions in symbols	Little evidence in using numbers up to millions in symbols

Reading, writing and relating numbers up to 100,000 in words	Reads, writes and relates numbers greater than 100,000 in words correctly and with ease	Reads, writes and relates numbers up to 100,000 in words correctly	Inconsistently reads, writes and relates numbers up to 100,000 in words	Little evidence in reading, writing and relating numbers up to 100,000 in words
Ordering numbers up to 100,000	Orders numbers more than 100,000 correctly and with ease	Orders numbers up to 100,000 correctly	Inconsistently orders numbers up to 100,000	Little evidence in ordering numbers up to 100,000
Rounding off numbers up to 100,000 to the nearest thousand	Rounds off numbers up to 100,000 to the nearest thousand correctly and with ease	Rounds off numbers up to 100,000 to the nearest thousand correctly	Inconsistently rounds off numbers up to 100,000 to the nearest thousand	Little evidence in rounding off numbers up to 100,000 to the nearest thousand
Applying squares of whole numbers up to 100	Applies squares of whole numbers up to 100 correctly and with ease	Applies squares of whole numbers up to 100 correctly	Inconsistently applies squares of whole numbers up to 100	Little evidence in applying squares of whole numbers up to 100
Applying square roots of perfect squares up to 10,000	Applies square roots of perfect squares up to 10,000 correctly and with ease	Applies square roots of perfect squares up to 10,000 correctly	Inconsistently applies square roots of perfect squares up to 10,000	Little evidence in applying square roots of perfect squares up to 10,000

Using IT devices for learning more on whole numbers	Uses IT devices for learning more on whole numbers efficiently and with ease	Uses IT devices for learning more on whole numbers efficiently	Inconsistently uses IT devices for learning more on whole numbers	Little evidence in using IT devices for learning more on whole numbers

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
1.0 NUMBERS	1.2 Multiplication **(6 Lessons)**	By the end of the Sub Strand, the learner should be able to; a) Multiply up to a 4-digit number by a 2-digit number in real life situations, b) Estimate products by rounding off numbers being multiplied to the nearest ten in real life situations, c) Make patterns involving multiplication of numbers not exceeding 10,000 in different situations, d) Use it devices for learning more on multiplication and for enjoyment, e) Appreciate use of multiplication in real life.	• Learners in pairs/groups or as individuals to multiply up to a 4-digit number by a 2-digit number using; - fact families - skip counting - multiplication chart - expanded form - IT devices. • Learners in pairs/groups or as individuals to estimate products using; - rounding off factors - compatibility of numbers - own strategies. • Learners in pairs/groups or as individuals to make patterns involving multiplication with products not exceeding 10,000 using number cards.	1. Where is multiplication used in real life situations? 2. How can you estimate products of numbers? 3. How can you form patterns involving multiplication?

			• Learners in pairs/groups or as individuals to play digital games involving multiplication.	
Core Competencies to be developed: Citizenship as learners work in pairs/groups with a common focus. **Critical thinking and problem solving** as learners round off numbers using front/back strategy to estimate answers in multiplication.				
PCIs: Self-esteem; as learners devise personal strategies to estimate products in multiplication. **Education for Sustainable Development;** career as statisticians, bankers, researchers and in business.			**Values: Responsibility;** as learners commit to working out answers of given tasks. **Respect** for self and others; as learners work in pairs/groups.	
Links to other subjects: Languages as learners use mathematical terms. PHE; as learners skip count numbers when playing. Agriculture; as learners estimate harvests, seeds or fertilizer required for sowing or application.			**Suggested Community Service Learning Activities:** Learners may assist in estimating the amount of animal feed/harvest/food for a meal. Learners may volunteer to assist in family/ communal business activities during stock taking.	

Assessment Rubric

Indicators	Exceeds Expectations	Meets Expectations	Approaches Expectations	Below Expectations
Multiplying up to a 4-digit number by a 2-digit number	Correctly and consistently multiplies up to a 4-digit number by a 2- digit number	Correctly multiplies up to a 4-digit number by a 2- digit number	Inconsistently multiplies up to a 4-digit number by a 2- digit number	Little evidence in multiplying up to a 4-digit number by a 2- digit number
Estimating products by rounding off factors to the nearest ten	Estimates products by rounding off factors to the nearest ten correctly and with ease	Correctly estimates products by rounding off factors to the nearest ten	Inconsistently estimates products by rounding off factors to the nearest ten	Little evidence in estimating products by rounding off numbers to the nearest ten
Making patterns involving multiplication of numbers not exceeding 10,000	Makes patterns involving multiplication of numbers not exceeding 10,000 correctly and with ease	Correctly makes patterns involving multiplication of numbers not exceeding 10,000	Inconsistently makes patterns involving multiplication of numbers not exceeding 10,000	Little evidence in making patterns involving multiplication of numbers not exceeding 10,000
Using IT devices for learning more on multiplication	Uses IT devices for learning more on multiplication efficiently and with ease	Uses IT devices for learning more on multiplication efficiently	Inconsistently uses IT devices for learning more on multiplication	Little evidence in using IT devices for learning more on multiplication

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
1.0 NUMBERS	1.3 Division **(6 Lessons)**	By the end of the Sub Strand the learner should be able to; a) Divide up to a 4-digit number by up to a 3-digit number where the dividend is greater than the divisor in real life situations, b) Estimate quotients by rounding off the dividend and divisor to the nearest ten in real life situations, c) Perform combined operations involving addition, subtraction, multiplication and division in different situations, d) Use it devices for learning more on division of whole	• Learners in pairs/groups or as individuals to divide up to a 4-digit number by up to a 3-digit number where the dividend is greater than the divisor using; - relationship between multiplication and division - long method. • Learners in pairs/groups or as individuals work out quotients by rounding the dividend and divisor to the nearest ten. • Work out questions involving two, three or four operations. • Learners play digital games involving division.	1. How can you estimate quotients? 2. Where is division used in real life? 3. How can you work out questions involving combined operations?

		numbers and for enjoyment e) appreciate use of division of whole numbers in real life.		
Core Competencies to be developed:Communication and collaboration as learners in pairs/groups discuss the relationship between multiplication and division. **Critical thinking and problem solving** as learners estimate quotients.				
PCIs: Animal welfare as learners practise fair sharing during animal feeding chores.			**Values: Respect** as learners analyse and accept each other's quotient estimates. **Honesty** as learners fairly and accurately divide or share items during learning and daily life.	
Links to other subjects: Languages as learners use mathematical language in discussions.			**Suggested Community Service Learning Activities:** Learners may help to fairly distribute food and other items during community events e.g. funerals, public rally or baraza.	

Assessment Rubric

Indicators	Exceeds Expectations	Meets Expectations	Approaches Expectations	Below Expectations
Dividing up to a 4-digit number by up to a 3-digit number	Divides up to a 4-digit number by up to a 3-digit number correctly and with ease	Divides up to a 4-digit number by up to a 3-digit number correctly	Inconsistently divides up to a 4-digit number by up to a 3-digit number	Little evidence in dividing up to a 4-digit number by up to a 3-digit number
Estimating quotients by rounding off numbers to the nearest ten	Estimates quotients by rounding off numbers to the nearest ten correctly and with ease	Estimates quotients by rounding off numbers to the nearest ten correctly	Inconsistently estimates quotients by rounding off numbers to the nearest ten	Little evidence in estimating quotients by rounding off numbers to the nearest ten
Performing combined operations involving addition, subtraction, multiplication and division	Performs combined operations involving addition, subtraction, multiplication and division correctly and with ease	Performs combined operations involving addition, subtraction, multiplication and division correctly	Inconsistently performs combined operations involving addition, subtraction, multiplication and division	Little evidence in performing combined operations involving addition, subtraction, multiplication and division
Using IT devices for learning more on division of whole numbers	Uses IT devices for learning more on division of whole numbers efficiently and with ease	Uses IT devices for learning more on division of whole numbers efficiently	Inconsistently uses IT devices for learning more on division of whole numbers	Little evidence in using IT devices for learning more on division of whole numbers

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
1.0 NUMBERS	1.4 Fractions **(12 Lessons)**	By the end of the Sub Strand, the learner should be able to; a) Identify LCM of given numbers in different situations, b) Add fractions using LCM in different situations, c) Subtract fractions using LCM in different situations, d) Add mixed numbers in different situations, e) Subtract mixed numbers in different situations, f) Identify reciprocal of fractions for use in different situations, g) Work out squares of fractions in different situations,	• Learners in pairs / groups or as individuals to identify LCM of numbers given from number cards. • Learners in pairs/groups to add and subtract fractions using LCM by listing multiples. • Learners in pairs/groups or as individuals to add and subtract mixed fractions by converting the fractions to improper fractions. • Learners in pairs/groups or as individuals to add and subtract mixed fractions by adding and subtracting whole number and fraction parts separately.	1. Where are squares and fractions used in real life? 2. Where are percentages used in our day to day lives?

		h) Convert fractions to equivalent fractions with denominator 100 in different situations, i) Identify percentage as a fraction for use in different situations, j) Convert fractions to percentages in different situations, k) Convert percentages to fractions in different situations, l) use IT devices for learning more on fractions, m) appreciate use of fractions in real life.	• Learners in pairs/groups or as individuals to multiply fractions by whole numbers to get one. • Learners in pairs/groups or as individuals to discuss the results and identify the reciprocal of a fraction. • Learners in pairs/groups or as individuals to work out squares of fractions through multiplication practically. • Learners in pairs/ groups or as individuals to convert fractions to equivalent fractions with denominator 100 through multiplication. • Learners in pairs/groups or as individuals to identify a percentage as a fraction with denominator 100	

			• Learners in pairs/ groups to discuss real life situations where percentages are used. • Learners in pairs/ groups or as individuals to convert fractions to percentages and percentages to fractions. • Learners to play digital games involving fractions.	
Core Competencies to be developed: Creativity and imagination as learners work out squares of numbers and convert fractions from one form to another. **Learning to learn** as learners multiply fractions by fractions and fractions by whole numbers.				
PCIs: Life skills as learners relate fractions and percentages to real life. **Social cohesion** as learners share items at home and outside school.			**Values: Unity** as learners support each other in class when working out given questions. **Love** as learners share items with others and assist their loved ones.	
Links to other subjects: Languages as learners acquire new mathematical terms.			**Suggested Community Service Learning Activities:** Learners help family/peers/ community members in sharing items in fractional parts.	

Assessment Rubric

Indicators	**Exceeds Expectations**	**Meets Expectations**	**Approaches Expectations**	**Below Expectations**
Identifying LCM of given numbers	Identifies LCM of given numbers correctly and with ease	Identifies LCM of given numbers correctly	Inconsistently identifies LCM of given numbers	Little evidence in identifying LCM of given numbers
Adding fractions using LCM	Adds fractions using LCM correctly and with ease	Adds fractions using LCM correctly	Inconsistently adds fractions using LCM	Little evidence in adding fractions using LCM
Subtracting fractions using LCM	Subtracts fractions using LCM correctly and with ease	Subtracts fractions using LCM correctly	Inconsistently subtracts fractions using LCM	Little evidence in subtracting fractions using LCM
Adding mixed numbers	Adds mixed numbers correctly and with ease	Adds mixed numbers correctly	Inconsistently adds mixed numbers	Little evidence in adding mixed numbers
Subtracting mixed numbers	Subtracts mixed numbers correctly and with ease	Subtracts mixed numbers correctly	Inconsistently subtracts mixed numbers	Little evidence in subtracting mixed numbers
Identifying reciprocals of fractions	Identifies reciprocal of fractions correctly and with ease	Identifies reciprocal of fractions correctly	Inconsistently identifies reciprocal of fractions	Little evidence in identifying reciprocals of fractions

Working out squares of fractions	Works out squares of fractions correctly and with ease	Works out squares of fractions correctly	Inconsistently works out squares of fractions	Little evidence in working out squares of fractions
Converting fractions to equivalent fractions with denominator 100	Converts fractions to equivalent fractions with denominator 100 correctly and with ease	Converts fractions to equivalent fractions with denominator 100 correctly	Inconsistently converts fractions to equivalent fractions with denominator 100	Little evidence in converting fractions to equivalent fractions with denominator 100
Identifying percentage as a fraction	Identifies percentage as a fraction correctly and with ease	Identifies percentage as a fraction correctly	Inconsistently identifies percentage a fraction	Little evidence in identifying percentage a fraction
Converting fractions to percentages	Converts fractions to percentages correctly and with ease	Converts fractions to percentages correctly	Inconsistently converts fractions to percentages	Little evidence in converting fractions to percentages
Converting percentages to fractions	Converts percentages to fractions correctly and with ease	Converts percentages to fractions correctly	Inconsistently converts percentage to fractions	Little evidence in converting percentage to fractions
Using IT devices for learning more on fractions	Uses IT devices for learning more on fractions efficiently and with ease	Uses IT devices for learning more on fractions efficiently	Inconsistently uses IT devices for learning more on fractions	Little evidence in using IT devices for learning more on fractions

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
1.0 NUMBERS	1.5 Decimals **(12 Lessons)**	By the end of the Sub Strand, the learner should be able to; a) Identify decimals up to ten thousandths in different situations, b) round off decimals in different situations, c) Convert decimals to fractions in different situations, d) Convert fractions to decimals in different situations, e) Convert decimals to percentages in different situations, f) Convert percentages to decimals in different situations, g) add decimals up to 4-decimal places in different situations,	• Learners in pairs/groups or as individuals to identify place value of decimals up to ten thousandths using place value apparatus. • Learners in pairs/groups or as individuals to relate place value of decimals up to ten thousandths to number of decimal places. • Learners in pairs/groups or as individuals to round off decimals to a given number of decimal places. • Learners in pairs/ groups or as individuals to convert decimals to fractions using a square/ rectangular grid.	Where are decimals applicable in real life?

		h) subtract decimals up to 4-decimal places in different situations, i) Use it devices for more learning on decimals and leisure, j) Appreciate use of decimals in real life situations.	• Learners in pairs/ groups or as individuals to convert fractions to decimals using a square/ rectangular grid. • Learners in pairs/ groups or as individuals to convert decimals to percentages and percentages to decimals. • Learners in pairs/groups or as individuals to add decimals up to 4-decimal places using place value apparatus. • Learners in pairs/groups or as individuals to subtract decimals up to 4- decimal places using place value apparatus. • Learners in pairs/groups or as individuals to play digital games involving decimals.	

Core Competencies to be developed:Critical thinking and problem solving as learners round off decimals and convert decimals to fractions using a paper grid. **Communication and collaboration** as learners work in pairs or groups.	
PCIs: Life skills as learners work out word questions involving decimals in real life situations. **Education for Sustainable Development**: Careers in engineering, and surveying where decimals are used to ensure precision of values.	**Values: Responsibility** as learners take up their roles in group tasks. **Integrity** as learners practise fair play and honesty in measuring and recording their masses while making frequency tables.
Links to other subjects: Languages as learners acquire new mathematical terms. **Home Science** as learners measure mass of ingredients in decimals.	**Suggested Community Service Learning Activities:** Learners assist family/peers/ community members in sharing out items using decimals.

Assessment Rubric

Indicators	**Exceeds Expectations**	**Meets Expectations**	**Approaches Expectations**	**Below Expectations**
Identifying decimals up to ten thousandths	Identifies decimals up to ten thousandths correctly and with ease	Identifies decimals up to ten thousandths correctly	Inconsistently identifies decimals up to ten thousandths	Little evidence in identifying decimals up to ten thousandths
Rounding off decimals	Rounds off decimals correctly and with ease	Rounds off decimals correctly	Inconsistently rounds off decimals	Little evidence in rounding off decimals

Converting decimals to fractions	Converts decimals to fractions correctly and with ease	Converts decimals to fractions correctly	Inconsistently converts decimals to fractions	Little evidence in converting decimals to fractions
Converting fractions to decimals	Converts fractions to decimals correctly and with ease	Converts fractions to decimals correctly	Inconsistently converts fractions to decimals	Little evidence in converting fractions to decimals
Converting decimals to percentages -	Converts decimals to percentages correctly and with ease	Converts decimals to percentages correctly	Inconsistently converts decimals to percentages	Little evidence in converting decimals to percentages
Converting percentages to decimals-	Converts percentages to decimals efficiently and with ease	Converts percentages to decimals correctly	Inconsistently converts percentages to decimals in	Little evidence in converting percentages to decimals
Adding decimals up to 4-decimal places	Adds decimals up to 4- decimal places correctly and with ease	Adds of decimals up to 4- decimal places correctly	Inconsistently adds decimals up to 4-decimal places	Little evidence in adding decimals up to 4-decimal places
Subtracting decimals up to 4-decimal places	Subtracts decimals up to 4-decimal places correctly and with ease	Subtracts decimals up to 4- decimal places correctly	Inconsistently subtracts decimals up to 4- decimal places	Little evidence in subtracting decimals up to 4- decimal places

Using IT devices for more learning on decimals and leisure	Uses IT devices for more learning on decimals and leisure efficiently and with ease	Uses IT devices for more learning on decimals and leisure correctly	Inconsistently uses IT devices for more learning on decimals and leisure	Little evidence in using IT devices for more learning on decimals and leisure

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
2.0 MEASUREMENT	2.1 Length **(14 Lessons)**	By the end of the Sub Strand, the learner should be able to; a) Use the millimetre (mm) as a unit of measuring length in different situations, b) Establish the relationship between the millimetre and centimetre in different situations, c) Convert centimetres to millimetres in different situations, d) Convert millimetres to centimetres in different situations, e) add centimetres and millimetres in different situations, f) Subtract centimetres and millimetres in different situations,	• Learners in pairs/groups or as individuals to identify the millimetre as a unit of measuring length using a ruler. • Learners in pairs/ groups or as individuals to measure length in millimetres using a ruler. • Leaners in pairs/groups or as individuals to measure a given length in cm and mm to establish the relationship between mm and cm. • Learners in pairs/ groups or as individuals to convert mm to cm and cm to mm when measuring lengths of different objects.	1. Why do we measure distances in day to day life? 2. What do we use to measure length in real life?

		g) Multiply centimetres and millimetres by whole numbers in real life situations, h) Divide centimetres and millimetres by whole numbers in real life situations, i) Measure the circumference of a circle practically, j) Identify the relationship between circumference and diameter in different situations, k) Use it devices for learning more on length and for enjoyment, l) Appreciate use of length in real life situations.	• Learners to choose appropriate units to measure lengths of different objects. • Learners in pairs/ groups or as individuals determine lengths in mm and cm in addition, subtraction, multiplication and division. • Learners in pairs/groups or as individuals to work out the circumference, diameter and radius of a circle practically. • Learners in pairs/ groups or as individuals to measure the circumference of a circle practically. • Learners in pairs/groups or as individuals to divide circumference by diameter to get pi (π).	

			• Leaners in pairs/groups or as individuals to play digital games involving length in mm and cm.	
Core Competencies to be developed: Communication and collaboration as learners measure lengths of objects in pairs/groups. **Imagination and creativity** as learners determine when/where/how to apply cm and mm in daily life experiences.				
PCIs: Life skills as learners relate estimation and measuring length to budgeting and actual expenditure in real life situations. **Environmental education** as learners' measure length of different objects in the school compound. **Education for Sustainable Development**: Career in sports (athletics), civil engineering, tailoring.			**Values: Respect** as learners appreciate each other's contribution in pairs/group discussion. **Unity** as learners work in teams.	
Links to other subjects:Languages as learners use new terms in measurement of length. **Hygiene and Nutrition** as learners handle objects with care when measuring lengths of different objects in the school compound. **PHE** as learners measure lengths of different field events and track events in the school field.			**Suggested Community Service Learning Activities:**Learners assist family members and/or community in estimating and measuring different lengths.	

Assessment Rubric

Indicators	Exceeds Expectations	Meets Expectations	Approaches Expectations	Below Expectations
Using the millimetre (mm) as a unit of measuring length	Uses the millimetre (mm) as a unit of measuring length correctly and with ease	Uses the millimetre (mm) as a unit of measuring length correctly	Inconsistently uses the millimetre (mm) as a unit of measuring length	Little evidence in using the millimetre (mm) as a unit of measuring length
Identifying the relationship between the millimetre and the centimetre	Identifies the relationship between the millimetre and the centimetre correctly and with ease	Identifies the relationship between the millimetre and the centimetre correctly	Inconsistently identifies the relationship between the millimetre and the centimetre	Little evidence in identifying the relationship between the millimetre and the centimetre
Converting centimetres to millimetres	Converts centimetres to millimetres correctly and with ease	Converts centimetres to millimetres correctly	Inconsistently converts centimetres to millimetres	Little evidence in converting centimetres to millimetres
Converting millimetres to centimetres	Converts millimetres to centimetres correctly and with ease	Converts millimetres to centimetres correctly	Inconsistently converts millimetres to centimetres	Little evidence in converting millimetres to centimetres

Adding centimetres and millimetres	Adds centimetres and millimetres correctly and with ease	Adds centimetres and millimetres correctly	Inconsistently adds centimetres and millimetres	Little evidence in adding centimetres and millimetres
Subtracting centimetres and millimetres	Subtracts centimetres and millimetres correctly and with ease	Subtracts centimetres and millimetres correctly	Inconsistently subtracts centimetres and millimetres	Little evidence in subtracting centimetres and millimetres
Multiplying centimetres and millimetres by whole numbers	Multiplies centimetres and millimetres by whole numbers correctly and with ease	Multiplies centimetres and millimetres by whole numbers correctly	Inconsistently multiplies centimetres and millimetres by whole numbers	Little evidence in multiplying centimetres and millimetres by whole numbers
Dividing centimetres and millimetres by whole numbers	Divides centimetres and millimetres by whole numbers correctly and with ease	Divides centimetres and millimetres by whole numbers correctly	Inconsistently divides centimetres and millimetres by whole numbers	Little evidence in dividing centimetres and millimetres by whole numbers
Measuring the circumference of a circle	Measures the circumference of a circle correctly and with ease	Measures the circumference of a circle correctly	Inconsistently measures the circumference of a circle	Little evidence in measuring the circumference of a circle

Establishing the relationship between circumference and diameter	Establishes the relationship between circumference and diameter correctly and with ease	Establishes the relationship between circumference and diameter correctly	Inconsistently establishes the relationship between circumference and diameter	Little evidence in establishing the relationship between circumference and diameter
Using IT devices for learning more on length	Uses IT devices for learning more on length efficiently and with ease	Uses IT devices for learning more on length efficiently	Inconsistently uses IT devices for learning more on length	Little evidence in using IT devices for learning more on length

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
2.0 MEASUREMENT	2.2 Area **(6 Lessons)**	By the end of the Sub Strand, the learner should be able to; a) Work out area of triangles in square centimetres (cm^2) in different situations, b) Work out area of combined shapes involving squares, rectangles and triangles in cm^2 in different situations, c) Use IT devices for learning more on area and for enjoyment, d) Appreciate the use of cm^2 in working out area in real life	• Learners in pairs/groups or as individuals are guided to establish that the area of a triangle is equal to a half of the area of a rectangle or a square when the rectangle or the square is divided by a diagonal. • Learners in pairs/groups work out the area of triangles in cm^2 using the relationship between a rectangle and a triangle (Area of a triangle is equal to ½ area of a rectangle or square. $A = ½ (L x W)$. • Learners in pairs/groups or as individuals to come up with own combined shapes involving rectangles squares,	Where is area used in real life?

			• triangles and ask other groups/pairs to determine the area. • Learners in pairs/groups to play digital games involving area.	
Core Competencies to be developed: Critical thinking and problem solving as learners work out area of combined shapes and figure out the relationship between areas in cm^2 and areas of surfaces of different objects. **Imagination and creativity** as learners come up with own questions on area.				
PCIs: Self-esteem as learners come up with own combined shapes involving rectangles, squares and triangles.			**Values:Unity** as each group tries to work out other group questions. **Respect** for rules and laws as learners adhere to given rules of calculating and converting area.	
Links to other subjects: Language as learners come to terms with new words. **Social Studies** as learners explore their environment to calculate area of fields.			**Suggested Community Service Learning Activities:** Learners to assist family and/or community members on how to work out area of rooms in their house.	

Assessment Rubric

Indicators	**Exceeds expectations**	**Meets expectations**	**Approaches expectations**	**Below expectations**
Working out area of triangles in cm^2	Works out area of triangles in cm^2 correctly and with ease	Works out area of triangles in cm^2 correctly	Inconsistently works out area of triangles in cm^2	Little evidence in working out area of triangles in cm^2
Working out area of combined shapes	Works out area of combined shapes correctly and with ease	Works out area of combined shapes correctly	Inconsistently works out area of combined shapes	Little evidence in working out area of combined shapes
Using IT devices for learning more on area	Uses IT devices for learning more on area efficiently and with ease	Uses IT devices for learning more on area efficiently	Inconsistently use IT devices for learning more on area	Little evidence in using IT devices for learning more on area

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
2.0 MEA-SUREMENT	2.3 Capacity **(6 Lessons)**	By the end of the Sub Strand, the learner should be able to; a) Identify the relationship among cubic centimetres (cm^3), mililitres and litres in real life, b) Convert litres to mililitres in different situations, c) Convert capacity in millilitres to litres in different situations, d) Use it devices for more learning on capacity and for enjoyment, e) Appreciate use of cm^3 and litres in measuring capacity in real life.	• Learners in pairs/ groupsor as individuals to identify the relationship between cm^3, mililitres and litres through measuring practically. • Learners in pairs/groups or as individuals to measure capacity in millilitres and litres. • Learners in pairs/groups or as individuals to convert capacity in litres to millilitres. • Learners in pairs/ groups or as individuals to convert capacity in millilitres to litres. • Learners in pairs/groups or as individuals to play digital games involving capacity.	1. How can we measure capacity? 2. Where is capacity applicable in real life?

Core Competencies to be developed: Critical thinking and problem solving as learners choose appropriate units when measuring different capacities. **Self-efficacy** as learners present their group results on measurements of capacity in litres or millilitres to other groups.	
PCIs: Environmental education as learners conserve water while measuring capacity of containers using water.	**Values: Responsibility** as learners take their roles in turns to lead the groups. **Unity** as learners measure capacity in groups.
Links to other subjects: Science and Technology as learners take accurate measurements of liquids	**Suggested Community Service Learning Activities:** Sensitise people within the community on the importance of choosing appropriate units when measuring capacity.

Assessment Rubric

Indicators	**Exceeds Expectations**	**Meets Expectations**	**Approaches Expectations**	**Below Expectations**
Identifying the relationship among cm^3, millilitres and litres	Identifies the relationship among cm^3, millilitres and litres correctly and with ease	Identifies the relationship among cm^3, millilitres and litres correctly	Inconsistently identifies the relationship among cm^3, millilitres and litres	Little evidence in identifying the relationship among cm^3, millilitres and litres
Converting litres to millilitres	Converts litres to millilitres correctly and with ease	Converts litres to millilitres correctly	Inconsistently converts litres to millilitres	Little evidence in converting litres to millilitres

Converting millilitres to litres	Converts millilitres to litres correctly and with ease	Converts millilitres to litres correctly	Inconsistently converts millilitres to litres	Little evidence in converting millilitres to litres
Using IT devices for learning more on capacity	Uses IT devices for learning more on capacity efficiently and with ease	Uses IT devices for learning more on capacity efficiently	Inconsistently uses IT devices for learning more on capacity	Little evidence in using IT devices for learning more on capacity

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
2.0 MEASUREMENT	2.4 Mass **(14 Lessons)**	By the end of the Sub Strand, the learner should be able to; a) Identify the tonne as a unit for measuring mass in real life, b) Identify items measured in tonnes in real life, c) Identify the relationship between the kilogram and the tonne practically, d) Estimate mass in tonnes in different situations, e) Convert kilograms to tonnes and tonnes to kilograms in real life situations, f) Add tonnes and kilograms in real life situations,	• Learners in pairs/ groups/ or as individuals are guided to identify the tonne as a unit of measuring mass though discussions. • Learners in pairs/groups/ or as individuals to discuss items whose mass may be measured in tonnes • Leaners in pairs/groups or as individuals to identify the relationship between the kilogram and the tonne (1000kg = 1 tonne). • Learners in pairs estimate mass of objects in tonnes. • Learners in pairs/groups or as individuals to convert kilograms to	1. How can we measure large amounts of mass? 2. In what situations would the tonne be more applicable to use when measuring mass?

		g) subtract tonnes and kilograms in real life situations, h) multiply tonnes and kilograms by whole numbers in real life situations, i) Divide tonnes and kilograms by whole numbers in real life situations, j) Use it devices for learning more on mass and for enjoyment, k) Appreciate use of the kilogram and tonne in measuring mass.	• tonnes and tonnes to kilograms in real life situations. • Learners in pairs/groups or as individuals to determine mass of items in tonnes and kilograms using different operations in real life situations. • Learners in pairs/groups/ individuals to play digital games involving mass.	
Core Competencies to be developed: Communication and collaboration as learners discuss given pictures/ videos on why different units of measuring mass are used. **Imagination and creativity** as learners estimate mass in tonnes. **Digital literacy** as learners use IT devices for learning more on mass.				
PCIs:Animal welfare education as learners talk about animal feeds in relation to mass of animals. **Environmental education** as learners explore various objects in their environment to appreciate the tonne as a unit for measuring mass of heavy objects.			**Values: Integrity** as learners purpose to use suitable measures. **Honesty** as learners appreciate fairness in measuring items in daily life.	

Links to other subjects: Languages as learners acquire new terms such as tonnes	**Suggested Community Service Learning Activities:**Learners may assist friends/family community members in working out total mass of items in tonnes. Learners could visit a local store e.g. supermarket to discuss with proprietors the importance of using tonnes instead of other units.

Assessment Rubric

Indicators	**Exceeds Expectations**	**Meets Expectations**	**Approaches Expectations**	**Below Expectations**
Identifying the tonne as a unit for measuring mass	Identifies the tonne as a unit for measuring mass correctly and with ease	Identifies the tonne as a unit for measuring mass correctly	Inconsistently identifies the tonne as a unit for measuring mass	Little evidence in identifying the tonne as a unit for measuring mass
Identifying items measured in tonnes	Identifies items measured in tonnes correctly and with ease	Identifies items measured in tonnes correctly	Inconsistently identifies items measured in tonnes	Little evidence in identifying items measured in tonnes
Identifying the relationship between the kilogram and the tonne	Identifies the relationship between the kilogram and the tonne correctly and with ease	Identifies the relationship between the kilogram and the tonne correctly	Inconsistently identifies the relationship between the kilogram and the tonne	Little evidence in identifying the relationship between the kilogram and the tonne

Estimating mass in tonnes	Estimates mass in tonnes correctly and with ease	Estimates mass in tonnes correctly	Inconsistently estimates mass in tonnes	Little evidence in estimating mass in tonnes
Converting tonnes to kilograms and kilograms to tonnes	Converts tonnes to kilograms and kilograms to tonnes correctly and with ease.	Converts tonnes to kilograms and kilograms to tonnes correctly	Inconsistently converts tonnes to kilograms and kilograms to tonnes	Little evidence in converting tonnes to kilograms and kilograms to tonnes
Adding tonnes and kilograms	Adds tonnes and kilograms correctly and with ease	Adds tonnes and kilograms correctly	Inconsistently adds tonnes and kilograms	Little evidence in adding tonnes and kilograms
Subtracting tonnes and kilograms	Subtracts tonnes and kilograms correctly and with ease	Subtracts tonnes and kilograms correctly	Inconsistently subtracts tonnes and kilograms	Little evidence in subtracting tonnes and kilograms
Multiplying tonnes and kilograms by whole numbers	Multiplies tonnes and kilograms by whole numbers correctly and with ease	Multiplies tonnes and kilograms by whole numbers correctly	Inconsistently multiplies tonnes and kilograms by whole numbers	Little evidence in multiplying tonnes and kilograms by whole numbers
Dividing tonnes and kilograms by whole numbers	Divides tonnes and kilograms by whole numbers correctly and with ease	Divides tonnes and kilograms by whole numbers correctly	Inconsistently divides tonnes and kilograms by whole numbers	Little evidence in dividing tonnes and kilograms by whole numbers

Using IT devices for learning more on mass	Uses IT devices for learning more on mass efficiently and with ease	Uses IT devices for learning more on mass efficiently	Inconsistently uses IT devices for learning more on mass	Little evidence in using IT devices for learning more on mass

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
2.0 MEASUREMENTS	**2.5 Time** (10 Lessons)	By the end of the sub-strand, the learner should be able to; a) Identify time in a.m. And p.m. In day to day life experiences, b) Write time in a.m. And p.m. In day to day life experiences, c) Relate time in a.m. And p.m. To the 24h clock system, d) Convert time from 12h to 24h and 24h to 12h system, e) Interpret travel timetable in different situations, f) Use it devices for learning more on reading time and for leisure,	• Learners in pairs/groups or as individuals are guided to identify time in a.m. and p.m. from digital and analogue clocks. • Learners in pairs/groups or as individuals to write time in a.m. and p.m. from digital and analogue clocks. • Learners in pairs/groups or as individuals to relate time in a.m. and p.m. to the 24h clock system using a chart. • Learners in pairs/groups or as individuals to convert time from the 12h to 24h system and 24h to 12h using a chart. • Learners in pairs/groups or as individuals	How can you read and tell time?

		g) Appreciate use of time in both 12h and 24h systems.	to interpret travel timetables. • Learners in pairs/groups or as individuals to determine time durations using travel timetables. • Learners in pairs/groups or as individuals to play digital games involving time on 12h and 24 h systems.	
Core Competencies to be developed: Communication and collaboration as learners discuss together on how to read, write and convert time. **Digital literacy** as learners use IT devices to read and play games. **Learning to learn** as learners use the internet to interpret travel timetables.				
PCIs: Health education as learners maintain correct times of taking drugs. **Citizenship** as learners practise good time management.			**Values: Integrity** as learners observe time in various activities. **Responsibility** through dedication and commitment as learners appropriately use allocated time to perform tasks.	
Links to other subjects: Languages as learners discuss in pairs/groups. **Home Science and Science** as learn record time taken to perform given activities.			**Suggested Community Service Learning Activities:** Learners may assist in managing time in social activities or community functions. Learners could visit a health centre and discuss why observing time in administration of medicinal drugs is important.	

Assessment Rubric

Indicators	Exceeds Expectations	Meets Expectations	Approaches Expectations	Below Expectations
Identifying time in a.m. and p.m.	Identifies time in a.m. and p.m. accurately and with ease	Identifies time in a.m. and p.m. accurately	Inconsistently identifies time in a.m. and p.m.	Little evidence in identifying time in a.m. and p.m.
Writing time in a.m. and p.m.	Writes time in a.m. and p.m. accurately and with ease	Writes time in a.m. and p.m. accurately	Inconsistently writes time in a.m. and p.m.	Little evidence in writing time in a.m. and p.m.
Relating time in a.m. and p.m. to the 24h clock system	Relates time in a.m. and p.m. to the 24h clock system accurately and with ease	Relates time in a.m. and p.m. to the 24h clock system accurately	Inconsistently relates time in a.m. and p.m. to the 24hour-clock system	Little evidence in relating time in a.m. and p.m. to the 24h clock system
Converting time from 12h to 24h and 24h to 12h system	Converts time from 12h to 24h and 24h to 12h system accurately and with ease	Converts time from 12h to 24h and 24h to 12h system accurately	Inconsistently converts time from 12h to 24h and 24h to 12h system,	Little evidence in converting time from 12h to 24h and 24h to 12h system,
Interpreting travel timetables	Interprets travel timetables accurately and with ease	Interprets travel timetables accurately	Inconsistently interprets travel timetables	Little evidence in interpreting travel timetables

Using IT devices for learning more on reading time	Uses IT devices for learning more on reading time efficiently and with ease	Uses IT devices for learning more on reading time efficiently	Inconsistently uses IT devices for learning more on reading time	Little evidence in using IT devices for learning more on reading time

Strand	Sub Strand	Specific Learning Outcome	Suggested Learning Experiences	Key Inquiry Questions
2.0 MEASUREMENT	2.6 Money **(8 lessons)**	By the end of the Sub Strand, the learner should be able to; a) Prepare a simple budget, b) Work out profit and loss in real life situations, c) Identify types of taxes in different situations, d) Use it devices to learn about profit and loss, e) Appreciate profit and loss in real life situations.	• Learners in pairs/groups or as individuals to prepare price lists. • Learners in pairs/ groups or as individuals to discuss factors to consider when preparing a simple budget • Learners in pairs/groups or as individuals to prepare a budget. • Learners in pairs/groups or as individuals to discuss the meaning of profit and loss in real life situations and share with other groups. • Learners in pairs/groups or as individuals work out questions involving profit and loss. • Learners in pairs/groups or as individuals to	1. Why is it important to prepare a budget? 2. How can you make profit in a business?

			discuss income and value added tax (VAT) as types of taxes. • Learners in pairs/groups to use IT devices to play digital games.	
Core Competencies to be developed: Communication and collaboration as leaners work in pairs/groups. **Creativity and imagination** as learners learn how to add value to their goods to charge earn profit.				
PCIs: Patriotism as leaners discuss importance of paying taxes. **Personal hygiene** as learners are advised to wash their hands after handling money. **Financial literacy** as learners appreciate honest ways of earning profits.			**Values: Honesty** as leaners spend money as directed by family members. **Responsibility** as learners spend money according to budget. **Integrity** through fair play; as learners learn not to exploit or overcharge their clients or customers.	
Links to other subjects: Languages as learners use mathematics terms in discussions. **Home Science** as learners participate in making budgets for buying food at home.			**Suggested Community Service Learning Activities:** Learners to discuss family budgeting with family members. Learners could visit a shopkeeper and learn how to charge profit on their goods. Learners may assist in selling goods and services in the family business.	

Assessment Rubric

Indicators	**Exceeds Expectations**	**Meets Expectations**	**Approaches Expectations**	**Below Expectations**
Preparing a simple budget	Prepares a simple budget accurately and with ease	Prepares a simple budget accurately	Inconsistently prepares a simple budget	Little evidence in preparing a simple budget
Working out profit and loss	Works out profit and loss accurately and with ease	Works out profit and loss accurately	Inconsistently works out profit and loss	Little evidence in working out profit and loss
Identifying types of taxes	Identifies types of taxes accurately and with ease	Identifies types of taxes accurately	Inconsistently identifies types of taxes	Little evidence in identifying types of taxes
Using IT devices to learn more about profit and loss	Uses IT devices to learn more about profit and loss efficiently and with ease	Uses IT devices to learn more about profit and loss efficiently	Inconsistently uses IT devices to learn more about profit and loss	Little evidence in using IT devices to learn more about profit and loss

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
3.0 GEOMETRY	3.1 Lines **(6 Lessons)**	By the end of the sub-strand, the learner should be able to; a) Construct parallel lines in different situations, b) Bisect lines through construction, c) Construct perpendicular lines in different situations, d) Use it devices for more learning on lines and leisure e) Appreciate use of lines in daily life.	• Learners in pairs/ groups or as individuals to construct parallel lines using geometrical instruments. • Learners in pairs/groups or as individuals to bisect lines using geometrical instruments. • Leaners in pairs/groups or as individuals to construct perpendicular lines using geometrical instruments. • Learners in pairs/groups or as individuals to play digital games.	1. Why do we need to construct lines? 2. How can you construct a line?
Core Competencies to be developed: Communication and collaboration as learners work in pairs/groups when constructing and bisecting lines. **Creativity and imagination** as learners use perpendicular lines in day to day life.				
PCIs: Social cohesion as leaners work in pairs and groups. **Safety** as leaners are guided to carefully handle drawing instruments.			**Values: Unity** as learners work in groups. **Responsibility** as learners take turns in sharing drawing instruments	

Links to other subjects: Creative Arts and **Languages** as learners construct and discuss. **Social Studies** as learners interact with various lines in the environment.	**Suggested Community Service Learning Activities:** Use lines to make patterns for beauty display at home and in community offices. Learners could visit a surveyor or construction project to appreciate the importance of various lines e.g. perpendicular and parallel lines.

Assessment Rubric

Indicators	**Exceeds Expectations**	**Meets Expectations**	**Approaches Expectations**	**Below Expectations**
Constructing parallel lines	Constructs parallel lines accurately and with ease	Constructs parallel lines accurately	Inconsistently constructs parallel lines	Little evidence in constructing parallel lines
Bisecting lines through construction	Bisects lines through construction accurately and with ease	Bisects lines through construction accurately	Inconsistently bisects lines through construction	Little evidence in bisecting lines through construction
Constructing perpendicular lines	Constructs perpendicular lines accurately and with ease	Constructs perpendicular lines accurately	Inconsistently constructs perpendicular lines	Little evidence in constructing perpendicular lines

Using IT devices for more learning on lines	Uses IT devices for more learning on lines efficiently and with ease	Uses IT devices for more learning on lines efficiently	Inconsistently uses IT devices for more learning on lines	Little evidence in using IT devices for more learning on lines

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
3.0 GEOMETRY	3.2 Angles **(6 Lessons)**	By the end of the Sub Strand, the learner should be able to; a) identify angles on a straight line in different situations, b) measure angles on a straight line in different situations, c) determine the sum of angles in a triangle practically, d) use IT devices for learning more on angles and for enjoyment, e) appreciate use of angles in real life.	• Learners in pairs/groups or as individuals to identify angles on a straight line practically. • Learners in pairs/groups or as individuals to measure angles on a straight line in degrees • Learners in pairs/groups or as individuals to practically establish that the sum of angles in a triangle is equal to two (2) right angles. • Learners in pairs/groups or as individuals to play digital games involving angles.	Where can you use angles in real life?
Core Competencies to be developed: Critical thinking and problem solving as learners measure angles using a protractor. **Learning to learn** as learners measure and confirm the sum of angles on a straight line and a triangle. **Self-efficacy** as learners learn to practically establish that the sum of angles in a triangle is equal to 2 right angles				

PCIs: Social cohesion as leaners work in pairs and groups. **Safety** as learners handle different instruments. **Environmental education** as learners discover use of angles in daily life. **Education for Sustainable Development:** Career in construction, engineering, survey and piloting.	**Values: Honesty** and **unity** as learners share and take turns in using the instruments. **Responsibility** as learners learn to be precise in making measurements.
Links to other subjects: Creative Arts and Languages as learners measure, draw and discuss.	**Suggested Community Service Learning Activities:**Learners could explain the importance of straight lines and angles in daily life situations to family members and community e.g. planting of crops

Assessment Rubric

Indicators	**Exceeds Expectations**	**Meets Expectations**	**Approaches Expectations**	**Below Expectations**
Identifying angles on a straight line	Identifies angles on a straight line accurately and with ease	Identifies angles on a straight line accurately	Inconsistently identifies angles on a straight line	Little evidence in identifying angles on a straight line
Measuring angles in degrees	Measures angles in degrees accurately and with ease	Measures angles in degrees accurately	Inconsistently measures angles in degrees	Little evidence in measuring angles in degrees

Determining the sum of angles in a triangle	Determines the sum of angles in a triangle accurately and with ease	Determines the sum of angles in a triangle accurately	Inconsistently determines the sum of angles in a triangle	Little evidence in determining the sum of angles in a triangle
Using IT devices for learning more on angles	Uses IT devices for learning more on angles efficiently and with ease	Uses IT devices for learning more on angles efficiently	Inconsistently use IT devices for learning more on angles	Little evidence in using IT devices for learning more on angles

Strand	Sub Strand	Specific Learning Outcome	Suggested Learning Experiences	Key Inquiry Questions
3.0 GEOMETRY	**3**.3 3-D Objects **(6 Lessons)**	By the end of the Sub Strand, the learner should be able to; a) Identify vertices, faces and edges in 3-D objects, b) Use IT devices for learning more on 3-D objects and for enjoyment, c) Appreciate use of 3-D objects in real life.	• Learners in pairs/ groups or as individuals are guided to identify 3-D objects in the environment. • Learners in pairs/ groups to identify cubes, cuboids, cylinders and pyramids in the environment. • Learners in pairs and groups to identify vertices, faces and edges of cubes, cuboids, cylinders and pyramids in different situations. • Learners in pairs/groups or as individuals to play digital games.	Where can we use 3-D objects?
Core Competencies to be developed: Critical thinking and problem solving as learners recognise 3-D shapes used for making 3-D objects. **Learning to learn** as learners explore 3-D objects in their environment.				

PCIs: Social cohesion as leaners discuss and agree with each other's views. **Environmental education** as learners identify 3-D objects in their environment. **Education for Sustainable Development:** Career in engineering, survey and construction sector.	**Values: Responsibility** as leaners explore what makes 3-D objects different.
Links to other subjects: Creative Arts and Languages as learners establish and discuss the differences between 3-D objects.	**Suggested Community Service Learning Activities:** Learners may help identify and organise visual information at home and in the community on the importance of 3-D shapes in daily life.

Assessment Rubric

Indicators	**Exceeds Expectations**	**Meets Expectations**	**Approaches Expectations**	**Below Expectations**
Identifying vertices, faces and edges in 3-D objects	Identifies vertices, faces and edges in 3-D objects correctly and with ease	Identifies vertices, faces and edges in 3-D objects correctly	Inconsistently identifies vertices, faces and edges in 3-D objects	Little evidence in identifying vertices, faces and edges in 3-D objects,
Using IT devices for learning more on 3-D objects	Uses IT devices for learning more on 3-D objects efficiently and with ease	Uses IT devices for learning more on 3-D objects efficiently	Inconsistently uses IT devices for learning more on 3-D objects	Little evidence in using IT devices for learning more on 3-D objects

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
4.0 DATA HANDLING	4.1 Bar Graphs **(10 Lessons)**	By the end of the Sub Strand, the learner should be able to; a) Collect and represent data from real life situations using tables, b) Represent data from real life situations through piling, c) Represent data from real life situations using bar graphs, d) Interpret information from bar graphs, e) Use it devices for learning more on bar graphs and for leisure, f) Appreciate use of bar graphs in real life.	• Learners in pairs/groups or as individuals are guided to collect data and organise it in a frequency table. • Learners in pairs/groups or as individuals to represent information through piling similar objects like matchboxes vertically. • Learners in pairs/groups to represent information by drawing bar graphs. • Learners in pairs/groups to discuss information represented on bar graphs. • Learners in pairs/groups or as individuals to use IT devices to learn more on representing data using bar graphs.	How can bar graphs be used in real life situations?-

Core Competencies to be developed: Communication and collaboration as learners discuss in groups. **Creativity and imagination** as learners interpret data from bar graphs. **Digital literacy** as learners use IT devices to learn more on how to represent data using bar graphs.	
PCIs: Safety as learners collect data in the environment. **Education for Sustainable Development:** Learners relate bar graphs to careers in research and banking.	**Values: Honesty** as learners collect and represent data. **Responsibility and respect** as learners work and share in groups.
Links to other subjects: Languages as learners discuss in groups. **Science and Technology** as learners collect information from different sources.	**Suggested Community Service Learning Activities:** Learners may discuss with family members how they can use bar graphs to represent information at home. Learners may assist farmers collect data, for example, on how to use their land in relation to farm outputs and to represent this information as bar graphs that may be used by farmers for improving their activities.

Assessment Rubric

Indicators	Exceeds Expectations	Meets Expectations	Approaches Expectations	Below Expectations
Collecting and representing data using tables	Collects and represents data using tables accurately and with ease	Collects and represents data using tables accurately	Inconsistently collects and represents data using tables	Little evidence in collecting and representing data using tables

Representing data through piling	Represents data through piling accurately and with ease	Represents data through piling accurately	Inconsistently represents data through piling	Little evidence in representing data through piling
Representing data using bar graphs	Represents data using bar graphs accurately and with ease	Represents data using bar graphs accurately	Inconsistently represents data using bar graphs	Little evidence in representing data using bar graphs
Interpreting information from bar graphs	Interprets information from bar graphs accurately and with ease	Interprets information from bar graphs accurately	Inconsistently interprets information from bar graphs	Little evidence in Interpreting information from bar graphs
Using IT devices to learn more about bar graphs	Uses IT devices to learn more about bar graphs efficiently and with ease	Uses IT devices to learn more about bar graphs efficiently	Inconsistently uses IT devices to learn more about bar graphs	Little evidence in using IT devices to learn more about bar graphs

Strand	Sub Strand	Specific Learning Outcome	Suggested Learning Experiences	Key Inquiry Questions
5.0 ALGEBRA	5.1 Inequalities **(8 Lessons)**	By the end of the Sub Strand, the learner should be able to; a) Form simple inequalities in one unknown involving real life situations, b) Simplify simple inequalities in one unknown involving real life situations, c) Use it devices to simplify inequalities and play digital games involving inequalities. d) Appreciate use of algebraic expressions in real life.	• Learners in pairs/ groups or as individuals to discuss meaning of algebraic inequality symbols ' > ' and ' < ' • Learners in pairs/groups or as individuals to form algebraic inequalities in one unknown using different operations. • Learners in pairs/ groups or as individuals to simplify algebraic inequalities in one unknown. • Learners in pairs/groups or as individuals to use IT devices to simplify algebraic inequalities and play digital games.	Where are algebraic expressions used?
Core Competencies to be developed: Communication and collaboration as learners discuss algebraic inequalities. **Critical thinking and problem solving** as learners form and simplify algebraic inequalities. **Digital literacy** as learners learn how to use digital devices to learn more on algebraic inequalities and play digital games.				

PCIs: Education for Sustainable Development: Learners discover careers related to inequalities e.g. in business as statisticians and health care providers.	**Values: Responsibility** as learners represent their groups in working out questions. **Social cohesion** as learners work in groups.
Links to other subjects: Languages as learners work in groups.	**Suggested Community Service Learning Activities**: Learners may visit a local shop and assist in measuring masses of different items.

Assessment Rubric

Indicators	**Exceeds Expectations**	**Meets Expectations**	**Approaches Expectations**	**Below Expectations**
Forming inequalities in one unknown	Forms inequalities in one unknown accurately and with ease	Forms inequalities in one unknown accurately	Inconsistently forms inequalities in one unknown	Little evidence in forming inequalities in one unknown
Simplifying inequalities in one unknown	Simplifies inequalities in one unknown accurately and with ease	Simplifies inequalities in one unknown accurately	Inconsistently simplifies inequalities in one unknown	Little evidence in simplifying inequalities in one unknown
Using IT devices to simplify inequalities	Uses IT devices to simplify inequalities efficiently and with ease	Uses IT devices to simplify inequalities efficiently	Inconsistently uses IT devices to simplify inequalities	Little evidence in using IT devices to simplify inequalities

Suggested Resources

Strand	Sub Strand	Resources
NUMBERS	Whole numbers	Place value apparatus, number charts, number cards, multiplication table
	Multiplication	Multiplication tables
	Division	Multiplication tables
	Fractions	Equivalent fraction board, circular and rectangular cut outs, counters
	Decimals	Place value charts, number cards
MEASUREMENT	Length	Metre rule, 1metre ticks, tape measure
	Area	Square cut outs, 1cm squares, 1m squares
	Capacity	Tea spoons, containers of different sizes, water, sand, soil,
	Mass	Tea spoons, soil or sand, manual/electronic weighing machine, beam balance,
	Time	Analogue and digital clocks, digital watches, stop watches
	Money	Price list, classroom shop, electronic money tariff charts
GEOMETRY	Lines	Chalk board ruler, 30cm ruler, straight edges
	Angles	Unit angles, protractors, rulers
	3-D objects	Cubes, cuboids, cylinders, pyramids, spheres, cut outs of rectangles, circles, and triangles of different sizes
DATA HANDLING	Bar graphs	Bar graph worksheets, data graph worksheets, data samples from different sources

ALGEBRA	Inequalities	Digital inequality worksheets; greater than, less than or equal to, sorting cards.

Note

The following ICT devices may be used in the teaching/learning of mathematics at this level;
Learner digital devices (LDD),teacher digital devices(TDD), mobile phones, digital clocks, television sets, videos, cameras, projectors, radios, DVD players, CD's, scanners, internet among others.