REPUBLIC OF KENYA

MINISTRY OF EDUCATION

JUNIOR SECONDARY SCHOOL CURRICULUM DESIGN

GRADE 7

MATHEMATICS

KENYA INSTITUTE OF CURRICULUM DEVELOPMENT
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FOREWORD

Curriculum is a tool which a country employs to empower its citizens. The Kenya Institute of Curriculum Development in meeting its core mandate *'to develop curriculum and curriculum support materials'* has spearheaded curriculum reforms in the education sector. The reforms are based on rigorous research, monitoring and evaluation activities conducted on the 8-4-4 system of education to inform the Competency-Based Curriculum through a phase-in phase-out model. The reforms were informed by the Summative Evaluation Survey (2009), Needs Assessment Study (2016) and the Task Force Report on Re-alignment of Education Sector (2012), 21st century learning and approaches, the East Africa Protocol on harmonisation of education, among many others.

The curriculum reforms aim at meeting the needs of the Kenyan society by aligning the curriculum to the Constitution of Kenya 2010, the Kenya Vision 2030 and the East African Protocol, among other policy requirements as documented by the Sessional Paper No. 1 of 2019 on 'Reforming Education and Training in Kenya for Sustainable Development'. The reforms adopted the Competency-Based Curriculum (CBC) to achieve development of requisite knowledge, skills, values and attitudes that will drive the country's future generations as documented by the Basic Education Curriculum Framework (BECF). Towards achieving the mission of the Basic Education, the Ministry of Education has successfully and progressively rolled out curriculum implementation for Early Years Education, Grades 4 and 5. The roll out for Grade 6 and Junior Secondary (Grade 7-9) will subsequently follow.

It is my hope that the curriculum designs for Grade 7 will guide the teachers, among other educational stakeholders, for progressive achievement of the curriculum vision which seeks to have engaged, empowered and ethical citizens.

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PREFACE

The Government of Kenya embarked on the national implementation of the Competency Based Curriculum in January, 2019 for Early Years Education (Pre-Primary 1 and 2, and Lower Primary Grade 1, 2 and 3). The implementation progressed to Upper Primary (Grade 4, 5 and 6) based on the reorganization of the Basic Education structure. Grade 7 curriculum furthers implementation of the Competency-Based curriculum to Junior Secondary education level. This level marks the zenith of Middle School education whose main feature is to offer a broad opportunity for the learner to explore talents, interests and abilities before selection of pathways and tracks in Senior Secondary education level.

The Grade 7 curriculum designs for the respective learning areas will enable the development of twenty first century competencies. Ultimately, this will lead to the realization of the vision and mission of the Competency-Based curriculum as documented in the Basic Education Curriculum Framework (KICD, 2017).

It is my hope that all government agencies among other stakeholders in education will use the designs to guide effective and efficient implementation of the learning activities as well as provide relevant feedback on various aspects of the curriculum. Successful implementation of the Grade 7 curriculum will be a significant milestone towards realization of the curriculum mission 'Nurturing Every Learner's Potential'.

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ACKNOWLEDGEMENT

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

The Kenya Institute of Curriculum Development has developed the Grade 7 curriculum designs taking cognisance of the tenets of the CBC, key among them being the need to ensure that learners are provided with learning experiences that call for higher order thinking, thereby ensuring they become engaged, empowered and ethical citizens as articulated in the BECF Vision. The Grade 7 designs also provide opportunities for learners to develop the core competencies as well as engage in Community Service Learning. The designs present assessment rubrics linked to sub strands in the individual subjects. Teachers are encouraged to use varied assessment tools when assessing learners.

KICD obtains its funding from the Government of Kenya to enable the achievement of its mandate and implementation of the Government and Sector (Ministry of Education (MoE) plans. The Institute also receives support from development partners targeting specific programmes. The Grade 7 curriculum designs have been developed with the support of the World Bank through the Kenya Secondary Education Quality Improvement Program (SEQIP) commissioned by the MoE. The Institute is grateful for the support accorded to the process by the Government of Kenya, through the MoE and the development partners for the policy, resource, and logistical support.

I acknowledge the KICD curriculum developers and other staff, teachers and all the educators who participated, as panelists, in the development of the designs. I also appreciate the contribution of the Semi-Autonomous Government Agencies

(SAGAs) and representatives of various stakeholders for their various roles in the development of the Grade 7 curriculum designs.

My special thanks to the Cabinet Secretary, Ministry of Education; the Principal Secretary State Department of Early Learning and Basic Education; the Secretary, Teachers' Service Commission (TSC) and the Chief Executive Officer, Kenya National Examinations Council (KNEC) for their support in the process. Finally, I am grateful to the KICD Governing Council for their consistent guidance during the development of the curriculum designs. The Institute assures all curriculum implementers, parents, and other stakeholders that the designs will ensure effective implementation of the CBC at Grade 7.

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TIME ALLOCATION

No	Subject	Number of Lessons Per Week (40 minutes per lesson)
1.	English	5
2.	Kiswahili/KSL	4
3.	Mathematics	5
4.	Integrated Science	4
5.	Health Education	2
6.	Pre-Technical and Pre-Career Education	5
7.	Social Studies	3
8.	Religious Education (CRE/IRE/HRE)	2
9.	Business Studies	3
10.	Agriculture	3
11.	Life Skills Education	1
12.	Physical Education and Sports	2
13.	Optional Subject	3
14.	Optional Subject	3
	Total	**45**

NATIONAL GOALS OF EDUCATION

Education in Kenya should:

i) Foster nationalism and patriotism and promote national unity.

Kenya's people belong to different communities, races and religions, but these differences need not divide them. They must be able to live and interact as Kenyans. It is a paramount duty of education to help young people acquire this sense of nationhood by removing conflicts and promoting positive attitudes of mutual respect which enable them to live together in harmony and foster patriotism in order to make a positive contribution to the life of the nation.

ii) Promote the social, economic, technological and industrial needs for national development.

Education should prepare the youth of the country to play an effective and productive role in the life of the nation.

a) Social Needs

Education in Kenya must prepare children for changes in attitudes and relationships which are necessary for the smooth progress of a rapidly developing modern economy. There is bound to be a silent social revolution following in the wake of rapid modernization. Education should assist our youth to adapt to this change.

b) Economic Needs

Education in Kenya should produce citizens with the skills, knowledge, expertise and personal qualities that are required to support a growing economy. Kenya is building up a modern and independent economy which is in need of an adequate and relevant domestic workforce.

c) Technological and Industrial Needs

Education in Kenya should provide learners with the necessary skills and attitudes for industrial development. Kenya recognizes the rapid industrial and technological changes taking place, especially in the developed world. We can only be part of this development if our education system is deliberately focused on the knowledge, skills and attitudes that will prepare our young people for these changing global trends.

iii) Promote individual development and self-fulfilment

Education should provide opportunities for the fullest development of individual talents and personality. It should help children to develop their potential interests and abilities. A vital aspect of individual development is the building of character.

iv) Promote sound moral and religious values.

Education should provide for the development of knowledge, skills and attitudes that will enhance the acquisition of sound moral values and help children to grow up into self-disciplined, self-reliant and integrated citizens.

v) **Promote social equality and responsibility.**
Education should promote social equality and foster a sense of social responsibility within an education system which provides equal educational opportunities for all. It should give all children varied and challenging opportunities for collective activities and corporate social service irrespective of gender, ability or geographical environment.

vi) Promote respect for and development of Kenya's rich and varied cultures.
Education should instill in the youth of Kenya an understanding of past and present cultures and their valid place in contemporary society. Children should be able to blend the best of traditional values with the changing requirements that must follow rapid development in order to build a stable and modern society.

vii) Promote international consciousness and foster positive attitudes towards other nations.
Kenya is part of the international community. It is part of the complicated and interdependent network of peoples and nations. Education should therefore lead the youth of the country to accept membership of this international community with all the obligations and responsibilities, rights and benefits that this membership entails.

viii. Promote positive attitudes towards good health and environmental protection.
Education should inculcate in young people the value of good health in order for them to avoid indulging in activities that will lead to physical or mental ill health. It should foster positive attitudes towards environmental development and conservation. It should lead the youth of Kenya to appreciate the need for a healthy environment.

LEARNING OUTCOMES FOR MIDDLE SCHOOL

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

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

ESSENCE STATEMENT

We live in a world of Mathematics whereby we count, add, subtract, multiply or divide quantities and substances throughout our daily interactions. Mathematics involves understanding numbers and the numerical operations used to develop strategies for mental mathematical problem-solving skills, estimation and computational fluency. We live in a world of space, shape and structures. It is impossible to think of a world without Mathematics. It is applied in the economic activities, scientific, social, religious and political worlds. It is therefore imperative that children are taught Mathematics from early years.

In Junior Secondary, Mathematics builds on the competencies acquired by the learner from primary school. It enhances the learner's competencies in mathematical skills as a foundation for Science, Technology, Engineering and Mathematics (STEM) and other pathways at Senior School. Mathematics also prepares the learner to have sufficient skills and competencies for application in solving problems in real life situations. This is in line with vision 2030 and sessional paper number 1 of 2019 which emphasizes on STEM areas.

SUBJECT GENERAL LEARNING OUTCOMES

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

1) Demonstrate mastery of number concepts by working out problems in day to day life
2) Represent and apply algebraic expressions in different ways
3) Apply measurement skills to find solutions to problems in a variety of contexts
4) Use money and carry out financial transactions in real life situations
5) Generate geometrical shapes and describe spatial relationships in different contexts
6) Collect and organize data to inform and solve problems in real life situations
7) Develop logical thinking, reasoning, communication and application skills through a mathematical approach to problem solving
8) Apply mathematical ideas and concepts to other learning areas or subjects and in real life contexts.
9) Develop confidence and interest in mathematics for further training and enjoyment.

STRAND1.0: NUMBERS
Sub Strand: Whole Numbers

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 hundreds of millions in real life b) read and write numbers in symbols up to hundreds of millions in real life situations c) read and write numbers in words up to millions for efficiency d) round off numbers up to the nearest hundreds of millions in real life situations e) classify natural numbers as even, odd and prime in different situations	The learner is guided to: • identify and write place value and total value of digits using place value apparatus • read and write numbers in symbols on number cards or charts • read and write numbers in words on number cards or charts and practice writing dummy cheques for different sums of money • prepare and use place value charts to round off numbers • play a number game, make number cards, sort and classify numbers according to those that are even, odd or prime • work out or perform 2, 3 or more combined operations in the correct order using digital devices	1. Why do we write numbers in words and/or symbols? 2. Where do we write numbers in words or symbols? 3. Why do we round off numbers in real life situations?

		f) apply operations of whole numbers in real life situations g) identify number sequence in different situations h) create number sequence for playing number games i) use IT devices for learning more on whole numbers and for enjoyment j) appreciate use of whole numbers in real life situations.	• identify the number patterns to work out number sequences • play games of creating number puzzles that involve number sequences using IT devices or other materials.	

Core Competencies to be developed:

- **Communication and collaboration**: Speaking, listening and team work as learners work in pairs or groups to prepare and use place value charts to round off numbers.
- **Critical thinking and problem solving**: Interpretation and inference as learners work together to identify number patterns.
- **Creativity and Imagination**: Making observations as learners play games of creating number puzzles that involve number sequences.

Values:

- **Respect** as learners work in pairs/groups and play number games.
- **Unity** as learners work towards achieving set goals of making number puzzles.
- **Peace** as learners work in groups and share different roles in playing games.

Pertinent and contemporary Issues (PCIs):

- **Financial literacy** as learners practice writing dummy cheques for different sums of money.

• **Self–esteem**: as learners create number puzzles that involve number sequences.
Links to other subjects • **Business studies**: writing numbers in words and in symbols as the learners practice writing dummy cheques at home. • **Computer Studies**: as learners use digital devices to play number games. • **Languages**: writing numbers in words.

Assessment Rubric				
Indicators	**Exceeds Expectations**	**Meets Expectations**	**Approaches Expectations**	**Below Expectations**
Ability to use place value and total value of digits up to hundreds of millions	Uses place value and total value of digits up to hundreds of millions, correctly and systematically	Uses place value and total value of digits up to hundreds of millions correctly	Uses place value or total value of digits up to hundreds of millions correctly	Uses place value or total value of digits up to hundreds of millions with difficulties
Ability to read and write numbers in symbols up to hundreds of millions	Reads and writes numbers in symbols correctly and proficiently	Reads and writes numbers in symbols correctly	Reads or writes numbers in symbols correctly	Reads or writes numbers in symbols with difficulties
Ability to read and write numbers in words up to millions	Reads and writes numbers in words up to millions correctly and proficiently	Reads and writes numbers in words up to millions correctly	Reads or writes some numbers in words up to millions correctly	Reads and writes numbers in words up to millions with difficulties

Ability to round off numbers up to the nearest hundreds of millions	Rounds off numbers up to the nearest hundreds of millions accurately and systematically	Rounds off numbers up to the nearest hundreds of millions accurately	Rounds off some numbers up to the nearest hundreds of millions accurately	Rounds off some numbers up to the nearest hundreds of millions with difficulties
Ability to classify natural numbers as even, odd and prime	Classifies natural numbers as even, odd and prime systematically and accurately	Classifies natural numbers as even, odd and prime accurately	Classifies some natural numbers as even or odd or prime accurately	Classifies some natural numbers as even, odd and prime with difficulties
Ability to apply operations of whole numbers	Applies operations of whole numbers accurately and proficiently	Applies operations of whole numbers accurately	Applies operations of some whole numbers accurately	Applies operations of some whole numbers with major errors
Ability to identify number sequence	Identifies number sequence correctly and determines missing numbers	Identifies number sequence correctly	Identifies some number sequences correctly	Identifies some number sequences with difficulties
Ability to create number sequence	Creates number sequence correctly and systematically	Creates number sequence correctly	Creates some number sequences correctly	Attempts to create some number sequences with difficulties

Sub Strand: Factors

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
1.0 Numbers	**1.2 Factors** (7 lessons)	By the end of the sub strand, the learner should be able to: a) test divisibility of numbers by 2, 3, 4, 5, 6, 8, 9,10 and 11 in different situations b) express composite numbers as a product of prime factors in different situations c) work out the Greatest Common Divisor (GCD) and the Least Common Multiples (LCM) of numbers by factor method in different situations d) apply the Greatest Common Divisor (GCD) and the Least Common Multiples (LCM) in real life situations e) use IT devices for learning more on factors and for enjoyment f) appreciate use of factors in real life situations.	The learner is guided to: • determine divisibility of numbers using regrouping and divisibility rule work sheets • write factors of composite numbers by factorization, factor tree, factor rainbow in charts, colour charts or cards using locally available materials • use factors to determine the LCM and the GCD using number cards or charts • use IT to access factors of numbers including songs/poems or games on divisibility tests • work out application questions and solve problems relating to the GCD and the LCM in real life situations.	1. Where do we use factors in day to day activities? 2. How do we use factors in day to day activities? 3. How do we apply the GCD and the LCM in day to day activities?

			• determine the GCD and LCM of numbers using IT to perform exercises on factors such as matching activities or games.	

Core Competencies to be developed:

- **Creativity and imagination**: Making connections as learners work in groups to create songs and poems on divisibility tests.
- **Critical thinking and problem solving**: Interpretation and inference as learners apply the GCD and the LCM in solving real life problems.

Values:

- **Unity** as learners sing together or solve puzzles on factors.
- **Respect for self and others** as learners work in groups to write factors of composite numbers using factor tree.

PCIs

- **Self-awareness** as learners work in groups to create songs and poems on divisibility tests
- **Education for Sustainable Development (ESD)** as learners use locally available materials for making number cards and charts

Links to other subjects

- **Music** as learners work in groups to create songs and poems on divisibility tests.
- **Home Science** as learners apply LCM or GCD as they plan for smallest or largest containers for measuring different substances.

Assessment Rubric				
Indicators	**Exceeds Expectations**	**Meets Expectations**	**Approaches Expectations**	**Below Expectations**
Ability to test divisibility of numbers by 2, 3, 4, 5, 6, 8, 9,10 and 11	Tests divisibility of numbers by 2, 3, 4, 5, 6, 8, 9,10 and 11 accurately and systematically	Tests divisibility of numbers by 2, 3, 4, 5, 6, 8, 9,10 and 11 accurately	Tests divisibility of some numbers by 2, 3, 4, 5, 6, 8, 9,10 and 11 accurately	Tests divisibility of some numbers by 2, 3, 4, 5, 6, 8, 9,10 and 11 with difficulties
Ability to express composite numbers as a product of prime factors	Expresses composite numbers as a product of prime factors correctly and writes the answer in power form	Expresses composite numbers as a product of prime factors correctly	Expresses some composite numbers as a product of prime factors correctly	Expresses some composite numbers as a product of prime factors with difficulties
Ability to work out the Greatest Common Divisor (GCD) and the Least Common Multiples (LCM) of numbers by factor method	Work out the Greatest Common Divisor (GCD) and the Least Common Multiples (LCM) of numbers by factor method correctly and systematically	Works out the Greatest Common Divisor (GCD) and the Least Common Multiples (LCM) of numbers by factor method correctly	Works out the Greatest Common Divisor (GCD) and the Least Common Multiples (LCM) of some numbers by factor method correctly	Works out the Greatest Common Divisor (GCD) and the Least Common Multiples (LCM) of some numbers by factor method with difficulties
Ability to apply the Greatest Common	Applies the GCD and the LCM correctly	Applies the Greatest Common Divisor	Applies either the Greatest Common	Applies either the GCD or the LCM in

Divisor (GCD) and the Least Common Multiples (LCM) in real life situations	using examples in real life situations	(GCD) and the LCM correctly in real life situations	Divisor (GCD) or the LCM correctly in real life situations	real life situations with difficulties

Sub Strand: Fractions

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
1.0 Numbers	**1.3 Fractions** (9 lessons)	By the end of the sub strand, the learner should be able to: a) compare fractions in different situations b) add fractions in different situations c) subtract fractions in different situations d) multiply fractions by a whole number, fraction and a mixed number in real life situations e) identify the reciprocals of fractions in different situations f) divide fractions by a whole number, fraction and a mixed fraction in real life situations g) divide a whole number by fractions in different situations	The learner is guided to: • discuss and arrange fractions in increasing and decreasing order using different strategies • arrange fractions in ascending or descending order using fraction cards • add and subtract fractions in cut outs, cards, charts and concrete objects • multiply and divide fractions in cut outs, cards, charts and models • use flip cards to discuss reciprocals • play games of creating number puzzles that involve fractions number sequences using IT devices or other materials	1. How do we use fractions in daily activities? 2. Where do we use fractions in daily activities?

		h) identify number sequence involving fractions in different situations i) create number sequence involving fractions for playing number games j) use IT devices for learning more on fractions and for enjoyment k) appreciate the use of fractions in real life situations.	• create a fraction sequence game that can be used for play and learning • use IT devices to work out operations of fractions.	
Core Competencies to be developed: • **Creativity and imagination**: Observed as learners create puzzles involving fractions. • **Critical thinking and problem solving**: Evaluation and decision making as learners apply fractions using cut outs, cards, charts and models from local resources.				
Values • **Social justice**: as learners share things fairly • **Responsibility**: as learners perform multiplication and division of fractions when sharing or allocating resources.				
Pertinent and Contemporary Issues (PCIs) • **Citizenship** as learners carry out division of fractions which implies sharing • **Social cohesion** as learners share items at home and outside school using fractions				
Links to other subjects • **Music** as learners use fractions in types of musical notes like semi- quavers (1/16), quavers. • **Agriculture** as learners give fractional portions of animal feeds.				

Assessment Rubric				
Indicators	**Exceeds Expectations**	**Meets Expectations**	**Approaches Expectations**	**Below Expectations**
Ability to compare fractions	Compares fractions using various methods correctly	Compares fractions correctly	Compares fractions partially	Compares fractions with difficulties
Ability to add fractions	Adds fractions correctly using various methods	Adds fractions correctly	Adds some fractions correctly	Adds fractions with difficulties
Ability to subtract fractions	Subtracts fractions precisely	Subtracts fractions correctly	Subtracts some fractions correctly	Subtracts fractions with difficulties
Ability to multiply fractions by a whole number, fraction and a mixed number	Multiplies fractions by a whole number, a fraction and a mixed number using various methods	Multiplies fractions by a whole number, fraction and a mixed number correctly	Multiplies fractions by a whole number or a fraction or a mixed number correctly	Multiplies fractions by a whole number, a fraction and a mixed number with difficulties
Ability to find reciprocals of fractions	Finds reciprocals of fractions systematically	Finds reciprocals of fractions correctly	Finds reciprocals of some fractions correctly	Finds the reciprocals of fractions with difficulties
Ability to divide fractions by a whole number, fraction and a mixed number	Divides fractions by a whole number, fraction and a mixed number correctly and proficiently	Divides fractions by a whole number, fraction and a mixed number correctly	Divides fractions by a whole number, fraction or a mixed number correctly	Divides fractions by a whole number, a fraction or a mixed number with difficulties

Ability to divide a whole number by fractions	Divides a whole number by fractions proficiently	Divides a whole number by fractions correctly	Divides a whole number by fractions partially	Divides a whole number by fractions with difficulties
Ability to identify number sequence involving fractions	Identifies fractions sequence correctly and proficiently	Identifies fractions sequence accurately	Identifies fractions sequence partially	Identifies simple fractions sequences with difficulties
Ability to create number Sequence involving fractions	Creates number sequence involving fractions correctly and systematically	Creates number sequence involving fractions Correctly	Creates number sequence involving fractions partially	Creates number sequence involving fractions with difficulties

Sub Strand: Decimals

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
1.0 Numbers	1.4 **Decimals** (4 lessons)	By the end of the sub strand, the learner should be able to: a) identify the place value and the total value of digits in decimals in real life b) multiply decimals by a whole number and by a decimal in real life situations c) divide decimals by a whole number and by a decimal in real life situations d) use IT devices for learning more on decimals and for enjoyment e) appreciate the use of decimals in real life situations.	The learner is guided to: • discuss, state and use the place value and total the value of decimals using place value apparatus and worksheets • multiply and divide decimals using cut outs, cards, charts and models • use calculators and other IT devices to work out operations of decimals. • play games involving multiplication and division of decimals.	1. Where are decimals applicable in real life? 2. How do you use decimals in daily activities?
Core Competencies to be developed: • **Critical thinking and problem solving**: Open mindedness and creativity as learners identify and use the place value and the total value of decimals using place value apparatus and worksheets. • **Digital literacy**: Interacting with technology; as learners use IT gadgets to learn more on decimals.				
Values • **Unity** as learners work in groups to multiply and divide decimals using cut outs, cards, charts and models. • **Responsibility** as learners perform multiplication and division of decimals.				
Pertinent and Contemporary Issues (PCIs)				

Safety as learners make paper cut outs or other materials and models.

Links to other subjects • **Integrated Science** - quantities expressed in decimal forms in measurement • **Home science** as learners measure mass of ingredients for cooking in decimals.

Assessment Rubric				
Indicators	**Exceeds Expectations**	**Meets Expectations**	**Approaches Expectations**	**Below Expectations**
Ability to identify place value and total value of decimals	Identifies place value and total value of decimals correctly and proficiently	Identifies place value and total value of decimals correctly	Identifies place value or total value of decimals correctly	Identifies place value or total value of decimals with difficulties
Ability to multiply decimals by a whole number and by a decimal	Multiplies decimals by a whole number and by a decimal correctly and proficiently	Multiplies decimals by a whole number and by a decimal correctly	Multiplies decimals by a whole number or a decimal correctly	Multiplies decimals by a whole number or by a decimal with difficulties
Ability to divide decimals by a whole number and by a decimal	Divides decimals by a whole number and by a decimal systematically	Divides decimals by a whole number and by a decimal correctly	Divides decimals by a whole number or a decimal correctly	Divides decimals by a whole number or by a decimal with difficulties

Sub Strand: Squares and Square Roots

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Question(s)
1.0 Numbers	**1.5 Squares and Square Roots** (5 lessons)	By the end of the sub strand, the learner should be able to: a) determine the squares of whole numbers, fractions and decimals by multiplication in different situations b) determine the square roots of whole numbers, fractions and decimals of perfect squares in different situations c) use IT devices for learning more on squares and square roots and for enjoyment d) appreciate the use of squares and square roots in real life situations.	The learner is guided to: • work out squares of numbers using: ✓ grids and charts ✓ long multiplication method ✓ using calculators • work out square roots of number using: ✓ factors method ✓ division method ✓ calculators • use IT devices to play games involving squares and square roots	1. Where do we apply squares and square roots in daily activities? 2. How do we apply squares and square roots in daily activities?

Core Competencies to be developed:

- **Critical thinking and problem solving**: Reflection as learners use grid squares and charts to find squares and square roots.
- **Digital literacy**: Interacting with technologies as learners use IT devices to work out squares and square roots of numbers.

Values

- **Respect** as learners appreciate each other's contribution in groups in using grids and charts
- **Unity** as learners work in groups and work out the factors of numbers to get the square roots.

Pertinent and Contemporary Issues (PCIs)

- **Environmental education** as learners consider shapes of different objects in the school compound especially the ones that are squares.

Links to other subjects

- **Pre-career and pre-tech**: in areas such as carpentry and technical drawing.
- **Agriculture** as learners determine the number of seedlings that would fit in a square portion of land.

Assessment Rubric

Indicators	**Exceeds Expectations**	**Meets Expectations**	**Approaches Expectations**	**Below Expectations**
Ability to determine the squares of whole numbers, fractions and decimals by multiplication	Determines the squares of whole numbers, fractions and decimals by multiplication correctly and proficiently	Determines the squares of whole numbers, fractions and decimals by multiplication correctly	Determines the squares of whole numbers or fractions or decimals by multiplication	Determines the squares of whole numbers, fractions and decimals by multiplication with difficulties
Ability to determine the square roots of whole numbers,	Determines the square roots of whole numbers, fractions	Determines the square roots of whole numbers, fractions	Determines the square roots of whole numbers or fractions	Determines the square roots of whole numbers, fractions

fractions and decimals of perfect squares	and decimals of perfect squares correctly and proficiently	and decimals of perfect squares correctly	or decimals of perfect squares	and decimals of perfect squares with difficulties

STRAND 2.0: ALGEBRA
Sub Strand: Algebraic Expressions

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
2.0 Algebra	**2.1 Algebraic Expressions** (5 lessons)	By the end of the sub strands the learner should be able to: a) form algebraic expressions from real life situations b) form algebraic expressions from simple algebraic statements in real life situations c) simplify algebraic expressions in real life situations d) use IT devices for more learning on algebraic expressions and for enjoyment, e) appreciate the use of algebraic expressions in real life.	The learner is guided to: • discuss and classify objects in their immediate environment according to given attributes such as similarities or differences • discuss how to form algebraic expressions from the classified objects • read and interpret algebraic statements to form algebraic expressions • discuss how to simplify algebraic expressions from the classified objects • use IT to work out exercises and activities in algebra or drag and drop activities to group similar objects	How do we use algebraic expressions in daily activities?

Core Competencies to be developed:

- **Communication and collaboration:** Speaking, listening and team work**;** as learners discuss in groups on formation of algebraic expressions.
- **Critical thinking and problem solving:** Interpretation and inference**;** as learners factorize algebraic expressions

Values • **Unity** as learners classify/group similar object in groups. • **Respect** as learners appreciate each other's contribution while discussing and forming algebraic expressions.
• **Pertinent and Contemporary Issues (PCIs)** • **Environmental education** as learners classify objects from the environment. • **Friendship formation** as learners work and discuss in groups on formation of algebraic expressions.
Links to other subjects **Languages** as learners interpret statements to form algebraic expressions.

Assessment Rubric				
Indicators	**Exceeds Expectations**	**Meets Expectations**	**Approaches Expectations**	**Below Expectations**
Ability to form algebraic expressions	Forms algebraic expressions systematically	Forms algebraic expressions correctly	Forms algebraic expressions partially	Forms algebraic expressions with difficulties
Ability to form algebraic expressions from simple algebraic statements	Forms algebraic expressions from simple algebraic statements systematically	Forms algebraic expressions from simple algebraic statements correctly	Forms algebraic expressions from simple algebraic statements partially	Forms algebraic expressions from simple algebraic statements with difficulties
Ability to simplify algebraic expressions	Simplifies algebraic expressions correctly and proficiently	Simplifies algebraic expressions correctly	Simplifies algebraic expressions partially	Simplifies algebraic expressions with difficulties

Sub Strand: Linear Equations

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
2.0 Algebra	2.2 **Linear Equations** (6 lessons)	By the end of the sub strand, the learner should be able to: a) form linear equations in one unknown in different situations b) solve linear equations in one unknown in different situations c) apply linear equations in one unknown to real life situations d) use IT devices for more learning on linear equations and for enjoyment e) appreciate use of linear equations in real life situations.	The learner is guided to: • role play activities involving equations with one unknown for example weighing using beam balance and shopping activities • discuss how to form and solve linear equations generated from role play activities • use IT to form and solve linear equations.	1. How do we use linear equations in real life? 2. Why do we use linear equations in real life?

Core Competencies to be developed:

- **Communication and collaboration:** Speaking, listening and team work as learners' role play activities involving equations in one unknown.
- **Self-efficacy-:** Self-awareness skills as learners carry out weighing using beam balance and role play.
- **Learning to learn:** Organizing own learning as learners apply linear equations in real life.

Values

- **Integrity** as learners share resources as per the given equation (conditions).
- **Responsibility:** as learners use a given letter in the equation to represent an item.

Pertinent and Contemporary Issues (PCIs)
• **Social cohesion** as learners work in groups to role play in shopping activities. • **Self – esteem** as learners participate in role play activities like weighing and shopping that will lead to equations in one unknown.
Links to other subjects
• **Computer studies** as learners use IT devices in forming and solving equations.

Assessment Rubric				
Indicators	**Exceeds Expectations**	**Meets Expectations**	**Approaches Expectations**	**Below Expectations**
Ability to form linear equations in one unknown	Forms linear equations in one unknown systematically	Forms linear equations in one unknown correctly	Forms linear equations in one unknown partially	Forms linear equations in one unknown with difficulties
Ability to solve linear equations in one unknown	Solves linear equations in one unknown precisely	Solves linear equations in one unknown correctly	Solves linear equations in one unknown partially	Solves linear equations in one unknown with difficulties
Ability to apply linear equations in one unknown	Applies linear equations in one unknown correctly and systematically	Applies linear equations in one unknown correctly	Applies linear equations in one unknown partially	Applies linear equations in one unknown with difficulties

Sub Strand: Linear Inequalities

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
2.0 Algebra	**2.3 Linear Inequalities** (8 lessons**)**	By the end of the sub strand the learner should be able to: a) apply inequality symbols to inequality statements in learning situations b) form simple linear inequalities in one unknown in different situations c) illustrate simple inequalities on a number line d) form compound inequality statements in one unknown in different situations e) illustrate compound inequalities in one unknown on a number line f) use IT devices for more learning on linear inequalities and for enjoyment g) appreciate use of linear inequalities in real life.	The learner is guided to: • use inequality cards to complete simple inequality statements • use inequality cards/objects to form simple linear inequalities with one unknown • draw and represent simple inequality statements on a number line • use inequality cards to complete compound inequality statements • draw and represent compound inequality statements on a number line • use IT graphing tools to present solutions to inequalities.	1. How do we use linear inequalities in real life? 2. Why do we use linear inequalities in real life?
Core Competencies to be developed:				

- **Communication and collaboration:** Speaking and listening as learners discuss on how to form the linear inequalities.
- **Creativity and Imagination:** Open mindedness and creativity as learners draw and represent inequality statements on a number line.

Values

- **Social justice** as learners apply linear inequalities,
- **Integrity** as learners observe the conditions of the given inequalities.

Pertinent and Contemporary Issues (PCIs)

- **Health education:** observing the correct dosage in drugs / limits on drug consumption.
- **Gender equality**: gender representation for inclusivity.

Links to other subjects

- **Language** as learners form linear inequalities from different situation.
- **Pre – career and pre- technical** in measuring quantities.

Assessment Rubric

Indicators	**Exceeds Expectations**	**Meets Expectations**	**Approaches Expectations**	**Below Expectations**
Ability to apply inequality symbols to inequality statements	Applies inequality symbols to inequality statements comprehensively	Applies inequality symbols to inequality statements accurately	Applies inequality symbols to inequality statements partially	Applies inequality symbols to inequality statements with difficulties
Ability to form simple linear inequality in one unknown	Forms simple linear inequality in one unknown correctly and systematically	Forms simple linear inequality in one unknown correctly	Forms simple linear inequality in one unknown partially	Forms simple linear inequality in one unknown with difficulties

Ability to illustrate simple linear inequality on a number line	Illustrates simple linear inequality on a number line correctly and proficiently	Illustrates simple linear inequality on a number line correctly	Illustrates simple linear inequality on a number line partially	Illustrates simple linear inequality on a number line with difficulties
Ability to form compound inequality statements in one unknown	Forms compound linear inequality in one unknown correctly and systematically	Forms compound inequality statements in one unknown correctly	Forms compound inequality statements in one unknown partially	Forms compound inequality statements in one unknown with difficulties
Ability to illustrate compound linear inequality on a number line	Illustrates compound linear inequality on a number line correctly and proficiently	Illustrates compound linear inequality on a number line correctly	Illustrates compound linear inequality on a number line partially	Illustrates compound linear inequality on a number line with difficulties

STRAND 3.0: MEASUREMENTS
Sub Strand: Pythagorean Relationship

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
3.0 Measurements	**3.1 Pythagorean Relationship** (4 lessons)	By the end of the sub strand, the learner should be able to: a) recognize the sides of a right-angled triangle in different situations b) identify Pythagorean relationship in different situations c) apply Pythagorean relationship to real life situations d) use IT devices for more learning on Pythagoras Theorem and for enjoyment e) appreciate the use of Pythagoras Theorem in real life situations.	The learner is guided to: • draw and represent practical cases of right-angled triangle of an object leaning on a wall at different positions and recognize the sides as the hypotenuse the height and the base. For example, a ladder leaning on a wall. • do a variety of activities for example, counting squares on different sides of a 3, 4, 5 right angled-triangle, establish the Pythagorean relationship and practice using other right angled-triangles • work out exercises related to Pythagorean relationship • create Pythagorean relationship puzzles	How do we use Pythagorean relationship in real life situations?

			• use IT devices to explore the use of Pythagorean relationship in daily life.	

Core Competencies to be developed

- **Critical thinking and problem solving**: Interpretation and inference as learners identify Pythagorean relationship in different situations.
- **Creativity and imagination**: Open mindedness and creativity as learners create Pythagorean relationship puzzles.
- **Learning to learn**: Sharing learnt knowledge as learners apply Pythagorean relationship in real life situations.

Values

- **Unity** as learners carry out various activities together, such as creating Pythagorean relationship puzzles.
- **Respect** as learners appreciate each other's opinions when identifying and applying Pythagorean relationship in real life situations.

Pertinent and Contemporary Issues (PCIs)

- **Peer education** as learners work in groups to establish the Pythagorean relationship.
- **Safety** as learners take care when using the ladder to do various activities on Pythagorean relationship.

Links to other subjects

Pre -career and pre-technical: technical drawing, building construction, surveying.

Assessment Rubric				
Indicators	**Exceeds Expectations**	**Meets Expectations**	**Approaches Expectations**	**Below Expectations**
Ability to recognize the sides of a right-angled triangle	Recognizes the sides of a right-angled triangle correctly and proficiently	Recognizes the sides of a right-angled triangle correctly	Recognizes the sides of a right-angled triangle partially	Recognizes the sides of a right-angled triangle with difficulties
Ability to identify Pythagorean relationship	Identifies Pythagorean relationship correctly and proficiently	Identifies Pythagorean relationship accurately	Identifies Pythagorean relationship inconsistently	Identifies Pythagorean relationship with difficulties
Ability to apply Pythagorean relationship	Applies Pythagorean relationship to various situations correctly	Applies Pythagorean relationship correctly	Applies Pythagorean relationship partially	Applies Pythagorean relationship with difficulties

Sub Strand: Length

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Question(s)
3.0 **Measurements**	**3.2 Length** (6 lessons)	By the end of the sub strand, the learner should be able to: a) convert units of length from one form to another involving cm, dm, m, Dm, Hm in learning situations b) perform operations involving units of length in different situations c) work out the perimeter of plane figures in different situations d) work out the circumference of circles in different situations e) use IT devices for more learning on length and for enjoyment f) appreciate the use of length in real life situations.	The learner is guided to: • generate conversion tables involving cm, dm, m, Dm, Hm • practice different operations involving length • watch videos on correct procedures of measuring length and working out perimeter • use appropriate measuring tools to measure the length of various objects. • measure and work out perimeter of different plane figures including combined shapes. • measure the circumference and diameter of different circular objects and establish the relationship between circumference and diameter which is Pi. • use Pi to practice working out circumference of circles and can use IT devices for calculations.	1. Why do we use different units of measuring length? 2. How do we measure the perimeter of different objects?

Core Competencies to be developed:

- **Communication and collaboration**: Speaking, listening and team work; as learners work in pairs/groups when measuring lengths of various objects and also as they discuss the relationship between circumference and diameter.
- **Self-efficacy:** Personal skills as the learners practice different operations using length.
- **Critical thinking and problem solving**: interpretation and inference as learners relate circumference to diameter.

Values

- **Integrity** as learners carry out the activities and give the correct measurement.
- **Unity** as learners work in groups measuring lengths of various objects.

Pertinent and Contemporary Issues (PCIs)

- **Social cohesion** as learners work in pairs and groups in measuring lengths of various objects.
- **Safety** as learners handle different instruments of measuring length.
- **Global citizenship** as they appreciate units of measurements especially the SI units of length.

Links to other subjects

- **Integrated science**: units of measuring length
- **Pre-career and pre- technical**: Tailoring, constructions, engineering.

Assessment Rubric				
Indicators	**Exceeds Expectations**	**Meets Expectations**	**Approaches Expectations**	**Below Expectations**
Ability to convert units of length from one form to another involving cm, dm, m, Dm, Hm	Converts units of length from one form to another involving cm, dm, m, Dm, Hm systematically	Converts units of length from one form to another involving cm, dm, m, Dm, Hm correctly	Converts units of length from one form to another involving cm, dm, m, Dm, Hm partially	Converts units of length to other forms involving cm, dm, m, Dm, Hm with difficulties
Ability to perform operations involving units of length	Performs operations involving units of length and in appropriate units correctly and proficiently	Performs operations involving units of length correctly	Performs operations involving units of length partially	Performs operations involving units of length with difficulties
Ability to work out the perimeter of plane figures	Works out the perimeter of plane figures accurately and proficiently	Works out the perimeter of plane figures accurately	Works out the perimeter of plane figures partially	Works out the perimeter of plane figures with difficulties
Ability to work out the circumference of circles	Works out the circumference of circles correctly and systematically	Works out the circumference of circles accurately	Works out the circumference of circles partially	Works out the circumference of circles with difficulties

Sub Strand: Area

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
3.0 **Measurements**	**3.3 Area (**8 lessons)	By the end of the sub strand, the learner should be able to: a) identify square metre (m^2), acres and hectares as units of measuring area b) work out the area of rectangle, parallelogram, rhombus and trapezium in different situations c) work out the area of circles in different situations d) calculate the area of borders and combined shapes in real life situations e) use IT devices for more learning on area and for enjoyment f) appreciate the use of area in real life situations.	The learner is guided to: • generate conversion tables involving acres and hectares as units of measuring area • use cut outs to find the area of the plane figures • watch videos on how to cut out a circle to small sectors to demonstrate how to derive the formula for the area of a circle • cut out a circle into small sectors and rearrange to form a rectangle to derive the formula for the area of a circle • practice cutting out the plane figures of combined shapes into different shapes to work out the area.	1. What are plane figures? 2. How do we work out the areas of plane figures?
Core Competencies to be developed: • **Critical thinking and problem solving:** Reflection as learners cut out the circle into small sectors, joining them to create a rectangle and generate formula of getting the area of a circle.				

- **Creativity and imaginations:** Open mindedness and creativity as learners combine different shapes to make patterns.
- **Self-efficacy:** Personal skills as learners demonstrate how to derive the formula for the area of a circle.

Values

- **Responsibility** as the learner cuts out the small sectors of the circle and joins them up to form a rectangle.
- **Integrity** as learners work out exact areas of different shapes.
- **Unity** as learners work in groups and share tasks in measuring the area.

PCIs

- **Safety**; as learners handle different instruments/tools to make cut outs of different materials.
- **Environmental education**; as learners use locally available materials in measuring the area.

Links to other subjects

- **Pre-career and pre- technical** - correct area of different shapes, surveying.
- **Creative arts** - as learners combine different shapes to make patterns.
- **Integrated science** - relating area to friction and pressure.

Assessment Rubric

Indicators	**Exceeds Expectations**	**Meets Expectations**	**Approaches Expectations**	**Below Expectations**
Ability to identify square metre (m^2), ares and hectares as units of measuring area	Identifies square metre (m^2), ares and hectares as units of measuring area accurately and proficiently	Identifies square metre (m^2), ares and hectares as units of measuring area accurately	identifies square metre (m^2), ares or hectares as units of measuring area	Identifies square metre (m^2), ares and hectares as units of measuring area with difficulties
Ability to work out the area of	Works out the area of rectangles,	Works out the area of rectangles,	Works out the area of rectangles or	Works out the area of rectangles,

rectangles, parallelogram, rhombus and trapezium	parallelogram, rhombus or trapezium accurately and proficiently	parallelogram, rhombus and trapezium accurately	parallelogram or rhombus or trapezium	parallelogram, rhombus and trapezium with difficulties
Ability to work out the area of circles	Works out the area of circles accurately and systematically	Works out the area of circles accurately	works out the area of circles partially	Works out the area of circles with difficulties
Ability to calculate the area of borders and combined shapes	Calculates the area of borders and combined shapes accurately and systematically	Calculates the area of borders and combined shapes accurately	Calculates the area of borders and combined shapes partially	Calculates the area of borders and combined shapes with difficulties

Sub Strand: Volume and Capacity

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
3.0 Measurements	**3.4 Volume and Capacity (**8 lessons)	By the end of the sub strand, the learner should be able to: a) identify metre cube (m^3) as a unit of volume in measurements b) convert metre cube (m^3) into centimeter cube (cm^3) and vice versa in different situations c) work out the volume of cubes, cuboids and cylinder in different situations d) identify the relationship between cm^3, m^3 and litres in real life situations e) relate volume to capacity in real life situations f) work out the capacity of containers in real life situations g) use IT devices for more learning on volume and capacity and for enjoyment h) appreciate use of volume and capacity in real life situations.	The learner is guided to: • make a cube of sides 1 metre using locally available materials • discuss and work out the conversions of cm cube (cm^3) and m cube (m^3) • collect labelled containers of different volume and capacity from the environment • generate conversion tables of volume and capacity • create models of cubes, cuboids, and cylinders which they will use to work out volume • watch videos on volume and capacity	1. Where do we use volume and capacity in daily activities? 2. Why do we measure volume?

Core Competencies to be developed:

- **Critical thinking and problem solving:** Interpretation and inference as learners create a conversion table of units of volume.
- **Creativity and Imagination:** Open mindedness and creativity as learners create models of cubes and cuboids.

Values

- **Responsibility** as learners work in groups and share different tasks in making models.
- **Peace** as learners discuss to make the models for different volumes and capacities.

Pertinent and Contemporary Issues (PCIs)

- **Environmental education** as learners use big and small containers of different volume from locally available resources.
- **Safety** as learners make models of cubes and cuboids.
- **ESD** water conservation using containers of different capacities.

Links to other subjects

- **Creative Arts** as learners create models of cubes and cuboids.
- **Pre- career and pre- technical** as learners create models of cubes and cuboids.
- **Integrated Science** as learners work out volume of different substances.

Assessment Rubric

Indicators	**Exceeds Expectations**	**Meets Expectations**	**Approaches Expectations**	**Below Expectations**
Ability to identify metre cube (m^3) as a unit of volume	Identifies metre cube (m^3) as a unit of volume accurately and proficiently	Identifies metre cube (m^3) as a unit of volume accurately	Identifies metre cube (m^3) as a unit of volume inconsistently	Identifies metre cube (m^3) as a unit of volume with difficulties
Ability to convert metre cube (m^3) into	Converts metre cube (m^3) into centimeter cube (cm^3) and vice	Converts metre cube (m^3) into centimeter	Converts metre cube (m^3) into centimeter cube or converts	Converts metre cube (m^3) into centimeter

centimeter cube (cm^3) and vice versa	versa accurately and proficiently	cube and vice versa accurately	centimeter cube into metre cube (m^3)	cube and vice versa with difficulties
Ability to work out the volume of cubes, cuboids and cylinders	Works out the volume of cubes, cuboids and cylinders systematically	Works out the volume of cubes, cuboids and cylinders correctly	Works out the volume of cubes or cuboids or cylinders	Works out the volume of cubes, cuboids and cylinders with difficulties
Ability to identify the relationship between cm^3, m^3 and litres	Identifies the relationship between cm^3, m^3 and litres accurately and proficiently	Identifies the relationship between cm^3, m^3 and litres accurately	Identifies the relationship between cm^3, m^3 and litres partially	Identifies the relationship between cm^3, m^3 and litres with difficulties
Ability to convert units of capacity from one form to another	Converts units of capacity from one form to another systematically	Converts units of capacity from one form to another correctly	Converts units of capacity from one form to another partially	Converts units of capacity from one form to another with difficulties
Ability to relate volume to capacity	Relates volume to capacity accurately and proficiently	Relates volume to capacity accurately	Relates volume to capacity partially	Relates volume to capacity with difficulties
Ability to work out the capacity of containers	Works out the capacity of containers systematically	Works out the capacity of containers correctly	Work out the capacity of some containers	Works out the capacity of containers with difficulties

Sub Strand: Time, Distance and Speed

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
3.0 **Measurements**	**3.5 Time, Distance and Speed** **(**8 lessons)	By the end of the sub strand, the learner should be able to: a) identify units of measuring time in real life situations b) convert units of time from one form to another in learning situations c) convert units of measuring distance in learning situations d) identify speed as distance covered per unit time in different situations e) work out speed in km/h and m/s in real life situations f) Convert units of speed from kilometers per hour (Km/h) to meters per second (m/s) and vice versa in real life situations g) Use IT devices to learn more on time, distance and speed for planning	The learner is guided to: • use analog or digital clock to tell time in hours, minutes and seconds and discuss the units of time • create conversion table on units of time • discuss and estimate distances between two or more points and convert from Km to meters and vice versa • engage in activities that involve distance and time such as track events to relate time, distance and speed • discuss how long they take to travel from home to school, discuss the aspects of distance, and time taken to get to school • practice calculating speeds in km/h or m/s	1. Why do we relate distance, time and speed? 2. What is the importance of speed in daily activities?

		h) Appreciate the use of time, distance and speed in real life situations	• play digital games involving racing or watch marathon	

Core Competencies to be developed:

- **Critical thinking and problem solving-** interpretation and inference as learners create conversion tables relate and determine distance, time and speed.
- **Self-efficacy -** Personality skills as learners observe punctuality in attending to different activities.

Values

- **Patriotism** as learners observe road safety rules including speed limits.
- **Integrity** as learners observe punctuality and work out correct distances.

Pertinent and Contemporary Issues (PCIs)

- **Disaster Risk Reduction (DRR) and Safety** as learners observe safety in road and machines in relation to speed.

Links to other subjects

- **Integrated science** as learners observe time as they carry out different experiments.
- **PHE** as learners participate in athletics.

Assessment Rubric

Indicators	**Exceeds Expectations**	**Meets Expectations**	**Approaches Expectations**	**Below Expectations**
Ability to identify units of measuring time	Identifies units of measuring time correctly and proficiently	Identifies units of measuring time correctly	Identifies some units of measuring time	Identifies units of measuring time with difficulties
Ability to convert units of time from one form to another	Converts units of time from one form to another correctly and proficiently	Converts units of time from one form to another correctly	Converts some units of time from one form to another	Converts units of time from one form to another with difficulties

Ability to convert units of measuring distance	Converts units of measuring distance systematically	Converts units of measuring distance correctly	Converts units of measuring distance partially	Converts units of measuring distance with difficulties
Ability to identify speed as distance covered per unit time	Identifies speed as distance covered per unit time correctly and proficiently	Identifies speed as distance covered per unit time correctly	Identifies speed as distance covered per unit time partially	Identifies speed as distance covered per unit time with difficulties
Ability to work out speed in km/h and m/s	Works out speed in Km/h and m/s systematically	Works out speed in Km/h and m/s accurately	works out speed in Km/h or m/s	Works out speed in Km/h and m/s with difficulties
Ability to convert units of speed from kilometers per hour (Km/h) to meters per second (m/s) and vice versa	Converts units of speed from kilometers per hour (Km/h) to meters per second (m/s) and vice versa systematically	Converts units of speed from kilometers per hour (Km/h) to meters per second (m/s) and vice versa correctly	Converts units of speed from kilometers per hour (Km/h) to meters per second (m/s) or meters per second (m/s) to kilometers per hour (Km/h)	Converts units of speed from kilometers per hour (Km/h) to meters per second (m/s) and vice versa with difficulties

Sub Strand: Temperature

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
3.0 **Measurements**	**3.6 Temperature** (4 lessons)	By the end of the sub strand, the learner should be able to: a) describe the temperature conditions of the immediate environment as either warm, hot or cold b) compare temperature using hotter, warmer, colder and same as in different situations c) identify units of measuring temperature as degree Celsius and Kelvin in different situations d) convert units of measuring temperature from degree Celsius to Kelvin and vice-versa e) work out temperature in degree Celsius and	The learner is guided to: • move to the field, observe the temperature in the environment and discuss the temperature conditions as either warm, hot or cold • discuss and test temperature of different substances using arbitrary methods like touching, for example cold, warm or hot water (exercise caution when dealing with hot substances) • identify and use tools of measuring temperature, for example, thermometers that are in degrees Celsius. • work out conversions of temperature from degrees Celsius to Kelvin and vice versa	1. How does temperature affect our everyday lives? 2. How do we measure temperature?

		Kelvin in real life situations f) use IT devices to learn about temperature conditions of different places g) appreciate temperature changes in the environment.	• use IT devices to tell temperature in degree Celsius and Kelvin of different places.	

Core Competencies to be developed

- **Communication and collaboration**: Team work as learners work in groups and use tools of measuring temperature.
- **Digital literacy**: Interacting with technology as learners determine temperature of different places using digital devices.

Values

- **Responsibility** as learners carefully handle tools of measuring temperature.
- **Integrity** as learners give correct measurements of temperature.

Pertinent and Contemporary Issues (PCIs)

- **Self-awareness** as learners take their body temperatures.
- **Safety** as learners work in groups and exercise caution when dealing with hot substances.

Links to other subjects

- **Health Education** as learners consider their body temperatures to establish their health status and dressing appropriately.
- **Social studies** as learners consider climatic temperature changes.

Assessment Rubric				
Indicators	**Exceeds Expectations**	**Meets Expectations**	**Approaches Expectations**	**Below Expectations**
Ability to describe the temperature conditions of the immediate environment as either warm, hot or cold	Describes the temperature conditions of the immediate environment as either warm, hot or cold comprehensively	Describes the temperature conditions of the immediate environment as either warm, hot or cold correctly	Describes the temperature conditions of the immediate environment as either warm, hot or cold partially	Describes the temperature conditions of the immediate environment as either warm, hot or cold with difficulties
Ability to compare temperature using hotter, warmer, colder and same as	Compares temperature using hotter, warmer, colder and same as accurately and comprehensively	Compares temperature using hotter, warmer, colder and same as accurately	Compares temperature using hotter, warmer, colder and same as partially	Compare temperature using hotter, warmer, colder and same as with difficulties
Ability to identify units of measuring temperature as degrees Celsius and Kelvin	Identifies units of measuring temperature as degree Celsius and Kelvin precisely	Identifies units of measuring temperature as degree Celsius and Kelvin correctly	Identifies units of measuring temperature as degree Celsius or as Kelvin	Identifies units of measuring temperature as degree Celsius and as Kelvin with difficulties
Ability to convert units of measuring temperature from degree Celsius to Kelvin and vice-versa	Converts units of measuring temperature from degree Celsius to	Converts units of measuring temperature from degree Celsius to	Converts units of measuring temperature from either degree Celsius	Converts units of measuring temperature from degree Celsius to

	Kelvin and vice-versa systematically	Kelvin and vice-versa correctly	to Kelvin or Kelvin to Celsius	Kelvin and vice-versa with difficulties
Ability to work out temperature in degrees Celsius and Kelvin	Works out temperature in degree Celsius and Kelvin accurately and Proficiently	Works out temperature in degree Celsius and Kelvin accurately	Works out temperature in degree Celsius or Kelvin	Works out temperature in degree Celsius and Kelvin with difficulties

Sub Strand: Money

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
3.0 Measurements	**3.7 Money** (12 lessons)	By the end of the sub strand, the learner should be able to: a) work out profit and loss in real life situations b) calculate the percentage profit and loss in different situations c) calculate discount and percentage discount of different goods and services d) calculate commission and percentage commission in real life situations e) interpret bills at home f) prepare bills in real life situations g) work out postal charges in real life situations h) identify mobile money services for different transactions	The learner is guided to: • role play shopping activities involving profit, loss, discount and commission • work out profit and loss in different situations • work out percentage profit/loss in different situations • work out discount and percentage discount in different situations • work out commission and percentage commission in different situations • identify different types of bills and read the components of bills • prepare bills in different situations • visit post office to gather information on postal services and charges	1. Why do we use money in daily activities? 2. What considerations would we make when buying or selling? 3. What is involved in mobile money transactions?

		i) work out mobile money transactions in real life situations j) use IT devices to learn more about money for expenditure and investment, k) appreciate use of money in day to day activities.	• work out postal charges in different situations • discuss and identify mobile money services • work out mobile money transactions in different situations for example, sending or receiving money, credit and savings • use IT devices to generate bills, pay for goods and services, and other online transactions	

Core Competencies to be developed:

- **Critical thinking and problem solving:** Evaluation and decision making as learners work out discounts, commissions and mobile money as well as postal charges and bills.
- **Communication and collaboration:** Speaking and listening as learners' role play on negotiating for discounts and commissions.
- **Citizenship** Active social skills as learners work out discounts, commissions and mobile money in Kenyan currency.
- **Self-efficacy -** Negotiation skills as learners role play on negotiating for discounts and commissions.

Values

- **Patriotism** as learners work out and pay bills in Kenyan currency.
- **Integrity** as learners pay bills and appreciate use of money

Pertinent and Contemporary Issues (PCIs)

- **Financial literacy** as learners work out any discounts, commissions and mobile money as well as postal charges and bills.
- **Decision making** as learners use money in paying bills and postal charges.

Links to other subjects

- **Business studies** as learners work out bills, discounts, commissions and postal charges.
- **Life skills** as learners apply negotiation skills in discounts and commissions.
- **Languages** as learners gather information on postal services and charges.

Assessment Rubric				
Indicators	**Exceeds Expectations**	**Meets Expectations**	**Approaches Expectations**	**Below Expectations**
Ability to work out profit and loss	Works out profit and loss correctly and proficiently	Works out profit and loss correctly	Works out profit or loss	Works out profit and loss with difficulties
Ability to calculate percentage profit and loss	Calculates percentage profit and loss systematically	Calculates percentage profit and loss correctly	Calculates percentage profit or loss	Calculates percentage profit and loss with difficulties
Ability to calculate discount and percentage discount	Calculates discount and percentage discount systematically	Calculates discount and percentage discount correctly	Calculates discount and percentage discount partially	Calculates discount and percentage discount with difficulties
Ability to calculate commission and	Calculates commission and percentage	Calculates commission and percentage	Calculates commission and percentage commission partially	Calculates commission and percentage

percentage commission	commission systematically	commission correctly		commission with difficulties
Ability to interpret bills	Interprets bills comprehensively	Interprets bills accurately	Interprets bills inconsistently	Interprets bills with difficulties
Ability to prepare bills	Prepares bills systematically	Prepares bills accurately	Prepares bills partially	Prepares bills with difficulties
Ability to work out postal charges	Works out postal charges systematically	Works out postal charges correctly	Works out postal charges partially	Works out postal charges with difficulties
Ability to identify mobile money services	Identifies mobile money services comprehensively	Identifies mobile money services correctly	Identifies some mobile money services	Identifies mobile money services with difficulties
Ability to work out mobile money transactions	Works out mobile money transactions systematically	Works out mobile money transactions accurately	Works out some mobile money transactions	Works out mobile money transactions with difficulties

STRAND 4.0: GEOMETRY
Sub Strand: Angles

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
4.0 Geometry	**4.1 Angles** (10 lessons)	By the end of the sub strand, the learner should be able to: a) relate different types of angles on a straight line in real life situations b) solve angles at a point in learning situations c) relate angles on a transversal in different situations d) solve angles in a parallelogram in different situation e) identify angle properties of polygons up to hexagon in different situations f) relate interior angles, exterior angles and the number of sides of a polygon up to hexagon in different situations	The learner is guided to: • discuss positions of objects in the immediate environment in relation to angles • draw straight lines with different angles, measure and relate them. • draw different angles at a point, measure, relate and work out angles at point • draw transversals, measure and relate angles • draw parallelograms, measure and relate various angles • use cut outs or drawings of different polygons up to hexagon, measure the interior angles and relate to the number of right angles • use cut outs or drawings of different polygons up to hexagon, measure interior and exterior	1. What are angles? 2. Where do we use angles in real life situations?

		g) solve angles and sides of polygons up to hexagon in learning situations h) use IT devices to learn more about angles and for leisure, i) appreciate use of angles in real life situations.	angles and relate to the number of sides • work out angles and sides in different polygons up to hexagon • use IT devices to draw angles at point and parallelograms.	
Core Competencies to be developed: • **Communication and collaboration:** Team work as learners discuss in groups positions of objects in the immediate environment in relation to angles. • **Critical thinking and problem solving:** Interpretation and inference as learners draw, measure and relate angles. • **Digital literacy**: Interacting with technology as learners learn use digital devices to learn more on algebraic inequalities and play digital games.				
Values • **Responsibility** as learners explore positions of objects in the immediate environment in relation to angles. • **Unity** as learners work in groups to use cut outs or drawings of different polygons up to hexagon.				
Pertinent and Contemporary Issues (PCIs) • **Safety** as learners work in groups to use cut outs or drawings of different polygons up to hexagon. .				
Links to other subjects • **Pre –career and pre –technical** as learners use cut outs or drawings of different polygons up to hexagon, or drawings in tailoring.				

Assessment Rubric				
Indicators	**Exceeds Expectations**	**Meets Expectations**	**Approaches Expectations**	**Below Expectations**
Ability to relate different types of angles on a straight line	Relates different types of angles on a straight line comprehensively	Relates different types of angles on a straight line correctly	Relates different types of angles on a straight line partially	Relates different types of angles on a straight line with difficulties
Ability to solve angles at a point	Solves angles at a point systematically	Solves angles at a point accurately	Solves angles at a point partially	Solves angles at a point with difficulties
Ability to relate angles on a transversal	Relate angles on a transversal comprehensively	Relates angles on a transversal correctly	Relates some angles on a transversal	Relates angles on a transversal with difficulties
Ability to solve angles on a parallelogram	Solves angles on a parallelogram systematically	Solves angles on a parallelogram correctly	Solves angles on a parallelogram partially	Solves angles on a parallelogram with difficulties
Ability to identify angle properties of polygons up to hexagon	Identifies angle properties of polygons up to hexagon comprehensively	Identifies angle properties of polygons up to hexagon correctly	Identifies some angle properties of polygons up to hexagon	Identifies angle properties of polygons up to hexagon with difficulties
Ability to relate interior angles, exterior angles and the number of sides of a polygon up to hexagon	Relates interior angles, exterior angles and the number of sides of a polygon up to	Relates interior angles, exterior angles and the number of sides of a polygon up to hexagon correctly	Relates interior angles, exterior angles and the number of sides of a polygon up to hexagon partially	Relates interior angles, exterior angles and the number of sides of a polygon up to

	hexagon comprehensively			hexagon with difficulties
Ability to solve angles and sides of polygons up to hexagon	Solves angles and sides of polygons up to hexagon systematically	Solves angles and sides of polygons up to hexagon accurately	Solves angles and sides of polygons up to hexagon partially	Solves angles and sides of polygons up to hexagon with difficulties

Sub Strand: Geometrical Constructions

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
4.0 Geometry	**4.2 Geometrical Constructions** (10 lessons)	By the end of the sub strand, the learner should be able to: a) measure different angles in learning situations b) bisect angles using a ruler and a pair of compasses only in learning situations c) construct 90^0, 45^0 60^0, 30^0 and other angles that are multiples of 7.5^0 using a ruler and a pair of compasses only in learning situations d) construct different triangles using a ruler and a pair of compasses only in different situations e) construct circles using a ruler and a pair of compasses only in different situations f) use IT devices to learn about geometric constructions for skills development g) appreciate the use of geometric constructions in real life situations.	The learner is guided to: • draw and measure different angles • draw and bisect different angles • construct 90^0, 45^0 60^0, 30^0 including 120^0, 105^0 and practice with angles that are multiples of 7.5^0 using a pair of compasses and rulers • construct triangles using a pair of compasses and rulers • construct circles using a pair of compasses and rulers • use IT devices on graphics to draw angles and circles, watch videos of bisecting angles and constructing angles and circles.	1. Where do we use geometric constructions in real life situations? 2. Why do we use geometric constructions?

Core Competencies to be developed: • **Creativity and imagination:** Making observations as learners construct angles, triangles and circles. • **Digital literacy:** Interacting with digital devices as learners learn to use digital devices to learn more on construction of angles, triangles and circles
Values • **Responsibility** as learners use geometrical instruments for construction of angles and circles. • **Unity** as learners work in groups to draw and measure different angles.
Pertinent and Contemporary Issues (PCIs) • **Safety** as learners use geometrical instruments such as a pair of compasses and dividers.
Links to other subjects • **Creative arts** as learners construct angles, triangles and circles which they can use to make geometrical patterns.

Assessment Rubric				
Indicators	**Exceeds Expectations**	**Meets Expectations**	**Approaches Expectations**	**Below Expectations**
Ability to measure different angles	Measures different angles accurately and systematically	Measures different angles accurately	Measures different angles less accurately	Measures different angles with difficulties
Ability to bisect angles using a ruler and a pair of compasses only	Bisects angles using a ruler and a pair of compasses accurately and systematically	Bisects angles using a ruler and pair of compasses accurately	Bisects angles using a ruler and a pair of compasses partially	Bisects angles using a ruler and a pair of compasses with difficulties

Ability to construct 90^0, 60^0, 45^0 30^0 and other angles that are multiples of 7.5^0 using a ruler and a pair of compasses only	Constructs 90^0, 60^0, 45^0 , 30^0 and other angles that are multiples of 7.5^0 using a ruler and a pair of compasses accurately and systematically	Constructs 90^0, 60^0, 45^0 , 30^0 and other angles that are multiples of 7.5^0 using a ruler and a pair of compasses accurately	Constructs 90^0 , 60^0 , 45^0 , 30^0 or other angles that are multiples of 7.5^0 using a ruler and a pair of compasses partially	Constructs 90^0, 60^0, 45^0 , 30^0 and other angles that are multiples of 7.5^0 using a ruler and a pair of compasses with difficulties
Ability to construct different triangles using a ruler and a pair of compasses only	Constructs different triangles using a ruler and a pair of compasses accurately and systematically	Constructs different triangles using a ruler and a pair of compasses accurately	Constructs different triangles using a ruler and a pair of compasses partially	Constructs different triangles using a ruler and a pair of compasses with difficulties
Ability to construct circles using a ruler and a pair of compasses only	Constructs circles using a ruler and a pair of compasses only accurately and systematically	Constructs circles using a ruler and a pair of compasses only accurately	Constructs circles using a ruler and a pair of compasses only less accurately	Constructs circles using a ruler and a pair of compasses only with difficulties

STRAND 5.0: DATA HANDLING AND PROBABILITY

The sub strand on data handling in this strand is the main basis of Community Service Learning (CSL) Project. It is expected that the learners will carry out and implement the components of the project as they learn the concepts in data handling. Reference should be made to the CSL matrix at every step-in data handling concept development.

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
5.0 Data Handling and Probability	**5.1 Data Handling (**10 lessons)	By the end of the sub strand, the learner should be able to: a) state the meaning of data in learning situation b) collect data from different situations c) draw frequency distribution table of data from different situations d) determine suitable scale for graphs e) draw pictographs of data from real life situations f) draw bar graphs of data from different situations g) interpret bar graphs of data from real life situations	The learner is guided to: • collect and organize data from real life situations. For example, as suggested in CSL project, data from class registers (indicates school attendance) • tally and represent the data in a frequency table • discuss and come up with suitable scale to represent data in graphs • use a suitable scale to draw pictographs from CSL or other data • use a suitable scale to draw bar graphs from CSL or other data • discuss and interpret bar graphs of CSL or other data	1. Why do we collect data? 2. How do we represent data? 3. How do we interpret data?

		h) draw pie charts of data from real life situations i) interpret pie charts of data from real life situations j) draw a line graph of data from different situations k) interpret travel graphs from real life situations l) use IT devices to represent data m) appreciate use of data in real life situations.	• represent CSL or other data on pie charts • discuss and interpret pie charts of CSL or other data • use suitable scale to represent CSL or other data on line graphs • discuss and interpret travel graphs from real life situations • use IT devices to draw pie charts, pictographs and read data from bar graphs or watch videos relating to data.	

Core Competencies to be developed:

- **Creativity and imagination:** Making observations as learners present data in form of pie charts and pictograms.
- **Critical thinking and problem solving**: Interpretation and inference as learners interpret data from bar graphs, pictograms and pie charts.

Values

- **Responsibility** as learners collect and present data in pictograms that may involve different resources.
- **Peace** as learners work in groups to collect and present data.

Pertinent and Contemporary Issues (PCIs)

- **ESD** as learners choose careers in research related fields.
- **Decision making** as learners present data that can be used to make informed decisions.

Links to other subjects

- **Creative Arts** as learners draw pictographs and pie charts.
- **Social studies** as learners present data in pie charts and pictographs.

Assessment Rubric				
Indicators	**Exceeds Expectations**	**Meets Expectations**	**Approaches Expectations**	**Below Expectations**
Ability to state the meaning of data	States the meaning of data comprehensively	States the meaning of data correctly	States the meaning of data inconsistently	States the meaning of data incomprehensively
Ability to collect data	Collects data systematically	Collects data accurately	Collects data irregularly	Collects data with difficulties
Ability to draw frequency distribution table of data	Draws frequency distribution table of data accurately and systematically	Draws frequency distribution table of data accurately	Draws frequency distribution table of data inconsistently	Draws frequency distribution table of data with difficulties
Ability to determine suitable scale for graphs	Determines suitable scale for graphs precisely	Determines suitable scale for graphs correctly	Determines suitable scale for graphs inconsistently	Determines suitable scale for graphs with difficulties
Ability to draw Pictographs of data	Draws Pictographs of data explicitly	Draws Pictographs of data accurately	Draws Pictographs of data partially	Draws Pictographs of data with difficulties
Ability to draw Bar Graphs of data	Draws Bar Graphs of data skillfully	Draws Bar Graphs of data Correctly	Draws Bar Graphs of data partially	Draws Bar Graphs of data with difficulties
Ability to interpret Bar Graphs of data	Interprets Bar Graphs of data Precisely	Interprets Bar Graphs of data correctly	Interprets Bar Graphs of data inconsistently	Interprets Bar Graphs of data incomprehensively
Ability to draw Pie Charts of the given data	Draws Pie Charts of data precisely	Draws Pie Charts of data accurately	Draws Pie Charts of data partially	draws Pie Charts of data with difficulties

Ability to interpret Pie Charts of data	Interprets Pie Charts of data comprehensively	Interprets Pie Charts of data correctly	Interprets Pie Charts of data inconsistently	Interprets Pie Charts of data incomprehensively
Ability to draw a Line Graph	Draws a Line Graph accurately and systematically	Draws a Line Graph accurately	Draws a Line Graph partially	Draws a Line Graph with difficulties
Ability to interpret travel graphs	Interprets travel graphs comprehensively	Interprets travel graphs correctly	Interprets travel graphs inconsistently	Interprets travel graphs incomprehensively

COMMUNITY SERVICE LEARNING (CSL) PROJECT

The project is based on the **Strand: Data Handling and Probability**. The project seeks to deepen the understanding of the concepts of data handling by providing an opportunity to extend learners' knowledge beyond the classroom. For purposes of this project, the learner or the school should select one study area to collect data. It is further suggested that learners undertake the project in groups. A suggested area that **may** involve data collection and presentation include class attendance This can be done from different class registers. This will lead to:

1. **Meaningful Learning Experience Created**
   The use of school registers to generate data on school attendance.
2. **Integration of Learning and Community Service**

Applying findings on class attendance to inform the school and community on the extent of absenteeism, truancy and drop-out rates which could be a real problem in the society. The information derived from various calculations can inform school and community guidelines, regulations and intervention programs on educational issues like retention and reducing drop- out rates among children and the youth.

Strands relating to CSL project	**Sub Strands**	**Specific Project Outcomes**	**Suggested Learning Experiences**	**Key Inquiry Questions**
1. **Data Handling and Probability** 2. **Numbers**	**Data handling** **Whole numbers** **Fractions** **Decimals**	By the end of the project, the learner should be able to: a) identify an issue in society to be addressed through data handling in a project	The learner is guided to: • identify, discuss and select an area of study that relates to the issue to be addressed • do a write up on a suitable project that relates to data handling. The write up should have: ✓ Title of the project	1. Why do we collect data? 2. How do we represent data?

	(6 lessons)	b) prepare a write up on the selected project c) communicate to the necessary authorities about the project d) prepare a timeline for the project e) apply and obtain necessary permissions for the project f) prepare tools or paper work for data collection g) collect data for the intended project h) organize data in selected formats i) present data in selected formats suitable for different community groups j) interpret data and draw conclusions k) disseminate data to different community groups for further action.	✓ Purpose of the project ✓ Data collection, organization, presentation and dissemination processes ✓ Timeline for the project • communicate by writing to the relevant teachers and school administration about the intended project. Apply for permissions to undertake the project • write necessary paper work to use for data collection • collect and organize data in tables or short paragraphs depending on the nature of the data • discuss and represent data on pictographs or bar graphs or line graphs as well as pie charts depending on their preferred modes of presentation • interpret data, discuss and make conclusions as well as recommendations to school and community	3. How do we use data in real life situations?

		l) use IT devices to organize, represent and disseminate data and for archive or incubation m) appreciate use of data in real life situations.	• discuss, organize and hold meetings or workshops to disseminate information to different community groups for necessary actions • use IT devices throughout the project including photos and videos in workshops • use various online platforms to share information.	

Key components of CSL developed

Research: Importance of research in the school/community

- The learners will explore opportunities for conducting research in the school/community as they choose their project.
- The learners will appreciate the significance of research in transforming the school or community as they disseminate or share data and make necessary recommendations that are based on data.

Core Competencies to be developed:

- **Creativity and imagination**: Making observations as learners present data in form of pie charts, pictographs or bar graphs.
- **Critical thinking and problem solving**: Interpretation and inference as learners interpret data from bar graphs and pie charts and make conclusions.
- **Communication and collaboration**: Team work as learners disseminate data in workshops.

Values

- Responsibility and respect; as learners apply and obtain necessary permissions for the project.
- Unity; as learners work together in groups to collect and present data share it with the community

Pertinent and Contemporary Issues (PCIs)

- **Citizenship**: Peer education as learners share the recommendations that would contribute to the wellbeing of other learners and community that is based on data.
- **Counselling services** as learner's present data that can be used to make informed decisions in the school and the community.

Links to other subjects

- **Creative Arts** as learners draw pictographs, bar graphs, line graphs and pie charts.
- **Social studies** as learners disseminate data that relate to children's wellbeing and education (child's rights).

Assessment Rubric for the CSL Project

Indicator	**Exceeds Expectation**	**Meets Expectation**	**Approaches Expectation**	**Below Expectation**
Ability to identify an issue in society to be addressed through data handling in the project	Identifies and discusses an issue to be addressed through data handling critically and elaborately	Identifies and discusses an issue to be addressed through data handling elaborately	Identifies and discusses an issue to be addressed through data handling partially	Identifies and discusses an issue to be addressed through data handling with difficulties
Ability to document the proposed plans and processes of the project for effective implementation	Documents the proposed plans and processes of the project for effective implementation comprehensively	Documents the proposed plans and processes of the project for effective implementation accurately	Documents the proposed plans and processes of the project for effective implementation partially.	Documents the proposed plans and processes of the project for effective implementation sketchily.

Ability to collect data for the intended project	Collects data for the intended project systematically	Collects data for the intended project correctly	Collects data for the intended project incompletely	Collects data for the intended project haphazardly
Ability to apply the knowledge in data handling and numbers to generate data on school attendance.	Applies the knowledge in data handling and numbers to generate data on school attendance creatively	Applies the knowledge in data handling and numbers to generate data on school attendance appropriately	Applies the knowledge in data handling and numbers to generate data on school attendance partially	Applies the knowledge in data handling and numbers to generate data on school attendance with difficulties
Ability to utilize the data generated to address a problem related to school attendance in the community	Utilizes the data generated to address a problem related to school attendance in the community appropriately and extensively	Utilizes the data generated to address a problem related to school attendance in the community appropriately	Utilizes the data generated to address a problem related to school attendance in the community less appropriately	Utilizes the data generated to address a problem related to school attendance in the community with difficulties
Ability to outline the benefits of the CSL project for learning and to the community	Outlines the benefits of the CSL project for learning and to the community comprehensively	Outlines the benefits of the CSL project for learning and to the community correctly	Outlines the benefits of the CSL project for learning or to the community	Outlines the benefits of the CSL project for learning and to the community with difficulties

APPENDIX 1: LIST OF ASSESSMENT METHODS, LEARNING RESOURCES AND NON-FORMAL ACTIVITIES

Strand	Sub strand	Suggested Assessment Methods	Resources Suggested Learning	Suggested Non-Formal Activities
Numbers	Whole Numbers	Class activities Class written tests Out of school/home assignments or activities	Place value apparatus, Number charts, Number cards, Multiplication table	Prepare or improvise number charts and different Place value apparatus.
	Factors	Class activities Class written tests Out of school/home assignments	Multiplication tables	
	Fractions	Class activities Class written tests Out of school/home assignments	Multiplication tables	
	Decimals	Class activities Class written tests Out of school/home assignments	Equivalent fraction board, Circular and Rectangular cut outs, Counters	

	Squares and square roots	Class written tests Class activities	Place value charts, Number cards	
Algebra	Algebraic Expressions	Class activities Class written tests Out of school/home assignments or activities	Information from different sources	Carry out activities involving classifying objects in their immediate environment according to given attributes such as similarities or differences. This can be done at home. Take photos and share with class or school. Use concept of classification of objects to own things at school and home.
	Linear Equations	Class activities Class written tests Out of school/home assignments or activities	Information from different sources	
	Inequalities	Class written tests Class activities	Information from different sources	

Measurement	Pythagorean Relationship	Class activities Class written tests Out of school/home assignments	ladder, stairs, Square cut outs, 1cm squares, 1m squares ,	
	Length	Class written tests Class activities	Metre Rule, 1metre ticks, Tape measure	
	Area	Class written tests Out of school/home assignments or activities	Square cut outs, 1cm squares, 1m squares	
	Volume and Capacity	Class written tests Class activities Out of school/home assignments or activities	Cubes, Cuboids, Cylinders, Pyramids, Spheres, Cut outs of Rectangles, Circles, and Triangles of different Sizes	Measure volume of liquids using containers of different sizes from smallest to biggest. Relate this to packaging of goods such as water, milk and other things in market place and how this affects consumer awareness and protection.
	Mass	Class written tests Class activities	Tea spoons, Soil or Sand,	

			Manual/Electronic weighing machine, Beam balance,	
	Time, distance and speed	Class written tests Out of school/home assignments or activities	Analogue and Digital clocks, Digital watches, Stop watches	
	Temperature	Class activities Out of school/home assignments or activities	Thermometer, weather charts	Record weather changes for a period of time, for example a month/term and discuss how this affects the way one dresses.
	Money	Class written tests Class activities Out of school/home assignments or activities	Price List, Classroom shop, Electronic money tariffs charts	
Geometry	Angles	Class activities Class written tests Out of school/home assignments or activities	Unit angles, Protractors, Rulers, Straight edges	

	Geometric constructions	Class activities Class written tests	Pair of compasses, rulers,	
Data handling and probability	Data handling	Class activities Class written tests	Data from different sources	Undertake the CSL project

APPENDIX 2: USE OF ICT DEVICES

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.