KENYA INSTITUTE OF CURRICULUM DEVELOPMENT

A Skilled and Ethical Society

JUNIOR SCHOOL CURRICULUM DESIGN

MATHEMATICS

GRADE 7

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NATIONAL GOALS OF EDUCATION

Education in Kenya should:

1. **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.

2. **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.

   i) **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.

   ii) **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.

   iii) **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.

3. **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.

4. **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.

5. **Promote social equity and responsibility**
   Education **respect** 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.

6. **Promote 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.

7. **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.

8. **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.

LESSON ALLOCATION AT JUNIOR SCHOOL

S/No	Learning Area	Number of Lessons
1.	English	5
2.	Kiswahili / Kenya Sign Language	4
3.	Mathematics	5
4.	Religious Education	4
5.	Social Studies	4
6.	Integrated Science	5
7.	Pre-Technical Studies	4
8.	Agriculture and Nutrition	4
9.	Creative Arts and Sports	5
	Pastoral /Religious Instructional Program	1
Total		**40 + 1**

LEARNING OUTCOMES FOR JUNIOR SCHOOL

By end of Junior 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.
10) Develop confidence and interest in mathematics for further training and enjoyment.

STRAND 1.0: NUMBERS
Sub Strand: Whole Numbers

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested key inquiry question(s)
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 fluency 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 ● identify the number patterns to work out number sequences	1. Why do we write numbers in words and/or symbols? 2. Where do we write numbers in words or symbols?

		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) appreciate use of whole numbers in real life situations.	• 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.

Link to other subjects

Languages: writing numbers in words.

Sub Strand: Factors

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested key inquiry question(s)
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) reflect on 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. ● determine the GCD and LCM of numbers using IT to perform exercises on factors such as matching activities or games.	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?

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
Link to other subjects **Agriculture and nutrition;** as learners apply LCM or GCD as they plan for smallest or largest containers for measuring different substances.

Sub Strand: Fractions

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested key inquiry question(s)
1.0 Numbers	**1.3 Fractions** (9 lessons)	By the end of the sub strand, the learner should be able to:	The learner is guided to:	1. How do we use fractions in daily activities?

		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 h) identify number sequence involving fractions in different situations i) create number sequence involving fractions for playing number games j) recognise use of fractions in real life situations.	• 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 • create a fraction sequence game that can be used for play and learning • use IT devices to work out operations of fractions.	2. Where do we use fractions in daily activities?
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
Link to other subjects: **Agriculture** and nutrition; as learners give fractional portions of animal feeds.

Sub Strand: Decimals

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested key inquiry question(s)
1.0 Numbers	**1.4 Decimals** (6 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	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	1. Where are decimals applicable in real life? 2. How do you use decimals in daily activities?

		c) divide decimals by a whole number and by a decimal in real life situations d) recognise use of decimals in real life situations.	• use calculators and other IT devices to work out operations of decimals. • play games involving multiplication and division of decimals.	

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.

Link to other subjects

Learners relate quantities expressed in decimal forms in measurement as learnt from **Integrated Science**

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) appreciate 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.

Link to other subjects

- **Pre-technical studies**: in areas such as carpentry and technical drawing contribute to squares and roots of numbers.
- **Agriculture and nutrition;** as learners determine the number of seedlings that would fit in a square portion of land.

Assessment Rubric

Level / Indicators	Exceeds Expectations	Meets Expectations	Approaches Expectations	Below Expectations
Ability to use place value and total value of digits up to hundreds of millions and decimals	Uses place value and total value of digits up to hundreds of millions and decimals, correctly and systematically	Uses place value and total value of digits up to hundreds of millions and decimals correctly	Uses place value or total value of digits up to hundreds of millions or decimals correctly	Uses place value or total value of digits up to hundreds of millions
Ability to read and write numbers in symbols up to hundreds of millions and words up to millions	Reads and writes numbers in symbols up to hundreds of millions and words up to millions correctly and proficiently	Reads and writes numbers in symbols up to hundreds of millions and words up to millions correctly	Reads or writes numbers in symbols up to hundreds of millions or words up to millions correctly	Reads or writes numbers in symbols up to millions or words up to hundreds

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 natural numbers as even or odd or prime accurately	Classifies natural numbers as even, odd or prime with continuous support
Ability to apply operations of whole numbers	Applies operations of whole numbers accurately and proficiently	Applies operations of whole numbers accurately	Applies operations of whole numbers partially accurately	Applies operations of whole numbers with continuous support
Ability to identify and create number sequence	Identifies and creates number sequence correctly and consistently	Identifies and creates number sequence correctly	Identifies or creates number sequences correctly	Identifies or creates number sequences with continuous support
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 and apply the Greatest Common	Work out and applies the Greatest Common Divisor (GCD) and the	Works out and applies the Greatest Common Divisor (GCD) and the	Works out or applies the Greatest Common Divisor (GCD) and the	Works out or applies the Greatest Common Divisor (GCD) or the

Divisor (GCD) and the Least Common Multiples (LCM) of numbers by factor method	Least Common Multiples (LCM) of numbers by factor method correctly and systematically	Least Common Multiples (LCM) of numbers by factor method correctly	Least Common Multiples (LCM) of numbers by factor method correctly	Least Common Multiples (LCM) of numbers by factor method
Ability to add, subtract and multiply fractions	Adds, subtracts and multiplies fractions correctly and systematically	Adds, subtracts and multiplies fractions correctly	Adds, subtracts or multiplies fractions correctly	Adds fractions correctly
Ability to determine reciprocals of fractions and divide fractions	Determines reciprocals of fractions and divides fractions correctly and systematically	Determines reciprocals of fractions and divides fractions correctly	Determines reciprocals of fractions or divides fractions correctly	Determines reciprocals of fractions correctly
Ability to multiply and divide decimals by a whole number and by a decimal	Multiplies and divides decimals by a whole number and by a decimal correctly and proficiently	Multiplies and divides decimals by a whole number and by a decimal correctly	Multiplies or divides decimals by a whole number or by a decimal correctly	Multiplies and divides decimals by a whole number correctly
Ability to determine the squares and square roots of whole numbers, fractions and decimals	Determines the squares and square roots of whole numbers, fractions and decimals correctly and proficiently	Determines the squares and square roots of whole numbers, fractions and decimals correctly	Determines the squares or square roots of whole numbers, fractions or decimals correctly	Determines the squares and square roots of whole numbers correctly

STRAND 2.0: ALGEBRA
Sub Strand: Algebraic Expressions

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested key inquiry question(s)
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) appreciate 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 objects 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.
Link to other subjects: **Languages** as learners interpret statements to form algebraic expressions.

Sub Strand: Linear Equations

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested key inquiry question(s)
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	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?

		d) reflect on use of linear equations in real life situations.		
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.				
Link to other subjects: **Pre-technical studies;** as learners use IT devices in forming and solving equations.				

Sub Strand: Linear Inequalities

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested key inquiry question(s)
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) 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.

Link to other subjects

Language as learners form linear inequalities from different situation in statement form.

Assessment Rubric

Level / Indicators	Exceeds Expectations	Meets Expectations	Approaches Expectations	Below Expectations
Ability to form and simplify algebraic expressions	Forms and simplifies algebraic expressions correctly and proficiently	Forms and simplifies algebraic expressions correctly	Forms or simplifies algebraic expressions correctly	Forms algebraic expressions correctly
Ability to form, solve and apply linear equations in one unknown	Forms, solves and applies linear equations in one unknown accurately and systematically	Forms, solves and applies linear equations in one unknown accurately	Forms, solves or applies linear equations in one unknown accurately	Forms linear equations in one unknown accurately

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 and compound linear inequality in one unknown and illustrate on a number line	Forms simple and compound linear inequality in one unknown and illustrate on a number line correctly and systematically	Forms simple and compound linear inequality in one unknown and illustrate on a number line correctly	Forms simple or compound linear inequality in one unknown or illustrate on a number line correctly	Forms simple linear inequality in one unknown or illustrate on a number line correctly

STRAND 3.0: MEASUREMENTS
Sub Strand: Pythagorean Relationship

Strand	**Sub Strand**	**Specific Learning Outcomes**	**Suggested Learning Experiences**	**Suggested key inquiry question(s)**
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	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.	How do we use Pythagorean relationship in real life situations?

		b) identify Pythagorean relationship in different situations c) apply Pythagorean relationship to real life situations d) promote use of Pythagoras Theorem in real life situations.	• 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 • 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.				

Link to other subjects **Pre-technical studies**: technical drawing, building construction, surveying.

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) promote 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.	1. Why do we use different units of measuring length? 2. How do we measure the perimeter of different objects?

			• use Pi to practice working out circumference of circles and can use IT devices for calculations.	

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.

Link to other subjects

- **Integrated science**: as learners use units of measuring length
- **Pre- technical studies**: as learners do tailoring, constructions, engineering works that contributes to measurement of length.

Sub Strand: Area

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested key inquiry question(s)
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) recognise 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.
Link to other subjects • **Creative arts** - as learners combine different shapes to make patterns. • **Integrated science** - relating area to friction and pressure.

Sub Strand: Volume and Capacity

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested key inquiry question(s)
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	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)	1. Where do we use volume and capacity in daily activities? 2. Why do we measure volume?

		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) promote use of volume and capacity in real life situations.	• collect labeled 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	
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.
Link to other subjects • **Pre- technical studies** as learners create models of cubes and cuboids. • **Integrated Science** as learners work out volume of different substances.

Sub Strand: Time, Distance and Speed

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested key inquiry question(s)
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	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	1. Why do we relate distance, time and speed? 2. What is the importance of speed in daily activities?

		vice versa in real life situations g) reflect on use of time, distance and speed in real life situations	• 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 • 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.				
Link to other subjects • **Integrated science** as learners observe time as they carry out different experiments.				

Sub Strand: Temperature

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested key inquiry question(s)
3.0 Measurements	**3.6 Temperature** (6 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 Kelvin in real life situations	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?

		f) use IT devices or other resources to read temperature conditions of different places g) recognise temperature changes in the environment.	• practice using IT devices or other resources to determine temperature of different places in degree Celsius and Kelvin.	
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.				
Link to other subjects • **Integrated Science;** as learners consider their body temperatures to establish their health status and dressing appropriately. • **Social studies** as learners consider climatic temperature changes.				

Sub Strand: Money

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested key inquiry question(s)
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 and selling activities involving profit, loss, discount and commission ● work out profit and loss involving different activities and settings ● work out percentage profit/loss from the role play activities ● work out discount and percentage discount from model shopping activities ● work out commission and percentage commission from the role play activities ● identify different types of bills and read the components of bills ● prepare bills of different items and expenses ● visit post office to gather information on postal services and charges ● work out postal charges in different situations	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 on money transactions k) recognise use of money in day to day activities.	• discuss and identify mobile money services • work out mobile money transactions, for example, in sending or receiving money, credit and savings • generate bills, pay for goods and services, and other online transactions using IT devices	
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.				
Link to other subjects • **Pre-technical studies** as learners work out bills, discounts, commissions and postal charges. • **Languages** as learners gather information on postal services and charges.				

Assessment Rubric				
Level / **Indicators**	**Exceeds Expectations**	**Meets Expectations**	**Approaches Expectations**	**Below Expectations**
Ability to identify and apply Pythagorean relationship	Identifies and applies Pythagorean relationship correctly and proficiently	Identifies and applies Pythagorean relationship correctly	Identifies or applies Pythagorean relationship correctly	Identifies Pythagorean relationship correctly
Ability to convert units of length and perform operations involving length	Converts units of length and perform operations involving length accurately and systematically	Converts units of length and perform operations involving length accurately	Converts units of length or perform operations involving length accurately	Converts units of length accurately
Ability to work out the perimeter of plane figures and circumference of circles	Works out the perimeter of plane figures and circumference of circles accurately and proficiently	Works out the perimeter of plane figures and circumference of circles accurately	Works out the perimeter of plane figures or circumference of circles accurately	Works out the perimeter of plane figures accurately
Ability to work out the area of rectangles, parallelogram, rhombus,	Works out the area of rectangles, parallelogram, rhombus, trapezium	Works out the area of rectangles, parallelogram, rhombus,	Works out the area of rectangles or parallelogram or rhombus or trapezium or circles accurately	Works out the area of rectangles or parallelogram or rhombus accurately

trapezium and circles	and circles accurately and proficiently	trapezium and circles accurately		
Ability to work out the volume of cubes, cuboids and cylinders	Works out the volume of cubes, cuboids and cylinders accurately and systematically	Works out the volume of cubes, cuboids and cylinders accurately	Works out the volume of cubes, cuboids or cylinders accurately	Works out the volume of cubes or cuboids accurately
Ability to identify the relationship between cm^3, m^3 and litres, and relate volume to capacity	Identifies the relationship between cm^3, m^3 and litres and relate volume to capacity accurately and proficiently	Identifies the relationship between cm^3, m^3 and litres and relate volume to capacity accurately	Identifies the relationship between cm^3, m^3 or litres or relate volume to capacity accurately	Identifies the relationship between cm^3, m^3 or litres accurately
Ability to work out the capacity of containers	Works out the capacity of containers accurately systematically	Works out the capacity of containers accurately	Works out the capacity of containers partially accurately	Works out the capacity of containers with continuous support
Ability to work out speed in km/h and m/s	Works out speed in Km/h and m/s accurately and systematically	Works out speed in Km/h and m/s accurately	works out speed in Km/h or m/s accurately	Works out speed in Km/h accurately
Ability to identify and convert units of measuring temperature from	Identifies and converts units of measuring temperature from degree Celsius to Kelvin and vice-versa	Identifies and converts units of measuring temperature from degree Celsius to	Identifies or converts units of measuring temperature from degree Celsius to Kelvin and vice-versa accurately	Identifies units of measuring temperature as degree Celsius and Kelvin accurately

degree Celsius to Kelvin and vice-versa	accurately and systematically	Kelvin and vice-versa accurately		
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 accurately
Ability to work out profit, loss, discount and commission	Works out profit, loss, discount and commission correctly and proficiently	Works out profit, loss, discount and commission correctly	Works out profit, loss, discount or commission correctly	Works out any one of; profit, loss, discount or commission correctly
Ability to calculate percentage profit, loss, discount and commission	Calculates percentage profit, loss, discount and commission accurately and systematically	Calculates percentage profit, loss, discount and commission accurately	Calculates percentage profit, loss, discount or commission accurately	Calculates any one of; percentage profit, loss, discount and commission accurately
Ability to interpret and prepare bills	Interprets and prepare bills correctly and comprehensively	Interprets and prepare bills correctly	Interprets or prepare bills correctly	Interprets bills correctly
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 and work	Identifies and works out mobile money	Identifies and works out mobile	Identifies or works out mobile money services accurately	Identifies out mobile money services accurately

out mobile money services	services accurately and comprehensively	money services accurately		

STRAND 4.0: GEOMETRY
Sub Strand: Angles

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested key inquiry question(s)
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	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	1. What are angles? 2. Where do we use angles in real life situations?

		up to hexagon in different situations g) solve angles and sides of polygons up to hexagon in learning situations, h) reflect on use of angles in objects within the environment.	• use cut outs or drawings of different polygons up to hexagon, measure interior and exterior angles and relate to the number of sides • work out angles and sides in different polygons up to hexagon • draw angles at a point and in parallelograms using IT devices.	

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. .

Link 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.

Sub Strand: Geometrical Constructions

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested key inquiry question(s)
4.0 Geometry	**4.2 Geometrical Constructions** (12 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	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?

		f) recognise use of geometric constructions of different shapes in objects		

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.

Link to other subjects

Creative arts and sports; as learners construct angles, triangles and circles which they can use to make geometrical patterns.

Assessment Rubric

Level / Indicators	Exceeds Expectations	Meets Expectations	Approaches Expectations	Below Expectations
Ability to relate and solve angles on a straight line, at a point and on a transversal	Relates and solves angles on a straight line, at a point and on a transversal	Relates and solves angles on a straight line, at a point and on a transversal accurately	Relates or solves angles on a straight line, at a point or on a transversal accurately	Relates angles on a straight line, at a point or on a transversal accurately

	accurately and comprehensively			
Ability to identify angle properties of polygons up to hexagon	Identifies angle properties of polygons up to hexagon accurately and comprehensively	Identifies angle properties of polygons up to hexagon accurately	Identifies angle properties of polygons up to pentagon accurately	Identifies angle properties of quadrilaterals accurately
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
Ability to measure, bisect and 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	Measure, bisects and 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	Measure, bisects and 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	Measure, bisects or constructs 90^0, 60^0, 45^0 , 30^0 using a ruler and a pair of compasses accurately	Measure, bisects or constructs 90^0, 60^0, 45^0 using a ruler and a pair of compasses accurately
Ability to construct different triangles and circles using a ruler and a pair of compasses only	Constructs different triangles and circles using a ruler and a pair of compasses accurately and systematically	Constructs different triangles and circles using a ruler and a pair of compasses accurately	Constructs different triangles or circles using a ruler and a pair of compasses partially	Constructs different triangles using a ruler and a pair of compasses with difficulties

STRAND 5.0: DATA HANDLING AND PROBABILITY
Sub strand: Data handling

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested key inquiry question(s)
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 sources d) determine suitable scale for graphs of data from different situations e) draw pictographs of data from real life situations f) draw bar graphs of data from different sources g) interpret bar graphs of data from real life situations h) draw pie charts of data from real life situations	The learner is guided to: ● discuss, collect and organize data from immediate environment ● tally and represent the data in a frequency tables ● discuss and come up with suitable scale to represent data in graphs ● discuss and use a suitable scale to draw pictographs from data ● discuss and use a suitable scale to draw bar graphs from data ● discuss and interpret bar graphs of data ● discuss and represent data on pie charts ● discuss and interpret pie charts of data	1. Why do we collect data? 2. How do we represent data? 3. How do we interpret data?

		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) promote use of data in real life situations.	• use suitable scale to represent data on line graphs • discuss and interpret travel graphs from real life situations • draw pie charts, pictographs and read data from bar graphs using IT devices or watch videos relating to data.	
Core Competencies to be developed: • **Creativity and imagination:** Making observations as learners present data in the 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) • **Decision making** as learners present data that can be used to make informed decisions.				
Link to other subjects • **Creative Arts and Sports;** as learners draw pictographs and pie charts. • **Social studies** as learners present data in pie charts and pictographs that may involve populations.				

Assessment Rubric				
Level / Indicators	**Exceeds Expectations**	**Meets Expectations**	**Approaches Expectations**	**Below Expectations**
Ability to collect data	Collects data systematically and accurately	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 and draw Pictographs and Bar Graphs of data	Determines suitable scale for graphs and draws Pictographs and Bar Graphs of data accurately and systematically	Determines suitable scale for graphs and draws Pictographs and Bar Graphs of data accurately	Determines suitable scale for graphs or draws Pictographs or Bar Graphs of data accurately	Determines suitable scale for graphs or draws Pictographs of data accurately
Ability to interpret from pictographs and Bar Graphs	Interprets data from pictographs Bar Graphs Precisely	Interprets data from pictographs and Bar Graphs correctly	Interprets data from pictographs or Bar Graphs	Interprets Bar Graphs of data
Ability to draw and interpret Pie Charts of data	Draws and Interprets Pie Charts of data precisely	Draws and Interprets Pie Charts of data accurately	Draws or Interprets Pie Charts of data accurately	Draws Pie Charts of data

Ability to draw a Line Graph	Draws a Line Graph accurately and systematically	Draws a Line Graph accurately	Draws a Line Graph partially accurately	Draws a Line Graph with continuous support
Ability to interpret travel graphs	Interprets travel graphs comprehensively	Interprets travel graphs correctly	Interprets travel graphs partially	Interprets travel graphs with continuous support

Community Service Learning Class Activity

Community Service Learning (CSL) is an experiential learning strategy that integrates classroom learning and community service to enable learners reflect, experience and learn from the community. The CSL activity/project is expected to benefit the learner, the school and local community. Knowledge and skills on how to carry out a CSL activity/project has been covered in Life Skills Education (LSE).

All learners in Grade 7 will be expected to participate in a **CSL class activity,** which may be based on any strand or sub strand in Mathematics. The activity will give learners an opportunity to practise the CSL Project skills covered under LSE. This activity will be undertaken in groups or as whole for purposes of learning. Learners will be expected to apply knowledge and skills on steps of the CSL project to carry out the suggested activity as per the guidelines provided in the template. The learning approach will take the form of a whole school approach, where the entire school community will be engaged in the learning process. Teachers will guide learners to execute a simple school based integrated CSL **class activity**. This activity can be done in 1-2 weeks outside the classroom time.

CSL Skills to be developed:

Research: Learners will develop research skills as they investigate PCIs to address the activity, ways and tools to use in collecting the data, manner in which they will analyse information and present their findings.

Communication: Learners will develop effective communication skills as they engage with peers and school community members. These will include listening actively, asking questions, and presentation skills using varied modes.

Citizenship: Learners will be able to explore opportunities for engagement as members of the school community and providing a service for the common good.

Leadership: Learners develop leadership skills as they take up various roles within the CSL activity.

Financial Literacy Skills: Learners consider how they can undertake the project as well as sourcing and utilising resources effectively and efficiently.

Entrepreneurship: Learners consider ways of generating income through innovation for the CSL class activity.

Suggested PCIs	**Specific Learning Outcomes**	**Suggested Learning Experiences (Customise to the focus of the grade)**	**Suggested key inquiry question(s)**
The learners will be guided to consider the various PCIs provided in the subjects in Grade 7 and choose one suitable to their context and reality	By the end of the CSL class activity, the learner should be able to: a) identify a problem in the school community through research,	The learner is guided to: ● brainstorm on issues/pertinent and contemporary issues in their school that need attention ● choose a PCI that needs immediate attention and explain why ● discuss possible solutions to the identified issue ● propose the most appropriate solution to the problem	1. How does one determine community needs? 2. Why is it necessary to be part of a community?

	b) plan to solve the identified problem in the community, c) design solutions to the identified problem, d) implement solution to the identified problem, e) share the findings to relevant actors f) reflect on own learning and relevance of the project, g) appreciate the need to belong to a community	• discuss ways and tools they can use to collect information on a problem (questionnaires, interviews, observation) • develop tools for collecting the information/data • identify resources they need for the activity • collect the information/data using various means • develop various reporting documents on their findings • use the developed tools to report on their findings • implement project • collect feedback from peers and school community regarding the CSL activity • share the report on activity through various media to peers and school community • discuss the strengths and weaknesses of implemented project and lessons learnt • reflect on how the project enhanced own learning while at the same time facilitated service on an issue in the school community	3. What can one do to demonstrate a sense of belonging

Indicator	Exceeds Expectation	Meets Expectation	Approaches Expectation	Below Expectation
The ability to identify and analyse a pertinent issue in society to be addressed	Learner critically defines and elaborately discusses a pertinent issue to be addressed.	Learner defines and discusses a pertinent issue to be addressed.	Learner defines and discusses a pertinent issue to be addressed with minimal support.	Learner requires support to critically examine and select the appropriate issue.
The ability to plan to solve the identified problem	Learner correctly and systematically establishes resources needed, develops plans, assigns responsibilities, and generates data on the CSL project.	Learner correctly establishes resources needed, develops plans, assigns responsibilities, and generates data on the CSL project.	Learner sometimes establishes resources needed, develops plans, assigns responsibilities, and generates data on the CSL project.	Learner has difficulty establishing resources needed, developing plans, assigning responsibilities and generating data on the CSL project.
The ability to design solutions to the identified problem and implement them	Learner constantly applies the knowledge and skills gained in subjects to address the identified issue.	Learner applies the knowledge and skills gained in subjects to address the identified issue.	Learner applies the knowledge and skills gained in subjects to address the identified issue with some support.	Learner requires a lot of probing to apply the knowledge and skills gained in subjects to address the identified issue.
Ability to share findings to relevant actors	Learner comprehensively and confidently shares findings of the issue	Learner confidently shares findings of the issue addressed in the activity.	Learner shares some of the findings of the issue addressed in the activity.	Learner briefly shares findings of the issue addressed in the

	addressed in the activity.			activity, lacks necessary details.
The ability to reflect on own learning and relevance of the activity	Learner distinctively and clearly outlines the benefits of the CSL activity on the target community and own learning.	Learner clearly outlines the benefits of the CSL activity on the target community and own learning.	Learner outlines the benefits of the CSL activity on the target community and own learning, a few unclear.	Learner struggles to outline the benefits of the CSL activity on the target community and own learning.

APPENDICES

APPENDIX 1: GUIDELINES FOR INTEGRATING CSL AT JUNIOR SCHOOL

Guidelines for Grade 7 Community Service-Learning Project

Introduction

Community Service Learning (CSL) is an experiential learning strategy that integrates classroom learning and community service to enable learners reflect, experience and learn from the community. The CSL activity is hosted as a strand in Social Studies. The Social Studies teacher will be expected to coordinate teachers from other learning areas to carry out the integrated CSL class activity. Learners will be expected to apply knowledge, skills, attitudes and values from the different Learning Areas to undertake the integrated CSL class activity. Learners will undertake **one common** integrated class CSL activity following a 6-step milestone approach that is:

Milestone	Description
Milestone 1	**Problem Identification** Learners study their community to understand the challenges faced and their effects on community members.
Milestone 2	**Designing a solution** Learners create an intervention to address the challenge identified.
Milestone 3	**Planning for the Project** Learners share roles, create a list of activities to be undertaken, mobilise resources needed to create their intervention and set timelines for execution
Milestone 4	**Implementation** The learners execute the project and keep evidence of work done.

Milestone 5	Showcasing /Exhibition and Report Writing Exhibitions involve showcasing learners' project items to the community and reflecting on the feedback Learners write a report detailing their project activities and learnings from feedback
Milestone 6	**Reflection** Learners review all project work to learn from the challenges faced. They link project work with academic concepts, noting how the concepts enabled them to do their project as well as how the project helped to deepen learning of the academic concepts.

Assessment of CSL integrated Activity

Assessment for the integrated CSL activity will be conducted formatively. The assessment will consider both the process and end product. This entails assessing each of the milestone stages of the integrated CSL class activity. It will focus on 3 components namely: skills from various learning areas applied in carrying out the activity, core competencies developed and values nurtured.

Appendix 2: 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	Information from different sources	Carry out activities involving classifying objects in their immediate

		Out of school/home assignments or activities		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 the concept of classification of objects or things at school and home to be orderly.
	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 the 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,	Make an improvised weighing machine/beam balance that can be used in markets to weigh 1 or 1/2kgs
	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 project that may involve data collection and presentation

APPENDIX 3: Use of ICT Devices

The following ICT devices may be used in the teaching/learning of mathematics at this level:

1. Learner digital devices (LDD),
2. Teacher digital devices (TDD),
3. Mobile phones,
4. Digital clocks (use of other clocks is also encouraged)
5. Television sets,
6. Videos,

7. Cameras,
8. Projectors,
9. Radios,
10. DVD players and CD’s,
11. Scanners,
12. Internet and Others.