



**REPUBLIC OF KENYA
MINISTRY OF EDUCATION**

JUNIOR SECONDARY SCHOOL CURRICULUM DESIGN

MATHEMATICS FOR LEARNERS WITH VISUAL IMPAIRMENT

GRADE 7



KENYA INSTITUTE OF CURRICULUM DEVELOPMENT

First Published in 2022

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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 harmonization 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 and Foundation level, Grades 4, 5 and Intermediate Level. The roll out for Grade 6, Junior Secondary (Grade 7-9), and Prevocational Level will subsequently follow.

It is my hope that the curriculum designs for learners with visual Impairment in 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) and Foundation Level. The implementation progressed to Upper Primary (Grade 4, 5 and 6) and Intermediate Level 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. This is similar to the Pre-vocational and Vocational Level.

The Grade 7 curriculum designs for learners with Visual Impairment in the respective learning areas will enable the development of 21st 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 for learners with Visual Impairment 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 conceptualized 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 and adapted the Grade 7 curriculum designs for learners with Visual Impairment 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 for learners with Visual Impairment also provide opportunities for learners to develop the core competencies as well as engage in Community Service Learning. The designs present assessment rubric 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 and adapted 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 and adaption 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 and adaptation 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 and adaptation 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

	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 Studies	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 and Health Education	2
13.	Optional Subject including Braille skills	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-fulfillment

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.

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 a positive attitude 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 with visual impairment 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. Practice 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

Mathematics is essential to our daily interactions whereby we count, add, subtract, multiply or divide quantities and substances. It involves understanding numbers and the numerical operations used to develop strategies for mental mathematical problem-solving skills, estimation and computational fluency. It covers areas like space, shape and structures, therefore learners with visual impairment will need an adapted design to take part in activities involving abstract concepts. It is impossible to think of a world without Mathematics which can be applied in the economic activities, scientific, social, religious and political worlds. It is therefore imperative that learners with visual impairment are taught Mathematics from early years.

In Junior Secondary, Mathematics builds on the competencies acquired by the learner with visual impairment 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 with visual impairment 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 with visual impairment 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.

STRAND 1.0: 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)	<p>By the end of the sub strand the learner should be able to:</p> <ol style="list-style-type: none"> apply place value and total value of digits up to hundreds of millions in real life read and write numbers in symbols up to hundreds of millions in real life situations read and write numbers in words up to millions for fluency round off numbers up to the nearest hundreds of millions in real life situations classify natural numbers as even, odd and prime in different situations apply operations of whole numbers in real life situations identify number sequence in different situations create number sequence for playing number games use digital devices with assistive technology for learning more on whole numbers and for enjoyment appreciate use of whole numbers in real life situations 	<ul style="list-style-type: none"> Learner with low vision is guided to identify and write place value and total value using place value charts with appropriate color contrast and font size while learner with blindness is guided to identify and write place value and total value using an abacus and other relevant apparatus. Learner with low vision is guided to read and write numbers in symbols on number cards or charts with appropriate color contrast and font size while learner with blindness is guided to read and write numbers in symbols on Braille work cards and abacus. Learner with low vision is guided to read and write numbers in words on number cards or charts with appropriate color contrast and font size and practice writing dummy cheques for different sums of money while learner with blindness is guided to read and write numbers in words on Braille work cards and practice writing dummy cheques in Braille for different sums of money. Learner with low vision is guided to prepare and use place value charts with appropriate color contrast and font size to round off numbers while learner with blindness is 	<ol style="list-style-type: none"> Why do we write numbers in words or symbols? How do we write numbers in words or symbols? Why do we round off numbers in real life situations?

			<p>guided to prepare and use tactile place value parade or an abacus to round off number.</p> <ul style="list-style-type: none"> • In pairs or groups learners with low vision play a number game, make number cards with appropriate color contrast and font size while learners with blindness are guided to play an adapted number game and make number cards using tactile materials. • In pairs or in groups, learners are guided to sort and classify numbers according to those that are even, odd or prime. • In pairs or in groups, learners work out or perform 2, 3 or more combined operations in the correct order using digital devices with assistive technology. • Learner is guided to identify the number patterns to work out number sequences. • In pairs or in groups, learners play games of creating puzzles that involve number sequences using digital devices with assistive technology or other materials like tactile blocks and puzzles. 	
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Core Competencies to be developed:

- Communication and collaboration as learners speak, listen and team work in pairs or groups to prepare and use place value charts to round off numbers.
- Critical thinking and problem solving as learners make interpretations and inferences while working together to identify number patterns.
- Creativity and Imagination as learners make observations while playing games of creating number puzzles that involve number sequences.

<p>Pertinent and contemporary Issues (PCIs):</p> <ul style="list-style-type: none"> Financial literacy is enhanced as learners practice writing dummy cheques for different sums of money. Self-esteem is enhanced as learners create number puzzles individually that involve number sequences.
<p>Values:</p> <ul style="list-style-type: none"> Respect is enhanced as learners work in pairs or groups and play number games. Unity is enhanced as learners work towards achieving set goals of making number puzzles. Peace is enhanced as learners work in groups and share different roles in playing games.
<p>Links to other subjects</p> <ul style="list-style-type: none"> Business studies is promoted as learners write numbers in words and in symbols when practicing writing dummy cheques at home. Computer Studies is promoted as learners use digital devices with assistive technology to play number games. Languages are promoted as learners discuss and write numbers in words.
<p>Suggested non-formal activities Learners participate in counting of votes during students' council election.</p>
<p>Suggested assessment methods Written assignment, observation, home assignments, self and peer assessment.</p>
<p>Suggested resources Abacus, place value chart, tactile place value chart, number cards, Braille work cards, dummy cheques, Braille dummy cheques, digital devices with assistive technology, Four Figure Mathematical tables, Four Figure Braille Mathematical tables.</p>

Assessment Rubric				
Criteria	Exceeds Expectations	Meets Expectations	Approaches Expectations	Below Expectations
Applying place value and total value of digits up to hundreds of millions	Applies place value and total value of digits up to thousands of millions.	Applies place value and total value of digits up to hundreds of millions.	Applies place value or total value of digits up to tens of millions.	Applies place value or total value of very few digits up to thousands.
Reading and writing numbers in symbols up to hundreds of millions	Reads and writes numbers in symbols up to thousands of millions.	Reads and writes numbers in symbols up to hundreds of millions.	Reads and writes numbers in symbols up to millions.	Reads or writes numbers in symbols up to hundreds.

Reading and writing numbers in words up to millions	Reads and writes numbers in words up to thousands of millions.	Reads and writes numbers in words up to millions.	Reads or writes numbers in words up to millions.	Reads or writes numbers in words up to hundreds.
Rounding off numbers up to the nearest hundreds of millions	Rounds off numbers up to the nearest thousands of millions and gives total values.	Rounds off numbers up to the nearest hundreds of millions.	Rounds off numbers up to the nearest millions.	Rounds off numbers up to the nearest hundreds.
Classifying natural numbers as even, odd and prime	Classifies and sequences natural numbers as even, odd and prime.	Classifies natural numbers as even, odd and prime.	Classifies natural numbers as even or odd or prime.	Identifies natural numbers as even or odd or prime.
Applying operations of whole numbers	Applies mixed operations of whole numbers.	Applies operations of whole numbers.	Applies some operations of whole numbers.	Recognises operations of whole numbers.
Identifying number sequence upto millions	Identifies number sequence up to hundreds of millions.	Identifies number sequence up to millions.	Identifies number sequence up to thousands.	Identifies number sequence up to hundreds.
Creating number sequence	Creates number sequence and states common factor in each case.	Creates number sequence.	Applies number sequence.	Identifies number sequence.

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: <ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> • In pairs or in groups, learners determine divisibility of numbers using regrouping and divisibility rule on worksheets in print and in braille. • In pairs or in groups, learners with low vision write factors of composite numbers by factorization using factor tree, factor rainbow or cards with appropriate color contrast and font size while learners with blindness write factors of composite numbers by factorization using tactile factor tree, tactile factor rainbow 	<ol style="list-style-type: none"> 1. Why 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?

		<p>(LCM) of numbers by factor method in different situations</p> <p>d. apply the Greatest Common Divisor (GCD) and the Least Common Multiples (LCM) in real life situations</p> <p>e. use digital devices with assistive technology for learning more on factors and for enjoyment</p> <p>f. reflect on the use of factors in real life situations.</p>	<p>with colours labeled in Braille or tactile cards.</p> <ul style="list-style-type: none"> • In pairs or in groups, learners with low vision use factors to determine the LCM and the GCD using number cards or charts with appropriate color contrast and font size while learners with blindness use factors to determine the LCM and GCD using braille work cards. • Learner is guided to use digital devices with assistive technology to access factors of numbers and songs, poems or games on divisibility tests. • In groups, learners to work out application questions and solve problems relating to the GCD and the LCM in real life situations. • In groups or in pairs, learners determine the GCD and LCM of numbers using digital devices with assistive technology to perform exercises on factors such as matching activities or adapted games. 	
<p>Core Competencies to be developed;</p> <ul style="list-style-type: none"> • Creativity and imagination as learners work in groups to create songs and poems on divisibility tests. • Critical thinking and problem solving as learners apply the GCD and the LCM in solving real life problems. 				
<p>Pertinent and Contemporary Issues</p> <ul style="list-style-type: none"> • Self-awareness is enhanced as learners work in groups to create songs and poems on divisibility tests. • Education for Sustainable Development (ESD) is enhanced as learners use locally available materials for making number cards and charts. 				
<p>Values</p> <ul style="list-style-type: none"> • Unity is enhanced as learners sing together or solve puzzles on factors. • Respect for self and others is enhanced as learners work in groups to write factors of composite numbers using the factor tree. 				

<p>Links to other subjects</p> <ul style="list-style-type: none"> • Music is promoted as learners work in groups to create songs and poems on divisibility tests. • Home Science is promoted as learners apply LCM or GCD to plan for measuring different ingredients in small and large quantities.
<p>Non formal activities</p> <p>Learners prepare factorization cards for competition in mathematics symposiums.</p>
<p>Suggested assessment methods</p> <p>Observation, class written assignment, home assignment, peer and self-assessment.</p>
<p>Suggested resources</p> <p>Factor rainbow, tactile factor rainbow, factor cards, tactile factor cards, number charts, Braille number charts on LCM and GCD and digital devices with assistive technology</p>

Assessment Rubric				
Criteria	Exceeds Expectations	Meets Expectations	Approaches Expectations	Below Expectations
Testing divisibility of numbers by 2, 3, 4, 5, 6, 8, 9, 10 and 11	Tests and generates 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.	Tests divisibility of numbers by 2, 3, 4, 5, 6 and 10.	Tests divisibility of numbers by 2, 3, 4, 5.
Expressing composite numbers up to 100 as a product of prime factors	Expresses composite numbers up to 1000 as a product of prime factors.	Expresses composite numbers up to 100 as a product of prime factors.	Expresses composite numbers up to 50 as a product of prime factors.	Expresses very few composite numbers as a product of prime factors up to 20.
Working out the Greatest Common Divisor (GCD) and the Least Common Multiples (LCM) of numbers by factor method	Works out and generates the Greatest Common Divisor (GCD) and the Least Common Multiples (LCM) of numbers by factor method.	Works out the Greatest Common Divisor (GCD) and the Least Common Multiples (LCM) of numbers by factor method.	Works out the Greatest Common Divisor (GCD) or the Least Common Multiples (LCM) of numbers by factor method.	States the Greatest Common Divisor (GCD) or the Least Common Multiples (LCM) of numbers.
Applying the Greatest Common Divisor (GCD) and the Least Common Multiples (LCM) in real life situations	Applies and justifies the use of Greatest Common Divisor (GCD) and the Least	Applies the Greatest Common Divisor (GCD) and the Least Common	Applies either the Greatest Common Divisor (GCD) or the Least Common	Identifies either the Greatest Common Divisor (GCD) or the Least Common

	Common Multiples (LCM) in real life situations.	Multiples (LCM) in real life situations.	Multiples (LCM) in real life situations.	Multiples (LCM) in real life situations.
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Sub Strand: Fractions

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
1.0 Numbers	1.3 Fractions (9 lessons)	<p>By the end of the sub strand, the learner should be able to:</p> <p>a) compare fractions in different situations</p> <p>b) add fractions in different situations</p> <p>c) subtract fractions in different situations</p> <p>d) multiply fractions by a whole number, fraction and a mixed fractions in real life situations</p> <p>e) identify the reciprocals of fractions in different situations</p> <p>f) divide fractions by a whole number, fraction and a mixed fraction in real life situations</p> <p>g) divide a whole number by fractions in different situations</p> <p>h) identify number sequence involving fractions in different situations</p> <p>i) create number sequence involving fractions for playing number games</p> <p>j) use digital devices with assistive technology for learning more on fractions and for enjoyment</p>	<ul style="list-style-type: none"> • Learner is guided to discuss and arrange fractions in increasing and decreasing order using different strategies. • In groups or in pairs, learners with low vision arrange fractions in ascending or descending order using fraction cards with appropriate colour contrast, font size and type while learners with blindness arrange fractions in ascending or descending order using tactile fraction cards. • In pairs or in groups, learners with low vision add and subtract fractions using cut outs, cards, and concrete objects with appropriate colour contrast and font size while learners with blindness add and subtract fractions using tactile cut outs, tactile cards, abacus and concrete objects. • In groups or in pairs, learners with low vision multiply and divide fractions using cut outs, cards and concrete objects while learners with blindness multiply and divide fractions using tactile cut outs, tactile cards, abacus and concrete objects. • In pairs or in groups, learners with low vision use flip cards with appropriate colour contrast and font size to discuss reciprocals while learners with blindness are guided to 	<ol style="list-style-type: none"> 1. Why do we perform operation of fractions in daily activities? 2. How do we use digital devices with assistive technology to find the uses of fractions in daily life?

		<p>k) recognize use of fractions in real life situations.</p>	<p>listen to audio flip cards to discuss reciprocal.</p> <ul style="list-style-type: none"> • In pairs or in groups, learners play adapted games of creating number puzzles that involve fractions number sequences using digital devices with assistive technology or other materials. • In pairs or in groups, learners create a fraction sequence game that can be used for playing and learning. • In pairs or in groups, learners use digital devices with assistive technology to work out operations of fractions 	
<p>Core Competencies to be developed:</p> <ul style="list-style-type: none"> • Creativity and imagination as learners create puzzles involving fractions. • Critical thinking and problem solving as learners apply fractions using cut outs, cards, charts and models using locally available materials. 				
<p>. Pertinent and Contemporary Issues (PCIs)</p> <ul style="list-style-type: none"> • Citizenship is enhanced as learners carry out division of fractions which implies sharing. • Social cohesion is enhanced as learners share items at home and outside school using fractions. 				
<p>Values</p> <ul style="list-style-type: none"> • Social justice is enhanced as learners share resources fairly. • Responsibility is enhanced as learners perform multiplication and division of fractions when sharing or allocating resources. 				
<p>Links to other subjects</p> <ul style="list-style-type: none"> • Music is promoted as learners use fractions in types of musical notes like semi- quavers (1/16), quavers. • Agriculture is promoted as learners use fractions to state portions of animal feeds. 				
<p>Suggested non-formal activities This is enhanced as learners share a loaf of bread during tea break.</p>				
<p>Suggested assessment methods Written assignments, home assignments, observation, self and peer assessment.</p>				

Suggested resources

Fraction cards, tactile fraction cards, paper cut outs on fraction, tactile paper cut out on fractions, audios on flip cards, digital devices with assistive technology.

Assessment Rubric				
Criteria	Exceeds Expectations	Meets Expectations	Approaches Expectations	Below Expectations
Comparing fractions	Compares and contrasts fractions using various methods.	Compares fractions.	Compares simple fractions.	Lists fractions.
Adding fractions	Adds fractions using various methods.	Adds fractions.	Adds simple fractions.	Adds simple fractions with same denominators.
Subtracting fractions	Subtracts fractions and give examples.	Subtracts fractions.	Subtracts simple fractions.	Subtract simple fractions with same denominator.
Multiplying 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.	Multiplies fractions by a whole number or a fraction or a mixed number.	Multiplies simple fractions by a whole number.
Finding reciprocals of fractions	Finds reciprocal of fractions and relate with the denominator.	Finds reciprocals of fractions.	Finds reciprocals of fractions with the numerator 1.	States the reciprocals of fractions.
Dividing fractions by a whole number, fractions and a mixed number	Divides fractions by a whole number, fractions and a mixed number and simplifies the quotient.	Divides fractions by a whole number, fraction and a mixed fraction.	Divides fractions by a whole number and fractions.	Divides fractions by a whole number.
Dividing whole numbers by fractions	Divides a whole number by fractions and formulates similar division.	Divides a whole number by fractions.	Divides a whole number by some fractions.	Divides a whole number by fractions with the denominator similar to the whole number.
Identifying number sequence involving fractions	Identifies number sequence involving fractions and arranges them in order.	Identifies number sequence involving fractions.	Identifies number sequence involving simple fractions.	Copies number sequence involving simple fractions.

Creating number Sequence involving fractions	Creates and analyses various number sequences involving fractions.	Creates number sequence involving fractions.	Creates number sequence involving simple fractions.	Copies number sequence involving fractions.
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Sub Strand: Decimals

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
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 c) divide decimals by a whole number and by a decimal in real life situations d) use digital devices with assistive technology for learning more on decimals and for enjoyment e) recognize the use of decimals in real life situations.	<ul style="list-style-type: none"> In pairs or in groups, learners with low vision are guided to discuss, state and use the place value and total value of decimals using place value apparatus and worksheets with appropriate colour contrast while learners with blindness discuss, state and use the place value and total value of decimals using an abacus and braille work cards. In pairs or in groups, learners with low vision multiply and divide decimals using cut outs, cards, charts and Models with appropriate colour contrast while learners with blindness multiply and divide decimals using an abacus and braille work cards. In pairs or in groups, learners use calculators or talking calculators and other digital devices with assistive technology to work out operations of decimals. In pairs or in groups, learners play games involving multiplication and division of decimals. 	<ol style="list-style-type: none"> How are decimals applicable in real life? Why do you use decimals in daily activities?

<p>Core Competencies to be developed:</p> <ul style="list-style-type: none"> • Critical thinking and problem solving as learners creatively identify the place value and the total value of decimals using place value apparatus and worksheets. • Digital literacy as learners use digital devices with assistive technology to play games involving multiplication and division of decimals.
<p>. Pertinent and Contemporary Issues (PCIs)</p> <ul style="list-style-type: none"> • Safety is enhanced as learners use cutting tools carefully to make paper cut outs or other materials and models.
<p>. Values</p> <ul style="list-style-type: none"> • Unity is enhanced as learners work in groups to multiply and divide decimals using cut outs, cards, charts and models. • Responsibility is enhanced as learners clear the working area after using cut outs and cards to perform multiplication and division of decimals.
<p>Links to other subjects</p> <ul style="list-style-type: none"> • Integrated Science is promoted as learners express quantities in decimal forms in measurement. • Home science is promoted as learners measure mass of ingredients for cooking in decimals.
<p>Suggested non-formal activities</p> <p>Learners use decimals to measure different quantities of ingredients during home science practical</p>
<p>Suggested assessment methods</p> <p>Written assignments, home assignments, observation, self and peer assessment</p>
<p>Suggested resources</p> <p>Abacus, cubes and cubarithm board, types and taylor frame, digital devices with assistive technology, fraction cards in print and in braille, strings, glue, paper cut outs, calculators and talking calculators.</p>

Assessment Rubric				
Criterion	Exceeds Expectations	Meets Expectations	Approaches Expectations	Below Expectations
Identifies place value and total value of decimals	Identifies and examines place value and total value of decimals in a variety of contexts.	Identifies place value and total value of decimals.	Identifies place value of decimals.	Recites place value of decimals.
Multiplying decimals by a whole number and by a decimal	Multiplies decimals by a whole number and by a decimal and generates similar multiplications.	Multiplies decimals by a whole number and by a decimal.	Multiplies decimals by a whole number.	Denotes decimals in multiplication of decimals by a whole number or by a decimal.

Dividing decimals by a whole number and by a decimal	Divides decimals by a whole number and by a decimal and generates similar divisions.	Divides decimals by a whole number and by a decimal.	Divides decimals by a whole number.	Denotes decimals in division of decimals by a whole number or by a decimal
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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 digital devices with assistive technology learning more on squares and square roots and for enjoyment d) Appreciate use of squares and square roots in real life situations.	<ul style="list-style-type: none"> In pairs or in groups, learners with low vision work out squares of numbers using grids, charts or a wheatley board with appropriate colour contrast while learners with blindness use tactile grids and tactile charts to work out squares of numbers. Learners with low vision are guided to use long multiplication method on worksheets while learners with blindness are guided to use cubes and cubarithm boards to work out long multiplication. Learners with low vision are guided to use calculators to work out squares of numbers while learners with blindness are guided to use a talking calculators to work out squares of numbers In pairs or in groups, learners work out square roots of numbers using factors method Learners are guided to work out square roots of numbers using division method. Learners with low vision are guided to work out square roots of numbers using calculators while learners with blindness are guided to use 	<ol style="list-style-type: none"> How do we apply squares and square roots in daily activities? Why do we use long multiplication method in working out squares of numbers?

			<p>a talking calculator to work out square root of numbers.</p> <ul style="list-style-type: none"> • In pairs or in groups, learners use digital devices with assistive technology to play games involving squares and square roots. 	
<p>Core Competencies to be developed:</p> <ul style="list-style-type: none"> • Critical thinking and problem solving as learners reflect on the use of grid squares and charts to find squares and square roots. • Digital literacy as learners interact with IT devices with assistive technology to work out squares and square roots of numbers. 				
<p>Pertinent and Contemporary Issues (PCIs)</p> <ul style="list-style-type: none"> • Environmental education is enhanced as learners consider shapes of different objects in the school compound especially the ones that are squares. 				
<p>Values</p> <ul style="list-style-type: none"> • Respect is enhanced as learners appreciate each other's contribution in groups in using grids and charts. • Unity is enhanced as learners work in groups and work out the factors of numbers to get the square roots. 				
<p>Links to other subjects</p> <ul style="list-style-type: none"> • Pre-Technical Studies is promoted as learners measure square lengths in carpentry and technical drawing. • Agriculture is promoted as learners determine the number of seedlings that would fit in a square portion of land. 				
<p>Suggested non-formal activities</p> <p>This is enhanced as learners find the areas of square plots for agriculture projects.</p>				
<p>Suggested assessment methods</p> <p>Observation, written assignment, home assignment, self and peer assessment.</p>				
<p>Suggested resources</p> <p>Calculators, talking calculators, square grids, tactile square grids, charts on squares, tactile charts on squares, cubes and cubarithm boards and digital devices with assistive technology.</p>				

Assessment Rubric				
Criteria	Exceeds Expectations	Meets Expectations	Approaches Expectations	Below Expectations
Determining the squares of whole numbers, fractions and decimals by multiplication	Determines and analyzes the squares of whole numbers, fractions and decimals by multiplication.	Determines the squares of whole numbers, fractions and decimals by multiplication.	Determines the squares of whole numbers or fractions by multiplication	Identifies whole numbers or fractions or decimals by multiplication.
Determining the square roots of whole numbers, fractions and decimals of perfect squares.	Determines and analyzes the square roots of whole numbers, fractions and decimals of perfect squares.	Determines the square roots of whole numbers, fractions and decimals of perfect squares.	Determines the square roots of whole numbers or fractions of perfect squares.	Identifies square roots of whole numbers, fractions and decimals of perfect squares.

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 strand 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 digital devices with assistive technology for more learning on algebraic expressions and for enjoyment, e) Appreciate use of algebraic expressions in real life.	<ul style="list-style-type: none"> • In pairs or in groups, learners with low vision to discuss and classify objects in their immediate environment according to given attributes such as similarities or differences while learners with blindness are given orientation and verbal description of their immediate environment as the learner manipulates the different phenomena in order to discuss and classify objects in their immediate environment according to some given attributes such as similarities or differences. • In groups or in pairs, learners discuss how to form algebraic expressions from the classified objects. • In groups or in pairs, learners read and interpret algebraic expressions. • In groups or in pairs, learners with low vision discuss how to simplify algebraic expressions from the classified objects while learners with blindness manipulate classified objects for familiarization and to discuss how to simplify algebraic expressions. • In groups or in pairs, learners use digital devices with assistive technology to work 	<ol style="list-style-type: none"> 1. How do we use algebraic expressions in daily activities?

			out exercises and activities in algebra to group similar objects.	
Core Competencies to be developed:				
<ul style="list-style-type: none"> • Communication and collaboration; as learners speak, listen and work in teams or as learners discuss in groups on formation of algebraic expressions. • Critical thinking and problem: solving is developed as learners interpret to factorize algebraic expressions. 				
Values				
<ul style="list-style-type: none"> • Unity is enhanced as learners classify similar objects in groups. • Respect is enhanced as learners appreciate each other's contribution while discussing and forming algebraic expressions. 				
Pertinent and Contemporary Issues (PCIs)				
<ul style="list-style-type: none"> • Environmental education is enhanced as learners classify objects from the environment. • Friendship formation is enhanced as learners work and discuss in groups on formation of algebraic expressions. 				
Links to other subjects				
<ul style="list-style-type: none"> • Languages is promoted as learners interpret statements to form algebraic expressions. • Integrated science is promoted as learners classify different objects within their local environment. 				
Suggested non-formal activities				
<ul style="list-style-type: none"> • Learners form teams based on preferences and ability for inter class competitions. 				
Suggested assessment methods				
<ul style="list-style-type: none"> • Written assignments, self and peer assessments, observation and out of school assignment. 				
Suggested resources				
<ul style="list-style-type: none"> • Realia and digital devices with assistive technology 				

Assessment Rubric				
Criteria	Exceeds Expectations	Meets Expectations	Approaches Expectations	Below Expectations
Forming algebraic expressions	Forms and analyzes algebraic expressions.	Forms algebraic expressions.	States algebraic expressions.	Identifies algebraic expressions.
Forming algebraic expressions from simple algebraic statements	Forms algebraic expressions from complex algebraic statements.	Forms algebraic expressions from simple algebraic statements.	States algebraic expressions from simple algebraic statements.	Identifies algebraic expressions from simple algebraic statements.
Simplifying algebraic expressions	Simplifies advanced algebraic expressions.	Simplifies algebraic expressions.	Simplifies simple algebraic expressions.	Relates algebraic expressions.

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 digital devices with assistive technology for more learning on linear equations and for enjoyment e) Reflect on use of linear equations in real life situations.	<ul style="list-style-type: none"> In pairs or in groups, learners with low vision to role play activities involving equations with one unknown while learners with blindness are given one on one demonstration on aspects that require vision to role play activities involving equations with one unknown. In groups or in pairs, learners discuss how to form and solve linear equations generated from role play activities. In groups or in pairs, learners use digital devices with assistive technology to form and solve linear equations. Learners use digital devices with assistive technology or other relevant resources to play games involving linear equations to enhance their learning. 	<ol style="list-style-type: none"> How do we use linear equations in real life? Why do we use linear equations in real life?
Core Competencies to be developed <ul style="list-style-type: none"> Communication and collaboration as learners speak, listen and work as a team during role play activities involving equations in one unknown. Self-efficacy as learners role play activities involving equations with one unknown. 				
Values <ul style="list-style-type: none"> Integrity is enhanced as learners share resources as per the given equation (conditions). Responsibility is enhanced as learners use the given resources carefully. 				
Pertinent and Contemporary Issues (PCIs) <ul style="list-style-type: none"> Social cohesion is enhanced as learners appreciate each other's role in activities involving equations with one unknown. Self – esteem is enhanced as learners participate in role play activities. 				
Links to other subjects <ul style="list-style-type: none"> Computer studies as learners use digital devices with assistive technology in forming and solving equations with one unknown. 				

Suggested non formal activities Learners play games involving balancing on a see saw.
Suggested assessment methods Class written assignments in print and braille, observation, home assignments, self and peer assessment.
Suggested learning resources <ul style="list-style-type: none"> Digital devices with assistive technology, see saw and realia

Assessment Rubric				
Criterion	Exceeds Expectations	Meets Expectations	Approaches Expectations	Below Expectations
Forming linear equations in one unknown	Forms and compares linear equations in one unknown.	Forms linear equations in one unknown.	States linear equations in one unknown.	Recognizes linear equations in one unknown.
Solving linear equations in one unknown	Solves and analyses linear equations in one unknown	Solves linear equations in one unknown	Solves simple linear equations in one unknown.	Writes linear equations in one unknown.
Applying linear equations in one unknown	Applies and analyzes linear equations in one unknown.	Applies linear equations in one unknown.	Applies simple linear equations in one unknown.	Writes linear equations in one unknown.

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)	<p>By the end of the sub strand the learner should be able to:</p> <ul style="list-style-type: none"> 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 digital devices with assistive technology for more learning on importance of linear inequalities and for enjoyment g) Appreciate use of linear inequalities in real life. 	<ul style="list-style-type: none"> • In pairs or in groups, learners with low vision use inequality task cards with appropriate colour contrast, font size and type to complete simple inequality statements while learners with blindness use tactile inequality task cards to complete simple inequality statements. Learners to practice how to write the inequality signs both in print and Braille. • In pairs or in groups learners with low vision use inequality task cards with appropriate colour contrast, font size and type to form simple inequality statements while learners with blindness use tactile inequality task cards to form simple inequality statements. • In pairs or in groups learners with low vision draw and represent simple inequality statements on a bold ruled number line displayed in a graph book with high quality contrast for text or graphics while learners with blindness are paired with their sighted peers in order to describe textures that represent different inequalities and use them to illustrate and represent simple inequalities on tactile number lines or or an APH desk top stick on line . • In pairs or in groups learners with low vision use inequality task cards with appropriate colour contrast font size and type to complete compound inequality statements while learners with blindness use tactile inequality task cards to complete compound inequality statements. 	<ol style="list-style-type: none"> 1. How do we use linear inequalities in real life? 2. Why do we use linear inequalities in real life?

			<ul style="list-style-type: none"> In pairs or in groups, learners use adapted digital graphing tools to present solutions to inequalities. 	
Core Competencies to be developed: <ul style="list-style-type: none"> Communication and collaboration as learners discuss in groups on how to form the linear inequalities. Creativity and Imagination as learners illustrate and represent inequality statements on a number line. 				
Pertinent and Contemporary Issues (PCIs) <ul style="list-style-type: none"> Health Education is enhanced as learners form compound inequality statements on issues affecting health. Gender equality is enhanced as learners work together to form simple linear inequalities on gender issues. 				
Values <ul style="list-style-type: none"> Social justice is enhanced as learners share learning resources fairly. Love is enhanced as learners respect each other's views in groups while sharing on linear inequalities. 				
Links to other subjects <ul style="list-style-type: none"> Language is promoted as learners form linear inequalities from different situations. Visual arts is promoted as learners mix primary colors to get secondary colors. 				
Non formal Activities to support Learning Learners determine the number of players per team to participate in different sports during games.				
Suggested Assessment methods Observation, class written assignments, out of school or home assignments, self and peer assessment.				
Suggested Learning Resources Print inequality task cards, tactile inequality task cards, graphs with appropriate partitions and colour contrast, bold tip pencils and rulers with tactile calibration.				

Assessment Rubric				
Criteria	Exceeds Expectations	Meets Expectations	Approaches Expectations	Below Expectations
Applying inequality symbols to inequality statements	Applies inequality symbols to complex inequality statements.	Applies inequality symbols to inequality statements.	Expresses inequality symbols to inequality statements.	States inequality statements.
Forming simple linear inequality in one unknown	Forms and solves simple linear inequality in one unknown.	Forms simple linear inequality in one unknown.	Forms part of simple linear inequality in one unknown.	Identifies simple linear inequality in one unknown.

Illustrating simple linear inequality on a number line	Illustrates simple linear and complex inequality on a number line.	Illustrates simple linear inequality on a number line.	Illustrates simple linear inequality on a section of a number line.	Identifies simple linear inequality on a section of a number line.
Forming compound inequality statements in one unknown	Forms a variety of compound linear inequality in one unknown.	Forms compound inequality statements in one unknown.	Forms part of compound inequality statements in one unknown.	Identifies compound inequality statements in one unknown.
Illustrating compound linear inequality in one unknown on a number line	Illustrates complex compound linear inequality in one unknown on a number line.	Illustrates compound linear inequality in one unknown on a number line.	Illustrates simple linear inequality in one unknown on a section of a number line.	Identifies simple linear inequality in one unknown on a number line.

STRAND 3.0: MEASUREMENTS

Sub Strand: Pythagorean Relationship

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
<p>3.0 Measurements</p>	<p>3.1 Pythagorean Relationship (4 lessons)</p>	<p>By the end of the sub strand, the learner should be able to:</p> <ul style="list-style-type: none"> 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 digital devices with assistive technology for more learning on Pythagoras Theorem and for enjoyment e) promote use of Pythagoras Theorem in real life situations. 	<ul style="list-style-type: none"> • In pairs or in groups, learners with low vision draw and represent practical cases of right-angled triangles 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 while learners with blindness model and represent practical cases of right-angled triangles of an object leaning on a wall at different positions and recognize the sides by being given verbal descriptions and orientation of the hypotenuse, the height and the base. For example, model a ladder leaning on a wall and manipulate the different dimensions for familiarization. • In pairs or in groups, learners with low vision count squares on different sides of a right angled-triangle, for example 3, 4, 5, to establish the Pythagorean relationship and practice using other right angled-triangles, learners with blindness to be guided by being given verbal descriptions on how to count squares with tactile boundaries on different sides of a right angled-triangle, for example 3, 4, 5, to establish the Pythagorean relationship and practice using other the wheatley board to create shapes . 	<ol style="list-style-type: none"> 1. How do we use Pythagorean relationships in real life situations?

			<ul style="list-style-type: none"> • In pairs or in groups, learners work out exercises related to Pythagorean relationships. • In pairs or in groups, learners create Pythagorean relationship puzzles. • In pairs or in groups, learners use digital devices with assistive technology to explore the use of Pythagorean relationships in daily life. 	
Core Competencies to be developed: <ul style="list-style-type: none"> • Critical thinking and problem solving as learners interpret and infer Pythagorean relationships in different situations. • Creativity and imagination as learners create Pythagorean relationship puzzles. • Learning to learn as learners apply Pythagorean relationships in real life situations. 				
Pertinent and Contemporary Issues (PCIs) <ul style="list-style-type: none"> • Peer education is enhanced as learners work in groups to establish the Pythagorean relationship. • Safety is enhanced as learners take care when using the ladder to do various activities on Pythagorean relationship. 				
Values <ul style="list-style-type: none"> • Unity is achieved as learners carry out various activities together, such as creating Pythagorean relationship puzzles. • Respect is achieved as learners appreciate each other's opinions when identifying and applying Pythagorean relationships in real life situations. 				
Links to other subjects <ul style="list-style-type: none"> • Pre-Technical Studies is promoted as learners with low vision do technical drawing and those with blindness model walls and ladders. 				
Suggested non formal activities <ul style="list-style-type: none"> • Learners make Pythagorean relationship puzzles in the mathematics club. 				
Suggested Modes of Assessment: Observation, class written assignments in print and braille, out of school or home assignments or activities, self and peer assessment.				
Suggested Learning Resources Ladder, clay or plasticine, real objects, cardboards, spur wheel and mat, cutting tools, twine thread, glue, stairs, ramp , wikki stix graphics ard , wheatley board ,				

Assessment Rubric				
Criteria	Exceeds Expectations	Meets Expectations	Approaches Expectations	Below Expectations
Recognizing the sides of a right-angled triangle in different situations	Recognizes and differentiates the sides of a right-angled triangle in different situations.	Recognizes the sides of a right-angled triangle in different situations.	Recognizes the hypotenuse of a right-angled triangle in different situations.	Lists the sides of a right-angled triangle in different situations.
Identifying Pythagorean relationship	Identifies and relates Pythagorean relationship.	Identifies Pythagorean relationship.	Counts squares on the base and the height to identify Pythagorean relationships.	States Pythagorean relationship.
Applying Pythagorean relationship	Applies and explains Pythagorean relationship to various situations.	Applies Pythagorean relationship.	States Pythagorean relationship.	Identifies Pythagorean relationship.

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	<ul style="list-style-type: none"> In pairs or in groups learners generate conversion tables in print or Braille involving cm, dm, m, Dm, Hm. In pairs or in groups, learners practice different operations involving length. In pairs or in groups learners watch or listen to audio-visual clips on correct procedures of measuring length and working out perimeter. In pairs or in groups, learners use appropriate measuring tools to measure the length of various objects while learners with blindness are given guidance on aspects that require vision in order to measure the length of various objects. In pairs or in groups, learners with low vision measure and work out perimeter of 	<ol style="list-style-type: none"> Why do we use different units of measuring length? How do we measure the perimeter of different objects?

		<p>e) use digital devices with assistive technology for more learning on length and for enjoyment</p> <p>f) promote use of length in real life situations.</p>	<p>different plane figures including combined shapes while learners with blindness measure by being given one on one guidance on start and end point of the targeted measurement and work out perimeter of different tactile plane figures including combined shapes.</p> <ul style="list-style-type: none"> • In pairs or in groups, learners with low vision a measure the circumference and diameter of different circular objects using appropriately labeled measuring tools and establish the relationship between circumference and diameter which is Pi while learners with blindness measure the circumference and diameter of different circular objects with tactile marks using tactile measuring tools by being given one on one guidance on start and end point of the targeted measurement and establish the relationship between circumference and diameter which is Pi. • In pairs or in groups, learners use Pi to practice working out the circumference of circles and use digital devices with assistive technology for calculations. 	
<p>Core Competencies to be developed:</p> <ul style="list-style-type: none"> • Communication and collaboration as learners work in pairs or in groups when measuring lengths of various objects and also as they discuss the relationship between circumference and diameter. • Self-efficacy as learners practice different operations using length. • Critical thinking and problem solving as learners relate circumference to diameter. 				
<p>Pertinent and Contemporary Issues (PCIs)</p> <ul style="list-style-type: none"> • Social cohesion is enhanced as learners work in pairs and groups in measuring lengths of various objects. 				

<ul style="list-style-type: none"> • Safety is enhanced as learners take care of different instruments of measuring length. • Global citizenship is enhanced as learners appreciate units of measurements especially the S.I units of length.
Values <ul style="list-style-type: none"> • Social justice as learners get equal opportunities to get acquainted with measuring tools. • Unity is enhanced as learners work harmoniously in groups to measure lengths of various objects.
Links to other subjects <ul style="list-style-type: none"> • Integrated science is promoted as learners use units of measuring length in measuring activities • Pre- Technical Studies is promoted as learners use measurements in tailoring, constructions, and engineering.
Non formal Activities to support learning: Learners participate in marking various courts in the playing field.
Suggested assessment methods Observation, class written tests in print and braille, out of school or home assignments or activities.
Suggested Learning Resources: Calibrated ruler or tape measure, ruler or tape measure with appropriate color contrast and font, circular objects with tactile marks, strings, ropes, glue and cello tape, wikki stix and Wheatley Tactile Diagramming kit.

Assessment Rubric				
Criteria	Exceeds Expectations	Meets Expectations	Approaches Expectations	Below Expectations
Converting 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 and states their relationship.	Converts 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, and m.	Recites the conversion table involving units of length from cm to Hm
Performing operations involving units of length	Performs mixed operations involving units of length in whole numbers and decimals.	Performs operations involving units of length.	Performs addition, subtraction and multiplication involving units of length.	Performs addition or subtraction involving units of length.
Working out the perimeter of plane figures	Works out the perimeter of combined plane figures.	Works out the perimeter of plane figures.	Works out the perimeter of regular plane figures.	Identifies the perimeter of plane figures.
Working out the circumference of circles	Works out the circumference of numerous circles and express the result in different units of length.	Works out the circumference of circles.	States the formula for finding the circumference of circles.	Identifies the circumference of circles.

Sub Strand: Area

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
3.0 Measurements	3.3 Area (8 lessons)	<p>By the end of the sub strand, the learner should be able to:</p> <ul style="list-style-type: none"> a) identify square metre (m), 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 digital devices with assistive technology for more learning on area and for enjoyment f) recognise use of area in real life situations. 	<ul style="list-style-type: none"> • Learner is guided to generate conversion tables involving acres and hectares as units of measuring area in print or in Braille. • Learner with low vision is guided to use cut outs to find the area of the plane figures while learner with blindness is given one on one demonstration in order to find the area of embossed plane figures. • Learner with low vision is guided to cut out a circle into small sectors and rearrange them to form a rectangle to derive the formula for the area of a circle while learner with blindness be guided by being given support on actions that require vision to cut provided circles with embossed segments and rearrange them along guided embossed lines to form rectangular shape and derive the formula for the area of a circle. • Learner with low vision is guided to work out the area of combined shapes by cutting out plane figures, finding the area of each plane figure and getting the sum while learner with blindness is guided to work out the area of combined shapes by cutting out embossed plane figures, finding the area of each plane figure and getting the sum by being given support on aspects that require vision. 	<ol style="list-style-type: none"> 1. How do we derive the formula of a circle using plane figures? 2. How do we work out the areas of plane figures?

			<ul style="list-style-type: none"> In groups or in pairs, learners with low vision watch audiovisual clips on deriving the formula for the area of a circle from circular paper cut outs while learners with blindness listen to audio visual clips on deriving the formula for the area of a circle from circular paper cut outs and be given verbal descriptions and demonstrations of the non-verbal activities in the clip. 	
<p>Core Competencies</p> <ul style="list-style-type: none"> Critical thinking and problem solving as learners cut out the circle into small sectors, join them to create a rectangle and generate a formula of getting the area of a circle. Creativity and imaginations as learners combine different shapes to make patterns. Self-efficacy as learners demonstrate how to derive the formula for the area of a circle. 				
<p>Pertinent and Contemporary Issues</p> <ul style="list-style-type: none"> Safety is enhanced as learners handle different instruments/tools to make cut outs of different materials. Environmental education is enhanced as learners use locally available materials in measuring the area. 				
<p>Values</p> <ul style="list-style-type: none"> Responsibility is enhanced as the learner cuts out the small sectors of the circle and joins them up to form a rectangle. Integrity is enhanced as learners return tools and resources after the practicals. Unity is enhanced as learners work in groups and share tasks in measuring the area. 				
<p>Links to other subjects</p> <ul style="list-style-type: none"> Pre-Technical Studies is promoted as learners work out the correct area of different shapes in studying surveys. Visual Arts is promoted as learners combine different shapes to make patterns. Integrated sciences is promoted as learners relate areas to friction and pressure. 				

Suggested non-formal activities Learners make patterns in the school flower garden.
Suggested assessment methods Observation , class written assignments in print and braille, out of school or home assignments, self and peer assessment
Suggested resources Cutting tools, manila paper, spur wheel and mat, pens and pencils of different colours, cotton wool, glue, abacus, talking calculator, scientific calculator, square cut outs, 1cm squares and 1m square, wikki stix, Wheatley Tactile Diagramming kit.

Assessment Rubric				
Criteria	Exceeds Expectations	Meets Expectations	Approaches Expectations	Below Expectations
Identifying square metre (m), ares and hectares as units of measuring area	Identifies square metre (m), ares and hectares as units of measuring area and states their relationship.	Identifies square metre (m), ares and hectares as units of measuring area.	Identifies square metre (m), ares or hectares as units of measuring area.	Identifies square metre (m) as a unit of measuring area.
Working out the area of rectangles, parallelogram, rhombus and trapezium	Works out the area of rectangles, parallelograms, rhombus or trapezia and expresses the result in hectares.	Works out the area of rectangles, parallelograms, rhombus and trapezia.	Works out the area of rectangles or parallelograms or rhombus or trapezium.	Works out the area of rectangles.
Working out the area of circles	Works out the area of circles and expresses the answer in different units.	Works out the area of circles.	States the formula for finding the area of a circle.	Identifies the radius of a circle.
Calculating the area of borders and combined shapes	Calculates and analyzes the area of borders and combined shapes.	Calculates the area of borders and combined shapes.	Calculates the area of combined shapes.	Identifies the formulae of different plane figures.

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 cubic metre (m^3) as a unit of volume in measurements b) convert cubic metre (m^3) into cubic centimetres (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 digital devices with assistive software for more learning on volume and capacity and for enjoyment	<ul style="list-style-type: none"> • In pairs or in groups, learners with low vision make a cube of sides 1 metre using locally available materials while learners with blindness are guided by being given support in areas that require vision to make a cube of sides 1 metre using locally available materials. • In pairs or in groups, learners discuss and work out the conversions of cubic centimetres (cm^3) and cubic metres (m^3). 	<ol style="list-style-type: none"> 1. How do we use volume and capacity in daily activities? 2. Why do we measure volume?

		<p>h) appreciate use of volume and capacity in real life situations.</p>	<ul style="list-style-type: none"> • In pairs or in groups, learners with low vision collect labeled containers of different volumes and capacity from the environment learners with blindness are guided by being given verbal descriptions of phenomena that require vision to identify and collect containers of different volumes and capacity from the environment. • In pairs or in groups, learners generate conversion tables in print or in Braille of 	
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			<p>volume and capacity.</p> <ul style="list-style-type: none"> • In pairs or in groups, learners create models of cubes, cuboids, and cylinders which they will use to work out volume. • In pairs or in groups, learners watch or listen to audio visual clips on volume and capacity. 	
<p>Core Competencies to be developed:</p> <ul style="list-style-type: none"> • Critical thinking and problem solving as learners create a conversion table of units of volume and capacity. • Creativity and Imagination as learners create models of cubes and cuboids. 				
<p>Pertinent and Contemporary Issues (PCIs)</p> <ul style="list-style-type: none"> • Environmental education is enhanced as learners make big and small containers of different volumes from locally available resources. • Safety is enhanced as learners make models of cubes and cuboids using sharp cutting tools. • ESD is enhanced as learners learn water conservation methods using containers of different capacities. 				
<p>Values</p> <ul style="list-style-type: none"> • Responsibility is enhanced as learners work in groups and share different tasks in making models. • Peace is enhanced as learners discuss how to make the models of different volumes and capacities. 				
<p>Links to other subjects</p> <ul style="list-style-type: none"> • Creative Arts is promoted as learners create models of cubes and cuboids. • Pre Technical Studies is promoted as learners create models of cubes and cuboids. • Integrated Science is promoted as learners work out volumes of different substances. 				

Suggested non formal activities Learners sing songs about water conservation.
Suggested assessment methods Observation, class written assignments in print and braille, out of school or home assignments or activities, self and peer assessment.
Suggested resources Liquid level indicator, models of cubes and cuboids, tactile calibrated containers, cylinders, scissors or razor blade, liquids, wood, metre rule, tactile tape measure and realia

Assessment Rubric				
Criteria	Exceeds Expectations	Meets Expectations	Approaches Expectations	Below Expectations
Identifying cubic metres (m) as a unit of volume	Identifies and analyses cubic metres (m) as a unit of volume.	Identifies cubic metres (m) as a unit of volume.	Identifies cubic centimeters (cm) as a unit of volume.	Recites cubic centimetres (cm) as a unit of volume.
Converting cubic metres (m) into cubic centimeter (cm) and vice versa	Converts and applies cubic metre (m) into cubic centimetres (cm) and vice versa.	Converts cubic metres (m) into cubic centimetres and vice versa.	Converts cubic metres (m) into cubic centimetres or converts cubic centimetres into cubic metres (m).	Recites the formula of converting cubic metre (m) into cubic centimetres.
Working out the volume of cubes, cuboids and cylinders	Works out the volume of cubes, cuboids and cylinders and convert the result in both (m) and (cm).	Works out the volume of cubes, cuboids and cylinders.	Works out the volume of cubes and cuboids.	Works out the volume of cubes
Identifying the relationship between cm, m and litres	Identifies the relationship between cm, m and litres and create a conversion table.	Identifies the relationship between cm, m and litres.	Identifies the relationship between cm and litres.	Recites the conversion table showing the relationship between cm, m and litres.
Relating volume of cubes, cuboids and cylinder to capacity	Relates volume of cubes, cuboids and cylinders to capacity and generates conversion tables.	Relates volume of cubes, cuboids and cylinders to capacity.	Relates volume of cubes, and cuboids to capacity.	Relates volume of cubes to capacity.

Working out the capacity of regular and irregular containers	Works out and compares the capacity of regular and irregular containers.	Works out the capacity of regular and irregular containers.	Works out the capacity of regular containers.	Writes the formula of capacity of regular containers.
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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 digital devices with assistive technology to learn	<ul style="list-style-type: none"> • In pairs or in groups, learners use analog or digital adapted clocks to tell time in hours, minutes and seconds and discuss the units of time. • In pairs or in groups, learners create conversion tables in print or in braille on units of time. • In pairs or in groups, learners with low vision discuss and estimate distances between two or more points and convert from Km to meters while learners with blindness discuss and estimate distances between two or more points by first covering the distance between the two points for familiarization and then converting from Km to meters and vice versa. • In pairs or in groups, learners with low vision engage in activities that involve distance and time such as track events to relate time, distance 	<ol style="list-style-type: none"> 1. Why do we relate distance, time and speed? 2. How is speed important in daily activities?

		<p>more on time, distance and speed for planning</p> <p>h) reflect on use of time, distance and speed in real life situations</p>	<p>and speed on appropriately marked fields while learners with blindness are paired with their sighted peers to participate in the track events.</p> <ul style="list-style-type: none"> • In pairs or in groups, learners discuss how long they take to travel from home to school and discuss the aspects of distance, and time taken to get to school. • In pairs or in groups, learners practice calculating speeds in km/h or m/s. • In pairs or in groups learners play adapted digital games involving racing or watching or listen to audios on ongoing marathon. 	
<p>Core Competencies to be developed:</p> <ul style="list-style-type: none"> • Critical thinking and problem solving as learners create conversion tables, relate and determine distance, time and speed. • Self-efficacy as learners participate in different track activities. 				
<p>Pertinent and Contemporary Issues (PCIs)</p> <p>Disaster Risk Reduction (DRR) and Safety is enhanced as learners observe safety, participate in measuring distance between two points.</p>				
<p>Values</p> <ul style="list-style-type: none"> • Patriotism is enhanced as learners deliberate on how to observe different speed limits in different areas. • Integrity is enhanced as learners observe set rules for track events. 				
<p>Links to other subjects</p> <ul style="list-style-type: none"> • Integrated science is promoted as learners observe time as they carry out different track events. • Physical and Health Education is promoted as learners participate in athletics. 				
<p>Suggested non formal activities</p> <p>Learner records time taken in athletics competition.</p>				
<p>Suggested assessment methods</p> <p>Observation, class written tests in print and braille ,out of school or home assignments or activities, self and peer assessment</p>				

Suggested learning resources

Adapted analogue and digital clocks, adapted digital watches, adapted stop watches, tactile tape measure, tape measure, ropes, pegs, talking calculators, scientific calculators, abacus

Suggested Assessment Rubric

Criteria	Exceeds Expectations	Meets Expectations	Approaches Expectations	Below Expectations
Identifying hours, minutes and seconds as units of measuring time	Identifies and compares hours, minutes and seconds as units of measuring time.	Identifies hours, minutes and seconds as units of measuring time.	Identifies minutes and hours as units of measuring time.	Mentions minutes or hours as units of measuring time.
Converting units of time from hours to minutes, minutes to seconds, hours to seconds and vice versa.	Converts units of time from hours to minutes, minutes to seconds, hours to seconds and vice versa and generates conversion tables.	Converts units of time from hours to minutes, minutes to seconds, hours to seconds and vice versa.	Converts units of time from hours to minutes, minutes to seconds and vice versa.	Converts units of time from hours to minutes and vice versa.
Converting units of measuring distance in kilometres (Km) to metres (M) and vice versa	Converts and formulates units of measuring distance in kilometres (km) to metres (M) and vice versa	Converts units of measuring distance in kilometres (Km) to metres (M) and vice versa.	Converts units of measuring distance in kilometres (Km) to metres (M).	States units of measuring distance in kilometres (Km) and metres (M).
Identifying speed as distance covered per unit time	Identifies and analyses speed as distance covered per unit time	Identifies speed as distance covered per unit time.	Recites the formula of speed as distance covered per unit time.	Identifies time taken to cover a certain distance.
Working out speed in km/h and m/s	Works out and compares speed in Km/h and m/s.	Works out speed in Km/h and m/s.	Works out speed in Km/h or m/s	Identifies speed in Km/h or m/s
Converting units of speed from kilometers	Converts and compares units of speed from	Converts units of speed from kilometers per hour (Km/h) to	Converts units of speed from kilometers per hour (Km/h) to	Identifies units of speed from kilometers per hour

per hour (Km/h) to meters per second (m/s) and vice versa	kilometers per hour (Km/h) to meters per second (m/s) and vice versa.	meters per second (m/s) and vice versa.	meters per second (m/s) or meters per second (m/s) to kilometers per hour (Km/h).	(Km/h) to meters per second (m/s).
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Sub Strand: Temperature

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
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 f) use digital devices or other resources to learn about	<ul style="list-style-type: none"> In pairs or in groups, learners move to the field, observe the temperature in the environment and discuss the temperature conditions as either warm, hot or cold. In pairs or in groups, learners discuss and test the temperature of different substances using arbitrary methods like touching, for example cold, warm or hot water while exercising caution when dealing with hot substances. In pairs or in groups, learners identify tools of measuring temperature, for example, thermometers or talking thermometers that are in degrees Celsius. learner is guided to record the symbol for temperature in both braille and print In groups or in pairs, learners work out conversions of temperature from degrees Celsius to Kelvin and vice versa and display them on tactile or print charts. In pairs or in groups, learners practice using digital devices with assistive 	<ol style="list-style-type: none"> How does temperature affect our everyday lives? How do we measure temperature?

		temperature conditions of different places g) recognise temperature changes in the environment.	technology or other adapted resources to determine temperature of different places in degrees Celsius and Kelvin.	
Core Competencies to be developed:				
<ul style="list-style-type: none"> • Communication and collaboration as learners work in groups and use adapted tools of measuring temperature. • Digital literacy as learners determine the temperature of different places using adapted digital devices. 				
Pertinent and Contemporary Issues (PCIs)				
<ul style="list-style-type: none"> • Self-awareness is enhanced as learners take their body temperatures. • Safety is enhanced as learners work in groups and exercise caution when dealing with hot substances. 				
Values				
<ul style="list-style-type: none"> • Responsibility is enhanced as learners carefully handle tools of measuring temperature. • Respect is enhanced as learners take turns in giving measurements of temperature. 				
Links to other subjects				
<ul style="list-style-type: none"> • Physical and Health Education is promoted as learners take and record their body temperatures for health purposes. • Social Studies is promoted as learners discuss climatic temperature changes. 				
Suggested non formal activities				
Learners listen to the weather forecasting over the radio.				
Suggested assessment methods				
Observation, class written tests in print and braille, out of school or home assignments or activities, self and peer assessment.				
Suggested resources				
Thermometer, weather charts both in print and braille, talking thermometer.				

Suggested Assessment Rubric

Criteria	Exceeds Expectations	Meets Expectations	Approaches Expectations	Below Expectations
Describing the temperature conditions of the immediate environment as either warm, hot or cold	Describes and relates 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.	Describes the temperature conditions of the immediate environment as either hot or cold.	Cites temperature conditions of the immediate environment as either hot or cold.

Comparing temperature using hotter, warmer, colder and same as	Analyses temperature using hotter, warmer, colder and same as.	Compares temperature using hotter, warmer, colder and same as.	Compares Temperature using hotter and colder.	Selects temperature as either hotter or colder.
Identifying units of measuring temperature as degrees Celsius and Kelvin	Identifies and relates units of measuring temperature as degree Celsius and Kelvin.	Identifies units of measuring temperature as degree Celsius and Kelvin.	Identifies units of measuring temperature as degree Celsius or Kelvin.	Mentions units of measuring temperature as degree Celsius.
Converting units of measuring temperature from degree Celsius to Kelvin and vice-versa	Converts units of measuring temperature from degree Celsius to Kelvin and vice-versa and creates a conversion table.	Converts units of measuring temperature from degree Celsius to Kelvin and vice-versa.	Converts units of measuring temperature from either degree Celsius to Kelvin or Kelvin to Celsius.	Recites conversion table of units of measuring temperature from degrees Celsius to Kelvin.
Working out temperature in degrees Celsius and Kelvin	Works out and analyzes temperature in degrees Celsius and Kelvin.	Works out temperature in degrees Celsius and Kelvin.	Works out temperature in degrees Celsius or Kelvin.	Identifies temperature in degree Celsius or Kelvin.

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	<ul style="list-style-type: none"> In pairs or in groups, learners with low vision role play shopping and selling activities involving profit, loss, discount and commission while learners with blindness are given orientation of the props and stage to role play shopping and selling activities involving profit, loss, discount and commission. In pairs or in groups, learners work out profit and loss involving different activities and settings. In pairs or in groups, learners work out percentage profit or loss from the role play activities while denoting the braille and print 	<ol style="list-style-type: none"> Why do we use money in daily activities? How are considerations made when buying or selling? How is mobile money transaction carried out?

		<p>e) interpret bills at home</p> <p>f) prepare bills in real life situations</p> <p>g) work out postal charges in real life situations</p> <p>h) identify mobile money services for different transactions</p> <p>i) work out mobile money transactions in real life situations</p> <p>j) use digital devices with assistive technology to learn more about money for expenditure and investment</p> <p>k) recognise use of money in day to day activities.</p>	<p>symbol for profit and loss appropriately and aligning work in separate lines for different steps..</p> <ul style="list-style-type: none"> • In pairs or in groups, learners work out discount and percentage discount from model shopping activities while denoting the braille and print symbol for discount and percentage discount appropriately and aligning work in separate lines for different steps.. • In pairs or in groups, learners work out commission and percentage commission from the role play activities while denoting the braille and print symbol for commission and percentage commission appropriately and aligning work in separate lines for different steps.. • In pairs or in groups learners with low vision identify different types of bills and read the components of bills while learners with blindness identifies Braille models of bills and read the components of the bills. • In pairs or in groups, learners prepare bills of different items and expenses in print or Braille. • In pairs or in groups, learners with low vision visit the post office to gather information on postal services and charges while learners with blindness visit the post office and be given support and verbal descriptions of phenomenal that require vision and then gather information on postal services and charges. • In pairs or in groups, learners are guided to work out postal charges in different situations. 	
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			<ul style="list-style-type: none"> • In pairs or in groups, learners discuss and identify mobile money services. • In pairs or in groups, learners work out mobile money transactions, for example, in sending or receiving money, in credit and savings activities. • In pairs or in groups, learners generate bills, role play paying for goods and services, and other online transactions using digital devices with assistive technology or other print or braille media. 	
<p>Core Competencies to be developed:</p> <ul style="list-style-type: none"> • Critical thinking and problem solving as learners work out discounts, commissions and mobile money and postal charges and bills. • Communication and collaboration as learners role play on negotiating for discounts and commissions. • Citizenship as learners work out discounts, commissions and mobile money in Kenyan currency. • Self-efficacy as learners individually make and display bills. 				
<p>Pertinent and Contemporary Issues (PCIs)</p> <ul style="list-style-type: none"> • Financial literacy is enhanced as learners work out discounts, commissions and postal charges and bills. • Life skills are developed as learners make decisions while role playing, paying bills and postal charges. 				
<p>Values</p> <ul style="list-style-type: none"> • Patriotism is enhanced as learners work out and pay bills in Kenyan currency. • Integrity is enhanced as learners pay bills and appreciate use of money. 				
<p>Links to other subjects</p> <ul style="list-style-type: none"> • Business studies is promoted as learners work out bills, discounts, commissions and postal charges. • Life skills are promoted as learners apply negotiation skills in discounts and commissions. • Languages are promoted as learners gather information on postal services and charges. 				
<p>Suggested non formal activities</p> <p>Learners participate in shopping activities involving items for use in school.</p>				
<p>Suggested assessment methods</p> <p>Observation, class written tests in print and braille, out of school or home assignments or activities, self and peer assessment.</p>				
<p>Suggested learning resources</p> <p>Price list both in braille and print, classroom shop, electronic money tariffs charts both in braille and print, currency recognition system or app.</p>				

Assessment Rubric				
Criteria	Exceeds Expectations	Meets Expectations	Approaches Expectations	Below Expectations
Working out profit and loss	Works out and analyzes profit and loss.	Works out profit and loss.	Works out profit or loss.	Identifies profit or loss in real life situations.
Calculating percentage profit and loss	Calculates and compares percentage profit and loss.	Calculates percentage profit and loss.	Calculates percentage profit or loss.	Cites examples involving percentage profit or loss.
Calculating discount and percentage discount	Calculates and applies discount and percentage discount.	Calculates discount and percentage discount.	Calculates discount or percentage discount.	Identifies discount
Calculating commission and percentage commission	Calculates and applies commission and percentage commission.	Calculates commission and percentage commission.	Calculates commission or percentage commission.	Identifies commission.
Interpreting bills	Interprets and infers bills.	Interprets bills.	Describes bills.	Mentions types of bills.
Preparing bills	Prepares and analyzes bills.	Prepares bills.	Records sections of a bill.	Identifies components of bills.
Working out postal charges	Works out and sequences postal charges.	Works out postal charges.	Lists postal charges.	Recites postal charges.
Identifying mobile money services	Identifies and uses mobile money services.	Identifies mobile money services.	Lists mobile money services.	Recites mobile money services.
Working out mobile money transactions	Works out and compares mobile money transactions.	Works out mobile money transactions.	Gives examples of mobile money transactions.	Cites mobile money transactions.

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: <ol style="list-style-type: none"> relate different types of angles on a straight line in real life situations solve angles at a point in learning situations relate angles on a transversal in different situations solve angles in a parallelogram in different situation identify angle properties of polygons up to hexagon in different situations relate interior angles, exterior angles and the number of sides of a polygon up to hexagon in different situations solve angles and sides of polygons up to hexagon in learning situations use digital devices with assistive technology to learn more about angles and for leisure 	<ul style="list-style-type: none"> In pairs or in groups, learners with low discuss positions of objects in the immediate environment in relation to angles while learners with blindness be guided to use olfactory, auditory and kinesthetic senses to identify objects in the immediate environment and discuss positions of the objects in the immediate environment in relation to angles. In pairs or in groups, learners with low vision draw straight lines with different angles using bold tip pencils on plane papers, measure using clear protractors and relate the angles, while learners with blindness to draw lines with different angles using a tactile ruler and measure using a tactile protractor and relate the angles. In pairs or in groups, learners with low vision draw transversals using bold tip pencils on plane papers, measure using clear protractors and relate the angles ,while learners with blindness draw transversals consisting of few lines using a tactile ruler and measure the angles using a tactile protractor and relate them. In pairs or in groups, learners with low vision draw parallelograms using bold tip pencils on plane papers, measure using clear protractors and relate the various angles while 	Why do we use angles in real life situations?

		<p>i) express admiration for use of angles in objects</p>	<p>learners with blindness are guided to draw parallelograms using a tactile ruler and measure the angles using a tactile protractor and relate the angles.</p> <ul style="list-style-type: none"> • In pairs or in groups, learners use cut outs and drawings or tactile drawings of polygons up to hexagon to measure the interior angles and relate them to the number of right angles. • In pairs or in groups, learners use cut outs and drawings or tactile drawings of polygons up to hexagon to measure the exterior angles and relate them to the number of right angles. • In pairs or in groups, learners work out angles and sides in different polygons up to hexagon. • In pairs or in groups, learners with low vision draw angles at a point using digital devices with assistive technology or make angles using locally available materials while learners with blindness listen to audio visual clips on how to draw angles at a point and make different angles from locally available materials. 	
<p>Core Competencies to be developed:</p> <ul style="list-style-type: none"> • Communication and collaboration as learners discuss in groups positions of objects in the immediate environment in relation to angles. • Critical thinking and problem solving as learners draw, measure and relate angles. • Digital literacy as learners use digital devices to draw angles at a point. 				
<p>Pertinent and Contemporary Issues (PCIs)</p> <ul style="list-style-type: none"> • Safety is enhanced as learners work in groups to use cut outs or drawings of different polygons up to hexagon. 				
<p>Values</p> <ul style="list-style-type: none"> • Responsibility is enhanced as learners explore positions of objects in the immediate environment in relation to angles. • Unity is enhanced as learners work in groups to use cut outs or drawings of different polygons up to hexagon. 				
<p>Links to other subjects</p> <ul style="list-style-type: none"> • Pre-technical Studies is promoted as learners use knowledge learnt to cut out or draw different polygons up to hexagon to drawings in tailoring. 				

Suggested non-formal activities Learners make different angles when performing scouting activities.
Suggested assessment methods: <ul style="list-style-type: none"> • Observation, class written tests, out of school assignments, home assignments or activities, self and peer assessment.
Suggested resources Unit angles, protractors, rulers, straight edges, tactile protractors, tactile rulers, spur wheel and mat, paper cut outs of different shapes, APH tactile Geometry kit, wheatley tactile diagramming kit.

Assessment Rubric				
Criteria	Exceeds Expectations	Meets Expectations	Approaches Expectations	Below Expectations
Relating different types of angles on a straight line.	Defines and relates different types of angles on a straight line.	Relates different types of angles on a straight line.	Describes different types of angles on a straight line.	Names types of angles on a straight line.
Solving angles at a point.	Solves and generates angles at a point.	Solves angles at a point.	Describes angles at a point.	Identifies angles at a point.
Relating angles on a transversal.	Relates and generates angles on a transversal.	Relates angles on a transversal.	Describes angles on a transversal.	Names angles on a transversal.
Solving angles on a parallelogram.	Solves and generates angles on a parallelogram.	Solves angles on a parallelogram.	Selects all angles on a parallelogram.	Identifies angles on a parallelogram.
Identifying angle properties of polygons up to hexagon.	Identifies and compares angle properties of polygons up to hexagon.	Identifies angle properties of polygons up to hexagon.	Identifies angle properties of polygons up to pentagon.	Identifies angle properties of polygons up to quadrilateral.
Relates interior angles, exterior angles and the number of sides of a polygon up to hexagon	Relates and generates 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 hexagon.	Relates interior angles, exterior angles and the number of sides of a polygon up to pentagon.	Relates interior angles, exterior angles and the number of sides of a polygon up to quadrilateral.
Solving angles and sides of polygons up to hexagon	Solves and generates angles and sides of polygons up to hexagon.	Solves angles and sides of polygons up to hexagon.	Solves angles and sides of polygons up to pentagon.	Solves very few angles and sides of polygons up to quadrilateral.

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
4.0 Geometry	4.2.0 Geometrical Constructions (For learner with low vision) (12 lessons)	By the end of the sub strand, the learner should be able to; <ol style="list-style-type: none"> a) measure different angles in shapes in different learning situations b) bisect angles using a ruler and a pair of compasses only in learning situation c) construct 90°, 45°, 60°, 30° and other angles that are multiples of 7.5° using a ruler and a pair of compasses only in learning situation d) construct different triangles using a ruler and a protractor only in different situations e) construct circles using a ruler and a pair of compasses only in different situations f) use digital devices with assistive technology to learn about geometric constructions for skills development g) recognise use of geometric constructions of different shapes in objects 	<ul style="list-style-type: none"> • In pairs or in groups, learners with low vision observe and measure diagrams with appropriate contrast showing different angles. • In pairs or in groups, learners with low vision bisect and measure different angles on white plain papers using bold tip pencils, pairs of compasses and adapted rulers with visible calibrations. • In pairs or in groups, learners with low vision construct 90°, 45°, 60°, 30° including 120°, 105° and practice with angles that are multiples of 7.5° using a pair of compasses and rulers with visible calibrations on white plain papers, using bold tip pencils and pairs of compasses. • In pairs or in groups, learners with low vision construct different triangles on white plain papers, using bold tip pencils, adapted rulers visible calibrations and pairs of compasses. • In pairs or in groups, learners with low vision construct circles on white plain papers, using bold tip pencils, adapted rulers with visible calibrations and pairs of compasses. • In pairs or in groups, learners use digital devices with assistive technology to draw angles and circles, watch videos on bisecting angles and constructing angles and circles or use paper cut outs to play games involving angles. 	<ol style="list-style-type: none"> 1. How do we use geometric constructions in real life situations? 2. Why do we bisect angles in geometric constructions?

	<p>4.2.1 Geometrical Constructions 12 lessons (For learner with blindness)</p>	<p>a) measure different angles in shapes in different learning situations</p> <p>b) identify bisected angles using a ruler and a protractor only in learning situation</p> <p>c) interpret bisected 90°, 45°, 60°, 30 and other angles that are multiples of 7.5° in learning situation</p> <p>d) describe properties of different tactile triangles in different situations</p> <p>e) construct tactile circles in different situations</p> <p>f) use digital devices with assistive technology to learn about geometric constructions for skills development</p> <p>g) recognise use of geometric constructions of different shapes in objects</p>	<ul style="list-style-type: none"> • In pairs or in groups, learners with blindness to manipulate different angles for familiarization in the environment and then measure using a tactile protractor. • In pairs or in groups, learners with blindness are given one on one guidance to identify bisected tactile angles from different tactile embossed diagrams. • In pairs or in groups, learners with blindness discuss, manipulate and record the angles by measuring using a tactile ruler and protractor bisected angles of 90°, 45°, 60°, 30 and other angles that are multiples of 7.5°. • In pairs or in groups, learners with blindness describe properties of different tactile triangles by manipulating to identify the angles and the sides of the triangles. • In pairs or in groups, learners with blindness construct circles using a ruler and a pair of compasses by being given one on one demonstration of placing the tactile ruler to draw targeted radius on a line and placing the adapted pair of compasses adjusted to the targeted radius on the line then make a circle. • Learner is guided to use digital devices with assistive technology to draw angles and circles, listen to audio visual videos on bisecting and constructing angles and circles or use paper cut outs to play games involving angles. 	<ol style="list-style-type: none"> 1. How do we use geometric constructions in real life situations 2. Why do we bisect angles in geometric constructions?
<p>Core Competencies to be developed:</p> <ul style="list-style-type: none"> • Creativity and imagination as learners construct or draw angles, triangles and circles. 				

<ul style="list-style-type: none"> Digital literacy as learners interact with digital devices to learn more on construction of angles, triangles and circles
Pertinent and Contemporary Issues (PCIs) <ul style="list-style-type: none"> Safety is enhanced as learners use adapted geometrical instruments such as a pair of compasses and dividers with care to avoid injury to self or others. Social cohesion is enhanced as learners display and appreciate work from different groups.
Values <ul style="list-style-type: none"> Responsibility is enhanced as learners use adapted geometrical instruments carefully for construction of angles and circles. Unity is enhanced as learners work in groups to draw and measure different angles.
Links to other subjects <ul style="list-style-type: none"> Visual Arts is promoted as learners construct angles, triangles and circles which they can use to make geometrical patterns.
Suggested non-formal activities Learners participate in marking the field for various games and sports.
Suggested assessment methods Observation, class written assignments in print and braille, out of school or home assignments or activities, self and peer assessment.
Suggested resources Pair of compasses, rulers, tactile geometrical kit, cut outs of different angles and triangles, APH tactile Geometry kit, wheatley tactile diagramming kit

Assessment Rubric for learner with low vision				
Criteria	Exceeds Expectations	Meets Expectations	Approaches Expectations	Below Expectations
Measuring different angles.	Measures and compares different angles.	Measures different angles.	Measures 90° different angles.	Identifies different angles.
Bisecting angles using a ruler and a pair of compasses only.	Bisects and relates angles using a ruler and a pair of compasses only.	Bisects angles using a ruler and a pair of compasses only.	Bisects 90° using a ruler and a pair of compasses only.	Draws angles using a ruler and a protractor only.
Constructing 90°, 60°, 45° 30° and other angles that are multiples of 7.5° using a ruler and a pair compasses only.	Constructs and relates 90°, 60°, 45° 30° and other angles that are multiples of 7.5° using a ruler and a pair of compasses only.	Constructs 90°, 60°, 45° 30° and other angles that are multiples of 7.5° using a ruler and a pair of compasses only.	Constructs 90°, 60° 30° using a ruler and a pair of compasses only.	Draws 90° and 60° using angles using a ruler only and a protractor only.

Constructing different triangles using a ruler and a pair of compasses only.	Constructs and analyzes different triangles using a ruler and pair of compasses only.	Constructs different triangles using a ruler and a pair of compasses only.	Constructs equilateral and right angled triangles using a ruler and a pair of compasses only.	Draws an equilateral triangle using a pair of compasses only.
Constructing circles using a ruler and a pair of compasses only	Constructs and creates patterns of circles using a ruler and a pair of compasses only.	Constructs circles using a ruler and a pair of compasses only.	Constructs circles using a pair of compasses only.	Draws circles using circular objects.

Assessment Rubric for learner with blindness				
Criteria	Exceeds Expectations	Meets Expectations	Approaches Expectations	Below Expectations
Measuring different angles	Measures and analyzes different angles.	Measures different angles.	Identifies different angles.	Lists different angles.
Identifying bisected angles	Classifies bisected angles.	Identifies bisected angles.	Identifies meeting points of two different bisected angles.	Identifies different lines in a tactile diagram showing bisected angles.
Interpreting 90°, 60°, 45°, 30° and other angles that are multiples of 7.5°.	Interprets and relates 90°, 60°, 45°, 30° and other angles that are multiples of 7.5°.	Interprets 90°, 60°, 45°, 30° and other angles that are multiples of 7.5°.	Interprets 90°, 60°, 45° and 30°.	Interprets 90° and 60°.
Describing properties of different tactile triangles in different situations.	Describes and classifies different triangles using a ruler and a pair of compasses.	Describes properties of different tactile triangles in different situations.	States properties of different tactile triangles in different situations.	Recites properties of tactile triangles.
Constructing circles using a ruler and a pair of compasses only in different situations	Constructs circles using a ruler and a pair of compasses only in different situations	Constructs circles using a ruler and a pair of compasses only.	Draws circles using a pair of compasses only.	Identifies the radius of a circle.

STRAND 5.0: DATA HANDLING AND PROBABILITY

Sub strand: Data handling

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
5.0 Data Handling and Probability	5.1 Data Handling (10 lessons)	<p>By the end of the sub strand, the learner should be able to:</p> <ol style="list-style-type: none"> state the meaning of data in learning situation collect data from different situations draw frequency distribution table of data from different sources determine suitable scale for graphs of data from different situations create pictographs of data from real life situations create bar graphs of data from different sources interpret bar graphs of data from real life situations create pie charts of data from real life situations interpret tactile or print pie charts of data from real life situations create a line graph of data from different situations interpret travel graphs from real life situations 	<ul style="list-style-type: none"> In pairs or in groups, learners brainstorm the meaning of data with reference from different sources. In pairs or in groups, learners with low vision collect and organize data from immediate environment while learners with blindness do so by using extra sensory perception and by being given verbal descriptions of data in the environment. In pairs or in groups, learners with low vision tally and represent the data in a frequency table by first practicing to write the sign for tally marks while learners with blindness do so by first drawing uncluttered tables using Braille machines and practice writing tally marks in Braille. In pairs or in groups, learners discuss and come up with suitable scale to represent data in graphs In pairs or in groups, learners with low vision discuss and use a suitable scale to draw pictographs from data while learners with blindness discuss and use braille symbols to represent pictographs from data by being given verbal descriptions of pictures and objects in the environment. 	<ol style="list-style-type: none"> Why do we collect data? How do we represent data? How do we interpret data?

		<p>l) use digital devices with assistive technology or other resources to represent data</p> <p>m) appreciate use of data in real life situations.</p>	<ul style="list-style-type: none"> • In pairs or in groups learners with low vision discuss and use a suitable scale to draw bar graphs from data while learners with blindness do so by being given one on one demonstration to use plasticine or clay or other relevant materials to represent data on a tactile cartesian plane. • In pairs or in groups, learners discuss and interpret bar graphs of data while learners with blindness do so by being given one on one demonstration to use plasticine or clay or other relevant materials to represent data on a tactile Cartesian plane graph. • In pairs or in groups, learners with low vision discuss and represent data on pie charts with appropriate colour contrast while learners with blindness discuss data and subdivide circles using strings or sticks or wikki stix for them to represent data using materials of different textures. • In pairs or in groups, learners discuss and interpret tactile or print pie charts of data. • In pairs or in groups, learners with low vision use suitable scale to represent data on line graphs while learners with blindness do so by being given one on one demonstration to use wires or sticks or strings or talking graphics calculator to represent data on a cartesian plane graph or embossed tactile graph. 	
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			<ul style="list-style-type: none"> • In pairs or in groups, learners discuss and interpret print or tactile travel graphs from real life situations. • In pairs or in groups, learners draw pie charts, pictographs and read data from bar graphs using digital devices with assistive technology or watch or listen to audio visual videos relating to data. 	
Core Competencies to be developed: <ul style="list-style-type: none"> • Creativity and imagination as learner’s present data in the form of pie charts and pictograms. • Critical thinking and problem solving as learners interpret data from bar graphs, pictograms and pie charts. 				
Pertinent and Contemporary Issues (PCIs) <ul style="list-style-type: none"> • Decision making is enhanced as learner’s present data that can be used to make informed decisions. 				
Values <ul style="list-style-type: none"> • Responsibility is enhanced as learners collect and present data in pictograms that may involve different resources. • Peace is enhanced as learners work in groups to collect and present data. 				
Links to other subjects <ul style="list-style-type: none"> • Visual Arts is promoted as learners draw pictographs and pie charts. • Social Studies is promoted as learner’s present data in pie charts and pictographs that may involve populations. 				
Non formal Activities to support Learning: Learners present data during a field trip.				
Suggested Modes of Assessment: Observation, class written assignments, out of school or home assignments or activities, peer and self-assessment.				
Suggested Learning Resources: Tactile or print bar graphs, tactile or print line graphs, tactile or print travel graphs, tactile or print pie chart, tactile or print pictographs, cartesian plane graph, adapted rulers, pairs of compasses, Bold line Tactile Graph sheets, wikki stix, talking graphics calculator.				

Assessment rubric				
Criteria	Exceeds expectations	Meets expectations	Approaches expectations	Below expectations
Stating the meaning of data	Analyzes the meaning of data.	States the meaning of data.	Copies the meaning of data.	Recites the meaning of data.
Collecting data	Categorizes data.	Collects data.	Identifies data.	Lists data.
Drawing frequency distribution table of data	Draws and analyzes frequency distribution tables of data.	Draws frequency distribution table of data.	Identifies components of a frequency distribution table of data.	Reads a frequency distribution table of data.
Determining a suitable scale for graphs	Determines and applies a suitable scale for graphs.	Determines a suitable scale for graphs.	Identifies a scale for graphs.	Copies identified scale for graphs.
Drawing pictographs of data	Draws and interprets pictographs of data.	Draws pictographs of data.	Identifies pictographs of data.	Observes pictographs of data.
Drawing bar graphs of data	Draws and analyzes bar graphs of data.	Draws bar graphs of data.	Identifies bar graphs of data.	Observes bar graphs.
Interpreting bar graphs of data	Interprets and analyzes bar graphs of data.	Interprets bar graphs of data.	Identifies bar graphs of data.	Observes bar graphs of data.
Drawing pie charts of data	Draws and analyzes pie charts of data.	Draws pie charts of data.	Identifies pie charts of data.	Observes pie charts of data.
Interpreting pie charts of data	Interprets and analyzes pie charts of data.	Interprets pie charts of data.	Identifies pie charts of data.	Observes pie charts of data.
Drawing a line graph	Draws and describes a line graph.	Draws a line graph.	Identifies a line graph.	Observes a line graph.
Interpreting travel graphs	Interprets and analyzes travel graphs.	Interprets travel graphs.	Identifies travel graphs.	Observes travel graphs.

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 project is expected to benefit the learner, the school and local community. Knowledge and skills on how to carry out a CSL project have been covered in Life Skills Education (LSE).

All learners with visual impairment in Grade 7 will be expected to participate in a CSL class activity. The activity will give learners an opportunity to practise the CSL Project skills covered under LSE. This activity will be undertaken in groups where learners with blindness will be grouped with those who have sight. Learners will be expected to apply the steps provided to carry out the CSL project.

The activity 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 with visual impairment to execute a simple school based CSL class activity. This activity can be done in 4-6 weeks outside the classroom time. The duration may be adjusted accordingly to accommodate learners with blindness who may require more time to implement the CSL project.

CSL Skills to be covered

- i) **Research:** Learners will develop research skills as they investigate PCIs to address, ways and tools to use in collecting data, analyzing information and presenting their findings.
- ii) **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.
- iii) **Citizenship:** Learners will be able to explore opportunities for engagement as members of the school community and provide a service for the common good.
- iv) **Leadership:** Learners will develop leadership skills as they take up various roles within the CSL activity.
- v) **Financial Literacy Skills:** Learners will consider how to source and utilize resources effectively and efficiently.
- vi) **Entrepreneurship:** Learners will consider ways of generating income through innovation for the CSL class activity.

Suggested PCIs	Specific Learning Outcomes	Suggested Learning Experiences (Customize to the focus of the grade)	Key Inquiry Questions
<p>Learners will be guided to consider the various PCIs provided in the subject in Grade 7 and choose one suitable to their context and reality</p>	<p>By the end of the CSL class activity, the learner should be able to:</p> <ul style="list-style-type: none"> a) identify a problem in the school community through research; b) develop a 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. 	<ul style="list-style-type: none"> • In groups, learners brainstorm on pertinent and contemporary issues in the community that need attention. • In groups, learners discuss various PCIs within the school community and identify the one that requires immediate attention giving reasons for their choice. • In groups, learners discuss possible solutions to the identified issue and propose the most appropriate solution to the problem. • Learners brainstorm on the resources needed for the activity and source for them. Learners with blindness to be guided in selecting materials that are safe and accessible such as tactile charts, pictures, graphs and braille. Those with low vision use reference materials with appropriate font size and contrasting colours as well as three dimensional resources. • In groups, learners discuss different methods and tools of collecting data and determine the ones suitable for the selected project. Learners with visual impairments to be supported in preparation and use of data collection methods and tools such as questionnaires, focus discussions and interviews. • In groups, learners develop appropriate tools for collecting data with the guidance of the teacher. 	<ol style="list-style-type: none"> 1. How does one determine community needs? 2. Why is it necessary to be part of a community?

		<ul style="list-style-type: none"> • In groups, learners collect data and record findings. Learners with blindness to work with sighted peers when collecting data. The sighted peers would support in explaining or describing aspects that require use of sight. • Learners with blindness use audio recorders to record the responses. • In groups, learners discuss their findings, develop various reporting documents and use them to report on their findings. • Based on the research report, learners implement a project to get solutions to the identified problem. Learners with blindness to work with sighted peers and ensure the project site is free from hazards such as hanging trees, sharp objects and potholes to ensure safe mobility. • Learners use feedback from peers and the school community to improve on the implementation of the project. • In groups, learners discuss the successes, challenges faced while implementing the project activities and lessons learnt; write a report and share through various media to peers and the school community. • Learners reflect on how the project enhanced learning while at the same time facilitating service to the school by providing solutions to the identified issue(s). 	
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Assessment Rubric				
Criteria	Exceeds Expectation	Meets Expectation	Approaches Expectation	Below Expectation
Identifying a pertinent issue in school and the community to be addressed.	Gives Justification for the identified pertinent issue in the school community to be addressed.	Identifies a pertinent issue in the school community to be addressed.	States a pertinent issue in the school community to be addressed.	Recalls a pertinent issue discussed in class.
Planning to solve the identified issue.	Designs and develops a step-by-step plan of the activities to be carried out in the process of solving the problem.	Develops a plan to solve the identified problem.	Gives an outline of a plan to solve the identified problem.	States some activities to be included in the plan to solve the identified problem.
Designing and implementing solutions to the identified problem.	Designs, implements and solves the identified problem.	Designs and implements solutions to the identified problem.	Designs solutions to the identified problem.	Suggests solutions to the identified problem.
Sharing findings to relevant actors.	Incorporates feedback from relevant actors to the findings.	Shares findings to relevant actors.	Gives a brief description of findings to relevant actors.	States some aspects of the findings to relevant actors.

APPENDIX 1: USE OF ICT DEVICES

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

1. Adapted Learner digital devices (**ALDD**).
2. Teacher digital devices (**TDD**).
3. Mobile phones with assistive technology.
4. Adapted Digital clocks
5. Television sets
6. Audio visual Videos
7. Cameras
8. Projectors
9. Radios
10. DVD players
11. CD's
12. Scanners
13. Internet
14. Others.
15. Whikki stiks art graphics
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