



**REPUBLIC OF KENYA  
MINISTRY OF EDUCATION**

# **UPPER PRIMARY SCHOOL CURRICULUM DESIGN**

## **MATHEMATICS**

### **GRADE 6**

#### **FOR LEARNERS WITH VISUAL IMPAIRMENT**



**KENYA INSTITUTE OF CURRICULUM DEVELOPMENT**  
*A Skilled and Ethical Society*

First Published in 2021

Revised 2024

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**ISBN:**

Published and printed by Kenya Institute of Curriculum Development

## **FOREWORD**

The Government of Kenya is committed to ensuring that policy objectives for Education, Training and Research meet the aspirations of the Constitution of Kenya 2010, the Kenya Vision 2030, National Curriculum Policy 2019, the United Nations Sustainable Development Goals (SDGs) and the Regional and Global conventions to which Kenya is a signatory. Towards achieving the mission of Basic Education, the Ministry of Education (MoE) has successfully and progressively rolled out the implementation of the Competency Based Curriculum (CBC) at Pre-Primary, Primary and Junior School levels.

The implementation of Competency Based Curriculum involves monitoring and evaluation to determine its success. After the five-year implementation cycle, a summative evaluation of the primary education cycle was undertaken to establish the achievement of learning outcomes as envisaged in the Basic Education Curriculum Framework. The Government of Kenya constituted a Presidential working Party on Education Reforms (PWPER) in 2022 to address salient issues affecting the education sector. PWPER made far reaching recommendations for basic education that necessitated curriculum review. The recommendations of the PWPER, monitoring reports, summative evaluation, feedback from curriculum implementers and other stakeholders led to rationalisation and review of the basic education curriculum.

The reviewed Grade six curriculum designs for learners with visual impairment build on competencies attained by learners at Grade 5. Emphasis at this grade is the development of basic literacy, numeracy and skills for interaction with the environment.

The curriculum designs present National Goals of Education, essence statements, general and specific expected learning outcomes for the subjects as well as strands and sub strands. The designs also outline suggested learning experiences, key inquiry questions, core competencies, Pertinent and Contemporary Issues (PCIs), values, and assessment rubric.

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

**HON. EZEKIEL OMBAKI MACHOGU, CBS**  
**CABINET SECRETARY,**  
**MINISTRY OF EDUCATION**

## **PREFACE**

The Ministry of Education (MoE) nationally implemented Competency Based Curriculum (CBC) in 2019. Grade one is the first grade of Primary education level while Grade 6 is the final grade of the level in the reformed education structure.

The reviewed Grade six curriculum furthers implementation of the CBC from Grade 5. The curriculum provides opportunities for learners to focus in a field of their choice to form a foundation for further education and training and/or gain employable skills. This is very critical in the realization of the Vision and Mission of the on-going curriculum reforms as enshrined in the Sessional Paper No. I of 2019 whose title is: Towards Realizing Quality, Relevant and Inclusive Education and Training for Sustainable Development in Kenya. The Sessional Paper explains the shift from a content-focused curriculum to a focus on **nurturing every learner's potential**.

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

The curriculum designs provide suggestions for interactive and differentiated learning experiences linked to the various sub strands and the other aspects of the CBC. They also offer several suggested learning resources and a variety of assessment techniques. It is expected that the designs will guide teachers to effectively facilitate learners to attain the expected learning outcomes for Grade six and prepare them for smooth transition to Junior school. Furthermore, it is my hope that teachers will use the adapted designs to make learning interesting, exciting and enjoyable.

**DR. BELIO KIPSANG', CBS**  
**PRINCIPAL SECRETARY**  
**STATE DEPARTMENT FOR BASIC EDUCATION**  
**MINISTRY OF EDUCATION**

## **ACKNOWLEDGEMENT**

The Kenya Institute of Curriculum Development (KICD) Act Number 4 of 2013 (Revised 2019) mandates the Institute to develop and review (SNE adapt) curricula and curriculum support materials for basic and tertiary education and training. The curriculum development process for any level of education involves thorough research, international benchmarking and robust stakeholder engagement. Through a systematic and consultative process, the KICD conceptualized the Competency Based Curriculum (CBC) as captured in the Basic Education Curriculum Framework (BECF) 2017, that responds to the demands of the 21<sup>st</sup> Century and the aspirations captured in the Constitution of Kenya 2010, the Kenya Vision 2030, East African Community Protocol, International Bureau of Education Guidelines and the United Nations Sustainable Development Goals (SDGs).

KICD receives its funding from the Government of Kenya to facilitate successful achievement of the stipulated 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 revised Grade six curriculum designs for learners with visual impairment were developed and adapted with the support of the World Bank through the Kenya Primary Education Equity in Learning Programme (KPEELP); a project coordinated by MoE. Therefore, the Institute is very grateful for the support of the Government of Kenya, through the MoE and the development partners for policy, resource and logistical support. Specifically, special thanks to the Cabinet Secretary-MoE and the Principal Secretary – State Department of Basic Education,

I also wish to acknowledge the KICD curriculum developers and other staff, all teachers, educators who took part as panelists; the Semi-Autonomous Government Agencies (SAGAs) and representatives of various stakeholders for their roles in the development and adaptation of the Grade six curriculum designs for learners with visual impairment. In relation to this, I acknowledge the support of the Chief Executive Officers of the Teachers Service Commission (TSC) and the Kenya National Examinations Council (KNEC) for their support in the process of developing and adapting these designs. Finally, I am very grateful to the KICD Council Chairperson and other members of the Council for very consistent guidance in the process.

I assure all teachers, parents and other stakeholders that this curriculum design will effectively guide the implementation of the CBC at Grade six and preparation of learners with visual impairment for transition to Junior school.

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## **NATIONAL GOALS OF EDUCATION**

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

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

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

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

#### **a) Social Needs**

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

#### **b) Economic Needs**

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

#### **c) Technological and Industrial Needs**

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

### **3. Promote individual development and self-fulfillment**

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

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

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

### **5. Promote social equity and responsibility**

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

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

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

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

Kenya is part of the interdependent network of diverse peoples and nations. Education should therefore enable the learner to respect, appreciate and participate in the opportunities within the international community. Education should also facilitate the learner to operate within the international community with full knowledge of the obligations, responsibilities, rights and benefits that this membership entails.

## 8. Good health and environmental protection

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

### LESSON ALLOCATION AT UPPER PRIMARY

S/No	Learning Area	Number of Lessons
1.	English for learners with visual impairment	5
2.	Kiswahili for learners with visual impairment	4
3.	Mathematics for learners with visual impairment	5
4.	Religious Education	3
5.	Science & Technology for learners with visual impairment	4
6.	Agriculture and Nutrition for learners with visual impairment	4
7.	Social Studies for learners with visual impairment	3
8.	Creative Arts for learners with visual impairment	6
	Pastoral/Religious Instruction Programme	1
<b>Total</b>		<b>35</b>

**NOTE:** Braille skills for learners with blindness be implemented as Non-formal (co- curricular) programmes

### LEVEL LEARNING OUTCOMES FOR PRIMARY EDUCATION

By the end of the Primary Education level, the learner with visual impairment should be able to:

- communicate appropriately using verbal and or non-verbal modes in a variety of contexts,
- demonstrate mastery of number concepts to solve problems in day to day life,
- demonstrate social skills, moral and religious values for positive contribution to society,
- develop one's interests and talents for personal fulfillment,
- make informed decisions as local and global citizens of a diverse, democratic society in an interdependent world,
- explore, manipulate, manage and conserve the environment effectively for learning and sustainable development,
- acquire digital literacy skills for learning and enjoyment,
- appreciate the country's rich, diverse cultural heritage for harmonious living.



## **ESSENCE STATEMENT**

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

## **MATHEMATICS GENERAL LEARNING OUTCOMES**

By the end of Primary Education Level, 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) Apply measurement skills to find solutions to problems in a variety of contexts.
- 3) Describe properties of geometrical shapes and spatial relationships in real life experiences.
- 4) Collect, represent and analyze data to solve problems.
- 5) Analyze information using algebraic expressions in real life situations.
- 6) Apply mathematical ideas and concepts to other learning areas or subjects and in real life contexts.
- 7) Develop confidence and interest in mathematics for further learning and enjoyment.
- 8) Demonstrate values, competencies and management of pertinent and contemporary issues for healthy relationships.

**SUMMARY OF STRANDS AND SUB STRANDS**

<b>STRANDS</b>	<b>SUB STRANDS</b>	<b>Suggested Number of Lessons</b>
<b>1.0 Numbers</b>	1.1 Whole Numbers	20
	1.2 Multiplication	6
	1.3 Division	6
	1.4 Fractions	12
	1.5 Decimals	12
	1.6 Inequalities	8
<b>2.0 Measurement</b>	2.1 Length	14
	2.2 Area	6
	2.3 Capacity	6
	2.4 Mass	14
	2.5 Time	10
	2.6 Money	8
<b>3.0 Geometry</b>	3.1 Lines	6
	3.2 Angles	6
	3.3 3-D Objects	6
<b>4.0 Data Handling</b>	4.1 Bar Graphs	10
Total number of lessons		<b>150</b>
<b>Note:</b> The suggested number of lessons per sub strand may be less or more depending on the context.		

**STRAND 1.0 NUMBERS**

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
<p><b>1.0 Numbers</b></p>	<p>1.1 <b>Whole numbers</b>  (20 Lessons)</p>	<p>By the end of the Sub Strand, the learner should be able to:</p> <ul style="list-style-type: none"> <li>a) use place value and total value of digits up to millions in real life,</li> <li>b) use numbers up to millions in symbols in real life,</li> <li>c) read and write numbers up to 100,000 in words in real life,</li> <li>d) order numbers up to 100,000 in real life situations,</li> <li>e) round off numbers up to 100,000 to the nearest thousand in different situations,</li> <li>f) apply squares of whole numbers up to 100 in print or braille in different situations,</li> <li>g) apply square roots of perfect squares up to 10,000 in different situations,</li> <li>h) appreciate use of whole numbers in real life situations.</li> </ul>	<ul style="list-style-type: none"> <li>• Learners to be guided to identify place value and total value of digits of up to millions using place value apparatus with appropriate font and colour contrast or Taylor Frames with plastic types.</li> <li>• Learners to be guided to use place value and total value of digits up to millions to solve mathematical questions on daily life situations.</li> <li>• Learners to be guided to use numbers up to millions in symbols</li> <li>• Learners with low vision read and write numbers up to 100,000 in words.</li> <li>• Learners to be guided to arrange numbers up to 100,000 in order from smallest to largest and largest to smallest and share with other groups.</li> <li>• Learners are guided to round off numbers up to 100,000 to the nearest thousand and share with other groups.</li> <li>• Learners are guided to practice writing the symbol for square in print or in braille. Learners with blindness to note how square sign is written in braille.</li> <li>• Learners to be guided to identify the square root of a given number as the number which when multiplied by itself results in the given number. Learners with blindness to be guided to write the square root notation in Braille.</li> <li>• Learners to be guided to use digital devices with assistive technology to play digital games involving whole numbers.</li> </ul>	<ol style="list-style-type: none"> <li>1. How can you work out squares of numbers?</li> <li>2. How can you work out square roots of numbers?</li> <li>3. Why should we round off numbers?</li> </ol>

**Core competencies to be developed:**

- Critical thinking and problem solving: The learner develops explanation skills when solving different mathematical problems in order to identify the square and square root of given numbers.
- Learning to learn: The learner develops self-discipline as they are engaged in self-driven tasks of practicing writing the symbols of squares and square roots of numbers in print and in braille.

**Values:**

Unity: The learner cooperates with others as they work in groups to identify the square and square roots of whole numbers.

**Pertinent and Contemporary Issues (PCIs):**

- Learner Support Programme: The learner enhances peer education and mentorship to support one another in identifying place, total value, square and square roots of whole numbers.

**Links to other Learning Areas:**

- English and Other Languages: The learner reinforces speaking and writing skills as they read and write numbers up to 100,000 in words.

**Suggested Learning Resources:**

Taylor frames with plastic types, digital devices with assistive technology such as screen readers, adapted keyboards and screen magnifiers, Braille number cards, Braille number charts, number charts with appropriate font and colour contrast, number board, talking calculators, reference materials in Braille and in appropriate print

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
<b>1.0 Numbers</b>	<b>1.2 Multiplication</b>  <b>(6 Lessons)</b>	<p>By the end of the Sub Strand, the learner should be able to:</p> <ol style="list-style-type: none"> <li>explain the steps involved in multiplying a 4-digit number by a 2-digit number using place value concepts.</li> <li>multiply up to a 4-digit number by a 2-digit number in real life situations,</li> <li>estimate products by rounding off numbers being multiplied to the nearest ten in real life situations,</li> <li>make patterns involving multiplication of numbers not exceeding 10,000 in different situations,</li> <li>appreciate use of multiplication in real life.</li> </ol>	<ul style="list-style-type: none"> <li>• Learners discuss the correct procedure of the steps involved in multiplying a 4-digit number by a 2-digit number using place value concepts in a variety of mathematical concepts.</li> <li>• Learners are guided to multiply up to 4-digit numbers by a 2 – digit number using <ul style="list-style-type: none"> <li>- fact families</li> <li>- skip counting</li> <li>- multiplication chart in appropriate font and colour contrast for learners with low vision and in Braille for learners with blindness</li> <li>- expanded form</li> </ul> </li> <li>• Learners be guided to estimate products using; <ul style="list-style-type: none"> <li>- rounding off factors</li> <li>- compatibility of numbers</li> <li>- own strategies.</li> </ul> </li> <li>• Learners with low vision be guided to make patterns involving multiplication with product not exceeding 10,000 using number cards in appropriate font and colour contrast while learners with blindness uses Braille number cards and share with other groups.</li> <li>• Learners use digital devices with assistive technology to play digital games involving multiplication for learning and enjoyment.</li> </ul>	<ol style="list-style-type: none"> <li>How is multiplication used in real life?</li> <li>How can you estimate products of numbers?</li> </ol>

**Core Competencies to be developed:**

- Critical thinking and Problem solving: The learner develops explanation and reasoning skills as they multiply up to 4-digit numbers by a 2 – digit number.
- Digital literacy: The learner develops interacting and connecting skills as they use digital devices with assistive technology to play digital games involving multiplication.

**Values:**

Responsibility: The learner takes care of the learning resources used when multiplying up to 4-digit numbers by a 2 – digit number.

**Pertinent and Contemporary Issues (PCIs):**

Safety and security: The learner cares for learning resources like abacus, Taylor frames with plastic types, cubes and cubarithm boards and keeps them safely after use.

**Links to other Learning Areas:**

Creative arts: The learner makes patterns involving multiplication with product not exceeding 10 000 using number cards.

**Suggested learning resources**

Cubes and cubarithm boards, abacus, Taylor frames with plastic types, number board, talking calculator, Braille charts, Braille number cards, charts and cards with appropriate font and colour contrast, reference materials in Braille and in appropriate print

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
<b>1.0 Numbers</b>	<b>1.3 Division</b>  (6 Lessons)	By the end of the Sub Strand the learner should be able to: <ol style="list-style-type: none"> <li>a) explain the steps involved in divide up to a 4-digit number by up to a 3-digit number where the dividend is greater than the divisor in real life situations,</li> <li>b) divide up to a 4-digit number by up to a 3-digit number where the dividend is greater than the divisor in real life situations,</li> <li>c) estimate quotients by rounding off the dividend and divisor to the nearest ten in real life situations,</li> <li>d) perform combined operations involving addition, subtraction, multiplication and division up to 3-digit number in different situations,</li> <li>e) appreciate use of division of whole numbers in real life situations.</li> </ol>	<ul style="list-style-type: none"> <li>● Learners discuss the correct procedure of the steps involved dividing up to a 4-digit number by up to a 3-digit number where the dividend is greater than the divisor.</li> <li>● Learners be guided to divide up to 4-digit numbers by up to a 3 – digit number where the dividend is greater than the divisor using               <ul style="list-style-type: none"> <li>- Relationship between division and multiplication</li> <li>- Long method for learners with low vision and use of abacus for learners with blindness.</li> </ul> </li> <li>● Learners to be guided to work out quotients by rounding off the dividend and divisor to the nearest ten.</li> <li>● Learners are guided to work out questions involving combined operations up to 3-digit numbers using print number cards for learners with low vision and braille number cards for learners with blindness.</li> <li>● Learners are guided to use digital devices with assistive technology to access mathematical sites and play digital games on division of whole numbers for enjoyment.</li> </ul>	<ol style="list-style-type: none"> <li>1. How can you estimate quotients?</li> <li>2. How is division used in real life?</li> <li>3. How can you work out questions involving combined operations?</li> </ol>

**Core Competencies to be developed:**

- Communication and collaboration: The learner develops speaking skills and teamwork as they discuss on the relationship between multiplication and division.

**Values:**

- Respect: The learner values each other's opinion when dividing up to a 4-digit number by up to a 3-digit number and share answers in class.

**PCIs:**

- Safety and security: The learner observes internet safety and security by accessing safe online mathematical sites to play digital games on division of whole numbers.

**Links to other learning areas:**

- English and other Languages: The learner reinforces speaking and listening skills during discussion on the relationship between multiplication and division.

**Suggested Learning Resources:**

Cubes and cubarithm board, abacus, Taylor frames with plastic types, number board, talking calculator, Braille charts, charts and cards with appropriate font and colour contrast, reference material in braille and in appropriate print



Strand	Sub-Strand	Specific Learning Outcome	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
1.0 Numbers	1.4 Fractions (12 Lessons)	<p>By the end of the Sub Strand the learner should be able to:</p> <ul style="list-style-type: none"> <li>a) add fractions using LCM in different situations,</li> <li>b) subtract fractions using LCM in different situations,</li> <li>c) add mixed numbers in different situations,</li> <li>d) subtract mixed numbers in different situations,</li> <li>e) identify reciprocal of proper fractions up to a 2-digit number in different situations,</li> <li>f) work out squares of fractions with a numerator of one digit and denominator of a 2-digit number in different situations,</li> <li>g) convert fractions to equivalent fractions with denominator 100 in different situations,</li> <li>h) identify percentage as a fraction for use in different situations,</li> <li>i) convert fractions to percentages in different situations,</li> <li>j) convert percentage to fractions in different situations,</li> <li>k) appreciate the use of fractions in real life.</li> </ul>	<ul style="list-style-type: none"> <li>● Learners with low vision be guided to identify LCM of given numbers from number cards in appropriate font and colour contrast while learners with blindness be guided to identify LCM of given numbers from Braille number cards.</li> <li>● Learners are guided to add and subtract fractions using LCM by listing multiples.</li> <li>● Learners are guided to add and subtract mixed fractions by converting the fractions to improper fractions. Learners with blindness to note how simple and mixed fractions are written in braille.</li> <li>● Learners are guided to add and subtract mixed fractions by adding and subtracting whole number and fraction parts separately.</li> <li>● Learners are guided to list the inverse of numbers between 1 and 10.</li> <li>● Learners are guided to calculate the reciprocal by dividing 1 by the number. They should always start by working out the reciprocal of whole numbers before solving the reciprocal of proper fractions up to a 2-digit number.</li> <li>● In groups, learners are guided to discuss the various reciprocals of a proper fraction.</li> <li>● Learners are guided to calculate squares of fractions through multiplication practically.</li> <li>● Learners are guided to change fractions to equivalent fractions with denominator 100 through multiplication.</li> <li>● Learners are guided to identify percentage as a fraction with denominator 100. Learners with blindness to write the percentage sign in braille.</li> <li>● Learners are guided to discuss scenarios where percentages are used in day-to-day life and share with other groups.</li> </ul>	<ol style="list-style-type: none"> <li>1) How do you find LCM of numbers?</li> <li>2) Why do we convert fractions to percentages and percentages to fractions?</li> </ol>

			<ul style="list-style-type: none"> <li>• Learners are guided to change fractions to percentages and percentages to fractions.</li> <li>• Learners are guided to use digital devices with assistive technology to access mathematical sites, learn more on fractions and play digital games involving fractions.</li> </ul>	
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**Core Competencies to be developed:**

- Learning to learn: The learner develop self-discipline when engaging in self-driven tasks as they work out the reciprocal of whole numbers before solving the reciprocal of proper fractions.
- Communication and collaboration: The learners develop speaking and listening skills and also embrace teamwork as they work out reciprocals of fractions.

**Values:**

- Respect: The learner shows open mindedness when discussing where percentages are used in day to day life.

**PCIs:**

- Safety and Security: The learner demonstrates care for learning resources by keeping them safely after use.

**Links to Other Learning Areas:**

- English and Other Languages: The learner reinforces listening and speaking skills when discussing new mathematical terms in fractions.

**Suggested Learning Resources:**

Paper cut outs, equivalent fraction board, abacus, Taylor frames with plastic types, cubes and cubarithm boards, glue, scissors, digital devices with assistive technology such as screen readers, adapted keyboards and screen magnifiers, reference materials in Braille and in appropriate print

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
<b>1.0 Numbers</b>	<b>1.5 Decimals (12 Lessons)</b>	<p>By the end of the Sub Strand, the learner should be able to:</p> <ol style="list-style-type: none"> <li>identify decimals up to ten thousandths in different situations,</li> <li>round off decimals up to 3 decimal places in different situations,</li> <li>convert decimals to fractions and fractions to decimals in different situations,</li> <li>convert decimals to percentages and percentages to decimals in different situations,</li> <li>add decimals up to 4-decimal places in different situations,</li> <li>subtract decimals up to 4-decimal places in different situations,</li> <li>appreciate use of decimals in real life situations.</li> </ol>	<ul style="list-style-type: none"> <li>Learners with low vision to be guided to calculate place value of decimals up to ten thousandths using place value apparatus in appropriate font and colour contrast. Learners with blindness be guided to use place value setters with tactile marks to calculate the place value of decimals up to ten thousandths.</li> <li>In pairs, learners to be guided to relate place value of decimals up to ten thousandths to the number of decimal places.</li> <li>Learners to be guided to round off decimals up to 3 decimal places.</li> <li>Learners with low vision to be guided to change decimals to fractions using a square or rectangular grid in appropriate font and colour contrast Learners with blindness use tactile square or rectangular grid when changing decimals to fractions.</li> <li>Learners with low vision to be guided to change fractions to decimals using a square or rectangular grid in appropriate font and colour contrasts. Learners with blindness are guided to use tactile square or rectangular grids when changing fractions to decimals.</li> <li>Learners to be guided to convert decimals to percentages and percentages to decimals.</li> <li>Learners with low vision are guided to add decimals up to 4-decimal places using place value apparatus in</li> </ul>	<p>How can you use decimals in real life?</p>

			<p>appropriate font and colour contrast. Learners with blindness use abacus, Taylor frames with plastic types or cubes and cubarithm boards.</p> <ul style="list-style-type: none"> <li>• Learners are guided to subtract decimals up to 4-decimal places using place value apparatus.</li> <li>• Learners to be guided to use digital devices with assistive technology to access mathematical sites, learn more on decimals and play digital games on decimals.</li> </ul>	
<p><b>Core Competencies to be developed:</b></p> <ul style="list-style-type: none"> <li>• Self-Efficacy: The learner develops self-drive when carrying out addition and subtraction on decimals using various learning resources.</li> </ul>				
<p><b>Values:</b></p> <ul style="list-style-type: none"> <li>• Responsibility: The learner displays determination when converting decimals to percentages and percentages to decimal.</li> </ul>				
<p><b>PCIs:</b></p> <ul style="list-style-type: none"> <li>• Safety and security: The learner safely uses the digital devices with assistive technology to play games on decimals observing cyber safety and security rules.</li> </ul>				
<p><b>Links to Other Learning Areas:</b></p> <ul style="list-style-type: none"> <li>• Science and Technology: The learner uses weighing machines when measuring the masses of different substances in decimals during practicals.</li> <li>• Agriculture and Nutrition: The learner uses weighing machines when measuring cooking ingredients in decimals.</li> </ul>				
<p><b>Suggested Learning Resources:</b></p> <ul style="list-style-type: none"> <li>• Paper cut outs, a hundred square grid with appropriate colour contrast and font size, Braille chart, abacus, cubes and cubarithm boards, number board, talking calculator, place value apparatus with appropriate font and colour contrast abacus, Taylor frames with plastic types or cubes and cubarithm boards, reference materials in Braille and in appropriate print</li> </ul>				

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
<b>1.0 NUMBERS</b>	<b>1.6 Inequalities</b>  <b>(8 Lessons)</b>	By the end of the Sub Strand, the learner should be able to: a) explain the concept of inequalities in different situations, b) form simple inequalities in one unknown involving real life situations, c) simplify simple inequalities in one unknown involving real life situations, d) solve simple inequalities in one unknown involving real life situations, e) appreciate use of algebraic expressions in real life.	<ul style="list-style-type: none"> <li>● Learners with low vision be guided to discuss the meaning of algebraic inequality symbols ‘<math>&gt;</math>’ and ‘<math>&lt;</math>’ on flashcards in appropriate font and colour contrast while learners with blindness to be guided to use Braille work cards showing the symbol for greater than and less than in algebraic expressions using braille notation.</li> <li>● Learners be guided to form algebraic inequalities in one unknown using different operations.</li> <li>● Learners are guided to simplify algebraic inequalities in one unknown.</li> <li>● Learners are guided to work out simple inequalities involving one unknown.</li> <li>● Learners to be guided to use digital devices with assistive technology to simplify algebraic inequalities, learn more on algebraic inequalities as they play digital games.</li> </ul>	How can you simplify algebraic expressions?
<p><b>Core Competencies to be developed:</b></p> <ul style="list-style-type: none"> <li>● Self-efficacy: The learner develops self-drive as they individually and confidently work out simple inequalities involving one unknown.</li> </ul>				
<p><b>Values:</b></p> <ul style="list-style-type: none"> <li>● Responsibility: The learner takes care of learning resources when simplifying algebraic inequalities and playing digital games.</li> </ul>				
<p><b>Pertinent and Contemporary Issues (PCIs):</b></p> <ul style="list-style-type: none"> <li>● Citizenship: The learner displays social cohesion as they work in groups to form algebraic inequalities that represent different aspects of life within the environment.</li> </ul>				
<p><b>Links to Other Learning Areas:</b></p> <ul style="list-style-type: none"> <li>● Agriculture and Nutrition: The learner writes and simplifies inequalities to represent the amount of fertilizers and other production inputs to be used on a school farm during agriculture projects.</li> </ul>				

**Suggested Learning Resources**

- Reference materials in Braille and appropriate print, Mathematics Braille primer, place value apparatus with appropriate font and colour contrast, abacus, Taylor frames with plastic types or cubes and cubarithm boards.

**Suggested Assessment Rubric**

<b>Indicator</b>	<b>Level</b>	<b>Exceeds Expectations</b>	<b>Meets Expectations</b>	<b>Approaches Expectations</b>	<b>Below Expectations</b>
Ability to: <ul style="list-style-type: none"> <li>• apply squares of whole numbers up to 100 in print or braille in different situations,</li> <li>• multiply up to a 4-digit number by a 2-digit number in real life situations,</li> <li>• perform combined operations involving addition, subtraction, multiplication and division up to 3-digit number in different situations,</li> <li>• work out squares of fractions with a numerator of one digit and denominator of a 2-digit number in different situations,</li> <li>• identify decimals up to ten thousandths in different situations,</li> <li>• solve simple inequalities in one unknown involving real life situations,</li> </ul>		The learner demonstrates the six skills.	The learner demonstrates four to five skills.	The learner demonstrates two to three skills.	The learner demonstrates one skill or none.

<b>STRAND 2.0 MEASUREMENT</b>				
<b>Strand</b>	<b>Sub Strand</b>	<b>Specific Learning Outcomes</b>	<b>Suggested Learning Experiences</b>	<b>Suggested Key Inquiry Question(s)</b>
<b>2.0 MEASUREMENT</b>	<b>2.1 Length</b>  (14 Lessons)	By the end of the Sub Strand, the learner should be able to: a) use the millimetre (mm) as a unit of measuring length in different situations, b) write braille notations for units of measuring length, (for learners with blindness) c) establish the relationship between the millimetre and centimetre in different situations, d) convert centimetres to millimetres and millimetres to centimetres in different situations, e) add centimetres and millimetres in different situations, f) subtract centimetres and millimetres in different situations, g) multiply centimetres and millimetres by whole numbers in real life situations, h) divide centimetres and millimetres by whole numbers in real life situations, i) determine the circumference of a circle practically, j) identify the relationship between circumference and diameter in different situations,	<ul style="list-style-type: none"> <li>● Learners with low vision be guided to identify the millimetre as a unit of measuring length using a ruler. Learners with blindness are guided to identify and write millimetre and centimetre as a unit of measuring length in braille. Identify these units on tactile rulers.</li> <li>● Learners are guided to measure length of objects in millimetres using a ruler in appropriate font and colour contrast or tactile calibrations.</li> <li>● Learners are guided to measure a given length in cm and mm in order to establish the relationship between mm and cm. Learners to be guided to write symbols representing the millimetres (mm) and centimetres (cm) in print or Braille repeatedly for practice.</li> <li>● Learners to be guided to use a conversion table in appropriate font and colour contrast or embossed conversion tables to convert mm to cm and cm to mm when measuring lengths of different objects.</li> <li>● Learners to be guided to choose appropriate units to measure lengths of different objects in the environment.</li> <li>● Learners to be guided to determine lengths in mm and cm in addition, subtraction, multiplication and division and discuss the answers with their peers.</li> <li>● Learners with low vision to be guided to sketch the circumference, diameter and radius of a circle practically. Learners with blindness to be</li> </ul>	<ol style="list-style-type: none"> <li>1. Why do you measure lengths of different objects in day to day life?</li> <li>2. How do you establish the relationship between different units of measuring length?</li> </ol>

		<p>k) appreciate use of length in real life situations.</p>	<p>provided with a tactile diagram of a circle to tactually manipulate and explore in order to identify the circumference, diameter and radius.</p> <ul style="list-style-type: none"> <li>● Learners with low vision to be guided to measure the circumference of a circle practically. Learners with blindness to be guided to measure the circumference of a tactile circle using a thread or string then measure the length of the thread or string using a ruler with tactile calibrations in order to determine the circumference of the tactile circle.</li> <li>● In pairs or groups, learners to be guided to divide the circumference of the circle by the diameter to get pi (<math>\pi</math>). Learners with blindness to be guided on how to write the symbol of pi (<math>\pi</math>) in Braille and be given time to practice writing the symbol.</li> <li>● In pairs, learners be guided to use digital devices with assistive technology to access online sites and learn more on length in mm and cm.</li> </ul>	
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**Core Competencies to be developed:**

- Communication and Collaboration: The learner reinforces speaking, listening skills and embrace teamwork as they establish the relationship between centimetres and millimetres.

**Values:**

- Unity: The learner works collaboratively to determine the lengths in mm and cm in addition, subtraction, multiplication and division and discuss the answers with peers.

**Pertinent and Contemporary Issues (PCIs):**

- Citizenship: The learner displays social cohesion as they work in groups to choose appropriate units to measure lengths of different objects in the environment.

**Links to Other Learning Areas:**

- Creative Arts: The learner sketches the circumference of a circle and measure radius and diameter of a circle.

**Suggested Learning Resources:**

- Metre rule, tactile metre rule, tactile tape measure, tape measure, metre stick, place value apparatus with appropriate font and colour contrast , abacus, Taylor frames with plastic types or cubes and cubarithm boards, reference materials in Braille and appropriate print, threads

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
<b>2.0 Measurement</b>	<b>2.2 Area (6 Lessons)</b>	<p>By the end of the Sub Strand, the learner should be able to:</p> <ol style="list-style-type: none"> <li>describe triangles and squares in relation to surface area in different situations, situations</li> <li>work out area of triangles in square centimetres (<math>\text{cm}^2</math>) in different,</li> <li>work out area of combined shapes involving squares, rectangles and triangles in <math>\text{cm}^2</math> in different situations,</li> <li>estimate the area of circles by counting squares in different situations,</li> <li>appreciate the use of <math>\text{cm}^2</math> in working out area in real life.</li> </ol>	<ul style="list-style-type: none"> <li>Learners with low vision be provided with paper cut outs of rectangles and squares with appropriate colour contrast, be guided to cut out two triangles from each shape. Learners with blindness be provided with paper cut outs and given one on one support to make diagonal marks using calibrated metre rule and then cut out the two triangles formed. Learners could as well manipulate and explore surfaces that represent squares and triangles in applied contexts,</li> <li>Learners to be guided to establish that the area of a triangle is equal to a half of the area of a rectangle or a square when the rectangle or the square is divided by a diagonal using paper cut outs appropriately marked to show that a diagonal divides a rectangle or square into two equal triangles.</li> <li>Learners are guided to work out the area of triangles in <math>\text{cm}^2</math> using the relationship between a rectangle and a triangle (Area of a triangle is equal to <math>\frac{1}{2}</math> area of a rectangle or square. <math>A = \frac{1}{2} (L \times W)</math>). Learners with blindness to note how units of area are written in braille.</li> <li>Learners with low vision to be guided to sketch a circle on a unit square grid with appropriate colour contrast and bold lines and count the number of full squares to estimate the area of circles then compare answers with peers. Learners with blindness be provided with a tactile diagram of a circle on a unit square grid to manipulate, explore and be guided to count the number of full squares to estimate the area of circles.</li> <li>Learners are guided to work out area of combined shapes.</li> <li>In pairs, learners to be guided to use digital devices</li> </ul>	<p>How do you work out area of a triangle?</p>

			with assistive technology to access mathematical sites and play digital games involving working out areas of different shapes.	
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**Core Competencies to be developed:**

- Critical Thinking and Problem Solving: The learner develops explanation skills as they work out the area of triangles in  $\text{cm}^2$  using the relationship between a rectangle and a triangle.

**Values:**

- Respect: The learner shows open mindedness as they sketch a circle on a unit square grid and count the full squares to estimate the area of circles and compare their answers.

**Pertinent and Contemporary Issues (PCIs):**

- Learner Support Programme: The learner enhances peer education and mentorship to support one another in establishing that the area of a triangle is equal to a half of the area of a rectangle or a square when the rectangle or the square is divided by a diagonal.

**Links to Other Learning Areas:**

- Social Studies: The learner explores their environment to calculate the area of different geographical fields.

**Suggested Learning Resources:**

Square cut outs, square tactile cut outs, metre rule, tape measures, strings, glue, place value apparatus with appropriate font and colour contrast abacus, Taylor frames with plastic types or cubes and cubarithm boards, tactile ruler, reference materials in Braille and appropriate print

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
2.0 Measurement	2.3 Capacity (6 Lessons)	By the end of the Sub Strand, the learner should be able to: a) identify the relationship among cubic centimetres ( $\text{cm}^3$ ), millilitres and litres in real life, b) convert litres to millilitres in different situations, c) convert capacity in millilitres to litres in different situations, d) appreciate use of $\text{cm}^3$ and litres in measuring capacity in real life.	<ul style="list-style-type: none"> <li>● Learners with low vision to be provided with transparent containers labeled in contrasting calibration marks and coloured water to work out the relationship between <math>\text{cm}^3</math>, millimetres and litres through measuring. Learners with blindness be given one on one support to use calibrated tactile marks and their fingers to locate the depth of a liquid against the calibration marks and be able to work out the relationship between <math>\text{cm}^3</math>, millilitres and litres through measuring practically.</li> <li>● Learners with low vision be guided to measure capacity in millilitres and litres then compare their answers with other peers and make conclusions.</li> <li>● Learners be guided to change capacity in litres to millilitres.</li> <li>● Learners to be guided to equate capacity of millilitres to litres. Learners with low vision to be guided to write the symbol for <math>\text{cm}^3</math> and <math>\text{m}^3</math> in print while learners with blindness be guided to Braille notations for <math>\text{cm}^3</math> and <math>\text{m}^3</math>.</li> <li>● Learners use digital devices with assistive technology or other resources in print or in braille to learn more on capacity.</li> </ul>	How can you measure capacity?

**Core Competencies to be developed:**

- Critical thinking and problem solving: The learner develops exploration skills as they work out the relationship between  $\text{cm}^3$ , millilitres and litres through measuring practically.

**Values:**

- Unity: The learner appreciates efforts of others when identifying the relationship among cubic centimetres ( $\text{cm}^3$ ), millilitres and litres practically.

**Pertinent and Contemporary Issues (PCIs):**

- Learner Support Programme: The learner enhances peer education and mentorship to support one another in identifying the relationship among cubic centimetres ( $\text{cm}^3$ ), millilitres and litres practically.
- Environmental education and climate change: The learner changes capacity in litres to millilitres using containers collected from the environment.

**Links to Other Learning Areas:**

- Science and Technology: The learner takes accurate measurements of liquids and chemicals during practicals.

**Suggested Learning Resources:**

Transparent 1,  $\frac{1}{2}$  litres and  $\frac{1}{4}$  litres containers of different capacity, reference materials in Braille and appropriate print, coloured water and containers of different capacities, reference materials in Braille and Print

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
2.0 Measurement	2.4 Mass (14 Lessons)	<p>By the end of the Sub Strand, the learner should be able to:</p> <ol style="list-style-type: none"> <li>identify the tonne as a unit for measuring mass in real life,</li> <li>identify items measured in tonnes in real life,</li> <li>identify the relationship between the kilogram and the tonne practically in different situations,</li> <li>estimate mass in tonnes in different situations,</li> <li>convert kilograms to tonnes and tonnes to kilograms in real life situations,</li> <li>add tonnes and kilograms in real life situations,</li> <li>subtract tonnes and kilograms in real life situations,</li> <li>multiply tonnes and kilograms by whole numbers in real life situations,</li> <li>divide tonnes and kilograms by whole numbers in real life situations,</li> <li>appreciate use of the kilogram and tonne in measuring mass.</li> </ol>	<ul style="list-style-type: none"> <li>Learners are guided to discuss the tonne as a unit of measuring mass. Learners with blindness are guided to write units of measuring mass in braille.</li> <li>Learners be guided to discuss items in the environment such as loaded lorries whose mass may be measured in tonnes.</li> <li>Learners are guided to identify the relationship between the kilogram and the tonne (1000kg = 1 tonne).</li> <li>Learners with low vision be guided to estimate masses in tonnes of various objects found in the environment. Learners with blindness be given one on one support alongside clear verbal descriptions to estimate masses in tonnes of various objects found in the environment.</li> <li>Learners to be guided to change kilograms to tonnes and tonnes to kilograms.</li> <li>Learners to be guided to determine mass of items in tonnes and kilograms using different operations involving addition, subtraction, multiplication and division.</li> <li>Learners to be guided to use digital weighing machines to measure masses of different items. Learners with blindness to be given one on one support alongside clear verbal descriptions to use digital weighing machines or an electronic balance with voice output to measure masses of different items.</li> <li>Learners to be guided to use other digital devices with assistive technology to learn more on mass and for enjoyment.</li> </ul>	How can you measure large amounts of masses?

**Core Competencies to be developed:**

- Digital literacy: The learner develops interactive and connecting skills as they use digital devices to learn more on mass.

**Values:**

- Responsibility: The learner takes care of learning materials used when measuring mass of different substances.

**Pertinent and Contemporary Issues (PCIs):**

- Learner Support Programme: The learner enhances peer education and mentorship to support one another in identifying the relationship between the kilogram and the tonne practically.

**Links to Other Learning Areas:**

- English and Other Languages: The learner reinforces speaking and listening skills as they discuss units of measuring mass.

**Suggested Learning Resources:**

Beam balance, different masses, electronic balance with voice output, reference materials in Braille and appropriate print

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
<b>2.0 Measurement</b>	<b>2.5 Time (10 Lessons)</b>	<p>By the end of the Sub Strand, the learner should be able to:</p> <p>a) identify time in a.m. and p.m. in day to day life experiences,</p> <p>b) write time in a.m. and p.m. in day to day life experiences,</p> <p>c) relate time in a.m. and p.m. to the 24h clock system in real life situations,</p> <p>d) convert time from 12h to 24h and 24h to 12h system in real life situations,</p> <p>e) interpret travel timetable in different situations,</p> <p>f) appreciate use of time in both 12h and 24h systems.</p>	<ul style="list-style-type: none"> <li>● In pairs, learners with low vision to be guided to discuss time in a.m. and p.m. from digital and analogue clocks in appropriate font and colour contrast while learners with blindness to be provided with tactile digital or analog clock faces to tactually manipulate and read time in a.m. and in p.m.</li> <li>● Learners with low vision are guided to determine time in a.m. and p.m. from digital and analogue clocks with appropriate font and colour contrast. Learners with blindness be provided with tactile clock faces or talking digital clocks to manipulate, explore and determine time in a.m. and p.m.</li> <li>● Learners be guided to equate time in a.m. and p.m. to the 24h clock system using a chart in appropriate font and colour contrast or embossed charts.</li> <li>● Learners are guided to change time from the 12h to 24h system and 24h to 12h using time conversion charts in appropriate font and colour contrast or tactile charts.</li> <li>● Learners with low vision to be guided to interpret travel timetables in appropriate font and colour contrast while learners with blindness are guided to tactually manipulate, explore and interpret braille travel timetables.</li> <li>● Learners with low vision to determine time durations of travelling within the country using travel timetables in appropriate font and colour contrast while learners with blindness be guided to use tactile travel</li> </ul>	<ol style="list-style-type: none"> <li>1. How can you read and tell time?</li> <li>2. How is time measured?</li> </ol>



			<p>timetables or travel timetables embossed in braille to determine time duration of travelling within the country.</p> <ul style="list-style-type: none"> <li>● In groups, learners to be guided to use digital devices with assistive technology or other resources to learn more on changing time from 12h and 24 h systems.</li> </ul>	
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**Core Competencies to be developed:**

- Learning to learn: The learner develops learning independently as they determine time in a.m. and p.m. from digital and analogue clocks and manage time effectively.

**Values:**

- Unity: The learner collaborates with others to interpret travel timetables.
- Responsibility: The learner takes care and safely handles learning resources used when estimating time.

**Pertinent and Contemporary Issues (PCIs):**

- Learner Support Program: The learner enhances peer education and mentorship to support one another to convert time from 12h to 24h and 24h to 12h system.

**Links to Other Learning Areas:**

- English and Other Languages: The learner reinforces speaking and listening skills as they discuss how to equate time in a.m. and in p.m. to the 24h clock system.
- Creative Arts: The learner times various field and sporting activities.

**Suggested Learning Resources:**

Analogue and digital clocks, talking clocks, digital watches, tactile clocks faces, time charts with appropriate colour contrast and font size, Braille charts in a.m. and p.m., abacus, reference materials in Braille and in appropriate print

Strand	Sub Strand	Specific Learning Outcome	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
2.0 Measurement	2.6 Money (8 lessons)	<p>By the end of the Sub Strand, the learner should be able to:</p> <ol style="list-style-type: none"> <li>identify situation where budgeting is done in real life situations,</li> <li>prepare simple budget in different situations,</li> <li>determine buying and selling prices of different items in the community,</li> <li>work out profit from sales of different items in the community,</li> <li>calculate loss realized from sales of different items in the community,</li> <li>identify types of taxes in different situations,</li> <li>appreciate the importance of learning about profit and loss in real life situations.</li> </ol>	<ul style="list-style-type: none"> <li>Learners discuss the real life contexts in which the concept of budgeting is done and share the peers.</li> <li>Learners to be guided to identify different shopping items in the community and draw a simple budget.</li> <li>Learners to be guided to discuss the meaning of buying and selling price.</li> <li>Learners to be guided to determine buying and selling prices of different items in the community.</li> <li>In groups, learners discuss the meaning of profit and loss in real life situations and share with other groups.</li> <li>Learners to be guided to determine profit and loss.</li> <li>Learners to be guided to discuss income and value added tax (VAT) as a form of tax.</li> <li>Learners are guided to use digital devices with assistive technology or other resources to learn more about profit and loss.</li> <li>Learners use digital devices with assistive technology or other resources to learn more about profit and loss.</li> </ul>	How can you make profit in a business?

**Core Competencies to be developed:**

Communication and collaboration: The learner develops listening and speaking skills as they discuss the meaning of profit and loss in real life situations.

**Values:**

Integrity: The learner shows honesty when determining buying and selling prices of different items from their locality.

**Pertinent and Contemporary Issues (PCIs):**

Socio-economic Issues: The learner enhances their financial literacy skills as they discuss and learn more about income and value added tax (VAT) as a form of tax.

**Links to Other Learning Areas:**

English and Other Languages: The learner reinforces speaking and writing skills as they discuss the meaning of profit and loss.

**Suggested Learning Resources:**

Imitations of money, real money, price list in Braille, shopping list in both print and braille, a sample budget in both print and Braille, reference materials in Braille and in appropriate print

<b>Indicator</b> / <b>LEVEL</b>	<b>Exceeds Expectations</b>	<b>Meets Expectations</b>	<b>Approaches Expectations</b>	<b>Below Expectations</b>
Ability to: <ul style="list-style-type: none"> <li>• perform operation involving centimetres and millimetres by whole numbers in real life situations,</li> <li>• work out area of combined shapes involving squares, rectangles and triangles in cm<sup>2</sup> in different situations,</li> <li>• convert capacity in millilitres to litres in different situations,</li> <li>• convert capacity in millilitres to litres in different situations,</li> <li>• relate time in a.m. and p.m. to the 24h clock system in real life situations,</li> <li>• convert time from 12h to 24h and 24h to 12h system in real life situations,</li> <li>• identify types of taxes in different situations,</li> </ul>	The learner demonstrates the seven skills	The learner demonstrates five to six skills.	The learner demonstrates the four to three skills.	The learner demonstrates at most two skills

**STRAND 3.0 GEOMETRY**

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
<p><b>3.0 Geometry</b></p>	<p><b>3.1 Lines (6 Lessons)</b></p>	<p>By the end of the Sub Strand, the learner should be able to:</p> <ul style="list-style-type: none"> <li>a) describe parallel and perpendicular lines as used in real life situations,</li> <li>b) draw parallel lines in different situations,</li> <li>c) interpret tactile parallel lines in different situations (<i>for learners with blindness</i>),</li> <li>d) bisect lines by construction in different situations, (<i>for learners with low vision</i>),</li> <li>e) interpret tactile bisected lines in different situations (<i>for learners with blindness</i>),</li> <li>f) construct perpendicular lines in different situations, (<i>for learners with low vision</i>),</li> <li>g) interpret tactile perpendicular lines in different situations (<i>for learners with blindness</i>),</li> <li>h) appreciate use of lines in daily life.</li> </ul>	<ul style="list-style-type: none"> <li>i) Learners discuss a variety of scenarios in real life where the concepts of parallel and perpendicular lines as used in real life situations, <ul style="list-style-type: none"> <li>● draw parallel lines in different situations</li> <li>● Learners with low vision be guided to construct parallel lines using appropriate geometrical instruments while learners with blindness be given one on one support to draw tactile parallel lines by using ruler with tactile calibrations, spur wheel and rubber mat.</li> <li>● Learners with blindness are guided to interpret tactile parallel lines.</li> <li>● Learners with low vision be guided to bisect lines through construction by using appropriate geometrical instruments while learners with blindness be given one on one support to draw tactile horizontal and vertical lines using braille geometric instruments.</li> <li>● Learners with blindness are guided to interpret tactile bisected lines provided</li> <li>● Learners with low vision be guided to construct perpendicular lines using appropriate geometrical instruments while learners with blindness be given one on one support to construct tactile perpendicular lines using a ruler with tactile calibrations, spur wheel and rubber mat.</li> <li>● Learners with blindness are guided to interpret tactile perpendicular</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>1. How do we bisect lines?</li> <li>2. How do we identify parallel lines?</li> </ul>

			<ul style="list-style-type: none"> <li>• Learners with low vision to be guided to use digital devices with assistive technology and other resources to draw or sketch parallel lines. Learners with blindness use to be guide to use digital devices with assistive technology to access mathematical sites and learn more on lines.</li> </ul>	
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**Core Competencies to be developed:**

- Communication and Collaboration: The learner develop speaking and listening skills as they collaboratively work to come up with different types of lines.
- Digital Literacy: The learner develops interactive and connecting skills when using digital devices with assistive technology to learn more on lines.

**Values:**

- Responsibility: The learner takes care of learning resources used when coming up with parallel, vertical and perpendicular lines.

**Pertinent and Contemporary Issues (PCIs):**

- Safety and Security: A learner observes internet safety and security by accessing safe online mathematical sites to learn more on lines.

**Links to Other Learning Areas:**

- Creative Arts: The learner appreciates use of parallel, vertical and perpendicular lines in daily life.

**Suggested Learning Resources:**

Paper cut outs, Braille geometrical set such as ruler with tactile calibration, spur wheel and rubber mat, geometrical set with appropriate tools for learners with low vision such as rulers and protractors, Braille papers, reference materials in Braille and in appropriate print

Strand	Sub Strand	Specific Learning outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
<b>3.0 Geometry</b>	<b>3.2 Angles (6 Lessons)</b>	<p>By the end of the Sub Strand, the learner should be able to:</p> <ol style="list-style-type: none"> <li>identify angles on a straight line at a point in different situations,</li> <li>measure angles on a straight line at a point in different situations,</li> <li>work out sum of angles on a straight line in different situations,</li> <li>determine the sum of angles in rectangles and triangles in different situations,</li> <li>construct equilateral, right angled and isosceles triangles for familiarization, (<i>learners with low vision</i>)</li> <li>interpret tactile equilateral, right angled and isosceles triangles for familiarization, (<i>for learners with blindness</i>),</li> <li>measure their interior angles accurately in different situations,</li> <li>appreciate use of angles in real life.</li> </ol>	<ul style="list-style-type: none"> <li>Learners with low vision be guided to identify angles on a bold straight line drawn on a surface with appropriate colour contrast. Learners with blindness to be guided to tactually manipulate and explore provided tactile diagrams in order to identify angles on a straight line.</li> <li>Learners with low vision to be guided to draw a line that cuts the straight line to form an angle. Measure and write the size(s) of angles formed. Compare the sizes of angles with others. Learners with blindness to be given one on one support to tactually manipulate and explore provided tactile diagrams of angles and be guided to use tactile cut outs to measure and record the size(s) of the angles.</li> <li>Learners to be guided to determine the sizes of various angles.</li> <li>Learners to practically establish the sum of angles in a triangle and rectangles from different objects in the environment.</li> <li>Learners with low vision to be guided to identify and draw equilateral, right angled and isosceles triangles using appropriate geometrical instruments.</li> <li>Learners with blindness be given tactile diagrams of equilateral, right angled and isosceles triangles to learners with blindness to tactually manipulate, explore and interpret them.</li> <li>Learners are guided to practically establish the sum of the interior angles in a rectangle and triangle</li> <li>Learners to be guided to use digital devices with assistive technology or other resources to</li> </ul>	<p>How are angles used in day to day life?</p>

			learn more on angles.	
<b>Core Competencies to be developed:</b>				
<ul style="list-style-type: none"> <li>• Communication and Collaboration: The learner develops speaking and listening skills and also embrace teamwork as they work in groups to identify angles on a straight line.</li> </ul>				
<b>Values:</b>				
<ul style="list-style-type: none"> <li>• Unity: The learner collaborates with others as they compare sizes of angles.</li> </ul>				
<b>Pertinent and Contemporary Issues (PCIs):</b>				
<ul style="list-style-type: none"> <li>• Learner Support Programme: The learner enhances peer education and mentorship to support one another in establishing the sum of angles in a triangle and rectangles from different objects in the environment.</li> </ul>				
<b>Links to Other Learning Areas:</b>				
<ul style="list-style-type: none"> <li>• Creative Arts: The learner measures and draws different angles from a straight line.</li> </ul>				
<b>Suggested Learning Resources:</b>				
Clay, plasticine/modeling clay, paper cut outs, pair of scissors, tactile angles, models of angles, toys, geometrical shapes models of different angles, reference materials in Braille and in appropriate print				



Strand	Sub Strand	Specific Learning Outcome	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
3.0 Geometry	3.3 3-D Objects  (6 Lessons)	By the end of the Sub Strand, the learner should be able to: a) identify vertices, faces and edges in cuboids, cubes in different situations,  b) identify faces and edges of cylinders in different situations, c) describe plane figures in 3- D objects in the environment, d) appreciate use of 3-D objects in real life.	<ul style="list-style-type: none"> <li>● Learners are guided to discuss and collect 3-D objects (cuboids and cubes) and safely keep them as part of their role in environmental conservation then identify vertices, faces and edges on the collected objects.</li> <li>● Learners are guided to collect 3 D objects (cylinders) from the environment then identify their faces and edges.</li> <li>● Learners with low vision are guided to open up nets of cuboids, cubes and cylinders in order to observe plane figures in the 3-D objects. Learners with blindness are given one on one support with clear verbal descriptions to open nets of cuboids, cubes and cylinders then tactually manipulate and explore to familiarize with plane figures in the 3-D objects.</li> <li>● Learners are guided to discuss the rectangular, square and circular shapes identified on the nets of the 3-D objects.</li> <li>● Learners are guided to use digital devices with assistive technology and other resources to access mathematical sites to learn more on 3-D objects.</li> </ul>	How can you use 3-D objects?

**Core Competencies to be developed:**

- Creativity and imagination: The learner develops experimenting skills as they safely open up nets of cuboids, cubes and cylinders.

**Values:**

- Patriotism: The learner discusses and collect 3-D objects from the environment and safely keeps them as part of their role in environmental conservation.

**Pertinent and Contemporary Issues (PCIs):**

- Environmental education and climate change: The learner takes care of their environment when collecting different 3-D objects disposed of in the environment and uses them as learning resources.

**Links to Other Learning Areas:**

- English and Other Languages: The learner reinforces speaking and listening skills when discussing plane figures on different 3-D objects.
- Creative Arts: The learner relates concepts of shapes to faces, vertices and edges of 3-D objects in the environment.

**Suggested Learning Resources:**

Boxes, cylindrical containers, Cutout of rectangles, circles and triangles, geometrical shapes of different sizes, reference materials in Braille and appropriate print

**Suggested Assessment Rubric**

LEVEL Indicator	Exceeds Expectations	Meets Expectations	Approaches Expectations	Below Expectations
Ability to: <ul style="list-style-type: none"> <li>• interpret parallel, perpendicular and bisected lines (<i>for learners with blindness</i>) or construct parallel and perpendicular lines (<i>for learners with low vision</i>)</li> <li>• determine the sum of angles in rectangles and triangles in different situations,</li> <li>• construct equilateral, right angled and isosceles triangles for familiarization, (<i>learners with low vision</i>) or interpret tactile equilateral, right angled and</li> </ul>	The learner demonstrates the four skills.	The learner demonstrates three skills	The learner demonstrates two skills.	The learner demonstrates one or no skill

isosceles triangles for familiarization, (*for learners with blindness*),

- identify vertices, faces and edges in cuboids, cubes in different situations,

**STRAND 4.0 DATA HANDLING**

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
<p><b>4.0 Data Handling</b></p>	<p><b>4.1 Bar Graphs</b>  (10 Lessons)</p>	<p>By the end of the Sub Strand, the learner should be able to:</p> <ol style="list-style-type: none"> <li>describe graphical representation of data in different situations,</li> <li>draw a frequency table of real-life situation data, <i>(for learners with low vision)</i>,</li> <li>interpret information from an embossed frequency table of real-life situation data, <i>(for learners with blindness)</i></li> <li>represent data from real life situations using pictographs,</li> <li>represent data from real life situation through piling,</li> <li>represent data from real life situations using bar graphs, <i>(for learners with low vision)</i>,</li> <li>interpret information from tactile bar graphs in real life situations <i>(for learners with blindness)</i>,</li> <li>appreciate use of bar graphs in real life.</li> </ol>	<ul style="list-style-type: none"> <li>Learners discuss the concept of graphs in representing data collected from various sources as well as a variety of graphical representations of data.</li> <li>Learners with low vision be guided to collect data in a barrier free environment and organize it in a frequency table while learners with blindness be given one on one support to collect data in a barrier free environment and be guided to represent the collected data in a frequency table in Braille then interpret the data.</li> <li>In pairs, learners with low vision to be guided to collect data and organize it in pictographs while learners with blindness to be given one on one support to interpret information on pictograms</li> <li>Learners to be guided to pile similar objects such as match boxes, cubes and cuboids vertically.</li> <li>Learners with low vision to be guided to organize data in the form of bar graphs while learners with blindness to be provided with a tactile diagram of a bar graph to manipulate, explore and interpret information.</li> <li>Learners to be guided to discuss information represented on bar graphs.</li> <li>In groups, learners to be guided to use digital devices with assistive technology to</li> </ul>	<p>How can you represent data in real life situations?</p>

			learn more on representing data using bar graphs.	
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**Core Competencies to be developed:**

- Creativity and imagination: The learner makes connections when collecting data and organizing them in pictographs, frequency tables, bar graphs or by piling.
- Digital literacy: The learner develops interactive and connecting skills when using digital devices with assistive technology to learn more on data representation using bar graphs.

**Values:**

- Responsibility: The learner takes care of the various learning resources used in collecting, recording and representing data.

**Pertinent and Contemporary Issues (PCIs):**

- Safety and security: The learner takes care of themselves and others when collecting data from the environment.

**Links to Other Learning Areas:**

- Creative arts: The learner collects data from the environment and represents it in pictographs or bar graphs.

**Suggested Learning Resources**

Sticks, glue, pair of scissors, wire, soft board, reference materials in Braille and appropriate print, real objects such as matchboxes, cubes, cuboids

**Suggested Assessment Rubric**

LEVEL Indicator	Exceeds Expectations	Meets Expectations	Approaches Expectations	Below Expectations
Ability to: <ul style="list-style-type: none"> <li>• draw a frequency table of real-life situation data, <i>(for learners with low vision)</i>, or interpret information from an embossed frequency table of real-life situation data, <i>(for learners with blindness)</i></li> <li>• represent data from real life situations using pictographs,</li> <li>• represent data from real life situation through piling,</li> </ul>	The learner demonstrates the four skills.	The learner demonstrates three skills	The learner demonstrates two skills	The learner demonstrates one or no skill

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|--|--|--|--|--|
| <ul style="list-style-type: none"><li>• represent data from real life situations using bar graphs, (<i>for learners with low vision</i>),<br/>or</li><li>• interpret information from tactile bar graphs in real life situations (<i>for learners with blindness</i>),</li></ul> |  |  |  |  |
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**APPENDIX 1:****List of Learning Resources**

<b>Strand</b>	<b>Sub strand</b>	<b>Suggested assessment methods</b>
<b>1.0 NUMBERS</b>	<b>1.1 Whole Numbers</b>	a) Written assignments in print and in Braille b) Oral questioning c) Observation d) Self and peer assessment
	<b>1.2 Multiplication</b>	a) Written assignments in print and in Braille b) Oral questioning c) Observation d) Self and peer assessment
	<b>1.3 Division</b>	a) Written assignments in print and in Braille b) Oral questioning c) Observation d) Self and Peer assessment
	<b>1.4 Fractions</b>	a) Written assignments in print and in Braille b) Oral questioning c) Observation d) Self and Peer assessment
	<b>1.5 Decimals</b>	a) Written assignments in print and in Braille b) Oral questioning c) Observation d) Self and Peer assessment
	<b>1.6 Inequalities</b>	a) Written assignments in print and in Braille b) Oral questioning c) Observation d) Self and Peer assessment
<b>2.0 MEASUREMENT</b>	<b>2.1 Length</b>	a) Written assignments in print and in Braille b) Oral questioning c) Observation



		d) Self and Peer assessment
	<b>2.2 Area</b>	a) Written assignments in print and in Braille b) Oral questioning c) Observation d) Self and Peer assessment
	<b>2.3 Capacity</b>	a) Written assignments in print and in Braille b) Oral questioning c) Observation d) Self and Peer assessment
	<b>3.4 Mass</b>	a) Written assignments in print and in Braille b) Oral questioning c) Observation d) Self and Peer assessment
	<b>2.5 Time</b>	a) Written assignments in print and in Braille b) Oral questioning c) Observation d) Self and Peer assessment
	<b>2.6 Money</b>	a) Written assignments in print and in Braille b) Oral questioning c) Observation d) Self and Peer assessment
<b>3.0 GEOMETRY</b>	<b>3.1 Lines</b>	a) Written assignments in print and in Braille b) Oral questioning c) Observation d) Self and Peer assessment
	<b>3.2 Angles</b>	a) Written assignments in print and in Braille b) Oral questioning c) Observation d) Self and Peer assessment
	<b>3.3 3-D Objects</b>	a) Written assignments in print and in Braille b) Oral questioning c) Observation

		d) Self and Peer assessment
<b>4.0 DATA HANDLING</b>	<b>4.1 Data Representation</b>	a) Written assignments in print and in Braille b) Oral questioning c) Observation d) Self and Peer assessment