



**REPUBLIC OF KENYA
MINISTRY OF EDUCATION**

UPPER PRIMARY SCHOOL CURRICULUM DESIGN

MATHEMATICS

GRADE 4

FOR LEARNERS WITH VISUAL IMPAIRMENT



KENYA INSTITUTE OF CURRICULUM DEVELOPMENT

A Skilled and Ethical Society

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Revised 2024

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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 four curriculum designs for learners with visual impairment build on competencies attained by learners at Grade three. 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 four curriculum furthers implementation of the CBC from Grade three in Primary level. 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 four curriculum designs for learner 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 four and prepare them for smooth transition to Grade five. Furthermore, it is my hope that teachers will use the adapted designs to make learning interesting, exciting and enjoyable.

DR. BELIO KIPSANG', CBS
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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 21st 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 programs. The revised Grade four curriculum designs for learner with visual impairment with 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 four 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 four and preparation of learners with visual impairment for transition to Grade five.

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TABLE OF CONTENTS

FOREWORD.....	iii
PREFACE.....	iv
ACKNOWLEDGEMENT.....	v
TABLE OF CONTENTS	vi
NATIONAL GOALS OF EDUCATION.....	vii
LESSON ALLOCATION AT UPPER PRIMARY	viii
LEVEL LEARNING OUTCOMES FOR PRIMARY	ix
ESSENCE STATEMENT.....	ix
SUBJECT GENERAL LEARNING OUTCOMES	x
SUMMARY OF STRANDS AND SUB STRANDS	xi
STRAND 1.0 NUMBERS.....	1
STRAND 2.0 MEASUREMENT.....	18
STRAND 3.0: GEOMETRY.....	34
STRAND 4.0 DATA HANDLING.....	41
APPENDIX I:.....	43
APPENDIX II:.....	43
APPENDIX III:.....	44
APPENDIX IV:.....	45

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
Total		35

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:

- a) Communicate appropriately using verbal and or non-verbal modes in a variety of contexts.
- b) Demonstrate mastery of number concepts to solve problems in day to day life
- c) Demonstrate social skills, moral and religious values for positive contribution to society
- d) Develop one's interests and talents for personal fulfilment
- e) Make informed decisions as local and global citizens of a diverse, democratic society in an interdependent world.
- f) Explore, manipulate, manage and conserve the environment effectively for learning and sustainable development
- g) Acquire digital literacy skills for learning and enjoyment.
- h) 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.

SUBJECT GENERAL LEARNING OUTCOMES

By the end of Primary Education, 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) Apply properties of geometrical shapes and spatial relationships in real life experiences.
- 4) Apply data handling skills to solve problems in day-to-day life.
- 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) Develop values and competencies for a cohesive harmonious living in the society.
- 9) Manage pertinent and contemporary issues for enhanced inter-personal relationships.

SUMMARY OF STRANDS AND SUB STRANDS

S/ No	Strand	Sub Strand	Suggested Number of Lessons
1	1.0 Numbers	1.1 Whole Numbers	10
		1.2 Addition	8
		1.3 Subtraction	8
		1.4 Multiplication	8
		1.5 Division	8
		1.6 Fractions	6
		1.7 Decimals	10
		1.8 Use of letters	6
2	2.0 Measurement	2.1 Length	10
		2.2 Area	8
		2.3 Volume	8
		2.4 Capacity	8
		2.5 Mass	8
		2.6 Time	10
		2.7 Money	8
3	3.0 Geometry	3.1 Position and Direction	5
		3.2 Angles	5
		3.3 Plane Figures	6
4	4.0 Data Handling	4.1 Data	10
	Total number of lessons		150

Note: 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)
1.0 NUMBERS	1.1 WHOLE NUMBERS (10 Lessons)	By the end of the Sub Strand, the learner should be able to: a) tell place value and total value of digits up to tens of thousands in daily life situations, b) read and write numbers up to 10,000 in symbols in real life situations, c) read and write numbers up to 1,000 in words in day to day activities, d) order numbers up to 1,000 in different situations, e) round off numbers up to 1,000 to the nearest ten in different situations, f) identify factors of numbers up to 50 in different contexts, g) identify multiples of numbers up to 100 in different situations, h) apply even and odd numbers up to 100 in different situations, i) make patterns involving	<ul style="list-style-type: none">• Learners with low vision are guided to identify place values of up to tens of thousands using place value apparatus and charts in appropriate font and colour contrast. Learners with blindness are guided to use abacus, cubes and cubarithm boards, Taylor frames with plastic types to identify place value of up to tens of thousands.• Learners with low vision identify total values of digits up to tens of thousands using place value charts in appropriate font and colour contrast. Learners with blindness to identify total values of digits up to tens of thousands using abacus, cubes and cubarithm boards and Taylor frames with plastic types.• Learners are guided to solve mathematical challenges using the knowledge of place value and total value of digits up to tens of thousands.• Learners with low vision are guided to read numbers up to 10,000 from a number chart in appropriate font and colour contrast, then write the numbers in symbols. Learners with blindness are guided to read the numbers from Braille charts and write them in braille symbols.	<ol style="list-style-type: none">1. How do you write numbers in words?2. How can you find the place value of a digit in a number?3. How can you find the total value of a digit in a number?

		<p>even and odd numbers in real life situations,</p> <p>j) represent Hindu Arabic numerals using Roman numerals up to 'X' in different situations,</p> <p>k) appreciate use of whole numbers in real life situations.</p>	<ul style="list-style-type: none"> • Learners with low vision are guided to read numbers up to 1,000 from a number chart in appropriate font and colour contrast and write the numbers in words. Learners with blindness are guided to read the numbers from Braille charts and write them in words. • Learners with low vision use number cards in appropriate font and colour contrast while learners with blindness use Braille number cards and are guided to arrange numbers up to 1,000 in order from smallest to largest and largest to smallest. • Learners are guided to round off numbers up to 1,000 to the nearest ten and share with others. • Learners are guided to identify factors and divisors of numbers up to 50 and share with others. • Learners are guided to identify multiples of numbers up to 100 and share with other groups. • Learners are guided to identify even and odd numbers up to 100 and share with others. • Learners are guided to make patterns involving even and odd numbers and share with others. • Learners with low vision are guided to represent Hindu Arabic numerals using Roman numerals up to 'X' using number charts in appropriate font and colour contrast. Learners with blindness are guided to write mathematical notations of Roman numerals 	
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			<p>up to 'X' in braille and then be guided to represent Hindu Arabic numerals using Roman numerals up to 'X' using Braille number cards.</p> <ul style="list-style-type: none"> Learners are guided to use digital devices with assistive technology to browse mathematical sites and play digital games on whole numbers. 	
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Core Competencies to be developed:

- Critical thinking and problem solving:** The learner uses place value apparatus to identify place value of numbers up to tens of thousands.
- Learning to learn:** The learner rounds off numbers up to 1,000 to the nearest ten and share experiences with others.

Values:

- Respect:** The learner takes turn to represent Hindu Arabic numerals using Roman numerals up to 'X' using number charts.
- Unity:** The learner works amicably with peers to identify multiples of numbers up to 100 and share with others.

Pertinent and Contemporary Issues (PCIs):

- Social cohesion:** The learner works harmoniously in identifying factors/divisors of numbers up to 50.

Link to other learning areas:

- Social Studies:** The learner relates rounding off numbers up to 1,000 to the nearest ten to rounding off distances on a map.

Suggested Learning Resources:

Abacus, cubes and cubarithm boards, Taylor frames with plastic types, digital devices with assistive technology such as screen readers, adapted keyboards and screen magnifiers, Braille number cards, number charts in appropriate font and colour contrast, number board, manilla papers, felt pens, metre rule.

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
1.0 NUMBERS	1.2 ADDITION (8 Lessons)	<p>By the end of the Sub Strand, the learner should be able to:</p> <p>a) identify place values 4-digit numbers in readiness for addition,</p> <p>b) add up to two 4-digit numbers with single regrouping up to a sum of 10,000 in different situations,</p> <p>c) add up to two 4-digit numbers with double regrouping up to a sum of 10,000 in real life situations,</p> <p>d) estimate sum by rounding off numbers to the nearest ten in different situations,</p> <p>e) create patterns involving addition up to a sum of 10,000 in real life situations</p> <p>f) appreciate application of addition of numbers in real life situations.</p>	<ul style="list-style-type: none"> • Learners with low vision are guided to align two 4- digit numbers vertically in their squared exercise books with appropriate font and colour contrast and add them with single regrouping up to a sum of 10,000. Learners with blindness are guided to align two 4- digit numbers vertically with corresponding place value using Braille machine or frame and add them with single regrouping up to a sum of 10,000. Learners use abacus, Taylor frames with plastic types, cubes and cubarithm boards to perform operation. • Learners with low vision are guided to align two 4- digit numbers vertically squared exercise books with appropriate font and colour contrast and add them with double regrouping up to a sum of 10,000. Learners with blindness are guided to align two 4- digit numbers vertically with corresponding place value using Braille machine or frame and add them with double regrouping up to a sum of 10,000. Learners use abacus, Taylor frames with plastic types, cubes and cubarithm boards to perform operation. • In groups, learners discuss and estimate sum by rounding off numbers to be added to the nearest ten. • Learners are guided to create patterns involving addition up to a sum of 10,000. 	<ol style="list-style-type: none"> 1. How do you add numbers? 2. How do you form number patterns in addition?

			<ul style="list-style-type: none"> Learners play adapted digital games involving addition using digital devices with assistive technology. 	
<p>Core Competencies to be developed:</p> <ul style="list-style-type: none"> Self-efficacy: The learner successfully uses number cards, place value charts or place value apparatus to add up to two 4- 4-digit numbers with single regrouping with the sum not exceeding 10,000. Creativity and imagination: The learner in groups generates patterns involving addition up to a sum of 10,000. 				
<p>Values:</p> <ul style="list-style-type: none"> Unity: The learner works jointly to add up to two 4-digit numbers with double regrouping up to a sum of 10,000 in real life situations. 				
<p>Pertinent and Contemporary Issues (PCIs):</p> <ul style="list-style-type: none"> Social cohesion: The learner amicably teams up in adding up to two 4-digit numbers with single regrouping up to a sum of 10,000. Peer education: The learner supports one another in generating patterns involving the addition of numbers up to a sum of 10,000. 				
<p>Link to other learning areas:</p> <ul style="list-style-type: none"> Science and Technology: The learner safely uses digital devices with assistive technology to play digital games involving addition of two 4-digit numbers with single and double regrouping. 				
<p>Suggested Learning Resources: Abacus, cubes and cubarithm boards, Taylor frames with plastic types, Braille charts and Braille cards, embossed number line charts, number line charts in appropriate font and colour contrast, digital devices with assistive technology such as screen readers, screen magnifiers and adapted keyboard.</p>				

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
1.0 NUMBERS	1.3 SUBTRACTION (8 Lessons)	<p>By the end of the Sub Strand, the learner should be able to:</p> <p>a) identify place values 4-digit numbers in readiness for subtraction</p> <p>b) subtract up to 4-digit numbers without regrouping in real life situations,</p> <p>c) subtract up to 4-digit numbers with regrouping in real life situations,</p> <p>d) estimate difference by rounding off numbers to the nearest ten in different contexts,</p> <p>e) create patterns involving subtraction from up to 10,000,</p> <p>f) appreciate application of subtraction of numbers in real life situations.</p>	<ul style="list-style-type: none"> • Learners with low vision are guided to align 4- digit numbers in their correct place values vertically in squared exercise books with appropriate font and colour contrast and subtract them without regrouping using a place value apparatus prepared from locally available materials. Learners with blindness are guided to align 4-digit numbers vertically with corresponding place value using Braille machine or frame and subtract them without regrouping. Learners use abacus, Taylor frames with plastic types, cubes and cubarithm boards to perform operation. • Learners with low vision are guided to subtract up to 4-digit numbers with regrouping using number cards or charts in appropriate font and colour contrast. Learners with blindness use braille number cards or tactile charts to undertake the activity. • In groups, share tasks with peers to approximate and work out differences by rounding off the 	<ol style="list-style-type: none"> 1. How do you subtract two 4-digit numbers? 2. How do you estimate the difference of two 4-digit numbers? 3. How do you create patterns involving subtraction?

			<p>numbers to the nearest ten.</p> <ul style="list-style-type: none"> • Learners are guided to generate patterns involving subtraction of numbers up to 10,000. • Learners play adapted games involving subtraction using digital devices with assistive technology or other resources. 	
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Core Competencies to be developed:

- **Creativity and imagination:** The learner generates patterns involving subtraction of numbers from up to 10,000
- **Digital literacy:** The learner in pairs plays games involving subtraction using digital devices.

Values:

- **Respect:** The learner patiently works with peers to subtract numbers up to 4-digit numbers without regrouping using number cards.

Pertinent and Contemporary Issues (PCIs):

- **Environmental education:** The learner uses locally available materials to prepare place value apparatus for subtracting numbers up to 4-digit numbers without regrouping.

Link to other learning areas:

- **Agriculture and Nutrition:** The learner relates reading and writing numbers up to 10,000 in symbols to preparing planting site and planting costs.

Suggested Learning Resources:

Cubes and cubarithm boards, Taylor frames with plastic types, abacuses, print and braille number board, scientific talking calculator, Braille Charts, Braille Cards, charts and cards in appropriate colour contrast and font size, digital devices with assistive technology such as screen readers, screen magnifiers and adapted keyboard.

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
1.0 Numbers	1.4 MULTIPLICATION (8 Lessons)	<p>By the end of the Sub Strand, the learner should be able to:</p> <ul style="list-style-type: none"> a) relate multiplication to addition of numbers in different situations b) multiply up to a two-digit number by multiples of 10 in different situations, c) multiply up to a two-digit number by two-digit number with and without regrouping, d) estimate products by rounding off numbers to the nearest 10 with product not exceeding 1,000, e) create patterns involving multiplication with product not exceeding 100, f) appreciate application of multiplication of numbers in real life situation. 	<ul style="list-style-type: none"> ● Learners brainstorm on multiplication concept as repeated addition and share with peers. ● Learners are guided to multiply 2-digit numbers by multiples of 10. Learners with low vision use number cards or charts in appropriate font and colour contrast while learners with blindness use braille number cards or tactile charts. ● Learners team up to multiply up to a two-digit number by two-digit number with and without regrouping using counters and prepare a corresponding print or braille multiplication chart. ● In groups, learners to estimate and work out products by rounding off numbers to the nearest ten with products not exceeding 1,000. ● Learners with low vision to generate patterns involving multiplication with product not exceeding 100 and prepare charts using local materials to display their patterns. Learners with blindness are supported to assemble materials for preparing tactile charts involving multiplication. ● Learners play adapted digital games on multiplication using digital devices with assistive technology. 	<ol style="list-style-type: none"> 1. How can you multiply up to a two-digit number by two-digit number without regrouping? 2. How do you create patterns involving multiplication?

Core Competencies to be developed:

- **Creativity and imagination:** The learner generates patterns involving multiplication with a product not exceeding 100.

Values:

- **Unity:** The learner collaborates with others to estimate and work out answers by rounding off numbers to the nearest ten with a product not exceeding 1,000
- **Responsibility:** The learner takes care of the learning resources used when subtracting up to two 4-digit numbers without regrouping.

Pertinent and Contemporary Issues (PCIs):

- **Internet safety and security:** The learner use digital devices with assistive technology to access safe online sites to learn about multiplication.
- **Learner Support Program:** The learner enhances peer education and mentorship as they support one another in creating patterns involving multiplication.

Link to other learning areas:

- **Agriculture and Nutrition:** The learner is able to relate multiplication to square plot for gardening skills.

Suggested Learning Resources:

Cubes and cubarithm boards, abacus, Taylor frames with plastic types, number board, Manilla paper, scientific talking calculator, Braille charts, charts and cards in appropriate font and colour contrast, digital devices with assistive technology such as screen readers, screen magnifiers and adapted keyboard.

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
1.0 Numbers	1.5 DIVISION (8 Lessons)	<p>By the end of the Sub Strand, the learner should be able to:</p> <ul style="list-style-type: none"> a) relate division to subtraction of numbers in different situations, b) divide up to a two-digit number by a one-digit number with and without remainder, c) relate multiplication of numbers to division of same numbers in different situations, d) appreciate the use of division in day-to-day life. 	<ul style="list-style-type: none"> • Learners with low vision discuss and carry out division of up to a two-digit number by a one digit number without remainder using number cards with appropriate colour contrast and font size. Learners are guided to align digits appropriately in their exercise book when using long division method. Learners with blindness are guided to carry out division of up to a two digit number by a one digit number without remainder using abacus, cubes and cubarithms boards. • Learners with low vision are guided to carry out division up to a two-digit number by a one-digit number with remainder and prepare division charts. Learners with blindness are guided to carry out division up to a two-digit number by a one-digit number with remainder by setting and clearing beads on abacus or using Taylor frames with plastic types. • Learners team up with peers to carry out division and multiplication of the same numbers to establish a relationship between multiplication and division. • Learner jointly with peers play adapted games involving division using digital devices with assistive technology. 	<ol style="list-style-type: none"> 1. How do you divide a two-digit number by one digit number? 2. How do you use division to share substance?

Core Competencies to be developed:

- **Learning to learn:** The learner carries out division and multiplication of same numbers in group to establish relationship between multiplication and division.
- **Digital literacy:** The learner jointly with peers play games involving division using digital device.

Values:

- **Love:** The learner shares with others when carrying out division and multiplication of same numbers to establish relationship between multiplication and division.

Pertinent and Contemporary Issues (PCIs):

- **Learner Support Programme:** The learner enhances peer education and mentorship as they support one another in creating patterns involving multiplication up to a sum of 10,000.

Link to other learning areas:

- **Science and Technology:** Learner relates the concept of division to concept of mixtures.

Suggested Learning Resources:

Counters, Braille charts, print and braille multiplication tables, Taylor frames with plastic types, cubes and cubarithm boards, digital devices with assistive technology such as screen readers, screen magnifiers and adapted keyboard.

Strand	Sub Strand	Specific Learning Outcome	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
1.0 Numbers	1.6 FRACTIONS (6 Lessons)	<p>By the end of the Sub Strand, the learner should be able to:</p> <ul style="list-style-type: none"> a) identify the numerator and denominator in a fraction in different situations, b) represent a fraction with denominators not exceeding 12 as part of a whole and as part of a group, c) identify different types of fractions in real life situations, d) convert improper fractions to mixed fractions in different situations, e) convert mixed fractions to improper fractions in different contexts, f) use digital devices and other resources for learning more on fractions, g) appreciate application of fractions in real life situations. 	<ul style="list-style-type: none"> • Learners discuss the top (numerator) and bottom (denominator) numbers in a fraction and share with other groups. Learners with blindness are guided on how to write fraction symbols in braille. • Learners illustrate in groups fractions as part of whole or part of a group. • In groups, learners with low vision illustrate fractions as part of a whole or part of a group using cut outs, counters or clock face. Learners with blindness are guided to manipulate concrete objects that represent as part of a whole of a group. • Learners, work out proper, improper and mixed fractions as part of a whole or as part of a group using paper cut outs or counters. Learners with blindness are guided to write proper, improper and mixed fractions in braille. • Learners discuss changing of improper fractions to mixed fractions. 	<ol style="list-style-type: none"> 1. How do you convert improper fractions to mixed fractions? 2. How can you represent fractions?

			<ul style="list-style-type: none"> • Learners discuss changing of mixed fractions to improper fractions. • Learner team up with peers to play adapted digital games involving fractions. 	
<p>Core Competencies to be developed:</p> <ul style="list-style-type: none"> • Self-efficacy: The learner confidently illustrates fractions as part of a whole or part of a group using cut outs, counters or clock face. 				
<p>Values:</p> <ul style="list-style-type: none"> • Responsibility: The learner shares roles while illustrating proper, improper and mixed fractions as part of a whole or as part of a group using paper cut outs or counters. 				
<p>Pertinent and Contemporary Issues (PCIs):</p> <ul style="list-style-type: none"> • Peer education: Learner assists each other to change mixed fractions to improper fractions. 				
<p>Link to other learning areas:</p> <ul style="list-style-type: none"> • Science and Technology: The learner is able to relate fractions as part of a whole or part of a group using cut outs, counters or clock face to mixtures. 				
<p>Suggested Learning Resources:</p> <p>Paper cut outs, equivalent fraction board, abacus, Taylor frames with plastic types, cubes and cubarithms boards, glue, scissors, digital devices with assistive technology such as screen readers, adapted keyboards and screen magnifiers.</p>				

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
1.0 Numbers	1.7 DECIMALS (10 Lessons)	<p>By the end of the Sub Strand, the learner should be able to:</p> <ul style="list-style-type: none"> a) identify a tenth and a hundredth in real life situations, b) represent decimals using decimal notation in given situations in print (<i>for learners with low vision</i>) c) represent decimals using decimal notation in braille (<i>for learners with blindness</i>) d) identify place value of decimals up to hundredths in real life, e) order decimals up to hundredths in computation, f) use digital devices or other resources for learning about decimals in different situations, g) appreciate use of decimals in real life situations. 	<ul style="list-style-type: none"> • Learners discuss where tenths and hundredths are used in real life situations. • Learners with low vision to represent decimals using place value charts and write decimal numbers in exercise books. • Learners with blindness to represent decimals using abacus and write decimal numbers by clearly denoting the decimal sign in braille. • Learners with low vision to represent tenths and hundredths using place value charts with appropriate colour contrast and font size while learners with blindness to represent tenths and hundredths using abacus, cubes and cubarithms boards. • Learners with low vision to write tenths and hundredths using decimal marks on a place value chart while learners with blindness be guided to write tenths and hundredths using braille decimal notation. • Learners are guided to order given decimals in ascending and descending order. • Learner jointly with peers to play adapted digital games involving decimals. 	<ol style="list-style-type: none"> 1. How do you identify place value in decimals? 2. How can you represent decimals?
<p>Core Competencies to be developed:</p> <ul style="list-style-type: none"> • Learning to learn: The learner discusses with peers where tenths and hundredths are used in real life situations. 				

Values:

Peace: The learner in a group works in harmony to represent tenths and hundredths using place value charts.

Pertinent and Contemporary Issues (PCIs):

Environmental awareness: The learner represents decimals using place value charts and reuse charts for other activities.

Link to other learning areas:

- **English and other languages:** The learner reinforces speaking and writing skills as they discuss on decimals and place value.

Suggested Learning Resources:

Paper cut outs, a hundred square grid with appropriate colour contrast and font size, Braille cards, charts with appropriate colour contrast and font size, abacus, cubes and cubarithmetic boards, number board, talking calculator, digital devices with assistive technology such as screen readers, adapted keyboards and screen magnifiers

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
1.0 Numbers	1.8 Use of letters (6 Lessons)	By the end of the Sub Strand, the learner should be able to: a) identify variable and constant in simple word mathematical challenges, b) represent information using letters in real life situations, c) form simple algebraic expressions to represent real life situations, d) simplify algebraic expressions representing real life situations, e) appreciate the use of algebraic expressions.	<ul style="list-style-type: none"> • Learners discuss information on simple word challenges and mathematical contexts and share information on variables and constants. • Learners with low vision are guided to interpret and represent information using letters while learners with blindness be guided to represent information using letters in Braille. • Learners are guided to form algebraic expressions to illustrate real life situations. Learners with blindness are guided to combine algebra and numerals when forming algebraic expressions. • Learners are guided to simplify algebraic expressions representing real life situations. • Learners are play adapted digital games involving algebraic expressions using digital devices with assistive technology. 	How can you simplify algebraic expressions?

Core competencies to be developed:

- **Citizenship:** The learner represents various items from diverse geographical locations using letters.
- **Self-efficacy:** The learner confidently forms correct expressions to represent real life situation.

Values:

- **Unity:** The learner works together in forming algebraic expressions.
- **Responsibility:** The learner takes care of the learning resources used when learning algebra and algebraic formation.

Pertinent and Contemporary Issues (PCIs):

- **Learners support:** The learner relates well with others when simplifying algebraic expressions together.

Link to other learning areas:

- **English and other languages:** The learner represents the unknown using letters.

Suggested Learning Resources:

Digital devices with assistive technology such as screen readers, adapted keyboards and screen magnifiers, Braille reference materials and mathematics text books with appropriate print.

Suggested Assessment Rubrics

Indicator	Level	Exceeds Expectations	Meets Expectations	Approaches Expectations	Below Expectations
Ability to: <ul style="list-style-type: none"> a) read and write numbers up to 10,000 in symbols in real life situations. b) add up to two 4-digit numbers with single and double regrouping up to a sum of 10,000 in real life situations. c) subtract up to 4-digit numbers with and without regrouping in real life situations. d) multiply up to a two-digit number by two-digit number with and without regrouping. e) divide up to a two-digit number by a one-digit number with and without remainder. f) convert mixed fractions to improper fractions in different contexts. g) order decimals up to hundredth in computation. h) simplify algebraic expressions representing real life situations. 		The learner demonstrates the eight skills.	The learner demonstrates six to seven skills.	The learner demonstrates three to five skills.	The learner demonstrates at most two skills.

STRAND 2.0 MEASUREMENT				
Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
2.0 MEASUREMENT	2.1 LENGTH (10 Lessons)	<p>By the end of the Sub Strand, the learner should be able to:</p> <p>a) identify the centimetre as a unit of measuring length in real life situations,</p> <p>b) measure length in centimetres in real life situations,</p> <p>c) denote units of measurement of length in braille, (<i>for learners with blindness</i>)</p> <p>d) establish the relationship between metres and centimetres practically,</p> <p>e) convert metres to centimetres and centimetres to metres in real life situation,</p> <p>f) work out perimeter of plane figures in different contexts,</p> <p>g) work out addition involving length in metres and centimetres in real life situations,</p> <p>h) work out subtraction</p>	<ul style="list-style-type: none"> • Learners with low vision to identify the centimetre and mark out lengths of one centimetre using a ruler calibrated in appropriate colour. Learners with blindness are guided to manipulate a tactile centimetre ruler and identify the centimetre mark. Learners are supported to align the ruler on a surface and mark out one centimeter with a tactile mark. • Learners with low vision measure the length of a given object in centimetres using a metre ruler or a tape measure. Learners with blindness are guided to manipulate, explore and measure in centimetre using rulers with tactile calibration or talking tape measure/ tape measure with tactile calibration. • Learners with blindness are guided read and write units of measurement of length; cm, m in braille. • Learners are guided to estimate the length of a given object in centimetres. Learners with blindness 	<ol style="list-style-type: none"> 1. How can you measure distance? 2. Why do we measure distance in real life?

		<p>involving length in metres and centimetres in real life situations,</p> <p>i) carry out multiplication involving metres and centimetres in real life situations,</p> <p>j) carry out division involving metres and centimetres in real life situations,</p> <p>k) appreciate use of metres and centimetres in measuring distance in real life.</p>	<p>are guided to explore different objects before measuring its length.</p> <ul style="list-style-type: none"> • Learners are guided to measure actual length of the estimated length in centimetres. Learners with blindness are supported to align the centimeter ruler with the objects whose length is to be measured. • Learners share tasks while measuring the length of objects in classrooms in metres and centimetres and establish the relationship between the units. Learners with blindness are orientated in the classroom to explore different objects and use tactile metre and centimetre rule to measure length. • Learners use the relationship between centimetres and metres to measure length. • Learners are guided to convert metres into centimetres and centimetres into metres using whole numbers, decimals or fractions. • Learners are guided to work out perimeter of plane figures. Learners with blindness are guided to manipulate tactile plane figures to identify its dimensions and compute the perimeter. • Learners to work out addition and 	
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			subtraction involving metres and centimetres. <ul style="list-style-type: none"> • Learners to work out multiplication involving metres and centimetres. • Learners to work out division involving metres and centimetres. • Learners to play adapted digital games involving length using digital devices with assistive technology. 	
Core Competencies to be developed: <ul style="list-style-type: none"> • Learning to learn: The learner measures length of objects in classrooms in metres and centimetres and establish the relationship between the units. • Critical thinking and problem solving: The learner demonstrates autonomy in measuring the length of a given object in centimetres using a metre ruler or a tape measure. 				
Values: Responsibility: The learner takes care of metre ruler and a tape measure while measuring lengths of objects.				
Pertinent and Contemporary Issues (PCIs): <ul style="list-style-type: none"> • Self-awareness: The learner estimates and measures the length of a given object in centimetres using a metre ruler or a tape measure. 				
Link to other learning areas: Agriculture and Nutrition: The learner is able to relate the measurement of the length of objects to preparing planting sites and planting.				
Suggested Learning Resources: Metre rule, tactile metre rule, tactile tape measure, tape measure, metre stick, digital devices with assistive technology such as screen readers, adapted keyboards and screen magnifiers, rulers with tactile calibration or accurately cut out sticks, talking tape measure/ tape measure with tactile calibration.				

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
2.0 MEASUREMENT	2.2 AREA (8 Lessons)	<p>By the end of the Sub Strand, the learner should be able to:</p> <ol style="list-style-type: none"> a) identify different shapes (rectangles, squares, triangles) based on their characteristics relevant to calculating area, b) compare the area of given surfaces by direct manipulation, c) calculate the area of squares and rectangles by counting unit squares, d) calculate the area of squares and rectangles as a product of number of rows and columns, e) appreciate the use of rows and columns in calculating the area of squares and rectangles in real life situations. 	<ul style="list-style-type: none"> • Learners are guided to manipulate and explore models of different shapes and identify the surface area within a two-dimensional shape and relate them to real-world contexts. • Learners with low vision be guided to compare area of two surfaces directly by placing one surface on the other. Learners with blindness are guided to manipulate and compare the area of two surfaces directly by placing one surface on the other. • Learners with low vision are guided to use different unit square cut outs to cover a given surface. Learners with blindness be guided to manipulate, explore and compare different unit square cut outs to cover a given surface. • Learners are guided to count the number of unit square cutouts prepared from locally available materials to cover the surface. Learners with blindness are guided to manipulate tactile unit squares made from materials of different texture. • Learners establish that the area of a 	<p>How can you work out area of different surfaces?</p>

			<p>rectangle or a square is same as number of rows multiplied by number of columns. Learners with blindness are guided to manipulate tactile rectangles and squares to identify the number of rows and columns in them.</p> <ul style="list-style-type: none"> • Learners are guided to work out area of squares and rectangles by multiplying number of rows by number of columns, for example in tiled or paved floors. • Learners are guided to play games involving area of rectangles and squares using digital devices with assistive technology and other resources. 	
<p>Core Competencies to be developed:</p> <ul style="list-style-type: none"> • Critical thinking and problem solving: The learner works independently to calculate the area of squares and rectangles by multiplying number of rows by the number of columns. • Digital literacy: The learner in pairs plays games involving area of rectangles and squares using digital devices with assistive technology. 				
<p>Values:</p> <ul style="list-style-type: none"> • Unity: The learner works together with others to establish the area of a rectangle or a square is the same as the number of rows multiplied by the number of columns. • Integrity: The learner gives honest answers while counting the number of unit square cutouts used to cover the surface. 				
<p>Pertinent and Contemporary Issues (PCIs):</p> <ul style="list-style-type: none"> • Environmental education: The learner counts the number of unit square cutouts prepared from locally available materials to cover the surface. 				
<p>Link to other learning areas:</p> <ul style="list-style-type: none"> • Science and Technology: The learner is able to relate counting of the number of unit square cutouts prepared from locally available resources to properties of matter. 				

Suggested Learning Resources:

Square cut outs, square tactile cut outs, metre rule, tactile metre rule, tape measures, strings, glue, digital devices with assistive technology such as screen readers, adapted keyboards and screen magnifiers, squares cut outs with different textures.

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
2.0 Measurement	2.3 Volume (8 Lessons)	<p>By the end of the Sub Strand, the learner should be able to:</p> <p>a) Identify three-dimensional shapes such as cubes and rectangular prisms based on their characteristics relevant to calculating volume.</p> <p>b) pile objects into stacks of cubes and cuboids in real life situations,</p> <p>c) work out volume of cuboids by piling blocks to form a cuboid,</p> <p>d) calculate the volume of cubes by piling blocks to form a cubes,</p> <p>e) appreciate use of pilling method in working out volume in real life.</p>	<ul style="list-style-type: none"> • In groups, learners are guided to use 3-D models to discuss and share with peers the concept of volume as a measure of the amount of space enclosed within a three-dimensional shape and relate it to real-world contexts • Learners discuss and carefully arrange blocks or objects on top of each other into cuboid and cube shapes. Practice stacking objects or blocks to form cubes and cuboids of different sizes. Learners with blindness are guided to manipulate blocks and arrange them on top of each other. • In groups, learners are guided to count the number of objects in the pile that makes a cuboid to determine the volume. Learners with blindness are guided to explore a stack of cuboid and determine the number of objects in the pile. • Learners are guided to count the number of objects in the pile that makes a cube to determine the volume. Learners with blindness are guided to explore a stack of cubes and determine the number of objects in the pile. • Learners play adapted digital games using devices with assistive technology or use other resources to safely play games involving stacking blocks to form cubes and cuboids. 	How can you work out volume of cubes and cuboids?

Core Competencies to be developed:

- **Learning to learn:** The learner collaboratively practice stacking objects or blocks to form cubes and cuboids of different sizes.
- **Communication and collaboration:** The learner develops teamwork skills when stacking objects or blocks to form cubes and cuboids of different sizes while appreciating ideas of others.

Values:

Self-awareness: The learner discusses and carefully arranges blocks or objects on top of each other into cuboid and cube shape.

Pertinent and Contemporary Issues (PCIs):

- **Safety and security:** The learner safely and carefully arranges blocks or objects on top of each other into cuboid and cube shape.

Links to other learning areas:

- **Agriculture and Nutrition:** The learner is able to relate arranging blocks or objects on top of each other into cuboid and cube shapes to the Construction of food preservation equipment.

Suggested Learning Resources:

Cubes and cuboids, digital devices with assistive technology such as screen readers, adapted keyboards and screen magnifiers, stack blocks.

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
2.0 Measurement	3.4 Capacity (6 Lessons)	<p>By the end of the Sub Strand, the learner should be able to:</p> <p>a) describe the concept of capacity as used in real life situations,</p> <p>b) measure capacity in litres in real life situations,</p> <p>c) measure capacity in $\frac{1}{2}$ litres and $\frac{1}{4}$ litres in real life situations,</p> <p>d) work out addition and subtraction of capacity in litres in real life situations,</p> <p>e) appreciate use of the litre as a unit of measuring capacity in real life situations.</p>	<ul style="list-style-type: none"> • Learners brainstorm on the concept of capacity in relation to real life contexts and share experiences with peers. • Learners with low vision to measure capacity of containers using a 1 litre transparent container. Learners with blindness are given one on one demonstration on how to measure capacity of containers and be supported to note the level of water in a container. • Learners with are guided to make $\frac{1}{2}$ litre containers from locally available materials through filling and emptying the container with substances such as water or sand using a 1 litre container. Learners with blindness are given one on one support alongside verbal descriptions to make $\frac{1}{2}$ litre containers from locally available materials. • Learners are guided to make $\frac{1}{4}$ litre containers through filling and emptying using a 1 litre container. Learners with blindness are given one on one support alongside verbal descriptions to make $\frac{1}{4}$ litre containers through filling and emptying using a 1 litre container. • Learners be guided to use $\frac{1}{2}$ litre and $\frac{1}{4}$ litre containers to measure capacity of 	<p>How can you measure capacity?</p>

			<p>other containers. Learners with blindness are given one on one demonstrations as they undertake the activity.</p> <ul style="list-style-type: none"> • Learners be guided to add capacity involving litres in real life situations. • Learners to subtract capacity involving litres. • Learner to play games involving capacity using containers of different capacities or digital devices with assistive technology. 	
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Core Competencies to be developed:

- **Creativity and imagination:** The learner makes $\frac{1}{2}$ litre containers from locally available materials through filling and emptying the container with substances such as water or sand using a 1 litre container.
- **Self-efficacy:** The learner shows confidence in measuring capacity of $\frac{1}{2}$ litre and $\frac{1}{4}$ litre containers.
- **Digital literacy:** The learner interacts with digital devices with assistive technology when playing games involving capacity using containers of different capacities.

Values:

Responsibility: The learner makes $\frac{1}{4}$ litre containers from locally available materials through filling and emptying the container with substances such as water or sand using a one litre container.

Pertinent and Contemporary Issues (PCIs):

- **Safety:** The learner safely prepares $\frac{1}{2}$ litre and $\frac{1}{4}$ litre containers.
- **Environmental education:** The learner makes $\frac{1}{2}$ litre containers from locally available materials.

Link to other learning areas:

- **Science and Technology:** The learner is able to relate practical activities involving measurement of liquids to properties of matter.

Suggested Learning Resources:

Transparent 1 litre, $\frac{1}{2}$ litre and $\frac{1}{4}$ litre containers, coloured water and containers of different capacities, digital devices with assistive technology such as screen readers, adapted keyboards and screen magnifiers

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
2.0 Measurement	2.5 Mass (8 Lessons)	<p>By the end of the Sub Strand, the learner should be able to:</p> <ul style="list-style-type: none"> a) describe the concept of mass of objects in relation to day to day real life situations, b) use a kilogram mass to measure masses of different objects practically, c) use $\frac{1}{2}$ kg and $\frac{1}{4}$ kg masses to measure masses of different objects practically, d) add mass involving kilograms in real life situations, e) subtract mass involving kilograms in real life situations, f) appreciate kilogram as a unit of measuring mass. 	<ul style="list-style-type: none"> • Learners brainstorm on estimation and measurement masses of objects using standard units of mass, demonstrating accuracy in estimating and using scales or balances and share with peers the findings. • Learners use one-kilogram masses to measure masses of given objects using a beam balance. Learners with blindness are guided to explore the beam balance to identify its parts, then be supported to note when the beam balances. • Learner work with peers in making a $\frac{1}{2}$ kg mass and use it to measure mass of given objects using a beam balance. Learners with blindness are supported to assemble materials for making a $\frac{1}{2}$ kg mass. • In groups, learners share tasks while making a $\frac{1}{4}$ kg mass and use it to measure mass of given objects using a beam balance and an electronic balance. Learners with blindness are supported to assemble materials for making a $\frac{1}{4}$ kg mass. • Learners add mass involving kilograms 	<ol style="list-style-type: none"> 1. How do you measure mass in kg? 2. Why is the concept of mass important in real life situation?

			<p>(kg) in real life situations.</p> <ul style="list-style-type: none"> • Learners carry out subtraction of mass involving kilograms (kg). • Learners play adapted digital games involving mass using digital devices with assistive technology. 	
<p>Core Competencies to be developed:</p> <ul style="list-style-type: none"> • Digital literacy: The learner interacts with digital devices with assistive technology to play digital games involving mass. • Learning to learn: The learner collaboratively works out the mass of objects involving kilograms. 				
<p>Values:</p> <ul style="list-style-type: none"> • Unity: The learner works together and carefully make a $\frac{1}{2}$ kg mass and use it to measure mass of given objects using a beam balance. 				
<p>Pertinent and Contemporary Issues (PCIs):</p> <ul style="list-style-type: none"> • Social justice: Learner shares resources equitably as they use beam balance. 				
<p>Link to other learning areas:</p> <ul style="list-style-type: none"> • Science and Technology: The learner is able to relate the measurement of the mass of given objects using a beam balance to properties of matter. 				
<p>Suggested Learning Resources:</p> <p>Beam balance, different masses, manual or electronic balance with voice output, digital devices with assistive technology such as screen readers, magnifiers, adapted keyboards.</p>				

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
2.0 Measurement	2.6 Time (10 Lessons)	<p>By the end of the Sub Strand, the learner should be able to:</p> <ul style="list-style-type: none"> a) describe modern ways of telling time in real life contexts, b) read and tell time in a.m. and p.m. in print (<i>for learners with low vision</i>), c) denote and tell time in a.m. and p.m. in braille (<i>for learners with blindness</i>), d) estimate time using a.m. and p.m. in real life situations, e) convert units of time in real life situations, f) record time durations in hours and minutes in real life situations, g) work out time duration in real life situations, h) use digital clock to tell and record time of different activities, i) appreciate time in day to day activities. 	<ul style="list-style-type: none"> • Learners brainstorm on contemporary ways of measuring time using modern instruments in various real life contexts. • Learners with low vision are guided to read and tell time in a.m. and p.m. using digital and analogue clocks. • Learners with blindness be guided to read time using talking clocks or tactile clock and denote time in a.m and p.m in braille. • Learners with low vision are guided to estimate time of the day using the shadow of a building or a tree that is in a convenient location. Learners with blindness are given verbal descriptions on the appearance of the shadow at different times of the day and relate it to time. • Learners are guided to change hours to minutes and minutes to hours. • Learners are guided to convert hours to days and days to hours. • Learners are guided to convert days to weeks and weeks to days. • Learners with low vision are guided to measure and record duration of events in hours and minutes using digital and analogue clocks. Learners with blindness are guided to use talking clocks and record duration. • Learners work out addition involving units of time. Learners with blindness are guided to properly align 	<ol style="list-style-type: none"> 1. How can you tell time? 2. How can you find out time taken to do an activity?

			<p>the minutes and hours vertically before performing the operation.</p> <ul style="list-style-type: none"> • Learners to work out subtraction involving units of time. Learners with blindness are guided to properly align the minutes and hours vertically before performing the operation. • In groups, learners to discuss, tell and record time using an electronic clock or talking clock for enjoyment and learning. 	
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Core Competencies to be developed:

- **Imagination and creativity:** The learner explores new ways of estimating time using shadows of objects within the environment.
- **Digital literacy:** The learner discusses collaboratively with others and records time using digital devices.

Values:

- **Integrity:** The learner consistently measures and records accurately the duration of events in hours and minutes using digital or analogue clocks

Pertinent and Contemporary Issues (PCIs):

- **Safety and security:** A learner safely measures and records duration of events in hours and minutes using digital and analogue clocks.

Link to other learning areas:

- **English and other languages:** The learner participates in discussions on how to estimate time using shadows of objects within the environment.
- **Science and Technology:** The learner uses sun as source of light and also in estimating time duration of experiments.

Suggested Learning Resources:

Analogue and digital clocks, digital watches, stop watches, talking stop watches, talking digital watch, tactile clock faces, digital devices with assistive technology such as screen readers, adapted keyboards and screen magnifiers, Braille a.m. and p.m. charts, abacus.

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
2.0 Measurement	2.7 Money (8 Lessons)	<p>By the end of the Sub Strand, the learner should be able to:</p> <ul style="list-style-type: none"> a) explain how cents and shillings relate for conversion, b) denote shillings and cents in braille, (<i>for learners with blindness</i>) c) convert shillings into cents and cents into shillings in different contexts, d) prepare a shopping list of three items to buy, e) work out total cost of items in the shopping list not more than ten thousand shillings, f) model buying items as a shopping activity in school, g) appreciate the use of money in real life. 	<ul style="list-style-type: none"> • In groups, pairs or individually learners manipulate cents and shillings for familiarity. • Learners are guided to discuss and convert shillings into cents and cents into shillings using imitation or real money. • Learners with blindness are guided to read and write braille symbol for shillings and cents • Learners are guided on how to come up with a shopping list of some food items. • Learners calculate the total cost of items in the shopping list. • In groups, learners are guided to come up with a class or school model shop and role play shopping activities as buyers and shopkeepers. • Learners are guided to take video of their groups as they role play shopping activities. Learners with blindness are given one support to take audio visual clip of their peers as they role play shopping activities. 	<ol style="list-style-type: none"> 1. How do you convert shillings into cents and cents into shillings? 2. Why is money important in real life?

Core Competencies to be developed:

- **Communication and collaboration:** The learner listening and speaking skills when discussing and converting shillings into cents and cents into shillings using real/ imitation money.
- **Self-efficacy:** The learner develops negotiation skills when calculating the total cost of items in the shopping list.
- **Creativity and imagination:** The learner develops networking skills as they come up with a class or school model shop and role play shopping activities as buyers and shopkeepers.

Values:

- **Integrity:** The learner displays accountability as they calculate the total cost of items in the shopping list.
- **Patriotism:** The learner displays citizenship when converting shillings into cents and cents into shillings which is Kenyan currency.

Pertinent and Contemporary Issues (PCIs):

- **Financial literacy:** Learner exhibits financial knowledge and skills while calculating the total cost of items in the shopping list.

Link to other learning areas:

- **Social Studies:** The learner is able to relate shopping list for food items to the concept of Resources and Economic Activities.

Suggested Learning Resources:

Imitations of money, real money, price list in Braille and in appropriate colour contrast and font size, saving box, digital devices with assistive technology such as screen readers, adapted keyboards and screen magnifiers

Suggested Assessment rubrics

Indicator	Level	Exceeds Expectations	Meets Expectations	Approaches Expectations	Below Expectations
Ability to:					
a) carry out operation involving metres and centimetres in real life situations.		The learner demonstrates the seven skills.	The learner demonstrates five to six skills.	The learner demonstrates three to four skills.	The learner demonstrates at most two skills.
b) calculate the area of squares and rectangles as a product of number of rows and columns.					
c) calculate the volume of cubes by piling blocks to form a cubes.					
d) measure capacity in $\frac{1}{2}$ litres and $\frac{1}{4}$ litres in real life situations.					
e) add mass and subtract mass involving kilograms in real life situations.					
f) convert units of time in real life situations.					
g) convert shillings into cents and cents into shillings in different contexts.					

STRAND 3.0: GEOMETRY

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
3.0 Geometry	3.1 Position and Direction (5 Lessons)	By the end of the sub strand, the learner should be able to: a) identify a clockwise and an anti-clockwise turn in the environment, b) demonstrate a clockwise and an anti-clockwise turn in the environment, c) identify quarter, half and full turns direction in the environment, d) demonstrate a quarter turn, half turn and full turn direction in the environment, e) appreciate use of position and direction in real life situations.	<ul style="list-style-type: none">• Learners make clockwise or anticlockwise turns. Learners with blindness are given one on one demonstration on how to make the turns.• Learners discuss and demonstrate a clockwise turn.• Learner team with peers to demonstrate an anti-clockwise turn.• In groups, learners to safely make quarter, half and full turns in the surroundings. Learners with blindness are given one on one orientation on how to make the turns safely in the environment.• Learner team with peers to demonstrate a quarter turn in both directions. Learners with blindness are given one on one orientation on how to make the turns safely in the environment.• Learners demonstrate a half turn from a point. Learners with blindness are orientated to make the turn.	How can you change your position?

			<ul style="list-style-type: none"> • Learners demonstrate a full turn from a point. Learners with blindness are orientated to make the turn. • Learner jointly works with others to play adapted digital games involving position and direction. 	
Core Competencies to be developed:				
Learning to learn: The learner works collaboratively with others while making clockwise or anticlockwise turns in the environment.				
Values:				
Unity: The learner embraces others as they demonstrate a clockwise turn.				
Pertinent and Contemporary Issues (PCIs):				
Safety: Learner observes care and precautions while making quarter, half and full turns in the environment to enhance				
Link to other subjects				
Social Studies: The learner is able to relate making quarter, half and full turns in the surroundings to the Location, Position and size of Kenya.				
Suggested learning resources:				
Print and braille course books.				

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
3.0 Geometry	3.2 Angles (5 Lessons)	<p>By the end of the Sub Strand, the learner should be able to:</p> <ul style="list-style-type: none"> a) identify an angle at a point in lines, b) identify angles from the objects in the environment, c) relate a turn to angles in real life situations, d) appreciate use of angles in real life situations. 	<ul style="list-style-type: none"> • Learners with low vision discuss and recognise angles that are made by 2 lines that meet at point using a chart with a different line. Learners with blindness are guided to manipulate tactile charts with two lines to identify the meeting point. • In groups, learners with low vision to explore and identify angles from objects such as cubes, cuboids with appropriate colour contrast and font size in the environment. Learners with blindness are guided to explore the environment and identify angles from different objects such as cubes, cuboids. • Learners with low vision be guided to make clockwise quarter and half turns, and relate the turns to angles while learners with blindness be are orientated to make turns in the environment and relate it to angles. • Learners use digital devices with assistive technology to play digital games and learn more about angles. 	<ol style="list-style-type: none"> 1. How can you identify angles from the objects? 2. How do you identify an angle at a point?

Core competencies to be developed:

- **Communication and collaboration:** The learner develops speaking and listening skills when discussing and recognizing angles that are made by 2 lines that meet at point.

- **Learning to learn:** The learner makes clockwise quarter and half turns, and relate the turns to angles.

Values:

- **Responsibility:** The learner explores angles from the objects such as cubes, cuboids in the environment.

Pertinent and Contemporary Issues (PCIs):

- **Environmental education:** The learner explores and identifies angles from the objects such as cubes, cuboids in the environment.

Link to other subjects:

- **Creative Arts:** The learner is able to relate angles from objects such as cubes and cuboids in the environment to perspective.

Suggested Learning Resources:

Clay, plasticine, paper cutouts, pair of scissors, tactile angles, models of angles, toys, geometrical shapes, models of different angles and digital devices with assistive technology such as screen readers, adapted keyboards and screen magnifiers.

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
3.0 Geometry	3.3 Plane Figures (6 Lessons)	By the end of the Sub Strand, the learner should be able to: <ol style="list-style-type: none"> a) identify rectangles, squares, triangles, circles and ovals from objects in the environment, b) draw or model the shapes of rectangles, squares, triangles, circles and ovals from objects in the environment c) identify lines of symmetry of different shapes, d) make patterns using squares, rectangles and triangles for learning, e) identify properties of plane figures in different situations, f) appreciate using shapes in real life situations. 	<ul style="list-style-type: none"> • Learners with low vision discuss and recognize shapes of rectangles, squares, triangles, circles and ovals from common objects. Learners with blindness are guided to manipulate and identify shapes of rectangles, squares, triangles, circles and ovals from common objects. • Learners with low vision to be guided to draw the shapes of rectangles, squares, triangles, circles and ovals using real objects in their books or charts. Learners with blindness are guided to model shapes of rectangles, squares, triangles, circles and ovals. • Learners discuss and fold the shapes into two equal parts and recognise the fold line as the line of symmetry, discuss how many lines of symmetry each shape can possibly have by folding the shapes. Learners with blindness are given one on one demonstration to fold shapes and feel the line of symmetry. • Learner work with peers to make patterns using squares, rectangles and triangles. Learners with blindness are given one on one demonstrations on how to make patterns using different shapes. • Learners identify the properties of a square practically. Learners with blindness explore the cut-out or tactile of a square to identify 	<ol style="list-style-type: none"> 1. How can you identify shapes from objects? 2. How can you make patterns?

			<p>its properties.</p> <ul style="list-style-type: none"> • Learners discuss the properties of a rectangle practically. Learners with blindness explore the cut-out or tactile of a rectangle to identify its properties. • Learners identify properties of a triangle practically. Learners with blindness explore the cut-out or tactile of a triangle to identify its properties. • Learners use digital devices with assistive technology to learn more about plane figures and make patterns. 	
<p>Core competencies to be developed:</p> <ul style="list-style-type: none"> • Learning to learn: The learner develops relationship skills when discussing lines of symmetry in each plane shape. • Creativity and imagination: The learners develop their mental image when making patterns using squares, rectangles and triangles. 				
<p>Values:</p> <ul style="list-style-type: none"> • Unity: The learner works together with others when discussing together to recognize shapes of rectangles, squares, triangles, circles and ovals from common objects. 				
<p>Pertinent and Contemporary Issues (PCIs):</p> <ul style="list-style-type: none"> • Safety and security: The learner safely sketches, manipulates and explores the shapes of rectangles, squares, triangles circles and ovals from objects. 				
<p>Link to other learning areas:</p> <ul style="list-style-type: none"> • Creative Arts: The learner is able to relate making patterns using squares, rectangles and triangles to perspective. 				
<p>Suggested Learning Resources:</p> <p>Cut out of rectangles, circles and triangles, geometrical shapes of different sizes, realia of triangle, rectangles, squares, circles and ovals, digital devices with assistive technology such as screen readers, adapted keyboards and screen magnifiers and reference materials in Braille and appropriate print.</p>				

Suggested Assessment Rubrics

Indicator	Level	Exceeds Expectations	Meets Expectations	Approaches Expectations	Below Expectations
Ability to: <ul style="list-style-type: none"> a) identify a clockwise and an anti-clockwise turn in the environment. b) identify an angle at a point and from the objects in the environment. c) make patterns using squares, rectangles and triangles for learning. d) identify properties of plane figures in different situations. 		The learner demonstrates the four skills.	The learner demonstrates three skills.	The learner demonstrates two skills.	The learner demonstrates one or no skill.

STRAND 4.0 DATA HANDLING

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
<p>4.0 Data Handling</p>	<p>4.1 Data (10 Lessons)</p>	<p>By the end of the Sub Strand, the learner should be able to:</p> <ul style="list-style-type: none"> a) identify materials for data collection and recording in real life situations, b) collect data of at most 10 items within the school environment, c) draw a table for recording data, (<i>learners with low vision</i>) d) prepare rows and columns for recording data, (<i>for learners with blindness</i>) e) record data in the table, f) interpret the raw data from the table g) appreciate use of frequency tables in representing data in real life situations. 	<ul style="list-style-type: none"> • Learners name different materials that are used for data collection and recording such as rulers, braille books, exercise books for drawing tables, textbooks and digital devices with assistive technology. • Learners gather and share different items for purposes of recording data. Learners with blindness are supported to explore the environment and gather appropriate materials. • Learners with low vision represent the raw data in simple tables. • Learners with blindness are guided to represent the raw data appropriately in rows and columns on braille paper. • Learners are guided to explain and interpret the raw data from the print or tactile data tables. • Learners use digital devices with assistive technology other resources and for data collection and recording. 	<ol style="list-style-type: none"> 1. How can you represent data? 2. Why do you represent collected data?

Core competencies to be developed:

- **Critical thinking and problem solving:** The learner in groups or in pairs represent the raw data in simple tables.
- **Digital literacy:** The learners interact with digital devices with assistive technology and other resources for data collection and recording.

Values:

- **Unity:** The learner gathers and shares different items for purposes of recording data.

Pertinent and Contemporary Issues (PCIs):

Safety and security: The learner safely collects materials from the immediate classroom environment like the number of classrooms.

Link to other learning areas:

- **English and other languages:** The learner enhances their speaking and writing skills in group discussions while collecting and representing raw data.

Suggested Learning Resources:

Tactile data from different sources, sticks, glue, pair of scissors, wire board, digital devices with assistive technology such as screen readers, adapted keyboards and screen magnifiers, chalkboard rulers, rulers, exercise books for drawing tables, textbooks with appropriate print and other resources, braille -dotted rulers, braille books and Embossed resources.

Suggested Assessment Rubrics

Level Indicator	Exceeds Expectations	Meets Expectations	Approaches Expectations	Below Expectations
Ability to: <ul style="list-style-type: none"> a) identify materials for data collection and recording in real life situations. b) collect data of at most 10 items within the school environment. c) draw a table for recording data, (<i>learners with low vision</i>) <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> prepare rows and columns for recording data, (<i>for learners with blindness</i>) d) record data in the table. 	The learner demonstrates the four skills.	The learner demonstrates three skills.	The learner demonstrates two skills.	The learner demonstrates one or no skill.

APPENDIX I:**SUGGESTED ASSESSMENT METHODS**

Assessment may be through oral, written or observation following the assessment rubrics.

APPENDIX II: SUGGESTED LEARNING RESOURCES

Strand	Sub Strand	Suggested Resources
NUMBERS	Whole numbers	Place value apparatus, number charts, number cards, multiplication table
	Addition	Place value chart, Abacus
	Subtraction	Place value chart, Abacus
	Multiplication	Multiplication tables
	Division	Multiplication tables
	Fractions	Equivalent fraction board, Circular and rectangular cut outs, counters, clock face
	Decimals	100 square grid, rectangular paper strips, Place value charts, number cards
MEASUREMENT	Length	Metre rule, 1metre sticks, tape measure
	Area	Square cut outs, paper cut outs
	Mass	1kg mass, soil or sand, manual/electronic weighing machine, beam balance
	Volume	Cubes, cuboids
	Capacity	1 liter containers, containers of different sizes, water, sand ,soil
	Time	Analogue and digital clocks, digital watches, am /pm chart
	Money	Real / imitation money, price list
GEOMETRY	Position and direction	Clock face
	Angles	Representation of different angles
	plane figures	Cut outs of rectangles, circles, and triangles of different sizes
DATA HANDLING	Data	Data from different sources
ALGEBRA	Use of letters	Information from different sources

NOTE

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

Learner digital devices (LDD),Teacher digital devices(TDD),Mobile phones, Digital clocks, Television sets, Videos, Cameras, Projectors, Radios, DVD players, CD's, Scanners, Internet among others

APPENDIX III:

SUGGESTED NON-FORMAL ACTIVITIES

Strand	Sub Strand	Suggested Non-Formal Activities
Numbers	Whole Numbers	Learners to play number games and count items in the environment.
	Addition	Learners to work out total scores in a game.
	Subtraction	Learners to work out the difference in scores for various teams during play.
	Multiplication	Learners to work out the number of flowers in a flower bed by considering the number of rows and columns.
	Division	Learners to distribute themselves into teams during play activities e.g. football.
	Fractions	Learners to share items during play.
	Decimals	Learners to represent decimals using paper cut outs during play.
Measurement	Length	Learners to mark play areas.
	Area	Learners to mark their areas of operation in different games e.g. netball.
	Mass	Learners to play games using a sea saw.
	Volume	Learners to pile up same items during play.
	Capacity	Learners to fill and empty containers during play.
	Time	Learners to observe shadows and relate them to different times of the day.
	Money	Learners to practice shopping activities during play.
Geometry	Position and Direction	Learners to make different turns during singing games.
	Angles	Learners to make toys of cars or dolls during play.
	plane figures	Learners to make different shapes for use during play.
Data Handling	Data	Learners to represent different number of items using sticks as tallies practically.
Algebra	Use of letters	Learners to represent items using letters during play.

APPENDIX IV:

CSL GUIDELINES FOR UPPER PRIMARY (GRADE 4-6)

At this level, the goal of the CSL activity is to provide linkages between concepts learnt in the various Learning Activities and the real life experiences. Learners begin to make connections between what they learn and the relevance to their daily life. CSL is hosted in the Social studies learning area. The implementation of the CSL activity is a collaborative effort where the class teacher coordinates and works with other subject teachers to design and implement the integrated CSL activity. Though they are teacher-guided, the learners should progressively be given more autonomy to identify problems and come up with solutions. The safety of the learners should also be taken into account when selecting the CSL activity. The following steps for the integrated CSL activity should be staggered across the school terms:

Steps in carrying out the integrated CSL activity

1) Preparation

- Map out the targeted core competencies, values and specific learning areas skills for the CSL activity
- Identify resources required for the activity (locally available materials)
- Stagger the activities across the term (Set dates and time for the activities)
- Communicate to learners, parents/caregivers/guardians, school administration, teachers and other relevant stakeholders in the school community
- Identify and develop assessment tools

2) Implementation CSL Activity

- Assigning roles to learners.
- Ensure every learner actively participates in the activity
- Observe learners as they carry out the CSL activity and record feedback.
- Use an appropriate assessment tool to assess both the process and the product (Assess learner's work from the beginning to the end product)
- Assess the targeted core competencies, values and subject skills.

3) Reflection on the CSL Activity

Conduct a self-evaluation session with learners on the integrated CSL activity undertaken by discussing the following:

- what went well and why
- what did not go well and why,
- what can be done differently next time
- what they have learnt.

There will be **one** integrated CSL activity that will be conducted **annually**. The thematic areas for the integrated CSL activity will be derived from the broader categories of the PCIs and concepts from the various Learning Areas. Teachers are expected to vary the themes yearly to allow learners to address different PCIs within their contexts. There should be a linkage between the skills from the learning areas and the themes.

The integrated CSL activity will take a Whole School Approach (WSA) where the entire school community is involved (learners, parents/caregivers/guardians, school administration, teachers). Parents/caregivers/guardians are key stakeholders in the planning and execution of the CSL activity. Although the teacher takes the lead role in the planning and integration of the CSL activity, learners will be expected to participate actively in the whole process.

The CSL activity provides an opportunity for the development of core competencies and the nurturing of various values. The teacher is expected to vary the core competencies and values emphasised in the activity yearly.

ASSESSMENT OF THE CSL ACTIVITY

Assessment of the integrated CSL activity will focus on 3 components namely: skills from various learning areas applied in carrying out the activity, and core competencies and values demonstrated. Assessment should focus on both the process and end product of the CSL activity. The teacher will assess learners in groups using various tools such as an observation schedule, checklist or rating scale or any other appropriate tool.

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