REPUBLIC OF KENYA
MINISTRY OF EDUCATION

UPPER PRIMARY CURRICULUM DESIGN

MATHEMATICS
FOR LEARNERS WITH HEARING IMPAIRMENT
GRADE 5

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

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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 conceptualised 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 programmes. The revised Grade five curriculum designs for learners with Hearing 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 panellists; the Semi-Autonomous Government Agencies (SAGAs) and representatives of various stakeholders for their roles in the development and adaptation of the Grade five curriculum designs for learners with Hearing 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 five and preparation of learners with Hearing Impairment for transition to Grade six.

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TABLE OF CONTENT

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 instil 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-fulfilment**
   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 instil 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	No. of Lessons
1	English for Learners with Hearing Impairment	5
2	Kiswahili for Learners with Hearing Impairment	4
3	Mathematics for Learners with Hearing Impairment	5
4	Religious Education	3
5	Science & Technology for Learners with Hearing Impairment	4
6.	Agriculture & Nutrition for Learners with Hearing Impairment	4
7.	Social Studies for Learners with Hearing Impairment	3
8	Creative Arts for Learners with Hearing Impairment	6
9.	Pastoral/ Religious Instruction Programme	1
	Total	**35**

LEVEL LEARNING OUTCOMES

By end primary education level, the learner should be able to:

a) Communicate appropriately using signing, verbal and non-verbal 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 the society.
d) Develops one's interests and talents for personal fulfilment
e) Make informed decisions as local and global citizens of a diverse, democratic society in an independent world.
f) Explore, manipulate, manage and conserve environment effectively for learning and sustainable development.
g) Acquire digital literacy skills for learning and enjoyment.
h) appreciation of the country's rich and 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 hearing 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 competences 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 Science Technology Engineering and Mathematics (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. Further, this design has been adapted to ensure that learners who are Deaf and those with Hard of Hearing learn effectively. The adaptations include suggestions for provision of sign interpretation on aspects that require use of sound, use of digital devices with assistive technology, use of visual aids such as charts, maps and diagrams, use of hands-on activities, guided demonstrations, purposeful pairing and use of adapted learning resources. The design has also incorporated alternative learning outcomes and activities to enhance the acquisition of sign language vocabulary to learners with Hearing Impairments.

SUBJECT LEARNING OUTCOMES

i) Communicate appropriately using signing, verbal and non-verbal in a variety of contexts.
j) Demonstrate mastery of number concepts to solve problems in day to day life
k) Demonstrate social skills, moral and religious values for positive contribution to the society.
l) Develops one's interests and talents for personal fulfilment
m) Make informed decisions as local and global citizens of a diverse, democratic society in an independent world.
n) Explore, manipulate, manage and conserve environment effectively for learning and sustainable development.
o) Acquire digital literacy skills for learning and enjoyment.
p) appreciation of the country's rich and diverse cultural heritage for harmonious living

SUMMARY OF STRANDS AND SUB STRANDS GRADE 5

S/No	Strand	SUB-STRAND	Suggested Number of Lessons
1.0	**Numbers**	1.1 Whole Numbers	20
		1.2 Addition	6
		1.3 Subtraction	6
		1.4 Multiplication	6
		1.3 Division	6
		1.4 Fractions	8
		1.5 Decimals	6
		1.6 Inequalities	6
2.0	**Measurement**	2.1 Length	12
		2.2 Area	6
		2.3 volume	6

		2.4 Capacity	12
		2.5 Mass	12
		2.6 Time	8
		2.7 Money	8
3.0	**Geometry**	3.1 Lines	4
		3.2 Angles	6
		3.3 3-D Objects	6
4.0	**Data Handling**	4.1 Data Representation	6
	Total number of lessons		150
Note: The suggested number of lessons per sub strand may be less or more depending on the context.			

Strand	Sub strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Questions
1.0 NUMBERS	1.0 Whole Numbers (20 Lessons)	By the end of the sub strand, the learner should be able to; a) sign terms related to whole numbers and place values, b) Identify the place value of digits up to hundred thousand using place value apparatus. c) use place value and total value of digits up to hundreds of thousands in real life, d) use numbers up to hundreds of thousands in symbols in real life, e) read, write and relate numbers up to tens of thousands in words in real life,	• In groups, learners are guided to identify, fingerspell, sign and write terms relating to whole numbers and place values. • In groups, pairs or as individuals, learners discuss and present on identifying place value of digits up to hundreds of thousands using place value apparatus (learners with hearing impairments be supported by conventional signs or adapted signs to aid successful discussion). • In groups, pairs or as individuals, learners are guided to watch a captioned or signed video or observe an illustration chart on identifying the place value of numbers, number symbols, signing, reading, writing, order, and	1. How is ordering of numbers used in real life? 2. Why is it important to know the value of a number?

		f) order numbers up to tens of thousands in real life, g) round off numbers up to tens h) of thousands to the nearest hundred and thousand in different situations, i) apply divisibility tests of 2, 5 and 10 in real life, j) apply highest Common Factor (HCF) and Greatest Common Divisor (GCD) in different situations, k) use Least Common Multiple (LCM) in real life situations, l) use digital devices for learning more on whole numbers and leisure,	rounding off of numbers and write the key points. • In groups or pairs, learners are guided to identify the total value of digits up to hundreds of thousands using place value apparatus. • In pairs or groups or as individuals, learners are guided to sign read numbers up to hundreds of thousands in words from number charts or cards and then write down correctly in a given exercise. • In pairs or groups, learners are guided to sign read and write numbers up to tens of thousands in words from number charts or cards, then present in class. • In pairs, groups or individuals, learners are guided to arrange numbers up to tens of thousands in increasing and decreasing order using number cards and share with other groups.	

		m) appreciate use of whole numbers in real life situations.	• In pairs, groups or individuals, learners are guided to round off numbers up to tens of thousands to the nearest hundred and thousand using number cards and share with other groups. • In pairs or groups, learners discuss the division of numbers by 2, 5 and 10 and come up with divisibility rules, then present. (Learners with hearing impairments be supported by conventional signs or adapted signs to aid successful discussion • Activity: on the plain sheets provided, learners to work out the divisibility tests of 2,5 and10 and keep them in their portfolios • In pairs, groups or as individuals, learners are guided to identify factors and divisors of given numbers and write them down.	

			• In groups , learners are guided to identify the common factors and divisors. • In purposive groups, learners are guided to determine the highest or greatest common factor or divisor. • In pairs, learners are guided to identify multiples of given numbers. • In groups , learners are guided to identify the common multiples. • In pairs, groups or as individuals, learners are guided to determine the least common multiple. • In pairs or as individuals, learners are guided to play digital games involving numbers. (In the absence of digital devices, the learner is guided to develop their own practical games on numbers.	

Core Competencies to be developed:

- **Learning to learn**- learners read by signing, writing and compute HCF and GCD of different numbers.
- **Critical thinking and problem solving:** evaluation and decision making skills as learners order and round off numbers.
- **Digital literacy:** A learner interacts with digital devices with assistive technology to browse mathematical sites and play digital games involving whole numbers.

Values:

- **Respect**: As learners display patience and appreciate diverse opinions as they carry out various activities in groups involving whole numbers.
- **Unity**: As learners cooperate with others when working in pairs or groups to carry out various activities involving whole numbers.
- **Responsibility:** As learners take care of the learning resources used when finding the place value and total value of digits up to hundreds of thousands.

Pertinent and Contemporary Issues (PCIs):

- **Safety:** learners handle place value apparatus and other learning materials.
- **Learner Support Programme:** As learners enhance peer education and mentorship when supporting one another in rounding off numbers up to tens of thousands to the nearest hundred and thousand and also in identifying factors and divisors of given numbers.

Suggested Resources:

- Place value apparatus, Number charts, signs dictionary, digital devices

Link to other Learning Areas:

The learner is able to relate signing, fingerspelling and writing terms or words in addition to signing, fingerspelling in English.

Strand	Sub strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
	1.2 Addition (6 Lessons)	By the end of the sub strand, the learner should be able to; a. sign terms related to addition, b. add up to three 6 - digit numbers without regrouping up to a sum of 1,000,000 in different situations, c. add up to two 6 - digit numbers with double regrouping up to a sum of 1,000,000 in different situations,	● In pairs or pairs, learners are guided to identify fingerspell, sign and write terms related to addition. ● In pairs or groups, learners are guided to observe the teacher's demonstration or watch captioned or signed video on adding up to three 6-digit numbers without regrouping up to a sum of 1,000,000 in different situations.	1. How do you estimate the sum of given numbers? 2. How do you create patterns in addition? 3. Why is the skill of addition important in real life?

		d. estimate sum by rounding off the addends to the nearest hundred and thousand in different situations, e. create patterns involving addition of numbers up to a sum of 1,000,000 in real life situations, f. use digital devices for learning more on addition of numbers and for enjoyment, g. appreciate the use of addition of whole numbers in real life situations.	● In pairs or groups, learners are guided to add up to three 6-digit numbers without regrouping up to 1,000,000 using number cards, charts and place value apparatus. ● In pairs or groups, learners add up to two 6-digit numbers with double regrouping up to 1,000,000 using place value apparatus then display their findings in the class wall. ● In pairs or groups, learners observe the teacher demonstrating on how to estimate	

			sums by rounding off the addends to the nearest hundred and thousand using a number line. ● In pairs or groups, learners are guided to create patterns involving addition of numbers up to a sum of 1,000,000. ● In pairs or groups, learners are guided to play games involving addition using digital devices, print texts or any available resources.	

Core Competencies to be developed:

- Critical thinking and problem solving: explanation and reasoning skills as learners add, estimate and round off numbers to the nearest hundred and thousand and in making patterns.
- Creativity and imagination: connecting skills developed as learners create patterns involving addition of numbers up to a sum of 1,000,000.
- Digital literacy: interacting with digital devices as learners utilise assistive technology to browse mathematical sites and play

digital games involving addition of whole numbers.

Values:

- Responsibility: As learners take care of the learning resources used when adding digits up to a sum of 1,000,000.
- Unity: As learners cooperate with others when working in groups to solve mathematical problems and create patterns involving addition of whole numbers.
- Respect: As learners display patience and appreciate diverse opinions when working in groups to carry out various activities involving addition of whole numbers.

Pertinent and Contemporary Issues (PCIs):

- Learner Support Programme: As learners enhance peer education and mentorship when supporting one another in rounding off addends to the nearest hundred and thousand and also in creating patterns involving addition of numbers up to a sum of 1,000,000.
- Safety and security: As learners observe internet safety and security when browsing mathematical sites and playing digital games involving addition of whole numbers.

Links to other subjects:

The learner is able to relate the concept of addition to value addition in Agriculture and nutrition.

Suggested resources:

- Place value charts, Abacus, Realia, Signs dictionary

Strand	Sub strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
	1.3 Subtraction (6 Lessons)	By the end of the sub strand, the learner should be able to; a) Sign terms/words related to subtraction. b) subtract up to 6-digit numbers without regrouping in real life situations, c) subtract of up to 6-digit numbers with regrouping in different situations, d) estimate difference by rounding off the minus and the subtracted to the nearest hundred and thousand in different situations, e) perform combined operations involving addition and subtraction in different situations, f) create patterns involving subtraction from up to	● In groups or pairs, learners are guided to identify fingerspell, sign and write words related to subtraction. ● In pairs or groups, learners are guided to refer to the print text to discuss and write down steps on subtraction of up to 6-digit numbers without regrouping using place value apparatus. ● Learners to watch a captioned or signed video or number charts or illustration on the subtraction of two 6 - digit numbers without regrouping, then compare the method shown with their discussion points.	1. How do you work out the estimated difference to the nearest hundred? **2.** How can you create number patterns involving subtraction?

		1,000,000 in different situations, g) use digital devices for learning more on subtraction of numbers and for enjoyment, g) appreciate subtraction of numbers in real life situations.	• In groups or pairs, learners are guided to refer to the charts provided to discuss and write on subtraction of two 6 -digit numbers with regrouping. • Learners in class are guided to observe teacher's demonstration or chart or watch signed or captioned video on the subtraction of up to 6-digit numbers with regrouping using place value apparatus, then compare this with their discussion points • In groups, learners are guided to discuss and present using charts on the subtraction of two 6 -digit numbers and make a display on the class wall. • In pairs or groups, learners are guided to use digital or print media research on ways of creating number patterns	

			by subtraction from up to 1,000,000, and then post their patterns on a chart for presentation. ● In pairs or groups, learners are guided to work out questions provided involving addition and subtraction and file their finished work in the portfolio. ● In pairs or groups, learners are guided to refer to the number charts. Provided and create patterns involving subtraction of whole numbers from up to 1,000,000. • Learners in pairs or groups play digital games involving subtraction.	

Core Competencies to be developed:

- Self-efficacy: self-confidence as learners presents the group's discussion outcomes to others.
- Critical thinking and problem solving: explanation and reasoning skills developed as learners discuss and present using charts on the subtraction of two 6 -digit numbers.
- Creativity and imagination: Connecting skills developed as learner create patterns involving subtraction numbers.

Values:

- Responsibility: As learners take care of the digital devices and other learning resources used when subtracting numbers.
- Unity: As learners cooperate with others when working in groups to solve mathematical problems and create patterns involving subtraction of numbers.
- Respect: As learners display patience and appreciate diverse opinions when working in pairs or groups to carry out various activities involving subtraction of numbers.

Pertinent and Contemporary Issues (PCIs):

- Citizenship: As learners enhance social cohesion when working in groups to accomplish tasks involving subtraction of numbers.
- Safety and security: As learners observe internet safety and security when browsing mathematical sites and playing digital games involving subtraction of numbers.

Links to other learning areas:

The learner is able to relate signing skills when discussing in groups on how to subtract and round off numbers to signing skills in English.

The learner is able to relate creativity when making patterns involving subtraction from up to 1,000,000 to creative making patterns in Creative Arts.

Suggested resources:

- Place value charts, Abacus, Signs dictionary, digital devices, course books

Strand	Sub strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
	1.4 **Multiplication** (6 Lessons)	By the end of the sub strand, the learner should be able to; a) sign terms related to multiplication. b) multiply up to a 3-digit number by up to a 2-digit number in real life situations, c) estimate product by rounding off numbers to the nearest ten in different situations, d) make patterns involving multiplication of numbers with product not exceeding 1000 in in different situations, e) use digital devices for learning more on	● In pairs, groups or as individuals, learners are guided to identify, fingerspell and sign terms related to multiplication. ● Learners are guided to refer to the charts provided and multiply up to a 3-digit number by up to a 2-digit number using different methods. ● In groups, learners are guided to discuss and present on rounding off numbers to the nearest 10 in different situations ● In class, learners are guided to observe the teacher demonstrating using charts	1. How is multiplication used in real life? 2. How can you estimate products of numbers? 3. How can you form patterns involving multiplication?

		multiplication and for enjoyment, f) appreciate the use of multiplication in real life.	on multiplication table then workout on estimate product by; (rounding off factors, using compatibility of numbers, and own strategies.) ● In pairs, groups or individuals, learners are guided to refer to charts or digital devices or any resource available to discuss and make patterns involving multiplication with products not exceeding 1000 then keep the made patterns in portfolios. ● In pairs, learners are guided to play digital games involving multiplication of whole numbers.	
Core Competencies to be developed: ● Communication and collaboration; signing and observation skills as learners multiply up to 3- digit number by up to a 2- digit number in groups.				

- Critical thinking and problem solving: Explanation and reasoning skills developed when estimating products of numbers.
- Creativity and imagination**:** Connecting skills developed as learners make patterns involving multiplication of numbers.

Values:

- Love: as learners work in groups, discuss and share answers.
- Unity: As learners cooperate with others when working in groups to make patterns involving multiplication of numbers.
- Responsibility: As learners show determination when undertaking assigned tasks.

Pertinent and Contemporary Issues (PCIs):

- Self- esteem; as learners discover own strategies in multiplication and estimation of products of numbers
- Citizenship: As learners enhance social cohesion when working in pairs or groups to carry out activities involving multiplication of whole numbers.
- Learner Support Programme**:** As learners enhance peer education and mentorship when supporting one another in exploring other methods of working out products of numbers.

Links to other learning areas:

The learner is able to relate signing and observation skills as they discuss in pairs or groups on other methods of working out products of numbers to signing and observation skills in English.

Suggested resources:

- Multiplication table, counters, number chart, signs dictionary

Strand	Sub strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
	1.5 Division (6 Lessons)	By the end of the sub strand, the learner should be able to; a) sign terms related to division. b) divide up to a 3-digit number by up to a 2-digit number where the dividend is greater than the divisor in real life. c) apply the relationship between multiplication and division in different situations, d) estimate quotients by rounding off the dividend and divisor to the nearest ten in real life situations, e) perform combined operations involving	• Learners are guided to identify, fingerspell sign and write terms related to division. • In pairs or groups or as individuals, learners are guided to use the charts provided to discuss and present on division up to a 3-digit number by up to a 2-digit number where the dividend is greater than the divisor using (long and short form, own strategies). • Learners in class observe charts or multiplication tables or watch signed or captioned videos to demonstrate that multiplication is the	1) Why is division skill important in real life? 2) How can we estimate quotients?

		addition, subtraction, multiplication and division of whole numbers of different situations, f) use digital devices for learning more on division of whole numbers and for enjoyment, g) appreciate use of division of whole numbers in real life situations.	opposite of division then present in class ● In pairs, groups or as individuals, learners are guided to refer to the print texts or digital media to discuss on estimation of quotients by rounding off the dividend and divisor to the nearest ten. ● In pairs or groups or as individuals, learners are guided to work out questions involving addition, subtraction, multiplication and division. ● In pairs or groups or as individuals, learners are guided to create and present number games and puzzles involving division. ● In pairs or as individuals, learners are guided to use	

			print texts or digital devices to play games involving division of whole numbers.	

Core Competencies to be developed:

- Critical thinking and problem solving explanation skills as learners discuss on estimation of quotients by rounding off the dividend and divisor to the nearest ten.
- Communication and collaboration: signing and observation skills as a learner discuss and work in groups to work out division of numbers.
- Creativity and Imagination: A learners enhance their connecting skills as they create number games and puzzles involving division

  Digital Literacy: A learner uses digital devices to browse mathematical sites and play digital games involving division of whole numbers.

Values:

- Social justice: As learners ensure equal sharing of resources equitably among themselves and the wider society.

  Responsibility: As learners take care of the resources used during learning.

Pertinent and Contemporary Issues (PCIs):

- Safety and security: As learners observe internet safety and security when browsing mathematical sites and playing digital games.

  Learner Support Programme: As learners enhance peer education and mentorship when supporting one another in dividing numbers and estimating quotients by rounding off the dividend and divisor to the nearest ten.

Links to other learning areas: The learner is able to relate signing and writing skills when discussing in groups to signing and writing in English and other languages.
Suggested resources: multiplication table, number chart, digital devices, signs dictionary

Strand	Sub strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
	1.6 Fractions (8 Lessons)	By the end of the sub strand, the learner should be able to; a) sign terms related to fractions. b) construct equivalent fractions in real life, c) simplify fractions in different situations, d) compare fractions in order to make decisions in real life, e) order fractions with denominators not exceeding 12 in different situations, f) add fractions with same denominator in different situations,	● Learners are guided to fingerspell sign and write terms related to fractions such as Fraction, numerator, denominator, mixed fraction. ● In groups, learners are guided to discuss and present on equivalent fractions in day to day life using a chart drawing or paper cut out or real objects. ● Learners to watch signed or captioned video or refer to charts on equivalent fractions using real objects. alternatively, pictures or paper cut outs or models or realia can be used ● In pairs, groups or as individuals, learners are guided to simplify given fractions using a fraction chart.	How are fractions used in real life?

		g) subtract fractions with same denominator in different situations, h) add fractions with one renaming in different situations, i) subtract fractions with one renaming in different situations, j) use digital devices for learning more on fractions and for enjoyment, j) appreciate the use of fractions in real life.	• In pairs, groups, learners are guided to compare given fractions using paper cut outs and concrete objects, then do a presentation • In pairs, groups or as individuals, learners are guided to order given fractions in ascending and descending order using a number line, using paper cut outs or real objects. • In pairs or groups, learners are guided to discuss how to add fractions with similar denominators. Then, the same learners in groups observe teachers demonstrate in the same area and compare the steps and work out given assignments. Note: demonstration by using models or realia or paper cut outs can also be done. • In pairs or groups, learners are guided to discuss how to subtract fractions with similar denominators. Then, the same learners in groups observe the teacher's demonstration	

			or watch a captioned or signed video on the same area and compare the steps. Note: demonstration by using models or realia or paper cut outs can also be done. ● In pairs, learners are guided to add two fractions with the same denominator using paper cut outs, number line or real objects. ● In pairs, groups, learners are guided to subtract two fractions with the same denominator using paper cut outs, number line, and real objects. ● In pairs, groups or as individuals, learners refer to charts to add and subtract two fractions by renaming one fraction using equivalent fractions. ● In pairs or groups, learners are guided to play speed games on the addition and subtraction of fractions.	

			• In pairs or as individuals, learners are guided to play digital games involving fractions. • Activity: on the plain sheets provided each learner to work out given questions in addition, and subtraction of fractions for filling in their portfolio.	
Core Competencies to be developed: • **Learning to learn** share learnt knowledge as learners order, compare and simplify fractions. **Digital Literacy:** A learner interacts with digital devices to play digital games and signs terms related to fractions.				
Values: **Integrity –** during group work while using resources learners utilise the learning resources prudently during group work.				
Pertinent and Contemporary Issues (PCIs): **Safety and security:** As learners observe personal safety and security of their learning resources when working in pairs or groups.				
Links to other learning areas: The learner is able to relate the use signs related to fraction during discussion to communication skills in English and other languages.				
Suggested resources: Equivalent fractions board, Circular cut out, Rectangular cut out, Counters, Signs dictionary				

Strand	Sub strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
	1.7 Decimals (6 Lessons)	By the end of the sub strand, the learner should be able to; a) sign terms related to place value of decimals, b) order decimals up to thousandths in different situations, c) add decimals up to thousandths in real life situations, d) subtract decimals up to thousandths in real life situations,	● Learners are guided to identify, fingerspell and sign terms related to place value of decimals such as decimal and place value. ● Learners observe the teacher's demonstration on determining the place value of decimals up to thousandths using a place value chart and try out sample questions provided. ● Learners are guided to watch captioned or signed videos or observe charts or number lines on decimals. ● Learners observe the teacher's demonstration on decimals then work out given exercises. ● In pairs, groups, learners are guided to discuss and present on how to arrange decimals in ascending and descending order, using number cards or number line.	1. How do you use decimals in real life? 2. Why is it important to order decimals?

		e) use IT devices for learning more on fractions and for enjoyment, f) appreciate use of decimals in real life situations.	● In pairs, groups or as individuals, learners are guided to add decimals up to thousandths using place value apparatus mounted on the wall. ● In pairs or groups, learners are guided to discuss referring to the place value apparatus to subtract decimals up to thousandths ● In groups, learners are guided to use print or digital media research and present application of decimals in real life. ● Learners to be guided to play speed games on decimals. ● In pairs or groups, learners are guided to use digital devices or print texts to play games involving decimals.	

Core Competencies to be developed

- Creativity and Imagination: as the learner orders decimals up to thousandths from smallest to largest and from largest to smallest using number cards.
- Self-efficacy: as learners explore further operations with decimals.

Values:

- Social justice: as learners take turns in making contributions in the groups.
- Unity: Co-operation is enhanced as learners take turns in making contributions in the groups during group discussion on ordering decimals.

Pertinent and Contemporary Issues (PCIs):

- Social Cohesion: as learners work in groups.
- Citizenship**:** Learners enhance social cohesion as they display positive and inclusive group dynamics where learners collaborate, respect diversity, and contribute to share their findings as they work in groups.

Links to other subjects:

The learner is able to relate the concept of decimal numbers to reading quantities of ingredients in Agriculture and Nutrition

Suggested resources:

- Place value charts, Number cards, Signs dictionary, Digital devices

Strand	Sub strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
1.0 NUMBERS	**1.8 Simple equations** (6 Lessons)	By the end of the sub strand, the learner should be able to; a) sign terms related to simple equations, b) form simple equations with one unknown involving real life situations, c) solve simple equations with one unknown involving real life situations, d) use IT devices to learn more about equations and for enjoyment, e) appreciate the use of equations in solving problems in real life.	● Learners to be guided to identify, fingerspell and sign terms related to simple equations. ● Learners watch a captioned or signed video or observe a teacher's demonstration on formation of simple equations, then write the steps. ● In pairs, groups or as individuals,	1. Where are equations used in real life?

			learners are guided to discuss and form equations with one unknown from daily experiences. ● In pairs or groups, learners are guided to discuss and present on solving equations with one unknown. ● In pairs or groups, learners are guided to use digital devices or print media to research and write more about equations.	

Core Competencies to be developed:

- Critical thinking and problem solving: as learners solve equations.
- Digital literacy**:** as learners learn more about equations using digital devices.

Values:

- Honesty: as learners solve problems and give answers as a pair/group or individuals. Social cohesion; as learners work in pairs/groups.

Pertinent and Contemporary Issues (PCIs):

- Safety: learners observe safety as they manipulate the learning resources**.**

Links to other subjects:

The learner is able to relate the concept equations with one unknown to the concept of marketing goods in Pre-technical Studies**.**

Suggested resources:

- Information from different sources, Digital devices, Signs dictionary

Suggested Assessment Rubrics

Level Criteria	Exceeds Expectation	Meets Expectation	Approaches Expectation	Below Expectation
Ability to sign terms related to numbers, whole numbers, addition, subtraction, multiplication, division, fractions and decimals	signs terms related to numbers, whole numbers, addition, subtraction, multiplication, division, fractions and decimals with exceptional accuracy demonstrating signing proficiency	signs terms related to numbers, whole numbers, addition, subtraction, multiplication, division, fractions and decimals accurately	signs terms related to numbers, whole numbers, addition, subtraction, multiplication, division, fractions and decimals with noticeable errors	Signs terms related to numbers, whole numbers, addition, subtraction, multiplication, division, fractions and decimals inaccurately lacking clarity
Ability to add up to a three 6-digit numbers with single and double regrouping up to a sum of 1,000,000	Adds up to a six digit number with single and double regrouping up to a sum of 1,000,000 by explaining the process step-by-step clearly and logically.	Adds up to a six digit number with single and double regrouping up to a sum of 1,000,000.	Adds up to a six digit number with single and double regrouping up to a sum of 1,000,000 requiring some minimal guidance.	Adds up to a six digit number with single and double regrouping up to a sum of 1,000,000 with limited understanding even with guidance.
Ability to subtract up to 6-digit numbers with	Subtracts up to 6-digit numbers with and without regrouping	Subtracts up to 6-digit numbers with and without regrouping.	Subtracts up to 6-digit numbers with and	Subtracts up to 6-digit numbers with or

and without regrouping in real life situations	providing clear, detailed explanations.		without regrouping with minimal errors.	without regrouping with major errors
Ability to multiply up to a three -digit number by up to a two-digit number with and without regrouping	Multiplies up to a three-digit number by two-digit number with and without regrouping explaining the process clearly and details well illustrated.	Multiplies up to a three-digit number by two-digit number with and without regrouping correctly.	Multiplies up to a three-digit number by two-digit number with and without regrouping with minor errors.	Multiplies up to a three-digit number by two-digit number with and without regrouping incorrectly with major errors.
Ability to divide up to a two digit number by a one digit number with and without remainder	Divides up to a three digit number by a two digit number with and without remainder demonstrating a deep understanding of division principles.	Divides up to a three digit number by a two digit number with and without remainder displaying accuracy and consistency.	Divides up to a three digit number by a two digit number with and without remainder with occasional errors	Divides up to a three digit number by a two digit number with and without remainder with inaccuracies resulting to major errors.
Ability to perform addition and subtraction of fractions with denominator not exceeding 12	Performs addition and subtraction of fractions with denominator not exceeding 12 providing clear and detailed	Performs addition and subtraction of fractions with denominator not exceeding 12 accurately.	Performs addition and subtraction of fractions with denominator not exceeding 12 with noticeable errors	Performs operations on fractions with denominator not exceeding 12 with major errors

	explanations of the processes involved			
Ability to add and subtract decimals up to thousandth in computation	Add and subtract decimals up to thousandth by accurately and efficiently arranging decimals in ascending or descending order.	Add and subtract decimals up to thousandth accurately.	Add and subtract decimals up to thousandth with inaccuracy in alignments of the digits.	Add and subtract decimals up to thousandth making major errors.

Suggested Assessment Rubrics

Level / Indicator	Exceeds Expectation	Meets Expectation	Approaches Expectation	Below Expectation
Ability to sign terms related to simple equations	Signs terms related to simple equations correctly with ease	Signs terms related to simple equations correctly	Signs terms related to simple equations inconsistently	Signs terms related to simple equations with significant errors
Ability to form simple equations with one unknown	forms simple equations with one unknown correctly with ease	forms simple equations with one unknown Correctly	forms simple equations with one unknown with minimal errors	struggles forming simple equations with one unknown
Ability to solve simple equations with one unknown	solves simple equations with one unknown Correctly with explanation	solves simple equations with one unknown Correctly	solves simple equations with one unknown Inconsistently with noticeable errors	Little evidence in solving simple equations with one unknown

Strand	Sub strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
2.0 MEASUREMENT	**2.1 Length** (12 Lessons	By the end of the sub strand, the learner should be able to; a) sign terms related to measuring length. b) estimate distance in kilometres in real life situations, c) identify the relationship between the kilometre(km) and the metre (m) in different situations. d) convert kilometres to metres and metres to kilometres in real life situations,	● In pairs, groups or as individuals, learners are guided to identify, fingerspell sign terms related to measuring length. ● Learners are guided to observe the teacher demonstrate or watch captioned or signed video on measurement of length of different situations then do it on their own. ● In pairs, groups or as individuals, learners are guided to measure distance in kilometres practically and make some recording. ● In pairs, groups or as individuals, learners are	1. How do you measure distance? 2. Why do you measure distance?

		e) add metres and kilometres in real life situations, f) subtract metres and kilometres in real life situations, g) multiply metres and kilometres by whole numbers in real life situations, h) divide metres and kilometres by whole numbers in real life situations, i) use digital devices for learning more on measurement of length and for enjoyment, j) appreciate the use of kilometres and metres in measuring length in real life.	guided to estimate distance in kilometres and share their estimates. ● In pairs, groups or as individuals, learners are guided to measure distance estimated and compare findings with others. ● In pairs, groups or as individuals, learners are guided to establish the ● relationship between the kilometre and metre practically. ● In pairs, groups or as individuals, learners are guided to convert kilometres to metres and metres to kilometres and represent using a conversion table. ● In pairs, groups or as individuals, learners are guided to determine	

			distance in kilometres and metres involving addition, subtraction multiplication and division. ● In pairs or as individuals, learners are guided to play digital games involving length in kilometres and metres	

Core Competencies to be developed:

- Creativity and Imagination: learners develop experimental skill in measuring or estimating distance.
  Critical thinking and problem solving as learners develop active signing and observation skill in estimation of distance.

Values:

- Integrity: as learners record measurements.
- Respect: as learners take turns in group activities.

Pertinent and Contemporary Issues (PCIs):

- Safety: as learners work with or handle measuring instruments.

Links to other subjects:

The learner is able to link measurement of length to construction of food preservation equipment in Agriculture and Nutrition.

Suggested resources:

Metre rule, 1m sticks, Tape measure, Signs dictionary, Digital devices

Strand	Sub strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
	2.2 Area (6 Lessons)	By the end of the sub strand, the learner should be able to; a) sign terms related to the area. b) use the square centimetre (cm^2) as a unit of measuring area in real life, c) work out area of rectangles and squares in square centimetres (cm^2) in different situations, d) use IT devices for learning more on	● Learners are guided to fingerspell, sign and sign read terms related to area. ● Learners watch a captioned or signed video or observe paper cut out or charts on the area and write down short notes. ● In pairs, groups or as individuals, learners are guided to measure, trace and cut out 1 cm by 1cm units, and refer the area of each as one square centimetre ($1cm^2$). ● In pairs, groups or as individuals, learners are guided to cover a given surface using 1-centimetre square cut outs and count the number of cut outs to get the area in cm^2.	1. How can you determine the area of different surfaces?

		area and for enjoyment, e) appreciate the use of cm^2 in the working out area in real life.	● In pairs, groups or individuals, learners are guided to establish the area of rectangles and squares in cm^2 as the product of the number $1cm^2$ units in the row by the number of units in the column, Area of rectangle or square = length x width. ● In pairs or as individuals, learners are guided to play digital games involving area.	

Core Competencies to be developed:

- Creativity and imagination: as learners use paper cut outs in covering plane surfaces to get area in cm^2.
- Learning to learn: as learners explore how to determine areas of different surfaces in the environment.

Values:

- Unity: as learners perform an activity in pairs or groups

Pertinent and Contemporary Issues (PCIs):

- Safety: as learners cut out 1 cm squares.

Links to other subjects:

- English-as learners practise signing terms related to area in measurement.

Suggested resources;

- Square metre cut out, 1cm squares, 1m squares, Signs dictionary, Digital devices

Strand	Sub strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
	2.3 Volume (6 Lessons)	By the end of the sub strand, the learner should be able to; a) sign terms related to measuring volume, b) derive the formula for the volume of cuboid as V= l x w x h practically, c) work out volume of cuboids in cubic centimetres ($cm^{3)}$ using the formula, d) derive the formula for the volume of cube as V= s x s x s practically,	● In pairs, groups or as individuals, learners are guided to identify, fingerspell and sign terms related to measuring volume. ● Learners to be guided to observe teacher's demonstration or realia or watch captioned or signed video on finding volume of cubes, cuboid ● In pairs, groups or as individuals, learners are guided to measure the sides of a 1cm cube and identify it as a unit of measuring volume. ● In pairs, groups or as individuals, learners are guided to arrange a number of cubes along the length, width and vary the number of layers.	1. How is volume measuring skill applied in real life?

		e) work out volume of cubic centimetres ($cm^{3)}$ using the formula e) use IT devices for learning more on volume and for enjoyment, f) appreciate use of cubic centimetres in measuring volume in real life	● In pairs, groups or as individuals, learners are guided to count the number of cubes used in activity above and record. ● In groups or pairs, learners are guided to establish that the total number of cubes represents the volume of the cube or cuboid formed. ● In pairs, groups or as individuals, learners are guided to count the number of cubes on the length and multiply by the number in the width and the number of layers. The learners establish the formula for volume (V) of cuboid as V = l x w x h. ● Learners discuss the formula for volume of a cube V= SxSxS where, S is the side of a cube. ● Learners use digital devices to manipulate cubes or cubes by flipping around. Also use other resources to draw cubes and cuboids.	

			• Learners are guided to watch a video or observe a chart on working out the volume of a cube or cuboid. • In pairs, groups or as individuals, learners are guided to measure the dimensions of a 1cm cube to establish its volume as 1cm x 1cm x 1cm = $1cm^3$ and share with other groups. • In pairs, groups or as individuals, learners are guided to work out the volume of cubes and cuboids in cubic centimetres. • In pairs or as individuals, learners are guided to use digital devices to play digital games involving volumes.	

Core Competencies to be developed:

- Learning to learn: own reflection as learners explore volumes in real-life situations.
- Creativity and imagination**:** observation and experimentation skills as learners use cubes to make cuboids and calculate volume.

Values:

- Responsibility and respect: as learners work and take care of various learning resources.

Pertinent and Contemporary Issues (PCIs):

- Safety and security**:** as learners handle the various objects in the environment.

Links to other subjects:

- Learners relate sign terms involved in volume during discussions to knowledge learned in English and other languages.

Suggested resources:

- Cubes
- Cuboids
- Digital devices
- Signs dictionary

Strand	Sub strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
	2.4 Capacity (12 Lessons)	By the end of the sub strand, the learner should be able to; a) sign terms related to measuring capacity, b) measure capacity in millilitres in real life situations, c) estimate and measure capacity in multiples of 5 millilitres in different situations, d) identify the relationship between litres and millilitres in real life, convert litres to millilitres and	● Learners are guided to identify, fingerspell and sign terms related to measuring capacity. ● In pairs, groups or individuals, learners are guided to fill a teaspoon or cylinder graduated in millilitres with water and identify that the spoon or cylinder holds 5 millilitres. ● In groups or pairs, learners are guided to divide the water in the spoon or cylinder into 5 equal parts and identify each part as 1 millilitre. ● In groups or pairs, learners are guided to fill small containers with water and measure the capacity in millilitres using a container graduated in millilitres. ● Learners to be guided to watch a captioned or signed video or	How are litres and millilitres units used in day to day life?

		millilitres to litres in real life situations f) add litres and millilitres in real life situations, g) subtract litres and in real life situations, h) multiply litres and millilitres by whole numbers in real life situations, i) divide litres and millilitres by whole numbers in different situations, j) use digital devices for learning more on capacity and for enjoyment k) appreciate use of litres and millilitres in measuring e) capacity in real life	observe charts or realia on measuring capacity in milliliters. ● In pairs, groups or as individuals, learners are guided to estimate and measure capacity of different containers using a container graduated in millilitres. In pairs, groups or as individuals, learners are guided to fill a1- litre container using a 100 millilitres container. ● In pairs, groups or as individuals, learners are guided to count the number of 100 millilitre containers used to fill the 1- litre container and conclude that ten 100- millilitres containers fill 1 litre. (10x100 millilitre=1000 millilitres = 1L ● In pairs, groups or as individuals, learners are guided to convert litres to millilitres and millilitres to litres. ● In groups or pairs, learners are guided to work out capacity in litres and millilitres using addition,	

		f)	subtraction, multiplication and division. ● In pairs or as individuals, learners are guided to play digital games involving capacity.	

Core Competencies to be developed:

- Critical thinking and problem solving: as learners convert unit of capacity, relate unit of capacity and work questions involving capacity.
- Digital literacy**:** as learners play digital games involving capacity and observe signs related to capacity Using digital devices

Values:

- Responsibility: as learners take roles when working in pairs or groups.

Pertinent and Contemporary Issues (PCIs):

- Social cohesion: as learners work in pairs/groups in measuring capacity.
- Citizenship: as learners enhance social cohesion when working in pairs or groups to measure capacity.
- Safety and security**:** as learners observe safety of self and others as they use containers and water during measuring activities.

Links to other subjects:

- Learners relate signing and writing skills on new terms involving capacity in discussions to the knowledge learned in English.

Suggested resources:

- Teaspoons, Signed video, Containers of different sizes, Water/Sand/Soil, Digital devices, Signs dictionary

Strand	Sub strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
	2.5 Mass (12 Lessons)	By the end of the sub strand, the learner should be able to; a) sign terms related to measuring mass. b) measure mass in grams in different situations, c) estimate and measure mass in grams in different situations, d) identify the relationship between the kilogram and the gram in real life situations, e) convert kilograms to grams and grams to kilograms in real life situations, f) add grams and kilograms in real life situations, g) subtract grams and kilograms in real life situations,	● Learners are guided to identify, fingerspell and terms related to measuring mass. ● In pairs, groups or as individuals, learners are guided to scoop sand or soil using a teaspoon and explain to the learners the amount scooped is about 5 grams. ● In pairs, groups or as individuals, learners are guided to divide the amount scooped into 5 equal groups. Each of these small groups is about one gram. ● In groups or pairs, learners are guided to use an electronic or a manual weighing machine to	How do we estimate mass without using a machine?

		h) multiply grams and kilogram by whole numbers in real life situations, i) divide grams and kilograms by whole numbers in real life situations, j) use digital devices for learning more on mass and for enjoyment, k) appreciate the use of kilograms and grams in measuring mass in real life.	measure mass of sand or soil in grams. ● Learners to observe the teacher's demonstration or watch a captioned or signed video on measuring mass in grams. ● In pairs, groups or as individuals, learners are guided to estimate and measure mass of items in grams using a beam balance or electronic weighing machine. ● In pairs, groups or as individuals, learners are guided to establish the relationship and make a comparison between the kilogram and the gram using a beam balance or electronic weighing machine (1kg = 1000g). ● In groups or pairs, learners are guided to	

			convert kilograms to grams and grams to kilogram by working out on a given card then put in their portfolios. ● In pairs, groups or as individuals, learners are guided to determine and write down the mass of items in grams and kilograms using different operations in real life situations. ● In groups or pairs, learners are guided to play digital games involving mass.	

Core Competencies to be developed:

- Communication and collaboration: A learner develops Signing and writing skills as they work in groups to measure mass in grams.
- Digital literacy: A learner interacts with digital devices with assistive technology to play digital games involving mass.
- Critical thinking and problem solving: A learner develops **explanation skills** when working out mathematical problems involving addition, subtraction, multiplication and division of grams and kilograms.

Values:

- Respect: As learners display open mindedness as they come up with different ways of measuring mass when working in groups.
- Integrity: As learners display honesty as they give their correct values of objects measured.
- Responsibility: As learners take care of learning materials such as beam balance and electronic balance and keep them safely after use.

Pertinent and Contemporary Issues (PCIs):

- Citizenship: As learners display social cohesion when working in pairs or groups to measure mass.
- Safety and security: As learners observe safety of self and of others as they use beam balances to weigh different masses.

Links to other learning areas:

The learner is able to relate the concept of mass to measuring mass in grams in Science and Technology.

Suggested resources:

- Teaspoon, Soil/Sand, Manual/Electronic weighing machine, signed video, Beam balance

Strand	Sub strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
	2.6 Time (8 Lessons)	By the end of the sub strand, the learners should be able to; a) sign terms related to time. b) identify the relationship between the minute and the second in real life situations, c) convert minutes to seconds and seconds to minutes in real life, d) add minutes and seconds with conversion in real life situations, e) subtract minutes and seconds with conversion in real life situations, f) multiply minutes and seconds by whole numbers in real life situations,	● In pairs, groups or as individuals, learners are guided to fingerspell and sign terms related to time. ● Learners are guided to observe clock model or realia or teacher's demonstration or watch captioned or signed video on time then be able to read time on their own and record. ● Learners carry out activities taking 10 seconds. Let learners relate the activities to what can be done in one tenth of the time	How do we estimate time?

		g) divide minutes and seconds by whole numbers in real life situations, h) use IT devices in learning more on time and enjoyment, i) appreciate use of minutes and seconds as units of measuring time in real life situations.	taken to do the activity. The time taken is 1 Second. ● In pairs, groups or as individuals, learners are guided to measure and record time taken to do various activities in seconds and share with groups. ● In pairs or groups or as individuals, learners are guided to establish the relationship between seconds and minutes using a clock or stopwatch and watch as they write down their difference. ● In pairs, groups or as individuals, learners are guided to determine time durations in minutes and seconds using different	

			operations in real life situations ● In pairs or as individuals, learners are guided to use digital devices to play games involving time.	

Core Competencies to be developed:

- **Creativity and imagination:** thoughtful choices as learners work out questions involving time in real life situations.
- **Digital literacy:** as learners play digital games involving time.

Values:

- **Responsibility:** as learners work in pairs and groups sharing and taking care of digital devices and other learning material

Pertinent and Contemporary Issues (PCIs):

- **Social cohesion:** as learners estimate seasons of community activity planting, weeding.
- **Self-awareness:** as learners identify changes in their body during puberty.

Links to other subjects:

The learner is able to relate the concept of time to **c**hange of state of matter due to heating or freezing over time in Science and Technology.

Suggested resources:

- Analogue, Digital clocks, Digital watches, Stopwatch, signed videos, Signs dictionary

Strand	Sub strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question (s
	2.7 Money (8 Lessons)	By the end of the sub strand, the learners should be able to; a) sign terms related to money, b) explain the term budget in real life situations, c) identify the importance of a budget in real life, d) explain meaning of tax in real life, e) identify importance of tax to the governments, f) identify services provided by banks in real life situations g) identify factors to consider in order to save wisely, h) use IT devices to learn more about budgeting and bank services in real life, i) appreciate use of budgeting, bank services and payment of taxes in real life.	• In pairs or groups, learners are guided to identify, fingerspell and sign terms related to money such as budget, tax and banks. • Learners to be guided to observe the teacher's demonstration or watch captioned or signed video operations relating to money using real money. • In pairs or groups, learners are guided to be guided to discuss and note down the importance of a budget. • In groups or pairs, learners are guided to discuss using real examples like receipts from government services meaning of tax. • In groups or pairs, learners are guided to discuss the	2. How do you manage your money? 3. Why is it important to pay taxes?

			importance of taxes to the governments. ● In groups or pairs, learners are guided to discuss provision of loans, safe custody of items, money deposits and withdrawals, savings as services provided by banks. ● In pairs or groups, learners are guided to discuss factors to consider when saving money and share with others. ● In pairs or as individuals, learners are guided to use digits devices to learn more about, taxes budgeting and bank services.	

Core Competencies to be developed:

- Communication and collaboration: learners develop signing and observing skills as they discuss in groups and share their experiences.
- Learning to learn: learners use digital devices to learn more about budgeting, savings, taxes and electronic banking.
- Digital literacy: learner interacts with digital devices with assistive technology connected to the internet to learn more about taxes budgeting and bank services.

Values:

- Patriotism: as learners appreciate features in the Kenyan currency.
- Unity: As learners cooperate and respect other learners' opinions when conducting group discussions on various matters such as budgeting, taxes, savings among others.
- Responsibility**:** As learners enhance their accountability skills when discussing factors to consider in order to save wisely.

Pertinent and Contemporary Issues (PCIs):

- Financial literacy: as learners discuss budgeting, savings, banking.
- Safety and security: As learners observe internet safety and security as they use safe and secure online sites to learn more on taxes, budgeting and bank services.
- Socio-economic Issues: As learners enhance their financial literacy skills when carrying out discussions on budgeting, savings, taxes and banking.

Links to other subjects:

The learner is able to relate the concept of money to Resources and Economic Activities in Kenya in Social Studies.

Suggested resources:

- Pricelist, Classroom shop, electronic money, Tariffs, Charts, Digital devices, Sign dictionary

Suggested Assessment Rubrics

Level / Criteria	Exceeds Expectation	Meets Expectation	Approaches Expectation	Below Expectation
Ability to sign terms related to measurement, length, area, volume, capacity, mass, time and money	Signs terms related to measurement, length, area, volume, capacity, mass, time and money correctly with clear explanations.	signs terms related to measurement, length, area, volume, capacity, mass, time and money correctly	signs terms related to measurement, length, area, volume, capacity, mass, time and money inconsistently	signs terms related to measurement, length, area, volume, capacity, mass, time and money with difficulty
Ability to estimate distance in kilometres and metres	Estimates distance in kilometres and metres correctly with consistency.	Estimate distance in kilometres and metres correctly.	Estimate distance in kilometres and metres with noticeable minimal errors.	Estimate distance in kilometres and metres with major difficulties.
Ability to work out area of rectangles and squares in (cm^2)	Works out area of rectangles and squares in (cm^2) accurately with clear illustrations of detailed steps	Works out the area of rectangles and squares in (cm^2) correctly using appropriate formulas.	Works out area of rectangles and squares in (cm^2) partially with some minimal errors.	Works out area of rectangles and squares in (cm^2) with difficulty resulting in major errors.
Ability to work out	Works out volumes of cubes and	Works out volumes of cubes and cuboids in	Works out volumes of	Works out volumes of cubes and cuboids

volumes of cubes and cuboids in cubic centimetres (cm^3) using the formula	cuboids in cubic centimetres (cm^3) correctly using appropriate formula and cam explain to others.	cubic centimetres (cm^3) correctly using appropriate formula.	cubes and cuboids in cubic centimetres (cm^3) using the correct formula but occasionally make errors.	in cubic centimetres (cm^3) using the wrong formula and frequently making errors.
Ability to measure and estimate capacity in multiple of 5 millilitres	Measures capacity and estimates capacity in multiples of 5 millilitres accurately and consistently with precision.	Measures capacity and estimates capacity in multiples of 5 millilitres accurately.	Measures capacity and estimates capacity in multiples of 5 millilitres with minor difficulties.	Measures capacity and estimates capacity in multiples of 5 millilitres with major difficulties.

Ability to establish the relationship between kilograms and grams	Establishes the relationship between kilograms and grams by providing clear and detailed information.	Establishes the relationship between kilograms and grams correctly.	Establishes the relationship between kilograms and grams occasionally making errors.	Establishes the relationship between kilograms and grams frequently making errors.
Ability to multiply or divide minutes and seconds by whole numbers	Multiplies or divides minutes and seconds by whole numbers by showing deep understanding of time calculation.	Multiplies or divides minutes and seconds by whole numbers displaying accuracy.	Multiplies or divides minutes and seconds by whole numbers with guidance.	Multiplies or divides minutes and seconds by whole numbers with frequent errors.
Ability to identify the importance of tax to the government	Identifies the importance of tax to the government giving detailed explanations.	Identifies the importance of tax to the government correctly.	Identifies the importance of tax to the government missing on some relevant information.	Identifies the importance of tax to the government with difficulty and omitting major relevant information.

Strand	Sub strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
3.0 GEOMETRY	**3.1 Lines** (4 Lessons)	By the end of the sub strand, the learner with Hearing Impairment should be able to; a) sign terms related to horizontal and vertical lines. b) draw horizontal and vertical lines in different salutations, c) identify perpendicular lines in different situations, d) draw perpendicular lines different salutations, e) identify parallel lines different situations, f) draw parallel lines in different salutations, g) use IT devices to learn more about lines and leisure,	● In pairs or groups, learners are guided to identify, fingerspell and sign terms related to horizontal and vertical lines. ● In pairs or groups, learners are guided to observe teacher's demonstration or chart or watch captioned or signed videos on horizontal and vertical lines then describe lines in the environment and identify them as horizontal and vertical lines, parallel and perpendicular lines. ● In pairs, groups or as individuals, learners are	1. How are perpendicular lines used in real life?

		h) appreciate the use of various types of lines in real life.	guided to draw horizontal and vertical lines, parallel and perpendicular lines to represent real life situations then display their best work on the class wall. ● In pairs or groups, learners are guided to use digital devices to learn more about lines.	

Core Competencies to be developed:

- Learning to learn: own reflections as learners identify/ establish different lines and their differences.
- Digital literacy: A learner interacts with digital devices with assistive technology to browse mathematical sites and play digital games involving different lines for learning and enjoyment.

Values:

- Unity**:** as learners work in groups discuss about lines.

Pertinent and Contemporary Issues (PCIs):

- Safety: as learners in pairs or groups or as individuals identify uses of different lines.

Links to other subjects:

- Learners relate the discussion and sharing of information to knowledge acquired in English and other languages.

Suggested resources:

- Chalkboard ruler
- 30cm ruler

- Straight edges
- Digital devices
- Signs dictionary

Strand	Sub strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
	3.2 Angles (6 Lessons)	By the end of the sub strand, the learner should be able to; a) sign terms related to angles. b) read a protractor as a tool for measuring angles, c) use protractor to angles in different situations d) identify the degree as a unit of measuring angle, e) Measure angles in degrees in different situations,	● In pairs, groups or as individuals, learners are guided to fingerspell and sign terms related to angles. ● Make clockwise, quarter and half turns, and relate them to angles in the environment. ● Learners are guided to observe the teacher's demonstration or chart or watch a captioned or signed video on angles in the environment then make a presentation in class. ● In pairs, groups or as individuals, learners are guided to discuss and note down the use of angles in the environment and make displays in class. ● In pairs, groups or as individuals, learners are guided to make a unit angle	1. How are angles used in the environment?

		f) identify the use of angles in the environment, g) use IT devices to create and learn more about angles, h) appreciate the use of angles in our day to day life.	and use it to measure angles in the environment. ● In pairs, groups or as individuals, learners are guided to divide a 100 degrees angle into 10 equal parts and identify each part as equal to 1 degree. ● In pairs, groups or as individuals, learners are guided to measure angles in degrees using a protractor to make some drawing. ● In pairs, groups or as individuals, learners are guided to measure angles in degrees using a protractor and share results with others. ● In groups or pairs, learners are guided to use digital devices to create and learn more about angles.	
Core Competencies to be developed: ● Communication and collaboration: teamwork as learners work in pairs or groups to contribute on accurate measurement of angles. ● Learning to learn: own reflection as learners identify the degree as a unit of measuring angles.				

Values:

- **Responsibility**: as learners share tasks or roles in their groups and as they take care of digital devices.

Pertinent and Contemporary Issues (PCIs):

- Social cohesion: as learners work in groups.
- Safety: as learners handle a pair of scissors, razor blades.

Links to other Learning Areas:

The learner is able to relate lines to sketching and drawing in Creative Arts.

Suggested learning resources:

- Unit angles, Protractor, Rulers, Digital devices, Signs dictionary, Course books

Strand	Sub strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
	3.3 3-D Objects (6 Lessons)	By the end of the sub strand, the learner should be able to; a) sign and describe 3-D objects in the environment, b) describe 2-D shapes in 3-D objects in the environment, c) use IT devices to learn more about 3-D objects and for leisure appreciate the use of 3-D objects in the environment.	● In pairs or groups, learners are guided to identify, fingerspell and sign terms related to 3-D objects. ● collect objects and discuss cubes, cuboids, cylinders, spheres and pyramids as 3-D objects in the environment and share with other groups. ● Learners are guided to watch captioned or signed video or observe cut-outs and charts on 3-D objects then draw on their own. ● In groups or pairs, learners are guided to describe 2- D shapes found in 3-D objects, note the variation and share with other groups.	How are 3-D objects used in the environment?

			In pairs or individuals, learners are guided to use IT devices to learn more about 3-D objects.	

Core Competencies to be developed:

- Learning to learn own reflection as learners are prepared for further learning in 3-D objects.
- Critical thinking and problem solving: evaluation and decision making as learners describe 2- D shapes found in 3-D objects.

Values:

- Responsibility: as learners share and handle objects in pairs or groups.

Pertinent and Contemporary Issues (PCIs):

- Safety: as learners handle different objects

Suggested resources:

- Cubes, Cuboids, Cylinders, Spheres, Rectangles, Circles, Triangles, Digital devices, 3D shapes, 2D shapes

Link to other Learning Areas:

The learner is able to relate the concept of 3-D objects and 2-D shapes to modelling in **Creative Arts.**

Suggested Assessment Rubrics

Level Indicator	Exceeds Expectation	Meets Expectation	Approaches Expectation	Below Expectation
Ability to sign terms related to geometry, lines, angles and 3-D objects	signs terms related to geometry, lines, angles and 3-D objects accurately with precision.	Signs terms related to geometry, lines, angles and 3-D objects accurately.	signs terms related to geometry, lines, angles and 3-D objects inconsistently.	Demonstrates difficulty in signing terms related to geometry, lines, angles and 3-D objects.
Ability to identify parallel and perpendicular lines in different situations	Identifies parallel and perpendicular lines in different situations accurately and consistently.	Identifies parallel and perpendicular lines in different situations accurately.	Identifies parallel and perpendicular lines in different situations with noticeable minor errors.	Identifies parallel and perpendicular lines in different situations with significant errors.
Ability to read a protractor as a tool for measuring angles	Reads a protractor as a tool for measuring angles accurately and with precision.	Reads a protractor as a tool for measuring angles accurately.	Reads a protractor as a tool for measuring angles with minimal errors.	Reads a protractor as a tool for measuring angles inaccurately.
Ability to describe 3-D	Accurately describes 3-D	Accurately describes 3-D	Inconsistently describes 3-D objects.	Little evidence in describing 3-D

objects	objects with ease	objects.		objects
Ability to describe 2-D shapes in 3-D objects	Accurately describes 2-D shapes in 3-D objects correctly with precision	Accurately describes 2-D shapes in 3-D objects correctly	Inconsistently describes 2-D shapes in 3-D objects	Little evidence in describing 2-D shapes in 3-D objects

Strand	Sub strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Questions
4.0 DATA HANDLING	**4.1 Data Representation** (6 Lessons)	By the end of the sub strand, the learners should be able to; a) sign terms related data representation b) Draw a table to record data from real life c) Draw tally marks of the collected and any data d) Prepare a frequency table to represent data e) interpret data represented by frequency tables f) use digital devices to learn more on how to represent data and for leisure, appreciate the use of frequency tables in real life.	● In pairs, learners are guided to identify fingerspell, sign terms related to data representation such as (marks, shoe number, age of learners in a class.) ● Learners discuss preparing data collection and recording tools and record data on books or charts then display them on the walls in class. ● In groups, learners discuss and draw tally marks for the data and make a presentation in class. ● Learners organise it in a table from real life situations. ● In pairs or groups, learners discuss	Why is representing data in tables important?

			information represented by objects piled vertically. ● Learners in class observe the teacher's demonstration or watch signed or captioned video on data handling and write their observations and present in class	

Core Competencies to be developed:

- Learning to learn: a learner organises their own learning when practising piling different items vertically.
- Digital literacy: a learner develops connecting with technology as they use digital devices to learn more about frequency tables.

Value:

- Unity: as learners work in groups displays team spirit.

Pertinent and Contemporary Issues (PCIs):

- Safety: as learners represent data through piling objects.

Links to other learning areas:

The Learner is able to relate classification of plants and animals into living and non-living things to the knowledge of classification in **Science and Technology**.

Suggested resources:

- Data from different sources, digital devices, Signs dictionary

Suggested assessment rubrics

Level / Indicator	Exceeds Expectation	Meets Expectation	Approaches Expectation	Below Expectation
Ability to sign terms related to data handling and representation	Signs terms related to data handling and representation accurately with precision	Signs terms related to data handling and representation accurately	Signs terms related to data handling and representation with occasional mistakes	Struggles to signs terms related to data handling and representation
Ability to collect and represent data using tables	Accurately collects and represents data using tables with ease	Accurately collects and represents data using tables	collects and represents data Inconsistently using tables	Little evidence in collecting and representing data using tables
Ability to represent data through piling	represents data accurately through piling and can provide clear explanation	represents data through piling accurately	Inconsistently represents data through piling	representing data through piling with difficulty

Appendix 1: List of Learning Resources

Strand	Sub strand	Suggested assessment Methods	Suggested learning resources	Suggested non-formal activities
1.0 NUMBERS	Whole Numbers	a) Written exercises b) Oral and signed questions c) Observation d) Group discussion	● Place Value Apparatus ● Number Charts ● Number Cards ● Multiplication Table	1. Learners play number games e.g. competing, forming the largest number from given digits. 2. Learners to play number games using IT devices.
	Addition	a) Written exercises b) Oral and signed questions c) Observation d) Group discussion	● Place Value Chart ● Abacus	1. Learners to play games involving number patterns. 2. Learners to play number games using IT devices.
	Subtraction	a) Written exercises b) Oral and signed questions c) Observation	● Place Value Chart ● Abacus	1. Learners to work out the difference in scores for various teams during

		d) Group discussion		play.
				2. Learners to work out the difference of any two numbers during play.
	Multiplication	a) Written exercises b) Oral and signed questions c) Observation d) Group discussion	● Multiplication Tables	1. Learners work out the number of seedlings in a seedbed by considering the number of rows and columns. 2. Learners to work out the total number of learners in a class by counting rows and columns.

	Division	a) Written exercises b) Oral and signed questions c) Observation d) Group discussion	• Multiplication Tables	1. Learners to create number games during play activities e.g. what is 15 divided by 4? 2. Learners to divide numbers during play.
	Fractions	a) Written exercises b) Oral and signed questions c) Observation d) Group discussion	• Equivalent Fraction Board • Circular Cut outs • Rectangular Cut outs Counters	1. Learners to play games on creating equivalent fractions. 2. Learners to represent equivalent fractions using circular cut outs during play.
	Decimals	a) Written exercises b) Oral and signed questions c) Observation d) Group discussion	• Place Value Charts • Number Cards	1. Learners to represent decimals using paper cut outs during play. 2. Learners to represent decimals on place value charts during play.

2. 0 MEASUREMENT	Length	a) Written exercises b) Oral and signed questions c) Observation d) Group discussion e) Project	• Metre Rule • 1metre Sticks • Tape Measure	1. Learners to mark distances of 400m, 200m during play. 2. Learners to compete running 100 metres during play.
	Area	a) Written exercises b) Oral and signed questions c) Observation d) Group discussion e) Project	• Square Cut Outs • 1cm Squares • 1m Squares	1. Learners to determine area of playing fields e.g. netball pitch, football 2. Learners to determine area of their desks during play.
	Volume	a) Written exercises b) Oral and signed questions c) Observation	• Cubes • Cuboids • Videos	1. Learners stack up the same items during play.

		d) Group discussion e) Project		2. Learners to stack up cubes and cuboids during play.
	Capacity	a) Written exercises b) Oral and signed questions c) Observation d) Group discussion e) Project	• Teaspoons • Videos • Containers of different sizes • Water, Sand, Soil	1. Learners fill big containers using small containers during play. 2. Learners to empty big containers using small containers during play.
	Mass	a) Written exercises b) Oral and signed questions c) Observation d) Group discussion e) Project	• Teaspoons • Soil Or Sand • Manual/Electronic Weighing Machine • Videos • Beam Balance	1. Learners play games using a seesaw. 2. Learners play games using a beam balance.

	Time	a) Written exercise b) Oral and signed questions c) Observation d) Group discussion	• Analogue • Digital Clocks • Digital Watches • Stopwatch	1. Learners observe shadows and relate them to different times of the day. 2. Learners to discuss activities done at different times of the day during play.

	Money	a) Written exercises b) Oral and signed questions c) Observation d) Group discussion e) Project	● Price List ● Classroom shop ● Electronic Money Tariffs Chart	1. Learners to role play shopping activities. 2. Learners to role play banking activities e.g. depositing money.
3.0 GEOMETRY	Lines	a) Written exercises b) Oral and signed questions c) Observation d) Group discussion	● Chalkboard Ruler ● 30cm Ruler ● Straight Edges	1. Learners make lines using items like strings, number them and skip on them during play. 2. Learners to identify different lines during play.
	Angles	a) Written exercises b) Oral and signed questions c) Observation d) Group discussion e) Project	● Unit Angles ● Protractor ● Rulers	1. Learners to demonstrate angles during play. 2. Learners to identify angles in the

				environment during play.
	3-D Objects	a) Written exercises b) Oral and signed questions c) Observation d) Group discussion e) Project	● Cubes ● Cuboids ● Cylinders, Spheres ● Rectangles ● Circle and Triangle Cut outs of different sizes	1. Learners model toys of cars or dolls during play. 2. Learners to model cubes, cuboids, cylinders during play.
4.0 DATA HANDLING	Data Representation	a) Written exercises b) Oral and signed questions c) Observation d) Group discussion Project	Data from different sources	1. Learners to represent different numbers of items using sticks as tallies practically. 2. Learners to represent different numbers on the ground using tally marks.

5.0 ALGEBRA	Simple Equations	a) Written exercises b) Oral and signed questions c) Observation d) Group discussion	● Information from different sources	1. Learners to play balancing games using a seesaw. 2. Learners to play weighing games using a beam balance.

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.