



Republic of Namibia

MINISTRY OF EDUCATION, ARTS AND CULTURE

SENIOR PRIMARY PHASE

MATHEMATICS SYLLABUS

GRADE 4 - 7

For implementation in 2024

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Mathematics syllabus Grade 4 – 7

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1. INTRODUCTION

This syllabus describes the intended learning and assessment for Mathematics in the Senior Primary level. The mathematics learning area consists of preparatory Mathematics (Pre-Primary) and Mathematics (Grade1-12) and has thematic links to other subjects across the curriculum

The aims and learning objectives, which overlap between subjects are amongst the essential competencies within the curriculum as a whole. Under optimal circumstances, this subject would need seven (7) periods per week for grade 4 and six (6) periods per week for Grade5, 6 and 7.

2. RATIONALE

Mathematics involves observing, representing and investigating patterns and quantitative relationships in social and physical phenomena and between mathematical objects themselves. Through these processes new mathematical ideas and insights are generated.

Mathematics uses its own specialised language that involves notations and symbols for describing numeric, geometric and graphic relations. Mathematical concepts build on one another throughout all the phases, thereby creating a coherent structure. Mathematics is a purposeful activity in the context of social, political, technological and economic goals and constraints.

It is a discipline that is not value-free or culturally neutral. Its knowledge is part of culture and we need this knowledge and these skills in order to solve many everyday tasks, and to take care of personal interests and duties. It contributes to the development of logical and scientific thinking and provides pleasure and satisfaction when learners solve problems and enjoy number games.

Numeracy is one of the two core features of primary education, the other being literacy. Mathematics and the languages are thus the most important subjects in the curriculum in this phase. Therefore, the syllabus extends the basic competencies in computation with whole numbers to computation with common and decimal fractions. Measurement, time, and money and finance relate to the learner's everyday situation. Geometry is the mathematical understanding of space and shapes. The themes of problem solving, number patterns and data handling are ways of working with, understanding and communicating about and through Mathematics. Learners will **not use calculators**, but emphasis is to be placed on mental arithmetic strategies to develop the learners' awareness of number and number sense.

3. AIMS

Mathematics education promotes the following aims in the curriculum:

- to develop functional numeracy and mathematical thinking;
- to develop positive attitudes towards mathematics;
- to enable learners to acquire basic number concepts and numerical notation;
- to enable learners to understand and master the basic mathematical concepts and skills;
- to enable learners to apply mathematics in everyday life.
- to prepare learners for present and future studies in mathematics and other related subjects

4. INCLUSIVE EDUCATION

The Senior Primary phase of education promotes equality of opportunity in males and females, enabling both sexes to participate equally and fully. Teachers should know and understand how to treat learners equally, and all materials should support gender equity. Teachers must be aware of the ways in which boys or girls often become favouritised in the classroom interaction, and ensure that their role promotes gender equity. There are stereotype expectations that mathematics and science are more difficult for girls. However, it has been shown that “girls will not do as well as boys” becomes a self-fulfilling prophecy unless the teacher is aware of the problem. It is also known that the way problems are contextualised and exemplified in mathematics can act as a gender filter. It is essential that the Senior Primary phase creates motivation and confidence in girls as much as in boys in mathematics.

5. LINKS TO OTHER SUBJECTS AND CROSS-CURRICULAR ISSUES

The cross-curricular issues including Environmental Learning; HIV and AIDS; Population Education; Education for Human Rights and Democracy (EHRD), Information and Communication Technology (ICT) and Road Safety have been introduced to the formal curriculum to be dealt with in each subject and across all phases because each of the issues deals with particular risks and challenges in our Namibian society. All of our learners need to:

- understand the nature of these risks and challenges
- know how they will impact on our society and on the quality of life of our people now and in the future
- understand how these risks and challenges can be addressed on a national and global level
- understand how each learner can play a part in addressing these risks and challenges in their own school and local community

The main risks and challenges have been identified as:

- the challenges and risks we face if we do not care for and manage our natural resources
- the challenges and risks caused by HIV and AIDS
- the challenges and risks to health caused by pollution, poor sanitation and waste
- the challenges and risks to democracy and social stability caused by inequity and governance that ignores rights and responsibilities
- the challenges and risks we face if we do not adhere to Road Safety measures
- the challenges and risks we face from globalisation

Since some subjects are more suitable to address specific cross-curricular issues, those issues will receive more emphasis in those particular syllabuses. In this syllabus the following are links to cross-curricular issues:

HIV and AIDS	Population Education	Road Safety
Grade: 4 - 7 Topic: Data Handling and percentage -analyse and interpret information from pictograms, bar graphs and pie charts (grade 7) of real-life data -solve context problems involving everyday use of percentages (grade 7)	Grade: 4 – 7 Topics: Data Handling and percentages - analyse and interpret information from pictograms, bar graphs and pie charts (grade 7) of real-life data - solve context problems involving everyday use of percentages	Grade: 4 – 7 Topics: Whole numbers, Data Handling and percentages -solve context problems -analyse and interpret information from pictograms, bar graphs and pie charts (grade 7) of real-life data -solve context problems involving everyday use of percentages

6. APPROACH TO TEACHING AND LEARNING

The approach to teaching and learning is based on a paradigm of Learner-Centred Education (LCE) described in ministerial policy documents and the LCE conceptual framework. This approach ensures optimal quality of learning when the principles are put into practice.

The aim is to develop learning with understanding, and the knowledge, skills and attitudes to contribute to the development of society. The starting point for teaching and learning is the fact that the learner brings to the school a wealth of knowledge and social experience gained continually from the family, the community, and through interaction with the environment. Learning in school must involve, build on, extend and challenge the learner's prior knowledge and experience.

Learners learn best when they are actively involved in the learning process through a high degree of participation, contribution and production. At the same time, each learner is an individual with his/her own needs, pace of learning, experiences and abilities. The teacher must be able to sense the needs of the learners, the nature of the learning to be done, and how to shape learning experiences accordingly. Teaching strategies must therefore be varied but flexible within well-structured sequences of lessons.

The teacher must decide, in relation to the learning objectives and competencies to be achieved, when it is best to convey content directly; when it is best to let learners discover or explore information for themselves; when they need directed learning; when they need reinforcement or enrichment learning; when there is a particular progression of skills or information that needs to be followed; or when the learners can be allowed to find their own way through a topic or area of content.

Work in groups, in pairs, individually, or as a whole class must therefore be organised as appropriate to the task in hand. Co-operative and collaborative learning should be encouraged wherever possible. In such cases, tasks must be designed so that pair or group work is needed to complete it, otherwise the learners will not see any relevance in carrying out tasks together. As the learners develop personal, social and communication skills, they can gradually be given increasing responsibility to participate in planning and evaluating their work, under the teacher's guidance.

Learning experiences should aim to develop the learners' concept of number and their skills in performing calculations with numbers. They should be characterised by an atmosphere of trust, mutual support and the sharing of knowledge. Learners should have the opportunity to solve relevant problems and be encouraged to attempt to solve these problems before seeking help. Concrete aids (e.g. measuring instrument such as protractors, scales, etc.) and writing materials should be freely available.

Mathematical problems should always be exemplified in a context which is meaningful to the learners. The relationships between concepts and topics should continuously be developed throughout the phase. The learners' prior knowledge should always be elicited before commencing with a new topic. Where rote learning is the most appropriate method for certain things, it should be done by means of interesting activities and games to motivate learners and enable learners to learn by heart.

Particular attention must be given to ensuring that all learners achieve the basic competencies. Each learner's progress and achievement must be monitored carefully, and any learners not making progress or achieving these competencies must receive extra support from the teacher, and /or peers, with individualised materials, etc. Teachers should note that although all learners should attain the competencies in the syllabus, they are not intended to limit the initiative of the teacher or the class, and teachers are encouraged to extend their learners beyond them where possible.

7. END OF PHASE COMPETENCIES

On completion of the Senior Primary phase, all learners are expected to be able to:

Numbers: Demonstrate an understanding of numbers and be able to use mental and paper-and-pencil methods sensibly and appropriately. Use a variety of processes, e.g. comparison, classification, problem solving, abstraction and generalisation, approximation and estimation.

Money and finance: Use of Namibian currency in entrepreneurial activities.

Measure: length, mass, capacity and time

Demonstrate an understanding in using units of length, capacity, mass and time, and solve relevant problems in theoretical situations and in applications to everyday life.

Mensuration: Determine perimeters and areas of regular and irregular polygons and volumes of solids

Geometry: Understand the properties of shapes in two- and three-dimensional space classify and draw lines and angles and determine position and movement.

Algebra: Generalise number relationships and number patterns. Generate and solve simple equations and understand that in algebra letters are used as placeholders for numbers.

Data handling: Gather, organise, tabulate and, graph data as well as interpret graphs and tables in meaningful ways.

Values and attitudes: Appreciate and understand the place of Mathematics in everyday life and its widespread application to other subjects. Have an interest in and a positive attitude towards Mathematics

A few learners will just be able to manage the minimum number of competencies and must receive Learning Support through adapted teaching approaches, adapted materials, and assistance from peers. A small number of learners have special educational needs to a degree which requires greater individual attention, resources or assessment. Others will have impairments which do not necessarily limit cognitive and affective learning and development, e.g. the visually impaired, hearing impaired and physically challenged.

8. SUMMARY OF THE LEARNING CONTENT

Topic	Grade 4	Grade 5
Numbers	Order, compare, round, estimate and classify sets of numbers using numbers from 0 to 10 000. Read, pronounce and write numerals. Identify and describe number patterns. Apply four basic operations and mental arithmetic strategies to numbers from 0 to 10 000. Recognise and use number relationships for the four operations. Solve two-step problems involving numbers in the range. Use terminologies for common fractions. Compare and order unit fractions and common fractions with the same denominators of up to 10. Solve problems involving fractions.	Order, compare, round, estimate and classify sets of numbers using numbers from 0 to 100 000 Identify and describe relationships in number patterns. Apply four basic operations and mental arithmetic strategies to numbers from 0 to 100 000. Recognise and use number relationships for the four operations. Solve two-step problems involving numbers in the range. Classify fractions as proper and improper fractions and mixed numbers. Compare and order common fractions with the same and different denominators up to tenths and mixed numbers. Recognise equivalence of fractions within fraction families. Perform simple calculations with fractions and solve problems. Convert between proper fractions and mixed numbers with denominators consisting of 10 and 100 to decimal fractions. Express decimal numbers in expanded notation. Compare and order decimal numbers and locate them as points on the number line; Add and subtract numbers with up to two decimal places. Multiply and divide decimal numbers by 10 and 100.
Money and Finance	Name and identify all coins and notes of the Namibian currency. Equate coins and notes to given amount of money. Apply knowledge in practical situations.	Equate coins and notes to given set of money value and correctly. Estimate, add and subtract amounts of money in decimal notation. Solve problems involving change and cost price and selling price up to N\$ 500.

Topic	Grade 4	Grade 5
Measures - Length, Mass, Capacity and Time	Estimate, measure and compare familiar objects in the metric units of length (millimetre, centimetre and metre), mass (grams and kilogram) and capacity (millilitre and litre). Use correct vocabulary for measurement of time. Correctly read and record time on different time instruments. Convert between different units of time.	Estimate and measure familiar objects in metric units for length (km, m, cm and mm), mass (kg, g) and capacity (ℓ, mℓ). Convert between at most two consecutive metric units. (e.g. m to km or mℓ to ℓ). Perform the four basic operations on values that are expressed in not more than two different units. Measure and record time in analogue and digital 12 hour times. Use notations and abbreviations for all time units. Convert between units of time. Compare and order consecutive time units. Apply time concepts to timetables and calendars.
Geometry	Identify right angles and vertical, horizontal and slanting lines. Identify 2-Dimensional shapes, their lines of symmetry and apply transformations to 2-Dimensional shapes. Identify and describe 3-Dimensional shapes. Give and follow directions on diagrams and in the environment.	Identify and use benchmark angles and understand parallel and perpendicular lines. Differentiate between different kinds of quadrilaterals and between pyramids and prisms. Construct cubes and cuboids from nets. Use transformations to create composite 2-Dimensional shapes. Use alpha-numeric grids to determine position.
Mensuration	Estimate and measure perimeters of two-dimensional shapes. Calculate the perimeter of squares, rectangles and triangles. Use squared paper to determine the area of regular and irregular figures. Determine volume by packing containers with blocks.	Estimate, measure and calculate perimeters Determine area of regular and irregular 2-Ds by counting squares Record areas in square centimetres and the square metres Find volume of cuboids and cubes by counting cubes Record volume in cubic centimetres
Data Handling	Collect, organise, represent and interpret discrete data on bar graphs and pictograms	Collect, organise, represent and interpret discrete data on bar graphs and pictograms (many-to-one correspondence)

Topic	Grade 6	Grade 7
Numbers	Order, compare, round, estimate and classify sets of numbers using numbers from 0 to 1 000 000. Select and apply appropriate strategies and methods to the four operations, including long multiplication and long division. Apply number properties and relationships Solve two-step problems within the range of 0 to 1 000 000. Find equivalent fractions by extending or reducing fractions. Compare and order common fractions up to a denominator of 100. Do simple addition, subtraction and multiplication with common fractions. Solve two-step problems involving common fractions. Convert between proper fractions, improper fractions, mixed numbers and decimal fractions. Round to a specified number of decimal places up to the second decimal place. Solve two-step problems of decimals, involving addition and subtraction, and multiplication and division of decimals by a whole number.	Order, compare, round, estimate and classify sets of numbers using numbers from 0 to 1 000 000. Select and apply appropriate strategies to the four operations. Apply number properties and relationships. Solve three-step problems within the range of 0 to 1 000 000. Order and compare tenths and hundredths. Add, subtract and multiply common fractions. Divide common fractions by a whole number and whole numbers by common fractions. Solve two-step problems involving common fractions. Perform the four basic operations with decimal fractions up to three decimal places. Round and estimate answers. Solve three-step problems with decimal fractions. Use percentage notation correctly. Convert between common fractions, decimal fractions and percentages. Calculate the percentage of a given quantity, express one quantity as a percentage of another. Solve word problems involving percentages.
Patterns, Functions and Algebra	Complete and describe number patterns. Construct and solve simple number sentences.	Use algebraic notation to represent numbers with letters.
Money and Finance	Solve problems involving selling price, cost price, and profit and loss up to N \$ 1000.	Solve problems involving selling price, cost price, profit, loss and discount using percentages

Topic	Grade 6	Grade 7
Measurement - Length, Mass, Capacity and Time	Express metric units of length (km, m, cm and mm), mass (t, kg, g and mg) and capacity (kl, l, ml) in decimals. Convert, compare and order measures. Apply approximation and estimation to measures. Apply the four basic operations to problems in context. Convert between 12-hour and 24-hour clocks. Apply approximation to time units. Calculate time intervals.	Apply the metric units for length, mass and capacity involving conversion of units. Interpret international time zones. Apply all the units of time in solving problems.
Geometry	Name, classify angles and draw and measure angles smaller than 180° . Classify triangles and quadrilaterals according to angles, sides and symmetry. Construct prisms from nets and sketch nets. Identify and name simple transformations. Use cardinal directions and alpha-numeric grids to describe position and movement.	Name, construct and measure lines and angles. Describe, sort, name and compare different kinds of quadrilateral and triangles. Draw circles and use circle terminology. Describe, sort and compare different kinds of pyramids and prisms Identify and describe symmetry and transformations of geometric figure. Use the Cartesian coordinate system to describe and determine location.
Mensuration	Apply the formula (in words) to determine the perimeter and area of squares and rectangles and the volume of cuboids.	Calculate the perimeter and area of rectangles, squares, parallelograms and triangles. Calculate the volume of a cube and cuboids. Give answers to perimeter, area and volume in appropriate units. Find unknown dimensions of rectangles, squares, cubes and cuboids.
Data Handling	Collect and organise data. Represent and interpret discrete data on vertical, horizontal and double graphs and pictograms.	Collect and organise data. Represent data on various graphs, including pie charts. Interpret graphs and data and summarise and report.

9. LEARNING CONTENT

NOTE:

For decimal fractions the decimal point should be placed on the line, e.g., 52.35. Whole numbers greater than or equal to 1 000 should be written without commas. A space should be left between each group of three whole numbers from left to right, e.g., 4 256 789.

Analogue and digital clock time e.g., 12 minutes past 3 should be recorded as 3:12.

When using 12-hour clock (a.m. & p.m.) or 24-hour clock e.g., 12 minutes past 3 should be written either as 3:12 a.m. or 03:12 or 3:12 p.m. or 15:12 depending on the time of day or night. The a.m. and p.m. should be written with decimal points as they are abbreviation.

The duration of time (e.g., duration of a journey) should be written as 3 hours 12 minutes and abbreviated as 3h12min.

For Grade4 & 5 all vocabulary and terminology should be read, pronounced and written in both language of instruction and English.

9.1 Grade 4

LEARNING OBJECTIVES <i>Learners will:</i>		COMPETENCIES <i>Grade 4 learners should be able to:</i>	
TOPIC 1: WHOLE NUMBERS			
(a) Counting			
understand the principle of counting up to 10 000 using a variety of counting strategy		- count up to 500 objects by grouping them into groups of 5, 10 and 20 - count forward and backward 1s, 2s, 5s, 10s, 25s, 30s, 50s, 100s and 1 000s, starting with any number in the number range e.g., count in 2s from 27 to 57	
(b) Numeration			
know how to read and write numbers in words and as numerals		- read, pronounce and write numerals from 0 to 10 000 - write numbers as numerals given in words up to 10 000 - write numbers from 0 to 100 in words - write numbers which are multiples 100 in words e.g., 2 100 written as two thousand one hundred	

LEARNING OBJECTIVES <i>Learners will:</i>	COMPETENCIES <i>Grade 4 learners should be able to:</i>
(c) Place value	
understand the positional notation of the base ten number system	- recognise and write down the missing numbers on the number chart and number line - recognise and identify the place value and the value of the digit in a four-digit number (0 – 9 999) - express four-digit numbers up to 10 000 in expanded notation and vice versa (in thousands, hundreds, tens and ones e.g., $1253 = 1\,000 + 200 + 50 + 3$)
(d) Rounding off and estimation	
develop the skill to use approximation and of rounding off numbers to facilitate estimation of answers to calculations	- estimate (without counting) and then count the number of objects up to 50 in different arrangements of objects - round off numbers up to 10 000 to the nearest power of 10, 100 or 1 000 - apply estimation in real-life situations

LEARNING OBJECTIVES <i>Learners will:</i>	COMPETENCIES <i>Grade 4 learners should be able to:</i>
(e) Comparing and ordering	
know how to compare and order whole numbers and develop an understanding of relative value of numbers	- use appropriate vocabulary such as; more than, less than, equal to, how many more, how many less, greater than, smaller than etc. to compare quantities given as whole numbers - identify the number before and after a given two-, three- or four-digit number - order a set of numbers, up to and including four-digit numbers, in ascending or descending order - use the symbols for “less than” (<), “greater than” (>) and equal to (=) to compare two numbers up to 10 000 - identify, write and use ordinal numbers from 1st to 100th
(f) Number patterns	
know how to create, continue and describe number patterns	- recognise odd and even numbers up to 10 000 - identify and describe patterns in the multiplication tables - continue a number pattern given the first five terms - describe a simple number pattern in words - create simple number patterns

LEARNING OBJECTIVES <i>Learners will:</i>	COMPETENCIES <i>Grade 4 learners should be able to:</i>
TOPIC 2: COMPUTATION	
(a) Addition and subtraction: (Mental and written methods)	
use mental and written strategies for addition and subtraction involving two- and three-digit numbers	- use the following terminologies in context: more, less, lose, gain, decrease, increase, total, sum, difference - recall and apply the basic addition and subtraction facts up to 50 - use a variety of mental strategies for addition and subtraction involving two-digit and three-digit numbers, for example: - preserve the first number, split the second number e.g., $32 + 56$; $32 + 50 = 82$, then $82 + 6 = 88$ or $53 - 27$; $53 - 20 = 33$, then $33 - 7 = 26$ - split both numbers into tens and units e.g., $32 + 56$; $30 + 50 + 2 + 6$ is 88 - using patterns to extend number facts e.g., if $6 - 4 = 2$, then $600 - 400$ is 200 - changing the order of addends to form multiples of 10 e.g., $24 + 15 + 6$; add 24 and 6 first - record or explain mental strategies e.g., $246 + 35$; $246 + 35 \rightarrow 246 + 30 \rightarrow 276 + 5 \rightarrow 281$ or on an empty number line - use any formal written algorithm (paper and pencil methods) and apply place value to add and subtract two-, three- and four-digit numbers e.g., $437 + 863$ is worked out as + $\begin{array}{r} 437 \\ 863 \\ \hline \end{array}$

LEARNING OBJECTIVES <i>Learners will:</i>	COMPETENCIES <i>Grade 4 learners should be able to:</i>
(b) Addition and subtraction: (Number relationships)	
• make generalisations about number relationships and use number relationships to make calculations easier • understand the use of symbols in number sentences	• recognise that addition and subtraction are inverse operations • e.g., $50 + 40 = 90$; so, $90 - 50 = 40$ • apply commutative property of addition e.g., $55 + 61 = 61 + 55$ • apply the associative property of addition, e.g., $37 + 12 + 3 = 37 + 3 + 12$ • use the equals sign to record equivalent number relationships and to mean 'is the same as' rather than as an indication to perform an operation e.g., $15 + 2 = 11 + 6$ • complete number sentences involving one operation by calculating missing values e.g., find Δ so that $8 + \Delta = 27$
(c) Addition and subtraction: (Problem solving)	
• develop an understanding of adding and subtracting two-step context problems and use various techniques to check answers	• select and use mental or written methods to solve context problems • determine solutions by using estimation or inverse operation

LEARNING OBJECTIVES <i>Learners will:</i>	COMPETENCIES <i>Grade 4 learners should be able to:</i>
(d) Multiplication and division: (Mental and written methods)	
acquire knowledge on mental and written strategies for multiplication involving two-, three- and four-digit numbers	- use the following terminologies in context: times, equal sharing, divided by, multiplied by, product and quotient - double and halve numbers from 0 up to 200 - count in steps of 6, 7, 8 and 9 - recall multiplication and division facts of up to 10×10 multiplication tables - multiply mentally up to three-digit numbers by 10 and 100 with answers less than or equal to 10 000 - use mental strategies to multiply a two-digit number by a one-digit number e.g., $10 \times 9 = 90$ so $13 \times 9 = 90 + 9 + 9 + 9$ or 7×19 is $(7 \times 10) + (7 \times 9) = 70 + 63 = 133$ or 23×4 is double 23 and double again - multiply up to three-digit numbers by a one-digit number with answers less than or equal to 10 000 using any formal or informal paper and pencil method - divide a two-digit number by a number from 1 – 10 with or without a remainder
(e) Multiplication and division: (Number relationships)	
- make generalisations about number relationships and use number relationships to make calculations easier - understand the use of symbols in number sentences	- relate multiplication and division as inverse operations, e.g., $9 \times 7 = 63$; so, $63 \div 7 = 9$ - apply commutative and associative property of multiplication - use the equals sign to record equivalent number relationships and to mean ‘is the same as’ rather than as an indication to perform an operation e.g., $12 \times 2 = 6 \times 4$ - complete number sentences involving one operation by calculating missing values e.g., find Δ so that $42 = \Delta \times 7$

LEARNING OBJECTIVES <i>Learners will:</i>	COMPETENCIES <i>Grade 4 learners should be able to:</i>
(f) Multiplication and division: (Problem solving)	
develop an understanding for multiplying and dividing two-step context problems and use various techniques to check answers	- select and use mental or written methods to solve context problems - use estimation or inverse operation to check solutions
TOPIC 3: COMMON FRACTIONS	
(a) Fraction representation and notation	
model and represent fractions using fraction terminologies and notations	- recognise, find, name and write common fractions with denominators up to 10 of a length, shape, set of objects or quantity - interpret the denominator as the number of equal parts a whole has been divided into - interpret the numerator as the number of equal fractional parts
(b) Comparing and ordering	
know how to compare fractions with the same and different denominator and unit fractions up to tenths	- compare and order proper fractions with the same denominator up to a denominator of 10 e.g., $\frac{3}{8} < \frac{5}{8}$ - compare and order unit fractions by comparing the denominators or by using diagrams e.g., $\frac{1}{3} > \frac{1}{5}$

LEARNING OBJECTIVES <i>Learners will:</i>	COMPETENCIES <i>Grade 4 learners should be able to:</i>
(c) Calculations and problem solving	
understand simple calculations with fractions and solve context problems involving simple fractions	- calculate the unit fractional part of a small collection of objects or a quantity where the answer is a whole number, e.g., $\frac{1}{5}$ of N\$15 - add and subtract fractions with the same denominator within one whole, e.g., $\frac{1}{6} + \frac{4}{6}$ or $\frac{3}{5} - \frac{2}{5}$ - solve simple one-step problems involving fractions
TOPIC 4: MONEY AND FINANCE	
(a) Coins and notes	
consolidate and extend their knowledge of the Namibian currency in practical situations	- name and identify all Namibian coins and notes according to their values - use the correct notation for money in dollars and cents and express the amount in words and vice versa e.g., N\$12.45 is “twelve Namibian dollars forty-five cents” or “twelve Namibian dollars forty-five” and “six Namibian dollars thirty cents” is N\$6.30 - calculate change in notes and coins up to N\$100 - select various sets of coins and notes that make up a given amount of money up to N\$250 e.g., N\$215 = N\$200 + N\$ 10 + N\$5 or N\$215 = 2 × N\$100 + 2 × N\$5 + 5 × N\$1

LEARNING OBJECTIVES <i>Learners will:</i>	COMPETENCIES <i>Grade 4 learners should be able to:</i>
TOPIC 5: MEASUREMENT: LENGTH, MASS AND CAPACITY	
(a) Length	
understand the importance of measuring length in standard units and its application in everyday life	- use standard units of length and their correct abbreviations for metre (m), centimetre (cm) and millimetre (mm) - use the following terminologies associated with length: long/-er/-est, short/-er/est, breadth, width, height, distance - use rulers, tape measures or trundle wheels to measure lengths or distances and record the measurement in two consecutive units, e.g., 4 cm and 6 mm or 7 m and 20 cm - measure lengths and distances, and record data in tables, in and around the classroom and the school ground to the nearest metre, centimetre or millimetre - compare lengths, including scaling, e.g., “twice as far”, “half as long” - estimate lengths and distances to the nearest metre, centimetre or millimetre
(b) Mass	
understand the importance of measuring mass in standard units and its application in everyday life	- use the standard units of mass and their correct abbreviations for gram (g) and kilogram (kg) - use the following terminologies associated with mass: the same mass, heavy/light; heavier/lighter, heaviest/lightest - use scales and balances to measure mass and record the measurement in two consecutive units, e.g., 1 kg and 200 grams - estimate mass of objects to the nearest kilogram or gram - compare masses, including scaling, e.g., ‘twice as heavy’

LEARNING OBJECTIVES <i>Learners will:</i>	COMPETENCIES <i>Grade 4 learners should be able to:</i>
(c) Capacity	
understand the importance of measuring capacity in standard units and its application in everyday life	- recognise and use standard units and abbreviations of capacity as millilitre (mℓ) and litre (ℓ) - use the following terminologies associated with capacity: the same, more / less, full / empty - use measuring instruments calibrated in millilitres to measure capacity and record the measurement in two consecutive units, e.g., 1 litre and 50 millilitres - measure and record the capacity of everyday containers to the nearest litre or millilitre - estimate the capacity of containers to the nearest litre or millilitre - compare capacities, including scaling, e.g., “twice as much”; “half full”
TOPIC 6: MEASUREMENT OF TIME	
(a) Vocabulary	
understand and use the vocabularies of time	- use vocabulary associated with time correctly such as; past, present, future, earlier, later, now, then, a long time, a short time, morning, midday, afternoon and midnight - recognise and use the units of time and their abbreviations as seconds (s), minutes (min), hour (h), day, week, month and year

LEARNING OBJECTIVES <i>Learners will:</i>	COMPETENCIES <i>Grade 4 learners should be able to:</i>
(b) Reading and recording time	
understand how to read, record and interpret time from clocks and calendars	- read and record analogue and digital clock time to the nearest 5 minutes e.g., “25 minutes past 3”; recorded as 3:25 - recognise the difference between times between 12 o’clock at midnight and 12 o’clock at midday and vice versa as in the morning or in the afternoon - convert analogue time to digital notation and indicate morning or afternoon, e.g., “25 minutes past 3” is recorded as 3:25 in the morning (or 3:25 in the afternoon) and vice versa - read and interpret simple timetables and calendars
(c) Conversion	
understand the relationship between units of time and know how to find the length of time between various events	- recognise that there are 60 minutes in an hour; 24 hours in a day; 7 days in a week and 12 months in a year - convert from hours to minutes; days to hours; weeks to days; years to months (for Grade 4 restricted to converting from a bigger unit to a smaller) - calculate the time intervals where time is given in hours only - calculate the number of days between any two dates within the same month

NOTE: Time in digital notation is read as minutes past an hour (between 1 and 30 minutes) e.g., 6:25 is read as “twenty-five minutes past six”. After half past an hour, the time is read as minutes left to the next hour, e.g., 6:45 is read as “fifteen minutes to seven”

LEARNING OBJECTIVES <i>Learners will:</i>	COMPETENCIES <i>Grade 4 learners should be able to:</i>
TOPIC 7: GEOMETRY	
(a) Lines and angles	
understand the concept of angles and lines	- identify and draw vertical and horizontal lines and slanting in pictures and diagrams - identify examples of angles in the environment and in 2-Dimensional shapes - recognise a right angle as a quarter of a complete turn - identify angles bigger or smaller than a right angle in shapes and in the environment
(b) Two-dimensional shapes	
- understand that 2-Dimensional shapes are not affected by their orientation and after simple transformations - understand line symmetry	- identify and name the following regular and irregular two-dimensional shapes: triangle, square, rectangle, rhombus, parallelogram, other quadrilaterals, pentagon, hexagon and circles in different orientations - identify 2-Dimensional shapes found in pictures and diagrams - draw 2-Dimensional shapes in different orientations - identify a line of symmetry on symmetrical 2-Dimensional shapes - complete, draw or construct symmetrical figures, e.g., through paper folding - apply simple transformations to shapes (flips, slides and turns) using concrete materials and physical motion

LEARNING OBJECTIVES <i>Learners will:</i>	COMPETENCIES <i>Grade 4 learners should be able to:</i>
(c) Three-dimensional shapes	
distinguish between 3-Dimensional figures and visualise 3-Dimensional figures from 2-Dimensional representations	- identify and name the following 3-Dimensional objects: cones, pyramid, prisms (cube, cuboid, triangular prism), spheres and cylinders from a collection of everyday objects - identify 3-Dimensional objects in 2-Dimensional drawings, pictures and photographs - use terms “faces”, “edges” and “corners” to describe 3-Dimensional shapes - recognise 2-Dimensional shapes as faces of 3-Dimensional objects
(d) Position and movement	
know how to give and follow directions	- locate and describe the location of an object using more than one descriptor e.g., “I am sitting in the second row, five places from the left” or “find the book on the third shelf, second from the left” - give or follow simple directions on diagrams (grid paper) or in the environment, using distance and the terms “left”, “right”, “quarter turn” “half turn”

LEARNING OBJECTIVES <i>Learners will:</i>	COMPETENCIES <i>Grade 4 learners should be able to:</i>
TOPIC 8: MENSURATION	
(a) Perimeter, Area and Volume	
• know how to determine perimeters of regular two-dimensional figures • understand the concept of area and volume	• correctly use vocabulary such as perimeter, polygons, area, surface, volume, regular and irregular shapes • measure lengths of sides and calculate the perimeters of regular and irregular shapes • determine the areas of regular and irregular shapes by counting squares units on grids • estimate the volume of regular everyday containers by packing them with blocks
TOPIC 9: DATA HANDLING	
(a) Collect and represent data	
• develop an understanding of collecting, organising, representing and interpreting data	• collect and record discrete data from local sources e.g., shoe sizes, ages, colour of cars • organise data in tally forms and tables • represent data on pictograms and vertical bar graphs (one to one correspondence) • analyse and interpret data from pictograms and vertical bar graphs

9.2 Grade 5

LEARNING OBJECTIVES <i>Learners will:</i>		COMPETENCIES <i>Grade 5 learners should be able to:</i>
TOPIC 1: WHOLE NUMBERS		
(a) Counting		
understand the principle of counting up to 100 000 using a variety of counting strategy and develop a sense for the base ten number system	- count forward and backward in 10s, 100s, 1 000s and 10 000s from any number within the number range - count forward and backward in 20s, 25s and 50s from any multiple of these numbers, e.g., counting in 20s from 60 will give 60, 80, 100, 120, 140, ...	
(b) Numeration		
know how to read and write numbers in words and as numerals	read and write any number as a numeral and in words within the range of 0 to 100 000	
(c) Place value		
understand the positional notation of the base ten number system	- identify and place numbers on the number chart and number line - state the place value and the value of the digit in a five-digit number (0 – 99 999) - express five digits numbers up to 99 999 in expanded notation e.g., $32\ 653 = 30\ 000 + 2\ 000 + 600 + 50 + 3$ - express numbers written in expanded notation as ordinary numbers	
(d) Rounding off and estimation		
develop the skill to use approximation to reduce the complexity of large numbers and to facilitate controlled estimation	- round off numbers up to 100 000 to the nearest ten, hundred, thousand and ten thousand - use estimation in real-life situations e.g., reasonable estimation of the number of learners in a school	

LEARNING OBJECTIVES <i>Learners will:</i>	COMPETENCIES <i>Grade 5 learners should be able to:</i>
(e) Comparing and ordering	
know how to compare and order whole numbers and develop an understanding of relative value of numbers	- determine the number before and after a given number in the number range - order a set of numbers, up to and including five-digit numbers, in ascending or descending order - use the symbols for “less than” (<), “greater than” (>) and “equal to” (=) to show the relationship between two numbers - recognise, name and use ordinal numbers (1st, 2nd, 3rd ...)
(f) Number patterns	
understand that number patterns are built on constant relationships between the terms in a sequence	- complete numeric patterns in sequences involving one operation only, e.g., 1; 4; 7; 10; 13; or 1; 2; 4; 8; 16.... - describe the observed relationship or rule, e.g., “start with 1 and add 3”; “start with 1 and double the number” - determine input values, output values and rules for patterns and relationships in flow diagrams and tables

LEARNING OBJECTIVES <i>Learners will:</i>	COMPETENCIES <i>Grade 5 learners should be able to:</i>
TOPIC 2: COMPUTATION	
(a) Addition and subtraction: (Mental and written methods)	
consolidate their understanding and use of mental strategies and develop formal written methods for addition and subtraction involving numbers up to 100 000	- use the following terminologies in context: more/less than, how many lost (taken away), lose, gain, decrease/increase, put together, sum, difference - recall and apply the basic addition and subtraction facts up to 100 - revise from grade 4 and use a variety of mental strategies for addition and subtraction involving two-digit and three-digit numbers, with further examples as: - the compensation strategy e.g., $47 + 39$; $47 + 40$ is 87, subtract 1, to obtain 86 $73 - 38$; $73 - 40 = 33$, add 2 to obtain 35 - bridging the decades e.g., $74 + 27$; $74 + 20$ is 94, $94 + 7 = 94 + 6 + 1 = 101$ or $74 + 6 \rightarrow 80 + 21 = 101$, $65 - 48$; $65 - 40 = 25$, $25 - 8 = 25 - 5 - 3 = 17$ or $65 - 5 \rightarrow 60 - 40 \rightarrow 20 - 3 = 17$ - record or explain mental strategies e.g., $246 + 35$; $246 + 35 \rightarrow 246 + 30 \rightarrow 276 + 5 \rightarrow 281$ or on an empty number line - apply a formal written algorithm (paper and pencil methods) and place value concepts to add and subtract number within the number range

LEARNING OBJECTIVES <i>Learners will:</i>	COMPETENCIES <i>Grade 5 learners should be able to:</i>
(b) Addition and subtraction: (Number relationships)	
• make generalisations about number relationships and use number relationships to make calculations easier • understand the use of symbols in number sentences	• recognise that addition and subtraction are inverse operations e.g., $50 + 40 = 90$; so, $90 - 50 = 40$ • apply the commutative property of addition e.g., $55 + 61 = 61 + 55$ • apply the associative property of addition, e.g., $37 + 12 + 3 = 37 + 3 + 12$ • complete number sentences involving more than one operation e.g., find Δ so that $8 + \Delta = 26 - 11$
(c) Addition and subtraction: (Problem solving)	
• develop the skill for adding and subtracting two-step context problems and use various techniques to check answers	• select and use mental or written methods to solve two-step context problems • use estimation or inverse operation to check solutions

NOTE: Addition is commutative but subtraction is not commutative

LEARNING OBJECTIVES <i>Learners will:</i>	COMPETENCIES <i>Grade 5 learners should be able to:</i>
(d) Multiplication and Division: (Mental and written methods)	
consolidate their understanding and use of mental strategies to develop formal written methods for multiplication and division involving two-, three- and four-digit numbers	- use the following terminologies in context: times, equal sharing, divided by, multiplied by, product and quotient - recall multiplication facts of up to 12×12 multiplication tables and related division facts - mentally multiply up to four-digit numbers by 10 and 100 with answers less than or equal to 10 000 - use mental strategies to multiply a two-digit number by a one-digit number, including - using known facts e.g., $10 \times 9 = 90$ so $13 \times 9 = 90 + 9 + 9 + 9$ - multiplying the tens and then the units e.g., 7×19 is $(7 \times 10) + (7 \times 9) = 70 + 63 = 133$ - the relationship between multiplication facts e.g., 23×4 is double 23 and double again - multiply up to three-digit numbers by a two-digit number with answers less than or equal to 100 000 using any formal or informal paper and pencil method - divide three- and four- digit numbers by a number from 1 to 10 with or without a remainder using any formal or informal paper and pencil method - recognise the multiples of one-digit numbers (1 -9) e.g., 32 is a multiple of 8 within the range of numbers to 100 - recognise the multiples of 10, 20, 25 and 50
(e) Multiplication and Division: (Number relationships)	
- make generalisations about number relationships and use number relationships to make calculations easier - understand the use of symbols in number sentences	- relate multiplication and division as inverse operations, e.g., $9 \times 7 = 63$; so, $63 \div 7 = 9$ - apply commutative property of multiplication e.g., $15 \times 4 = 4 \times 15$ - apply the associative property of multiplication, e.g., $5 \times 13 \times 2 = 13 \times 2 \times 5$ - use the equals sign to record equivalent number relationships and to mean 'is the same as' rather than as an indication to perform an operation e.g., $12 \times 2 = 6 \times 4$ - complete number sentences involving one operation by calculating missing values e.g., find Δ so that $42 = \Delta \times 7$

LEARNING OBJECTIVES <i>Learners will:</i>	COMPETENCIES <i>Grade 5 learners should be able to:</i>
(f) Multiplication and Division: (Problem solving)	
know how to apply multiplication and division to two-step context problems and use various techniques to check answers	- select and use mental or written methods to solve context problems - use estimation or inverse operation to check solutions - interpret the remainder in the context of a division problem
(g) Order of operations	
know and understand the order of operations in problems involving more than one operation	apply the correct order of operations in calculations involving addition/subtraction and multiplication/division, e.g., $2 + 3 \times 4$

NOTE: For activities dealing with order of operations, avoid examples and activities that can produce negative answers.

LEARNING OBJECTIVES <i>Learners will:</i>	COMPETENCIES <i>Grade 5 learners should be able to:</i>
TOPIC 3: COMMON FRACTIONS	
(a) Vocabulary, Counting and Conversion	
- develop an understanding of counting in fractions - understand the relationship between improper fractions and mixed numbers	- count backward and forward in fractions (with denominators up to 10) beyond 1 e.g. $\frac{1}{4}; \frac{2}{4}; \frac{3}{4}; \frac{4}{4}; \frac{5}{4}; \frac{6}{4} \dots$ - count in fractions along the number line - recognise that a fraction with the same numerator and denominator are equal to 1, e.g., $\frac{4}{4} = 1$ - distinguish between proper fractions, improper fractions and mixed numbers - convert an improper fraction to a mixed number, e.g., $\frac{7}{4} = 1\frac{3}{4}$ and vice versa
(b) Equivalence of common fractions	
establish the equivalence of common fraction families	- recognise and use the equivalence of common fractions where one denominator is a multiple of another - halves, quarters and eighths - fifths, tenths and hundredths - thirds, sixths and twelfths - place common fraction families (e.g., halves, quarters, eighths) on a number line and a fraction chart
(c) Comparing and ordering	
know how to compare and order fractions	- apply relationship signs to compare proper fractions with the same denominators or numerators - order proper and improper fractions with the same denominators or numerators - locate fractions up to tenths as points on the number line, including fractions greater than 1 and mixed numbers

LEARNING OBJECTIVES <i>Learners will:</i>	COMPETENCIES <i>Grade 5 learners should be able to:</i>
(d) Calculations with fractions	
perform basic calculations with simple fractions	- recognise that a mixed number represents addition of a whole number and a proper fraction e.g., $1 + \frac{1}{2} = 1\frac{1}{2}$ - subtract a unit fraction from a whole number, e.g., $2 - \frac{1}{3} = 1\frac{2}{3}$ - add and subtract fractions with the same denominators - find the unit fraction of a whole number where the answer is a whole number, e.g., $\frac{1}{3}$ of 18 - find the whole when a unit fractional part is given, e.g., “Mother baked some cookies and gave Mary $\frac{1}{4}$ of the cookies. If Mary got 3 cookies, how many cookies did the mother bake?”
(e) Problem solving	
know how to solve simple context problems involving fractions	apply their knowledge of fractions to solve simple one-step problems, e.g., “John lives $\frac{1}{4}$ km from the school and Elias lives $\frac{1}{3}$ km from school. Who lives nearer to the school?”

LEARNING OBJECTIVES <i>Learners will:</i>	COMPETENCIES <i>Grade 5 learners should be able to:</i>
TOPIC 4: DECIMAL FRACTIONS	
(a) Converting between common and decimal fractions	
understand that common fractions with denominators 10 and 100 can be expressed in decimal notation	- convert common fractions with denominators 10 and 100 into decimal notation e.g., $\frac{1}{10} = 0.1$; $\frac{1}{100} = 0.01$ - write decimal fractions as common fractions with denominators 10 and 100, e.g., $0.04 = \frac{4}{100}$
(b) Counting and Place Value	
understand how to count in decimals and that decimal fractions have place value in the decimal number system	- count forwards and backwards in decimal fractions up to 2 decimal places, e.g., “zero point one two” for 0.12 NOT “zero point twelve” - write numbers with up to two decimal places on the place value chart - write numbers with up to two decimal places in expanded notation and vice versa
(c) Comparing and ordering	
understand the relative values of decimal fractions	- locate decimal fractions up to two decimal places as points on the number line - compare numbers up to two decimal places using the relationship signs (> < =) e.g., $3.24 > 3.19$ - arrange numbers up to two decimal places in ascending and descending order

LEARNING OBJECTIVES <i>Learners will:</i>	COMPETENCIES <i>Grade 5 learners should be able to:</i>
(d) Calculations	
understand how to add and subtract decimals and how the positions of the digits change, when multiplied and divided by 10 and 100	- add and subtract decimals with the same number of decimal places, up to 2 decimal places - multiply and divide numbers smaller than 1000 and with up to 2 decimal places by 10 and 100, e.g., 32.4×10; $187 \div 100$ and recognise the change of place value of the digits
TOPIC 5: MONEY AND FINANCE	
(a) Coins and notes	
demonstrate their understanding of Namibian coins and notes	- convert dollars to cents and vice versa - make up an amount using different combinations of coins and /or notes not exceeding N\$ 500
(b) Addition, subtraction and estimation	
- know how to add and subtract amounts of money in decimals - know how to estimate and round amounts of money	- add and subtract amounts of money with answers not exceeding N\$ 500 - round off amounts of money to the nearest dollar or nearest 10c - apply rounding off to estimate the answer to a calculation involving money
(c) Applications and problem solving	
acquire skills for solving problems involving money in practical situations	- solve problems involving buying and /or selling items and work out the change - draw up a simple budget - solve context problems involving amounts of money not exceeding N\$ 500 including amounts given with up to 2 decimal places

LEARNING OBJECTIVES <i>Learners will:</i>		COMPETENCIES <i>Grade 5 learners should be able to:</i>	
TOPIC 6: MEASUREMENT: LENGTH, MASS AND CAPACITY			
(a) Vocabulary			
understand expressions for measures of length, mass and capacity	- use and interpret expressions for opposites such as tall/short, long/short, higher/lower, far/near, thick/thin, wide/narrow, times more/times less, light/heavy, lighter/heavier, more mass/less mass, empty/full, large/small, more/less - use and interpret terms such as distance, thickness, length, height, perimeter, sides and opposite sides		
(b) Measuring and recording length, mass and capacity			
be familiar with the metric units for length, mass and capacity	- use the unit symbols for length (mm, cm, m, km), mass (g, kg) and capacities (mℓ, ℓ) - read and record measurement of length and capacity in two consecutive units up to two decimal places e.g., a length of 2 cm and 4 mm is recorded as 24 mm or 2.4 cm - read and record measurements of mass from analogue and digital balance into consecutive units up to two decimal places e.g., 1 kg and 240 g is recorded as 1.24 kg - use the appropriate unit for a certain measurement; e.g., the length of the classroom is measured in metres		
(c) Conversion, comparing and ordering			
- express the same measurement in different units - know how to order different quantities of measure	- recognise that 1 cm = 10 mm; 1 m = 100 cm; 1 km = 1 000 m; 1 kg = 1 000 g; 1 litre = 1 000 mℓ - convert between centimetres and millimetres, metres and centimetres, kilometres and metres, kilograms and grams, litres and millilitres - compare (using <, >, and = signs) and order (in ascending and descending) different lengths, masses and capacities stated in not more than 2 different (consecutive) units or in decimal notation up to 2 decimal places - relate fractions of a larger unit to the number of a consecutive smaller unit e.g., $\frac{1}{2}$ kg = 500 g or $\frac{1}{2}$ ℓ = 500mℓ		

LEARNING OBJECTIVES <i>Learners will:</i>	COMPETENCIES <i>Grade 5 learners should be able to:</i>
(d) Approximation and estimation	
develop the skill for estimating measurements to an appropriate accuracy and appreciate the value of rounded off measurements	- round measurements to the nearest appropriate units - estimate various lengths, masses and capacities of different items
(e) The four basic operations	
develop the knowledge for applying the four basic operations to length, mass and capacity	- add and subtract up to four lengths, masses and capacities given in two consecutive units up to 2 decimal places - multiply and divide lengths, masses and capacities stated in one unit only by whole numbers
(f) Problem solving	
determine suitable operations and strategies to solve context word problems	solve simple two step real-life problems, which require calculations with lengths, masses and capacities including measurements given in up to 2 decimal places

LEARNING OBJECTIVES <i>Learners will:</i>		COMPETENCIES <i>Grade 5 learners should be able to:</i>	
TOPIC 7: MEASUREMENT: TIME			
(a) Vocabulary and notation			
express time concepts accurately using the correct units and appropriate terminologies and know the correct notation for dates and length of time	- use and interpret terms associated with previous, current and future events in proper relation and with appropriate terms, e.g., yesterday, today, tomorrow, last year, this year, next year - use opposite terms longer/shorter, quicker/slower, faster/slower, sunrise/sunset, noon/midnight and before/after correctly - identify the units of time including their abbreviations (year→ yr.; month→ mo; week→ w; day→ d; hour→ h; minute→ min; second→ s) - interpret the term “leap year” as a year in which February has 29 days and a year has 366 days, occurring after every four years - use the alternative notation for dates, e.g., 25 September 2015 or 25 - 09 – 2015 or 2015 - 09 - 25		
(b) Reading and recording time			
understand how to read, record and interpret time from analogue and digital clocks, including the 24-hour clock	- read the analogue clock correct to 1 minute, e.g., “12 minutes past three”; “23 minutes to eight” - use a.m. and p.m. notation to record 12-hour clock times, e.g., 7.15 p.m. - compare time readings between own mother tongue and English e.g., some with use “half past five” while other would use the direct translation as “half to six”		
(c) Converting, comparing and ordering			
understand how to convert between time units and how to compare and order time intervals	- convert between years and months, months and weeks, months and days, weeks and days, days and hours, hours and minutes, minutes and seconds - compare and order lengths of time stated in not more than 2 different consecutive units - order a series of events according to the time taken to complete them		

NOTE: Use decimal points to write the abbreviations a.m. and p.m. in lower cases. Do not use the decimal point when writing these abbreviations in upper cases i.e., AM and PM. The abbreviations a.m. stands for “ante meridian” and p.m. stands for “post meridian”

LEARNING OBJECTIVES <i>Learners will:</i>	COMPETENCIES <i>Grade 5 learners should be able to:</i>
(d) Measuring and recording time intervals	
know how to measure and record the period of time for various events to happen	- use watches and stopwatches to measure time in hours, minutes and seconds - use the correct notation to record length of time or time interval e.g., 3 hours 40 minutes as 3h 40 min and 20 minutes 5 seconds as 20 min 5s - determine the duration of events using starting and finishing times to calculate elapsed time
(e) Application and problem solving	
make use of their knowledge of time to interpret everyday events and time instruments	- read, interpret and use the calendar and locally relevant timetables - solve problems relating to time in everyday contexts - calculate the number of days between any two dates within the same or consecutive years (including leap years)
TOPIC 8: GEOMETRY	
(a) Lines and Angles	
know benchmark angles and perpendicular and parallel lines	- identify benchmark angles (straight, right, half-right angles) - identify angles that are smaller or bigger than benchmark angles - identify and draw perpendicular lines and parallel lines
(b) Two-dimensional shapes	
know the basic properties of common regular quadrilaterals	- identify different kinds of quadrilaterals: square, rectangle, parallelogram and rhombus - describe differences and similarities between squares and rectangles; rectangles and parallelograms; squares and rhombuses in terms of lengths of sides, angles in shapes (limited to right-angles, angles smaller than or greater than a right angle) - lines of symmetry

LEARNING OBJECTIVES <i>Learners will:</i>	COMPETENCIES <i>Grade 5 learners should be able to:</i>
(c) Three-dimensional shapes	
distinguish between prisms and pyramids and know that 2-Dimensional shapes make up 3-Dimensional figures	- identify and name the following three-dimensional objects: rectangular prisms and other prisms, cube, spheres, cylinder, pyramids and cone in the environment and geometric settings - describe the differences between prisms and pyramids - draw, describe and sketch nets (made from cutting open boxes) of cubes and cuboids - construct cubes and cuboids from given nets
(d) Transformations	
understand the mathematical terminology for transformations of 2-Dimensional shapes	- describe transformations using the terms translations (slides), reflections (flips) and rotations (turns) - use transformations to draw basic tessellations using a variety of tools e.g., dotted and grid paper - identify and draw lines of symmetry in composite 2-Dimensional shapes
(e) Position and movement	
develop the knowledge for describing the location of objects	identify and describe the location of an object on a grid system or simple map with alpha-numeric grid references, e.g., "the church is in B3"

LEARNING OBJECTIVES <i>Learners will:</i>		COMPETENCIES <i>Grade 5 learners should be able to:</i>	
TOPIC 9: MENSURATION			
(a) Perimeter			
know how to find perimeters of regular and irregular shapes		- estimate and measure the perimeter of two-dimensional shapes - calculate perimeters of squares, rectangles and triangles	
(b) Area			
know how to determine areas of regular and irregular shapes and use standard units to measure and record area		- determine the areas of regular shapes (including squares and rectangles) and irregular shapes by counting square units on square centimetre grids - record areas in square centimetres and square metres - construct one square metre e.g., outside the classroom in the sand	
(c) Volume			
know how to determine the volume of regular and irregular shapes and use standard units for measuring and recording volume		- describe the concept “volume” as the amount of space occupied by a 3-Dimensional object - determine the volume of small cuboids and cubes by packing them with centimetre cubes without calculating - determine the volume of regular and irregular 3-Dimensional objects made up of centimetre cubes by counting cubes and record volume in cubic centimetres	

LEARNING OBJECTIVES <i>Learners will:</i>	COMPETENCIES <i>Grade 5 learners should be able to:</i>
TOPIC 10: DATA HANDLING	
(a) Collecting, organising and recording data	
know simple data collection and recording strategies	- collect and record a set of data appropriate to a problem / task orally (interview) - record and organise data using tallies and tables
(b) Representing data	
know pictograms and bar graphs as two different ways of representing data	- determine a suitable scale for data - record the scale for a pictogram in a key e.g., ☺ = 10 learners - draw pictograms or vertical bar graphs using a key or scale
(c) Interpreting data	
know how to extract and use information from data sets, tables and graphs	- read and interpret data from bar graphs and pictograms that have a scale and a key - interpret data from bar graphs and pictograms involving cross-curricular issues in their immediate environment to draw a conclusion and /or make a prediction

9.3 Grade 6

LEARNING OBJECTIVES <i>Learners will:</i>	COMPETENCIES <i>Grade 6 learners should be able to:</i>
TOPIC 1: WHOLE NUMBERS	
(a) Counting and numeration	
understand the principle of counting up to 1 000 000 using a variety of counting strategies and develop a sense for the base ten	- count forward and backward in 10s, 100s, 1 000s, 10 000s and 100 000s from any number within the number range - count forward and backward in 15s, 30s, 45s and 60s from any multiple of these numbers - read and write any number as a numeral and in words
(b) Place value	
understand the positional notation of the base ten number system	- state the place value and the value of the digit in a six-digit number - express numbers up to 1 000 000 in expanded notation and write numbers expressed in expanded notation as ordinary numbers
(c) Rounding off and estimation	
develop the skill to use approximation to reduce the complexity of large numbers and to facilitate controlled estimation	- round off numbers up to the nearest hundred-thousand (including 10, 100, 1 000 and 10 000) - apply estimation in real-life situations - estimate answers to calculation with reasonable accuracy e.g., $132 + 51 + 100 \approx 130 + 50 + 100 \approx 280$
(d) Comparing and ordering	
know how to compare and order whole numbers and develop an understanding of relative value of numbers	- apply the relationship signs to compare whole numbers ($>$; $<$; $=$) - arrange random numbers up to 1 000 000 in ascending and descending order - use ordinal numbers in context (1^{st}, 2^{nd}, 3^{rd}, ...)

LEARNING OBJECTIVES <i>Learners will:</i>	COMPETENCIES <i>Grade 6 learners should be able to:</i>
(e) Addition and Subtraction	
know how to select and apply appropriate mental strategies and written methods for addition and subtraction in the number range	- apply mental strategies for addition and subtraction - apply a formal written algorithm and place value concepts to add and subtract number within the number range - use estimation to check solutions to addition and subtraction problems e.g., $2\,515 + 485$ is about $2\,500 + 500$
(f) Multiplication and Division	
know how to select and apply appropriate mental strategies and written methods for multiplication and division	- recall multiplication facts up to 12×12 and related division facts - recognise and use mental calculation techniques for multiplying and dividing by multiples of 10 e.g., $40 \times 70 = 2\,800$ or $2100 \div 300 = 7$ - apply mental calculation strategies to multiply and divide whole numbers including the use of powers of 10 - multiply up to four-digit numbers by two-digit numbers using long multiplication - recognise and use different notations for division: $30 \div 6$; $6 \overline{)30}$; $\frac{30}{6}$ - record remainders to division problems as fractions or decimal where appropriate - divide a number with three or more digits by a one-digit number - divide a number with three or more digits by a two-digit number using long division

LEARNING OBJECTIVES <i>Learners will:</i>	COMPETENCIES <i>Grade 6 learners should be able to:</i>
(g) Multiples, Factors, Prime and Composite numbers	
know multiples, factors, prime and composite numbers and their properties	- recognise multiples of 15, 30, 45 and 60 within the number range up to 360 - determine common multiples of numbers up to 12 within the number range up to 100, e.g., the common multiples of 3 and 5 are 15, 30, 45, 60, 75 and 90 - determine the factors of any number up to 100, e.g., the factors of 24 are 1, 2, 3, 4, 6, 8, 12, 24 - determine whether a number is prime or composite by finding the number of factors, e.g., 17 is prime, because it has only two factors, i.e., 1 and 17, but 15 is composite because it has more than two factors, i.e., 1, 3, 5 and 15
(h) Number properties and order of operations	
know and use number properties and relationships to aid computations	- apply the commutative property of multiplication and addition - apply the associative property of multiplication and addition - apply the distributive property to perform calculations e.g., multiplication can be spread over addition and subtraction e.g., $3 \times 15 = 3 \times (10 + 5) = 3 \times 10 + 3 \times 5$ - apply the correct order of operations in calculations involving different operations: brackets; of; division and multiplication (from left to right); addition and subtraction (from left to right)
(i) Problem solving	
develop the skill for applying the four operations to two-step context problems and use various techniques to check answers	- select and use mental or written methods to solve context problems - use estimation or inverse operation to check solutions

LEARNING OBJECTIVES <i>Learners will:</i>	COMPETENCIES <i>Grade 6 learners should be able to:</i>
TOPIC 2: COMMON FRACTIONS	
(a) Equivalent fractions	
develop strategies to find equivalent forms of common fractions	- find equivalent fractions by multiplying the numerator and the denominator by the same number e.g. $\frac{1}{3} = \frac{1 \times 4}{3 \times 4} = \frac{1 \times 5}{3 \times 5}$, i.e. $\frac{1}{3} = \frac{4}{12} = \frac{5}{15}$ - simplify a common fraction to its lowest equivalent form by dividing the numerator and the denominator by a common factor
(b) Comparing and ordering	
know how to compare and order common fractions and mixed numbers with easy and denominators up to 100	- use relationship signs i.e., <, > and = signs, to compare common fractions with the same and different denominators, using equivalent fractions where necessary - order common fractions with the same and different denominators in ascending and descending order - compare and order mixed numbers and improper fractions - locate proper, improper fractions and mixed numbers on a number line
(c) Calculations with fractions	
perform simple calculations with fractions	- add and subtract fractions where one denominator is a multiple of the other, e.g., $\frac{1}{6} + \frac{2}{3}$ - add and subtract mixed numbers where one of the denominators is a multiple of the other - subtract a fraction from a whole number, e.g., $5 - \frac{3}{8}$ - multiply a fraction by a whole number, e.g., $4 \times \frac{3}{5}$ - find the whole when the unit fractional part is given e.g., $\frac{1}{3}$ of a distance is 5 km. What is the whole distance?

LEARNING OBJECTIVES <i>Learners will:</i>	COMPETENCIES <i>Grade 6 learners should be able to:</i>
(d) Fractional parts of quantities	
determine what fraction a quantity is of another quantity	- express one quantity as a fraction of another quantity e.g., 5 kg of 25 kg is $\frac{5}{25} = \frac{1}{5}$ - calculate the fractional parts of a quantity e.g. $\frac{2}{3} \times 15 = 10$
(e) Problem solving	
determine suitable operations and strategies to solve context word problems	apply their knowledge of fractions and calculations with fractions to solve two-step everyday life problems involving fractions
TOPIC 3: DECIMAL FRACTIONS	
(a) Equivalent fractions	
understand that the same number can be expressed in common fraction and decimal fraction form	- convert common fractions with denominators that are factors of 10 and 100 to decimal fractions, e.g., $\frac{1}{5} = \frac{1 \times 2}{5 \times 2} = \frac{2}{10} = 0.2$ - convert a decimal fraction to a common fraction in its simplest form, e.g., $0.45 = \frac{45}{100} = \frac{9}{20}$ - recognise and recall equivalence between common fractions with denominators 2, 4, 5, 10 and 100 and their decimal notation
(b) Comparing, ordering and rounding off	
understand the relative values of decimal fractions	- identify the value of each digit in numbers given to 3 decimal places - read, write, order and compare numbers with up to 3 decimal places - round numbers with 2 decimal places to the nearest whole number and to 1 decimal place

LEARNING OBJECTIVES <i>Learners will:</i>		COMPETENCIES <i>Grade 6 learners should be able to:</i>																																	
(c) The four basic operations																																			
know how to add and subtract decimal numbers and multiply and divide decimal numbers by a whole number		- add and subtract decimal numbers with not more than three decimal places and with a different number of decimal places, e.g., $25 + 6.27 + 0.8 + 4.125$ - multiply and divide decimal numbers by a whole number - multiply and divide decimal numbers by 10, 100 and 1 000 and recognise the changes in place value of each digit																																	
(d) Problem solving																																			
determine suitable operations and strategies to solve context word problems		solve context problems involving decimal numbers up to and including three decimal places																																	
TOPIC 4: PATTERNS AND NUMBER SENTENCES																																			
(a) Patterns in numeric and geometric sequences																																			
know how to find relationships in numeric and geometric number patterns		- complete a table of values and describe the pattern in words, e.g. in the table fill in the missing values <table border="1"><tr><td>First number</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr><tr><td>Second number</td><td>5</td><td>6</td><td>7</td><td>8</td><td></td><td></td><td></td></tr></table> The pattern or rule is: “add four to the first number” - draw a simple geometric pattern of multiples, complete a table of values, and describe the pattern in words, e.g. build a pattern of squares: □, □□, □□□, □□□□, ; then complete a table of values <table border="1"><tr><td>No of squares</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr><tr><td>No of sides</td><td>4</td><td>8</td><td>12</td><td>16</td><td></td><td></td><td></td></tr></table> The pattern or rule is: “multiply the number of squares by 4”		First number	1	2	3	4	5	6	7	Second number	5	6	7	8				No of squares	1	2	3	4	5	6	7	No of sides	4	8	12	16			
First number	1	2	3	4	5	6	7																												
Second number	5	6	7	8																															
No of squares	1	2	3	4	5	6	7																												
No of sides	4	8	12	16																															

LEARNING OBJECTIVES <i>Learners will:</i>		COMPETENCIES <i>Grade 6 learners should be able to:</i>	
(b) Number sentences			
understand how to construct and solve number sentences using geometric symbols as placeholders for numbers	- construct a number sentence to match a problem that is presented in words and requires finding an unknown, e.g., “Simon has N\$127. He buys a T-shirt and has N\$34 left. How much did he pay for the T-shirt?” Number sentence: $127 - \square = 34$ - solve and complete number sentences by inspection or trial and error - use substitutions to check the solutions to number sentences		
TOPIC 5: MONEY AND FINANCE			
(a) Cost price, selling price, profit and loss			
understand the basic nature of entrepreneurial activities	- distinguish between cost and selling price and profit and loss - calculate profit or loss and selling or cost price for items and services up to N\$1 000 - solve two-step context problems including cost and selling price and profit and loss		
TOPIC 6: MEASUREMENT: LENGTH, MASS AND CAPACITY			
(a) Conversion, comparing and ordering			
know how to convert between various metric units of measures and how to compare and order them	- convert between metric units of length, mass and capacity including measurements expressed in decimal notation - compare and order lengths, masses and capacities including measurements expressed in decimal notation		
(b) The four basic operations			
know how to add and subtract lengths, masses and capacities and how to multiply and divide measurements by whole numbers	- add and subtract lengths /distances, masses and capacities including measurements given in up to 3 decimal places - multiply and divide lengths /distances, masses and capacities, given in up to 3 decimal places, by whole numbers		

LEARNING OBJECTIVES <i>Learners will:</i>	COMPETENCIES <i>Grade 6 learners should be able to:</i>
(c) Approximation and estimation	
know how to round off and obtain appropriate values, estimate measures to an acceptable accuracy and appreciate the value of rounded answers	- round measurements to the nearest appropriate units or up to two decimal places - estimate various lengths, masses and capacities - recognise that the accuracy of a measurement depends on the measuring instrument - recognise the need for rounding off measurements
(d) Problem solving	
determine suitable operations and strategies to solve context problems	solve two-step word problems involving lengths, masses and capacities including measures given in up to 3 decimals places
TOPIC 7: MEASUREMENT: TIME	
(a) 12-hour and 24-hour clock times	
consolidate their knowledge of different ways of reading and recording clock time	- read time accurately in 24-hours clock time from digital clocks, e.g., 18:55 - use the correct notation for time in analogue display, e.g., 9:15 a.m., 2.30 p.m. and digital displayed time, e.g., 09:15, 14:30 - recognise 24:00 and 00:00 as the same time - convert between 24-hour time and 12-hour time, e.g., 02:50 is 2:50 am read as “ten minutes to three” in the morning and 5:30 pm is 17:30 read as “thirty minutes to six” or “half past five” in the afternoon
(b) Estimation and approximation	
know how to estimate and rounding off lengths of time	- estimate, within reasonable accuracy, the length of time for certain events to happen - round off lengths of time to the nearest unit

LEARNING OBJECTIVES <i>Learners will:</i>	COMPETENCIES <i>Grade 6 learners should be able to:</i>
(c) Calculations with time	
perform calculations with time that involve mixed units	- add and subtract time mentally using bridging strategies e.g., from 02:45 to 03:00 is 15 minutes and from 03:00 to 13:00 is 10 hours, so the duration of time from 02:45 until 13:00 is 15 minutes + 10 hours = 10 hours 15 minutes - calculate the time intervals where time is given in - seconds and / or minutes - minutes and / or hours - hours and / or days - days, weeks and / or months - years and / or decades - centuries, decades and / or years
(d) Application and problem solving	
make use of their knowledge of time to interpret everyday events and time instruments	- read, interpret and use the calendar and locally relevant timetables, including those in 24-hour times - solve problems relating to time in everyday contexts
TOPIC 8: GEOMETRY	
(a) Lines and Angles	
know how to classify angles according to their sizes, measure and draw angles and use proper notation to name angles	- identify, classify and name acute, right, obtuse, straight, reflex angles and revolution - measure and construct acute, right and obtuse angles - use a set square and a ruler to draw perpendicular lines - use different angle notations for the same angle, e.g., $\angle BAC$; $\widehat{BAC}$; $\hat{A}$

LEARNING OBJECTIVES <i>Learners will:</i>	COMPETENCIES <i>Grade 6 learners should be able to:</i>
(b) Two-dimensional shapes	
know the properties of different kinds of quadrilaterals and triangles	- identify squares, rectangles, rhombuses, parallelograms, trapeziums and kites and describe their properties in terms of their sides, angles and symmetry - identify and classify triangles according to their sides: scalene, isosceles, equilateral - draw lines of symmetry in triangles and quadrilaterals
(c) Three-dimensional shapes	
know and understand how to construct nets	- identify the nets of the following prisms from given drawn nets: cube, cuboid, triangular prism, cylinder - construct prisms (cube, cuboid, triangular prism, cylinder) from given nets - sketch nets for prisms
(d) Transformations	
acquire the knowledge of different transformations	- identify and describe transformations of simple 2-Dimensional shapes in composite 2-Dimensional shapes, patterns or nature as translations, reflections or rotations - use transformations to create different tessellation of the plane by making use of squares, rectangles, right-angled triangles and equilateral triangles
(e) Position and movement	
understand locations on grid systems	- locate an object and give directions using the cardinal directions (north, south, east and west) and distance on a grid system, e.g., "3 blocks north" - locate an object and give directions on diagrams and maps using alpha-numeric grid systems

LEARNING OBJECTIVES <i>Learners will:</i>		COMPETENCIES <i>Grade 6 learners should be able to:</i>
TOPIC 9: MENSURATION - PERIMETER, AREA AND VOLUME		
(a) Perimeter		
deduce and apply a formula to calculate the perimeter of regular polygons	- describe the relationship between the lengths of the sides and the perimeter for squares, rectangles and equilateral and isosceles triangles in words - calculate the perimeter of regular and irregular two-dimensional shapes including the use of formulae	
(b) Area		
deduce and apply a formula to calculate the area of squares and rectangles	- describe the relationship between the length of the sides of a square and the length and breadth of a rectangle and the area of the square or rectangle - use the formula to calculate the area of rectangles and squares in square centimetres and square metres	
(c) Volume		
deduce and apply a formula to calculate the volume of a cuboid	- describe the relationship between the length, breadth and height of a cube and cuboid and its volume in words - use the formula to calculate the volume of cubes and cuboids in cubic centimetres and cubic metres	

LEARNING OBJECTIVES <i>Learners will:</i>	COMPETENCIES <i>Grade 6 learners should be able to:</i>
TOPIC 10: DATA HANDLING	
(a) Collecting, organising and recording data	
• know simple data collection and recording strategies	• use pre-designed simple questionnaires to collect data • record and organise data using tables and tally charts
(b) Representing data	
• know how to represent data on a variety of graphs	• represent data on vertical and horizontal single or double bar graphs • represent data on a broken line graph
(c) Interpreting data	
• know how to extract and use information from a variety of graphs	• analyse and interpret information from tables, bar graphs, broken line graphs and pictograms using examples of real-life data, e.g., town/village population statistics, HIV and AIDS statistics and school statistics • read and interpret data represented in pie charts with not more than 4 sectors excluding measuring angles and converting to data • compare two data sets represented in double bar graphs • draw conclusions and /or make predictions from graphs and charts

9.4 Grade 7

LEARNING OBJECTIVES <i>Learners will:</i>	COMPETENCIES <i>Grade 7 learners should be able to:</i>															
TOPIC 1: WHOLE NUMBERS																
(a) Comparing, ordering and rounding off numbers																
know how to compare and order whole numbers and round off numbers within the number range to 1 000 000	- use, pronounce, write and determine the place value of each digit in any number - apply the relationship signs <; =; > to compare numbers - rearrange random numbers in ascending and descending order - round off numbers to the nearest 10, 100, 1 000, 10 000 and 100 000															
(b) Four basic operations																
perform calculations using all four operations on whole numbers and estimate answers	- add, subtract, multiply and divide using any paper and pencil algorithm or mental strategy - apply the commutative, associative and distributive properties to aid calculations for example: <table><tr><th colspan="2">Commutative property</th><th>Distributive property</th><th colspan="2">Associative property</th></tr><tr><td>Addition</td><td>Multiplication</td><td>$9 \times (24 + 26) = 450$ $9 \times 50 = 450$ or $(9 \times 24) + (9 \times 26) = 450$ $216 + 234 = 450$</td><td>Addition</td><td>Multiplication</td></tr><tr><td>$221 + 204 = 425$ $204 + 221 = 425$</td><td>$9 \times 50 = 450$ $50 \times 9 = 450$</td><td></td><td>$(221 + 204) + 210 = 635$ $221 + (204 + 210) = 635$</td><td>$(8 \times 2) \times 12 = 192$ $8 \times (2 \times 12) = 192$</td></tr></table> - recognise and use 0 as identity element for addition and subtraction - recognise and use 1 as identity element for multiplication - apply the correct order of operations to calculations involving more than one operation (BODMAS) {brackets, of, division and multiplication (from left to right), addition and subtraction (from left to right)} - apply approximations in real-life situations - estimate answers to calculations with reasonable accuracy	Commutative property		Distributive property	Associative property		Addition	Multiplication	$9 \times (24 + 26) = 450$ $9 \times 50 = 450$ or $(9 \times 24) + (9 \times 26) = 450$ $216 + 234 = 450$	Addition	Multiplication	$221 + 204 = 425$ $204 + 221 = 425$	$9 \times 50 = 450$ $50 \times 9 = 450$		$(221 + 204) + 210 = 635$ $221 + (204 + 210) = 635$	$(8 \times 2) \times 12 = 192$ $8 \times (2 \times 12) = 192$
Commutative property		Distributive property	Associative property													
Addition	Multiplication	$9 \times (24 + 26) = 450$ $9 \times 50 = 450$ or $(9 \times 24) + (9 \times 26) = 450$ $216 + 234 = 450$	Addition	Multiplication												
$221 + 204 = 425$ $204 + 221 = 425$	$9 \times 50 = 450$ $50 \times 9 = 450$		$(221 + 204) + 210 = 635$ $221 + (204 + 210) = 635$	$(8 \times 2) \times 12 = 192$ $8 \times (2 \times 12) = 192$												

LEARNING OBJECTIVES <i>Learners will:</i>	COMPETENCIES <i>Grade 7 learners should be able to:</i>
(c) Prime, square and cube numbers, factors and multiples	
know and use prime, square and cube numbers, factors and multiples, and their properties	- find factors and multiples of a given number smaller than 100 - use the divisibility rules of 2, 3 and 5 to determine that: 2 or 3 or 5 is a factor of a given number and - a given number is a multiple of 2 or 3 or 5 - recognise and list prime numbers smaller than 100 - recognise and list square and cube numbers of numbers up to 10 - find prime factors of a given number smaller than 100 - write a number as a product of its prime factors - find the Highest Common Factor (HCF) and the Lowest Common Multiple (LCM) of two whole numbers
(d) Problem solving	
acquire further knowledge for applying the four operations to solve up to three-step context problems	- apply suitable operations and strategies to solve problems in context involving whole numbers - solve three-step word problems in context

LEARNING OBJECTIVES <i>Learners will:</i>	COMPETENCIES <i>Grade 7 learners should be able to:</i>
TOPIC 2: COMMON FRACTIONS	
(a) Calculations with fractions	
- acquire further knowledge on how to apply four basic operations, order of operations - compare and order common fractions and mixed numbers	- compare common fractions and mixed numbers with denominators up to 10 using relationship signs - arrange common fractions and mixed numbers with denominators up to 10 in ascending or descending order - add and subtract common fractions and mixed numbers by finding common denominators - multiply a fraction by a whole number and a fraction by a fraction - multiply mixed numbers - divide a fraction by a fraction and by a whole number and explain the answer diagrammatically and/or by reasoning, e.g. $\frac{1}{4} \div 2 = \frac{1}{8}$, because if I divide $\frac{1}{4}$ into 2 equal parts, each part is $\frac{1}{8}$ - divide a whole number by a fraction and explain the answer diagrammatically and/or by reasoning, e.g., $2 \div \frac{1}{4} = 8$, because eight quarters can go into two as a whole number - apply the correct order of operations
(b) Problem solving	
apply their knowledge of fractions to solve context word problems	- express one quantity as a fraction of another quantity e.g., 5 kg of 25 kg as $\frac{5}{25} = \frac{1}{5}$ or 20 min of 1 hour as $\frac{20}{60} = \frac{1}{3}$ - calculate the fractional parts of a quantity - determine suitable operations and strategies of fractions and calculations with fractions to solve three-step everyday life problems involving fractions

LEARNING OBJECTIVES <i>Learners will:</i>	COMPETENCIES <i>Grade 7 learners should be able to:</i>
TOPIC 3: DECIMAL FRACTIONS AND PERCENTAGES	
(a) Conversion	
develop an understanding of the relationship between percentages, common fractions and decimal fractions	- convert common fractions to decimal fractions by division and round recurring decimals to the third decimal place - convert decimal fractions to common fractions in their simplest form (excluding recurring decimals) - recall common fractions with denominators of 2, 3, 4, 5, 8, 10 and their decimal equivalents - define percentage as a number of parts per hundred and identify and use the percentage symbol (%) - convert between common fractions, decimals and percentages e.g. $\frac{1}{5} = 0.2 = 20\%$ - recall decimal and percentage equivalents of fractions whose denominators are multiples of factors of 10 and 100 e.g., $\frac{1}{2}; \frac{1}{4}; \frac{3}{4}; \frac{1}{5}; \frac{2}{5}; \frac{3}{5}; \frac{4}{5}$
(b) The four basic operations	
know how to add and subtract decimal numbers and multiply and divide decimal numbers by a whole number	- add and subtract decimal numbers with up to three decimal places - multiply and divide decimal numbers by whole numbers with not more than 2 digits - multiply a number with up to two decimal places by a decimal fraction to not more than 2 decimal places giving answers with not more than 3 decimal places, e.g., 4.15×0.2 - divide a small decimal number by a decimal number with 1 decimal place, restricted to numbers where the quotient can be obtained by simplifying fractions or by short division e.g., $3.24 \div 0.8 = \frac{3.24}{0.8} = \frac{32.4}{8} = 4.05$

LEARNING OBJECTIVES <i>Learners will:</i>		COMPETENCIES <i>Grade 7 learners should be able to:</i>	
(c) Problem solving			
determine suitable operations and strategies to solve context problems	- solve problems in everyday contexts involving decimal numbers with up to 3 decimal places - calculate a percentage of a given quantity - express one quantity as a percentage of another - use percentages to represent and compare up to three different given quantities - solve context problems involving percentages		
TOPIC 4: MONEY AND FINANCE			
(a) Cost price, selling price, profit, loss and discount			
understand the basic nature of entrepreneurial activities	- express profit, loss and discount as percentages (%) of the cost price - calculate profit and loss and discount for items and services where profit, loss and discount is expressed as percentages - solve context problems involving percentages, cost, selling price, profit, loss and discount		

LEARNING OBJECTIVES <i>Learners will:</i>		COMPETENCIES <i>Grade 7 learners should be able to:</i>	
TOPIC 5: ALGEBRAIC NOTATION, PATTERNS, EQUATIONS AND FORMULAE			
(a) Algebraic notation			
understand the difference between a constant and an unknown/variable		- use letters to represent unknown numbers or values in formulae - identify and use the vocabulary of algebra i.e. variables, coefficients, constants, expression, equations e.g., in $P = 2l + 2b$, the letters represent any number and they are called variables; the number 2 is a coefficient, $y + 4$ is an expression but $y + 4 = 7$ is an equation - identify unknowns in equations, e.g., in the equation $y + 4 = 7$, the placeholder represents the number that will make the equation true, y is an unknown; the numbers 4 and 7 are constants	
(b) Algebraic rules and formulae			
know how to write, recognise and interpret rules for relationships in symbolic form		- use the rules and conventions of the language of algebra e.g., $4 \times n$, is written as $4n$, letters are written in alphabetical order i.e. xyz, but not yzx, when the constant is 1, it is not written down i.e. $n + 5$ but not $1n + 5$, we write numbers first in expressions i.e. $3n + 18m$ but not $n3 + m18$ - write formulae for perimeter, area and volume in symbolic form - find the value of expressions by substituting the given numeric values - solve simple equations by inspection, e.g., if $y + 4 = 7$, then $y = 3$	

LEARNING OBJECTIVES <i>Learners will:</i>		COMPETENCIES <i>Grade 7 learners should be able to:</i>
TOPIC 6: MEASUREMENT - LENGTH, MASS, CAPACITY AND TIME		
(a) Length, mass and capacity		
demonstrate their proficiency in solving context problems involving units of length, mass and capacity	- convert between different metric units of length, mass and capacity in the context of a calculation or a problem - solve context problems involving metric units of length, mass and capacity using whole numbers, common fractions, decimal fractions and percentages	
(b) Time		
understand international time zones and demonstrate proficiency in solving context problems involving time	- compare various time zones and calculate time differences between major cities of the world - interpret and use tables relating to time e.g., tide charts, sunrise/sunset tables, bus, train and airline timetables - solve word problems related to time in everyday contexts	
TOPIC 7: GEOMETRY		
(a) Points, lines and angles		
know how to draw, measure and name angles and lines	- recognise that a point is used to indicate a position or a place in Geometry - measure and draw straight, vertical, horizontal, slanting, perpendicular and parallel lines with given lengths using a ruler and a set square - measure and construct angles up to 360° using a ruler and a protractor - identify, name and sketch acute, right, obtuse, straight, reflex angles and revolution	

LEARNING OBJECTIVES <i>Learners will:</i>	COMPETENCIES <i>Grade 7 learners should be able to:</i>
(b) Two-dimensional shapes	
- understand the properties of quadrilaterals and triangles - know the terminologies for circles	- describe, sort, name and compare different kinds of quadrilaterals (square, rectangle, rhombus, parallelogram, trapezium and kite), in terms of their length of sides, parallel or perpendicular sides, angles (right, acute, obtuse) and symmetry - identify, name, describe, sort, and compare different kinds of triangles (equilateral, isosceles and right-angled triangles) in terms of their sides and angles - create circle patterns using a compass - identify and use the following circle terminologies: radius, diameter, circumference, chord and semi-circle
(c) Three-dimensional shapes	
understand the properties of prisms and pyramids	- identify, name, describe, sort and compare prisms and pyramids according to them - number of faces and the shape of their faces - number of edges - number of vertices
(d) Transformations	
understand the basic transformation of geometric figures	- identify translations, reflections and rotations of geometric figures on squared paper - recognise and draw lines of symmetry in geometric figures
(e) Position and movement	
understand the Cartesian co-ordinate system	- describe the position of a point on the first quadrant of the Cartesian plane in terms of its coordinates (x, y) - plot points on the first quadrant of the Cartesian coordinate system - draw geometric shapes with vertices given as coordinates on the first quadrant of the Cartesian coordinate system

LEARNING OBJECTIVES <i>Learners will:</i>	COMPETENCIES <i>Grade 7 learners should be able to:</i>
TOPIC 8: MENSURATION	
(a) Perimeter	
know how to solve problems involving perimeter	- calculate the perimeter of regular and irregular 2-Dimensional shapes - calculate the length of sides of rectangles and squares, given sufficient information
(b) Area	
- know how to solve problems involving the area of squares, rectangles, parallelograms, triangles and composite shapes - know and use standard units for area and their abbreviations	- use the formulae to calculate the areas of squares, rectangles and composite shapes that can be divided into rectangles and squares - calculate the area of the nets of cubes and cuboids - deduce and use the formula to calculate the area of a parallelogram and a triangle - recognise that a hectare (100 m × 100 m) and a square kilometre are units for large areas - use the following abbreviations for metric units of area: cm², m², ha, km² - calculate the length of sides of rectangles given the area and the length or a width of the rectangle
(c) Volume	
know how to solve problems involving the volume of cubes and cuboids and use standard units for volume and their abbreviations	- calculate the volume, in cubic centimetres (cm³) and cubic metres (m³), of cuboids and cubes using the formulae - calculate one unknown dimension of cuboids given the volume and two of the dimensions of the cuboid

LEARNING OBJECTIVES <i>Learners will:</i>	COMPETENCIES <i>Grade 7 learners should be able to:</i>
TOPIC 9: DATA HANDLING	
(a) Collecting, organising, recording and representing data	
• know how to design and use data collection instruments and data recording and representation strategies	• design and use yes/no and/or multiple-choice response questionnaires to collect data • record and organise responses from questionnaires on tables and tally charts • represent data on various types of bar graphs, broken line graphs, pictograms and pie charts (with not more than four sectors)
(b) Interpreting data and reporting	
• know how to extract, analyse and interpret data from various types of graphs	• extract and interpret information from tables, bar graphs, pictograms and broken line graphs • extract and interpret data represented in pie charts (with not more than 4 sectors, including measuring angles) and converting to data • find the mode, median and calculate the average (mean) of a set of discrete data • draw conclusions and/or make predictions from graphs and charts

10. ASSESSMENT

A learner-centred curriculum and learner-centred teaching use a broad range of knowledge and skills which are relevant to the knowledge-based society. The competencies in the syllabus state what understanding and skills a learner must demonstrate as a result of a teaching-learning process, and which will be assessed. However, it is intended that the curriculum be learning-driven, not assessment and examination driven. Assessment and examination are to support learning.

10.1 Types of assessment

Continuous Assessment (CA)

In order to capture the full range and levels of competence, a variety of formal and informal continuous assessment situations is needed to give a complete picture of the learner's progress and achievements in all subjects. Continuous assessment must be clear, simple and manageable, and explicitly anchored in learner-centred principles and practice. Teachers must elicit reliable and valid information of the learner's performance in the competencies. The information gathered about the learners' progress and achievements should be used to give feedback to the learners about their strong and weak points, where they are doing well, and why, where and how they need to try more. The parents should be regularly informed about the progress of their child in all subjects, be encouraged to reward achievements, and given suggestions as to how they can support their learning activities. The learner's progress in all subjects must be reported to parents on the school report.

Formative assessment

Formative assessment is any assessment made during the school year in order to improve learning and to help shape and direct the teaching-learning process. Assessment has a formative role for learners if and when:

- it is used to motivate them to extend their knowledge and skills, establish sound values, and to promote healthy habits of study
- assessment tasks help learners to solve problems intelligently by using what they have learned
- the teacher uses the information to improve teaching methods and learning materials

Summative assessment

Summative assessment is an assessment made at the end of the school year based on the accumulation of the assessment marks of the learner throughout the year in a given subject, together with any end-of-year examinations. The result of summative assessment is a single end-of-year promotion grade.

Informal and formal methods

The teacher must assess how well each learner masters the competencies described in the subject syllabus and from this gain a picture of the all-round progress of the learner. To a large extent, this can be done in an informal way through structured observation of each learner's progress in learning and practice situations while they are investigating things, interpreting phenomena and data, applying knowledge, communicating, making value judgments, and in their participation in general.

When it is necessary to structure assessment more formally, the teacher should, as far as possible, use the same sort of situation as ordinary learning and practice situations to assess the competency of the learner. The use of formal written and oral tests can only assess a limited range of competencies and therefore should not take up a great deal of time. Short tests in any subject should be limited to part of a lesson for the lower grades and a whole

lesson in higher grades. End-of-term tests should only be written in the first lesson of the day, so that teaching and learning can continue normally for the rest of the time. **No end-of-term examinations may be written.**

Evaluation

Information from informal and formal continuous assessment is to be used by the teacher to know where it is necessary to adapt methods and materials to the individual progress and needs of each learner. At the end of each main unit of teaching, and at the end of each term, the teacher, together with the learners, should evaluate the process in terms of tasks completed, participation, what the learners have learnt, and what can be done to improve the working atmosphere and achievements of the class.

10.2 Grade descriptors

The learner's level of achievement in relation to the competencies in the subject syllabus is shown in letter grades. When letter grades are awarded, it is essential that they reflect the learner's actual level of achievement in relation to the competencies. In Grade 1 to 3, letter grades are related to a six-point performance scale, while in Grade 4 to 12 letter grades are related to percentages. The relation between the grades awarded and competencies are shown below.

Grade	% Range	Grade descriptors
A	80%+	Achieved competencies exceptionally well. The learner is outstanding in all areas of competency.
B	70-79%	Achieved competencies very well. The learner's achievement lies substantially above average requirements and is highly proficient in most areas of competency.
C	60-69%	Achieved competencies well. The learner has mastered the competencies satisfactorily in unknown situations and contexts.
D	50-59%	Achieved competencies satisfactorily. The learner's achievement corresponds to average requirements. The learner may be in need of learning support in some areas.
E	40-49%	Achieved the minimum number of competencies to be considered competent. The learner may not have achieved all the competencies, but the learner's achievement is sufficient to exceed the minimum competency level. The learner is in need of learning support in most areas.
U	0-39%	Not achieved the minimum number of competencies. The learner has not been able to reach a minimum level of competency, even with extensive help from the teacher. The learner is seriously in need of learning support.

10.3 Assessment Objectives

The assessment will include, wherever appropriate, personal, social, environmental, economic and technological applications of Mathematics. The assessment must take into account the learner's ability to communicate clearly and logically and apply conventions where appropriate.

Assessment Objective A: Basic knowledge and technical skills	Numeracy and algebraic skills	Place value, +, -, *, / , and order of operation, number sense and approximation, operations with fractions and decimals and conversions, percentages, roots and powers, handling algebraic expressions, solving equations, functions
	Mental arithmetic skills	Multiplication tables, simple + , - , * , / exercises
	Measuring skills	Using measuring instruments (i.e., length, mass, capacity, time) estimating, accuracy
	Drawing skills	Using drawing instruments, i.e., ruler, compass, protractor, accuracy 1 mm, 1°
	Sketching skills (spatial perception)	Recognising and representing key features, i.e., right angles, equi-distance, parallel, proportionality
	Maths language skills	Key words (sum, product,, more, less, equal, large, small), correct use of symbol notations, conventions
	Knowledge of key concepts of Maths in life	Special concepts from money, time and measurements used in real-world problems
Assessment Objective B: Analysing, abstraction and synthesising skills	Problem analysis skills	Identify relevant and irrelevant elements, recognise the problem
		Analyse real world situations, connect correctly to mathematical concepts and translate into mathematical language
	Data analysis skills	Recognise patterns and algebraic relationships, make logical deductions
		Recognise and use spatial relationships in two and three dimensions
	Strategy finding skills	Use exploration strategies, like brainstorming, visualisation, exploring examples, testing and identifying steps
	Summarising and abstraction skills	Recognise an abstract mathematical rule in series of examples and formulate mathematical concepts in words, diagrams and formula
Assessment Objective C: Presentation skills	Combination skills and transfer skills	Combine a variety of appropriate mathematical concepts in solving problems
	Formal presentation skills	Write mathematical work in a clear form using appropriate symbols and terminology
	Logical presentation skills	Organise information, document steps and present problem solutions clearly
	Logical argumentation skills	Judge outcomes of investigations supported by convincing reasons

10.4 Continuous Assessment: Detailed Guidelines

Types of Continuous Assessment

Continuous assessment should be planned and programmed at the beginning of the year, and kept as simple as possible. Marks given for class and homework activities may be recorded for continuous assessment.

In mathematics in the Senior Primary Phase the continuous assessment tasks are as follows:

Practical Investigations: These assess the learners' ability to think and reason independently and to reflect critically on their own thinking.

Projects: A project is a longer assignment than a topic task, and gives learners an opportunity to complete an investigation into one of the themes /topics (e.g., HIV and AIDS) outlined in the syllabus. This type of investigation will enable the teacher and learner to pursue a topic in greater depth and in a more lively and creative way than possible with short discrete topic tasks or investigations. Projects assess the ability of learners to solve problems and apply mathematics processes to everyday life.

Topic Tasks: These are activities that most teachers already use in their day-to-day teaching. These are recorded, assessed activities that could introduce a topic, be used during the teaching of a topic and /or revision a topic. They may well include assessment involving competencies to do with locating information, conducting surveys, analysing information or presenting information

Topic Tests: Completed topics should be concluded with a test indicating the achievements of the learners in these topics. Written tests are specifically set by the teacher to assess the learners' achievements in relation to competencies specified in the syllabus and should consist of both short questions and more structured questions.

End of Term Test: This will be a more comprehensive topic test of the term's work. No homework should be assigned during the time of writing the end of term tests.

Criterion-referenced Grades

When grades are awarded in continuous assessment, it is essential that they reflect the learner's actual level of achievement in the Competencies, and are not related to how well other learners are achieving or to the idea that a fixed percentage of the learners must always be awarded a Grade A, B, C, and so on (norm-referencing). In criterion-referenced assessment, each assessment task must have an assessment rubric with criteria descriptors for what the learner must demonstrate in order to be awarded the grade. It is important that teachers in each department/section work together to have a shared understanding of what the criteria descriptors mean and how to apply them in continuous assessment, so that grades are awarded correctly and consistently across subjects. Only then will the assessment results be reliable.

Summary of Continuous Assessment Tasks

Continuous Assessment Grades 4						
Components	Term 1		Term 2		Term 3	
	Number & Marks	Total	Number & Marks	Total	Number & Marks	Total
Practical Investigations	2×10	20	2×10	20	1×10	10
Topic Tasks	2×10	20	2×10	20	2×10	20
Topic Tests	$(2 \times 10) \div 2$	10	$(2 \times 10) \div 2$	10	1×10	10
End of Term Test	1×20	20	1×20	20		
Term Marks		70		70		40
Weighted Term Marks		100%		100%		

Continuous Assessment Grades 5, 6 & 7						
Components	Term 1		Term 2		Term 3	
	Number & Marks	Total	Number & Marks	Total	Number & Marks	Total
Practical Investigations	2×15	30	1×15	15	2×15	30
Projects			$(1 \times 30) \div 2$	15		
Topic Tasks	2×10	20	2×10	20	1×10	10
Topic Tests	$(2 \times 20) \div 2$	20	$(2 \times 20) \div 2$	20	$(1 \times 20) \div 2$	10
End of Term Test	1×30	30	1×30	30		
Term Marks		100		100		$(50 \times 2) = 100$
Weighted Term Marks		100%		100%		

10.5 End of year examinations: Detailed guidelines

In Grade 5, 6 and 7 there will be internal end-of-year examinations. The purpose of these examinations is to focus on how well learners can demonstrate their thinking, communication and problem-solving skills related to the areas of the syllabus which are most essential for continuing in the next grade. Preparing for and conducting these examinations should not take up more than two weeks altogether right at the end of the year. The purpose of the examination is to assess how far each learner can demonstrate their achievement in reaching the competencies.

The end of year assessment for Grade 4 and 5 will be an end-of-year test of work done in the third term only. In Grade 5, the end-of-year examination will cover the work done during the second and third term only. The end of year examination for Grades 6 and 7 will cover of all the work done during the whole year.

End-of-year test for Grade 4 and Written Examination for Grade 5, 6 and 7			
Grades	Description of written Examination	Duration	Marks
4	End-of-year test	40 minutes	20
5	Paper 1 (Short questions)	50 minutes	25
	Paper 2 (Structured questions)	80 minutes	45
6 and 7	Paper 1 (Short questions)	60 minutes	40
	Paper 2 (Structured questions)	90 minutes	60

10.6 Promotion Mark

A promotion mark will be awarded at the end of each year based on the average of the Continuous Assessment mark and the mark obtained in the examination. In Grade 4 Continuous Assessment contributes 80% of the summative mark, in Grade 5 Continuous Assessment contributes 65% of the summative mark and in Grade 6 and 7, continuous assessment contributes 50% of the summative mark.

The weighting of each assessment component is as follows:

Grade 4: Component	Description	Marks	Weighting
Written end-of-year test	Paper	20	20%
Continuous Assessment	Topic Tasks, Topic Tests, Practical Investigations/Projects, End of Term Test	80	80%
	TOTAL		100%

Grade 5: Component	Description	Marks	Weighting
Written examination	Paper 1	25	13%
	Paper 2	45	22%
Continuous Assessment	Topic Tasks, Topic Tests, Practical Investigations/Projects, End of Term Test	130	65%
	TOTAL		100%

Grade 6 and 7: Component	Description	Marks	Weighting
Written Examination	Paper 1	40	20%
	Paper 2	60	30%
Continuous Assessment	Topic Tasks, Topic Tests, Practical Investigations/Projects, End of Term Test	100	50%
	TOTAL		100%

The promotion marks are calculated as follows:

Promotion Mark for Grade 4				
	Term 1	Term 2	Term 3	Total
Term Mark	70	70	40	180
CA mark	$(\text{Total} \div 180) \times 80$			80
End-of-term test	20			20
Promotion Mark	CA mark + End-of-term test			100

Promotion Mark for Grade 5, 6 and 7				
	Term 1	Term 2	Term 3	Total
Term Mark	100	100	100	300
CA mark Grade 5	$(\text{Total} \div 300) \times 130$			130
End-of-year examination Grade 5	25 + 45			70
CA mark Grade 6 & 7	$(\text{Total} \div 300) \times 100$			100
End-of-year examination	40 + 60			100
Promotion Mark	CA+ End-of-year examination $(\text{Total} \div 200) \times 100$			100

10.7 Specification Grid(s)

A rigid association between particular assessment objectives and individual components of assessment is not appropriate since any of the objectives can be assessed in any question. Nevertheless, the components of the scheme will differ in the emphasis placed on the various objectives. The grid below is for general guidance only and illustrates where particular objectives might receive most emphasis on the various components.

The short-answer questions in Paper 1 of the examination fulfil a particularly important function in ensuring syllabus coverage and allowing the testing of knowledge, understanding and manipulative skills, while the structured questions in Paper 2 place greater emphasis on applications to the processes of problem-solving in.

The specification grid(s) below indicate(s) the weighting allocated to each objective for both Continuous Assessment and for the Written Examination.

Assessment objectives for Written Examination	
Components	Weighting
Objective A Basic Knowledge and Technical skills	30%
Objective B Analysing, Abstraction and Synthesising skills	70%
Total	100%
Assessment Objectives for Continuous Assessment	
Components	Weighting
Objective A Basic Knowledge and Technical Skills	30%
Objective B Analysing, Abstraction and Synthesising skills	50%
Objective C Presentation skills	20%
Total	100%

10.8 Assessment Rubrics/Criteria

The marking rubrics should ideally be less than one page altogether and will meet the following criteria:

For a topic task:

- There must be an Objective A rubric
- There must be an Objective B rubric
- There is NO Objective C rubric

For an investigation:

- There must be an Objective A rubric
- There must be an Objective B rubric
- There may be an Objective C rubric – this is optional and will not happen often

For a project:

- There must be an Objective A rubric
- There must be an Objective B rubric
- There must be an Objective C rubric

Each Objective A, Objective B and Objective C rubric must meet the following criteria:

- Each rubric must address at least one skill (see 10.3 on page 60)
- Each Objective A and Objective B rubric should ideally address more than one skill.
- A particular skill on a rubric may be assessed more than once
- The maximum marks allocated to each Objective rubric must be a multiple of 5 (5, 10, 15, etc. marks)
- Each rubric should independently assess the whole task. For example, if a topic task has a rubric A and rubric B, then both rubrics should allocate marks to all the questions in the task (remember: this is because only one might be used in a particular year).

Example of an Assessment rubric: Fractional parts of quantities (Grade 5 Fractions)

Assessment Objective A Basic Knowledge and Technical Skills	Knowledge of key concepts of Maths in life (Q1)	3 All answers correct	2 Only one answer incorrect.	1 - 0 There is more than one error.
	Numeracy and algebraic skills (Q2)	3 All answers correct	2 Only one answer incorrect.	1 - 0 There is more than one error.
	Numeracy and algebraic skills (Q3, 4)	6 All correct answers obtained, with working shown if required	5 – 3 Most answers are correct	2 - 0 Only a few or no answers are correct
	Maths language skills (Q5.1)	5 - 4 All answers are correct and full or nearly full working is shown	3 - 2 Both answers correct, but with little or no working OR one or both answers wrong but most appropriate working is shown	1 - 0 Does not understand the concepts tested.
	Mental arithmetic skills (Q5.2)	3 All answers correct	2 Only one answer incorrect.	1 - 0 There is more than one error.

ANNEXE 1: GLOSSARY OF ACTION VERBS USED IN MATHEMATICS' TEACHING AND ASSESSMENT

Add up	Perform mathematical addition of figures
Analyse	Examine information in detail to discover patterns and relationships, or to study and determine relationship or accuracy
Apply/use	Use Example: as in “apply the commutative property of addition”, e.g., $3 + 27 = 27 + 3$. For most children it is not obvious that one can do this, but it makes calculation easier, especially when children still count on, instead of going from 3.. to 4, 5, 6, 7, etc., go from 27 .. to 28, 29, 30
Arrange	Put in a particular order or grouping Example: arrange objects in groups of 10
Calculate	To compute; to perform the indicated operation(s)
Classify	To arrange or organise according to systematic groups, classes or categories
Collect data	Pose questions, select sources and/or design questionnaires
Discrete data	Individually separate data, e.g., colour of cars – as opposed to continuous data, such as height
Compare	To state the similarities or differences between two or more numbers, objects, or figures by considering their attributes/characteristics; or to determine if two or more items, entries are the same and if not, identify differences
Compute	To calculate a quantity or a number
Construct	Make an accurate drawing or representation by using mathematical instruments and/or rules Example: Construct a triangle with given measurements, construct a sequence with a given rule
Convert	Change from one unit of measure to another
Correctly use	Emphasises the correct use of a procedure, rule or fact, e.g., a child may be able to use a protractor, but not do so correctly
Count	To name the numbers in order up to and including a given number (e.g., count to 10); to determine the total number or amount of a collection of objects
Create	Produce something using your own ideas or imagination
Deduce	Use the information provided to come to a conclusion, e.g., reference to a law or principle
Define	Describe the exact nature or meaning of something in words
Describe	Give a detailed account in words of what you do, observe or see
Design	Make a plan or drawing to show the appearance of something before it is made
Determine	Establish by calculation or research to decide or t make a conclusion
Derive	Obtain an unknown answer from a known fact Example: 16×4 : Double 16 is 32 and double 32 is 64, so $16 \times 4 = 64$ Comment: The competency to derive unknown answers from a known facts plays a big role in finding answers by mental methods
Discover	Become aware of a fact or situation; gain knowledge of something previously unseen or unknown

Discuss	Give a critical account of the points involved in the topic
Distinguish	Tell apart, show the difference between Example: Distinguish between a rectangle and a square
Divide	Mathematically: To share or group quantities to find a quotient. Generally: separate into parts
Do Mental arithmetic calculations	Apply mental arithmetic strategies Comment: Mental arithmetic calculations are: Computations done “in the head,” either in whole or in part This should not be confused with basic facts knowledge such as multiplication tables and number bonds! Basic facts knowledge is used to do mental calculations, e.g., $34 \times 8 = (30 \times 8) + (4 \times 8) = 240 + 32 = 272$ The development of mental calculations is regarded one of the most important objectives in mathematics – but sadly missing in our syllabuses, because nobody understands how it works!
Double	Increasing by adding an equal amount Comment: the ability to quickly and correctly recall doubles of numbers is important for multiplication and division of numbers as well as for learning multiplication tables Example: If a child knows the 3 times table and can double numbers, it is easy to derive the 6 times table
Draw	Produce a picture or a diagram on paper
Draw up	Prepare a table or a plan
Estimate	Produce an approximate answer using rational, logical procedures (e.g., rounding for numbers and benchmarks for measures)
Evaluate	Use the information provided to make a judgement about something
Explain	Give a reason for your answer
Extract	Extract information from tables or graphs” would mean that you should use the given information to come to some conclusions
Find/ complete	a general term which means fill in, calculate, determine measure or complete a geometric structure or object
Give/state/write down/express	write down your answer Comment: in maths we say for example “express your answer as a fraction in its simplest form”
Half	Halve – divide or separate into two equal parts Comment: the ability to quickly and correctly recall halves of numbers is important for multiplication and division of numbers as well as for learning multiplication tables
Identify	Find out what is unique about a material or situation
Indicate	Point out, show, give a reading of a measurement
Interpret	Reasoning or some reference to theory, depending on the content; explain the meaning of something
Investigate	Examine a problem in a systematic way
List	Give a number of points, generally one word for each
Locate	Find the exact place or position
Make up	Put together or prepare from parts
Measure	Find out the size, amount or degree of something by comparing it with a standard

Multiply	To combine equal groups to find one quantity called a product
Name	Identify by mentioning the name of something
Order	To place numbers or objects in a sequential arrangement Example: least to greatest or heaviest to lightest
Organise	Rearrange according to a plan or system
Organise data in tally forms and tables	Rearrange / summarise data to make it easier to understand and analyse
Outline	Give a brief answer, writing down the main points
Place	Put in a particular position
Plot	Place a point on a coordinate grid
Predict	To determine the next step or value (to make an educated guess), based on evidence or a pattern; make a logical deduction either from your own knowledge or from the information given in the question or both
Pronounce	Say correctly Comment: this is important in early years – children often mispronounce the ..teen and the .., ty (<u>thirteen</u> and <u>thirty</u>)
Read	Comment: In early years learners must ‘read’ numbers which means translate the symbols into words – you read 126 as one-hundred and twenty-six
Rearrange	Changing an arrangement of objects Example: Rearrange a grouping of objects from groups of 2 to groups of 5
Recall	Retrieve from memory without having to think for a long time Comment: basic facts should be recalled quickly and correctly
Recognise	Know something from having come across it before; be aware of a fact or problem
Record	Enter, transcribe, write down
Relate	find the relationship between one or more variables
Represent	Show or describe in a particular way
Represent data	Data can be represented just as a list of numbers or in tables or graphs
Round	To approximate the value of a whole number or decimal to a specific place value
Select	Choose from a number of alternatives
Sketch	Make a rough drawing that shows the salient or distinguishing features of an object; in diagrams, make a simple, freehand drawing and in graph work, the shape and/or position of the curve
Solve	Find an answer to or a way of dealing with a problem or to find the answer to an equation Comment: Calculating implies the use of arithmetic operations and has a numerical answer. Solving is more general and implies the use of different methods and procedures – the answers might not be a number. Methods should always be written down unless a calculation or procedure can be done mentally.
Study	Use the information or data provided to investigate a problem in a systematic way

Subitise	Determine the quantity of a small group of objects rapidly without counting.
Subtract	To take one or more quantities away from another; to find one quantity known as the difference
Suggest	Use your knowledge of the context of the problem and mathematical procedures to give what you think is the best strategy to use or answer to the question Use your knowledge of science and the information in the question to give what you think is the best answer
Summarise	Give a brief account of the most important points
Treat	To deal with in a certain way; to apply a process to
Write	Comment: this is often used to indicate a translation from one representation to another Example: “ Write the numbers from 1 to 100 in words” – here the child should translate the mathematical symbol into words

ANNEXE 2: GLOSSARY OF TERMS

Angle	An angle is formed when two lines cross or meet each other at a point. The size of the angle is measured by the amount one line has turned in relation to the other. Types of angles include: (a) acute angle which is less than 90° , (b) obtuse angle which is more than 90° , (c) right angle which is 90° and straight angle which is 180° .
approximate approximation approximately	Approximate means almost the same. An approximate value is close to the actual value.
Arc	A part of the circumference of a circle or any curved line
Area	A two-dimensional measure of the surface covered measured in square units
ascending order	Placing things in order from the smallest to the largest
average	Average is found by taking the sum of a group of numbers and then dividing by the total number of items. The mathematical term for this average is "arithmetic mean".
base (of a shape)	The face of a 3-Dimensional shape which is at right angles to the height
broken line graph	A graph that represents information through points or dots, which are then joined together by lines (they are the most common graphs, and are used to represent information that changes over a period of time)
Cost price	The price at which an item that is going to be sold is purchased
Capacity	The amount a 3-Dimensional object can hold
Circle	A round figure, every point on the edge (circumference) of which is the same distance from the centre.
Comma	Punctuation mark used in Southern Africa to indicate the slight separation between whole numbers and decimal fractions. A full stop is used for the same purpose in Europe and America
Circumference	The perimeter or the distance around the circle
Common denominator	A number divisible (without leaving a remainder) by all the denominators involved
Cone	A three – dimensional figure like a pyramid but with a circular base
Congruent	Equal in shape and size
Criterion, criteria	Standards, rules or tests by which something can be judged
Cube	A three – dimensional shape with six congruent faces. The six faces are congruent squares
Cylinder	A three – dimensional shape which is bounded by a circular surface and whose end faces are parallel circles
Data	Information in the form of facts or statistics which can be analysed
Decimal	A fraction with a denominator of ten, or some power of ten, indicated by the decimal point in a number.

Denominator	The number indicated below the line in a fraction. It tells a number of parts into which the whole has been divided
Descending order	Placing things in order from the biggest first to the smallest. Counting downwards too.
diagonal, diagonally	A slanting line from the top corner to the bottom corner in a polygon, e.g., a rectangle
Diagram	A sketch, plan, graph that explains something
Diameter	A straight line which joins two points on the circumference of a circle and passes through the centre
Difference	The amount by which one numbers differs from another or the answer you get when you subtract two numbers
Digit	Our decimal system has ten digits 0, 1, 2, 3, 4, 5, 6, 7, 8 and 9. Numbers are made up of digits, e.g., 346 is a three-digit number.
Dimension	The measurable part of the shape. Length, breadth, width, height, depth are the main measures of dimension
Discount	A deduction from the price allowed or offered by the seller of goods or by the provider of services
Discrete	Things which are separate from each other. Points on a line are continuous and are not therefore discrete. Bootle tops are separate and therefore they are discrete.
Edge	The line where two surfaces of a solid shape meet
Equilateral	Having all sides equal. An equilateral triangle has three sides that are equal
Equivalent	The same according to a given criterion
Face	Each individual surface that makes up a solid shape
Factor	A number that divides exactly into another number, e.g., 5 is a factor of 30.
Fraction	A part of a whole.
Graph	A picture used to illustrate a given collection of data
Height	The perpendicular distance from the base to the top of a 2-Dimensional figure or a 3-Dimensional object
Hexagon	A two-dimensional shape with six straight sides
Horizontal	Parallel to the ground
Length	The distance along the longest side of an object
Loss	When a product is sold at a price below its market cost
Lowest term	A fraction with its numerator and denominator not having a common factor greater than 1
Notation	A system of recording numbers by using symbols
Numeral	A symbol used to stand for a number
Octagon	A two-dimensional figure that has eight sides
Ordinal numbers	Numbers used to indicate the order of objects
Parallelogram	A four – sided figure whose pairs of opposite sides are parallel, and equal in length

Pattern	A model or plan identified in a mathematical situation
Pentagon	A two-dimensional shape that has five sides
Perimeter	The distance around an object
Polygon	A closed 2-Dimensional shape with three or more straight sides
Prime number	A whole number greater than 1 that has exactly two factors – the number itself and one. The number 1 is not a prime number.
Prime factor	A factor that is a prime number. All numbers can be expressed as the product of their prime factors, e.g., $18 = 2 \times 3 \times 3$.
Prism	A three-dimensional shape whose parallel cross sections are the same
Profit	Extra amount of money gained from an investment or business operation when a product is sold at a price more than the price it was bought
Pyramid	A three-dimensional figure with triangular faces meeting at a single point whose base is two-dimensional
Quadrilateral	A two-dimensional figure that has four sides
Radius	A straight line from the centre of any circle to the point on the circumference of that circle
Selling price	The price of a product or service that company charges a customer to buy the item.
Sphere	A round three-dimensional shape whose surface is at every point an equal distance from a point called the centre of the sphere
Tessellate	Lay out in a mosaic pattern of small patterned blocks
three-dimensional	Having measurable dimensions in three independent directions (height, width, length)
two-dimensional	Having measurable dimensions in two independent directions (length and width)
two-or three step problems	Word problems involving two or three operations to solve
Variable	The number or numbers indicated by a placeholder in the form of a letters or other symbols
Vertex/vertices	The point where lines, or edges, meet to form an angle
Volume	A measure of how much space a 3-Dimensional object occupies
Width	The distance something measures from one side to the other side

Annexe 3: Metric and SI units

Quantity	Metric units	SI unit
Length	mm, cm, m, km	Metre(m)
Mass	mg, g, kg	Kilogram(kg)
Time	ms, s, min, hr, d, wk, mo, yr	Second(s)
Area	mm ² , cm ² , m ² , Ha, km ²	m ²
Volume	mm ³ , cm ³ , m ³	m ³

Annexe 4: International System prefixes

Factor	Factor in words
1 000 000 000 000 or 10 ¹²	trillion
1 000 000 000 or 10 ⁹	billion
1 000 000 or 10 ⁶	million
1 000 or 10 ³	thousand

Annexe 5: Continuous Assessment Harvest Record Sheet

Harvest Record Sheet: Mathematics	Grade:
Teacher:	Year: .20.....
School:	Semester:

[illegible]

Annexe 6: Assessment Record Sheet for Grade 4 (Term 1 and 2)

ASSESSMENT RECORD SHEET: MATHEMATICS											Grade:			Year:		
School:											Teacher:					
		Practical Investigation/ Project			Topic Task			Topic Test			Total CASS mark	End of Term Test	Term Mark	CA Mark	End of Term Test mark	Report Mark
Name of Learner		1	2	Total	1	2	Total	1	2	Total						
	Mark	10	10	20	10	10	20	10	10	20÷2	50	20	70	Term mark ÷ 70 × 100%	100	
	1															
	2															
	Mark	10	10	20	10	10	20	10	10	20÷2	50	20	70	Term mark ÷ 70 × 100%	100	
	1															
	2															
	Mark	10	10	20	10	10	20	10	10	20÷2	50	20	70	Term mark ÷ 70 × 100%	100	
	1															
	2															
	Mark	10	10	20	10	10	20	10	10	20÷2	50	20	70	Term mark ÷ 70 × 100%	100	
	1															
	2															
	Mark	10	10	20	10	10	20	10	10	20÷2	50	20	70	Term mark ÷ 70 × 100%	100	
	1															
	2															
	Mark	10	10	20	10	10	20	10	10	20÷2	50	20	70	Term mark ÷ 70 × 100%	100	
	1															
	2															
Term 1								Term 2								
Moderated by: Date:								Moderated by: Date:								

Annexe 7: Assessment Record Sheet for Grade 4 (Term 3)

[illegible]

Annexe 8: Assessment Record Sheet for Grade 5

ASSESSMENT RECORD SHEET: MATHEMATICS											Grade:			Year:		
School:								Teacher:								
		Practical Investigation/ Project			Topic Task			Topic Test			Total CASS mark	End of Term Test	Term Mark	CA Mark	Exam mark	Report /Promotion Mark
Name of Learner		1	2	Total	1	2	Total	1	2	Total				130	70	100
	Mark	15	15	30	10	10	20	20	20	40÷2	70	30	100	Total ÷ 300 × 130		100
	1															
	2															
	Mark	15	15	30		10	10		20	20÷2	50		50x2	130	70	200÷2
	3															
	Mark	15	15	30	10	10	20	20	20	40÷2	70	30	100	Total ÷ 300 × 130		100
	1															
	2															
	Mark	15	15	30		10	10		20	20÷2	50		50x2	130	70	200÷2
	3															
	Mark	15	15	30	10	10	20	20	20	40÷2	70	30	100	Total ÷ 300 × 130		100
	1															
	2															
	Mark	15	15	30		10	10		20	20÷2	50		50x2	130	70	200÷2
	3															
	Mark	15	15	30	10	10	20	20	20	40÷2	70	30	100	Total ÷ 300 × 130		100
	1															
	2															
	Mark	15	15	30		10	10		20	20÷2	50		50x2	130	70	200÷2
	3															
Term 1																
	Mark	15	15	30	10	10	20	20	20	40÷2	70	30	100	Total ÷ 300 × 130		100
	1															
	2															
	Mark	15	15	30		10	10		20	20÷2	50		50x2	130	70	200÷2
	3															
Term 1 Term 2 Term 3																
Moderated by: Date: Moderated by: Date: Moderated by: Date:																

Annexe 9: Assessment Record Sheet for Grade 6 and 7

ASSESSMENT RECORD SHEET: MATHEMATICS											Grade:		Year:			
School:											Teacher:					
Name of Learner		Practical Investigation/ Project			Topic Task			Topic Test			Total CASS mark	End of Term Test	Term Mark	CA Mark	Exam mark	Promotion Mark
		1	2	Total	1	2	Total	1	2	Total						
	Mark	15	15	30	10	10	20	20	20	40÷2	70	30	100	Total ÷ 300 × 100		100
	1															
	2															
	Mark	15	15	30		10	10		20	20÷2	50		50x2	100	100	200÷2
	3															
	Mark	15	15	30	10	10	20	20	20	40÷2	70	30	100	Total ÷ 300 × 100		100
	1															
	2															
	Mark	15	15	30		10	10		20	20÷2	50		50x2	100	100	200÷2
	3															
	Mark	15	15	30	10	10	20	20	20	40÷2	70	30	100	Total ÷ 300 × 100		100
	1															
	2															
	Mark	15	15	30		10	10		20	20÷2	50		50x2	100	100	200÷2
	3															

Term 1
Term 2
Term 3

Moderated by: Date: Moderated by: Date: Moderated by: Date:



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