ZIMBABWE

MINISTRY OF PRIMARY AND SECONDARY EDUCATION

MATHEMATICS

JUNIOR (GRADE 3-7) SYLLABUS

(2015 - 2022)

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1.0 PREAMBLE

1.1 Introduction

Mathematics is one of the nine learning areas in junior school which provides a foundation for mathematical skills to be used in everyday life. This learning area intends to foster knowledge, routine manipulation, understanding, application and problem solving skills as well as develop a positive attitude towards the use of technology. The syllabus provides progression from one level to another. Teachers are encouraged to link the developmental stages of learners and their learning abilities to relevant competency and methodology. Although the objectives are organized on a grade by grade basis, flexibility is allowed to cater for the differences in learning ability. The pace should be determined by the needs of the learner and the environment. Learners are encouraged to work diligently preparing for vocational, enterprise skills and further studies. Integration of mathematical skills in other learning areas is encouraged.

1.2 Rationale

Mathematics is a key fundamental tool in life that aims to prepare Zimbabwean citizens for a productive life in the twenty first century. As a nation, the development of highly skilled manpower is critical to support an innovation and technology driven economy. An understanding of mathematical concepts and the ability to apply these concepts in practical situations are valuable attributes which enable new skill sets that empower citizens to live and work competitively in the global village. While some professions such as engineering, medicine and architecture require high levels of Mathematics, almost all jobs require some level of mathematical skills. In addition, managing many aspects of our personal lives such as unhu/Ubuntu/vumunhu understanding nutrition and organising our finances demand mathematical competence.

1.3 Summary of Content

The syllabus is designed to cover the five years of Junior School Education in Mathematics which will form a firm foundation for Secondary Education and further studies. The content to be covered will include number, operations, measures and relationships. The learners will be exposed to mathematical and scientific skills which will enable them to explore their environment for sustainable development. Learner performance will be evaluated through summative and continuous assessment which will allow self-evaluation and career identification.

1.4 Assumptions

It is assumed that the learners;

- have numeracy and literacy skills
- are motivated to make progress in learning
- have prior knowledge of Information and Communication Technologies (ICTs) and e-learning
- have knowledge of shapes and form

1.5 Cross-Cutting Themes

This learning area will encompass and have a universal thrust on the following cross-cutting themes:

- Financial literacy
- Collaboration
- HIV and AIDS
- Heritage studies
- Children's Constitutional Rights and responsibilities
- Gender
- ICT
- Environmental issues
- Disaster Risk management
- Enterprise Skills
- Inclusivity

2.0 PRESENTATION OF THE SYLLABUS

The Junior School Mathematics Syllabus is presented as one document covering Grades 3-7. The document presents: Preamble, Aims, Syllabus Objectives, Topics, Scope and Sequence, Competency Matrix and Assessment.

3.0 AIMS

The syllabus aims to help learners to:

3.1 develop holistically and show a positive attitude towards Mathematics;

3.2 acquire and apply mathematical concepts and skills and use them as tools in study, work, leisure and everyday transactions through use of technology;

3.3 think and express themselves clearly and logically;

3.4 develop an inquiring mind through child centred approaches;

3.5 prepare for vocation and further studies in Mathematics and other learning areas and

3.6 develop an awareness of the importance of culture in the learning of Mathematics.

4.0 SYLLABUS OBJECTIVES

Learners should be able to:

4.1 recall, recognise and use mathematical symbols, terms and definitions;

4.2 carry out calculations accurately with the aid of various technological devices;

4.3 estimate, approximate and use appropriate degree of accuracy;

4.4 read, interpret and use tables, charts and graphs;

4.5 solve mathematical problems showing steps and necessary information;

4.6 develop and use appropriate formulae and /or appropriate algorithms to solve problems;

4.7 interpret and apply Mathematics in life situations;

4.8 explore mathematical and scientific ideas and come up with innovations and conclusions and

4.9 demonstrate how people are influenced by mathematics.

5.0 METHODOLOGY AND TIME ALLOCATION

Teaching and learning methods which help learners build interest and confidence in solving problems are recommended. Learner centred and multi-sensory approaches as well as principles of individualisation, concreteness, totality and stimulation should be employed to enhance the suggested teaching/learning methods. The teaching and learning process must be inclusive, gender sensitive and encourage collaboration. This will promote self-confidence, mathematical ethics, unhu/Ubuntu /vumunhu children's rights and responsibilities among others. The use of technological tools such as smartphones is recommended in problem solving. The following are suggested teaching and learning methods:

- Discovery
- Project work
- Experimentation
- Research
- Exploration
- Role play
- Poetry
- Drama

- Simulation
- Games

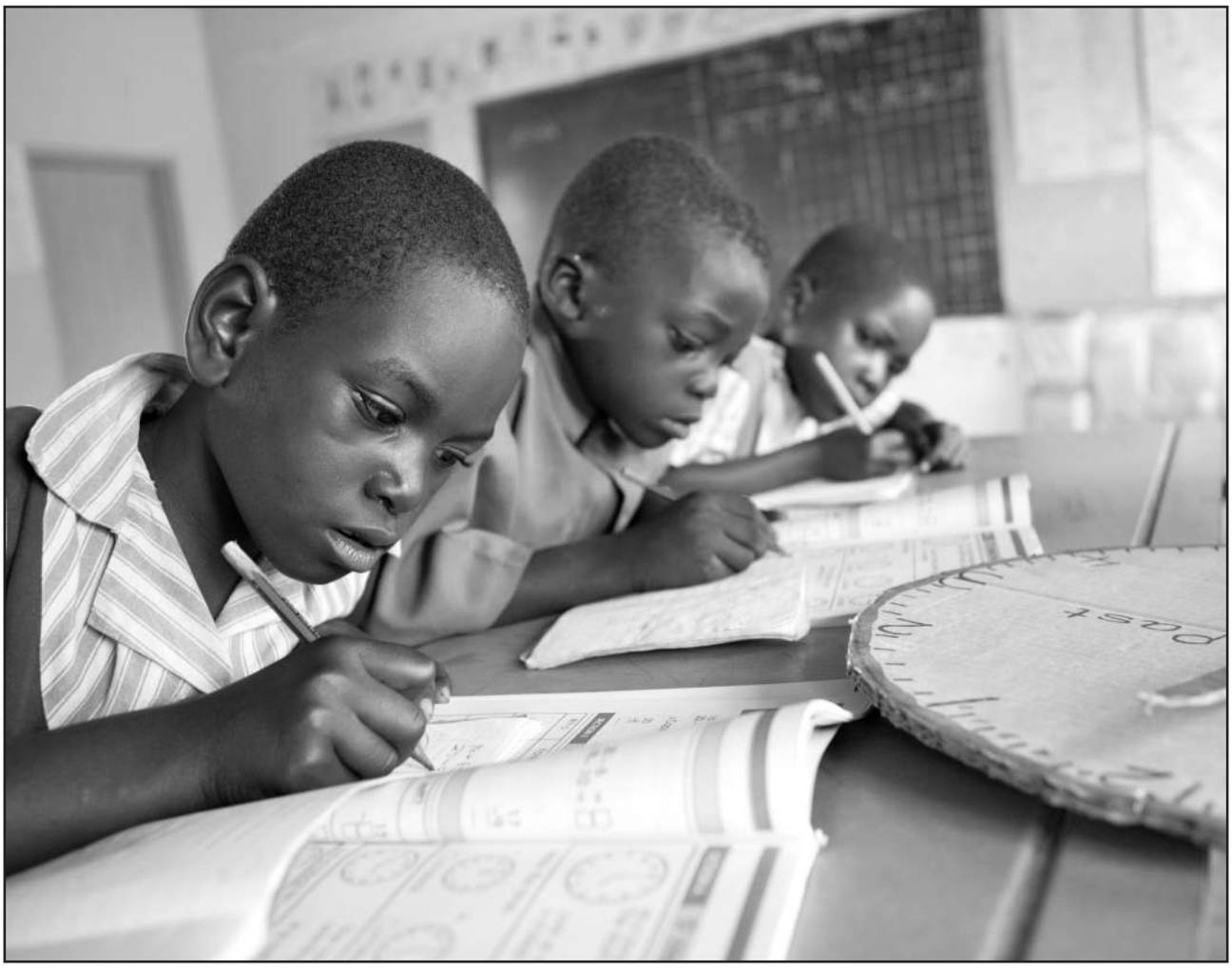
Time Allocation

It is recommended that Mathematics be allocated at least 3 hours per week for Grades 3 to 7

NB: 6 periods of 30 minutes

6.0 TOPICS

5.1 Number
5.2 Operations
5.3 Measures
5.4 Relationships



7.0 SCOPE AND SEQUENCE

TOPIC	GRADE 3	GRADE 4	GRADE 5	GRADE 6	GRADE 7
NUMBER	• Whole numbers • Numerals (0 to 1000) • Words (zero to one thousand) • Number notation • Place value of digit (zero to 1000) • Ordinal numbers from first to thirtieth • Quantifying of number • Cardinal numbers (0 to 1000) • Number sequence (counting in hundreds to one thousand) • Approximation (nearest 10 and 100) • Estimation (0 to 1 000) • Numeration system (Arabic and Roman numerals: I to X) • Proper fractions (denominators 2, 4, 5 and 10)	• Whole numbers • Numerals (0 to 10 000) • Words (zero to ten thousand) • Ordinal numbers from first to hundredth • Place value of digits • Comparison and approximation (nearest 10, 100 and 1 000) • Numeration system (Arabic: 1- 50 and Roman Numerals: I to L or vice versa) • Proper fractions (denominators 2, 10, 20, 50 and 100) • Mixed numbers (with denominators 2 to 10, 20, 50 and 100) • Decimals (up to 2 decimal places) • Rounding off decimals to the nearest unit/whole number • Percentages	• Whole numbers • Numerals (0 to 100 000) • Words (zero to hundred thousand) • Place value of digits • Comparison and approximation (nearest 10, 100, 1 000 and 10 000) • Number sequence (counting in thousands to one hundred thousand) • Proper fractions (where denominators are 2 to 10, 20, 50 and 100 • Mixed numbers • Numeration system (Arabic and Roman: I to C) • Decimals (up to 3 places) • Rounding off decimals to the nearest unit and 1 decimal place • Percentages	• Whole numbers • Numerals (0 to 1 000 000) • Words (zero to one million) • Comparison and approximation (nearest 10, 100, 1 000, 10 000 and 100 000) • Estimation (0 to 1 000 000) • Decimals (with up to 6 digits including up to 3 decimal places) • Rounding off decimals up to 2 decimal places • Proper fractions (where denominators are 2 to 10 and multiples of 5 up to 100) • Mixed numbers (where denominators are 2 to 10 and multiples of 5 up to 100) • Numeration system (Arabic and Roman numerals from I to D) • Percentages	• Whole numbers • Numerals (0 to 10 000 000) • Words (zero to ten million) • Comparison 0 to 10 000 000) • Approximation (nearest 10, 100, 1 000, 10 000, 100 000 and 1 000 000) • Place value of digits • Roman numerals: I to M • Decimals (with up to 8 digits including up to 3 decimal places) • Rounding off decimals to 2 decimal places • Proper fractions (where denominators are 2 to 10 and multiples of 5 up to 1 000) • Mixed numbers (where denominators are 2 to 10 and multiples of 5 up to 100) • Percentages
OPERATIONS	• Addition of whole numbers whose sum is less than or equal to 1 000 • Subtraction of whole numbers (0 to 1 000) • Addition of proper fractions (same denominators 2, 4, 5 and 10)	• Addition of whole numbers whose sum is less than or equal to 10 000 • Subtraction of whole numbers (0 to 10 000) • HCF and LCM • Multiplication of whole numbers whose product is less than 10 000	• Addition of whole numbers whose sum is less than or equal to 100 000 • Subtraction of whole numbers (0 to 100 000) • HCF and LCM • Multiplication of whole numbers where the multipliers are two digit numbers made of 0 to 5,	• Addition of whole numbers whose sum is less than or equal to 1 000 000 • Subtraction of whole numbers (0 to 1 000 000) • Addition and subtraction of proper fractions with denominators of 2 to 10 and multiples of 10 up to 100	• Addition of whole numbers whose sum is less than or equal to 10 000 000 • Subtraction of whole numbers (0 to 10 000 000) • Addition and subtraction of proper fractions with denominators of 2 to 10 and multiples of 5 up to 100

TOPIC	GRADE 3	GRADE 4	GRADE 5	GRADE 6	GRADE 7
	• Subtraction of proper fractions (two fractions with the same denominators 2, 4, 5 and 10) • HCF and LCM • Multiplication of whole numbers (whose product is 0 to 1 000 and where the multiplier is a one-digit number) • Division of whole numbers (1 to 1 000 by a digit) • Multiplication of whole numbers by fractions with denominators 2, 4, 5 and 10	• Division of whole numbers by one digit (1 to 10 000) • Addition of proper fractions (where denominators are the same and not more than 3 terms are involved) • Subtraction of proper fractions (where denominators are the same and not more than 3 terms are involved) • Multiplication of proper fractions (with denominators from 2 to 10 and 100) • Addition of decimals (up to two places) • Subtraction of decimals (up to two places)	multiples of 10 up to 100 • Division of whole numbers by two digit numbers, multiples of 10 and 100 • Addition and subtraction of decimals (up to 2 decimal places) • Multiplication and division of decimal numbers by one or two digit whole numbers • Addition and subtraction of fractions where not more than three terms are involved • Multiplication of fractions by whole numbers not exceeding 100 • Percentages	• Addition and subtraction of mixed numbers where denominators are 2 to 10 and multiples of 10 up to 100 • Addition and subtraction of decimals with up to six digits including up to three decimal places • HCF and LCM • Multiplication and division of whole numbers, fractions and decimals • Combined operations • Ratio and scale: expressing ratios, dividing quantities and measures using ratio • Scale interpretation and drawing	• Addition and subtraction of mixed numbers where denominators are 2 to 10 and multiples of 5 up to 100 • Addition and subtraction of decimals with up to eight digits including up to three decimal places • HCF and LCM • Multiplication of whole numbers where the multipliers are three digit numbers and multiples of 5 to 100 • Division of whole numbers by three digit numbers and multiples of 5 up to 100 • Multiplication and division of decimals • Multiplication and division of proper fractions and mixed numbers up to a maximum of three terms where the denominator is below 10 • Financial transaction: selling price, cost price, profit, loss, percentage profit and loss, discount, commission, interest, percentage, hire purchase, sales tax and Value Added Tax (V.A.T.) • Combined operations • Proportion, ratio and scale • Exchange rate

TOPIC	GRADE 3	GRADE 4	GRADE 5	GRADE 6	GRADE 7
MEASURES	• Money (up to $10,00) • Change • Time: hourly, half hourly and quarter hourly • Days of the week and months of the year • Seasons of the year • Conversions of time • Mass: standard measures (100g, 200g, 500g, 1kg) • Length (up to 10 m) • Perimeter • Rate: fixed period of time. • Area: non-standard measures and standard measures in cm^2 • Volume and capacity: half litre and 1 litre • Direction, angles and lines • Shapes: plane and solid	• Money (up to $100,00) • Conversions • Time units • Approximation of time, am, noon, pm, midnight and fortnight • Conversions • Mass: units and conversion of mass up to 10kg • Length (0 to 30cm), (1m to 100 m) • Rate: relating two measures • Area: rectangle, square and right angled triangle • Volume and capacity -conversion of units • Direction, angles and lines • Shapes: solid and plane	• Money: notes and coins in use (up to $1 000,00) • Time: tell and estimate time to the nearest minute • Units of time • Mass (quantities up to 100 kg) • Length: standard and non-standard units, perimeter of rectangle and square • Rate: relate 2 quantities • Area: standard and non-standard units (rectangle, square and triangle) • Volume and capacity: cube and cuboid • Direction (8 cardinal points), lines and angles • Shapes: solid and plane • Polygons with sides up to 10	• Money: up to $10 000,00 • Invoices, profit and loss • Time: second to a century • 12 hours and 24-hour notation (digital clock) • Standard International units • Mass: units from a gram up to a tonne • Length (non-standard and standard units up to 1 000m) • Rate: linking 2 quantities, use of formula $S = \frac{D}{T}$ • Area of rectangle, square, triangle and composite shapes • Volume and capacity: regular and irregular shapes • Direction, lines and angles • Cardinal points • Angles on horizontal, vertical and perpendicular lines • Shapes: symmetry • Geometrical properties of a circle	• Money: preparing and interpreting financial transactions • Mass from gram up to a tonne • Length: standard units up to a kilometre • Time: Operations on time 24 hour and 12-hour notation (digital clock) • Rate: distance, speed and time • Area: rectangle, triangle, square, combined and irregular shapes (units of area up to a hectare) • Volume and capacity: up to a cubic metre • Direction, angles and lines: including acute, obtuse, right, straight, reflex angles and complete revolution • Arc and chord of a circle • Shapes: 2 and 3 dimensional
RELATION-SHIPS	• Data handling: - tables - bar graphs - tally system	• Data handling: - tables - bar graphs - column graphs - pie charts	• Data handling: - tables - bar graphs - column graphs - ready reckoners - pie charts	• Data handling: - tables - bar graphs - column graphs - ready reckoners - pie charts	• Data handling: - tables - bar graphs - column graphs - pie charts - ready reckoners - jagged line graphs

8.0 COMPETENCY MATRIX

8.1 GRADE 3 TOPIC: NUMBER

SUB-TOPIC	OBJECTIVES Learners should be able to:	CONTENT (Attitude, skills, knowledge)	SUGGESTED LEARNING ACTIVITIES AND NOTES	SUGGESTED RESOURCES
Whole numbers (0 to 1000)	• read and write any number in numerals and words in the range • identify, read, write and count forward and backwards within the range • identify a number before and after a specified number • identify multiples of 2, 3, …, 10 • supply missing numbers on a number line • state the value of digits in a number within the range • expand numbers • round off numbers to the nearest ten or hundred • identify, list, read and write even or odd numbers in the range • convert Roman numerals to Arabic numerals and vice versa in the range (I to X)	• Numerals and words • Number sequence • Number notation • Place value • Approximation (rounding off) • Numeration systems (Roman and Arabic numerals)	• Saying, reading and writing in numerals and words using the numbers from 0 to 1 000 • Counting forward and backwards in the range from a number • Supplying neighbours of numbers • Counting in multiples of two, three, up to ten • Giving missing numbers in a sequence • Locating numbers on a number line in the range 0 to 1000 • Determining place value of a digit in a number for example 4 in 427, represents hundreds • Expressing numbers in the range in expanded notation and vice-versa for example 152 = 100 + 50 + 2 or 200+90+7=297 • Rounding off to the nearest ten or hundred • Identifying numbers as odd or even • Supplying odd or even numbers in a range • Reading and writing numbers in Arabic and Roman numerals or vice versa	• Number lines, charts, number strips with patterns, cards with numbers to be expanded, place value charts, abacuses and ICT tools
Ordinal numbers	• tell positions of objects in a row • arrange a set of numbers in order	• Ordinal numbers from first to thirtieth	• Arranging and telling positions of objects according to some order • Writing ordinal numbers denoting positions	• Sets of objects, number line charts, vocabulary chart providing words for ordinal numbers and flash cards

SUB-TOPIC	OBJECTIVES Learners should be able to:	CONTENT (Attitude, skills, knowledge)	SUGGESTED LEARNING ACTIVITIES AND NOTES	SUGGESTED RESOURCES
Quantifying numbers	• arrange in ascending and descending order a set of numbers • compare any two numbers by inserting the correct sign between them • estimate within reasonable range	• Quantifying number (cardinal numbers 0 to 1000) • Comparisons (>, <, =) • Estimation	• Ordering numbers from highest to lowest and vice versa • Comparing any two numbers in the range using <, > and = signs • Estimating number of elements in any set such as books in a pile, school enrolments and checking by counting and verifying from records	• Number lines, charts, piles of books, seeds, attendance registers, stock books and class inventories
Fractions	• read and write fractions in numerals • draw shapes and shade to represent fractions • name fractions shaded in a diagram • express fractions in their equivalent form • compare fractions • arrange fractions in ascending and descending order	• Proper fractions (denominators 2, 4, 5 and 10)	• Saying and reading fractions with 2, 4, 5 and 10 as denominators • Interpreting diagrammatic representations of fractions • Folding paper into equal parts and shading required parts • Demonstrating what the numerator and the denominator of a fraction represent • Matching fraction strips or number line charts to find equivalent fractions • Comparing any two fractions using the equivalency charts and <, > and = signs • Arranging fractions in ascending and descending order • Solving leading to the discovery of equivalent fractions	• Regular geometric shapes, fruits, paper strips, fraction charts and plastic materials

8.2 GRADE 3 / TOPIC: OPERATIONS

SUB-TOPIC	OBJECTIVES Learners should be able to:	CONTENT (Attitude, skills, Knowledge)	SUGGESTED LEARNING ACTIVITIES AND NOTES	SUGGESTED RESOURCES
Addition	• add numbers without carrying • add vertically numbers which require carrying once or twice • demonstrate addition by using commutative and associative laws	• Addition of whole numbers whose sum is less than or equal to 1 000	• Reinforcing basic facts through mental work. • Calculating the sum of two or three whole numbers which do not involve carrying, for example: 462 + 27 _____ • Adding two or three whole numbers carrying only once, for example: (1) 127 + 245 = ____ (2) 281 + 145 = ___ • Finding the total of two or three whole numbers, carrying only twice, for example: (1) 259 + 183 = ___ (2) 540 + 360 = ___ • Working out problems involving the commutative and associative laws with two or three numbers within the range for example Commutative: 242 + 113 = 355 113 + 242= 355 Therefore 242 + 113 = 113 + 242 Associative: 112 + (224 + 101) = (112 + 224) + 101 • Applying addition to measures relating to everyday transactions such as money, time, mass, length and volume **NB: teachers should not teach the terms commutative and associative**	• Abacuses, work cards, flash cards, number lines, counters, smart phones and calculators

SUB-TOPIC	OBJECTIVES Learners should be able to:	CONTENT (Attitude, skills, Knowledge)	SUGGESTED LEARNING ACTIVITIES AND NOTES	SUGGESTED RESOURCES
Subtraction	• subtract numbers within the range • subtract numbers with one to two equal additions	• Subtraction of whole numbers (0 to 1 000)	• Reinforcing basic subtraction facts through mental work • Subtracting numbers such as 476 - 105 35 - 20 = • Decreasing numbers with one equal addition such as (1) 455 (2) 345 - 129 - 172 • Differentiating numbers with two equal additions such as 724 - 158 • Applying subtraction of measures such as mass, length, time, volume	• Abacuses, work cards, flash cards calculators, computer and smartphones
Addition of proper fractions	• identify denominators and numerators in fractions • add two proper fractions with the same denominators • find missing values in fraction sentences.	• Addition of 2 proper fractions with the same denominators 2, 4, 5 and 10.	• Stating parts of a fraction. • Summing up proper fractions with the same denominators using diagrams. • Putting missing values in sentences involving addition such as $\frac{3}{5} + \square = \frac{5}{5}$	• Fraction strips and diagrams, charts, open sentences on work cards counters and ICT tools
Subtraction of proper fractions	• subtract proper fractions with the same denominators	• Subtraction of 2 proper fractions with the same denominators 2, 4, 5 and 10.	• Demonstrating subtraction of proper fractions with the same denominators within the range such as $\frac{4}{4} - \frac{2}{4} = \frac{2}{4}$	• Fraction strips, regular diagrams, charts, work cards, fraction number lines and counters.

SUB-TOPIC	OBJECTIVES Learners should be able to:	CONTENT (Attitude, skills, Knowledge)	SUGGESTED LEARNING ACTIVITIES AND NOTES	SUGGESTED RESOURCES
	• find missing values in fraction sentences.		• Putting missing values in fraction sentences involving subtraction for example; $\frac{4}{4} - \square = \frac{1}{4}$ • Applying subtraction to measures such as mass, length, time and volume	
Multiplication	• demonstrate that multiplication is repeated addition • multiply any number by one-digit multiplier with or without carrying • recall multiplication facts mentally • identify factors of numbers within in the range 0 to 100 • find missing values in multiplication sentences	• Multiplication of whole numbers whose product is 0 to 1 000 and where the multiplier is a one digit number • factors	• Using the multiplication sign in repeated addition such as 3 + 3 + 3 = 3 (3) = 3 x 3 = 9 • Constructing multiplication tables up to 10 • Multiplying by one-digit multiplier without carrying such as 314 x 2 Multiplying by one-digit multiplier with one carry such as 328 x 2 • Reinforcing basic multiplication facts mentally. • Finding factors of numbers within the range 0 to 100 • Applying multiplication to measures such as mass, length, time and volume	• Number lines, multiplication tables, work cards, flash cards , smart phones and calculators
Division of whole numbers	• share equally with or without a remainder • divide by one digit divisors using repeated subtraction	• Division of whole numbers (1 to 1 000 by a digit)	• Reinforcing basic division facts mentally. • Demonstrating division by sharing equally with or without a remainder. • Using a number line to demonstrate division as repeated subtraction such as 22 ÷ 6	• Number lines, counters, pencils, books, flash cards, work cards, calculators and smartphones

SUB-TOPIC	OBJECTIVES Learners should be able to:	CONTENT (Attitude, skills, Knowledge)	SUGGESTED LEARNING ACTIVITIES AND NOTES	SUGGESTED RESOURCES
			is 22 - 6 = 16 first step 16 - 6 = 10 second step 10 - 6 = 4 third step Number of times is 3 r 4 • Using the division sign for example 14 ÷ 2 = 7. • Dividing numbers with or without remainder such as (i) 40 ÷ 5 = 8 and (ii) 15 ÷ 6 = 2 r 3	
Multiplication of whole numbers by fractions	• multiply a whole number by a proper fraction	• Multiplication of whole numbers by proper fractions with denominators 2, 4, 5 and 10.	• Illustrating multiplication of whole numbers by proper fractions as repeated addition such as (3) $\frac{1}{4}=\frac{1}{4}+\frac{1}{4}+\frac{1}{4}=\frac{3}{4}$ • Using diagrams to demonstrate multiplication of a whole number by a proper fraction and using the word "of " such as (1) $\frac{1}{2}$ of 12 = 6 or 12 halves make 6 units or 12 $(\frac{1}{2})$= 6 (2) $\frac{1}{4}$ of 16 = 4 or 16 $(\frac{1}{4})$ = 4 • Applying multiplication to measures such as mass, length, time and volume	• Counters, fraction charts and regular diagrams such as rectangles, calculators and smartphones.

8.3 GRADE 3 / TOPIC: MEASURES

SUB-TOPIC	OBJECTIVES Learners should be able to:	CONTENT (Attitude, skills, Knowledge)	SUGGESTED LEARNING ACTIVITIES AND NOTES	SUGGESTED RESOURCES
Money	• identify currency up to $10,00 • describe features on coins and notes • convert cents to dollars and vice-versa • calculate composition of amounts in terms of smaller notes and coins • apply the concept of buying and selling	• Currency up to $10,00 • Conversions • Money denominations • Buying and selling	• Identifying coins and notes in use in Zimbabwe • Reading inscriptions on coins and notes • Expressing cents in dollars and vice versa • **Describing the heritage features on different coins and notes** • Matching prices to items • Reading ready reckoners and tables • Breaking down amounts into smaller denominations such as $10.00= $5.00 + $2.00 + $2.00 + $1.00 • **Buying and selling exercises using the shop corner in the classroom to enhance financial literacy and enterprise skills** • Visiting shops to understand the value embedded on the shop items.	• Real coins and notes, paper money, conversion tables or ready reckoners, shop items, adverts of prices in newspapers and calculators
Time	• tell time up to the hour, half hour and quarter hour • recognise days of the week, seasons and months of the year • convert units of time	• Time telling • Days of the week, months of the year and seasons • Conversions	• Making clock faces and showing time on clock faces • Reading time on clock faces by the hour, half hour and quarter hour • Changing hours to days, days to weeks, weeks to months, months to years and vice-versa • **Stating days of the week, months of the year and seasons in relation to national events such as Independence, Heroes and sacred days (Chis/ Iziko)**	• Clock faces, calendars, scissors and manila
Mass	• find the mass of objects by weighing • compare mass of different objects using weights	• Standard measures	• Estimating mass of objects as more or less than a kilogramme for example 1 000g = 1 kg ½ kg = 500 g	• Scale, weights of 100g, 200g, 500g and 1kg, balance scale, sand, fruits and see- saw
Length	• measure length of objects and lines accurately	• Length up to 10metres • Perimeter	• Measuring lines of different lengths in centimetres	• Metre rules, conversion tables,

SUB-TOPIC	OBJECTIVES Learners should be able to:	CONTENT (Attitude, skills, Knowledge)	SUGGESTED LEARNING ACTIVITIES AND NOTES	SUGGESTED RESOURCES
	• calculate perimeter of shapes		• Measuring length up to 10 metres using sticks, measuring tape and string • Finding perimeter of shapes by measuring • Discussing where length and perimeter are in important life **NB: The above activities to be done in groups to promote collaboration which will enhance *unhu/Ubuntu/vumunhu***	metre sticks, strings, tape measures, 30 centimetres rulers, click wheels and string
Rate	• state fixed periods of time to express rate • compare the rate of task completion	• Fixed period of time • Rate	• Performing tasks within a time such as filling a 5 litre container with sand/fine particles in a specified time • Stating time taken to perform different activities	• Clocks, stop watches, sand and containers
Area	• measure and compare area using standard and non-standard equal units • count square centimetre squares covering rectangular or square surfaces	• Standard and non-standard measures	• Finding area using non-standard units • Finding area using square centimetres • Comparing area by covering surfaces using standard units • Discussing where areas is important in life	• Tables, books, squared papers, floors and tiled floors
Volume and capacity	• calculate volume and capacity of containers • compare volume of solid objects by displacement	• Half litre and one litre • Volume by displacement	• Finding volume and capacity of containers by filling them using $\frac{1}{2}$ litre and 1 litre jugs and counting • Demonstrating volume of solid irregular objects by displacement	• Containers of various sizes, one litre and half litre containers, graduated containers, liquids, sand, fine particles and solid irregular objects **NB: Avoid poisonous liquids and contaminated containers**
Direction, angles and lines	• give direction of objects and places using the four cardinal points • find direction shown by	• Four cardinal points	• Identifying direction of familiar places by pointing and indicating the position in terms of the four cardinal points (North, South, East and West)	• Squared paper, dices, compasses, electronic

SUB-TOPIC	OBJECTIVES Learners should be able to:	CONTENT (Attitude, skills, Knowledge)	SUGGESTED LEARNING ACTIVITIES AND NOTES	SUGGESTED RESOURCES
	arrows on grids		• Discussing things which are located in the N, E, W and S in relation to the local environment • Playing games involving following direction such as Treasure hunting with instructions like 2 steps facing East, 10 steps facing North, then 2 steps facing South • Showing positions and movements on a grid such as route from A to B following lines on the grid **NB: Knowledge of four cardinal points help learners to locate positions where certain events occurred such as rape, burglary and theft**	devices, improvised compasses indicating North, South, East and West
Shapes	• draw plane shapes • name solid shapes • model solid shapes	• Plane shapes and Solid shapes	• Drawing representations of squares, rectangles, triangles and circles • Identifying cylinders, cubes rectangular prisms and spheres from an assortment of solid shapes • Modelling the solid shapes such as cubes, cylinders and prisms • Cutting out plane shapes • Describing and filling in properties of plane and solid shapes • Discussing shapes found in Zimbabwe artefacts	• Solid shapes, chart with plane shapes, pairs of scissors, plasticise, clay, sheets of paper. templates and ICT tools

8.4 GRADE 3 / TOPIC: RELATIONSHIPS

SUB-TOPIC	OBJECTIVES Learners should be able to:	CONTENT (Attitude, skills, knowledge)	SUGGESTED LEARNING ACTIVITIES AND NOTES	SUGGESTED RESOURCES
Data handling	• represent information using tally system • interpret information from tables • interpret information from bar graphs • collect data • draw bar graphs to represent data	• Tally system • Tables • Bar graphs	• Showing data using tally system • Reading information shown by tally system • Reading information in tables • Solving problems using tables • Representing information in the form of tables • Answer questions using bar graphs • Interpreting data in order to answer questions using bar graphs • Conducting simple investigations and gathering data within the classroom and the local environment such as ages, trees, shoe sizes, months of birth and drawing tables and bar graphs as a project **NB: This exercise will help in promoting critical thinking, enterprise skills and environmental awareness.**	• Time tables, newspaper cuttings of tables and graphs, calendars and charts with graphs

8.1 GRADE 4 / TOPIC: NUMBER

SUB-TOPIC	OBJECTIVES Learners should be able to:	CONTENT (Attitude, skills, knowledge)	SUGGESTED LEARNING ACTIVITIES AND NOTES	SUGGESTED RESOURCES
Whole numbers (0 to 10 000)	• identify, read and write numbers in numerals and words in the range • tell positions of objects in a row • arrange sets of numbers in order • use abacuses to represent numbers • draw abacuses to show numbers • write whole numbers in expanded notation	• Numerals • Words • Ordinal numbers • Place value of digits	• Saying, reading and writing any number in numerals or words • Identifying positions of objects • Writing numbers showing positions within the range 1st to 100th • Representing numbers on abacuses or using bundles and / or sticks • Reading and writing numbers in expanded notation such as 4 260 = 4000 +200 + 60	• Abacuses, number cards, number lines number squares and sticks
Whole numbers	• compare any two numbers using comparison signs (<,>, =) • arrange numbers in order of size • round off to the nearest ten, hundred and thousand • estimate quantities of objects	• Comparisons signs (<, >, =) • Approximation • Estimation	• Comparing any two numbers, objects and quantities using less than, greater than and equal signs • Ordering numbers in ascending and descending order • Approximating quantities by rounding off numbers to the nearest ten, hundred and thousand • Estimating with reasonable accuracy the number of objects and cross checking by counting	• Objects in the environment such as maize cobs, maize plants, trees, school enrolment records, counters and technological devices
Arabic and Roman numerals	• read and write numbers in Arabic and Roman numerals • convert numbers from Arabic to Roman numerals and vice-versa	• Numeration systems (Roman numerals I to L)	• Matching game using number cards • Expressing Arabic as Roman numerals and vice-versa	• Abacuses, clock faces with Roman and Arabic numerals, number cards in Roman numerals, number cards of Arabic and Roman numerals
Proper fractions	• read and write fractions in numerals • interpret diagrams representing fractions	• Fractions with denominators 2 to 10, 20, 50 and 100	• Identifying, reading and writing fractions in numerals • illustrating using diagrammatic representations of fractions	• Regular shapes that can be divided, number line chart, fraction charts and

SUB-TOPIC	OBJECTIVES Learners should be able to:	CONTENT (Attitude, skills, knowledge)	SUGGESTED LEARNING ACTIVITIES AND NOTES	SUGGESTED RESOURCES
	• draw, name and shade fractions on diagrams • reduce fractions to lowest terms • use fractions and number strips to find equivalent fractions • compare fractions • arrange fractions in ascending or descending order		• Simplifying fractions to lowest terms • Matching and sorting fractions by size using number strips • Using common denominator • Reduce fractions to lowest	fraction strips
Mixed numbers	• identify parts of a mixed number • write mixed numbers from diagrams • compare mixed numbers • arrange mixed numbers in ascending and descending order	• Mixed numbers with denominators 2 to 10, 20, 50 and 100	• Describing parts of a mixed number • Identifying, reading and writing diagrammatic representations of mixed numbers • Comparing mixed numbers using diagrams • Placing mixed numbers in ascending and descending order	• Number line charts and diagrams of various figures
Decimal numbers	• read and write decimals up to two places • relate fractions with denominators 10 and 100 to decimals • identify the place value of digits in decimals • compare decimals • write decimals in expanded form • arrange decimals in ascending and descending order • round off decimals to the nearest unit and tenth	• Decimals up to two places	• Identifying, reading and writing decimals up to two places • Changing decimals to proper fractions with denominators 10 and 100 • Stating place value of digits represented on abacuses • Representing decimal numbers in expanded notation such as 2,52 = 2+ 0,5 + 0,02 • Comparing any two decimals using <, > and = signs • Arranging decimals in order of size • Approximating decimals to the nearest unit and tenth	• Abacuses, number line charts, fraction charts, 100 square grids, reading metres and scales
Percentages	• read and write fractions with a denominator of hundred • illustrate percentages diagrammatically	• Percentages of fractions	• Identifying and writing fractions with denominator 100 • Drawing diagrams representing percentages	• Fraction charts, diagrammatic representation charts, 100 square grids, discount

SUB-TOPIC	OBJECTIVES Learners should be able to:	CONTENT (Attitude, skills, knowledge)	SUGGESTED LEARNING ACTIVITIES AND NOTES	SUGGESTED RESOURCES
	• express half, quarters, fifths and tenths as percentages • use 100 square grids to express fractions as percentages		• Using diagrams to represent percentages • Changing half, quarters, fifths and tenths to percentages • Using fractional charts and 100 square grids to show fractions, then express as percentages • Discussing the use of percentage in life	advertisements and technological tools

8.2 GRADE 4 / TOPIC: OPERATIONS

SUB-TOPIC	OBJECTIVES Learners should be able to:	CONTENT (Attitude, skills, knowledge)	SUGGESTED LEARNING ACTIVITIES AND NOTES	SUGGESTED RESOURCES
Addition of whole numbers	• add within the range, including carrying up to three times • add measures	• Addition of whole numbers whose sum is less than or equal to 10 000	• Demonstrating basic addition facts • Finding the sum of two or three whole numbers involving carrying up to 3 times • Adding measures such as money, length, time and volume **NB: Addition terms such as total, sum of and altogether should be used**	• Abacuses, flash cards, paper money, clock faces, abacus diagrams, counters, calculators and smartphones
Subtraction of whole numbers	• subtract using equal addition • subtract measures	• Subtraction of whole numbers (0 to 10 000)	• Demonstrating basic subtraction facts • Subtracting any two numbers in the range including equal addition up to three times • Subtracting measures such as money, length, time, mass and volume **NB*:* Subtraction terms such as subtract, difference between, take away, count back, subtrahend and minuend should be used**	• Abacuses, flash cards on basic facts, clock faces, counters, smartphones and calculators
Multiplication of whole numbers	• demonstrate multiplication facts by single digits • multiply where carrying is involved • multiply measures by numbers • identify factors of numbers within the range 0 to 1 000	• Multiplication of whole numbers whose product is less than 10 000 • Factors	• Illustrating multiplication facts such as the product of 3, 2 and 4 • Filling in blanks on multiplication such as 482 X 5 2 1 • Multiplying whole numbers by 1-digit number, including carrying	• Rulers, clocks, jars, scales, counters, work cards, multiplication timetables and calculators

SUB-TOPIC	OBJECTIVES Learners should be able to:	CONTENT (Attitude, skills, knowledge)	SUGGESTED LEARNING ACTIVITIES AND NOTES	SUGGESTED RESOURCES
			up to three times Such as 1 294 x 7 _____ • Finding the product of numbers with measures of money, time, mass and volume • Finding factors of numbers within the range 0 to 1 000 **Note: Use of mathematical terms such as product of, multiplier, multiplication and should be used**	
Division of whole numbers	• divide whole numbers by one-digit number • divide measures by whole numbers	• Division of whole numbers by one-digit number (1 to 10 000)	• Practising basic division facts • Carrying out division without remainder • Carrying out division with one-digit remainders. • Dividing measures by numbers. **NB: Terms such as the quotient, divisor and dividend should be introduced**	• Paper money , number lines, rulers, counters and calculators
Addition of proper fractions	• add up to three proper fractions with the same denominator.	• Addition of proper fractions not more than three terms involved	• Identifying parts of a fraction • Adding proper fractions where denominators are the same and not more than 3 terms are involved such as (1) $\frac{1}{6} + \frac{3}{6} = \frac{4}{6}$ (2) $\frac{2}{9} + \frac{3}{9} + \frac{1}{9} = \frac{6}{9}$	• Number lines, fraction charts, ICT tools and fraction diagrams

SUB-TOPIC	OBJECTIVES Learners should be able to:	CONTENT (Attitude, skills, knowledge)	SUGGESTED LEARNING ACTIVITIES AND NOTES	SUGGESTED RESOURCES
Subtraction of proper fractions	• subtract proper fractions with the same denominators.	• Subtraction of proper fractions not more than three terms involved	• Subtracting fractions with the same denominators such as (1) $\frac{7}{8} - \frac{2}{8} = \frac{5}{8}$ (2) $\frac{7}{9} - \frac{4}{9} - \frac{2}{9} = \frac{1}{9}$	• Number lines, fraction charts, real objects such as fruits and ICT tools
Multiplication of proper fractions	• multiply proper fractions • calculate fractions of numbers and measures within the range	• Multiplication of proper fractions with denominators from 2 to 10 and 100	• Multiplying fractions such as $\frac{1}{2} \times \frac{2}{5} = \frac{1 \times 2}{2 \times 5} = \frac{2}{10}$ • Finding fractions of numbers and measures such as $\frac{3}{4}$ of \$16 = \$12	• Number lines, fraction charts, calculators and ICT tools
Addition of decimals	• add decimals.	• Addition of decimals up to two places	• Revising place values in decimals. • Adding decimal numbers such as 128,49 +423,55 • Applying addition of decimals to measures	• Abacuses, number lines, work cards, counters and calculators
Subtraction of decimals	• subtract decimals.	• Subtraction of decimals up to two places.	• Subtracting decimals such as 822,61 - 621,88 • Applying subtraction of decimals to measures	• Abacuses, Number lines, work cards, counters and calculators

8.3 GRADE 4 / TOPIC: MEASURES

SUB-TOPIC	OBJECTIVES Learners should be able to:	CONTENT (Attitude, skills, knowledge)	SUGGESTED LEARNING ACTIVITIES AND NOTES	SUGGESTED RESOURCES
Money	• express money in decimal form • show money in expanded form • convert cents to dollars and vice versa. • calculate change within the range	• Money up to $100.00 • Conversions	• Changing dollars to cents and vice-versa • Breaking down bank notes and coins into smaller units • Writing amounts of money in expanded notation such as $4,84 = $4,00 + $0,80 + $0,04 • Writing amounts of money as expanded fraction such as $8,94 = $ (8+ 90/100 + 4/100) • Calculating change within the range through role playing to enhance financial literacy	• Real coins, bank notes, plastic or card representations of money, shop corner and calculator
Time	• identify units of time • apply a.m., noon, p.m., midnight and fortnight to tell time • tell time to the nearest 5 minutes • convert time from one unit to another	• Units of time a.m., noon, p.m., midnight and fortnight • Approximation of time • Conversions	• Giving times when events occurred • Giving the duration of an event • Telling and using number of days in each month • Reading time on clock faces to the nearest 5 minutes • Indicating time on clock faces and stating the given time • Using a.m., noon, p.m., midnight and fortnight to tell time • Changing units of time from one form to another such as 60min = 1hr 14 days = 2 weeks = fortnight	• Calendars, watches, sun dials, conversion charts, clock-faces with Arabic or Roman numerals and clocks
Mass	• find the mass of different objects by weighing • convert kilogrammes to grimes and vice versa	• Measuring mass • Units and conversion of mass up to 10kg	• Finding and comparing masses of objects • Listing units of mass • Expressing kilogrammes as grimes and vice versa	• Scales, balances, beam balances and containers
Length (up to 100 m)	• approximate lengths using spans and paces • measure lengths to the nearest	• Length (0 to 30 cm) (1 metre to 100 metres)	• Estimating length using spans and paces	• Strings, rulers, measuring tapes, click wheels, trundle wheels

SUB-TOPIC	OBJECTIVES Learners should be able to:	CONTENT (Attitude, skills, knowledge)	SUGGESTED LEARNING ACTIVITIES AND NOTES	SUGGESTED RESOURCES
	millimetre(mm), centimetre(cm) or metre(m) • convert units of length (mm, cm and m)		• Stating and using the conversions: 10 mm = 1 cm 100 cm = 1 m 1 000 mm = 1 m • Finding length of objects • Comparing length by calculating their differences • Discussing where length is important in life	and calculators
Rate	• relate two measures	• Relating two measures	• Linking two measures correctly to express rate such as kilometres per hour (km/h) • Applying rate to measures such as mass, time and volume	• Distance tables and clock faces
Area	• find area of rectangle, square and right angled triangle	• Area of rectangle, square, right angled triangle	• Marking square grids in rectangles • Counting and tabulating the number of squares along the length, width and the total to establish that Length X Width (L×W) = Area of rectangle and area of square = Side x Side (S×S) • Estimating area of square and rectangle by using spans or paces • Using formula to find area of rectangle and square • Discovering area of right angled triangle by folding rectangles and squares • Discussing where area is important in life	• Square and rectangular shapes, rubber bands (assorted colours) strings, geo board and calculators
Volume and capacity	• convert millilitres to litres and vice versa	• Conversion of units	• Finding capacity or volume in millilitres and litres • Measuring liquids in litres, $\frac{1}{2}$ litre, $\frac{1}{4}$litre and millilitres • Changing millilitres to litres and vice-versa (using 1 litre = 1000 millilitres)	• Graduated containers (water / liquids 1 litre containers $\frac{1}{2}$ litre containers $\frac{1}{4}$ litre containers)

SUB-TOPIC	OBJECTIVES Learners should be able to:	CONTENT (Attitude, skills, knowledge)	SUGGESTED LEARNING ACTIVITIES AND NOTES	SUGGESTED RESOURCES
				NB: Poisonous liquids and contaminated containers should be avoided to enhance disaster risk management
Direction, angles and lines	• indicate North (N), South (S), East (E) and West (W) • identify horizontal and vertical lines • recognise 1, 2, 3 and 4 right angles	• Cardinal points • Horizontal and vertical lines • Right angles	• Showing N, S, E and W • Drawing a compass and labelling cardinal points • Drawing horizontal and vertical lines • Identifying and telling the number of right angles on the compass • Drawing diagrams with right angles • Identifying and naming right angles on the compass and drawing diagrams with right angles • Showing use of right angles in life situations • **Identifying directions of places and heritage sites in relation to the school**	• Compasses, maps, card strips, diagrams, rectangular cards, rulers, electronic devices and maps
Shapes	• identify different solid and plane shapes • identify various shapes in patterns • state the properties of plane and solid shapes • draw and construct a cube, rectangular prism and frames (triangular and rectangular)	• Properties of plane and solid shapes • Construction of solid shapes • Construction of frames	• Naming and drawing representations of cylinders, cubes, rectangular prisms, squares, rectangles, right-angled triangles, circles and spheres • Drawing and colouring shapes to produce various patterns • Making models of cubes and rectangular prisms • Making models of rectangular and triangular frames • Exploring the rigidity of rectangular and triangular frames • Exploring the environment and identifying the shapes and patterns	• Models of shapes, scissors, paper, paint or crayons brushes, road signs, reeds, sticks, pins and nails

8.4 GRADE 4 / TOPIC: RELATIONSHIPS

SUB-TOPIC	OBJECTIVES Learners should be able to:	CONTENT (Attitudes, skills, knowledge)	SUGGESTED LEARNING ACTIVITIES AND NOTES	SUGGESTED RESOURCES
Data handling	• read information from tables • collect and record data on tables • read and interpret information from graphs • solve problems using graphs and tables	• Tables • Bar Graphs • Column graphs • Pie charts	• Interpreting information from tables • Representing data collected on tables • Reading information from bar graphs • Collecting various forms of data, for example, number of trees in an orchard and learners' modes of travelling to and from school • Drawing bar graphs showing data • Interpreting data shown on column graphs • Solving problems using column graphs • Reading information on pie charts • Solving problems using pie charts **NB: Data to be used should captured from HIV/AIDS, records, heritage sites and gender**	• Timetables, pie charts, bar graphs, column graphs and technological tools

8.1 GRADE 5 / TOPIC: NUMBER

SUB-TOPIC	OBJECTIVES Learners should be able to:	CONTENT (Attitude, Skill, Knowledge)	SUGGESTED LEARNING ACTIVITIES AND NOTES	SUGGESTED RESOURCES
Whole numbers **(0 to 100 000)**	• identify, read and write numbers in words and numerals in the range • count in ascending and descending order • give values of digits in a number • arrange numbers in order of size • write number sequences • round off numbers to a degree of accuracy • apply approximation in life situation • express numbers in expanded notation/form	• Numerals and words • Place value • Comparison • Estimation and Approximation • Expanded notation	• Saying, reading and writing numbers in the range in numerals and words • Arranging numbers in ascending and descending order • Identifying values of digits in any number such as 2475: where digit 4 is four hundred • Comparing numbers using <, > and = signs • Sequencing numbers in order of size • Designing number sequences • Estimating numbers to the nearest ten, hundred, thousand and ten thousand • Approximating number of objects in life situations and verifying by counting and checking • Writing numbers in expanded form: 5236 = 5000 + 200 + 30 + 6 and vice versa	• Abacuses, flash cards, charts counters and technological devices (calculators, smartphones)
Proper fractions **(where the denominators are 2 to 10, 20, 50 and 100)**	• identify read and write fractions with denominators in the given range • compare fractions • write fractions in their equivalent forms. • reduce fractions to their lowest terms • arrange fractions in ascending or descending order	• Proper fractions • Comparison • Equivalence • Lowest terms • Sequencing	• Selecting, stating and writing fractions with denominators in the range • Expressing fractions using <, > and = signs • Simplifying fractions to their lowest terms using the highest common factor (HCF) • Expressing fractions in their equivalent forms • Arranging a set of fractions in ascending or descending order	• Fraction charts, work cards, flash cards, technological tools: (power point presentation) and real objects such as bread and fruits
Mixed numbers	• identify mixed numbers	• Mixed numbers • Conversion	• Forming mixed numbers by putting together wholes and fractions	• Fraction charts, diagrams, regular objects and

SUB-TOPIC	OBJECTIVES Learners should be able to:	CONTENT (Attitude, Skill, Knowledge)	SUGGESTED LEARNING ACTIVITIES AND NOTES	SUGGESTED RESOURCES
	• convert mixed numbers to improper fractions and vice-versa • compare mixed numbers • solve problems involving mixed numbers	• Comparison	2 and $\frac{3}{4}$, $2\frac{3}{4}$ • Using diagrammatic representations of mixed numbers • Converting mixed numbers into improper fractions and vice-versa • Comparing mixed numbers using signs <, > and = signs • Applying mixed numbers in solving problems: sharing	technological tools
Numeration systems	• identify, read and write Roman numerals • convert Roman numerals to Arabic numerals and vice versa within the range	• Numeration:(Arabic and Roman) • Conversion	• Stating, reading and writing Roman numerals I to C • Demonstrating how the Roman numeration system is built from I to L (I, V, X, L) • Expressing Arabic numerals to Roman numerals within the range I to C	• Number cards, conversion charts and watches
Decimals **(up to 3 places)**	• identify, read and write decimals • determine place value of a digit in a decimal • interpret diagrammatic representation of decimals • differentiate decimals • round off decimals	• Numeration • Place value • Comparison • Estimation	• Stating, reading and writing in numerals up to 3 decimal places • Giving values of digits in numbers up to 3 decimal places with not more than 5 digits • Illustrating diagrammatic representation of decimals • Comparing decimals using the < and > signs = • Estimating decimals to the nearest unit and tenth	• Abacuses, diagrams of fractions and decimal fraction charts,
Percentages	• express fractions as percentages and vice versa • change one quantity /amount as	• Conversion	• Converting percentages to fractions and vice versa • Expressing one quantity /amount as	• 100 square grids, charts and calculators

SUB-TOPIC	OBJECTIVES Learners should be able to:	CONTENT (Attitude, Skill, Knowledge)	SUGGESTED LEARNING ACTIVITIES AND NOTES	SUGGESTED RESOURCES
	a percentage of another • compare percentages • show relationships between percentages and fractions • use the calculator to consolidate conversions of fractions as percentages	• Comparison • Equivalence	percentages of another • Differentiating percentages using <,> or = signs • Finding percentages equivalent to $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{5}$ and $\frac{1}{10}$ • Discussing uses of percentages in life	

8.2 GRADE 5 / TOPIC: OPERATIONS

SUB-TOPIC	OBJECTIVES Learners should be able to:	CONTENT (Attitude, Skill, Knowledge)	SUGGESTED LEARNING ACTIVITIES AND NOTES	SUGGESTED RESOURCES
Addition of whole numbers	• demonstrate an understanding of basic addition facts • add with carrying • add measures • use the associative and commutative laws	• Addition of whole numbers whose sum is less than or equal to 100 000	• Adding whole numbers such as 9+9=18and 14+8=22 • Finding the total of numbers whilst carrying • Deducing and generalising using calculators the associative law such as 5+(4+6) =15 (5+4) +6=15 therefore,5+(4+6) = (5+4) +6 commutative law such as 9+2=11 and 2+9=11 • Applying addition of whole numbers to measures in life	• Abacuses, flash cards, work cards, counters, calculators and ICT tools
Subtraction of whole numbers	• demonstrate subtraction • subtract by decomposition and or equal addition and verify answers using calculators • subtract measures	• Subtraction of whole numbers (0 to 100 000)	• Differentiating whole numbers • Subtracting by decomposition and or equal addition up to 4 places • Applying subtraction to measures where whole numbers are involved **NB: Method of equal addition should be taught through place value principles**	• Abacuses, flash cards, work cards, counters and calculators
Multiplication of whole numbers	• demonstrate an understanding of basic multiplication • multiply by 1-digit number • multiply by 2 digit numbers • multiply by multiples of 10 and 100 • deduce and generalise multiplication processes • multiply measures within the range • find the HCF and LCM of two	• Multiplication of whole numbers where the multipliers are 2 digit numbers made of 0 to 5and multiples of 10 up to 100 • Factors and multiples	• Multiplying whole numbers up to 10 x10, including product values of 0 • Finding the product using 1-digit number: 6 248 x 4=24 992 • Solving problems which include multiplying by 2-digit number: 398 x 52 =20 696 • Calculating the product of numbers which are multiples of 10: 551 x 30=16 530 • Multiplying by multiples of 100 such as	• Multiplication charts, dials for multiplication, counters, work cards, computers, smartphones and calculators

SUB-TOPIC	OBJECTIVES Learners should be able to:	CONTENT (Attitude, Skill, Knowledge)	SUGGESTED LEARNING ACTIVITIES AND NOTES	SUGGESTED RESOURCES
	numbers		87 x 600 = 52 200 • Computing measures where whole numbers are involved • Using calculators and spreadsheet packages to deduce and generalise multiplication of numbers, for example 7x 2 x 3= (7 x 2) x3 = 7x (2x 3) • Finding HCF and LCM of two numbers	
Division of whole numbers	• demonstrate division as repeated subtraction • carry out division by one or two-digit divisor, with or without remainders • divide numbers involving measures where whole numbers are involved using calculators	• Division of whole numbers by two digit numbers, multiples of 10 up to 100	• Demonstrating repeated subtraction • Dividing by one-digit number: 4 972 ÷ 4 = 1 243 • Finding solutions to problems involving dividing by two-digit number: 3 750 ÷ 20 =187r5 • Solving problems by dividing using multiples 10 and 100: 18 000 ÷ 30 =600	• Charts, tables, counters, computers , calculators and smartphones
Addition and subtraction of decimals	• add and subtract decimals • consolidate addition and subtraction of decimals using calculators	• Addition and subtraction of decimals (up to 2 decimal places)	• Identifying place values • Finding sum and /or difference of decimals • Applying addition and subtraction of decimals to measures • Using calculators to add and subtract decimals	• Abacuses, flash cards, work cards, calculators , smartphones and computers
Multiplication and division of decimals	• state the place value of a digit in a decimal number • multiply and divide decimals • convert a fraction to a decimal	• Multiplication and division of decimal numbers (1 or 2 digit whole numbers)	• Identifying the place value of a digit in a decimal number • Multiplying by 1 and 2 digit numbers including multiples of ten • Dividing by 1 and 2 digit numbers including multiples of ten	• Abacuses, flash cards, work cards and calculators

SUB-TOPIC	OBJECTIVES Learners should be able to:	CONTENT (Attitude, Skill, Knowledge)	SUGGESTED LEARNING ACTIVITIES AND NOTES	SUGGESTED RESOURCES
			• Converting fractions to decimals and vice versa	
Addition and subtraction of Fractions	• add and subtract proper fractions with same denominators • add and subtract proper fractions with different denominators	• Addition and subtraction of fractions where not more than three terms are involved	• Computing solutions to proper fractions with same denominators • Using LCM to find the common denominators • Solving problems involving proper fractions with different denominators • Finding equivalent fractions	• Equivalent fraction charts, rods, blocks and calculators
Multiplication of fractions	• multiply proper fractions by whole numbers	• Multiplication of fractions by whole numbers not exceeding 100	• Demonstrating an understanding of basic multiplication facts • Multiplying whole numbers by proper fractions and vice versa • Finding part of a whole by multiplying by a fraction • Using the word "of " such as $\frac{3}{4}$ of 16, 75% of 50	• Number line charts, fraction charts and calculators
Percentages	• Calculate percentages of measures.	• Percentages	• Solving percentages of measures using appropriate operations	• Work cards, fraction charts, calculators, computers and smartphones

8.3 GRADE 5 / TOPIC: MEASURES

SUB-TOPIC	OBJECTIVES Learners should be able to:	CONTENT (Attitude, Skill, Knowledge)	SUGGESTED LEARNING ACTIVITIES AND NOTES	SUGGESTED RESOURCES
Money	• demonstrate relationship between coins and notes • calculate change	• Notes and coins up to $1 000 • Change	• Naming the denominations of the currencies in use • Showing relationships of currency denominations, for example expressing notes in terms of other denominations using the same currency • **Applying knowledge of money in business transactions to enhance enterprise skills**	• Shop articles, coins, notes, bills, bank statements and calculator
Time	• Tell time • measure time intervals of different actions and activities • estimate time from shadows and the position of the sun • convert units of time • construct clock faces	• Telling time • Estimating time • Converting time • Constructing clocks	• Relating duration of events in everyday life in terms of seconds, minutes, hours and days • Measuring time intervals of less than one minute, such as duration of: (I) a clap of hands (ii)a blink of an eye (iii)a jump • Telling time to the nearest minute, • Expressing time in a.m. and p.m. • Devising and using ways of estimating time from shadows and the position of the sun • Converting units of time such as -1 minute = 60 seconds -2 weeks = fortnight= 14 days -1 year = 365 ¼ days -1 leap year = 366 and day	• Watches, clock-faces, sun-dials, sand bottles, egg timers, calendars, digital watches, computers and smartphones

SUB-TOPIC	OBJECTIVES Learners should be able to:	CONTENT (Attitude, Skill, Knowledge)	SUGGESTED LEARNING ACTIVITIES AND NOTES	SUGGESTED RESOURCES
			• Saying and using the number of days in each month • Making clock faces • Using Standard International (SI) units for time	
Mass **(quantities up to 100kg)**	• change grammes to kilogrammes and vice versa • compare mass of objects • approximate mass up to 100kg	• Conversion of mass • Comparison of mass	• Establishing that 1 000 grammes = 1 kilogramme • Measuring and differentiating the masses of quantities up to 100 kilogrammes • Estimating masses of quantities from 0 to 100 kilogrammes and checking the degree of accuracy by weighing • Discussing the importance of mass in life situation	• Triple beam balances, 5g and 50g weights, standard masses, stones, books, shoes, bags and scales
Length	• estimate and measure length using standard and non-standard units • find the perimeter of rectangle and square	• Measurement of length • Perimeter of rectangle and square	• Measuring distances up to 1km using non-standard units • Calculating perimeter of shapes • Drawing rectangles and squares of different sizes to establish the perimeter of the rectangle and square • Deducing the formulae: - Perimeter of rectangle = 2 Length+ Width and Perimeter of square = 4 sides	• 30cm rulers, metre rules, tape measures, rope or string, conversion table, rectangular shapes and square shapes
Rate	• relate two quantities as rate	• Speed • Cost	• Linking two measures correctly to express rate, for example kilometres per hour (km/h), cents per litre	• Work cards and charts

SUB-TOPIC	OBJECTIVES Learners should be able to:	CONTENT (Attitude, Skill, Knowledge)	SUGGESTED LEARNING ACTIVITIES AND NOTES	SUGGESTED RESOURCES
			• Discussing rates in life situation such as comparing speeds of a person, car and aeroplane	
Area	• estimate the area of square, rectangle and triangle using non-standard units • calculate area of square, rectangle and triangle using formulae	• Standard and non-standard units • Area of rectangle and square • Area of triangle	• Estimating area of square, rectangle and triangle by counting squares • Deriving the area formulae for: square = side x side, rectangle=length x width, triangle= ½ base x height • Finding area of square, rectangle and triangle using formulae • Solving life problems involving area	• Metre rules, metre stick , charts with shapes, tape measures and ICT tools
Volume and Capacity	• calculate volume of cube and cuboid	• Volume of cube and cuboid	• Estimating the volume of cube and cuboid • Deriving and using the formula to calculate the volume of cube and cuboid • Computing the volume of cube and cuboid • Demonstrating that $1cm^3$ =1ml through experiments	• Cubes, cuboids, sand, calculators and water
Direction, angles and lines	• name the eight cardinal points • use cardinal points to identify the position of an object • identify horizontal and vertical lines • illustrate quarter, half and complete revolution	• Eight Cardinal points • Lines and angles • Revolution	• Identifying the eight cardinal points • Using cardinal points to identify the position of objects • Sketching horizontal and vertical lines • Showing quarter, half and complete revolution • Discussing things and places located in the eight cardinal points in relation to local environment	• Compasses, diagrams showing directions, compass points, charts with angles and computers

SUB-TOPIC	OBJECTIVES Learners should be able to:	CONTENT (Attitude, Skill, Knowledge)	SUGGESTED LEARNING ACTIVITIES AND NOTES	SUGGESTED RESOURCES
Shapes	• classify shapes • name polygons with sides up to ten	• Solid and plane shapes • Polygons	• Grouping shapes as solid or plane • Naming and drawing shapes such as cylinders, cubes, rectangular prisms, squares, rectangles, right angled triangle, equilateral triangles and spheres • Identifying and naming polygons with sides of up to 10 • **Visiting heritage sites and identifying different shapes**	• Models of plane solid shapes and ICT tools

8.4 GRADE 5 / TOPIC: RELATIONSHIPS

SUB-TOPIC	OBJECTIVES Learners should be able to:	CONTENT (Attitude, Skill, Knowledge)	SUGGESTED LEARNING ACTIVITIES AND NOTES	SUGGESTED RESOURCES
Data handling	• read data from tables • represent data collected on tables • collect statistical data • draw bar graphs, column graphs, ready reckoners and pie charts to represent data • read and interpret data from different types of graphs • solve problems on measures using different graphs	• Tables • Bar graphs • Column graphs • Ready Reckoners • Pie charts	• Interpreting data from tables • Collecting data in groups • Recording information on tables • Presenting data on tables • Reading and extracting information from bar graphs • Solving problems using information from the bar graphs • Drawing bar graphs representing data • Interpreting data from column graphs • Drawing column graphs and interpreting them • Reading and analysing data from ready reckoners • Using ready reckoners to solve problems • Interpreting data from pie charts • Solving problems using information from pie charts • Conducting simply investigations involving data collection in use of charts and graphs	• Charts, graphs, time table, electronic devices and print media

8.1 GRADE 6/ TOPIC: NUMBER

SUB-TOPIC	OBJECTIVES Learners should be able to:	CONTENT (Attitude, Skill, Knowledge)	SUGGESTED LEARNING ACTIVITIES AND NOTES	SUGGESTED RESOURCES
Whole numbers (0 to 1 000 000)	• identify, read, and write numbers in the range in words and numerals • give value of digits' in numbers • write numbers in expanded notation • arrange numbers in order of magnitude • identify prime numbers • approximate numbers	• Numeration • Place value • Expanded notation • Comparison • Prime numbers • Estimation and approximation	• Saying, reading and writing numbers in numerals or words • Identifying place values in the range • Expressing numerals in expanded notation to determine place value • Comparing two numbers by using <,> and = signs • Arranging sets of numbers in order of magnitude • Listing prime numbers between 0 and 50 • Rounding off numbers to the nearest ten, hundred, thousand, ten thousand and hundred thousand	• Abacuses, number lines, 50 square grids, work cards, calculators and ICT tools
Proper fractions (denominators 2 to 10 and multiples of 5 up to 100)	• identify, read and write fractions with denominators in the range • give equivalent fractions • compare fractions and arrange them in order of size	• Numeration • Equivalence • Comparison	• Saying, reading and writing fractions in numerals • Identifying numerators and denominators • Recognising, interpreting and using diagrammatic representation of proper fractions with denominators in the range • Presenting fractions in equivalent form: $\frac{3}{6} = \frac{1}{2}$ • Comparing two proper fractions using <, > and = signs • Arranging proper fractions in order of size	• Fraction charts, number cards, number line, ICT tools and charts

Mixed numbers (denominators 2 to 10 and multiples of 5 up to 100)	• identify, read and write mixed numbers • compare mixed numbers • convert mixed numbers to improper fractions and vice versa	• Numeration • Conversion	• Saying, reading and writing mixed numbers • Differentiating two mixed numbers using <, > and = signs • Changing mixed numbers to improper fractions and vice versa	• Mixed number charts, number lines and computers
Decimal numbers **(decimals up to 6 digits including up to 3 decimal places)**	• identify, read and write decimal numbers • find the value of digits in decimal numbers • compare decimal numbers • arrange decimal numbers in order of size • round off decimal numbers to a degree of accuracy	• Numeration • Place value • Comparison • Sequencing • Estimation and approximation	• Stating, reading and writing any number expressed in decimal form with up to 3 decimal places • Writing decimal numbers in expanded notation to determine place value • Differentiating decimal numbers by using <, >, and = signs • Grouping decimal numbers in order of magnitude • Rounding off decimal numbers and measures to the nearest unit, tenth and hundredth **NB: Nearest unit means to the nearest whole number, nearest tenth means to 1 decimal place, nearest hundredth means to 2 decimal places and nearest thousandth means to 3 decimal places**	• Number strips, abacuses, fraction charts, equivalent fraction charts, money, meters (water, electricity, odometer and fuel), calculators, computers and smartphones
Percentages	• express fractions as percentages and vice versa • represent percentages on diagrams	• Conversion • Illustrating	• Converting fractions to percentages and vice versa • Illustrating, identifying and writing percentages from diagrammatic representations and numerals • Discussing use of percentages in life	• Money, 100 square grids, number lines graduated up to 100 and metre rules
Numeration systems (Roman numerals)	• identify, read and write Roman numerals • convert Roman to Arabic numerals and vice versa	• Numeration • Roman and Arabic • Conversion	• Saying reading and writing Roman numerals in the range I to L Then C, D and M • Expressing Arabic to Roman numerals and vice versa	• Number cards, conversion charts and clock faces with Roman and Arabic numerals

8.2 GRADE 6 / TOPIC: OPERATIONS

SUB-TOPIC	OBJECTIVES Learners should be able to:	CONTENT (Attitude, Skill, Knowledge)	SUGGESTED LEARNING ACTIVITIES AND NOTES	SUGGESTED RESOURCES
Addition of whole numbers	• add whole numbers • apply associative and commutative laws to whole numbers	• Addition of whole numbers whose sum is less than or equal to 1 000 000	• Finding the sum of whole numbers mentally • Adding whole numbers • Using the commutative and associative laws where applicable: 8+10 =18 10 + 8=18 therefore, 8+10=10+8 and 7+(2+13) = (7+2) +13 respectively • Illustrating addition on a number line • Applying addition to measures	• Work cards, place value charts, number line charts, calculators and ICT tools.
Subtraction of whole numbers	• subtract whole numbers within the range	• Subtraction of whole numbers (0 – 1 000 000)	• Subtracting whole numbers within the range	• Work cards, place value charts, number line charts, ICT tools and calculators
Addition and subtraction of proper fractions	• apply associative and commutative laws to add and subtract proper fractions • add and subtract proper fractions	• Addition and subtraction of proper fractions (denominators 2 to 10 and multiples of 10 to 100)	• Solving problems involving addition and subtraction of proper fractions using the associative and commutative laws • Filling in missing elements for open sentences involving addition or subtraction	• Work cards, fraction charts, place value charts, number line chart, calculators and ICT tools
Addition and subtraction of mixed numbers	• add and subtract mixed numbers	• Addition and subtraction of mixed numbers where denominators are 2 to 10 and multiples of 10 to 100	• Illustrating addition and subtraction operations on a number line • Demonstrating addition and subtraction of mixed numbers with denominators 2 to 10 and multiples of 10 up to 100	• Work cards, place value charts, number line charts, and calculators

Addition and subtraction of decimals	• add and subtract decimals • add and subtract measures using calculators	• Addition and subtraction of decimals(up to six digits including up to 3 decimal places)	• Illustrating addition and subtraction on a number line • Adding and subtracting decimals up to six digits and up to 3 decimal places • Computing measures where not more than two units of each measure are involved • Solving life problems involving addition and subtraction of decimals	• Weights, balances, graduated non-graduated containers, metre rules, rulers and calculators
Multiplication and division	• demonstrate understanding of multiplication facts • find HCF and LCM • multiply and divide using long methods • multiply decimals by decimals • multiply and divide proper fractions by whole numbers and vice versa • multiply and divide proper fractions, mixed numbers and decimals	• HCF and LCM • Multiplication and division of whole numbers, proper fractions, mixed numbers and decimals	• Finding HCF and LCM • Multiplying whole numbers up to 12 x 12 including product values of 0 • Devising ways of dividing whole numbers where the dividends are not more than 100 and the divisor is a single digit whole number and multiples of ten • Devising ways of multiplying using the long method: numbers and measures within the range • Dividing using the long method: numbers and decimal measures up to 3 decimal places • Multiplying proper fractions and mixed numbers where not more than 3 terms are used and where the denominator is 10 and below • Dividing fractions by whole numbers and vice versa	• Addition charts, number line charts, fraction charts, work cards, 100 square grids, abacuses, multiplication tables, flash cards, ICT tools and calculators
Combined operations	• work out mathematical problems involving three operations	• Combined operations	• Adding, subtracting, multiplying and dividing whole numbers and/or fractions using the rule of precedence/priority, for example, 8 – 3x2+7 = 8 – 6+7 =8 + 7 – 6 = 15-6 = 9 and $\frac{3}{4} + \frac{1}{6} \div \frac{2}{3} - \frac{1}{8}$	• Work cards, counters and calculators

			$= \frac{3}{4} + \frac{1}{6} \times \frac{3}{2} - \frac{1}{8}$ $= \frac{3}{4} + \frac{1}{4} - \frac{1}{8}$ $= \frac{8}{8} - \frac{1}{8}$ $= \frac{7}{8}$ **NB: Multiplication and division are carried out before addition and subtraction** • Solving life problems involving combined operations	

SUB-TOPIC	OBJECTIVES Learners should be able to:	CONTENT (Attitude, Skill, Knowledge)	SUGGESTED LEARNING ACTIVITIES AND NOTES	SUGGESTED RESOURCES
Ratio and scale	• express ratio in three ways • express quantities as ratio • reduce ratio to the lowest terms • express ratios as representative fractions • share quantities and measures using ratio • draw diagrams to scale and interpret scale	• Ratio and scale	• Writing ratio in 3 ways such as 2 to 5, 2:5 and $\frac{2}{5}$ • Expressing quantities as ratio: such as15cm to 1m, 20c: $1,50 • Expressing ratio to the lowest terms • Writing ratios as equivalent fractions • Dividing quantities and measures using ratio • Converting scale distances into actual measurements and vice versa • Drawing lines and simple plans to scale • Discussing uses of ratio and scale in life • Solving life problems involving ratio and scale	• Diagrams drawn to scale, rulers, classrooms, money, click wheels, tape measures, atlas, strings and ICT tools

8.3 GRADE 6 / TOPIC: MEASURES

SUB-TOPIC	OBJECTIVES Learners should be able to:	CONTENT (Attitude, Skill, Knowledge)	SUGGESTED LEARNING ACTIVITIES AND NOTES	SUGGESTED RESOURCES
Money	• prepare invoices correctly • work out change • calculate profit or loss	• Money up to $10 000,00 • Invoices • Change • Profit and Loss	• Visiting shops and noting prices • Preparing invoices • Calculating change • Distinguishing buying price from selling price • Role playing on buying and selling to enhance enterprise skills • Discussing importance of profit and loss in life	• Invoices, corners/class shop, money, buying and selling charts and receipts
Time (second to a century)	• tell and convert time • estimate and calculate time taken • tell and write time in 12 and 24 hour notation	• Time Notation: 12 hours and 24-hour notation) • Standard International notation	• Using the following units of time in meaningful contexts: century, decade, leap year, month, week, day, hour, minute and second • Relating time calculations to practical situations such as finding duration of time • Telling the number of days in each month • Using the following conversions: 60 minutes = 1 hour 24 hours = 1 day 7 days = 1 week 365 ¼ days = 1 year 366 days = 1 leap year 10 years = 1 decade 100 years = 1 century • Telling and writing time to the nearest minute	• Charts on units of time, watches, calendars, clock faces and sun dials

			• Telling and writing time using the 12 and 24-hour notation • Interpreting a calendar and writing in SI notation **NB: 12-hour notation should have a single dot 10.30 p.m.** **24 hour notation should be written as 2230 and not 2230 hours**	
Mass (grammes up to tonne)	• convert units of mass • measure mass • find gross, net and tare mass	• Conversion • Measurement of mass • Gross, net and tare mass	• Using the conversions 1 000g = 1 kg and 1 000kg = 1 tonne to convert mass from smaller units to larger units and vice-versa • Estimating and comparing masses • Measuring the mass of quantities up to 50kg • Selecting appropriate units for finding mass • Estimating and measuring mass to the nearest kilogram in the range 1 kg to 5 kg • Determining gross, net and tare mass • Discussing the importance of gross, net and tare mass in life	• Scales, balances, soil, stones, 50g to 1kg weights ,empty containers: packets, bottles and bags
Length (standard and non-standard units up to 1 000m)	• measure length using standard and non-standard units • find the perimeter of shapes • draw lines to scale	• Standard and non-standard units • Perimeter • Scale	• Estimating length by pacing and using spans • Applying the formula P= 2(L+B) for rectangles and P=4xS units for squares • Discussing meaning and use of scale • Drawing lines to a given scale • Measuring distances up to 1 km • Solving life problems involving perimeter and scale	• Rulers, metre rules, metre sticks, tape measures, ropes or strings, conversion table of length, buildings and rectangular shapes, maps ,click wheels and electronic devices

Rate	• link two measures as rate • calculate speed, distance and time	• Rate • Speed, distance and time	• Linking two measures as rate, such as cents/kilogrammes and grammes/ litre • Comparing distance covered and time taken • Deriving the formulae for calculating speed, distance and time • Using the formulae to calculate rate such as: $\text{Speed} = \frac{\text{Distance}}{\text{Time}}$ • Discussing different rates in life	• Charts with formulae, ready reckoners, graphs, pendulums, stop watches and calculators

SUB-TOPIC	OBJECTIVES Learners should be able to:	CONTENT (Attitude, Skill, Knowledge)	SUGGESTED LEARNING ACTIVITIES AND NOTES	SUGGESTED RESOURCES
Area (quadrilaterals and triangles)	• calculate the area of square and rectangle • find area of a triangle • compute the area of composite shapes	• Area of square and rectangle • Area of triangle • Area of composite shapes	• Deriving the formulae: A= L x W for rectangle A = $\frac{1}{2}$B x H for triangle • Selecting the appropriate unit for measuring area of different surfaces up to square metres • Calculating area of combined shapes • Solving life problems involving area **NB: Area is measured in square units**	• Metre rules, metre sticks, tape measures, figures divided into one centimetre squares, diagrams showing combined shapes and calculators
Volume and capacity	• determine volume of cube and rectangular prism • calculate volume of regular shapes • find volume of irregular shapes by displacement	• Volume of regular and irregular shapes • Calculation of volume • Displacement	• Stating and using the following conversions: 1000ml = 1 litre 1000cm^3 = 1 litre 1cm^3 = 1ml • Selecting the appropriate unit to measure volume • Applying the appropriate unit of volume • Deriving and using the formula: V = L x W X H for rectangular prisms • Using estimated length of sides of regular solids to estimate volume based on the formula • Finding volume of irregular objects by displacement • Discussing the importance of volume and capacity in life • Solving life problems involving volume and capacity **NB: Volume is measured in cubic units**	• Cubes, rectangular prisms, water, fine sand, graduated measuring cylinders, irregular objects, containers and calculator
Direction, angles and lines	• identify the 8 cardinal points • identify the position of a point in relation to another point or lines • identify horizontal, vertical and/or perpendicular lines	• 8 Cardinal points • Lines • Types of angles • Revolution	• Identifying and illustrating 8 main points of a compass • Showing $\frac{1}{4}, \frac{1}{2}, \frac{3}{4}$ and 1 revolution in terms of right angles	• Pairs of compasses, diagrams showing direction or compass points, rims of bicycles, tyres, protractors,

	• illustrate $\frac{1}{4}, \frac{1}{2}, \frac{3}{4}$ angles and 1 revolution • name and identify different types of angles		• Determining whether an angle lies between 0 and 1; 1 and 2; 2 and 3; or 3 and 4 right angles • Drawing acute, obtuse and reflex angles. • Discussing importance of angles an direction in life	newsprint, manila, letters of the alphabet on charts with circles, rectangles, squares, triangles, regular polygons and ICT tools
Shapes	• draw and state the number of lines of symmetry for different shapes and letters of the alphabet • name lines and parts of a circle	• Symmetry • Geometrical properties of a circle	• Illustrating axis of mirror symmetry for squares, triangles; rectangles, circles, letters of the alphabet and relevant combinations • Identifying the radius, the diameter, circumference, arc and chord of a circle	• Plane shapes, solid shapes, atlas and letters of the alphabet

8.4 GRADE 6 / TOPIC: RELATIONSHIPS

SUB-TOPIC	OBJECTIVES Learners should be able to:	CONTENT (Attitude, Skill, Knowledge)	SUGGESTED LEARNING ACTIVITIES AND NOTES	SUGGESTED RESOURCES
Data handling	• interpret information from tables • read and extract information from bar graphs, column graphs, ready reckoners and pie charts • present data on bar and column graphs, ready reckoners and pie charts • solve problems using information from bar and column graphs, ready reckoners and pie charts	• Tables • Bar graphs • Column graphs • Ready reckoners • Pie charts	• Reading and extracting information from tables • Interpreting information from bar graphs • Solving problems using bar graphs • Drawing bar graphs representing data • Reading information from column graphs • Solving problems using column graphs • Constructing column graphs representing data • Interpreting information from ready reckoners • Answering questions using ready reckoners • Interpreting information on pie charts • Solving problems using pie charts • Constructing pie charts • Conducting simply investigations involving data collection in use of charts and graphs	• Charts, timetables, distance tables, graph papers, fare tables, bar graphs, column graphs, ready reckoners, pie charts, electronic and print media

8.1 GRADE 7 / TOPIC: NUMBER

SUB-TOPIC	OBJECTIVES Learners should be able to:	CONTENT (Attitude, Skill, Knowledge)	SUGGESTED LEARNING ACTIVITIES AND NOTES	SUGGESTED RESOURCES
Whole numbers **(0 - 10 000 000)**	• identify, read and write numbers in numerals and words • give the value of a digit in a number • Write numbers in index notation • express numbers in expanded index notation • arrange numbers in order of magnitude • compare numbers using comparison signs • identify prime numbers in the range 0 to 100 • find prime factors of numbers in the range 0 to 100 • round off numbers to the nearest ten, hundred, thousand, ten thousand, hundred thousand and million	• Numeration • Place value • Expanded index notation • Sequencing • Prime numbers • Estimation and approximation • Comparisons (<, >, =)	• Saying, reading and writing in numerals and words numbers in the range • Finding the place value of a digit in a number • Identifying place value of digits of numbers represented on an abacus • Writing numbers in expanded index notation such as 37 642 = $(3 \times 10^4) + (7 \times 10^3) + (6 \times 10^2) + (4 \times 10^1) + (2 \times 10^o)$ • Group numbers in ascending or descending order • Comparing numbers using <, > and = signs • Listing prime numbers in the range 0 to 100 • Factorising numbers in the range 0 to 100 • Expressing numbers to the nearest ten, hundred, thousand, ten thousand, hundred thousand and million	• Abacuses, number cards, seeds/counters, maize cobs, trees in a school plantation, number line charts, vegetables in the school garden,100-square grids and computers
Numeration systems **(Arabic and Roman numerals I to** M)	• convert Roman to Arabic numerals and vice versa	• Roman and Arabic numerals	• Matching Roman and Arabic numerals in the range I to M • Working with Roman numeral symbols to construct numbers up to 1 000 • Changing from Roman to Arabic numerals and vice versa	• Clock faces with Roman and Arabic numerals, number line charts, number cards in Roman and Arabic numerals, group work cards and computers
Proper fractions (denominators 2 to 10 and multiples of 5 up to 100)	• identify, read, and write proper fractions • interpret diagrams representing proper fractions • compare proper fractions	• Numeration • Comparison	• Saying, reading and writing proper fractions • Identifying and using diagrammatic representations of proper fractions • Distinguishing proper fractions using <, > and = signs	• Fraction charts, number line charts, diagrammatic representation of proper fraction,

	• arrange proper fractions in order of size • convert proper fractions to decimals • simplify proper fractions to their lowest terms	• Conversion • Lowest terms	• Arranging proper fractions in order of magnitude • Expressing proper fractions to decimals and vice-versa • Reducing proper fractions to their lowest terms	equivalency and conversion charts and computers
Mixed numbers (denominators 2 to 10 and multiples of 5 up to 100)	• identify, read and write mixed numbers • represent mixed numbers on diagrams and vice- versa • identify whole number and fraction parts of a mixed number • write mixed numbers as improper fractions • write mixed numbers as decimals	• Numeration • Conversion • Mixed numbers • Improper fractions	• Saying, reading and writing mixed numbers • Recognising diagrammatic representations of mixed numbers • Stating whole numbers and fractions in mixed numbers • Converting mixed numbers to improper fractions and vice - versa • Expressing mixed numbers as decimals and vice-versa	• Number line charts, fraction charts, conversion charts and diagrammatic representation charts, ICT tools
Decimal numbers (up to 8 digits including up to 3 decimal places)	• identify, read and write decimal numbers with 3 decimal places • find place value of digits in decimal numbers • write decimal numbers in expanded notation • compare decimal fractions • round off decimal numbers to the nearest unit, tenth and hundredth	• Numeration • Place value • Expanded notation • Estimation • Comparisons (<,>,=)	• Saying, reading and writing decimal numbers • Giving the value of a digit in a decimal number with three decimal places • Expressing decimal numbers in expanded notation • Arranging decimal numbers in order of size • Comparing decimal numbers using <, > and = signs • Approximating decimal numbers to the nearest unit, tenth and hundredth	• Abacuses, decimal number line charts, metre rule, odometer readings, water and electricity meter readings, ICT tools
Percentages	• identify, read and write percentages • express fractions as percentages and vice-versa	• Numeration • Conversion	• Saying, reading and writing percentages • Expressing fractions as percentages and vice versa • Converting quantities to percentages • Discussing the importance of percentages in life	• Fraction charts, conversion charts, 100-square grids, calculators and technological tools such as smartphones and computers

8.2 GRADE 7 / TOPIC: OPERATIONS

SUB-TOPIC	OBJECTIVES Learners should be able to:	CONTENT (Attitude, Skill, Knowledge)	SUGGESTED LEARNING ACTIVITIES AND NOTES	SUGGESTED RESOURCES
Addition of whole numbers	• add whole numbers less than or equal to 10 000 000 • use the associative and commutative law with whole numbers.	• Addition of whole numbers (whose sum is less than or equal to 10 000 000) • Associative and commutative laws	• Finding the sum of whole numbers mentally • Adding whole numbers • Using the commutative and associative laws where applicable such as 12+9= 9+ 12 and 14+(2+4) = (14+2) +4 respectively • Illustrating addition on a number line • Solving life problems involving addition of measures • Consolidating addition of whole numbers using calculators	• Work cards, place value charts, number line charts, metre rules rulers ,calculators and ICT tools
Subtraction of whole numbers	• subtract whole numbers	• Subtraction of whole numbers (0 -10 000 000) • Subtraction of whole numbers using calculators	• Finding differences between whole numbers within the range • Solving life problems involving subtraction of measures • consolidating subtraction using calculators	• Work cards, place value charts, number line charts, calculators and ICTs tools
Addition and subtraction of proper fractions	• add and subtract proper fractions • use the associative and commutative laws to add proper fractions	• Addition and subtraction of proper fractions (denominator 2 to 10 and multiples of 5 up to 100)	• Carrying out calculations involving addition and subtraction of improper fractions • Using the associative and commutative laws to add fractions • Filling in missing elements for open sentences involving addition or subtraction • Applying addition and subtraction of fractions to measures • Solving problems involving addition and subtraction of proper fractions	• Work cards, fraction charts, place value charts and number line charts

SUB-TOPIC	OBJECTIVES Learners should be able to:	CONTENT (Attitude, Skill, Knowledge)	SUGGESTED LEARNING ACTIVITIES AND NOTES	SUGGESTED RESOURCES
Addition and subtraction of mixed numbers	• add and subtract mixed numbers • apply addition and subtraction of mixed numbers to measures	• Addition and subtraction of mixed numbers (where denominators are 2 to 10 and multiples 5 to 100)	• Illustrating addition and subtraction of mixed numbers of number lines • Demonstrating addition and subtraction of mixed numbers with denominators 2 to 10 and multiples 5 up to 100 • Adding and subtracting mixed numbers involving measures	• Work cards, place value charts, number line charts, calculators and ICT tools
Addition and subtraction of decimals	• add and subtract decimals in the range • consolidate addition and subtraction of decimals by use of a calculator	• Addition and subtraction of decimals (up to eight digits including up to three decimals places) • Carrying out practical work involving addition and subtraction of measures	• Illustrating addition and subtraction on a number line • Adding and subtracting decimals up to eight digits and up to 3 decimal places • Computing measures using less than three units	• Weights, balances, graduated containers, metre rules, rulers, calculators and number lines
Multiplication of whole numbers	• multiply numbers by 3 digit numbers • multiply whole numbers in the range using calculators • solve problems involving HCF and LCM	• Multiplication of whole numbers (where the multipliers are 3 digit numbers from 100 to 1 000) • HCM and LCM	• Multiplying whole numbers in the range using calculators • Applying multiplication of whole numbers to measures • Applying HCF and LCM in solving problems	• Addition charts, number line charts, calculators and ICT tools
Division of whole numbers	• divide whole numbers by 3 digit numbers	• Division of whole numbers by 3 digit numbers	• Dividing whole numbers where the dividends are not more than 100 000 • Dividing numbers and measures in the range using the long method • Involving division of measures	• Charts, work cards, 100 square grids, abacuses, multiplication tables, flash cards and calculators
Multiplication and division of decimals	• multiply and divide decimal numbers up to 3 places • multiply and divide decimal numbers using calculators	• Multiplication and division (up to 3 decimal places)	• Dividing and multiplying decimals up to 3 decimal places • Multiplying and dividing decimals with the aid of calculators	• Work cards, calculators, multiplication tables and abacuses

SUB-TOPIC	OBJECTIVES Learners should be able to:	CONTENT (Attitude, Skill, Knowledge)	SUGGESTED LEARNING ACTIVITIES AND NOTES	SUGGESTED RESOURCES
Multiplication and division of proper fractions and mixed numbers	• multiply and divide proper fractions and mixed numbers	• Multiplication and division of proper fractions (up to a maximum of three terms where the denominator is below 10)	• Multiplying and dividing proper fractions and mixed numbers within the range • deducing the division algorithm pertaining to proper and mixed numbers such as: $\frac{1}{4} \div \frac{1}{3} = \frac{1}{4}$ $\frac{1}{3} = \frac{1}{4} \times \frac{3}{1}$	• calculators, multiplication tables and work cards
Combined operations	• solve combined operation problems • consolidate combined operations using calculators	• Combined operations (addition, subtraction multiplication and division)	• Carrying out combined operations involving addition, subtraction, multiplication and division using rule of precedence /priority, such as 6÷ 3 X 2 – 4 + 3 = 2 x 2– 4 +3 = 4 – 4+3 = 0+3 = 3 **NB: Multiplication and division are carried out before addition and subtraction** • Solving life problems involving combined operations	• Operation charts, work cards and calculators
Financial Transactions	• calculate selling and cost price using calculators • compute profit, loss as well as percentage profit and loss • calculate hire purchase sales, tax and value added tax • calculate discount, commission and simple interest	• Selling price, cost price profit, loss, percentage profit and loss discount, commission, interest hire purchase, sales tax and value Added Tax (VAT)	• Finding sales tax and value added tax of items • Computing cost price, selling price, profit, loss, discount and commission • Calculating percentage profit and loss • Interpreting statements on hire purchases and calculating interest, instalment and deposit • Discussing hire purchase, commission, interest and (VAT)	• Calculators, computers, bills, charts and work cards

SUB-TOPIC	OBJECTIVES Learners should be able to:	CONTENT (Attitude, Skill, Knowledge)	SUGGESTED LEARNING ACTIVITIES AND NOTES	SUGGESTED RESOURCES
Proportion, ratio and scale	• calculate direct and inverse proportion • express one quantity as a ratio of another • share using ratio • convert scale distance to actual distance and vice versa	• Direct and inverse proportion • Ratio • Scale	• Computing direct and inverse proportion including exchange rate • Relating quantities using ratios • Simplifying ratios to their lowest terms • Sharing using ratio such as 1:2:3 • Calculating actual distance/lengths using a scale • Carrying out activities demonstrating direct and inverse proportion	• Rulers, diagrams drawn to scale, atlases, building plans, money ,maps and ICT tools

8.3 GRADE 7 / TOPIC: MEASURES

SUB-TOPIC	OBJECTIVES Learners should be able to:	CONTENT (Attitude, Skill, Knowledge)	SUGGESTED LEARNING ACTIVITIES AND NOTES	SUGGESTED RESOURCES
Money	• prepare and interpret invoices • complete deposit and withdrawal slips • analyse financial transactions • calculate postal rates • prepare simple personal and household budget	• Invoices • Financial transactions • Postal rates • Exchange rate • Budget	• Drawing invoices • Filling in deposit and withdrawal slips • Interpreting statements of accounts which contain details of withdrawals, deposits, interest and balance • Calculating postal rate of letters, parcels, postal orders and money orders • Finding exchange rate • Interpreting statements involving hire purchase • Drawing up simple household and personal budgeting	• Invoices, deposit slips, withdrawal slips, statements of accounts, money order forms, postal order forms, telegram forms, money, used stamped envelopes, hire purchase statements, newspaper adverts on hire purchase, ready reckoners on interest and smartphones
Mass **(from a gramme up to a tonne**)	• convert one unit of mass to another • measure mass of quantities to the nearest 500g • solve problems involving gross, net and tare mass	• Converting mass • Rounding off mass • Gross, net and tare mass	• Changing one unit of measurement to another such as grammes, kilogrammes, tonnes and vice versa • Determining the mass of quantities up to 50 kg to the nearest 500g • Selecting appropriate units of mass to measure quantities • Estimating mass to the nearest kilogramme in the range 1 kg to 10kg • Estimating mass to the nearest 5 kg in the range 11 kg to 50kg • Differentiating the terms net, tare and gross mass • Solving problems involving net, gross and tare mass	• Weights, scales, objects to be weighed, containers, balances and ICT tools

SUB-TOPIC	OBJECTIVES Learners should be able to:	CONTENT (Attitude, Skill, Knowledge)	SUGGESTED LEARNING ACTIVITIES AND NOTES	SUGGESTED RESOURCES
Length **(Using standard units up to a kilometre and non-standard units)**	• measure length and distance using spans and paces • find length and distance in metres and kilometres • calculate perimeter of figures • draw lines and simple plans to scale	• Measurement of length • Perimeter • Scale	• Finding length by paces and spans • Measuring distance up to 1km • Illustrating lines and simple plans to scale • Applying the formula P=2(L+W) for rectangles and P= 4xS for squares **NB: P is Perimeter; L is Length W is Width (width is the same as Breadth) and S is side**	• Rulers, tape measures, metre sticks, click wheels, strings ,plane and solid shapes
Time	• express and write time in 12 and 24-hour notation • add and subtract time units • write dates in SI notation • solve problems involving time	• 12 and 24 hour notation • Standard International notation	• Showing and writing time in 12 and 24-hour notation • Converting time from 12 to 24-hour notation and vice versa • Increasing and decreasing time units • Writing dates in SI notation such as 2015-09-28 • Solving problems involving time	• 12 and 24 hour clock faces, calendars, watches, time conversion charts and timetables
Rate	• relate distance, speed and time • calculate distance, speed and time • apply knowledge of rate in problem solving	• Speed (S) • Distance (D) • Time (T)	• Recording time taken to cover stipulated distances • Using the information to derive the formula for rate such as: $S = \frac{D}{T}$ in km/h or m/s • Using formulae to calculate speed, distance and time • Estimating speed by use of experience involving walking, cycling and driving • Solving problems involving rate	• Pendulums, watches, click wheels, tape measures, metre sticks, strings, scales, money and ICT tools

SUB-TOPIC	OBJECTIVES Learners should be able to:	CONTENT (Attitude, Skill, Knowledge)	SUGGESTED LEARNING ACTIVITIES AND NOTES	SUGGESTED RESOURCES
Area	• identify units of area • calculate area of square and rectangle • find area of triangles • calculate area of composite shapes	• Units of area • Area of rectangle, square and triangle • Area of composite shapes	• Choosing appropriate units from square centimetres, areas and hectares for measuring area • Relating and using the following units of area: 1 square metre = 10 000 square centimetres ($1m^2$ =10 000 cm^2) (100m^2 = 1 are) 100 acres = 1 hectare (100 a = 1ha) 10 000 square metres = 1 hectare (10 000m^2 = 1 ha) • Finding area of rectangle, triangle and square using units of measure • Applying the formulae: A = L x W for rectangles A = $\frac{1}{2}$B x H for triangles • Finding area of composite shapes • Solving life problems involving area	• Tape measures, 30cm rulers, metre rules, ropes, triangular templates, rectangular templates, plane surfaces, garden, field, plots, tiles and electronic devices

SUB-TOPIC	OBJECTIVES Learners should be able to:	CONTENT (Attitude, Skill, Knowledge)	SUGGESTED LEARNING ACTIVITIES AND NOTES	SUGGESTED RESOURCES
Volume and capacity (up to cubic metres)	• state and use units of capacity and volume • measure volume and capacity • compute volume up to a cubic metre (m^3)	• Units of volume • Measurement of capacity and volume • Calculation of volume	• Relating and using the following conversions 1 cubic centimetre ($cm^{3)}$ = 1 millilitre (ml) 1 000 millilitres (ml) = 1 litre (l) 1 000cubic centimetres = 1 litre 1 000 litres = 1 cubic metre ($m^{3)}$ • Measuring capacity and volume of various containers and objects in millilitres, cubic centimetres and litres • Deriving and using the formula Volume = Length x Width X Height (V = L x W X H) for rectangular prisms or Base Area X Height (A X H) • Approximating capacity of containers according to the appropriate units of measure • Using approximated lengths of sides to calculate estimates of volume • Discussing water conservation • Solving life problems involving volume and capacity	• Graduated containers, cubes, rectangular prisms, various containers, measuring cylinders or jugs and conversion tables, calculators and computers
Direction, angles and lines	• show direction of points from a reference point • identify and name types of angles • calculate missing angles • illustrate and name lines of a circle • Convert fractions by revolutions	• Compass points • Angles: acute, right, obtuse, straight, reflex and complete revolution • Circle: arc and chord • Conversion	• Giving direction of points from a reference point • Drawing and naming different types of angles: acute, right, obtuse, straight and reflex • Determining whether an angle lies between 0 and 1; 1 and 2; 2 and 3 or 3 and 4 right angles • Establishing and drawing radius, diameter, circumference, arc and chord of a circle • Deducing that interior angles of rectangles add up to 4 right angles (360^0) and those of a triangle add up to(180^0) • Dividing a square and a rectangle diagonally to make right angled triangles • Converting fractions of revolution to degrees	• Compasses, atlases, right angled templates/set squares, clock faces, circle templates, mirrors, alphabet figures, lines on charts, pairs of scissors, regular and irregular plane figures, calculators and computers

Shapes	• identify 2 and 3 dimensional shapes • list properties of 2 and 3 dimensional shapes • construct models of 3 dimensional shapes	• 2 and 3 dimensional shapes	• Classifying and naming 2 and 3 dimensional shapes • Identifying flat and curved surfaces, edges, corners (vertices) and sides of shapes • Counting edges, corners /vertices and sides of shapes • Naming the properties of 2 and 3 dimensional shapes • Identifying and drawing representations of scalene, isosceles, equilateral and right angled triangles, regular and irregular quadrilaterals, pentagons, hexagons, circles, cubes, rectangular and triangular prisms, cylinders, square based pyramids, spheres and cones • Making models of solid shapes • Identifying a combination of shapes in physical structures	• 3 dimensional shapes, charts with 2 and 3 dimensional shapes, rulers, pencils, physical structures of plane and solid shapes and models

8.4 GRADE 7 / TOPIC: RELATIONSHIPS

SUB-TOPIC	OBJECTIVES Learners should be able to:	CONTENT (Attitude, Skill, Knowledge)	SUGGESTED LEARNING ACTIVITIES AND NOTES	SUGGESTED RESOURCES
Data handling	• interpret data from tables • Represent data on tables • read and extract information from graphs and pie charts • present data on graphs and pie charts • use statistical graphs in life situations	• Tables • Bar graphs • Column graphs • Pie charts • Ready reckoners • Jagged line graphs	• Reading and extracting data from tables • Collecting, classifying and tabulating data such as heights of learners, rainfall, mass and temperature • Calculating the mean or average from data • Solving problems using tables • Interpreting data from bar graphs • Answering questions using bar graphs • Drawing bar graphs to show data • Reading information from column graphs • Answering questions using column graphs • Constructing column graphs • Reading and interpreting information on pie charts • Solving problems using pie charts • Interpreting and answering question using ready reckoners • Constructing ready reckoners • Reading and representing data on a jagged line graphs • Solving problems using jagged line graphs **NB: Conducting simple investigations involving statistical data from life situations such as population, examination result, health issues and historical events**	• Square papers, tables, diagrams, graphs pie charts, on statistical data, electronic and print media

9.0 ASSESSMENT

This syllabus' scheme of assessment is grounded on the principle of inclusivity. Arrangements, accommodations and modifications must be visible in both continuous and summative assessments to enable candidates with special needs to access assessments.

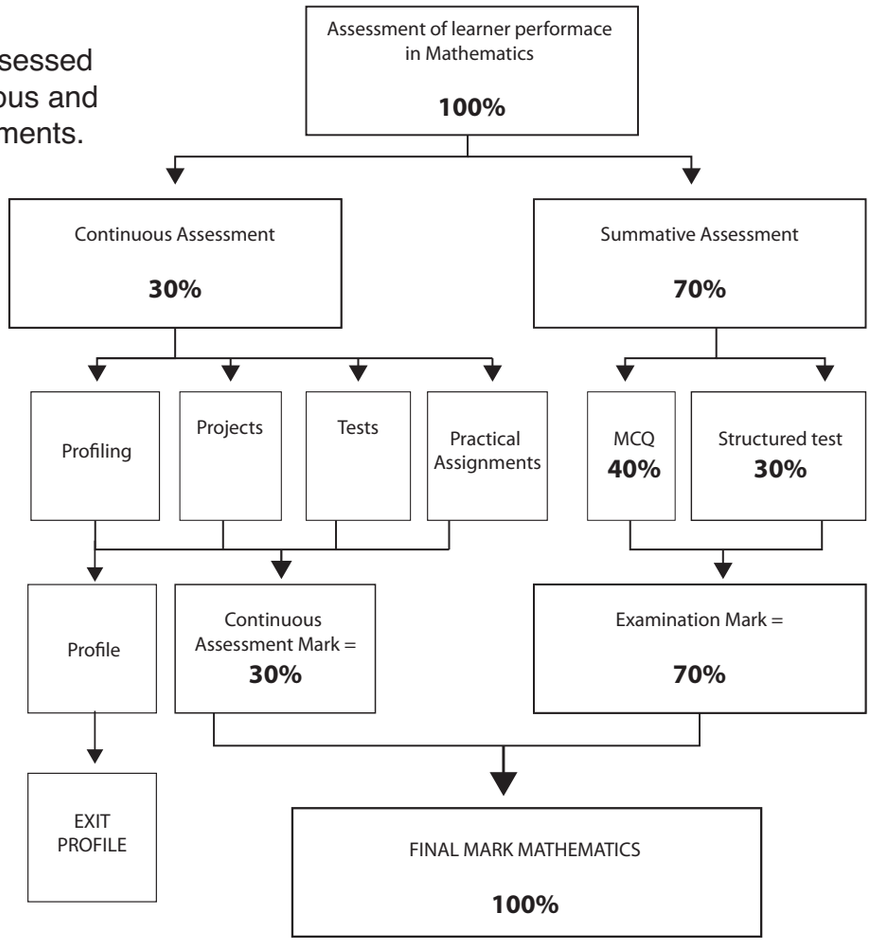
ASSESSMENT OBJECTIVES

Learners should be able to:

8.1 recall, recognise and use mathematical symbols, terms and definitions;
8.2 carry out calculations accurately, checking the correctness of solutions;
8.3 estimate, approximate and use appropriate degree of accuracy;
8.4 read, interpret and use tables, charts and graphs;
8.5 solve mathematical problems showing steps and necessary information;
8.6 use appropriate formulae and /or appropriate algorithms to solve problems;
8.7 apply Mathematics in real life situations;
8.8 explore mathematical ideas to come up with innovations and conclusions;
8.9 demonstrate how people are influenced by mathematics

ASSESMENT MODEL

Learners will be assessed using both continuous and summative assessments.



Continuous assessment: (30%)

a) Assessment of content (tests and written assignments).

b) Projects (practical and folio)

c) Profiling (soft skills)

Soft skills will be assessed using checklists, rating scales and observation guides.

Tests, written assignments and projects are administered from grade 3 to 7. Continuous assessment marks from Grade 6 contribute to the final mark.

Summative Assessment: (70%)

Paper	DESCRIPTION	DURATION	MARKS	PAPER WEIGHTING %	WEIGHTING %
1	50 Multiple Choice Questions	2 hours	50	40	70%
2	Structured questions	2 hours	40	30	

Paper 1:

There are 50 questions and candidates are expected to answer all.

Paper 2:

Comprises of sections A and B. Section A will consists approximately 10 structured questions. Candidates must answer all questions. The total for this section is 25 marks. Section B will consist of 5 structured questions each worth 5 marks. Candidates must choose and answer three questions. The total for this section is 15 marks.

Skills Weighting

The weighting of the skills to be assessed will be as follows:

Skill		Continuous %	Summative %	Weighting %
1.	Knowledge	5	10	15
2.	Routine manipulation	5	20	25
3.	Understanding and application	10	25	35
4.	Problem solving	10	15	25
Total		30	70	100

Specification Grid for summative assessment

Topic	Skill 1	Skill 2	Skill 3	Skill 4	Total
Numbers	3	4	5	3	15
Operations	3	5	5	4	17
Measures	2	8	7	3	20
Relationships	2	3	8	5	18
Total	10%	20%	25%	15%	70%