ZIMBABWE

MINISTRY OF PRIMARY AND SECONDARY EDUCATION

CURRICULUM DEVELOPMENT AND TECHNICAL SERVICES

MATHEMATICS

JUNIOR
(GRADE 3-7)
2015 - 2022

TEACHER'S GUIDE

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1.0 ORGANISATION OF THE GUIDE

The Junior Mathematics syllabus document covers one of the eleven learning areas in the junior school curriculum 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 to develop positive attitudes towards the use of technology. The syllabus provides progression from one level to another. You are encouraged to link the developmental stages of learners and their learning abilities to relevant competence and methodology. Although the objectives are organised on a grade by grade basis, flexibility is allowed to cater for differences in learning ability. The pace should be determined by the need of the learner and the environment. You are urged to encourage learners to to work diligently preparing for vocational, enterprise skills and further studies. Integration of mathematical skills in other learning areas is encouraged. The syllabus was also designed to enable a smooth transition from Junior to Secondary School learning. The learners are being assessed through continuous assessment (formative and summative).

The teacher's guide is divided into two parts as follows:

SECTION A: CRITICAL DOCUMENTS

These include among others:

- Curriculum framework
- National syllabus
- School syllabus
- Schemes of work
- Lesson plans
- Scheme-cum plans
- Records

SECTION B: CURRICULUM DELIVERY

The documents under Curriculum delivery are:

- Content
- Objectives
- Methodology
- Instructional Materials
- Class Management
- Evaluation

2.0 PART A: CRITICAL DOCUMENTS

2.1 INTRODUCTION

As a teacher you need to know the critical documents you should have in order to deliver the curriculum effectively. You should have the following:

- Curriculum Framework
- National Syllabus
- School syllabus
- Schemes of Work/Scheme Cum Plan
- Lesson Plans
- Learner Profile
- Progress Records
- Register of Attendance

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 competences.

2.2.1 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

- can think and reason logically

- have knowledge of shape and form

2.2.2 CROSS CUTTING THEMES

Mathematics learning 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

2.3 OBJECTIVES

The guide was developed for the teacher to know and have access to the following aspects and be able to implement them. You need to frequently consult and be familiar with the following critical documents.

- Curriculum Framework
- National Syllabus
- School syllabus
- Schemes of Work/Scheme Cum Plan
- Lesson Plans
- Learner Profile
- Records

UNIT 1

CURRICULUM FOR PRIMARY AND SECONDARY EDUCATION (2015 -2022)

Introduction

This is a policy document that outlines underpinning principles, national philosophy, learning areas, the description and expectations of Ministry of Primary and Secondary Education (MOPSE) at policy level. It prescribes what the government expects you to deliver as you go about your duties.

The Zimbabwe Curriculum framework sets out the common aims and objectives of the education system and the specific features of different education levels, thereby providing the basis for transparent relationships between schools, parents, and local communities. It also provides guidance to schools and education administrators in the organization, management and evaluation of the effectiveness of the school activities. Schools are encouraged to actively engage, as learning organisations, in providing diversified opportunities for all learners to develop the knowledge, key skills and attitudes defined in this framework. This framework is intended to be the main reference document informing the development of syllabuses, revision of syllabuses, development and use of learning resources and the creation of guidelines for in-service teacher training and support. This Curriculum Framework sets out what learners are expected to know, understand, value and be able to do as a result of their learning experiences in schools and no formal education settings from Early Childhood Development (ECD) to secondary level. Its fundamental purpose is to provide a structure around which schools can build educational programmes that ensure learners achieve desired outcomes. This framework identifies learning areas for all learners. It is intended to guide schools and teachers, stakeholders and parents over the curriculum process in a rapidly changing environment.

OBJECTIVES OF THE CURRICULUM

The Curriculum was developed to:

- promote and cherish the Zimbabwean identity
- Prepare learners for life and work in a largely agro-based economy and an increasingly globalised and competitive environment.
- foster life-long learning in line with the opportunities and challenges of the knowledge society
- Prepare learners for participatory citizenship, peace and sustainable development
- Prepare and orient learners for participation, leadership and voluntary service

KEY ELEMENTS

The Curriculum of Zimbabwe is made up of the following key elements:

- Background
- Principles and values guiding the curriculum
- Goals of the curriculum
- Learning areas
- Teaching and learning methods

- Assessment and learning
- Strategies for curriculum implementation
- The future

UNIT 2

SYLLABUS INTERPRETATION

INTRODUCTION

Syllabus interpretation is the process of making sense out of the syllabus. Interpretation is about finding the meaning. It is the process of unpacking the syllabus, analysing and synthesising it. It is now the role of you, the teacher to bridge the gap between the planned and implemented curriculum as you interpret the syllabus.

Objectives

The following are objectives for syllabus interpretation

- Expose the teacher to various teaching/learning methodologies and materials
- Assist the teacher to narrow the gap between planned and implemented curriculum
- Helps the teacher to come up with a comprehensive school based syllabus
- Helps the teacher to break down content into teachable units

As a teacher you therefore need to be familiar with the two syllabuses, that is the national syllabus and the school syllabus. This will assist you in your lesson delivery.

OBJECTIVES

By the end of this unit you should be able to interpret the Heritage - Social Studies National Syllabus

TYPES OF SYLLABUSES

Syllabuses are **key documents** for every teacher. There are two types of syllabuses namely the:

- National Syllabus
- School syllabus

OFFICIAL OR NATIONAL SYLLABUS

As a teacher, you should be able to interpret the National and the School syllabus and these contain the following components:

Aims, content, assessment objectives, methodology and the assessment or

examination format.

Types of Syllabuses

2.1National Syllabus

It is a policy document that outlines and specifies the learning area philosophy, aims and objectives, Learning/teaching concepts and content, suggested methodology and assessment criteria at every grade level. As a teacher you should always have it and use it to guide you in your day to day teaching and learning activities.

Elements (Structure of School syllabus)

- **Aims:** general direction in which you should be guiding your learners (long term)
- **Objectives:** Llearner behaviour after treatment
- **Assessment objectives:** examination oriented (what is to be tested)
- **Content:** topics or aspects to be covered
- **Methodology:** teaching approaches to achieve desired learning outcomes

  Learner-centred approaches allow learners to practice skills learnt
- **Examination format:** how learners will be assessed

2.2 School Syllabus (A breakdown of the national/official syllabus)

This is a document drawn from the National Syllabus by reorganising content taking into account local factors. It is a breakdown of the national/official syllabus to suit the contextual environment into which the school is located but without changing the content of the national syllabus. This document is drafted at school level by the teachers.

Factors influencing drafting of the school syllabus

- Level of learner performance (knowledge they already have)
- Facilities and funds available
- Time allocation in the official syllabus
- Local conditions that affect the choice and sequencing of topics
- Supply of textbooks and other teaching materials
- Education technology
- Community influences (including political, traditional norms and values)
- Geographical set up of the area
- Teachers failing to interpret the national syllabus

Elements of the School Syllabus

- Preamble
- Aims: broad indication of what the learners should learn
- Objectives: learner behaviour at the end of the teaching-learning experience

  (Competencies)

- Topics/Activities (Content)
- Methodology (Learner – Centred)
- Instructional Or Teaching Materials
- Assessment/Evaluation

UNIT 3

SCHEMES OF WORK

Definition:

This is a document that you as a teacher should draw from the national and school syllabus. You should outline the objectives activities, content, methodologies (see scheme of work/scheme cum plan template below). You should draw your scheme of work/scheme cum plans two weeks ahead of lesson delivery date. (Use of ICT in drawing the documents is encouraged). It is a weekly breakdown of activities.

Components of a Scheme of work

By the end of this unit, you should be able to:

- describe the essential components of a scheme-cum plan
- develop a scheme-cum plan
- explain the advantages of writing down your plan
- realise the merits of planning your lessons well in advance

The following are the components of a scheme of work that you as a teacher should know:

Week ending	Topic/ content	Objectives	SOM	Suggested Teaching and learning equipment	Methods/ activities	Evaluation

Example of a scheme of work

The following is an example of a scheme of work that a Junior Mathematics teacher can follow:

GRADE 7

General aims

By the end of the term, learners should be able to:

- recall, recognise and use mathematical symbols, terms and definitions;
- carry out calculations accurately with the aid of various technological devices;
- estimate, approximate and use appropriate degree of accuracy;
- read, interpret and use tables, charts and graphs;
- solve mathematical problems showing steps and necessary information;
- develop and use appropriate formulae and /or appropriate algorithms to solve problems;

- interpret and apply Mathematics in life situations;
- explore mathematical and scientific ideas and come up with innovations and conclusions and
- demonstrate how people are influenced by mathematics.

WEEK ENDING	CONTENT/ TOPIC	OBJECTIVES	COMPETENCIES/ SKILLS/ KNOWLEDGE	SOM	SUGGESTED METHODS/ ACTIVITIES	METHODS/ ACTIVITIES	Evaluation
16/12/16	Relationships -data handling	By the end of the week learners should be able to: • interpret data from tables • represent data on tables	• tables • interpretation • representation • extraction • analysis	• Mathematics (grade 3-7) National Syllabus page 86	• Tables • Statistical data • Environment (eg indeginous versus exotic trees) • Electronic and print media	• Reading and extracting data from tables from statistical data and print media • Interpretation of data from • Field tour to identify things/objects in the environment and use the data to make tables • Discovery through identification of environmental pollution (identify sources of litter in the environment) to cap environmental issues in cross cutting themes • Group Work on interpretation and representation of data • Individual written work	

UNIT 4

LESSON PLAN

Definition

This is a detailed daily plan of what you intend to deliver during the lesson. This is to be used in the event of you having drawn a scheme of work rather than a scheme cum plan

Components of a lesson plan

A lesson plan is made up of the following components:

- Preparation (objectives, Media)
- Date
- Time
- Grade/Class
- Number of learners
- Learning area
- Topic/content
- Sub-topic
- SOM
- Lesson objectives
- Equipment
- Assumed knowledge
- Lesson steps
- Evaluation

Example of a lesson plan

The following is an example of a lesson plan drawn from the scheme of work above.

Detailed Lesson Plan

Date:	15 December 2016
Time:	11.30 -12.30
Grade /Class	Grade 7 Red
Learning Area	Mathematics
Topic/Content:	Relationships
Sub-Topic:	Data handling
S.O.M:	Mathematics (Grade 3-7) National Syllabus page 86
Equipment:	Tables, Statistical data, Environment (eg indeginous versus exotic trees), Electronic and print media
Number of learners:	47
Assumed Knowledge:	Learners have knowledge of tables

Lesson Objectives

By the end of the lesson, learners should be able to:

- Interpret data from tables
- Represent data on tab

STAGE	CONTENT	ORGANISATION	COACHING POINTS
Introduction 5min	• objects/things in the environment	Horse shoe	-ICT tools(video of local heroes and heroines) - Resource persons - Charts - Picture - books
Lesson development 10 mins	• collection - different objects from the environment that pollutes it • classification -different collected objects and pictures	• Field touring the environments identifying and collecting different objects • In groups learners sample out their collection • In groups they draw tables to represent collected material • Learners justify their classification and suggest ways of keeping the environment clean.	-identifying different objects -facilitator ensures that learners do not encroach or touch dangerous objects -guidance by the teacher to learners on justification
Conclusion 5 mins	-Findings from the classification	-feedback by learners from data collection and classification	-follow up questions by the facilitator

LESSON EVALUATION:

Strength:

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Weaknesses:

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Way Forward

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YOU SHOULD NOTE THAT A COMBINATION OF A SCHEME OF WORK AND LESSON PLAN FORMULATE SCHEME-CUM PLAN

NB It should be noted by teachers that the strengths and weaknesses should reflect on both the learners and the teacher. (Media, methodology, content, activities, timing, level of learners should be looked at)

UNIT 5

RECORDS

Definition

Record keeping is the maintenance of information about each learner, which includes basic biographical data, contact information, educational progress and modifications, attendance, discipline, and medical concerns. You should have a progress record to capture learner performances. An attendance register is a critical document you should have as a teacher to track and record your learner's class or lesson attendance.

Objectives

By the end of this unit, you should be able to:

- identify the various records you are expected to keep
- prepare accurate records
- Interpret information from records to promote learning
- Maintain and keep records safely
- Appreciate the need to update records regularly

Records to be kept

Records are critical documents about the teaching – learning process which you must keep as a teacher
They include:

- Syllabuses (National and School)
- Examination documents (list of candidates, , exam analysis)
- Mark lists (mark schedules)
- Stock control registers
- Records of staff details (teacher professional standard documents)
- Records of learner details (register, social, progress, remedial)
- Supervision records (crits)
- Files, circulars, handouts, past exam papers
- Minutes of meetings (staff developments, staff meetings)
- Inventory of resource materials
- Stock control registers

Conclusion

You should note that the above information has defined a guide and its importance. Some of the vital things mentioned are the critical documents, curriculum for primary and secondary school, syllabus interpretation, national and school based syllabuses, schemes of work and lesson plans as well as record keeping. The onus is now on the teacher to implement the documented components of the syllabus as provided in the guide.

3.0 PART B:

CURRICULUM DELIVERY

Introduction

This section comprises of the content, Objectives, Methodology, Teaching-learning materials, Class management, Evaluation and Assessment. These helps you as a teacher to deliver the critical documents dealt with in Part A above.

3.1 OBJECTIVES

By the end of this unit, you should be able to:

- select appropriate teaching methods and learning materials for your lessons to enhance effective evaluation and assessment
- use a variety of learner-centred approaches
- plan and organise study tours
- help pupils carry-out projects or experiments
- apply class management skills that will promote unhu/ubuntu/vumunhu in learners

3.2 CONTENT

The Mathematics Junior (Grades 3-7) syllabi covers the following content:

- Number
- Operations
- Measures
- relationships

3.3 METHODOLOGY

- As a teacher it is important for you to use problem-solving and learner-centred approaches:
- You are the facilitator
- The learner is the doer

The following are examples of methods that you can use in the teaching and learning process:

-Question and answer (Q/A)

- Lecture
- Demonstration
- Observation
- Simulation
- Role play
- Experimentation
- Project

- Field trips

Choice of method is influenced by:

- your personality
- learner`s level of development (cognitive, affective and psychomotor)
- Content to be covered
- Competencies to be developed
- Time of the year
- Place
- Society/community
- Size of class
- resources

Learner Profiles

Profile assessment is a quality assessment tool designed for a variety of learners to determine their strengths and identify areas of improvement. As a teacher, you should carry out profiling to track learner behaviour, knowledge, attitudes, aptitudes, skills, values and performances on an on-going basis. This assessment informs teaching and learning process and contributes to learner profile.

3.4 INSTRUCTIONAL (TEACHING-LEARNING) AIDS

- help learners to learn better and faster
- capture learners` interest
- create virtual reality

Objectives

By the end of this unit, you should be able to:

- select appropriate instructional aids
- make good quality aids from available resources
- use instructional aids effectively
- Design meaningful and effective instructional aids

Types:

The list below are examples of teaching/learning materials you can use:

- Charts
- Chalkboard
- Whiteboard
- computers
- slides
- films

- videos
- flannel graph
- textbooks
- local environment

3.5 Assessment and evaluation

Assessment/evaluation is an interactive process between learner and the teacher that informs school how well their learners are learning what they are teaching. The information is used by the school to make changes in the learning process. Assessment of teaching means taking a measure of its effectiveness. “Formative” assessment is measurement for the purpose of improving it.

Supervision

- Check learners` work in order to guide and correct them
- Areas that require supervision include practical work, written work, discussions, group work and field trips

Evaluation

- Measuring the success of teaching in terms of teacher and learner performance and soft skills (collaboration, leadership, discipline)
- Provides feedback on the acquisition of knowledge, skills and attitudes by learners

Objectives

By the end of this unit, you should be able to:

- evaluate both your work and that of the learners
- identify the essential assessment and evaluation methods that you can use
- prepare marking schemes for the various assessment and evaluation activities or projects

Methods of Evaluation

- Tests and exercises
- Projects
- Examinations
- Assignments
- observations

3.6 Class Management

Classroom management refers to the wide variety of skills and techniques that teachers use to keep learners organized, orderly, focused, attentive, on task, and academically productive during a class. It is the process of planning, organising, leading and controlling class activities to facilitate learning

Objectives

By the end of this unit, you should be able to:

- create an effective learning environment
- motivate the learners
- maintain discipline
- supervise class activities

Organisational Skills for Effective Learning

Classroom organisation which covers:

- physical environment
- emotional environment
- grouping the learners
- class control and discipline
- supervision

Physical Environment

- Classroom to be clean, tidy and airy
- Safety considerations when arranging furniture
- Teaching aids to be visible to learners

Emotional Environment

- Be firm, warm and pleasant
- Set the right tone
- Tell learners what behaviour you expect
- Rewarding good behaviour

Grouping

- Learners may be grouped according to needs, abilities
- Promote sharing of ideas among learners

Class Control and Discipline

- Know the schools policy on discipline
- Be firm and fair
- Punishment should be corrective
- Acknowledge good behaviour
- Make use of prefects and class monitors
- Create an atmosphere of trust and honesty
- Aim for intrinsic discipline

MOTIVATION

- Make learners feel important
- Recognise and reward excellence
- Be a role model in terms of your demeanour

UNIT 6

SCOPE OF THE TEACHERS`GUIDE

Syllabus Topics

It is important for you as a teacher to know the topics that are covered and how they are listed according to levels as shall be revealed below. You should also be able to state the objectives, methods, teaching and learning materials, records and evaluation techniques for each topic.

Mathematics learning area has 4 broad topics as stipulated below.

- **Number**
  - whole numbers
  - ordinal numbers
  - quantifying numbers
  - fractions

- **Operations**
  - addition
  - subtraction
  - addition of fractions
  - subtraction of fractions
  - multiplication
  - division

- **Measures**
  - money
  - mass
  - length
  - rate
  - area
  - volume and capacity
  - shapes

- **Relationships**
  - data handling

INTRODUCTION TO JUNIOR (Grades 3-7) MATHEMATICS

Objectives (learner – behaviour)

Learners should be able to:

- recall, recognise and use mathematical symbols, terms and definitions;
- carry out calculations accurately with the aid of various technological devices;
- estimate, approximate and use appropriate degree of accuracy;
- read, interpret and use tables, charts and graphs;
- solve mathematical problems showing steps and necessary information;
- develop and use appropriate formulae and /or appropriate algorithms to solve problems;
- interpret and apply Mathematics in life situations;
- explore mathematical and scientific ideas and come up with innovations and conclusions and
- demonstrate how people are influenced by mathematics.

Content

Activities

The following are some of the activities the learners and the teacher will be carrying out:

- Educational touring to industrial sites to observe some mathematical activities
- Discussing the benefits of mathematics activities done in their community and the nation
- Adding, subtracting, multiplying and dividing numbers as involved in daily transactions
- Rounding off numbers and apply to life situations
- Calculating profit and loss in their small businesses as they demonstrate entrepreneurship
- Interpretation of graphs, tables using information gathered from the environment

Methodology (learner - centeredness)

It is of interest for the Mathematics teachers and learners to employ the following methods during teaching and learning:

- Project based learning
- Educational tours
- Group work
- Imitation
- Discovery
- Experimentation
- E-learning

- Collections
- Demonstrations
- Resource person(s)
- Questions and Answers

Teaching-learning aids

There is need for the teacher to use the following as some of the teaching aids which can be used in the teaching and learning:

- ICT Tools
- Print Media
- Tools from the environment
- Audio and Visual Materials
- Realia

The following is a guide on some of the topics:

Grade 3

Number

Objectives

Learners should be able to:

- Read and write any number in numerals and words in the range
- Identify, read, write and count forward and backwards within the range

Content:

•Whole numbers - (0-1 000)

Methodology:

- Role playing
- Number games
- Group discussion
- demonstration

Teaching-Learning Aids:

- Ict Tools
- Number lines
- Pattern cards

- Place value charts
- Abacus

Activities (Learner-centredness)

- Saying, reading and writing in numerals and words
- Counting forward and backwards
- Singing number games

Competencies

Knowledge	Skills	Attitudes
• Numeracy • Number sequence	• Counting • approximation	• team work • collaboration

ANNEXTURE 1

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)	• 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	• 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	(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	• 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) • 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 1000 by a digit) • Multiplication of whole numbers by fractions with 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 • 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)	• 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, 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 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 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 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 • 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
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 cm2 • 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 hour 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 = DT • 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 24hour 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