



Republic of Zambia

**Ministry of Education, Science, Vocational Training and Early
Education**

Mathematics Syllabus

(Grades 1-7)



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VISION

Quality, lifelong education for all which is accessible, inclusive and relevant to individual, national and global needs and value systems.

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PREFACE

The syllabus was produced as a result of the Curriculum review process carried out by the Ministry of Education, Science, Vocational Training and Early Education under the auspices of the Curriculum Development Centre (CDC). The curriculum reform process started way back in 1999 when the Ministry of Education commissioned five (5) curriculum studies which were conducted by the University of Zambia. These studies were followed by a review of the lower and middle basic and primary teacher education curriculum. In 2005 the upper basic education National survey was conducted and information from learners, parents, teachers, school managers, educational administrators, tertiary institutions traditional leaders civic leaders and various stakeholders in education was collected to help design a relevant curriculum..

The recommendations provided by various stakeholders during the Upper Basic Education National survey of 2005 and National symposium on curriculum held in June 2009 guided the review process.

The review was necessitated by the need to provide an education system that would not only incorporate latest social, economic, technological and political developments but also equip learners with vital knowledge, skills and values that are necessary to contribute to the attainment of Vision 2030.

The syllabus has been reviewed in line with the Outcome Based Education principles which seek to link education to real life experiences that give learners skills to access, criticize analyze and practically apply knowledge that help them gain life skills. Its competences and general outcomes are the expected outcomes to be attained by the learners through the acquisition of knowledge, skills, techniques and values which are very important for the total development of the individual and the nation as a whole.

Effective implementation of Outcome Based Education requires that the following principles be observed: clarity of focus, Reflective designing, setting high expectations for all learners and appropriate opportunities.

It is my sincere hope that this Outcome Based syllabus will greatly improve the quality of education provided at Grade 8 and 9 level as defined and recommended in various policy documents including Educating Our Future`1996 and the `Zambia Education Curriculum Framework `2013.

Chishimba Nkossa (Mr.)

Permanent Secretary,

MINISTRY OF EDUCATION, SCIENCE, VOCATIONAL TRAINING AND EARLY EDUCATION

ACKNOWLEDGEMENT

The syllabus presented here is a result of broad-based consultation involving several stakeholders within and outside the education system. Many individuals, institutions and organizations were consulted to gather their views on the existing syllabus and to accord them an opportunity to make suggestions for the new syllabus. The Ministry of Education wishes to express heartfelt gratitude to all those who participated for their valuable contributions, which resulted in the development of this syllabus.

The Curriculum Development Centre worked closely with other sister departments and institutions to create this document. We sincerely thank the Directorate of Teacher Education and Specialized Services, the Directorate of Planning and Information, the Directorate of Human Resource and Administration, the Directorate of Open and Distance Education, the Examinations Council of Zambia, the University of Zambia, schools and other institutions too numerous to mention, for their steadfast support.

We pay special tribute to co-operating partners especially JICA in conjunction with Hiroshima University and UNICEF for rendering financial and technical support in the production of the syllabus.

C.N.M Sakala (Mrs.)

Director-Standard and Curriculum

MINISTRY OF EDUCATION, SCIENCE, VOCATIONAL TRAINING AND EARLY EDUCATION

INTRODUCTION

This syllabus has been prepared and produced against the background of the need to set high standards for mathematics education and actualize the country's vision from ECCDE through to Teacher Education. It is a culmination of reviews of existing materials and policies from a number of countries both in Africa and beyond with progressive mathematics education. It also draws from studies, research and the country's policy documents and aspirations.

The following are the underlying principles for the revised Junior Secondary school mathematics syllabus:

- Equity
- Orderly and logical progression
- Varied teaching methodology with subjective learning as the keystone
- Integration of knowledge, skills and values

These syllabus guidelines have been defined at two levels namely the content and process domains. The content domain is defined according to six themes namely; **Numbers & Calculations**, **Algebra**, **Geometry**, **Measures**, **Probability & Statistics** and **Relations**. The process domain on the other hand is defined according to three categories of *knowledge, skills and values*. These two domains constitute the general outcomes of the Mathematics course.

Rationale

Mathematics is an important subject on the Zambian School curriculum. It is featured as one of the core subjects in all the options for both the academic as well as the practical career pathways.

Mathematics enhances the learners' understanding of the world around and prepares them for further education. It also plays a key role as a tool for learning other subjects and learning areas. The subject fosters the development and improvement of learners' intellectual competence in logical reasoning, spatial visualization, analysis and abstract thought. When learners have acquired enough knowledge in mathematics they develop reasoning, thinking and problem solving skills. Mathematics is also important in science and technology subjects which are vital for the development of the country. It therefore equips the learner to live in the age of Science and technology and enable them contribute to social, economic development of the country.

Mathematics can also be an interesting subject when learners appreciate basic concepts and insights that will equip them to pursue mathematics education at higher levels.

Suggested Teaching Methodology

This Syllabus for Primary schools aims at enabling learners acquire mathematical knowledge, values and skills for the further study of the subject at the Junior Secondary level as well as apply it in their daily lives. It is for this reason that teachers should focus on encouraging communication of mathematical ideas among learners, emphasise problem solving and application to real life situations besides cultivating interest in the subjects.

The mathematical concepts and principles presented in this syllabus aim to encourage learners to think logically and critically and make connections between topics and with other subjects. To achieve this, teachers should put emphasis on teaching the subject in a manner where learners communicate their mathematical ideas as well as misconceptions. This approach will enhance learners' understanding and appreciation of mathematical concepts and ideas as they construct their own knowledge. Teachers will also need to refocus their teaching approaches and continuously sharpen their pedagogical skills in line with contemporary approaches in the teaching of the subject.

Further, since Mathematics is a discipline with hierarchical concepts and skills, teachers should present it in a systematic manner. In the design of the syllabus, effort has been made to sequence the topics across the entire course of study. Successful interpretation and implementation of this syllabus however requires flexibility on the part of teachers in order for them to arrange the content in an easy to understand progression so as to improve mathematics education in the country.

Assessment

Assessment is an important diagnostic tool in the teaching and learning process used to determine whether teaching and learning have taken place or not. It requires well defined rubrics to facilitate a fair and consistent assessment of learner's work as well as clearly defined performance targets at key stages and during the process of teaching and learning.

Classroom based continuous assessment must form an integral part of the implementation of this syllabus. This is in view of the value that this adds to the modification of instruction delivery thereby contributing to best practices by the teacher. In order to attain this, teachers are urged to employ various techniques of assessment according to the topics and themes at various levels. These methods may include learner observation, projects, tests, portfolios and projects among others.

For terminal assessment, the Examinations Council will provide guidelines on the objectives to be assessed in at specific levels both for selection and certification.

Time and period allocation

Time allocation for this syllabus is at two levels; the Lower Primary (Grades 1 – 4) and the Upper Primary (Grades 5 – 7) levels.

- The Lower Primary Level will require at least 3 hours (Six-30 minutes periods) per week to complete.
- The Upper Primary Level on the other hand will require **at least** 4 hours (Six-40 minute periods) per week to complete.

General Outcome

1. To foster the development and improvement of learners' intellectual competence in logical reasoning, spatial visualization, analysis and abstract thought.
2. To equip the learner to live in the age of Science and technology and enable them contribute to social, economic development of the country

General Outcomes	Key Competences at Grade 1 Level
<ul style="list-style-type: none"> Develop numeracy and arithmetic operations skills. Enrich learners' understanding of mathematical concepts on Numbers, shapes and diagrams. 	<ul style="list-style-type: none"> Sort objects with respect to colour, size and shape . Identify digits from 0-9. Count given objects up to 20. Read and write numbers sequentially from 1-100. Identify and tell the meaning of addition and subtraction signs. Recognise denominations of Zambian money (Coins and notes) Identify circles, rectangles and triangles .

GRADE 1

TOPIC	SPECIFIC OUTCOMES	CONTENT		
		KNOWLEDGE	SKILLS	VALUES
1.1 NUMBERS AND NOTATION	1.1.1 Recognise, count, read and write numbers from 1 to 100 (including the meaning of zero). 1.1.2 Interpret numbers using ten as a unit. 1.1.3 Order numbers in terms of magnitude. 1.1.4 Count in tens up to ten tens (100).	<ul style="list-style-type: none"> Comparing number of objects by making one-to-one correspondence. The meaning of zero. Counting from 1 to 100 (Use concrete objects and math songs/games/rhymes, ICT as well). Reading and writing numbers from 1 to 100. Interpreting numbers using ten as a unit (i.e. 12 is 10 and 2, 13 is 10 and 3 etc). Recognizing that one number is more or less than the other. Counting numbers in tens up to 100. 	<ul style="list-style-type: none"> Identification of numerals. Communication through writing and counting. Comparison of number, magnitude and ordering them. Representation of numbers with 10 as a unit. 	<ul style="list-style-type: none"> Awareness of numeration system. Team work through cooperative learning. Interest in the numbers and their order.
1.2 SETS	1.2.1 Sort objects according to size, colour and shape. 1.2.2 Match sets into one-to-one correspondence.	<ul style="list-style-type: none"> Sorting objects according to size colour and shape. Matching sets of objects into one-to-one correspondence. 	<ul style="list-style-type: none"> Classification of objects. Comparison of objects in real 	<ul style="list-style-type: none"> Curiosity to explore nature. Appreciation of order in nature.

TOPIC	SPECIFIC UTCOMES	CONTENT		
		KNOWLEDGE	SKILLS	VALUES
	1.2.3 Place sets in order according to their cardinal numbers. 1.2.4 Assign numerals 0 to 10 to elements in a set. 1.2.5 Use cardinal and ordinal numbers in everyday life.	<ul style="list-style-type: none"> Ordering sets according to their cardinal and ordinal numbers. Counting the number of elements in a set (i.e. assign numerals 0 to 10 to elements in a set). 	life. <ul style="list-style-type: none"> Identification of various criteria for sorting objects. Application of groups in real life. 	<ul style="list-style-type: none"> Team work through collaborative learning.
1.3 ADDITION	1.3.1 Add whole numbers with sums up to 100. 1.3.2 Complete addition of number sentences. 1.3.3 Apply addition to real life up to 100.	<ul style="list-style-type: none"> Meaning of addition. Adding single digit numbers up to 10. Adding single digit numbers up to 18 horizontally (with carrying using the concept of ten as unit e.g. $8 + 5$ as $8 + 2 + 3$). Adding numbers in 10s up to 100 (e.g. $20 + 10$). Adding numbers horizontally up to 100 (without carrying). Applying addition to real life (For Money, DO NOT USE NGWEE AS A FRACTION OF KWACHA AT THIS STAGE). 	<ul style="list-style-type: none"> Addition of single and double digit numbers using the concept of 10 as a unit. Identification of the addition sign/symbol. Application of addition to money. 	<ul style="list-style-type: none"> Awareness of the meaning of addition. Accuracy in computations.
1.4 SUBTRACTION	1.4.1 Subtract whole numbers up to 100. 1.4.2 Develop the concept of zero as a difference. 1.4.3 Complete subtraction of number sentences. 1.4.4 Apply addition to real life up to 100. 1.4.5 Carry out shopping activities involving money.	<ul style="list-style-type: none"> Meaning of subtraction. Subtracting single digit numbers up to 10. Subtracting two digit numbers up to 18 by single digit number giving a single digit difference (e.g. $18 - 9$, $17 - 9$, $17 - 8$, . . . $12 - 3$, $12 - 2$, $11 - 2$), horizontally (with borrowing using the concept of ten as unit e.g. $12 - 3$ as $12 - 2 - 1$ or $10 - 3 + 2$). 	<ul style="list-style-type: none"> Subtraction of single and double digit numbers using the concept of 10 as a unit. Identification of the subtraction sign/symbol. Application of subtraction to 	<ul style="list-style-type: none"> Awareness of the meaning of subtraction. Accuracy in computations. Team work through the shopping activity.

TOPIC	SPECIFIC UTCOMES	CONTENT		
		KNOWLEDGE	SKILLS	VALUES
		<ul style="list-style-type: none"> • Subtracting numbers in 10s up to 100 (e.g. 90 - 30). • Subtracting numbers horizontally up to 100 (without borrowing). • Developing the concept of zero. • Relationship of subtraction to addition (e.g. $36 - 12 = 24$ or $24 + 12 = 36$). • Apply subtraction to real life up to 100. • Carrying out shopping activities involving money up to K100. (DO NOT USE NGWEE AS A FRACTION OF KWACHA AT THIS STAGE). 	<p>money.</p> <ul style="list-style-type: none"> • Relating subtraction to addition. 	
1.5 NUMBER PATTERNS	1.5.1 Identify number patterns involving addition and subtraction up to 100.	<ul style="list-style-type: none"> • Identifying number patterns involving addition and subtraction up to 100. 	<ul style="list-style-type: none"> • Identification of number patterns. • Ordering numbers. 	<ul style="list-style-type: none"> • Awareness in the arrangement of numbers.
1.6 PLANE SHAPES	<p>1.6.1 Recognise squares, circles, rectangles and triangles.</p> <p>1.6.2 Trace outline of squares, circles, rectangles and triangles.</p> <p>1.6.3 Make pictures using shapes of squares, rectangle circles and triangles.</p>	<ul style="list-style-type: none"> • Recognizing squares, circles, rectangles and triangles. • Tracing outlines of Shapes using concrete three dimensional shapes to draw squares, circles, rectangles and triangles. • Making pictures using shapes of squares, circles, rectangles and triangles. 	<ul style="list-style-type: none"> • Recognition of squares, circles, rectangles and triangles. 	<ul style="list-style-type: none"> • Appreciation of basic shapes. • Creativity in combining basic shapes to make pictures.

TOPIC	SPECIFIC UTCOMES	CONTENT		
		KNOWLEDGE	SKILLS	VALUES
1.7 MEASURES	1.7.1 Identify times of the day. 1.7.2 Tell days of the week. 1.7.3 Name months of the year 1.7.4 Compare lengths of different objects.	<ul style="list-style-type: none"> • Identifying the times of the day using activities (morning, midday, afternoon, evening, night). • Days of the week. • Months of the year. • Non standard measurements e.g. strides, feet, strings, heights such as heights of learners. 	<ul style="list-style-type: none"> • Ordering days of the week and months of the year. • Comparing lengths of different objects. 	<ul style="list-style-type: none"> • Awareness of times of the day and months of the year. • Curiosity of comparing lengths of different objects. • Time consciousness

General Outcomes	Key Competences at Grade 2 Level
<ul style="list-style-type: none"> • Develop numeracy and arithmetic operations skills. • Enrich learners’ understanding of mathematical concepts on Numbers, shapes and diagrams. 	<ul style="list-style-type: none"> • Count in tens up to 1 000. • Identify and apply place values up to 1 000. • Add and subtract numbers both vertically and horizontally up to 1 000 (without regrouping). • Identify and tell the meaning of multiplication and division signs • Arrange numbers sequentially up to 1 000. • Memorise or master multiplication table of single digit numbers • Draw rectangles, circles and triangles. • Differentiate objects in terms of their size, length and weight • Tell time on a 12 hour clock to full hours (hourly interval).

GRADE 2

TOPIC	SPECIFIC OUTCOMES	CONTENT		
		KNOWLEDGE	SKILLS	VALUES
2.1 SETS	2.1.1 Describe sets in relation to real life situations. 2.1.2 State membership of a set using symbol \in , \notin and $\{ \}$.	<ul style="list-style-type: none"> • Describing sets in relation to real life situations. • Set notation; (Membership of a set using symbols \in “a member of”, \notin “not a member of”, $\{ \}$ Empty set or no member in the set. 	<ul style="list-style-type: none"> • Communication through use of appropriate set symbols. • Analysis of elements of a set. 	<ul style="list-style-type: none"> • Teamwork through cooperative learning. • Awareness of set notation symbols and their use.
2.2 NUMBERS & NOTATION	2.2.1 Count, read and write numbers up to 1 000. 2.2.2 Count in tens and hundreds up to 1 000 2.2.3 Identify place values of digits in given numbers. 2.2.4 Write numbers in	<ul style="list-style-type: none"> • Counting numbers up to 1 000 (Use mathematics songs/games/rhymes, ICT as well). • Reading and writing numbers up to 1 000. • Counting in tens and hundreds up to 1 000. 	<ul style="list-style-type: none"> • Communication through writing. • Observation of number patterns • Application to real life. • Identification of 	<ul style="list-style-type: none"> • Ordering numbers in tens. • Awareness of place values in numbers. • Teamwork through cooperative learning.

TOPIC	SPECIFIC OUTCOMES	CONTENT		
		KNOWLEDGE	SKILLS	VALUES
	expanded notation.	<ul style="list-style-type: none"> Identifying place values of digits in numbers up to 1 000. Using the place value charts and the abacus. Writing numbers in expanded notation without and with words (e.g. 800+50+4 for 854 or 8 hundreds+5 tens + 4 Ones). 	numerals. <ul style="list-style-type: none"> Interpretation of numbers in terms of their place values. 	
2.3 ADDITION	2.3.1 Add whole numbers vertically with sums up to 100 (including carrying). 2.3.2 Add whole numbers with sums up to 1 000. 2.3.3 Carry out addition of quantities in real life situations (e.g. money, quantities).	<ul style="list-style-type: none"> Adding whole numbers vertically with sums up to 100 including carrying. Adding whole numbers with sums up to 1 000 by expanded notation and regrouping ones, tens, hundreds and thousands. Adding whole numbers with sums up to 1 000 without regrouping. Applying the commutative law and zero property of addition. Adding numbers using number trees, wheels, and magic squares. Adding quantities in real life situations (e.g. money, number of items, people). 	<ul style="list-style-type: none"> Addition of double and triple digit numbers using the concept of 10 and 100 as a unit. Application of addition in real life. 	<ul style="list-style-type: none"> Awareness of the role of place values in addition. Accuracy in computations. Team work through the shopping and marketing activity. Appreciation of the commutative law. Interest in addition using number tree, wheels and magic squares.
2.4 SUBTRACTION	2.4.1 Subtract whole numbers vertically up to 100 (including borrowing). 2.4.2 Subtract whole numbers vertically up to 1 000. 2.4.3 Carry out subtraction and addition in real life. 2.4.4 Carry out practical	<ul style="list-style-type: none"> Subtracting whole numbers vertically up to 100. Subtracting whole numbers vertically up to 1 000 by expanded notation and regrouping. Subtracting whole numbers up to 1 000 without regrouping. Subtracting whole numbers using 	<ul style="list-style-type: none"> Subtraction of single and double digit numbers using the concept of 10 as a unit. Application of subtraction and addition to 	<ul style="list-style-type: none"> Accuracy in computations. Team work through the shopping activity.

TOPIC	SPECIFIC OUTCOMES	CONTENT		
		KNOWLEDGE	SKILLS	VALUES
	shopping and marketing activities involving money up to K 1 000.	number trees and wheels. • Application of Subtraction and Addition in real life. • Shopping and marketing activities involving money up to K 1 000 (DO NOT USE NGWEE AS A FRACTION OF KWACHA AT THIS STAGE).	money. • Relating subtraction to addition.	
2.5 MULTIPLICATION	2.5.1 Express multiplication as repeated addition. 2.5.2 Multiply single digit numbers. 2.5.3 Memorize the multiplication table of single digit numbers. 2.5.4 Use Multiplication vocabulary. 2.5.5 Apply Multiplication in real life situations.	• Grouping items/objects in twos (2s), fives (5s), threes (3s), fours (4s) up to tens (10s) and finding their values. • Understanding the concept of multiplication using some model (i.e. Multiplication as repeated addition – e.g. $2+2+2+2 = 4 \times 2$; $4+4 = 2 \times 4$; $3+3+3+3+3 = 5 \times 3$). • Multiplication sign • Multiplication vocabulary (multiplicand, multiplier , factor, product). • Multiplying single digits numbers. • Introduction to the single-digits number multiplication tables. • Commutative law of multiplication (Emphasis is on highlighting commutation of numbers rather than the Law i.e. $2 \times 3 = 3 \times 2$). • Property of one as an identity in multiplication (i.e. Any number multiplied by 1 equals that number).	• Multiplication of single digit numbers. • Accuracy in computations . • Identification of the multiplication sign/symbol. • Application of the commutative law.	• Appreciation of the meaning of multiplication. • Teamwork through cooperative learning.

TOPIC	SPECIFIC OUTCOMES	CONTENT		
		KNOWLEDGE	SKILLS	VALUES
		<ul style="list-style-type: none"> • Multiplying quantities in real life situations (application) 		
2.6 DIVISION	<p>2.6.1 Express division as repeated subtraction or sharing.</p> <p>2.6.2 Use division vocabulary.</p> <p>2.6.3 Divide numbers whose divisor and quotient is a single digit.</p> <p>2.6.4 Apply division in real life situations.</p>	<ul style="list-style-type: none"> • Understanding the concept of division as repeated subtraction or sharing. • Using division vocabulary (divisor, dividend, quotient, and remainder). • Divide single by single digits numbers. • Divide two digit by single digit numbers WITHOUT LEAVING A REMAINDER (Relate division to multiplication e.g. $7 \times 8 = 56$ which is $56 \div 7 = 8$ or $56 \div 8 = 7$). • Dividing quantities in real life situations (application). 	<ul style="list-style-type: none"> • Division of double digit by single digit numbers. • Accuracy in <i>computations</i>. • Identification of the division sign/symbol. • Application of division to real life. 	<ul style="list-style-type: none"> • Appreciation of the meaning of multiplication. • Teamwork through cooperative learning.
2.7 NUMBER PATTERNS	<p>2.7.1 Recognize and use number patterns involving the four mathematical operations.</p> <p>2.7.2 Determine the rule in the number pattern.</p>	<ul style="list-style-type: none"> • Number patterns involving the four mathematical operations (+, -, \times, \div). • Determining the rule in the number pattern. • Ordering numbers in terms of magnitude. 	<ul style="list-style-type: none"> • Identification of rule in number pattern. • Ordering numbers. 	<ul style="list-style-type: none"> • Curiosity to explore different number pattern.

TOPIC	SPECIFIC OUTCOMES	CONTENT		
		KNOWLEDGE	SKILLS	VALUES
2.8 MEASURES	2.8.1 Read and tell time in full hours. 2.8.2 Measures of different objects using standard units. (cm, mm, m). 2.8.3 Find the perimeter of simple plane figures.	<ul style="list-style-type: none"> • The analogue clock in relation to Morning, Midday, Afternoon, Evening, Night. • Time in full hours and minutes. (30 minute-interval) using the 12 hour analogue clock. • Measuring length of shapes and objects using standard units (cm, mm, m). • Finding the perimeter of simple plane figures (square and rectangle). 	<ul style="list-style-type: none"> • Reading and telling times in full hours. • Measuring of different objects using standard units. (cm, mm, m). 	<ul style="list-style-type: none"> • Awareness of usefulness of analogue clock. • Curiosity of measuring different objects.
2.9 RELATIONS	2.9.1 Draw arrow diagrams to illustrate matching.	<ul style="list-style-type: none"> • Matching sets using arrow to illustrate matching involving “addition and subtraction” of two-digit numbers. • Note: Range should be up to 1000. 	<ul style="list-style-type: none"> • Matching of relations using arrow diagrams. • Interpretation of relations from arrow diagrams. 	<ul style="list-style-type: none"> • Creativity of drawing diagrams. • Teamwork through cooperative learning.
2.10 STATISTICS	2.10.1 Collect and present data using pictures.	<ul style="list-style-type: none"> • Data collection methods. • Data presentation (pictographs only). 	<ul style="list-style-type: none"> • Collection and presentation of data using pictures. • Interpretation of pictographs. 	<ul style="list-style-type: none"> • Teamwork through cooperative learning. • Curiosity in collecting data.
2.11 PLANE SHAPES	2.11.1 Identify right angle with squared paper or paper folding. 2.11.2 Draw rectangle and square on squared paper. 2.11.3 Identify side and vertex of rectangle and square.	<ul style="list-style-type: none"> • Identifying right angle with squared paper or paper folding • Drawing rectangle and square on squared paper. • Identifying side and vertex (limit usage of term ‘<i>vertex</i>’ to ‘CORNER’) of rectangle and square. 	<ul style="list-style-type: none"> • Identification of right angle. • Drawing rectangle and square on squared paper. 	<ul style="list-style-type: none"> • Appreciation in drawing rectangle and square on squared paper.

TOPIC	SPECIFIC OUTCOMES	CONTENT		
		KNOWLEDGE	SKILLS	VALUES
2.12 SOLID SHAPES	2.12.1 Recognise cuboid, cube, cylinder and sphere. 2.12.2 Mould cuboid, cube, cylinder and sphere using clay plasticine.	<ul style="list-style-type: none"> • Recognising cuboid, cube, cylinder and sphere. • Moulding cuboid, cube, cylinder and sphere using clay or plasticine. 	<ul style="list-style-type: none"> • Recognition of basic solid shapes. • Moulding of basic solid shapes. 	<ul style="list-style-type: none"> • Awareness of solid basic shapes. • Creativity in moulding basic solid shapes.

General Outcomes	Key Competences at Grade 3 Level
<ul style="list-style-type: none"> • Develop numeracy and arithmetic operations skills • Enable learner represent, interpret and use data in a variety of forms. • Enrich learners' understanding of mathematical concepts on numbers, shapes and diagrams. 	<ul style="list-style-type: none"> • Describe and list members of a given set. • Add and subtract numbers vertically up to 100 000 (by regrouping). • Multiply and divide one number by another (Long division and multiplication). • Generate number sequence after establishing rule (using the four operations). • Order numbers and appropriately use the symbols $>$, $<$, $=$ and \neq. • Use rule to measure length and width of given shapes and objects. • Tell time on a 24 hour analogue clock to quarter of an hour • Read and translate a calendar. • Acquire an understanding of the concept of fractions. • Add and subtract fractions with a common denominator.

GRADE 3

TOPIC	SPECIFIC OUTCOMES	CONTENT		
		KNOWLEDGE	SKILLS	VALUES
3.1 SETS	3.1.1 Describe a set by listing its members. 3.1.2 Recognise and use the symbols " $=$ " equal to, " \neq " not equal to.	<ul style="list-style-type: none"> • Sets and notation. • Listing members of a set. • Set symbols: "$=$" equal to, "\neq" not equal to. (Also recap on "\in" member of, "\notin" not a member of, "$\{ \}$" braces). • Applying sets in real life situations. 	<ul style="list-style-type: none"> • Communication of set notation through symbolization. • Application of the concept of sets in real life. 	<ul style="list-style-type: none"> • Teamwork through cooperative learning. • Awareness of set notation or symbolisation.
3.2 NUMBERS AND NOTATION	3.2.1 Read and write numbers up to 1 000 000. 3.2.2 Express a number in	<ul style="list-style-type: none"> • Reading and writing numbers up to 1 000 000 (draw attention of learners to the number structure 	<ul style="list-style-type: none"> • Communication through writing. • Presentation of 	<ul style="list-style-type: none"> • Accuracy in recognizing and reading.

TOPIC	SPECIFIC OUTCOMES	CONTENT		
		KNOWLEDGE	SKILLS	VALUES
	expanded notation.	<ul style="list-style-type: none"> or repetition i.e. 1, 10, 100, 1000, 10000 . . .). • Expressing numbers in expanded notation. 	numbers in expanded notation.	<ul style="list-style-type: none"> • Application of numeration in real life.
3.3 ADDITION	3.3.1 Add whole numbers with sums up to 100 000. 3.3.2 Carry out addition of numbers in real life situations.	<ul style="list-style-type: none"> • Addition of whole numbers with sums up to 100 000 by regrouping (Expanded notation). • Addition of whole numbers with sums up to 100 000 without regrouping. • Adding whole numbers by using number trees, number wheels and magic squares. • Applying addition of numbers in real life situations (e.g. money, number of items, Lengths). 	<ul style="list-style-type: none"> • Addition of up to five digit numbers using the concept of 10, 100, 1000 and 10000 as a unit. • Application of addition in real life. 	<ul style="list-style-type: none"> • Awareness of the role of place values in addition. • Accuracy in computations.
3.4 SUBTRACTION	3.4.1 Subtract whole numbers up to 100 000. 3.4.2 Carry out subtraction and addition in real life situation.	<ul style="list-style-type: none"> • Subtraction of whole numbers up to 100 000 by regrouping. (Vertical subtraction, expanded notation). • Subtraction of whole numbers up to 100 000 without regrouping. (Vertical subtraction). • Subtracting whole numbers using number trees, number wheels and magic squares. • Applying subtraction and addition in real life situations (e.g. money, number of items, Lengths). 	<ul style="list-style-type: none"> • Subtraction of up to five digit numbers using the concept of 10, 100, 1000 and 10000 as a unit. • Application of subtraction and addition to money. • Relating subtraction to addition. 	<ul style="list-style-type: none"> • Accuracy in computations. • Teamwork through cooperative learning.

TOPIC	SPECIFIC OUTCOMES	CONTENT		
		KNOWLEDGE	SKILLS	VALUES
3.5 MULTIPLICATION	<p>3.5.1 Multiply two and three digit numbers by a single digit number vertically.</p> <p>3.5.2 Apply multiplication in real life situation.</p>	<ul style="list-style-type: none"> • Multiplying two and three digit numbers by a single digit number using vertical multiplication. • Applying multiplication in problems involving money. 	<ul style="list-style-type: none"> • Multiplication of two and three digit by single digit numbers. • Accuracy in computations. • Application of place values. 	<ul style="list-style-type: none"> • Appreciation of the use of multiplication in real life. • Teamwork through cooperative learning.
3.6 DIVISION	<p>3.6.1 Divide two and three digit numbers by single digit number using Long division (with remainders).</p> <p>3.6.2 Demonstrate multiplication and division skills in real life situations.</p>	<ul style="list-style-type: none"> • Dividing single and two-digit numbers by single digit numbers WITH REMAINDERS. • Dividing two and three digit numbers by single digit number WITH REMAINDERS using Long division. • Long division • Applying multiplication and division in real life situations involving money. 	<ul style="list-style-type: none"> • Division of two and three digit by single digit numbers. • Accuracy in computations. • Identification of the long division symbol. • Application of division to real life. 	<ul style="list-style-type: none"> • Awareness of the concept of remainder. • Teamwork through cooperative learning.
3.7 NUMBER PATTERNS	3.7.1 Order numbers using mathematical symbols ">", "<", "=" and "≠".	<ul style="list-style-type: none"> • Using mathematical symbols ">", "<", "=" and "≠" to order numbers. 	<ul style="list-style-type: none"> • Analysis to determine magnitude. 	<ul style="list-style-type: none"> • Appreciation for systematic arrangement.
3.8 FRACTIONS	<p>3.8.1 Identify and represent proper fractions as equal parts of a whole.</p> <p>3.8.2 Draw and shade proper fractions.</p> <p>3.8.3 Add and subtract proper fractions with common denominator.</p> <p>3.8.4 Apply proper fractions in</p>	<ul style="list-style-type: none"> • Identifying proper fractions as equal parts of a whole (Utilize concrete and semi concrete objects as much as possible). • Names of parts (denominator, numerator, division line). • Common fractions. (Half, one quarter, three quarters, one third, two thirds, one fifth, one tenth 	<ul style="list-style-type: none"> • Identification of proper fractions. • Addition and subtraction of proper fractions. • Representation of proper fractions as equal parts of a whole 	<ul style="list-style-type: none"> • Appreciation of the concept of proper fractions. • Accuracy in adding and subtracting proper fractions.

TOPIC	SPECIFIC OUTCOMES	CONTENT		
		KNOWLEDGE	SKILLS	VALUES
	real life situations.	etc.). • Drawing and shading proper fractions. • Adding and subtracting proper fractions having a common denominator. • Fractions in real life situations (e.g. liquids, paper folding).	in real life.	
3.9 MEASURES	3.9.1 Tell time at specified intervals. 3.9.2 Read and use the calendar. 3.9.3 Describe the unit for measuring long distances (Km). 3.9.4 Describe mass and the standard units for its measure. 3.9.5 Describe capacity and the standard units for its measure.	• Telling time to half, quarter of an hour and five minute intervals (using the 24 hour clock). • Calendar. • Standard unit for measuring long distances (Km) • Describing mass. • Standard units for measuring mass (grammes, Kilogrammes) • Describing capacity. • Standard units for measuring capacity (litres, milliliters).	• Telling time at specified intervals. • Reading and use the calendar. • Describe the standard unit for measuring distance, mass and capacity.	• Accuracy in telling time. • Appreciation of standard units in measures.
3.10 STATISTICS	3.10.1 Collect and present ungrouped data on a frequency table.	• Data collection methods. • Data presentation(Frequency table) table involving use of tally marks(Including bundling fives).	• Presentation of ungrouped data on a frequency table. • Interpretation of frequency tables.	• Interest in collecting data. • Appreciation of presenting data on a frequency table.
3.11 RELATIONS & MAPPINGS	3.11.1 Draw Arrow diagrams to illustrate one-to-one mappings.	• Relations and mappings (involving “Times 2 plus 1 etc” Whole numbers in range should not exceed 100 000. • Applying relations and	• Matching of one-to-one mapping using arrow diagrams. • Interpretation of	• Creativity of drawing arrow diagrams. • Awareness of one-one

TOPIC	SPECIFIC OUTCOMES	CONTENT		
		KNOWLEDGE	SKILLS	VALUES
		mappings in real life situations (Should be related to proportion, number patterns and graphs).	one-to-one mapping.	mapping.
3.12 PLANE SHAPES	3.12.1 Identify right angled triangle by folding rectangular and squared paper. 3.12.2 Draw right angled triangle on squared paper.	<ul style="list-style-type: none"> • Identifying right angled triangle by folding rectangular and squared paper. • Drawing right angled triangle on squared paper. 	<ul style="list-style-type: none"> • Drawing right-angled triangle. 	<ul style="list-style-type: none"> • Curiosity in making different right angled triangles using squared paper.

General Outcomes	Key Competences at Grade 4 Level
<ul style="list-style-type: none"> Develop numeracy and arithmetic operations skills. Enable learner represent, interpret and use data in a variety of forms. Enrich learners' understanding of mathematical concepts on numbers, shapes and diagrams. 	<ul style="list-style-type: none"> Use the symbols "=", "∈", "∉", "⊂" and "{ }" appropriately in set notation. Apply the four operations to resolve practical problems with numbers up to 1 000 000. Solve practical problems dealing with measurement of length and convert between units. Calculate area of squares and triangles. Apply fractions in resolving real life problems.

GRADE 4

TOPIC	SPECIFIC OUTCOMES	CONTENT		
		KNOWLEDGE	SKILLS	VALUES
4.1 SETS	4.1.1 Identify equivalent sets. 4.1.2 Identify subsets and use the subset symbol "⊂". 4.1.3 Apply sets to solve problems in real life situations.	<ul style="list-style-type: none"> Equivalent sets. Subsets and the use of the symbol "⊂" (is a subset of). Applying sets to solve problems in real life situations (creation of order). 	<ul style="list-style-type: none"> Interpretation of the meaning of subset. Identification of the subset symbol. Communication through the use of subset symbol in set notation. 	<ul style="list-style-type: none"> Teamwork through collaborative learning. Awareness of set equivalence.
4.2 NUMBERS & NOTATION	4.2.1 Read and write numbers up to 1 000 000 000. 4.2.2 Express a number in expanded notation.	<ul style="list-style-type: none"> Reading and writing numbers up to 1 000 000 000 (Draw attention of learners to the number structure or repetition i.e. 1, 10, 100, 1000, 10000). Expressing a ten digit number in expanded notation. 	<ul style="list-style-type: none"> Communication through writing. Presentation of numbers in expanded notation. Application of numeration in real life. 	<ul style="list-style-type: none"> Accuracy in recognizing and reading numbers.

TOPIC	SPECIFIC OUTCOMES	CONTENT		
		KNOWLEDGE	SKILLS	VALUES
4.3 ADDITION	<p>4.3.1 Add whole numbers with sums up to 1 000,000.</p> <p>4.3.2 Apply addition to solve problems in real life.</p>	<ul style="list-style-type: none"> • Adding whole numbers with sums up to 1 000 000 in expanded form by regrouping ones, tens, hundreds, and thousands. • Adding whole numbers with sums up to 1 000 000 without regrouping. • Problems in real life situations (e.g. mass, distance, capacity, money up to K1 000 000). 	<ul style="list-style-type: none"> • Addition of up to six digit numbers using the concept of 10, 100, 1000, 10000 and 100000 as a unit. • Application of addition in real life. 	<ul style="list-style-type: none"> • Awareness of the role of place values in addition. • Accuracy in computations.
4.4 SUBTRACTION	<p>4.4.1 Subtract whole numbers up to 1 000 000</p> <p>4.4.2 Apply subtraction and addition to solve problems in real life.</p>	<ul style="list-style-type: none"> • Subtracting whole numbers up to 1 000 000 in expanded notation. • Subtracting whole numbers up to 1 000 000 without regrouping. • Solving problems in real life. • Using subtraction and addition to solve problems involving mass, distance, capacity, money up to K1 000 000. 	<ul style="list-style-type: none"> • Subtraction of up to six digit numbers using the concept of 10, 100, 1000, 10000 and 100000 as a unit. • Application of subtraction and addition in real life. 	<ul style="list-style-type: none"> • Awareness of the role of place values in subtraction. • Accuracy in computations.
4.5 MULTIPLICATION	<p>4.5.1 Multiply numbers by 10, 100 and 1000 using short multiplication.</p> <p>4.5.2 Multiply two and three by two digit numbers using vertical multiplication.</p> <p>4.5.3 Apply the properties of zero (0) and one (1) in multiplication.</p> <p>4.5.4 Apply multiplication to solve problems in real life.</p>	<ul style="list-style-type: none"> • Multiplying numbers by 10, 100 and 1000 using short multiplication (include multiples of 10 such as 20, 30, 40). e.g. $12 \times 10 = 120$ and $12 \times 20 = 12 \times (10 \times 2) = 240$ • Multiplying two and three by two digit numbers using vertical multiplication. • Applying the properties of zero. 	<ul style="list-style-type: none"> • Multiplication of two and three digit by two digit numbers. • Accuracy in computations. • Application of place values. 	<ul style="list-style-type: none"> • Appreciation of the use of multiplication in real life. • Teamwork through cooperative learning.

TOPIC	SPECIFIC OUTCOMES	CONTENT		
		KNOWLEDGE	SKILLS	VALUES
		(0) and one (1) in multiplication <ul style="list-style-type: none"> • Problems in real life such as those involving mass, distance, capacity, money. 		
4.6 DIVISION	4.6.1 Divide numbers by 10, 100 and 1000 using short division. 4.6.2 Divide two and three digit by two digit numbers using long division (with remainders). 4.6.3 Apply division to solve problems in real life.	<ul style="list-style-type: none"> • Dividing numbers by 10, 100 and 1000 using short division. • Dividing two and three digit by two digit numbers using long division (with remainders). • Dividing to solve problems in real life such as those involving mass, distance, capacity, money. 	<ul style="list-style-type: none"> • Division of two and three digit by two digit numbers • Accuracy in <i>computations</i>. • Application of division to real life. 	<ul style="list-style-type: none"> • Teamwork through cooperative learning.
4.7 NUMBER PATTERNS	4.7.1 Identify patterns and complete number sequences.	<ul style="list-style-type: none"> • Identifying Number Patterns. • Completing number sequences. • Generate number patterns. 	<ul style="list-style-type: none"> • Identification of rule in number pattern. 	<ul style="list-style-type: none"> • Creativity in the four operations. • Appreciation for systematic arrangement.
4.8 FRACTIONS	4.8.1 Describe equivalent fractions. 4.8.2 Arrange the common fractions either in ascending or descending order using proportion line. 4.8.3 Identify and represent improper and mixed fractions. 4.8.4 Convert mixed fractions to improper fractions and vice versa. 4.8.5 Add and subtract proper, improper and mixed fractions with common	<ul style="list-style-type: none"> • Describing equivalent fractions. • Arranging the common fractions either in ascending or descending order using proportion line. • Using symbols $>$, $<$ and $=$, to order fractions in terms of magnitude. • Identifying improper and mixed fractions. • Converting mixed fractions to improper fractions and vice versa. • Adding and subtracting proper, 	<ul style="list-style-type: none"> • Distinction between proper, improper and mixed fractions. • Conversion of mixed fractions to improper fractions and vice versa. • Arrangement of common fractions using proportion line. • Addition and 	<ul style="list-style-type: none"> • Appreciation of equivalent fractions. • Accuracy in adding and subtracting improper and mixed fractions.

TOPIC	SPECIFIC OUTCOMES	CONTENT		
		KNOWLEDGE	SKILLS	VALUES
	denominators. 4.8.6 Apply improper fractions to solve problems in real life.	improper and mixed fractions with a common denominator. • Applying improper fractions in everyday real life.	subtraction of improper and mixed fractions.	
4.9 ANGLES	4.9.1 Describe an angle. 4.9.2 Identify types of angles. 4.9.3 Use a protractor to measure and draw angles up to 180°.	<ul style="list-style-type: none"> • Describing an Angles. • Types of angles (right angle, acute angle, straight angle, reflex, obtuse and a complete revolution). • Using a protractor to measure and draw angles up to 180°. • Angles in real life situations(time, compass direction) 	<ul style="list-style-type: none"> • Identification of types of angles. • Using and handling of protractor appropriately. 	<ul style="list-style-type: none"> • Curiosity in using protractor. • Accuracy of measuring angles.
4.10 PLANE SHAPES	4.10.1 Draw a rectangle and square using protractor and set square. 4.10.2 Identify isosceles and equilateral triangles. 4.10.3 Draw the equilateral and isosceles triangles using protractor and set square.	<ul style="list-style-type: none"> • Drawing a rectangle and square using protractor and set square. • Identifying an isosceles and equilateral triangle. • Drawing an isosceles and equilateral triangle using protractor and Set Square. 	<ul style="list-style-type: none"> • Application of protractor to draw plane shapes. • Identification of isosceles and equilateral triangles. 	<ul style="list-style-type: none"> • Curiosity of drawing plane shapes.
4.11 MEASURES	4.11.1 Determine duration of time elapsed between events. 4.11.2 Relate seconds, minutes, hours and day. 4.11.3 Illustrate the meaning of area. 4.11.4 Describe standard units to measure area. (cm ² , mm ² , m ²). 4.11.5 Derive the formulae for finding area of rectangle	<ul style="list-style-type: none"> • Determining duration of time between events (Subtraction and addition of time). • Describing seconds. • Relating seconds, minutes, hours and day. • Understanding the concept of area. • Standard units to measure area. • Formulae for finding area of rectangle and square. 	<ul style="list-style-type: none"> • Determination of duration of time between events. • Deriving the formulae for finding area of rectangle and square. 	<ul style="list-style-type: none"> • Accuracy in determining duration of time. • Curiosity in deriving the formulae.

TOPIC	SPECIFIC OUTCOMES	CONTENT		
		KNOWLEDGE	SKILLS	VALUES
	and square. 4.11.6 Find the area of a rectangle and square.	<ul style="list-style-type: none"> • Deriving the formulae for area (rectangle and square). • Area of a rectangle and square. 		
4.12 RELATIONS & MAPPINGS	4.12.1 Illustrate one-to-many relation using arrow. 4.12.2 Apply relations in real life situations.	<ul style="list-style-type: none"> • One-to-many relations (“is greater than” , “ is less than”, “ is greater or equal to “) using arrow diagrams. • With domain: up to 100 000 (Only whole numbers). • Relations and mappings in real life situations. 	<ul style="list-style-type: none"> • Matching of one-to-many relation using arrow diagrams. • Interpretation of one-to-many relation. 	<ul style="list-style-type: none"> • Creativity of drawing arrow diagrams. • Awareness of one-many relation.
4.13 STATISTICS	4.13.1 Read and interpret line graphs. 4.13.2 Collect and present data on a line graph.	<ul style="list-style-type: none"> • Interpreting line graphs. • Data collection. • Data presentation (Line graph). 	<ul style="list-style-type: none"> • Interpretation of line graphs. • Representation of data on a line graph. 	<ul style="list-style-type: none"> • Appreciation of usefulness of line graphs.

General Outcomes	Key Competences at Grade 5 Level
<ul style="list-style-type: none"> • Develop algebraic, geometry and arithmetic skills in mathematics. • Solve mathematical challenges in everyday life through problem solving. • Enable learner represent, interpret and use data in a variety of forms. • Enrich learners' understanding of mathematical concepts on shapes and diagrams. 	<ul style="list-style-type: none"> • Convert numerals from Arabic to Roman numeration and vice versa. • Order both Arabic and Roman numerals in terms of magnitude. • Carry out combined operations observing the order of operations. • Apply factors and multiples to solve real life problems. • Add and subtract fractions with different denominators. • Solve problems involving length, capacity and mass. • Multiply fractions by whole numbers. • Divide whole numbers by fractions and vice versa. • Convert common fractions into decimals and vice versa • Solve problems involving percentages. • Present data on a stem-leaf plot and on a bar graph.

GRADE 5

TOPIC	SPECIFIC OUTCOMES	CONTENT		
		KNOWLEDGE	SKILLS	VALUES
5.1 NUMBERS & NOTATION	5.1.1 Identify Roman numeration system. 5.1.2 Convert numerals from Arabic to Roman numeration and vice versa. 5.1.3 Order Roman numerals.	<ul style="list-style-type: none"> • Identifying the roman numeration system. • Converting Arabic to Roman numeration and vice versa. • Ordering Roman numerals (either ascending or descending order). 	<ul style="list-style-type: none"> • Identification of Roman and Arabic numeration. • Communication through writing both Roman and Arabic numerals. • Ordering Roman and Arabic numerals. 	<ul style="list-style-type: none"> • Accuracy in recognizing and reading numbers. • Awareness of similarities and differences in Arabic and Roman numeration systems.

TOPIC	SPECIFIC OUTCOMES	CONTENT		
		KNOWLEDGE	SKILLS	VALUES
5.2 ADDITION	5.2.1 Add whole numbers using the number line. 5.2.2 Apply addition using the number line to solve problems in real life situations.	<ul style="list-style-type: none"> • Addition on the number line. • Addition using the number line to solve problems in real life situations. (To be connected to the addition of integers). 	<ul style="list-style-type: none"> • Addition using the number line. • Application of addition in real life. 	<ul style="list-style-type: none"> • Awareness of addition on the number line. • Accuracy in computations.
5.3 SUBTRACTION	5.3.1 Subtract whole numbers using a number line. 5.3.2 Apply subtraction and addition using the number line to solve problems in real life situations.	<ul style="list-style-type: none"> • Subtraction on the number line. • Subtraction and addition using the number line to solve problems in real life situations (To be connected to the addition of integers). 	<ul style="list-style-type: none"> • Subtraction using the number line. • Application of addition and subtraction in real life. 	<ul style="list-style-type: none"> • Awareness of subtraction on the number line. • Accuracy in computations.
5.4 COMBINED OPERATIONS	5.4.1 Perform combined operations. 5.4.2 Apply the commutative, associative and distributive laws to four basic mathematical operations.	<ul style="list-style-type: none"> • Combined operations or order of operations – BODMAS (related to real life problems i.e. length, mass, temperature, capacity and time). • Applying the commutative, associative and distributive laws to four basic mathematical operations. 	<ul style="list-style-type: none"> • Computation in the correct order. • Application of the four operations in real life. 	<ul style="list-style-type: none"> • Awareness of order of operations. • Accuracy in computations.
5.5 SETS	5.5.1 List all sub sets of a given set. 5.5.2 Describe sets of numbers. 5.5.3 Describe subset in a Venn diagram.	<ul style="list-style-type: none"> • Proper and improper subsets (For sets with up to 4 elements). • Sets of numbers (Natural, Whole, Even, Odd, Prime and Composite). • Subsets in Venn diagrams. 	<ul style="list-style-type: none"> • Identification of proper and improper subsets. • Representation of subsets within Venn diagram. • Description of sets of numbers. 	<ul style="list-style-type: none"> • Awareness of usefulness of Venn diagrams. • Curiosity in the usage of Venn diagrams.

TOPIC	SPECIFIC OUTCOMES	CONTENT		
		KNOWLEDGE	SKILLS	VALUES
5.6 FACTORS AND MULTIPLES	5.6.1 Identify factors of given numbers. 5.6.2 Identify the Highest Common Factor (HCF). 5.6.3 Identify multiples of a given number. 5.6.4 Identify the Lowest Common Multiple (LCM) by listing.	<ul style="list-style-type: none"> Identifying Factors. Listing factors of two numbers and Identifying Highest Common Factor (HCF) or Greatest Common Divisor (GCD). Identifying Multiples of a given numbers. Listing multiples of two numbers and Identifying Lowest Common Multiple (LCM). 	<ul style="list-style-type: none"> Identification of factors and multiples. 	<ul style="list-style-type: none"> Awareness of factors and multiples.
5.7 FRACTIONS	5.7.1 Identify equivalent fractions by multiplying or dividing the same number with numerator and denominator. 5.7.2 Express fractions with different denominators to the same denominator. 5.7.3 Add and subtract proper, improper and mixed fractions with different denominators. 5.7.4 Apply knowledge of fractions to solve problems in real life situations.	<ul style="list-style-type: none"> Identifying equivalent fraction by multiplying or dividing the same number with numerator and denominator. Expressing fractions with different denominators to the same denominator. Addition and subtraction of fractions with different denominators. Fractions in real life situations. 	<ul style="list-style-type: none"> Identification of equivalent fractions. Addition and subtraction of fractions with different denominators. 	<ul style="list-style-type: none"> Appreciation of Reduction of fractions. Awareness of importance of factors and multiples to fractions.
5.8 DECIMALS	5.8.1 Relate common fractions to decimals. 5.8.2 Describe decimal numbers by their names (up to 2 decimal places). 5.8.3 Add and subtract decimal numbers.	<ul style="list-style-type: none"> Relating common fractions to decimals up to 2 decimal places (i.e. $\frac{1}{10} = 0.1$, $\frac{1}{100} = 0.01$) Understanding the concept of decimals. Decimal numbers and their 	<ul style="list-style-type: none"> Identification of decimal numbers. Accuracy in Computation of problems involving decimal numbers. Application of 	<ul style="list-style-type: none"> Appreciation of relationship between common fractions and decimal numbers. Curiosity in decimal numbers

TOPIC	SPECIFIC OUTCOMES	CONTENT		
		KNOWLEDGE	SKILLS	VALUES
	5.8.4 Multiply decimal numbers by whole numbers. 5.8.5 Divide decimal numbers by whole numbers (up to 2 decimal places WITHOUT REMAINDER). 5.8.6 Apply decimals to solve problems in real life situations.	place values (names for 0.1, 0.01 i.e. tenths, hundredths) (note: <i>presentation of decimal numbers on the number line could aid understanding</i>). <ul style="list-style-type: none"> • Adding and subtracting decimals numbers up to 2 decimal places. • Multiplying and dividing decimal numbers with one or two digits. • Decimals in real life situations (e.g. problems involving money-Kwacha and ngwee, temperature and other measures). 	decimal numbers in real life.	and their use.
5.9 SOCIAL AND COMMERCIAL ARITHMETIC	5.9.1 Prepare simple household bills (budgeting). 5.9.2 Apply simple ready-reckoners 5.9.3 Read and interpret water and electricity bills.	<ul style="list-style-type: none"> • Budgeting. • Ready-reckoner. • Meter reading (water and electricity bills). 	<ul style="list-style-type: none"> • Preparation of simple household bills. • Application and of Ready-reckoner. • Interpretation of water and electricity bills. 	<ul style="list-style-type: none"> • Accuracy reading ready reckoners, water and electricity bills. • Curiosity using ready reckoners.
5.10 PLANE SHAPES	5.10.1 Identify and draw perpendicular and parallel lines. 5.10.2 Describe trapezium, rhombus and parallelogram. 5.10.3 Draw trapezium, rhombus and parallelogram. 5.10.4 Identify the uses of a pair of compasses.	<ul style="list-style-type: none"> • Identifying and drawing perpendicular and parallel lines using set squares. • Describing trapezium, rhombus and parallelogram. • Drawing trapezium, rhombus and parallelogram. • Identifying the uses of a 	<ul style="list-style-type: none"> • Drawing perpendicular and parallel lines. • Drawing trapezium, rhombus and parallelogram. • Using and handling 	<ul style="list-style-type: none"> • Appreciation in drawing plane shapes. • Curiosity in drawing circles.

TOPIC	SPECIFIC OUTCOMES	CONTENT		
		KNOWLEDGE	SKILLS	VALUES
	5.10.5 Use a pair of compass to draw a circle. 5.10.6 Identify centre, diameter and radius of a circle.	pair of compasses. <ul style="list-style-type: none"> Using a pair of compass to draw a circle. Identifying centre, diameter and radius of a circle. 	pair of compasses and set squares appropriately.	
5.11 SOLID SHAPES	5.11.1 Identify face, vertex and edges of cuboids and cubes. 5.11.2 Draw nets of cuboids and cubes. 5.11.3 Draw/sketch cuboid and cube.	<ul style="list-style-type: none"> Identifying face, vertex and edges on cuboids and cubes (by observing concrete/semi-concrete objects). Number of vertices, edges and faces of cuboid and cubes. Describing a net of a cuboid and cube. Drawing nets of cuboids and cubes by unfolding them. Drawing/sketching cuboid and cube. 	<ul style="list-style-type: none"> Identification of face, vertex and edges of cuboids and cubes. Drawing of nets of cuboids and cubes. Drawing/sketching of cuboid and cube. 	<ul style="list-style-type: none"> Curiosity of different types of net from one cuboid or cube. Appreciation in drawing plane shapes. Curiosity in drawing circles.
5.12 MEASURES	5.12.1 Find the perimeter of triangle, parallelograms, trapezium, rhombus and composite shapes. 5.12.2 Derive formula for area of triangle, parallelograms, trapezium and rhombus. 5.12.3 Calculate areas of triangle, parallelograms, trapezium, rhombus and composite shapes. 5.12.4 Describe volume 5.12.5 Use standard units to measure volume (cm^3 , m^3). 5.12.6 Relate volume to capacity	<ul style="list-style-type: none"> Finding perimeter of triangle, parallelograms, trapezium, rhombus and composite shapes. Deriving formulae for area of triangle, parallelograms, trapezium and rhombus. Calculating areas of triangle, parallelograms, trapezium, rhombus and composite shapes. Describing and using standard units to measure volume (cm^3, m^3). 	<ul style="list-style-type: none"> Calculation of perimeter of plane shapes. Computation of area of plane shapes. Identification of volume and formulae for finding it. 	<ul style="list-style-type: none"> Curiosity of deriving formula for finding area. Awareness of volume of solids and capacity.

TOPIC	SPECIFIC OUTCOMES	CONTENT		
		KNOWLEDGE	SKILLS	VALUES
	5.12.7 Derive the formulae for finding volume. 5.12.8 Calculate the volume of cubes and cuboids.	<ul style="list-style-type: none"> • Relating volume to capacity (cm^3, m^3, Milliliters, litres). • Formulae for finding volume. • Deriving the formulae for volume (Cube and cuboid). • Calculating the volume of cubes and cuboids. 		
5.13 STATISTICS	5.13.1 Understand stem-leaf plot and on a bar graph. 5.13.2 Collect and present data on a stem-leaf plot and on a bar graph.	<ul style="list-style-type: none"> • Understanding of stem-leaf plot and on a bar graph. • Data collection and presentation (on a stem-leaf plot, and on a bar graph). 	<ul style="list-style-type: none"> • <i>Interpretation</i> of graphs. • <i>Representation</i> of data bar graph. 	<ul style="list-style-type: none"> • <i>Teamwork</i> in collecting data. • <i>Appreciation</i> of presenting data in graphs.
5.14 RELATIONS AND MAPPINGS	5.14.1 Illustrate a one-to-many and many-to-one relations. 5.14.2 Apply knowledge of relations and mappings in real life situations.	<ul style="list-style-type: none"> • One-to-many and many-to-one relations (involving “is a factor of”, “is a multiple of”, etc) Domain: whole numbers up to 100 000. • Relations and mappings. 	<ul style="list-style-type: none"> • <i>Identification</i> one-to-many and many-to-one relations. • <i>Application</i> of relations and mappings. 	<ul style="list-style-type: none"> • <i>Appreciation</i> of one-to-many and many-to-one relations.

General Outcomes	Key Competences at Grade 6 Level
<ul style="list-style-type: none"> • Develop algebraic, geometry and arithmetic skills in mathematics. • Enrich learners' understanding of mathematical concepts on shapes and diagrams. • Solve mathematical challenges in everyday life through problem solving. 	<ul style="list-style-type: none"> • Convert numerals from Arabic to Roman numeration and vice versa. • Order both Arabic and Roman numerals in terms of magnitude. • Carry out combined operations observing the order of operations. • Apply factors and multiples to solve real life problems. • Add and subtract fractions with different denominators. • Solve problems involving length, capacity and mass. • Multiply fractions by whole numbers. • Divide whole numbers by fractions and vice versa. • Convert common fractions into decimals and vice versa. • Solve problems involving percentages. • Present data on a stem-leaf plot and on a bar graph.

GRADE 6

TOPIC	SPECIFIC OUTCOMES	CONTENT		
		KNOWLEDGE	SKILLS	VALUES
6.1 INDEX NOTATION	6.1.1 Describe index notation. 6.1.2 Change a number in index form to expanded notation and vice versa. 6.1.3 Evaluate numbers in index notation with positive bases and indices.	<ul style="list-style-type: none"> • Describing Index notation as the repetition of multiplication of numbers with the same base ($2 \times 2 \times 2 = 2^3$). • Expanded notation with positive bases and powers ranging from 1 to 5. • Evaluating numbers in index notation with positive bases and indices. 	<ul style="list-style-type: none"> • Interpretation of the meaning of index notation. • Computation of numbers in index notation. 	<ul style="list-style-type: none"> • Awareness of index notation.
6.2 SETS	6.2.1 Describe the intersection, union in a Venn diagram. 6.2.2 Use symbols of	<ul style="list-style-type: none"> • The intersection (includes the set within a set-<i>subset</i> and disjoint sets) and union 	<ul style="list-style-type: none"> • Interpretation of intersection and union sets. 	<ul style="list-style-type: none"> • Appreciation of relationship between listing and the formula

TOPIC	SPECIFIC OUTCOMES	CONTENT		
		KNOWLEDGE	SKILLS	VALUES
	<p>intersection "\cap", union "\cup" (and subset "\subset" as recap).</p> <p>6.2.3 Find number of subsets of a given set using the formula 2^n.</p> <p>6.2.4 Apply the knowledge of sets in real life situations.</p>	<p>set in a Venn diagrams.</p> <ul style="list-style-type: none"> • Intersection, union sets and subset including. Symbolisation (intersection "\cap", union "\cup" (and subset "\subset" as recap). • Subsets of a given set by listing and using the formula 2^n. • Applying the knowledge of sets in real life situations (i.e. intersection, union, and subset). 	<ul style="list-style-type: none"> • Communication through the use of correct intersection and union symbols. • Illustration of intersection and union on a Venn diagram. • Computation of subsets in given set. 	<p>method of finding subsets.</p> <ul style="list-style-type: none"> • Awareness of the subset computation method.
6.3 PRIME FACTORS	<p>6.3.1 Describe and list prime and composite numbers.</p> <p>6.3.2 Identify prime factors of given numbers.</p>	<ul style="list-style-type: none"> • Prime and composite numbers. • Prime factors of given numbers. • Express a number as a product of its prime factors. 	<ul style="list-style-type: none"> • Identification of prime factors. • Representation of a number as a product of its prime factors 	<ul style="list-style-type: none"> • Curiosity in exploring prime factors.
6.4 FRACTIONS	<p>6.4.1 Multiply fractions by whole numbers.</p> <p>6.4.2 Multiply a fraction by another fraction.</p> <p>6.4.3 Divide fractions by whole numbers.</p> <p>6.4.4 Divide whole numbers by fractions.</p> <p>6.4.5 Divide a fraction by another fraction.</p> <p>6.4.6 Apply fractions to solve problems in real life.</p>	<ul style="list-style-type: none"> • Understanding the concept of multiplication of fractions. • Multiplying fractions by whole numbers. • Multiplying a fraction by another fraction. • Understanding the concept of division of fractions. • Dividing fractions by whole numbers. • Dividing whole numbers by fractions. 	<ul style="list-style-type: none"> • Multiplication and Division of fractions. • Application of multiplication and division of fractions in real life. 	<ul style="list-style-type: none"> • Accuracy in multiplication and division of fractions.

TOPIC	SPECIFIC OUTCOMES	CONTENT		
		KNOWLEDGE	SKILLS	VALUES
		<ul style="list-style-type: none"> Dividing a fraction by another fraction. Applying multiplication and division of fractions to solve problems in real life. 		
6.5 DECIMALS	<p>6.5.1 Describe decimal numbers by their names (up to 3 decimal places).</p> <p>6.5.2 Add and subtract decimal numbers up to 3 decimal places.</p> <p>6.5.3 Multiply decimal numbers by decimal numbers.</p> <p>6.5.4 Divide decimal numbers by decimal numbers (up to 3 decimal places (INCLUDING REMAINDER)).</p>	<ul style="list-style-type: none"> Describing decimal numbers by their names (up to 3 decimal places). Adding and subtracting decimal numbers up to 3 decimal places. Multiplication and division of decimals up to 3 decimal places. 	<ul style="list-style-type: none"> Accuracy in Computation of problems involving decimal numbers. Problem solving in real life situations. 	<ul style="list-style-type: none"> Curiosity in decimal numbers and their use. Team work through cooperative learning.
6.6 APPROXIMATION	<p>6.6.1 Round off to the nearest unit.</p> <p>6.6.2 Round off to the nearest decimal places.</p> <p>6.6.3 Solve simple problems involving rounding off quantities to required number of decimal places.</p>	<ul style="list-style-type: none"> Rounding off to the nearest ten, hundred and thousand Rounding off to the given decimal places (1, 2 and 3 decimal places). Applying approximation in real life situations involving rounding off to required number of decimal places. Relating approximation with measurements. 	<ul style="list-style-type: none"> Estimation of quantities in real life. Application of rounding off in real life. 	<ul style="list-style-type: none"> Decision-making in approximating quantities. Team work through cooperative learning.
6.7 RATIO AND PROPORTION	<p>6.7.1 Describe ratio and direct proportion.</p> <p>6.7.2 Differentiate between ratio</p>	<ul style="list-style-type: none"> Describing ratio and direct proportion. 	<ul style="list-style-type: none"> Interpretation of the meaning of 	<ul style="list-style-type: none"> Team work through cooperative learning.

TOPIC	SPECIFIC OUTCOMES	CONTENT		
		KNOWLEDGE	SKILLS	VALUES
	<p>and direct proportion.</p> <p>6.7.3 Express a given ratio in its lowest term.</p> <p>6.7.4 Solve problems involving ratio and direct proportion.</p>	<ul style="list-style-type: none"> • Relating ratio and direct proportion with number patterns, relations and mappings. • Relationship between ratio and direct proportion. • Reduction of ratio to lowest term. • Unitary and proportional methods. • Real life problems involving direct proportion (e.g. exchange rates, measures). 	<p>proportional parts.</p> <ul style="list-style-type: none"> • Computation of problems involving ratio and direct proportion. • Application of ratio and proportion in solving real life problems. 	<ul style="list-style-type: none"> • Accuracy in computations.
6.8 SOCIAL AND COMMERCIAL ARITHMETIC	<p>6.8.1 Describe cost price, selling price, profit and loss.</p> <p>6.8.2 Calculate cost price, selling price, profit and loss.</p> <p>6.8.3 Calculate simple interest, discount, and profit and loss percentage.</p> <p>6.8.4 Carry out calculations involving transportation.</p>	<ul style="list-style-type: none"> • Cost price (CP) and Selling price. • Profit and loss. • Calculations involving cost price, selling price, profit and loss in real life situations. • Time tabling in transportation, Fare chart (Bus, train, marine and air). • Distance charts (ready reckoner). 	<ul style="list-style-type: none"> • Computation of cost price, selling price, profit and loss, and simple interest. • Application in transportation, entrepreneurship and banks. • Interpretation of transportation charts. 	<ul style="list-style-type: none"> • Teamwork and role-play in selling and buying. • Decision making in entrepreneurship. • Awareness of profit and lose in real life situations.
6.9 STATISTICS	<p>6.9.1 Describe averages or measures of central tendency.</p> <p>6.9.2 Solve problems involving averages.</p>	<ul style="list-style-type: none"> • Averages or measures of central tendency (Mean, mode and median). • Problems involving averages. 	<ul style="list-style-type: none"> • Interpretation of measures of central tendency. • Computation of average or mean. • Analysis of 	<ul style="list-style-type: none"> • Problem solving real life situations.

TOPIC	SPECIFIC OUTCOMES	CONTENT		
		KNOWLEDGE	SKILLS	VALUES
			measures to find mode and median.	
6.10 LINEAR EQUATIONS IN ONE VARIABLE	6.10.1 Describe an open sentences. 6.10.2 Solve linear equations in one variable.	<ul style="list-style-type: none"> • Open sentences. • Linear equations in one variable. • Applying linear equations in one variable in real life situations. 	<ul style="list-style-type: none"> • Interpretation of open sentences. • Representation of problems into linear equations in one variable. • Solving linear equations in one variable. 	<ul style="list-style-type: none"> • Appreciation of linear equations in solving problems. • Accuracy in solving linear equations.
6.11 PLANE SHAPES	6.11.1 Identify regular polygons up to six sides. 6.11.2 Draw pentagon and hexagon.	<ul style="list-style-type: none"> • Identifying regular polygons up to six sides. • Drawing pentagon and hexagon using set square, protractor and compass. 	<ul style="list-style-type: none"> • Identification of regular polygons up to six sides. • Construction of pentagon and hexagon. 	<ul style="list-style-type: none"> • Appreciation of constructing shapes. • Accuracy in constructing plane shapes.
6.12 MEASUREMENT	6.12.1 Find the total length of edges of cube and cuboid. 6.12.2 Find the total surface area of cube and cuboid. 6.12.3 Describe the meaning of speed. 6.12.4 Calculate speed using distance and time.	<ul style="list-style-type: none"> • Faces, vertices and edges of solids. • Total length of edges of cube and cuboid. • Total surface area of cube and cuboid. • Meaning of speed (at this level avoid use of average speed). • Calculating speed using distance and time. • Calculating distance using speed and time. 	<ul style="list-style-type: none"> • Computation of total surface area of cube and cuboid. • Interpretation of speed. • Computation of speed using distance and time. 	<ul style="list-style-type: none"> • Interest of calculations of surface area. • Awareness of speed related to distance and time.

TOPIC	SPECIFIC OUTCOMES	CONTENT		
		KNOWLEDGE	SKILLS	VALUES
		<ul style="list-style-type: none"> Calculating time using speed and distance (refer to the relationship between division and multiplication i.e. $s \times t = d$ or $t = d \div s$ or $s = d \div t$). 		

General Outcomes	Key Competences at Grade 7 Level
<ul style="list-style-type: none"> • Develop algebraic, geometry and arithmetic skills in mathematics. • Enrich learners' understanding of mathematical concepts on shapes and diagrams. • Solve mathematical challenges in everyday life through problem solving. 	<ul style="list-style-type: none"> • Convert numerals from Arabic to Roman numeration and vice versa. • Order both Arabic and Roman numerals in terms of magnitude. • Carry out combined operations observing the order of operations. • Apply factors and multiples to solve real life problems. • Add and subtract fractions with different denominators. • Solve problems involving length, capacity and mass. • Multiply fractions by whole numbers. • Divide whole numbers by fractions and vice versa. • Convert common fractions into decimals and vice versa. • Solve problems involving percentages. • Present data on a stem-leaf plot and on a bar graph.

GRADE 7

TOPIC	SPECIFIC OUTCOMES	CONTENT		
		KNOWLEDGE	SKILLS	VALUES
7.1 FRACTIONS	7.1.1 Solve problems involving addition, subtraction, multiplication and division of fractions (as recap).	<ul style="list-style-type: none"> • Addition and subtraction of fractions. • Multiplication and division of fractions. • Practical problems involving four rules on fractions. 	<ul style="list-style-type: none"> • <i>Application</i> of fractions to practical problems. 	<ul style="list-style-type: none"> • <i>Awareness</i> of the four operations as they relate to fractions.
7.2 DECIMALS	7.2.1 Solve problems involving addition, subtraction, multiplication and division of decimal (as recap). 7.2.2 Convert common fractions to decimals and vice	<ul style="list-style-type: none"> • Addition, subtraction, multiplication and division of decimals up to 4 decimal places. • Conversions of fractions to decimals and vice versa. • Ordering vulgar and decimal 	<ul style="list-style-type: none"> • <i>Conversion</i> from fractions to decimals. • <i>Computation</i> involving decimals. • <i>Ordering</i> fractions 	<ul style="list-style-type: none"> • <i>Accuracy</i> in operating on fractions. • <i>Appreciation</i> of the relationship between decimals and common

TOPIC	SPECIFIC OUTCOMES	CONTENT		
		KNOWLEDGE	SKILLS	VALUES
	<p>versa.</p> <p>7.2.3 Order Fractions and decimals.</p>	<p>fractions (either descending or ascending order).</p> <ul style="list-style-type: none"> Using the symbols ($>$, $<$, $=$) in comparing fractions. 	<p>and decimals.</p>	<p>fractions.</p>
7.3 PERCENTAGES	<p>7.3.1 Describe a percentage.</p> <p>7.3.2 Convert decimals to percentages and vice versa.</p> <p>7.3.3 Convert common fractions to percentages and vice versa.</p> <p>7.3.4 Solve problems involving percentages.</p> <p>7.3.5 Relate fractions, decimals and percentages to real life situations.</p>	<ul style="list-style-type: none"> Percentage (as fraction of hundred). Converting decimals to percentages and vice versa. Conversion of common fractions to percentages and vice versa. Problems involving addition, subtraction, multiplication and division of percentages. Fractions, decimals and percentages in real life. 	<ul style="list-style-type: none"> Computation of percentage, decimals and fractions. Application of percentage, decimals and fractions in real life. Conversion between fractions, percentages and decimals. 	<ul style="list-style-type: none"> Awareness of importance of percentage, fractions and decimals in real life. Curiosity in working with percentages, decimals and fractions in real life. Team work through cooperative learning.
7.4 RATIO AND PROPORTION	<p>7.4.1 Solve problems involving direct proportion (as recap).</p> <p>7.4.2 Describe indirect proportion.</p> <p>7.4.3 Solve problems involving indirect proportion.</p> <p>7.4.4 Draw graphs to illustrate quantities in direct and indirect proportion.</p>	<ul style="list-style-type: none"> Direct proportion (as recap). Describing indirect proportion. Indirect proportions using the fraction and proportional methods. Drawing graphs to illustrate quantities in direct and indirect proportion. Problems involving ratio and proportion in real life situation. 	<ul style="list-style-type: none"> Interpretation of the meaning of indirect proportion. Computation of problems involving indirect proportion. Representation of quantities in indirect proportion. Application of direct and indirect proportion in solving real life problems. 	<ul style="list-style-type: none"> Curiosity in the use of graphs. Team work through cooperative learning. Accuracy in computations.

TOPIC	SPECIFIC OUTCOMES	CONTENT		
		KNOWLEDGE	SKILLS	VALUES
7.5 SOCIAL & COMMERCIAL ARITHMETIC	7.5.1 Conversion of currencies. 7.5.2 Calculate the cost of goods priced in foreign currency.	<ul style="list-style-type: none"> • Buying and selling of foreign currency. • Conversion of currencies (from local to foreign currency and vice versa). 	<ul style="list-style-type: none"> • Computation of buying and selling of foreign currency. • Entrepreneurship involving cost of goods priced in foreign currency. 	<ul style="list-style-type: none"> • Appreciation of conversions of currency. • Honesty. • Assertiveness in conversions of currency.
7.6 INTEGERS	7.6.1 Understand integers. 7.6.2 Illustrate positive and negative numbers using the number line. 7.6.3 Order integers. 7.6.4 Add integers. 7.6.5 Subtract integers.	<ul style="list-style-type: none"> • Understanding positive and negative numbers. • Relating integers with addition and subtraction of whole numbers using number line. • Illustrating positive and negative numbers on the number line. • Ordering integers • Addition of integers using the number line. • Addition of integers without using the number line. • Subtraction of integers using the number line. • Subtraction of integers without using the number line. • Relating Integers to real life situations (e.g. profit and loss, temperature). 	<ul style="list-style-type: none"> • Representation of integers on the number line. • Accuracy of addition and subtraction of integers. 	<ul style="list-style-type: none"> • Appreciation of calculations using the number line. • Awareness of ordering of integers.

TOPIC	SPECIFIC OUTCOMES	CONTENT		
		KNOWLEDGE	SKILLS	VALUES
7.7 NUMBER BASES	7.7.1 Illustrate base ten numeration system. 7.7.2 Describe other number bases. 7.7.3 Convert from Base 10 to Bases 2, 5 and 8. 7.7.4 Convert from Bases 2, 5 and 8 to Base 10. 7.7.5 Convert from base 2 to base 5 and vice versa. 7.7.6 Add and subtract in Bases 2, 5 and 8.	<ul style="list-style-type: none"> • Base ten numeration (place values). • Numeration in other bases (2, 5 and 8). • Conversion from Base 10 to Bases 2, 5 and 8 and vice versa. • Conversion from base 2 to base 5 and vice versa. • Addition and subtraction of numbers in Bases 2, 5 and 8. 	<ul style="list-style-type: none"> • Representation of numbers to other numeration systems. • Conversions of bases from one base to the other. • Addition and subtraction of number bases. 	<ul style="list-style-type: none"> • Accuracy in conversions of bases. • Logical thinking in conversions.
7.8 NUMBER AND SEQUENCES	7.8.1 Describe perfect squares. 7.8.2 Find squares of whole numbers. 7.8.3 Describe cubes. 7.8.4 Find cubes of whole numbers. 7.8.5 Generate a sequence in a decreasing and increasing order. 7.8.6 Generate series.	<ul style="list-style-type: none"> • Square and squared whole numbers. • Cubes and Cubed whole numbers. • Triangular whole numbers. • Identification of sequences. • Generating a rule from given sequence and vice versa. • Generation of series (use ideas such as Fibonacci series). 	<ul style="list-style-type: none"> • Identification of squared and cubed numbers. • Computation of squared and cubed whole numbers. • Generation of sequence and series. 	<ul style="list-style-type: none"> • Accuracy. • Prediction of a series or sequence. • Appreciation of Fibonacci series.
7.9 INEQUALITIES	7.9.1 Describe an open sentence. 7.9.2 Solve simple linear inequations in one variable.	<ul style="list-style-type: none"> • Open sentences. • Simple linear inequations in one variable. • Show the solutions on the number line. 	<ul style="list-style-type: none"> • Representation of an open sentence. • Computation of simple linear inequations in one variable. 	<ul style="list-style-type: none"> • Appreciation of linear equations. • Awareness of open sentences.
7.10 PLANE SHAPES	7.10.1 Describe line symmetry. 7.10.2 Draw lines of symmetry of plane shape.	<ul style="list-style-type: none"> • Describing line symmetry through demonstration (paper folding). 	<ul style="list-style-type: none"> • Identification of line of symmetry. • Interpretation of 	<ul style="list-style-type: none"> • Curiosity of finding lines of symmetry. • Awareness of

TOPIC	SPECIFIC OUTCOMES	CONTENT		
		KNOWLEDGE	SKILLS	VALUES
	7.10.3 Establish the relationship between circumference and diameter.	<ul style="list-style-type: none"> • Completing symmetrical shapes (folded along line of symmetry). • Drawing lines of symmetry of plane shape (e.g. square, rectangle, circle). • Establishing the relationship between circumference and diameter (using experiment with cylindrical objects) [constant pi ($\pi = 3.14$)]. 	relationship between diameter and circumference.	relationship between diameter and circumference. <ul style="list-style-type: none"> • Teamwork in finding relationship between diameter and circumference.
7.11 MEASUREMENT	7.11.1 Calculate circumference, using radius or diameter of the circle. 7.11.2 Calculate the area of a circle.	<ul style="list-style-type: none"> • Circumference, using radius or diameter of the circle [constant pi ($\pi = 3.14$)]. • Establishing the formula for the area of circle (by demonstration). • Calculating the area of a circle [constant pi ($\pi = 3.14$)]. 	<ul style="list-style-type: none"> • Computation of circumference and area of circle. 	<ul style="list-style-type: none"> • Curiosity in establishing the formula of area of circle.
7.12 SOLID SHAPES	7.12.1 Identify a cylinder and triangular prism. 7.12.2 Draw nets of cylinder and triangular prism. 7.12.3 Draw/sketch cylinder and triangular prism.	<ul style="list-style-type: none"> • Identifying a cylinder and triangular prism. • Drawing of nets of cylinder and triangular prism. • Draw/sketch cylinder and triangular prism. 	<ul style="list-style-type: none"> • Identification of cylinder and triangular prism. • Drawing cylinders and prisms and their nets. 	<ul style="list-style-type: none"> • Curiosity if drawing nets of cylinders and prisms. • Appreciation of drawing of cylinders and prisms.

TOPIC	SPECIFIC OUTCOMES	CONTENT		
		KNOWLEDGE	SKILLS	VALUES
7.13 STATISTICS	<p>7.13.1 Interpret data on charts (pie chart, line graph, bar/line graph, frequency table).</p> <p>7.13.2 Collect and present data on a pictograph, pie chart, bar chart, line graph and frequency tables.</p> <p>7.13.3 Calculate Mean, Mode and Median.</p> <p>7.13.4 Calculate averages as applied to mass, money, time, temperature and speed.</p>	<ul style="list-style-type: none"> • Data Interpretation. • Data collection. • Data presentation on pictograph, pie chart, bar chart, line graph and frequency tables presentation. • Mean, Mode, Median as applied in real life situations. • Averages as applied to mass, money, time, temperature and speed. 	<ul style="list-style-type: none"> • Interpretation of data in a charts and graphs. • Presentation of data in a charts and graphs. • Computation of Mean, Mode and Median. 	<ul style="list-style-type: none"> • Accuracy in the computation of Mean, Mode and Median. • Logical thinking in the application of averages in measures.

APPENDIX Grades 1- 7 Topic Sequence

DOMAIN	TOPIC	SPECIFIC OUTCOME						
		GRADE 1	GRADE 2	GRADE 3	GRADE 4	GRADE 5	GRADE 6	GRADE 7
Numbers & calculation	NUMBERS & NOTATION	1.1.1 Recognise, count, read and write numbers from 1 to 100 (including the meaning of zero). 1.1.2 Interpret numbers using ten as a unit 1.1.3 Order numbers in terms of magnitude. 1.1.4 Count in tens up to ten tens (100).	2.2.1 Count, read and write numbers up to 1 000. 2.2.2 Count in tens and hundreds up to 1 000 2.2.3 Identify place values of digits in given numbers. 2.2.4 Write numbers in expanded notation.	3.2.1 Read and write numbers up to 1 000 000. 3.2.2 Express a number in expanded notation.	4.2.1 Read and write numbers up to 1 000 000 000 4.2.2 Express a number in expanded notation	5.1.1 Identify Roman numeration system. 5.1.2 Convert numerals from Arabic to Roman numeration and vice versa. 5.1.3 Order Roman numerals.		
	ADDITION	1.3.1 Add whole numbers with sums up to 100. 1.3.2 Complete addition of number sentences. 1.3.3 Apply addition to real life up to 100.	2.3.1 Add whole numbers vertically with sums up to 100 (including carrying) 2.3.2 Add whole numbers with sums up to 1 000. 2.3.3 Carry out addition of quantities in real life situations (e.g. money, quantities)	3.3.1 Add whole numbers with sums up to 100 000. 3.3.2 Carry out addition of numbers in real life situations.	4.3.1 Add whole numbers with sums up to 1 000 000. 4.3.2 Apply addition to solve problems in real life.	5.2.1 Add whole numbers using the number line. 5.2.2 Apply addition using the number line to solve problems in real life situations.		
	SUBTRACTION	1.4.1 Subtract whole numbers up to 100. 1.4.2 Develop the concept of zero as a difference 1.4.3 Complete subtraction of number sentences 1.4.4 Apply addition to real life up to 100. 1.4.5 Carry out shopping activities involving money.	2.4.1 Subtract whole numbers vertically up to 100 (including borrowing) 2.4.2 Subtract whole numbers vertically up to 1 000. 2.4.3 Carry out subtraction and addition in real life. 2.4.4 Carry out practical shopping and marketing activities involving money up to K 1 000	3.4.1 Subtract whole numbers up to 100 000 3.4.2 Carry out subtraction and addition in real life situation	4.4.1 Subtract whole numbers up to 1 000 000 4.4.2 Apply subtraction and addition to solve problems in real life.	5.3.1 Subtract whole numbers using a number line. 5.3.2 Apply subtraction and addition using the number line to solve problems in real life situations		
	MULTIPLICATION		2.5.1 Express multiplication as repeated addition 2.5.2 Multiply single digit numbers 2.5.3 Memorize the multiplication table of single digit numbers 2.5.4 Use Multiplication vocabulary 2.5.5 Apply Multiplication in real life situations	3.5.1 Multiply two and three digit numbers by a single digit number vertically. 3.5.2 Apply multiplication in real life situation.	4.5.1 Multiply numbers by 10, 100 and 1000 using short multiplication. 4.5.2 Multiply two and three by two digit numbers using vertical multiplication. 4.5.3 Apply the properties of zero (0) and one (1) in multiplication 4.5.4 Apply multiplication to solve problems in real			

Numbers & calculation

					life			
	DIVISION		<p>2.6.1 Express division as repeated subtraction or sharing</p> <p>2.6.2 Use division vocabulary</p> <p>2.6.3 Divide numbers whose divisor and quotient is a single digit.</p> <p>2.6.4 Apply division in real life situations.</p>	<p>3.6.1 Divide two and three digit numbers by single digit number using Long division (with remainders).</p> <p>3.6.2 Demonstrate multiplication and division skills in real life situations</p>	<p>4.6.1 Divide numbers by 10, 100 and 1000 using short division.</p> <p>4.6.2 Divide two and three digit by two digit numbers using long division (with remainders).</p> <p>4.6.3 Apply division to solve problems in real life</p>			
	COMBINED OPERATIONS					<p>5.4.1 Perform combined operations</p> <p>5.4.2 Apply the commutative, associative and distributive laws to four basic mathematical operations.</p>		
	NUMBER PATTERNS	<p>1.5.1 Identify number patterns involving addition and subtraction up to 100</p>	<p>2.7.1 Recognize and use number patterns involving the four mathematical operations.</p> <p>2.7.2 Determine the rule in the number pattern.</p>	<p>3.7.1 Order numbers using mathematical symbols ">", "<", "=" and "≠".</p>	<p>4.7.1 Identify patterns and complete number sequences.</p>			
	FRACTIONS			<p>3.8.1 Identify and represent proper fractions as equal parts of a whole.</p> <p>3.8.2 Draw and shade proper fractions.</p> <p>3.8.3 Add and subtract proper fractions with common denominator.</p> <p>3.8.4 Apply proper fractions in real life situations</p>	<p>4.8.1 Describe equivalent fractions</p> <p>4.8.2 Arrange the common fractions either in ascending or descending order using proportion line</p> <p>4.8.3 Identify and represent improper and mixed fractions</p> <p>4.8.4 Convert mixed fractions to improper fractions and vice versa.</p> <p>4.8.5 Add and subtract proper, improper and mixed fractions with common denominators.</p> <p>4.8.6 Apply improper fractions to solve problems in real life</p>	<p>5.7.1 Identify equivalent fractions by multiplying or dividing the same number with numerator and denominator</p> <p>5.7.2 Express fractions with different denominators to the same denominator</p> <p>5.7.3 Add and subtract proper, improper and mixed fractions with different denominators.</p> <p>5.7.4 Apply knowledge of fractions to solve problems in real life situations</p>	<p>6.4.1 Multiply fractions by whole numbers</p> <p>6.4.2 Multiply a fraction by another fraction.</p> <p>6.4.3 Divide fractions by whole numbers</p> <p>6.4.4 Divide whole numbers by fractions</p> <p>6.4.5 Divide a fraction by another fraction</p> <p>6.4.6 Apply fractions to solve problems in real life</p>	<p>7.1.1 Solve problems involving addition, subtraction, multiplication and division of fractions (as recap)</p>
	DECIMALS					<p>5.8.1 Relate common fractions to decimals.</p>	<p>6.5.1 Describe decimal numbers by their names (up to 3</p>	<p>7.2.1 Solve problems involving addition, subtraction,</p>

						<p>5.8.2 Describe decimal numbers by their names (up to 2 decimal places)</p> <p>5.8.3 Add and subtract decimal numbers.</p> <p>5.8.4 Multiply decimal numbers by whole numbers.</p> <p>5.8.5 Divide decimal numbers by whole numbers (up to 2 decimal places WITHOUT REMAINDER).</p> <p>5.8.6 Apply decimals to solve problems in real life situations.</p>	<p>6.5.2 Add and subtract decimal numbers up to 3 decimal places</p> <p>6.5.3 Multiply decimal numbers by decimal numbers</p> <p>6.5.4 Divide decimal numbers by decimal numbers (up to 3 decimal places (INCLUDING REMAINDER)</p>	<p>7.2.2 Convert common fractions to decimals and vice versa.</p> <p>7.2.3 Order Fractions and decimals</p>
	FACTORS & MULTIPLES					<p>5.6.1 Identify factors of given numbers</p> <p>5.6.2 Identify the Highest Common Factor (HCF)</p> <p>5.6.3 Identify multiples of a given number</p> <p>5.6.4 Identify the Lowest Common Multiple (LCM) by listing</p>	<p>6.3.1 Describe and list prime and composite numbers.</p> <p>6.3.2 Identify prime factors of given numbers</p>	
	SOCIAL & COMMERCIAL ARITHMETIC					<p>5.9.1 Prepare simple household bills (budgeting).</p> <p>5.9.2 Apply simple ready-reckoners</p> <p>5.9.3 Read and interpret water and electricity bills.</p>	<p>6.8.1 Describe cost price, selling price, profit and loss</p> <p>6.8.2 Calculate cost price, selling price, profit and loss</p> <p>6.8.3 Calculate simple interest, discount, and profit and loss percentage.</p> <p>6.8.4 Carry out calculations involving transportation</p>	<p>7.5.1 Conversion of currencies</p> <p>7.5.2 Calculate the cost of goods priced in foreign currency.</p>
	INDEX NOTATION						<p>6.1.1 Describe index notation.</p> <p>6.1.2 Change a number in index form to expanded notation and vice versa.</p> <p>6.1.3 Evaluate numbers in index notation with positive bases and indices.</p>	

	APPROXIMATION						6.6.1 Round off to the nearest unit. 6.6.2 Round off to the nearest decimal places 6.6.3 Solve simple problems involving rounding off quantities to required number of decimal places	
Numbers & calculation	RATIO & PROPORTION						6.7.1 Describe ratio and direct proportion 6.7.2 Differentiate between ratio and direct proportion 6.7.3 Express a given ratio in its lowest term 6.7.4 Solve problems involving ratio and direct proportion.	7.4.1 Solve problems involving direct proportion (as recap) 7.4.2 Describe indirect proportion. 7.4.3 Solve problems involving indirect proportion 7.4.4 Draw graphs to illustrate quantities in direct and indirect proportion.
	PERCENTAGES							7.3.1 Describe a percentage 7.3.2 Convert decimals to percentages and vice versa. 7.3.3 Convert common fractions to percentages and vice versa. 7.3.4 Solve problems involving percentages. 7.3.5 Relate fractions, decimals and percentages to real life situations
	INTEGERS							7.6.1 Understand integers 7.6.2 Illustrate positive and negative numbers using the number line. 7.6.3 Order integers 7.6.4 Add integers 7.6.5 Subtract integers
	NUMBER BASES							7.7.1 Illustrate base ten numeration system 7.7.2 Describe other number bases 7.7.3 Convert from Base

								10 to Bases 2, 5 and 8. 7.7.4 Convert from Bases 2, 5 and 8 to Base 10. 7.7.5 Convert from base 2 to base 5 and vice versa 7.7.6 Add and subtract in Bases 2, 5 and 8.
	NUMBER & SEQUENCES							7.8.1 Describe perfect squares 7.8.2 Find squares of whole numbers 7.8.3 Describe cubes 7.8.4 Find cubes of whole numbers. 7.8.5 Generate a sequence in a decreasing and increasing order. 7.8.6 Generate series
Algebra	LINEAR EQUATIONS						6.10.1 Describe an open sentences 6.10.2 Solve linear equations in one variable	
	INEQUATIONS							7.9.1 Describe an open sentence 7.9.2 Solve simple linear inequations in one variable.
	SETS	1.2.1 Sort objects according to size, colour and shape. 1.2.2 Match sets into one-to-one correspondence. 1.2.3 Place sets in order according to their cardinal numbers. 1.2.4 Assign numerals 0 to 10 to elements in a set. 1.2.5 Use cardinal and ordinal numbers in everyday life.	2.1.1 Describe sets in relation to real life situations. 2.1.2 State membership of a set using symbol \in , \notin and $\{ \}$.	3.1.1 Describe a set by listing its members. 3.1.2 Recognise and use the symbols "=" equal to, " \neq " not equal to.	4.1.1 Identify equivalent sets. 4.1.2 Identify subsets and use the subset symbol " \subset ". 4.1.3 Apply sets to solve problems in real life situations	5.5.1 List all sub sets of a given set. 5.5.2 Describe sets of numbers. 5.5.3 Describe subset in a Venn diagram.	6.2.1 Describe the intersection, union in a Venn diagram. 6.2.2 Use symbols of intersection " \cap ", union " \cup " (and subset " \subset " as recap). 6.2.3 Find number of subsets of a given set using the formula 2^n . 6.2.4 Apply the knowledge of sets in real life situations.	

Geometry	ANGLES				4.9.1 Describe an angle. 4.9.2 Identify types of angles 4.9.3 Use a protractor to measure and draw angles up to 180°.			
	PLANE SHAPE	1.6.1 Recognise squares, circles, rectangles and triangles. 1.6.2 Trace outline of squares, circles, rectangles and triangles. 1.6.3 Make pictures using shapes of squares, rectangle circles and triangles	2.11.1 Identify right angle with squared paper or paper folding. 2.11.2 Draw rectangle and square on squared paper. 2.11.3 Identify side and vertex of rectangle and square.	3.12.1 Identify right angled triangle by folding rectangular and squared paper 3.12.2 Draw right angled triangle on squared paper	4.10.1 Draw a rectangle and square using protractor and set square 4.10.2 Identify isosceles and equilateral triangles 4.10.3 Draw the equilateral and isosceles triangles using protractor and set square	5.10.1 Identify and draw perpendicular and parallel lines 5.10.2 Describe trapezium, rhombus and parallelogram 5.10.3 Draw trapezium, rhombus and parallelogram. 5.10.4 Identify the uses of a pair of compasses 5.10.5 Use a pair of compass to draw a circle 5.10.6 Identify centre, diameter and radius of a circle	6.11.1 Identify regular polygons up to six sides 6.11.2 Draw pentagon and hexagon.	7.10.1 Describe line symmetry 7.10.2 Draw lines of symmetry of plane shape. 7.10.3 Establish the relationship between circumference and diameter
	SOLID SHAPES		2.12.1 Recognise cuboid, cube, cylinder and sphere. 2.12.2 Mould cuboid, cube, cylinder and sphere using clay plasticine			5.11.1 Identify face, vertex and edges of cuboids and cubes 5.11.2 Draw nets of cuboids and cubes 5.11.3 Draw/sketch cuboid and cube		7.12.1 Identify a cylinder and triangular prism 7.12.2 Draw nets of cylinder and triangular prism 7.12.3 Draw/sketch cylinder and triangular prism
Relations	RELATIONS		2.9.1 Draw arrow diagrams to illustrate matching	3.11.1 Draw Arrow diagrams to illustrate one-to-one mappings	4.12.1 Illustrate one-to-many relation using arrow. 4.12.2 Apply relations in real life situations.	5.14.1 Illustrate a one-to-many and many-to-one relations 5.14.2 Apply knowledge of relations and mappings in real life situations.		

Measures	MEASURES	1.7.1 Identify times of the day. 1.7.2 Tell days of the week 1.7.3 Name months of the year 1.7.4 Compare lengths of different objects.	2.8.1 Read and tell time in full hours 2.8.2 Measures of different objects using standard units. (cm, mm, m) 2.8.3 Find the perimeter of simple plane figures	3.9.1 Tell time at specified intervals. 3.9.2 Read and use the calendar 3.9.3 Describe the unit for measuring long distances (Km). 3.9.4 Describe mass and the standard units for its measure 3.9.5 Describe capacity and the standard units for its measure	4.11.1 Determine duration of time elapsed between events 4.11.2 Relate seconds, minutes, hours and day. 4.11.3 Illustrate the meaning of area 4.11.4 Describe standard units to measure area. (cm ² , mm ² , m ²) 4.11.5 Derive the formulae for finding area of rectangle and square 4.11.6 Find the area of a rectangle and square	5.12.1 Find the perimeter of triangle, parallelograms, trapezium, rhombus and composite shapes 5.12.2 Derive formula for area of triangle, parallelograms, trapezium and rhombus. 5.12.3 Calculate areas of triangle, parallelograms, trapezium, rhombus and composite shapes 5.12.4 Describe volume 5.12.5 Use standard units to measure volume (cm ³ , m ³) 5.12.6 Relate volume to capacity 5.12.7 Derive the formulae for finding volume 5.12.8 Calculate the volume of cubes and cuboids	6.12.1 Find the total length of edges of cube and cuboid 6.12.2 Find the total surface area of cube and cuboid 6.12.3 Describe the meaning of speed 6.12.4 Calculate speed using distance and time	7.11.1 Calculate circumference, using radius or diameter of the circle. 7.11.2 Calculate the area of a circle
Statistics	STATISTICS		2.10.1 Collect and present data using pictures	3.10.1 Collect and present ungrouped data on a frequency table	4.13.1 Read and interpret line graphs 4.13.2 Collect and present data on a line graph	5.13.1 Understand stem-leaf plot and on a bar graph. 5.13.2 Collect and present data on a stem-leaf plot and on a bar graph	6.9.1 Describe averages or measures of central tendency 6.9.2 Solve problems involving averages	7.13.1 Interpret data on charts (pie chart, line graph, bar/ line graph, frequency table) 7.13.2 Collect and present data on a pictograph, pie chart, bar chart, line graph and frequency tables. 7.13.3 Calculate Mean, Mode and Median 7.13.4 Calculate averages as applied to mass, money, time, temperature and speed.

NOTES

Symbols

$>$	Greater Than
$<$	Less Than
\geq	Greater Than or Equal To
\leq	Less Than or Equal To
$=$	Equal To
\neq	Not Equal To
\cap	Intersection
\cup	Union
\subset	Subset
\in	Member of
\notin	Not a member of
$\{ \}$ or \emptyset	Empty Set

Constant pi (π) = 3.14

Acronyms

LCM	Lowest Common Multiple
HCF	Highest Common Factor