OECS
Organization of
Eastern Caribbean States

ORGANISATION OF EASTERN CARIBBEAN STATES
EDUCATION SECTOR STRATEGY

OECS PRIMARY GRADES' LEARNING STANDARDS
FOR
MATHEMATICS

GRADES K – 6

GLOBAL PARTNERSHIP *for* **EDUCATION**

CXC
CARIBBEAN
EXAMINATIONS
COUNCIL

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INTRODUCTION
TO

THE OECS PRIMARY GRADES' LEARNING STANDARDS

For

MATHEMATICS

BACKGROUND

The Organisation of Eastern Caribbean States (OECS) member countries have made significant strides in increasing access to primary education and secondary education. The Net Primary Enrollment Rate (6-11 year age children) is close to 100%. Gross enrollment rate at the secondary level (11-16 years) are also approaching 100%. However, low-learning outcomes remain the major challenge faced by the education sector in all OECS countries.

In order to address the underlying causes of low learning outcomes, the OECS countries developed a Regional Education Strategy "Every Learner Succeeds" whose focus is ensuring that all children learn and succeed in school. The strategy was developed in a consultative manner and has been endorsed by the OECS Ministerial Forum for implementation. With the aim of enhancing the quality of education, the Education Sector Strategy sets out the education priorities for the period 2012-2021.

The "Every Learner Succeeds" regional education strategy is results based and includes the following imperatives:

(i)   improve the quality and accountability of education leadership;
(ii)   improve teacher quality, management and motivation;
(iii)   improve the quality of teaching and learning using learner-centered approaches;
(iv)   improve curriculum and strategies for assessment to meet the needs of all learners;
(v)   increase access to quality early childhood development services;
(vi)   provide opportunities for all learners to develop the knowledge, skills and attitudes to enable them to progress to further education and training and productive employment; and
(vii)   increased access to and relevance of tertiary and continuing education.

In order to implement this Regional Education Strategy, the OECS countries have received a Global Partner for Education (GPE)-funded Education Plan Development Grant to provide for technical assistance for finalizing the development of an education quality framework, and to develop an implementation framework and assessment framework for primary grades.   The implementation plan encompasses all education sector activities to be implemented as part of the OECS Education Sector Strategy (OESS).

A portion of the grant funding has been used to develop regional learning standards for the primary grades. The purpose of the learning standards is to serve as a regional benchmark for the quality of primary pupils' learning outcomes that are to be achieved in each of the nine member countries of the OECS. The learning standards are built on regional consensus of what pupils need to know and be able to do in Mathematics, Science & Technology, History and Literacy as represented in both the OECS Harmonized Primary Curriculum, and in the Caribbean Primary Exit Assessment (CPEA).

CXC – An Overview

The Caribbean Examinations Council (CXC)® was established in 1972 under Agreement by the Participating Governments in the area to conduct examinations and then award certificates and diplomas on the results of any conducted examinations. The Council is also empowered to regulate the conduct of any such examinations and prescribe the qualification requirements of candidates and the fees payable by them.

It comprises sixteen (16) Participating Territories: Anguilla, Antigua and Barbuda, Barbados, Belize, British Virgin Islands, Cayman Islands, Dominica, Grenada, Guyana, Jamaica, Montserrat, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Trinidad and Tobago and Turks and Caicos Islands.

CXC has over 40 years of experience in developing syllabuses, formulating tests, administering examinations, issuing results and analysing statistics for large-scale examinations. CXC also engages in the provision of orientation and training of teachers to deliver our syllabuses, as well as training in item generation and fundamentals of classroom assessment.

CXC has introduced a comprehensive suite of qualifications to meet the needs of the region: Caribbean Primary Exit Assessment™ (CPEA™); Caribbean Certificate of Secondary Level Competence® (CCSLC®); Caribbean Vocational Qualification (CVQ); Caribbean Secondary Education Certificate® (CSEC®); Caribbean Advanced Proficiency Examination® (CAPE®); and the CXC Associate Degree® (CXC _AD®).

Over the years, the organisation has developed and expanded its repertoire of services in several consultancy areas related to Training and Professional Development, Measurement and Evaluation Services, Examinations Development and Production, Examinations Administration and Security as well as Syllabus and Curriculum Development, to name a few.

In developing the OECS Primary Grades' Learning Standards, CXC has devised a set of standards and descriptors that describe the knowledge, skills and attributes a pupil should attain by the end of Primary Grade 6. The standards describe educational objectives that concisely delineate what pupils are expected to know and be able to do by the end of a grade level. The learning standards are sequenced according to learning progression across grades, where each grade level learning expectations build on previous expectations while preparing the pupils for more challenging concepts and coursework at the higher level.

GENERAL FRAMEWORK OF THE LEARNING STANDARDS

GOAL

To document a set of standards and associated descriptors that describe the skills and attributes a pupil should attain by the end of Primary Grade 6.

The OECS Primary Grades Learning Standards describe the overarching long-term educational goals that pupils should have achieved by the time they complete a specific grade or education level. These learning standards describe the important knowledge, skills and personal attributes that educators should be continuously addressing and cultivating at all stages throughout the pupils' educational journey at the primary level. This must be done to ensure that the pupils are prepared for success at the secondary level and beyond.

OBJECTIVES

The Learning Standards detailed in this document are concise, clearly articulated descriptions of what pupils are expected to know and reliably demonstrate on successful completion of a grade level. It is expected that the Learning Standards will provide benchmarks for relevant educational progress and be utilised in the formulation of policies aimed at improving and enhancing the quality of the teaching-learning transactions. In addition, the Learning Standards can be used as guides in structuring instructional units as well as in determining how content learning should proceed within and across the primary grades in broad sub-related topic areas.

STRUCTURE

The Learning Standards are detailed for four content areas – Language Arts, Mathematics, Science and Technology and Social Studies. The standards have been developed based on international benchmarks drawn from several international education systems including the Caribbean, Australia, Canada, Singapore and the United Kingdom. These content-related standards may be integrated in a system of developing learning indicators at the classroom level that will help determine learning growth in the pupils over time. Consequently, by knowing beforehand the expected standards the pupils are expected to meet by the end of a grade level, teachers can design assignments and assessments to determine whether pupils are moving towards achieving specific learning standards. This system will also inform whether remedial action is required on an individual pupil or group basis.

The Learning Standards also address learning progressions across the grade levels. The progressions establish learning expectations of pupils at a specific level as well as learning needs and abilities at a particular stage of their intellectual, emotional, social and physical development.

These progressions represent clearly articulated learning sequences in that the standards are purposefully designed to prepare pupils to meet the standards of the next grade level.

FORMAT

Each Learning Standard or cluster of related standards is tied to an overarching strand. The strand is sub-divided into sub-strands to ensure adequate coverage of the knowledge, skills and attributes required for achievement across the content area.   These sub-strands represent content standards.

- Each standard represents a performance standard and is formatted as follows:

    Each Learning Standard is identified by an alpha numeric descriptor that indicates the content area (subject), the grade level and the strand and sub-strand if applicable, and the standard number.

    E.g.

    Standard Descriptor: **ST.3.TE.NT.3**

    Where,
    ST   represents the content area – **Science and Technology**
    3   represents the **Grade level**
    TE   represents the **Strand – Technology**
    NT   represents the **Sub-Strand – Nature of Technology**
    3   represents the **Standard Number**

The content area codes are assigned as follows:
Language Arts – **LA**
Mathematics – **MT**
Science and Technology – **ST**
Social Studies – **SS**

Information on the coding for the strands and sub-strands will be given in Section B of this document.

BENEFITS TO BE DERIVED

It is envisaged that the following benefits will be derived by consistent integration of the Learning Standards in the teaching-learning transactions across the OECS grouping:

- **Consistent use of the Learning Standards across the grouping will help guide the planning, implementation and assessment of pupil learning.**
  This contributes to the streamlining of instruction and ensures that teaching practices deliberately focus on agreed learning benchmarks. The Standards will also assist in the planning of focused instruction to meet the specific needs of pupils

- **The Learning Standards will encourage equitable learning experiences.**
  By organizing concepts and skills around the standards identified as those which all pupils should attain at designated points of time, educators will ensure that all pupils at the primary level within the grouping are afforded adequate and equitable opportunities to learn.

- **Consistent use of the Learning Standards will reduce overlap and aid in the scaffolding of the curriculum.**
  The standards are articulated and aligned within and across the grade levels in such a way that the overlap of knowledge and skills is reduced or avoided. In addition, the standards are designed so that content is scaffolded by increasing the depth, breadth and cognitive complexity as pupils move from one grade level to the next.

- **Standardisation of the preparation of all pupils in the OECS for secondary level education.** Adherence to regional standards would be beneficial for an increasingly mobile population that is taking advantage of job opportunities available across the OECS territories. This standardisation would make it easier for pupils to settle into new schools when they move from one territory to another.

It must be noted that Learning Standards found in this document do not dictate the teaching methodologies or curriculum design that should employed in order for pupils to attain the standards associated with any content area and respective grade levels.

BASIC GUIDELINES FOR USING THE LEARNING STANDARDS

The OECS Primary Grade Learning Standards may be utilised in the development of learning objectives and learning indicators. In most instances, the learning objectives will be similar to the Learning Standards. However, it is expected that the learning objectives will be more specific and have a narrower focus than the standards.

In utilising the learning standards in their everyday teaching activities, educators are encouraged to use the following approach:

1. When designing a unit/lesson plan, it is beneficial to compare your current curriculum with the standards for the respective grade level in the content area.

2. Check to see how many standards are addressed for the particular unit/lesson by the curriculum.   Determine whether additional activities or content will be required in order to ensure that the pupils will achieve the required standard(s).

3. Using the standards as a foundation, ensure that the learning experiences designed support the key learning areas addressed in the standards.

4. Utilise the standards to ensure that teacher expectation and proposed learning experiences are appropriate for the pupils. This can be achieved by focusing on a specific strand within the learning standard.

5. Link the learning standards to daily learning activities by determining which strands and sub-strands will be addressed in a particular lesson and deciding how specific learning experiences will build pupils' learning and support their skill and attribute development. Formative assessment is one tool that should be utilised to identify knowledge and skills that may require specific attention on an individual pupil or whole group basis.

LINKING LEARNING STANDARDS AND LEARNING OBJECTIVES

As stated previously, learning standards are concise, specific, written descriptors of what pupils are expected to know and be able to do at a specific stage of their education. The standards detail long-term educational goals which indicate what pupils should have learned and be able to do by the end of a grade level. It must be noted that learning standards do not describe or prescribe a particular teaching practice, curriculum or assessment method.

On the other hand, learning objectives are brief statements that describe what pupils will be expected to learn by the end of a unit, lesson, project or course. These forms of objectives represent short-term academic goals that are established by teachers for pupils who are working towards meeting a long-term goal or learning standard. The learning objectives also articulate the academic expectations of pupils so that they know what is expected of them.

It must be noted, that the terms standards, learning expectations, learning outcomes and achievement expectations are sometimes used interchangeably. There are two forms of standards that are used in curriculum and assessment literature – content standards and performance standards.

- Content standards are broad statements that describe specific content areas that pupils should learn at each grade level.
- Performance standards incorporate content standards and define the level of work that demonstrates achievement of the content standards.

In the OECS Primary Grades' Learning Standards for Grades 1 – 6 the performance standards are described in the respective tables.

The learning standards form the foundation of what is taught in the classroom. Therefore, in creating learning objectives from the standards, the teacher determining **what** they want pupils to learn and **how** the pupils will demonstrate that learning. This allows teachers the flexibility of determining how the standard should be reached and what additional information should be taught. See examples below.

Example 1. Mathematics

Learning Standard Addressed: MT.6.UM.LM.2
Working in small groups, use knowledge of relationship between units of length to convert from a larger unit to a smaller unit (e.g. metres to centimetres) using measures that are equivalent to whole or fractional parts (halves, quarters, and tenths) of the larger unit.

Suggested Learning Objective:

WHAT?   Pupils working in groups of three, will compute lengths and areas of the classroom to create a plan or blueprint drawing of the classroom indicating the scale used.

HOW?   Groups will then make a presentation to the class on why their plan or   blueprint is accurate.

Example 2. Language Arts

Learning Standard Addressed: LA.4.R.UT.3
Ask and answer questions, who, what, when, where, when, why, and how to demonstrate understanding of key details in text.

Suggested Learning Objective:

WHAT?   Working in pairs, pupils will read the story entitled "Paco Takes a Bath". Pupils will then complete the fishbone organiser to help them identify the key details of the story.

HOW?   Each pair will then discuss their completed organizer with the whole class. Each organizer will be assessed using pre-determined criteria.

SECTION B

OECS PRIMARY GRADES' LEARNING STANDARDS

For
MATHEMATICS

by
Grade Level

MATHEMATICS

INTRODUCTION

The Organisation of Eastern Caribbean States (OECS) Primary School Mathematics Standards is designed to promote a high quality of mathematical engagement for all learners at the primary school level. The target of the standards is to simultaneously develop mathematical literacy within these pupils, while establishing a sound foundation of mathematical understanding on which future studies can be built. The standards therefore outline the essential content and processes that are critical to the achievement of this goal, and challenges teachers to adopt a teaching approach that reflects the skillful use of stimulating instructional materials and strategies.

Rationale

Learning to construct mathematical knowledge, and regular focused engagement in mathematical processes at an early age, are two key pillars on which the OECS primary school mathematics learning standards are developed. The common thread that ties the learning standards as outlined per strand across grades 1 to 6, is the development of mathematical literacy. The standards target the cultivation of a positive attitude to mathematical learning.

A sound understanding of mathematical concepts, principles and processes, as well as the development of core mathematical skills essential for pupils to experience the beauty of mathematics; gain sustained enjoyment from their learning; establish a firm foundation on which future learning can be readily built; and make connections between in-class and out of school experiences. The OECS Primary School Mathematics Standards promotes that pupils be challenged to make sense of their mathematical experiences in a learning environment that emphasises collaborative learning, problem solving, reasoning, making connections, communicating and representing. This set of standards challenges pupils at every grade level to use a variety of tools and strategies to respond to familiar and novel situations with reasoned justification to support their choice of working.

Although the standards are outlined under four strands, each with several sub-strands, the document recognizes the high connectivity amongst mathematical concepts, topics and processes, as well as the links between mathematics and other subject disciplines. The suggestion is therefore made for concepts to be dealt with in ways which make it easy for learners to identify and make such connections. The standards stress the need for pupils to work collaboratively with opportunities for individuals to exhibit diversity in creativity and efficiency.

AIMS

The general goal of the OECS Mathematics Standards is to produce mathematically literate citizens. To achieve this goal, the set of standards aims to:

1. provide pupils with a variety of opportunities for them to enjoy learning mathematics and thereby develop a positive disposition for the subject at an early age;
2. encourage pupils to work efficiently at constructing meaningful understanding of mathematical concepts, principles and processes and developing mathematical skills to become confident mathematics learners; and
3. cultivate the attitude of consciously using mathematical knowledge to ask relevant questions, solve problems and make connections among experiences which reflect different mathematical principles.

Mathematical Processes

A core element of the OECS Primary School Mathematics Standards is pupils' regular engagement in work with the following mathematical processes:

Problem Solving

Problem solving is developed by solving appropriately challenging problems on a regular basis. The earlier pupils get into this key habit of learning mathematics, the more they are likely to develop a positive disposition for the subject. Pupils' ability to solve problems affords them the opportunity to construct understanding of mathematical concepts from their learning experiences. This way of working in the classroom, allows pupils to make choices relating to the utilisation of a variety of tools and strategies; to model and investigate mathematical situations in multiple ways; and to communicate ideas effectively through different media. By learning through problem solving, pupils get to realise that mathematical learning takes effort and time, and is punctuated by periods of being stuck. Success in solving problems increases pupils' confidence.

Reasoning

The depth of pupils' reasoning power is reflected in their ability to analyse, evaluate and formulate conjectures based on results obtained from their activities. Mathematical reasoning is also demonstrated in pupils' ability to use examples to verify conjectures, explain their thinking and to formulate generalizations based on observations. Pupils' engagement in reasoning therefore allows them to present their thoughts in a logical and confident way. This way of working encourages pupils to explore ideas and solutions and to develop the habit of communicating thoughts.

Communicating

Mathematics is a language. Pupils' early interaction with the many different modes of representing this language is critical in them developing the skills to write and speak with a great degree of fluency and confidence when communicating mathematical ideas. By focusing on pupils' mathematical communication, learning is promoted as a shared responsibility among a community of learners. Pupils are then more likely to participate in collaborative learning which needs to be fostered during the early years. Engagements that guide pupils to interact with theirs and other persons' ideas before sharing their thinking add value to the learning process. Additionally, pupils who operate in a classroom that encourages regular exchange and critique of ideas tend to be more active, confident and articulate in their pursuit of learning.

Connecting

Mathematics is a network of concepts, principles, skills and processes. Getting pupils to identify and make connects among mathematical concepts makes learning far less burdensome. Pupils who have the facility of working mathematically through the utilisation of a network of mathematical concepts, skills and processes are likely to gain deep insights into the structures that underpin mathematical ideas; and thereby find it more convenient to shift from a heavy dependence on rote learning to conceptual understanding. The more pupils are able to establish connection between mathematical concepts and topics; and between mathematics and other subjects, the deeper their understanding of concepts is likely to be. The standards, though divided into four strand, does NOT advocate a fragmented or linear approach to teaching and learning. Instead, it advances the need for a spiral approach to teaching and learning where concepts with connecting principles listed under two or more stands can be dealt with simultaneously. For example, using centimetre and metre units to measure could be done at the same time pupils are investigating results obtained from multiplying by 100.

Representing

Mathematical ideas including those presented textbooks are represented in a variety of forms. Mathematical ideas are often represented in a precise and concise way using a variety of forms. Pupils should be challenged to develop skills to read and interpret, with a great degree of fluency, information presented in the different forms (charts, tables, diagrams, pictures, symbols and words). The ability of pupils to represent the same idea in multiple ways and reflect on the benefit and effectiveness of each mode of representation is encouraged. The skill in reading mathematical ideas, in different directions (right to left, left to right, top to bottom, bottom to top, diagonally) in the classroom.

Organisation of the Learning Standards

The OECS Primary School Mathematics Standards are presented under four (4) content strands with related sub-strands which match the learning expectations at the different grade levels. The standards associated with the four strands at the different grade levels reflect a deepening of understanding concepts over the progressive years at primary school level. Until children are about 12 years old, many are challenged to learn new concepts and moreso abstract ones, if the proper foundation is not laid. For this reason, care must be taken to ensure that pupils are comfortable with all prerequisites when planning to introduce a new concept or skill, and work should be kept well within the realms of what a child can experience in practical ways. Although the Standards are arranged in Strands, the spiraling of content within each grade level and across the strands is strongly recommended. The table below outlines the match between sub-strands and grade level coverage. Not all sub-strands are covered at each grade level.

Table 1. Learning Standard Strand/Grade Level Grid

		LEARNING STANDARD STRAND/GRADE LEVEL GRID								
	Strand	**Sub- Strand**		**Grade Level**						
				K	1	2	3	4	5	6
1	Number Sense	Understanding Numbers	UN	√	√	√	√	√	√	√
		Operational Sense	OS	√	√	√	√	√	√	√
		Proportional Reasoning	PR			√	√	√	√	√
		Number Pattern	NP	√	√	√	√	√	√	√
2	Understanding Measurement	Linear Measurement	LM	√	√	√	√	√	√	√
		Measuring Area	MA					√	√	√
		Measuring Capacity	MC	√	√	√	√	√	√	√
		Measuring Mass	MM	√	√	√	√	√	√	√
		Understanding Time	UT	√	√	√	√	√	√	√
		Money Works	MW	√	√	√	√	√	√	√
3	Geometric Thinking	Points and Lines	PL				√	√	√	√
		Understanding Angles	UA				√	√	√	√
		Plane Shapes	PS	√	√	√	√	√	√	√
		Solid Shapes	SS	√	√	√	√	√	√	√
		Directional Sense	DS	√	√	√	√	√	√	√
4	Data Handling	Data Collection	DC	√	√	√	√	√	√	√
		Data Representation	DR	√	√	√	√	√	√	√
		Data Interpretation	DI	√	√	√	√	√	√	√

Key: √ *indicates the sub-strands that form part of the learning engagement at the different grade level*.

Number Sense

The focus is to guide pupils to work effectively with numbers. Pupils read, write, compare, count, order and represent numbers. Pupils use a variety of tools and strategies to construct understanding of the value of numbers (whole numbers, fractions and decimals) and investigate how different numbers behave under the four basic operations (addition, subtraction, multiplication and division). As a way of computing with numbers, pupils first formulate estimations of solutions, work to achieve solutions then compare estimations with obtained solutions. Pupils discover, through regular investigations relationships between numbers; recognize, describe and generate patterns among numbers and formulate related generalizations. Pupils communicate ideas about numbers, create and solve problems involving numbers and explain reasons to justify reasonableness of solutions obtained and to support choice which underpin their way of working with numbers.

Understanding Measurement

Learning is centered on the development of skills that allow pupils to perform tasks of estimating, comparing, measuring and recording different attributes of measurement. Pupils first learn to measure attributes using non-standard units; then through focused discussions of difference in results obtained, pupils explain reasons for standard units of measurement. Pupils choose appropriate instruments and units relative to the measurement of length area, mass, capacity, time and money. Estimation is stressed as a crucial first step to be done before conducting actual measurement. Pupils then compare estimated measures with the results obtain from performing and or calculating the actual measurement. Through investigations and collaborative learning engagements, pupils establish and make use of connections between units to convert measures given in one unit to another unit. Pupils use related vocabulary to describe comparisons between measures of objects.

Geometric Thinking

The development of awareness of size, shape and position of objects is fostered throughout the content standards outlined under Geometric Thinking. Pupils learn to recognize and draw basic plane and solid shapes. They develop, through investigation, the skill of identifying properties of basic plane and solid shapes, and using this knowledge to classify shapes and explain common features that link shapes in the same group. Opportunities are provided for pupils to develop and use directional language by locating, translating and reflecting points and shapes in the first quadrant of the Cartesian plane.

Data Handling

The ability to collect, organize, represent and interpret data is a necessary skill for pupils of all ages. Through this strand, pupils are involved in learning experiences which guide them to ask questions that are suitable for collecting relevant data. Pupils represent data in appropriate methods including tables, picture graphs, bar graphs and line graphs. Too, pupils are challenged to develop the skill of reading and interpreting data presented in different forms, and to determine and use basic statistical measures (range, mode, median and mean as a guide to make relevant comment on given data set.

Assessment of Mathematical Learning

Assessment is critical to learning. Assessment drives and informs the learning process. Assessment informs the teaching process. Assessment therefore assures accountability and quality. The OECS Primary Mathematics Standards advances the philosophy that assessment should serve to promote the progress of the learner and to improve the delivery of the teacher. For these reasons, the standards challenge teachers to:

- integrate assessment with instructions
- encourage continuous self-assessment among pupils
- use a variety of assessment strategies, forms and tools (including oral and written presentations)

Additionally, assessment associated with the teaching of these standards should aim to gather relevant information about pupils'

- understanding of concepts and procedures
- growth and development in engaging in mathematical processes
- deposition to mathematics and learning associated with it

It is critically important too, that pupils be given relevant, regular and timely feedback on their efforts at learning. This new way of assessing pupils' mathematical learning, calls for a different approach in teachers reporting to pupils, instructional leaders and parents. Effective reporting on pupils' learning progress dictates that teachers comment on and speak to different areas of mathematical literacy development to include pupils'

- mathematical thinking
- construction of mathematical concepts, procedures and skills
- ability to communicate effectively using mathematical ideas and vocabulary
- involvement in mathematical processes
- participation in the social construction of mathematical learning

Technology and Mathematical Learning

The use of technologies in the learning of mathematics is emphasized as a necessary tool to facilitate and support the learning of mathematics in meaningful ways. Pupils' learning benefits from using calculators, computers, cameras, videos, and other technological devices to record, investigate and present mathematical ideas. Additionally, technology strengthens pupils' engagement in problem solving, reasoning, reflecting and communicating. The use of technology also allows for increased time to be spent on collaborative work among pupils. The idea is for teachers to use the technology to better cater for the different learning styles, and for pupils to apply the technology to produce and share knowledge gained from their learning experiences.

With regards to the use of calculators, it is to be emphasized that access to this tool cannot replace the need for pupils to learn their basic facts. There is no substitute for the memorization of arithmetic facts, since that knowledge is essential to being able to perform in one's head or on paper the basic arithmetic functions; adding, subtracting, multiplying and dividing. Additionally, being given a calculator to perform these functions without having the basic knowledge in one's head will give a child no clue as to whether the answer on the calculator is right or wrong.

THE LEARNING STANDARDS

General Overview– Grade K

Introduction

The general knowledge, skills, attitude and mathematical processes which should be made manifest in pupils by the end of **Kindergarten** (**K**) are highlighted in this section in two categories: - Content Standards (CS) which gives indication of critical benchmarks, and Performance Standards which are organized under the four strands – Number Sense (NS), Understanding Measurement (UM), Geometric Thinking (GT) and Data Handing (DH). The performance standards are arranged in increasing levels of complexity, and against this backdrop, teachers are reminded of the need to ensure pupils' comfort with prerequisites, before introducing new concepts or skills. This section also provides guidelines about the type of activities which should be utilized by teachers towards their pupils' mastery of the content in the different strands: -

CONTENT STANDARDS – GRADE K

Number Sense (NS)

MT.K.CS.NS.1:   *Pupils can construct understanding of whole numbers up to 12 after being exposed to a variety of materials, media, tools, and strategies.*

MT.K.CS.NS.2:   *Pupils can display an awareness of numbers up to 50.*

MT.K.CS.NS.3:   *Pupils can utilize concrete, pictorial, symbolic representation and mental strategies to perform computational tasks related to addition and subtraction of whole numbers up to 12.*

MT.K.CS.NS.4:   *Pupils can understand and use mathematic content related vocabulary.*

MT.K.CS.NS.5:   *Pupils can recall basic mathematical facts and utilize simple calculators to create and solve simple problems using whole numbers up to 12.*

MT.K.CS.NS.6:   *Pupils can recognize and extend patterns which require skills in counting forwards and backwards.*

Understanding Measurement (UM)

MT.K.CS.UM.1:   *Pupils can select and apply appropriate units and tools in estimating and measuring lengths, heights, distances, capacity, and mass.*

MT.K.CS.UM.2:   *Pupils can understand and utilize part of the calendar e.g. days of the week, months of the year.*

MT.K.CS.UM.3:   *Pupils can tell and show time on the hour using the analog clock.*

MT.K.CS.UM.4:   *Pupils can recognize the different monies (coins and notes) used in the Eastern Caribbean.*

MT.K.CS.UM.5   *Pupils can order Eastern Caribbean notes based on their magnitude.*

Geometric Thinking (GT)

MT.K.CS.GT.1:   *Pupils can identify 2-D and 3-D shapes and understand the terms plane shapes (PS) and solid shapes (SS).*

MT.K.CS.GT.2:   *Pupils can classify objects using attributes ad features such as shape, size, and/or function.*

MT.K.CS.GT.3:   *Pupils can utilize personal language to locate objects in concrete and pictorial situations.*

Data Handling (DH)

MT.CS.DH.1:   *Pupils at Grade K understand the importance of gathering data in real life situations to answer questions and make decisions.*

MT.K.CS.DH.2:   *Pupils can collect data in the classroom, the wider school environment, and their home environment through observing and looking for answers.*

PERFORMANCE STANDARDS - GRADE K

At the completion of Grade K, pupils who demonstrate understanding will:

STRAND: NUMBER SENSE (NS)

Sub-Strand: Understanding Numbers (UN)

Subject	Grade	Strand	Sub-strand	Standard #	Performance Standards
MT	K	NS	UN	1	Count the number of objects in a set up to 12 objects, where objects are arranged in a variety of ways (such as close together, far apart, in rows, in columns, in circular, triangular, rectangular arrangements)
MT	K	NS	UN	2	Read, write and identify the numbers 0 to 12
MT	K	NS	UN	3	Make or draw sets of up to 12 objects, in a variety of arrangements (in rows, columns, close together, far apart, and so on)
MT	K	NS	UN	4	Write the correct number to indicate the number of objects in a set of 0 to 12 objects
MT	K	NS	UN	5	Subitise (recognize at a glance) and name familiar arrangements of 1 to 5 objects, dots or pictures
MT	K	NS	UN	6	Compare the number of objects in two sets of up to 12 objects, using phrases such as 'same number as', 'equal to', more than' and 'less than'.
MT	K	NS	UN	7	Make a set that has the same number of objects as/ or one more object than, a given set
MT	K	NS	UN	8	Order sets of objects and numbers from least to most or most to least
MT	K	NS	UN	9	Write and recognize numbers from 0 to 12 in words and make their association with sets of objects
MT	K	NS	UN	10	Use the terms (first, second, third, fourth and fifth) to describe the position of an object in an ordinal arrangement of up to five objects.

Sub-Strand: Operational Sense (OS)

Subject	Grade	Strand	Sub-strand	Standard #	Performance Standards
MT	K	NS	OS	1	Compose and decompose numbers up to 9 in a variety of ways using manipulatives, fingers and pictures (e.g. 7 = 6 + 1 or 5 + 2).
MT	K	NS	OS	2	Construct number sentences (verbally, then written) to represent addition and then written with symbols (+ and =).
MT	K	NS	OS	3	Use objects and then pictures to add two numbers, with totals up to 9.
MT	K	NS	OS	4	Use objects and then pictures to subtract one number from another, with both numbers being less than 10
MT	K	NS	OS	5	Construct number sentences orally and written to represent situations which involve subtraction.
MT	K	NS	OS	6	Create and solve simple word problems involving addition and subtraction of two whole numbers, based on situations in their everyday activities, with results less than 10
MT	K	NS	OS	7	Describe physical features of a simple calculator, e.g., the keys, the display area
MT	K	NS	OS	8	Identify and input the keys for addition, subtraction and equal (+, -, =) on the calculators to perform addition and subtraction of two numbers

Sub-Strand: Number Patterns (NP)

Subject	Grade	Strand	Sub-strand	Standard #	Performance Standards
MT	K	NS	NP	1	Count in sequence up to 50 with the aid of visuals
MT	K	NS	NP	2	Recite number names from one given number to another given number (forward from 1 to 20, backward from 10 to 1) using visual aids
MT	K	NS	NP	3	Name the number that comes after and before a given number (for the set of numbers one to nine)
MT	K	NS	NP	4	Arrange up to 5 objects in different patterns (such as 5 counters consisting of 1 blue and 4 red counters, 2 blue and 3 red counters, 3 blue and 2 red counters, 4 blue and 1 red counters; 4 counters as 1 green and 3 yellow counters, 2 green and 2 yellow counters, 3 green and 1 yellow counters)

STRAND: UNDERSTANDING MEASUREMENT (UM)

Sub-Strand: Linear Measurement (LM)

Subject	Grade	Strand	Sub-strand	Standard #	Performance Standards
MT	K	UM	LM	1	Compare lengths of objects using phrases (such as 'longer than', and 'shorter than')
MT	K	UM	LM	2	Compare the heights of objects using phrases (such as 'taller than', 'shorter than')
	K	UM	LM	3	Order a set of, up to three objects, based on their length or height
MT	K	UM	LM	4	Compare distances using phrases (such as 'shorter', 'longer', 'closer', 'farther')
MT	K	UM	LM	5	Estimate the length, of objects using non-standard units.
MT	K	UM	LM	6	Measure the length of objects using non-standard units.

Sub-Strand: Measuring Capacity (MC)

Subject	Grade	Strand	Sub-strand	Standard #	Performance Standards
MT	K	UM	MC	1	Compare the capacity of containers using phrases (such as 'holds more than', and 'holds less than')
MT	K	UM	MC	2	Estimate the capacity of containers using non-standard units (smaller containers).
MT	K	UM	MC	3	Measure the capacity of containers using non-standard units.

Sub-Strand: Measuring Mass (MM)

Subject	Grade	Strand	Sub-strand	Standard #	Performance Standards
MT	K	UM	MM	1	Compare the mass of objects, using phrases (such as 'heavier than', and 'lighter than')
MT	K	UM	MM	2	Estimate the mass of objects using non-standard units (smaller objects)
MT	K	UM	MM	3	Measure the mass, of objects using non-standard units.

Sub-Strand: Understanding Time (UT)

Subject	Grade	Strand	Sub-strand	Standard #	Performance Standards
MT	K	UM	UT	1	Name and read the days of the week.
	K	UM	UT	2	Identify the day corresponding to tomorrow or yesterday given the current day
	K	UM	UT	3	Identify the current month.
MT	K	UM	UT	4	State and recognize the month in which they were born.
MT	K	UM	UT	5	Tell and represent time on the hour on an actual or model clock.

Sub-Strand: Money Works (MW)

Subject	Grade	Strand	Sub-strand	Standard #	Performance Standards
MT	K	UM	MW	1	Recognize and distinguish between the 5-cent, 10-cent used in buying and selling in the Eastern Caribbean (EC) Currency.
MT	K	UM	MW	2	Recognize that 1-cent coin is no longer in circulation, but speak of the 5-cent coin as having a value of five 1-cent coins

STRAND: GEOMETRIC THINKING (GT)

Sub-Strand: Plane Shapes (two-dimensional shapes) (PS)

Subject	Grade	Strand	Sub-strand	Standard #	Performance Standards
MT	K	GT	PS	1	Identify rectangles, circles and triangles by name.
MT	K	GT	PS	2	Classify plane shapes on the basis of their attributes e.g., shape and size.
MT	K	GT	PS	3	Identify plane shapes when they occur as part of pictures or objects in the environment.
MT	K	GT	PS	4	Trace two-dimensional shapes in different orientations

Sub-Strand: Solid Shapes (three-dimensional shapes) (SS)

Subject	Grade	Strand	Sub-strand	Standard #	Performance Standards
MT	K	GT	SS	1	Describe the attributes of solid shapes (cubes, cuboids, cylinders, spheres, pyramids) using phrases such as 'roll', 'slide', 'stack up', 'flat', 'round', 'curved')
MT	K	GT	SS	2	Classify solid shapes on the basis of their attributes (such as shape, size, and function in real life).
MT	K	GT	SS	3	Identify examples of solid shapes in the environment
MT	K	GT	SS	4	Use solid shapes to make objects, (such as a car, a house)

Sub-Strand: Directional Sense (DS)

Subject	Grade	Strand	Sub-strand	Standard #	Performance Standards
MT	K	GT	DS	1	Describe the relative position of plane shapes, objects or people using positional language (e.g. in, out, above, below, inside, outside, over, under, in front of, behind, beside, between, along).
MT	K	GT	DS	2	Give and follow simple instructions involving direction (such 'move to the right, move to the left, move forward, move backwards)

STRAND: DATA HANDLING (DH)

Sub-Strand: Data Collection (DC)

Subject	Grade	Strand	Sub-strand	Standard #	Performance Standards
MT	K	DH	DC	1	Use special attributes such as size, colour, shape, texture and sound to collect simple sets of data in the class and school environment, through observation.
MT	K	DH	DC	2	Determine through counting, grouping and other appropriate strategies, the number of objects (up to 10) in given data sets.

Sub-Strand: Data Representation (DR)

Subject	Grade	Strand	Sub-strand	Standard #	Performance Standards
MT	K	DH	DR	1	Use simple statements to record and represent data (e.g. 'John has 4 marbles')
MT	K	DH	DR	2	Use concrete objects and cut-outs with faces of 2D squares and other images to represent data.

Sub-Strand: Data Interpretation (DI)

Subject	Grade	Strand	Sub-strand	Standard #	Performance Standards
MT	K	DH	DI	1	Read and locate specific information in a given data set
MT	K	DH	DI	2	Examine parts of a data set or the entire data set, and use comparative language (e.g. more than, less than, one more than, the same as, the most) to describe the data.

THE LEARNING STANDARDS – GRADE 1

General Overview: Grade 1

Introduction

The standards to be developed at this level are set out in increasing levels of complexity and takes into consideration the content to which pupils should have been exposed in their earlier years. Against this backdrop, teachers are reminded of the need to ensure pupils' comfort with prerequisites, before introducing new concepts or skills. The general knowledge, skills, attitude and mathematical processes which should be made manifest in pupils by the end of **Grade 1** are highlighted in this section under the four content strands – Number Sense (NS), Understanding Measurement (UM), Geometric Thinking (GT) and Data Handing (DH). This section also provides guidelines about the type of activities which should be utilised by teachers towards pupils' mastery of the content in the different strands.

CONTENT STANDARDS – GRADE 1

Number Sense (NS)

MT.1.CS.NS.1:   *Pupils can construct understanding of whole numbers up to 20.*

MT.1.CS.NS.2:   *Pupils can create and compare sets of objects.*

MT.1.CS.NS.3:   *Pupils can work effectively with unit fractions ½ and ¼.*

MT.1.CS.NS.4:   *Pupils can utilize concrete, pictorial, symbolic representation and mental strategies to perform computational tasks involving the four basic operations – addition, subtraction, multiplication, and division.*

MT.1.CS.NS.5:   *Pupils can utilize mathematical content related vocabulary appropriate for Grade 1.*

Understanding Measurement (UM)

MT.1.CS.UM.1   *Pupils can understand the magnitude of non-standard and metric units.*

MT.1.CS.UM.2:   *Pupils can understand the importance of using standard units to estimate, measure, and communicate heights, lengths, distances, capacity, and mass.*

MT.1.CS.UM.3:   *Pupils can tell and show time on the hour using analog clocks.*

MT.1.CS.UM.4   *Pupils can utilize the calendar to demonstrate understanding of time.*

MT.1.CS.UM.5:   *Pupils can distinguish among Eastern Caribbean coins and notes, e.g. 5 cent, 20 cent, $1, $5, $10 and work with them to find totals and give change in multiples of 5.*

Geometric Thinking (GT)

MT.1.CS.GT.1:   *Pupils can demonstrate spatial awareness by working with 2D and 3D shapes using the terms plane and solid shapes*

MT.1.CS.GT.2:   *Pupils can classify 2D and 3D shapes using attributes and/or features such as shape, size, and/or function.*

Data Handling (DH)

By the end of Grade 1, pupils develop an appreciation for the importance of gathering data in real-life situations to answer questions and to make decisions. Key skills to be fostered here are observing, interviewing and problem solving.

MT.1.CS.DH.1:   *Pupils can collect data in the classroom, the school environment, and the home environment.*

MT.1.CS.DH.2:   *Pupils can represent and communicate data using objects, numbers, and words.*

PERFORMANCE STANDARDS – GRADE 1

At the completion of Grade 1, pupils who demonstrate understanding will:

STRAND: NUMBER SENSE (NS)

Sub-Strand: Understanding Numbers (UN)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	1	NS	UN	1	Count in a variety of ways (by 1's and 10's to 100; by 2's and 5's to 50; backwards from 10; and count on, in 1's from a given number up to 100)
MT	1	NS	UN	2	Represent numbers up to twenty in a variety of ways (in words, in numbers, using counting blocks/rods; drawings/pictures, etc.)
MT	1	NS	UN	3	Count and identify the number of objects in a set of up to 20 objects; and make and draw sets of up to 20 objects.
MT	1	NS	UN	4	Make and draw a set that is equal to, one more than, or one less than a given set.
MT	1	NS	UN	5	Compare sets of objects and pairs of numbers up to twenty using phrases (such as: 'less than', 'same as', 'greater than')
MT	1	NS	UN	6	Read and write numbers up to 20.
MT	1	NS	UN	7	Identify the position of an object in an ordinal arrangement of up to 10 objects.
MT	1	NS	UN	8	Use collective number names such as pair, set, group.
MT	1	NS	UN	9	Demonstrate fluency when working with whole numbers up to 20 (e.g. speak of 12 as: ten plus two; six plus six; one less than thirteen, etc.)

Sub-Strand: Operational Sense (OS)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	1	NS	OS	1	Use examples to explain the procedures for carrying out addition, subtraction, and repeated addition, using appropriate vocabulary such as 'total', 'sum', 'join together', 'subtract', 'take away', and 'sets of'.
MT	1	NS	OS	2	Use several devices (e.g., concrete and pictorial representations, a calculator) to explore the properties of addition (e.g., if 5 + 2 =7 then 2 + 5 = 7).
MT	1	NS	OS	3	Use several devices to demonstrate relationships among the number facts for addition and subtraction (e.g., if 5 + 4 = 9 then 9 – 5 = 4) and to complete addition and subtraction statements by filling in a missing value in any position (e.g. 8 - __ = 6 and __+ 2 = 5).
MT	1	NS	OS	4	Add up to three one-digit numbers with totals up to 20, using objects and pictures/diagrams.
MT	1	NS	OS	5	Mentally add two one-digit numbers with totals up to 18.
MT	1	NS	OS	6	Subtract a one-digit number from numbers up to 20, with the aid of concrete objects, pictorial representations and diagrams.
MT	1	NS	OS	7	Write number sentences to represent situations involving the addition or subtraction of two quantities.
MT	1	NS	OS	8	Describe repeated addition situations with totals up to 12; and using the terms 'sets of', 'groups of' to describe repeated addition procedures.
MT	1	NS	OS	9	Use objects, pictures/diagrams and number statements to show situations involving repeated addition (e.g., 2 +2 +2 = 6 and 3 sets of 2 make 6).
MT	1	NS	OS	10	Use the calculation to perform one digit addition and subtraction problems with products up to 12 using the repeated addition concept.
MT	1	NS	OS	11	Create and solve problems involving addition, subtraction and repeated addition

Sub-Strand: Number Pattern (NP)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	1	NS	NP	1	Complete a sequence of numbers that involves counting by 1's, 2's, and 5's, and starting with a multiple of the number by which the count is done; and where the largest number in the sequence is less than or equal to 20.
MT	1	NS	NP	2	Generate and interpret whole number sequences involving adding and subtracting one and two; and where sequence consists no more than five elements (e.g. 3, 5 , 7, 9; 10, 8, 6, 4)
MT	1	NS	NP	3	Use a variety of tools (such as counters, pictures, number lines and drawings) to generate and interpret whole number patterns [e.g. (5 = 1 + 4; 2 + 3; 3+2; 4+1); (2=2; 4 = 2+2; 6 =2+2+2); (5 = 4 + 1; 6 = 5 + 1; 7 = 6 + 1)] 1, 2, 3, 5 & 10) and consisting of no more than 5 elements in a sequence

Sub-Strand: Proportional Reasoning (PR)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	1	NS	PR	1	Identify a whole and parts of a whole.
MT	1	NS	PR	2	Identify and represent one-half and one-quarter of a whole, using different models (such area, linear, volume)
MT	1	NS	PR	3	Read and write the fractions ½ and ¼ correctly as 'one half' and 'one quarter' (NOT 'one over two' and 'one over four').

STRAND: UNDERSTANDING MEASUREMENT (M)

Sub-Strand: Linear Measurement (LM)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	1	M	LM	1	Compare two objects using phrases such as longer than, shorter than, taller than, same in length etc.
MT	1	M	LM	2	Estimate and measure lengths and heights of objects, and distances using non-standard units [such as (drinking straws, index cards) and body parts (hand span, fore arm, foot, stride].
MT	1	M	LM	3	Use a metre stick or its equivalent to identify objects or distances which are less than, same length as or more than a metre in length.

Sub-Strand: Measuring Mass (MM)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	1	M	MM	1	Estimate and measure the mass of objects using non-standard units.
MT	1	M	MM	2	Estimate and measure the mass of objects using the kilogram as the unit of measure.
MT	1	M	MM	3	Compare the mass of two objects, using phrases (such as 'heavier than', same mass as', and 'lighter than').

Sub-Strand: Measuring Capacity (MC)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	1	M	MC	1	Estimate and measure the capacity of containers using non-standard units (smaller containers).
MT	1	M	MC	2	Use phrases such as 'holds more than', 'holds same as' and 'holds less than' to compare the capacity of two containers.

Sub-Strand: Understanding Time (UT)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	1	M	UT	1	Name the days of the week in order and recognize the names.
MT	1	M	UT	2	Name the months of the year and recognize the names.
MT	1	M	UT	3	State and write the date of the current day.
MT	1	M	UT	4	Use time vocabulary appropriately (e.g., now, later, soon, earlier) relative to year, month, week, day and hour.
MT	1	M	UT	5	Sequence events in chronological order using expressions such as 'first', 'next', 'before', 'after', 'tomorrow', 'yesterday', 'morning'.
MT	1	M	UT	6	Tell time on the hour on model clocks and templates.
MT	1	M	UT	7	Read and write time on the hour in several ways.
MT	1	M	UT	8	Represent time on the hour on analog clock templates.

Sub-Strand: Money Works (MW)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	1	M	MW	1	Recognize coins and notes (5-cent, 10-cent, $1, $5, and $10) of the Eastern Caribbean currency; and read and write amounts of money up to $20 in a variety of ways.
MT	1	M	MW	2	Represent amounts of money up to $20 using up to three combinations of coins only or combinations of notes only [e.g. (twenty cents as 10c + 10c or as 10c + 5c + 5c); (ten dollars as ($5 + $5); (Eleven dollars as $10 + $1 or as $5 + $5 + $1); (twenty dollars as $10 + $10 or as $10 + $5 + $5)
MT	1	M	MW	3	Compare the value of two coins or notes (5c, 10c, $1, $5, $10) using the words 'more than', 'same value as' and 'less than'
MT	1	M	MW	4	Recognize that although there is no 1-cent coin in EC currency, that a 5-cent coin is equivalent to five 1-cent and a 10-cent coin as equivalent to ten 1-cent coins

STRAND: GEOMETRIC THINKING (GT)

Sub-Strand: Plane Shapes (two-dimensional shapes) (PS)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	1	GT	PS	1	Classify two-dimensional shapes on the basis of their attributes (e.g., shape, size, color, number of sides).
MT	1	GT	PS	2	Identify, name, describe and classify special two-dimensional shapes - rectangles, squares, triangles, circles.
MT	1	GT	PS	3	Recognize two-dimensional shapes (rectangle, square, triangle, circle) when they appear in pictures.
MT	1	GT	PS	4	Make/complete patterns with two-dimensional shapes, based on one of the following attributes: shape, size, colour, orientation.

Sub-Strand: Solid Shapes (three-dimensional shapes) (SS)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	1	GT	SS	1	Describe the attributes of three-dimensional shapes, using phrases (such as flat, curved, round)
MT	1	GT	SS	2	Classify three-dimensional shapes (cuboids, cubes, cylinders, spheres, cones) on the basis of their attributes [such as shape, size, or function (i.e. ability to slide, roll or stack)]
MT	1	GT	SS	3	Classify objects (e.g., lead pencils, sticks of chalk, balls, etc.) according to the three-dimensional shape they represent.
MT	1	GT	SS	4	Use three-dimensional shapes to make an object (e.g., a tower, a car).

Sub-Strand: Directional Sense (DS)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	1	GT	DS	1	Identify the relative position of objects or people presented in concrete and pictorial form, using positional language (such as above, below, in front of, behind, beside and between, to the right of, to the left of)
MT	1	GT	DS	2	Follow and give precise instructions involving directions (such as move forward; move backward, move the right, move to the left, etc.)

STRAND: DATA HANDLING (DH)

Sub-Strand: Data Collection (DC)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	1	DH	DC	1	Classify objects and people according to selected criteria (e.g. gender, colour, size, shape, favourites)
MT	1	DH	DC	2	Collect simple sets of data as obtained in the class, school environment, at home, field of play through observations and interviews; and record data using simple tally charts and frequency tables.

Sub-Strand: Data Representation (DR)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	1	DH	DR	1	Represent collected data in simple pictographs and bar graphs on prepared templates, where one picture or block represents one unit of data.
MT	1	DH	DR	2	Construct pictographs and bar charts to represent data, using pictures and bars where one picture and one bar represents one unit in the data set

Sub-Strand: Data Interpretation (DI)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	1	DH	DI	1	Read and Interpret data presented in simple frequency tables.
MT	1	DH	DI	2	Read and interpret data presented in simple pictographs (horizontal or vertical) with the incorporation of terms such as 'most', 'least', 'greatest', 'smallest' and 'as any as'.
MT	1	DH	DI	3	Read and interpret data presented in simple bar graphs with the incorporation of terms such as 'most', 'least', 'greatest', 'smallest' and 'as many as'.

THE LEARNING STANDARDS – GRADE 2

General Overview: Grade 2

General Expectations

The standards to be developed at this level are presented with due recognition of those outlined for the preceding grades. Against this backdrop, teachers are once again reminded of the need to ensure pupils' comfort with prerequisites, before introducing new concepts or skills. The general knowledge, skills, attitudes and mathematical processes which should be made manifest in pupils by the end of **Grade 2** are highlighted in this section under the four content strands: - Number Sense (NS), Understanding Measurement (UM), Geometric Thinking (GT) and Data Handing (DH). This section also provides guidelines about the type of activities which should be utilised by teachers towards pupils' mastery of the content in the different strands.

CONTENT STANDARDS – GRADE 2

Number Sense (NS)

MT.2.CS.NS.1:   Pupils can utilize various strategies to represent whole numbers up to 100.

MT.2.CS.NS.2:   Pupils can understand and complete sequences which involve skip counting or counting forwards or backwards.

MT.2.CS.NS.3:   Pupils can utilize appropriate mental, written, and calculator techniques to demonstrate expanding, comparing, ordering, and rounding off numbers.

MT.2.CS.NS.4:   Pupils can utilize tools and strategies to perform addition and subtraction tasks with whole numbers up to 99.

MT.2.CS.NS.5:   Pupils can utilize tools and strategies to perform multiplication and division tasks with whole numbers up to 60.

MT.2.CS.NS.6:   Pupils can perform tasks with proper fractions of a whole.

Understanding Measurement (UM)

MT.2.CS.UM.1:   Pupils can understand the magnitude of things measured in metres, kilograms, and litres.

MT.2.CS.UM.2:   Pupils can select and use appropriate instruments and units for measuring lengths, heights, mass, and capacity of objects.

MT.2.CS.UM.3:   Pupils can tell and show time on the hour, half hour, and quarter hour on analog clocks.

MT.2.CS.UM.4:   Pupils can perform various tasks related to coins and notes of the Eastern Caribbean currency involving sums of money up to $20.

Geometric Thinking (GT)

MT.2.CS.GT.1:   Pupils can understand spatial relationships and other geometric concepts such as curved and straight lines.

MT.2.CS.GT.2:   Pupils can classify, compare, and describe plane shapes such as triangles, rectangles, squares, and circles.

MT.2.CS.GT.3:   Pupil can classify, compare, and describe solid shapes, i.e., cuboid, cube, cylinder, cone, and sphere, inclusive of number of faces.

MT.2.CS.GT.4:   Pupils can describe, create, and extend geometric patterns.

MT.2.CS.GT.5:   Pupils can understand and communicate position, direction, and location of objects by effectively using words such as by, on, in, inside, outside, opposite, beside.

Data Handling (DH)

MT.2.CS.DH.1:   Pupils can plan for data collection through making decisions related to when, where, and how to collect data.

MT.2.CS.DH.2:   Pupils can demonstrate skills in collecting, interpreting, and summarizing data in different ways.

MT.2.CS.DH.3:   Pupils can represent data effectively using simple tables, pictographs, and bar charts.

PERFORMANCE STANDARDS – GRADE 2

At the completion of Grade 2, pupils who demonstrate understanding will:

STRAND: NUMBER SENSE (NS)

Sub-Strand: Understanding Numbers (UN)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	2	NS	UN	1	Count in a variety of ways (by 2's, 5's, 10's, 20's and 25's up to 100 (such as counting forward, backward, starting from 1 and other numbers)
MT	2	NS	UN	2	Read, write and represent whole numbers up to 99.
MT	2	NS	UN	3	Represent numbers up to ninety nine (99) in a variety of ways (in words, in numbers, using counting blocks/rods; drawings/pictures)
MT	2	NS	UN	4	Arrange a set of two-digit numbers in order of magnitude and give reasons for the arrangement.
MT	2	NS	UN	5	Represent numbers up to ninety nine (99) as groups of tens and ones; and Identify and contrast among the face value, place value, and total value of the digits in any two-digit number.
MT	2	NS	UN	6	Represent, model, state and write unit fractions and other proper fractions with up to eight (8) parts, using a variety of ways (such as concrete objects, shaded region on given templates, movement along a marked number line, etc.)
MT	2	NS	UN	7	Use vocabulary (such as 'is greater than', 'equal to', 'is less than') to compare two unit fractions.
MT	2	NS	UN	8	Identify, represent, and model ordinal positions up to twentieth (20th); and solve problems related to the ordinal position of up to objects.
MT	2	NS	UN	9	Demonstrate fluency when working with whole numbers up to 40 (e.g. speak of 40 as: twenty plus twenty; four sets of tens; one more than 39, one less than 41, etc.)

Sub-Strand: Operational Sense (OS)
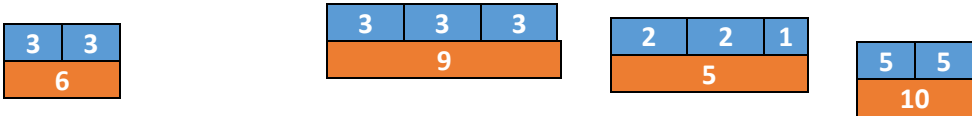
Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	2	NS	OS	1	Recall the basic facts for addition and subtraction.
MT	2	NS	OS	2	Use a variety of strategies and tools (counters, place value charts, sticks arranged in bundles of tens and singles) to add sets of two numbers (one and two-digit) without and with regrouping with totals up to 99; and explain strategies used.
MT	2	NS	OS	3	Use a variety of strategies and tools (counters, place value charts, sticks arranged in bundles of tens and singles) to subtract a one-digit number from a two-digit number without and with regrouping; and explain strategies used.
MT	2	NS	OS	4	Use appropriate vocabulary (such as 'add', 'sum', 'take away', 'minus') to explain the procedures they use for addition and subtraction.
MT	2	NS	OS	5	Interpret repeated addition (multiplication) procedures, using terms (such as 'sets of', 'times', 'groups of')
MT	2	NS	OS	6	Use examples to illustrate and explain properties of multiplication (e.g., any number times 1 equals the number, changing the order in which two numbers are multiplied does not change the result 3 x 4 = 4 x 3 = 12).
MT	2	NS	OS	7	Use a variety of strategies (such as concrete objects, a number line, or numerals) to illustrate division as repeated subtraction.
MT	2	NS	OS	8	Use appropriate vocabulary to interpret repeated subtractions procedures (e.g., number of groups, number of objects in each group).
MT	2	NS	OS	9	Use the calculator to perform addition, subtraction, repeated addition and repeated subtraction; and speak about the data input and the results obtained.
MT	2	NS	OS	10	Create and solve simple problems involving addition, subtraction, repeated addition, and repeated subtraction; and explain strategies used.
MT	2	NS	OS	11	Add up to four unit fractions with like denominators, for totals not exceeding 1.
MT	2	NS	OS	12	Create and solve problems involving addition of unit fractions.

Sub-Strand: Number Pattern (NP)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	2	NS	NP	1	Complete a sequence of numbers that involves counting by 2's, 5's, 10's, 20's, and 25's, and starting with a multiple of the number by which the count is done
MT	2	NS	NP	2	Generate and interpret whole number sequences involving adding and subtracting one, two and three; and where the sequence consists of no more than five elements [e.g. (2, 5, 8, 11); (12, 10, 8, 6, 4); (7, 8, 9, 10); (9, 8, 7, 6)]
MT	2	NS	NP	3	Use a variety of tools (such as counters, pictures, number lines and drawings) to generate and interpret whole number sequences involving doubling, starting with (1, 2, 3, 5 & 10); and where a sequence consists of no more than 5 elements [e.g. (2, 4, 8, 16); (5, 10, 20); (1,2, 4, 8]
MT	2	NS	NP	4	Use counters, pictures and drawings to generate rectangular numbers (numbers with 2 or more equal rows) up to 20

Sub-Strand: Proportional Reasoning (PR)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	2	NS	PR	1	Represent fractions of a whole or group, using concrete objects, pictures/diagrams, and numerals
MT	2	NS	PR	2	Compare unit fractions, using vocabulary (such as 'greater than', 'less than')
MT	2	NS	PR	3	Speak of, and create models to represent a proper fraction as the sum of two or three unit fractions [e.g. (two-halves as 'one-half plus one-half', or as a whole); (two-thirds as one-third plus one-third); and (three thirds as 'one third plus one third plus one third or as one whole'); (represent two-quarters as one-quarter plus one-quarter and as one half)]

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	2	NS	PR	5	Create and use different models (such as bar method, arrangement of counters) to show part-whole relationship for whole numbers up to 20, e.g.

STRAND: UNDERSTANDING MEASUREMENT (M)

Sub-Strand: Linear Measurement (LM)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	2	M	LM	1	Estimate, measure and compare lengths, heights and distances to the nearest metre
MT	2	M	LM	2	Use vocabulary (such as 'longer than', 'shorter than', 'same length as') when comparing length of objects
MT	2	M	LM	3	Arrange up to three objects in order of length

Sub-Strand: Measuring Mass (MM)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	2	M	MM	1	Estimate, measure and compare the mass of objects to the nearest kilogram.
MT	2	M	MM	2	Use vocabulary (such as 'heavier than', 'lighter than', 'same mass as') when comparing mass of objects
MT	2	M	MM	3	Arrange up to three objects in order of mass having heft the objects

Sub-Strand: Measuring Capacity (MC)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	2	M	MC	1	Estimate, measure and compare the capacity of containers using the litre as the unit of measurement.
MT	2	M	MC	2	Use vocabulary (such as 'holds more than', 'holds less than', 'holds the same as') when comparing capacity of objects
MT	2	M	MC	3	Arrange up to three containers in order of capacity

Sub-Strand: Understanding Time (UT)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	2	M	UT	1	Tell and write time on the hour and half hour using words and numerals.
MT	2	M	UT	2	Position (draw or manipulate) hands on a clock face (pictorial or concrete representation) to show time on the hour and half-hour.
MT	2	M	UT	3	Use the abbreviations 'a.m.' and 'p.m.' correctly.
MT	2	M	UT	4	Read and write a date, and interpret time related vocabulary (such as: yesterday, tomorrow, next week and last week, as well as a number of days before or after)
MT	2	M	UT	5	Solve simple problems related to time (including the calendar and the clock)

Sub-Strand: Money Works (MW)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	2	M	MW	1	Recognize coins and notes (5-cent, 10-cent, 25-cent, $1, $5, $10, $20) of the Eastern Caribbean currency; and read and write amounts of money up to $20 in a variety of ways.
MT	2	M	MW	2	Represent amounts of money up to $50 using up to four combinations of coins only or combinations of notes only [e.g. (25c as 10c + 10c + 5c or as 10c + 5c + 5c + 5c); ($10 as $5 + $5 or as $10 + $5 + $5); ($50 as $20 + $20 + $10 or as $20 + $10 + $10 + $10)
MT	2	M	MW	3	Read, represent and interpret the price of items up to $20.
MT	2	M	MW	4	Calculate the total cost of two or three items, with totals up to $20 and determine change consisting of ($10, $5 or $1) from totals more than $1; and change consisting of (25c, 10c or 5c) from totals less than $1.
MT	2	M	MW	5	Create and solve problems involving money

STRAND: GEOMETRIC THINKING (GT)

Sub-Strand: Points and Lines (PL)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	2	GT	PL	1	Distinguish between curves and straight lines.
MT	2	GT	PL	2	Classify curves as being closed or open
MT	2	GT	PL	3	Use a straight edge (e.g. ruler) to draw straight lines in different orientations

Sub-Strand: Plane Shapes (two-dimensional shapes) (PS)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	2	GT	PS	1	Identify, describe and classify plane shapes (squares, rectangles, triangles, and circles) based on the number, length and shape of their sides (on concrete objects, in diagrams, and in pictures).
MT	2	GT	PS	2	Use objects (such as match sticks, elastic bands on geoboards) to construct the outline of squares, rectangles and triangles;
MT	2	GT	PS	3	Sketch examples of rectangles and triangles; and use circular objects to trace the edge of circles and curves

Sub-Strand: Solid Shapes (three-dimensional shapes) (SS)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	2	GT	SS	1	Classify solid shapes on the basis of their attributes, (such as the number of faces, shape of their faces, size of shapes, function)
MT	2	GT	SS	2	Identify and name examples of cubes, cuboids, cones, cylinders, and spheres when presented in concrete or pictorial form.

Sub-Strand: Directional Sense (DS)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	2	GT	DS	1	Identify the relative position of objects or people presented in concrete and pictorial form, using positional language (such as above, below, in front of, beside and between, to the right of, to the left of)
MT	2	GT	DS	2	Follow and give simple instructions involving directions (such as move two steps forward; move three steps backward, move two strides to the right, etc.)
MT	2	GT	DS	3	Begin to use vocabulary which indicate opposite positions (such as 'top side' and 'bottom side', 'right side' and 'left side') when describing the rectangle

STRAND: DATA HANDLING (DH)

Sub-Strand: Data Collection (DC)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	2	DH	DC	1	Ask questions which can be used to collect data
MT	2	DH	DC	2	Collect simple sets of data through observation and simple interviews.
MT	2	DH	DC	3	Record collected data accurately in a variety of ways

Sub-Strand: Data Representation (DR)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	2	DH	DR	1	Represent recorded data by filling in templates for pictographs with available picture cards, where one picture represents one unit of data.
MT	2	DH	DR	2	Construct bar charts to represent data, using rectangular bars where one bar represents one unit in the data set

Sub-Strand: Data Interpretation (DI)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	2	DH	DI	1	Read and interpret data presented in simple tables, pictographs and bar charts
MT	2	DH	DI	2	Ask and answer questions based on data presented in simple tables, bar charts, pictograph

THE LEARNING STANDARDS – GRADE 3

General Overview: Grade 3

General Expectations

The standards to be developed at this level are presented with due recognition of those outlined for the preceding grades. Against this backdrop, teachers are once again reminded of the need to ensure pupils' comfort with prerequisites, before introducing new concepts or skills. The general knowledge, skills, attitudes and mathematical processes which should be made manifest in pupils by the end of **Grade 3** are highlighted in this section under the four content strands: - Number Sense (NS), Understanding Measurement (UM), Geometric Thinking (GT) and Data Handing (DH). This section also provides guidelines about the type of activities which should be utilised by teachers towards pupils' mastery of the content in the different strands.

CONTENT STANDARDS – GRADE 3

Number Sense (NS)

Pupils' vocabulary should be enriched with number-associated words such as pair, dozen, double, triple, etc., by the end of this Grade.

MT.3.CS.NS.1:	*Pupils can construct understanding of whole numbers up to 999 using a variety of materials, media, tools, and strategies.*
MT.3.CS.NS.2:	*Pupils can create and solve problems requiring the use of appropriate mental, written, and calculator techniques.*
MT.3.CS.NS.3:	*Pupils can demonstrate understanding if related concepts such as expanding, comparing, ordering, and rounding off numbers and estimating answers.*
MT.3.CS.NS.4:	*Pupils can work effectively with proper whole and group fractions having denominators 2, 3, 4, 5, 6, 8, and 10.*

Understanding Measurement (UM)

Pupils should engage in pair and small group investigations at this Grade level.

MT.3.CS.UM.1:   *Pupils can understand the magnitude of things measured in metres, centimetres, kilograms, grams, litres, and millilitres.*

MT.3.CS.UM.2:   *Pupils can select and use appropriate instruments and units for measuring lengths, heights, mass, and capacity of objects.*

MT.3.CS.UM.3:   *Pupils can tell and show time at 5-minute intervals on analog clocks.*

MT.3.CS.UM.4:   *Pupils can perform various tasks involving sums of money up to $999 and work with coins and notes of the Eastern Caribbean currency.*

Geometric Thinking (GT)

MT.3.CS.GT.1:   *Pupils can demonstrate understanding if line segments, angles, and lines of symmetry.*

MT.3.CS.GT.2:   *Pupils can classify and describe plane shapes, i.e., triangles, rectangles, squares, and circles inclusive of number of sides and angles.*

MT.3.CS.GT.3:   *Pupils can classify, compare, and describe basic solid shapes, i.e., cuboid, cube, cylinder, cone, and sphere, inclusive of number of faces, edges, and vertices.*

MT.3.CS.GT.4:   *Pupils can demonstrate skills in describing, creating and extending geometric patterns.*

MT.3.CS.GT.5:   *Pupils can use language effectively to communicate knowledge relating to the position, direction, and location of persons and objects.*

Data Handling (DH)

MT.3.CS.DH.1:   *Pupils can plan for data collection and make decisions related to the appropriate use if observation techniques and interviews to collect data.*

MT.3.CS.DH.2:   *Pupils can demonstrate correct use of tables and charts (tally charts, bar graph, and pictograph) in representing data.*

MT.3.CS.DH.3:   *Pupils can demonstrate skills in summarizing and interpreting data in a variety of ways.*

PERFORMANCE STANDARDS – GRADE 3

At the completion of Grade 3, pupils who demonstrate understanding will:

STRAND: NUMBER SENSE (NS)

Sub-Strand: Understanding Numbers (UN)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	3	NS	UN	1	Read, write and represent numbers up to ninety nine (999) in a variety of ways (in words, in numbers, in place value charts, using counting blocks/rods; drawings/pictures,)
MT	3	NS	UN	2	Use knowledge of face value, place value and total value to write, model and compare numbers with up to three digits.
MT	3	NS	UN	3	Identify, represent, and model ordinal positions up to fiftieth (50th); and solve problems related to the ordinal position of up to objects.
MT	3	NS	UN	4	Arrange a set of two- and/or three-digit numbers in order of magnitude and give reasons for the arrangement.
MT	3	NS	UN	5	Round off two-digit and three-digit numbers to the nearest ten and/or hundred.
MT	3	NS	UN	6	Model, classify, compare and speak of numbers up to 50 as odd or even.
MT	3	NS	UN	7	Develop fluency when working with whole numbers (e.g. speak of 99 as; the largest 2-digit number; one less than 100; one more than 98; one less than 10 tens; 90 plus 9; 50 + 50 minus 1, etc.)
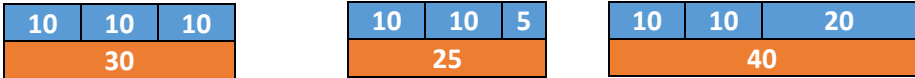
Sub-Strand: Operational Sense (OS)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	3	NS	OS	1	Recall the basic facts for addition and subtraction.
MT	3	NS	OS	2	Use the calculator to perform the four basic operations; and explain the steps followed to input the data and the results obtained

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	3	NS	OS	3	Estimate answers to computations involving the four basic operations on whole numbers; and use such estimations to determine the reasonableness of answers obtained from carrying out the computations
MT	3	NS	OS	4	Create and solve problems involving whole number addition and subtraction problems without and with regrouping with results not exceeding 999.
MT	3	NS	OS	5	Use several strategies to perform multiplication and division of one and two digit numbers by 2, 3, 4, 5, and 6.
MT	3	NS	OS	6	Create and solve problems involving multiplication of a two-digit number by 2, 3, 4, 5, 6, 10, and 100, without and with regrouping.
MT	3	NS	OS	7	Use repeated addition and subtraction to multiply and divide a two-digit number by a one-digit number, without and with remainders; and .
MT	3	NS	OS	8	Create and solve problems which involve addition of two proper fractions with like denominators.

Sub-Strand: Proportional Reasoning (PR)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	3	NS	PR	1	Explain the concept of a fraction and use examples to illustrate the concept of the terms 'numerator' and 'denominator'.
MT	3	NS	PR	2	Represent fractions of a whole or group, using concrete objects, pictures/diagrams, and numerals.
MT	3	NS	PR	3	Create a variety of models (area, linear, volume) of proper fractions; and represent such fractions words and numerals
MT	3	NS	PR	4	Speak of , represent and model proper fractions as a sum of several smaller fractions (e.g. three-fifths as one-fifth plus one-fifth plus one-fifth or as two-fifths plus one-fifth)
MT	3	NS	PR	5	Speak of, and create models to demonstrate knowledge of equivalence between two proper fractions (e.g. two quarters as one half; two-thirds as four sixths)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	3	NS	PR	6	Compare unit fractions, and proper fractions with like denominators, using vocabulary (such as 'greater than' and 'less than')
MT	3	NS	PR	7	Continue to create to speak of, and create models to show part-whole relationship, e.g.

Sub-Strand: Number Patterns (NP)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	3	NS	NP	1	Count by 2's, 5's, 10's, 20's, 25's, and 100's.
MT	3	NS	NP	2	Identify the ordinal position of an object in an arranged set, and identify an object in a given position in such a set.
MT	3	NS	NP	3	Define and use number-associated vocabulary (e.g., pair, dozen, double, triple, half of, etc.)
MT	3	NS	NP	4	Identify the pattern in a sequence of numbers, complete and extend sequences of numbers.

STRAND: UNDERSTANDING MEASUREMENT (M)

Sub-Strand: Linear Measurement (LM)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	3	M	LM	1	Estimate and measure lengths, heights and distances using the metre, or the centimetre as the unit of measure.
MT	3	M	LM	2	Explain why there is a need for a smaller unit of measure – the centimetre.
MT	3	M	LM	3	Compare linear measures of two or three objects.
MT	3	M	LM	4	Use examples to explain the concept of perimeter as the total distance all around plain shapes
MT	3	M	LM	5	Measure and utilize measurements obtained or given to determine perimeter of surfaces and shapes in diagrams.
MT	3	M	LM	6	Create and solve problems related to length and distance

Sub-Strand: Measuring Mass (MM)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	3	M	MM	1	Estimate and measure the mass of objects using the kilogram or the gram as the unit of measure.
MT	3	M	MM	2	Identify situations in everyday life where the kilogram, or gram is the most appropriate unit of measure.
MT	3	M	MM	3	Compare the mass of two or three objects.

Sub-Strand: Measuring Capacity (MC)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	3	M	MC	1	Estimate and measure the capacity of containers using the litre, as the unit of measure.
MT	3	M	MC	2	Explain why there is a need for the litre as a unit of measurement for capacity.
MT	3	M	MC	3	Describe situations in real life where the litre, is used as units of measure.
MT	3	M	MC	4	Create and solve problems related to capacity

Sub-Strand: Understanding Time (UT)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	3	M	UT	1	State and write dates in a variety of ways.
MT	3	M	UT	2	State and write time on the hour, half-hour and quarter hour intervals in a variety of ways (using digits and the words 'to' and 'past').
MT	3	M	UT	3	Draw hands on analog clock templates to show time on the hour, half-hour, and quarter hour intervals.
MT	3	M	UT	4	Use a clock or calendar to determine the duration of an event (e.g., a lesson, assembly, school vacation).
MT	3	M	UT	5	State the relationship between units of time: hour and minute, year and month, week and day.
MT	3	M	UT	6	Create and solve problems involving time

Sub-Strand: Money Works (MW)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	3	M	MW	1	Recognize coins and notes (5-cent, 10-cent, 25-cent, $1, $5, $10, $20, $50) of the Eastern Caribbean currency; and read and write amounts of money up to $50 in a variety of ways.
MT	3	M	MW	2	Represent amounts of money up to $50 using various combinations of coins and notes (5-cent, 10-cent, 25-cent and $1 coins; $5, $10, $20)
MT	3	M	MW	3	Read, represent and interpret the price of items up to $50.
MT	3	M	MW	3	Calculate the total cost of a set of items, with totals up to $50 and determine change consisting of ($20, $10, $5 or $1) from totals more than $1; and change consisting of (25c, 10c or 5c) from totals less than $1.
MT	3	M	MW	4	Create and solve problems involving money.

STRAND: GEOMETRIC THINKING (GT)

Sub-Strand: Points and Lines (PL)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	3	GT	PL	1	Distinguish between and sketch curves and straight lines in different orientations and positions
MT	3	GT	PL	2	Distinguish between vertical and horizontal lines; and draw representation of each using a straight edge
MT	3	GT	PL	3	Draw and label line segments (e.g., line segment AB, line CD).

Sub-Strand: Plane Shapes (two-dimensional shapes) (PS)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	3	GT	PS	1	Draw and label line segments e.g., line segment AB.
MT	3	GT	PS	2	Identify and draw open and closed curves.
MT	3	GT	PS	3	Speak of a quarter turn as a right angle.
MT	3	GT	PS	4	Identify angles that are equal to, greater than, and smaller than a quarter turn/right angle.
MT	3	GT	PS	5	Describe two-dimensional shapes in terms of the number and length of their sides and the number and type of angles; sketch 2-dimensional shapes in different orientations
MT	3	GT	PS	6	Identify objects that are symmetrical; and identify and draw the lines of symmetry on a cut-out or diagram.

Sub-Strand: Solid Shapes (three-dimensional shapes) (SS)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	3	GT	SS	1	Identify the faces, edges, and vertices of solid shapes.
MT	3	GT	SS	2	Describe solid shapes (the cube, cuboid, cylinder, cone, and sphere), in terms of the number of edges and vertices, and the number and type of faces.
MT	3	GT	SS	3	Identify and name objects which are examples of cubes, cuboids, cylinders, cones, and spheres.
MT	3	GT	SS	4	Identify the similarities and differences between the cube and cuboid, and the cylinder and cone.

Sub-Strand: Directional Sense (DS)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	3	GT	DS	1	Identify the relative position of objects or people presented in concrete and pictorial form, using positional language (such as above, below, in front of, beside and between, to the right of, to the left of, next to).
MT	3	GT	DS	2	Follow and give two part instructions involving directions (such as move two steps forward followed by three steps to the right; move three strides backward, then two strides to the right, etc.).
MT	3	GT	DS	3	Begin to use the term 'opposite sides' (to mean 'top' and 'bottom' sides or 'right' and 'left' sides) when describing the rectangle and square.

STRAND: DATA HANDLING (DH)

Sub-Strand: Data Collection (DC)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	3	DH	DC	1	State reasons why people collect data.
MT	3	DH	DC	2	Identify and describe situations in everyday life that involve data collection and data representation.
MT	3	DH	DC	3	Explain when it is appropriate to use observation and interviews to collect data.
MT	3	DH	DC	4	Create questions that may be answered through data collection, data representation and interpretation of collect data.

Sub-Strand: Data Representation (DR)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	3	DH	DR	1	Use tally charts and tables to organise collected data.
MT	3	DH	DR	2	Select an appropriate chart type (pictograph or bar graph) and scale based on counting patterns to represent a set of collected data.
MT	3	DH	DR	3	Draw pictographs and bar graphs where one picture or block represents 2, 5 or 10 units of data to represent collected data.

Sub-Strand: Data Interpretation (DI)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	3	DH	DI	1	Read and interpret data presented in tables, pictographs, and bar graphs.
MT	3	DH	DI	1	Ask and answer questions relating to raw and organized data.

THE LEARNING STANDARDS – GRADE 4

General Overview: Grade 4

Introduction

The standards to be achieved by Grade 4 pupils in mathematics are outlined in the next few pages. This section is designed to give principals, instructional leaders, teachers, and parents a clear picture of the learning engagements of pupils at this level. The expected knowledge, skills, attitude and mathematical processes in which pupils will be engaged are emphasised under four content strands of Number Sense (NS), Understanding Measurement (UM), Geometric Thinking (GT) and Data Handing (DH).

CONTENT STANDARDS – GRADE 4

Number Sense (NS)

At Grade 4 level*,* pupils engage in regular investigations of numbers to describe, extend and generate a variety of numeric patterns and identify and using multiplicative relationship to compare two quantities.

MT.4.CS.NS.1:	*Pupils can construct understanding of while numbers up to 10 000 using a variety of tools and strategies.*
MT.4.CS.NS.2:	*Pupils can work effectively with fractions having denominators 2, 3, 4, 5,6, 8, and 10 as well as with decimals up to tenths.*
MT.4.CS.NS.3:	*Pupils can demonstrate operational sense using multiple strategies to add and subtract whole numbers up to 4 digits.*
MT4.CS.NS.4:	*Pupils can demonstrate operational sense using multiple strategies to multiply and divide two- and three-digit whole numbers by one-digit whole numbers.*
MT.4.CS.NS.5:	*Pupils can demonstrate operational sense using multiple strategies to add and subtract decimal numbers up to tenths.*
MT.4.CS.NS.6:	*Pupils can demonstrate operational sense using multiple strategies to generate pairs of equivalent fractions.*

Understanding Measurement (UM)

The focus is the development of skills in measuring attributes of length, area, capacity, mass, time and money. Using a variety of strategies to solve problems is also emphasised at this grade level.

MT.4.CS.UM.1:   *Pupils demonstrate skills of reading, estimating, measuring, comparing, and recording measurement of the attributes of length, area, capacity, mass, time, and money.*

MT.4.CS.NS.2:   *Pupils demonstrate understanding of choosing the appropriate instrument and unit to measure different attributes.*

MT.4.CS.NS.3:   *Pupils can deduce and state the relationships between units and convert form larger whole units to smaller units.*

MT.4.CS.NS.4:   *Pupils can construct meaning if perimeter and area using a variety of tools and strategies.*

MT.4.CS.NS.5:   *Pupils can read and record time to the nearest 5-minute interval on both analog and digital clocks.*

MT.4.CS.NS.6:   *Pupils can read and write money amounts in words and symbols up to $1000.*

MT.4.CS.NS.7:   *Pupils can understand the value of money by adding, subtracting, and calculating total amounts up to $100.*

Geometric Thinking (GT)

MT.4.CS.GT.1:   *Pupils can distinguish among line segment, rays, and lines.*

MT.4.CS.GT.2:   *Pupils can demonstrate understanding of angles as the amount of turns about a fixed point through manipulation of objects which turn about a fixed point.*

MT.4.CS.GT.3:   *Pupils can demonstrate skills of drawing and classifying plane shapes, i.e., triangles, rectangles, and squares, based on their properties according to the number of angles, number of sides, and lines of symmetry.*

MT.4.CS.GT.4:   *Pupils can name the parts of the circle.*

MT.4.CS.GT.5:   *Pupils can compare and describe basic solid shapes i.e., cuboid, cube, cylinder, cone, and sphere, in terms of faces, edges, and vertices.*

MT.4.CS.GT.6:   *Pupils can demonstrate skills of describing, extending, and creating geometric patterns.*

MT.4.CS.GT.7:   *Pupils can effectively communicate knowledge about position, direction, and location of objects and people.*

Data Handling (DH)

MT.4.CS.DH.1:	*Pupils can plan, collect, and record data about a variety of current issues that are of interest to them.*
MT.4.CS.DH.2:	*Pupils can represent collected data using simple tables, tally charts, pictographs, and bar graphs to organize information.*
MT.4.CS.DH.3:	*Pupils can demonstrate understanding of reading, interpreting, and drawing conclusions based on data presented in table and graphs.*

Mathematical Process Skills to be Emphasised

Learning engagements associated with the standard approach outlined are directly tied to pupils having regular focused opportunities to construct understanding of the following mathematics process skills.

Problem Solving	The emphasis is on pupils DOING mathematics by having the opportunity to approach learning tasks in a variety of appropriate strategies, and to reflect on the effectiveness of tools and strategies used and the challenges and progress made.
Reasoning	Pupils develop the attitude of readily presenting logical justification to support choice made in selection of tools and strategies in response to learning tasks; checking the reasonableness of results obtained; and using multiple examples to verify tentative statements and test generalizations.
Communicating	As a critical feature in fostering a culture of social learning and the development of clarity of thought, pupils engage in asking questions of theirs and others' mathematical thinking and ways of working; readily share thoughts; and use mathematics vocabulary to communicate mathematical ideas orally and in the written form.
Connecting	Pupils make a conscious effort to connect mathematical ideas across mathematical concepts, skills and processes; across past, present and future learnings; across in-class/school and out of class experiences.

__Representing__

Pupils develop a way of working that reflects multiple ways of recording interpreting and modelling and representing concepts. They make use of oral, visual and written forms of communication and make use of symbols charts, graphs, diagrams, drawings, tables and words to express mathematical thoughts

PERFORMANCE STANDARDS – GRADE 4

At the completion of Grade 4, pupils who demonstrate understanding will:
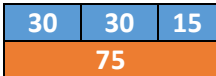
STRAND: NUMBER SENSE (NS)

Sub-Strand: Understanding Numbers (UN)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	4	NS	UN	1	Read, write, count, order, expand, and compare numbers up to 10 000, using a variety of tools (e.g. place value charts, counting blocks, counting rods, number line, bar methods); and differentiate between place value and total value of each digit; and round numbers up to 999 to nearest ten and hundred
MT	4	NS	UN	2	Model, represent, compare and order fractions with denominator (2, 3, 4, 5, 6, 8 and 10); and use appropriate vocabulary (e.g. two fifths instead of two over five; four and three-tenths instead of four point three) to communicate correct ideas about fractions.
MT	4	NS	UN	3	Model, generate, and classify different groupings of numbers (odd, even, factors, multiples, proper fraction, improper fraction and mixed numbers) and explain the common features among the numbers in each group.
MT	4	NS	UN	4	Create and solve problems involving ordinal numbers up to the one hundredth (100th)position
MT	4	NS	UN	5	Develop fluency when working with whole numbers (e.g. speak of 21 as being: one more than 20, one less than 22, four less than 25, a little more than half of 40, one more than two times 10, two tens plus one, three groups of 7, etc.)
MT	4	NS	UN	6	Use a variety of tools and strategies (such as the number line, place value chart) to represent, compare and order decimal numbers represented to tenths
MT	4	NS	UN	7	Use a variety of models (area model, number line model, and volume model model) to represent, compare and order unit fractions with different but related denominators and other proper fractions with like denominators.

Sub-Strand: Operational Sense (OS)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	4	NS	OS	1	Use a variety of mental and written strategies to estimate and perform addition and subtraction with numbers up to 3 digits without and with regrouping (e.g. 63 + 25 may be thought of as 60 + 20 + 3 + 5).
MT	4	NS	OS	2	Use a variety of mental and written strategies to estimate then multiply up to 9 × 9 and divide up to 81 ÷ 9; multiply and divide whole numbers by 10, 100, using calculator to check for pattern; and use identified patterns to formulate generalizations.
MT	4	NS	OS	3	Use a variety of tools and strategies to estimate, multiply and divide 2-digit whole numbers by one-digit whole numbers, and reflecting on the effectiveness approaches used.
MT	4	NS	OS	4	Create and solve a variety of one and two steps problems involving addition, subtraction and multiplication; and develop the skill of checking the reasonableness of worked solution against initial estimated result.
MT	4	NS	OS	5	Use concrete and pictorial models to represent and compare sets of two fractions to find equivalence among halves, quarters and eighths; and between thirds and sixths; and to add fractions with the same denominator; and simplify fractions as necessary.
MT	4	NS	OS	6	Count forwards and backwards in multiples of 6, 10, 25, 50 and 100, starting with a multiple of the number in which the counting is done; and link repeated counting to other related concepts (e.g. counting in 5's links to five minute intervals, counting 25's and 100's links to counting money and centimetre – metre relationship.
MT	4	NS	OS	7	Count forwards in fractional parts by halves, thirds, quarters, fifths and tenths beyond one whole; and count forward in decimal by tenths using numbers expressed to one decimal place; and link to related concepts (e.g. counting in halves links to measures of length, time, mass; counting hundredths links to money –cents).

Sub-Strand: Proportional Reasoning (PR)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	4	NS	PR	1	Use terms such as twice as many, three time as much, to describe one quantity in terms of another quantity (e.g. forty is twice as large as twenty; 5-eighthts is 2-eighths more than 3-eighths;).
MT	4	NS	PR	2	Use simple examples to illustrate the relationship between addition and subtraction, and use knowledge of this relationship to check the correctness of addition and subtraction results.
MT	4	NS	PR	3	Use a variety of tools and strategies to demonstrate an understanding of the relationship between the fraction and decimal representation of tenths.
MT	4	NS	PR	4	Use knowledge of multiplication to demonstrate understanding of unit rates, and use such knowledge to solve simple problems (e.g. The cost of 1 pencil is $2. What is the cost of 3 pencils?).
MT	4	NS	PR	5	Investigate relationships between whole numbers (e.g. sum of two odd numbers, sum of two even numbers)
MT	4	NS	PR	6	Continue to investigate multiple ways of creating models to show part-whole relationship of numbers (e.g. using the bar method, 75 may be shown in a part whole relationship as

Sub-Strand: Number Patterns (NP)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	4	NS	NP	1	Describe, complete and extend given whole number patterns obtained from counting forwards or backwards, doubling, adding or subtracting a constant.
MT	4	NS	NP	2	By analyzing the results obtained from computing with whole numbers, formulate and use the generalization (such as the order in which any two numbers are added does not change the result; a number multiplied by one gives the number itself; a number added to zero gives the number)
MT	4	NS	NP	3	Use knowledge of number facts and generated rules to aid in calculations (e.g. $4 \times 1 = 4$; $4 \times 10 = 10 \times 4$; and $5 - 0 = 5$).

STRAND: UNDERSTANDING MEASUREMENT (UM)

Sub-Strand: Linear Measurement (LM)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	4	UM	LM	1	Select and use appropriate instruments and units (centimetre, metre and kilometre) to estimate, measure and record length and distance, giving reasons for choice; and convert from metre to centimetre and from kilometer to metre, and link to multiplication by 100 and 1,000.
MT	4	UM	LM	2	Work in small groups to estimate, measure and record distance around plane shapes using variety of tools (grid paper, geoboard and ruler) and use the term **total distance around** plane shape to mean perimeter; and link the skill of adding to find perimeter to the generalization that order of adding does not change the result.
MT	4	UM	LM	3	Solve a variety of problems relating to length, distance and perimeter using different strategies (trial and error, acting out, drawing a diagram, looking for a pattern, using a table, working backwards) and communicate progress made and challenges encountered.

Sub-Strand: Measuring Area (UA)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	4	UM	MA	1	Estimate, measure and record surface enclosed by plane shapes by counting unit squares and using a variety of tools (centimetre grid, geoboard); and explaining strategies used.
MT	4	UM	MA	2	Solve a variety of one and two step problems relating to the area of surfaces using different strategies (trial and error, acting out, drawing a diagram, looking for a pattern, using a table, working backward) and communicate progress made and challenges encountered.

Sub-Strand: Measuring Capacity (MC)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	4	UM	MC	1	Estimate, measure and record capacity of containers in litre and millitre using appropriate instrument.
MT	4	UM	MC	2	Work in small groups to compare several examples of the same capacity given in millilitre and litre, and deduce that 1 000 millilitres = 1 litre; and use this knowledge to generate other equivalent measures between millitre and litre (whole and half litre measures), using knowledge of fractions and decimals (1/2 = 0.5) and the skill of multiplying by 1,000.
MT	4	UM	MC	3	Solve a variety of problems relating to capacity using different strategies (trial and error, acting out, drawing a diagram, looking for a pattern, using a table, working backwards) and communicating progress made and challenges encountered.

Sub-Strand: Measuring Mass (MM)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	4	UM	MM	1	Estimate, measure and record the mass of objects in gram and kilogram and using comparative vocabulary such as "same as"; "heavier than"; "lighter than" one kilogram.
MT	4	UM	MM	2	Work in small groups to compare several examples of the mass of the same object given in gram and kilogram and conclude that 1 000 grams = 1 kilogram; and generate other equivalence between grams and kilograms (whole and half kilogram measures), using knowledge of fractions and decimals (1/2 = 0.5) and the skill of multiplying by 1,000.
MT	4	UM	MM	3	Solve a variety of problems relating to mass using different strategies (trial and error, acting out, drawing a diagram, looking for a pattern, using a table, working backwards) and communicate progress made and challenges encountered.

Sub-Strand: Understanding Time (UT)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	4	UM	UT	1	Explain the coordinated movement of the hour and minute hands of the clock, and use such knowledge to read, tell and record time in different intervals (hour, half hour, quarter hour, five minute) on both the analogue and digital clocks, using correct vocabulary and notation.
MT	4	UM	UT	2	Work in small groups, and using the skill of reading and interpreting data presented in tables deduce correct information from simple calendars, timetables and schedules; and communicate points of agreement and disagreement among group members.
MT	4	UM	UT	3	Use a variety of strategies (trial and error, acting out, drawing a diagram, looking for a pattern, using a table, working backwards) to solve one and two steps problems relating to time; and reflect on the effectiveness of strategies used.

Sub-Strand: Money Works (MW)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	4	UM	MW	1	Read and write amounts of money up $1 000 dollars and show an understanding of value of a large amounts of money ($100 to $1 000) by stating purchasing power of given amounts.
MT	4	UM	MW	2	Use a variety of strategies, including concrete materials to add and subtract money involving dollars and cents not exceeding $100 (cents being multiples of 5 and 10); and generate different combinations of notes that give the same amount of money up to $100.
MT	4	UM	MW	3	Read, write and interpret prices of items; and use a variety of strategies to calculate the total cost (not exceeding $100) of a set of items, and make change from amounts up to $100 (where change consists of dollars only or cents only); and explain the effectiveness of approaches used.
MT	4	UM	MW	4	Use several strategies to create and solve problems involving money transactions.

STRAND: GEOMETRIC THINKING (GT)

Sub-Strand: Points & Lines (PL)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	4	GT	PL	1	Distinguish among points, line segments, rays and lines; sketch representation of each in different orientations.
MT	4	GT	PL	2	Compare and contrast line segments, rays and lines in terms of end and start points; direction; and length.

Sub-Strand: Understanding Angles (UA)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	4	GT	UA	1	Illustrate the concept of an angle as being the amount of turns about a fixed point; and that angles are measured in degrees (°).
MT	4	GT	UA	2	Demonstrate, and sketch a 90° angle (right angle) as a quarter (1/4) turn using tools such as grid paper, geoboard or simple computer programme; and compare the size of angles less than, equal to and greater than a quarter turn, using vocabulary such as "less than 90°"; "equal to 90°" and "greater than 90°".
MT	4	GT	UA	3	Use a variety of strategies (drawing, trial and error; looking for patterns; practical work) to respond to problems involving angles.

Sub- Strand: Plane Shapes (PS)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	4	GT	PS	1	Sketch triangles of various sizes and shape in different orientations; and describe all triangles as having three sides and three angles.
MT	4	GT	PS	2	Speak of rectangles as having: four sides, two pairs of opposite sides that are equal, and four right angles
MT	4	GT	PS	3	Speak of squares as having: four equal sides, two pairs of opposite sides being equal; four right angles
MT	4	GT	PS	4	Draw squares and rectangles using tools such as grid paper, geoboard and simple computer programme.
MT	4	GT	PS	5	Work in small groups to draw circles; insert and label the parts (center, diameter, radius and circumference) of a circle; measure and compare radii and diameters; and use information gathered to formulate generalisations between radius and diameter.
MT	4	GT	PS	6	Describe, extend and generate simple geometric patterns involving plane shapes; and use a variety of strategies to solve problems related to 2-D shapes.

Sub- Strand: Solid Shapes (SS)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	4	GT	SS	1	Draw solid shapes using pencil and paper and basic computer software.
MT	4	GT	SS	2	Describe (cubes, cuboids, cylinders, cones, spheres) in terms of the number of vertices, the number and shape of faces; draw/sketch nets of cubes, cuboids, cylinders, cones and sphere.
MT	4	GT	SS	3	Use a variety of strategies to explore and respond to problems based on 3D shapes and their nets.

Sub-Strand: Directional Sense (DS)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	4	GT	DS	1	Describe movements between two positions using terms of direction (left/right; up/down, opposite); and use computer software to construct 2D shapes.
MT	4	GT	DS	2	Begin to use terms (such as opposite sides, opposite angles) to describe rectangles and squares.
MT	4	GT	DS	3	Use knowledge of geometry to give simple directions; and complete drawing of a simple 2D shapes (triangles, squares and rectangles); and two shapes of same size in different positions on grid paper.
MT	4	GT	DS	4	Use a variety of strategies to solve problems relating to position and direction.

STRAND: DATA HANDLING (DH)

Sub- Strand: Data Collection (DC)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	4	DH	DC	1	Ask questions suitable for collecting relevant data; and accurately record responses.
MT	4	DH	DC	2	Collect data through simple observations, interviews and questionnaires.
MT	4	DH	DC	3	Use tally charts and simple tables to count and record occurrences and organise collected data.

Sub- Strand: Data Representation (DR)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	4	DH	DR	1	Use simple tables to display collected data; and appropriately label columns and rows of tables accurately; and give table a suitable title.
MT	4	DH	DR	2	Construct picture graphs and bar graphs on grid paper using one-to-one correspondence; and appropriately labelling axes and giving graphs a title that matches the data display.
MT	4	DH	DR	3	Represent the collected data in a variety of ways (table, picture graph and bar graph).
MT	4	DH	DR	4	Determine the appropriateness of different data representations by comparing tables and graphs constructed from the same data.

Sub- Strand: Data Interpretation (DI)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	4	DH	DI	1	Read, in different directions, information presented in tables, picture graphs and bar graphs (left to right; right to left; top to bottom; bottom to top).
MT	4	DH	DI	2	Pose and answer questions relating to raw or organised data; and solve simple problems involving data handling.
MT	4	DH	DI	3	Interpret data presented in pupil-constructed tables, picture graphs and bar graphs; and tables and graphs found in familiar sources such as students' textbooks, newspaper, internet.

THE LEARNING STANDARDS – GRADE 5

General Overview: Grade 5

Introduction

The standards to be achieved by Grade 5 pupils in mathematics are outlined in the next few pages. This section is designed to give principals, instructional leaders, teachers, and parents a clear picture of the learning engagements of pupils at this level. The expected knowledge, skills, attitude and mathematical processes in which pupils will be engaged are emphasised under four content strands of Number Sense (NS), Understanding Measurement (UM), Geometric Thinking (GT) and Data Handing (DH).

CONTENT STANDARDS – GRADE 5

Number Sense (NS)

MT.5.CS.NS.1:   *Pupils can construct understanding of whole numbers up to 100 000 using a variety of tools, media, and strategies.*

MT.5.CS.NS.2:   *Pupils can demonstrate their operational sense, inclusive of mental thinking, to add, subtract, and multiply.*

MT.5.CS.NS.3:   *Pupils can work effectively with fractions having denominators of 2, 3, 4, 5, 6, 8, 10, and 12.*

MT.5.CS.NS.4:   *Pupils can add and subtract two fractions and count forwards in fractional parts up to fifths.*

MT.5.CS.NS.5:   *Pupils can generate pairs of equivalent fractions.*

MT.5.CS.NS.6:   *Pupils can add and subtract decimals up to hundredths.*

MT.5.CS.NS.7:   *Pupils can investigate and communicate numbers to describe, generate, and extend a variety of numeric patterns and use multiplicative relationships to compare two quantities.*

Understanding Measurement (UM)

The focus is the development of skills in measuring attributes of length, area, capacity, mass, time and money. The use of a variety of strategies to solve two steps problems is also emphasised at this grade level.

MT.5.CS.UM.1:   *Pupils can read, estimate, measure, compare, and record measurement of the different attributes.*

MT.5.CS.UM.2:   *Pupils can choose appropriate instruments and units of measure and justify their choice.*

MT.5.CS.UM.3:   *Pupils can deduce and state the relationship between units and use this knowledge to convert from larger to smaller units of the larger unit using measures that are equivalent to whole or fractional parts (half or quarter).*

MT.5.CS.UM.4:   *Pupils can demonstrate understanding of perimeter using a variety of tools and strategies.*

MT.5.CS.UM.5:   *Pupils can devise efficient ways to count unit squares to determine the area plane of squares and rectangles.*

MT.5.CS.UM.6:   *Pupils can read and record time to the nearest minute on analog and digital clocks.*

MT.5.CS.UM.7:   *Pupils can read and write money amounts up to $10 000 in words and symbols.*

MT.5.CS.UM.8:   *Pupils can demonstrate understanding of the value of money by adding, subtracting, and calculating total amounts up to $1 000.*

Geometric Thinking (GT)

MT.5.CS.GT.1:   *Pupils can distinguish among line, line segment, and ray in terms of their dimensions.*

MT.5.CS.GT.2:   *Pupils can demonstrate understanding of angles by using terms such as acute, obtuse, straight, and reflex, to describe groups of angles based on the size in relation to quarter turn, half turn, and whole turn.*

MT.5.CS.GT.3:   *Pupils can use the term polygon to describe shapes bounded by straight lines.*

MT.5.CS.GT.4:   *Pupils can classify quadrilaterals based on common relationships between pairs of sides and number of lines of symmetry, and as squares, rectangles, and parallelograms.*

MT.5.CS.GT.5;   *Pupils can identify parts of the circle and compare diameter with the radius.*

MT.5.CS.GT.6:   *Pupils can classify, compare, and describe solid shapes (cuboid, cube, cylinder, cone, and sphere) using mathematical vocabulary e.g. circular faces, rectangular faces, square faces.*

MT.5.CS.GT.7:   *Pupils demonstrate skills of describing, extending, and creating geometric patterns.*

MT.5.CS.GT.8:   *Pupils can communicate ideas about position, direction, and location using clear mathematical language.*

Data Handling (DH)

Pupils learn to collect, represent and interpret data in different ways and use knowledge relating to data handling to solve related problems.

MT.5.CS.DH.1:   *Pupils can collect and record information about a variety of current issues that are of interest to them, using tables and tally charts to organize information.*

MT.5.CS.DH.2:   *Pupils can represent collected data using appropriate simple table, pictographs, bar graphs and line graphs.*

MT.5.CS.DH.3:   *Pupils can construct understanding through reading, interpreting, and drawing conclusions based on data presented in tables and graphs.*

MT.5.CS.DH.4   *Pupils can demonstrate understanding of the range, mode, and median of a simple data set.*

Mathematical Process Skills to be Emphasised

Learning engagements associated with the standard approach outlined are directly tied to pupils having regular focused opportunities to construct understanding of the following mathematics process skills.

Problem Solving   The emphasis is on pupils DOING mathematics by having the opportunity to approach learning tasks in a variety of appropriate strategies, and to reflect on the effectiveness of tools and strategies used and the challenges and progress made.

Reasoning   Pupils develop the attitude of readily presenting logical justification to support choice made in selection of tools and strategies in response to learning tasks; checking the reasonableness of results obtained; and using multiple examples to verify tentative statements and test generalizations.

Communicating   As a critical feature in fostering a culture of social learning and the development of clarity of thought, pupils engage in asking questions of theirs and others' mathematical thinking and ways of working; readily share thoughts; and use mathematics vocabulary to communicate mathematical ideas orally and in the written form.

Connecting   Pupils make a conscious effort to connect mathematical ideas across mathematical concepts, skills and processes; across past, present and future learnings; across in-class/school and out of class experiences.

Representing   Pupils develop a way of working that reflects multiple ways of recording interpreting and modelling and representing concepts. They make use of oral, visual and written forms of communication and make use of symbols charts, graphs, diagrams, drawings, tables and words to express mathematical thoughts

PERFORMANCE STANDARDS – GRADE 5

At the completion of Grade 5, pupils who demonstrate understanding will:

STRAND: NUMBERS AND NUMBER SENSE (NS)

Sub-Strand: Understanding Numbers (UN)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	5	NS	UN	1	Read, write, count, order, expand, and compare numbers up to 100 000; using a variety of tools (e.g. place value charts, counting blocks/rods, number line, bar method); and differentiate among face value, place value and total value of each digit.
MT	5	NS	UN	2	Generate and classify different groupings of numbers (such as: odd, even, factors, common factors, multiples, common multiples,).
MT	5	NS	UN	3	Create and solve problems involving ordinal numbers.
MT	5	NS	UN	4	Use a variety of tools and strategies to represent, compare and order decimal numbers represented in tenths and hundredths.
MT	5	NS	UN	5	Demonstrate fluency when working with whole numbers up to 7 digits (e.g. speak of 2500 as being close to two and a half thousands, twice as much as one and a quarter thousands, half as much as five thousands).
MT	5	NS	UN	6	Round whole numbers to nearest ten and hundred and thousand, two decimal place numbers to the nearest tenth and whole, using a variety of tools (such as number line, place value chart, bar method).
MT	5	NS	UN	7	Use a variety of tools and strategies to represent, compare and order fractions (such as: proper, improper, mixed numbers) with like and unlike but related denominators.

Sub-Strand: Operational Sense (OS)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	5	NS	OS	1	Use a variety of mental strategies to add, subtract and multiply whole numbers (e.g. 15 × 6 may be thought of as 15 × 3 × 2).
MT	5	NS	OS	2	Use a variety of mental and written strategies to estimate and perform addition and subtraction of whole numbers up to 4-digit without and with regrouping.
MT	5	NS	OS	3	Multiply and divide whole numbers by 10, 100, 1,000, use calculator to check for pattern, and use identified patterns to formulate generalizations.
MT	5	NS	OS	4	Use a variety of strategies to multiply two two-digit whole numbers and multiple and divide three and two-digit whole numbers by one-digit whole numbers.
MT	5	NS	OS	5	Use simple examples to illustrate the relationship between addition and subtraction, and use knowledge of this relationship to check correctness of addition and subtraction results.
MT	5	NS	OS	6	Create and solve a variety of one and two step problems involving addition, subtraction, multiplication and division and develop the skill of checking the reasonableness of worked solution against initial estimated result.
MT	5	NS	OS	7	Use a variety of tools and strategies including the calculator to add and subtract decimal numbers to hundredths including money.
MT	5	NS	OS	8	Use concrete and pictorial models to represent, compare and generate sets of two and three equivalence fractions with denominators that are multiples of the smallest denominator.
MT	5	NS	OS	9	Use a variety of tools and strategies to add and subtract two fractions (proper and improper mixed numbers) where one denominator is a multiple of the other; calculate a unit fraction of a whole (denominator not exceeding 12).
MT	5	NM	OS	10	Count forwards in 10's and 100's from any whole number; and count forward in decimal by tenths and hundredths using numbers expressed to one decimal place; and link to concept of measures (e.g. centimetre to metre; grams to kilograms; millilitre to litre, cents to dollar).
MT	5	NM	OS	11	Count forwards in fractional parts by (halves, thirds, quarters, fifths, sixths, eights and tenths) beyond one whole.

Sub-Strand: Proportional Relationship/Proportional Representation (PR)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	5	NS	PR	1	Use terms, (such as half, quarter, twice,) to describe the multiplicative relationship between two quantities (e.g. 5 pound is half as much as 10 pounds; 10 pounds is twice as much as 5 pounds; 12 is three times as many as 4).
MT	5	NS	PR	2	Work in small groups, use a variety of materials such as the 100 square grid and the calculator, to demonstrate understanding of the relationship between decimal numbers and fractions with denominators 2, 4, 5, 10, 20, 25, 50, 100 and begin to use the term percent to refer to fraction with denominator 100.
MT	5	NS	PR	3	Use knowledge of simple multiplicative relationships to solve one and two steps problems involving whole number rates (e.g. May has $10. Tim has three times as much money as May. How much money does Tim have?).

Sub-Strand: Number Patterns (NP)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	5	NS	NP	1	Complete, extend and describe (in words) given whole number patterns obtained from counting forward or backward, doubling or halving and adding, subtracting or multiplying by a constant.
MT	5	NS	NP	2	Generate a table of values to summarise results obtained from a pattern resulting from adding, subtracting or multiplying whole numbers by a constant to get successive terms.
MT	5	NS	NP	3	By analysing the results obtained from computing with whole numbers, formulate and use the generalizations (such as multiplication must be done before addition and subtraction; the order in which any two numbers are added or multiplied does not change the result).

STRAND: UNDERSTANDING MEASUREMENT (UM)

Sub-Strand: Linear Measurement (LM)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	5	UM	LM	1	Select, use and justify the choice of instrument and unit (millimetre, centimetre, metre and kilometre) to measure length and distance and explain strategy used.
MT	5	UM	LM	2	Use knowledge of relationship between units of length to convert from a larger unit to smaller unit (metres to centimetres; and kilometre to metre) using measures that are equivalent to whole or fractional parts (quarters, halves) of the larger unit.
MT	5	UM	LM	2	Determine the perimeter of plane shapes.
MT	5	UM	LM	3	Determine the length of one missing side in a triangle, rectangle or square given the perimeter and the other sides; and explain strategies used.

Sub-Strand: Measuring Area (MA)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	5	UM	MA	1	Use a variety of tools (centimetre grid, geoboard) to estimate, measure and record surface enclosed by plane shapes by counting unit squares (wholes and halves) and explain strategies used and conclude that area is the total number of unit squares enclosed.
MT	5	UM	MA	2	By counting centimetre squares, determine the area enclosed by rectangles and squares and estimate the area of irregular shapes on grid paper.
MT	5	UM	MA	3	Work in small groups to investigate the concept of "same area but different shape" using a variety of tools (one centimetre grid paper, geoboard) and comment on the effectiveness of each tool.
MT	5	UM	MA	4	Solve one step problems based on area of squares and rectangles using different strategies (trial and error, acting out, drawing a diagram, looking for a pattern, using a

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
					table, working backwards) and communicating progress made and challenges encountered.

Sub-Strand: Measuring Capacity (MC)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	5	UM	MC	1	Select, use and justify choice of unit (millilitre and litre) to estimate, measure and record capacity.
MT	5	UM	MC	2	Use knowledge of relationship between litre and millilitre to convert from a larger unit to a smaller unit using measures that are equivalent to whole or fractional parts (quarters, halves) of a litre.
MT	5	UM	MC	3	Develop the attitude of reading labels on commonly used packages to tell the capacity of containers.
MT	5	UM	MC	4	Solve a variety of problems relating to capacity, using different strategies (trial and error, acting out, drawing a diagram, looking for a pattern, using a table, working backwards) and communicating progress made and challenges encountered.

Sub-Strand: Measuring Mass (MM)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	5	UM	MM	1	Select, use and justify choice of unit (gram and kilogram) to estimate, measure and record mass.
MT	5	UM	MM	2	Use knowledge of relationship between gram and kilogram to convert from kilogram to gram using measures that are equivalent to whole or fractional parts (quarters, halves) of a kilogram.
MT	5	UM	MM	3	Develop the attitude of reading labels on commonly used packages to tell the mass (in gram and kilogram) of object.
MT	5	UM	MM	4	Solve a variety of problems relating to mass of objects using several strategies (trial and error, acting out, drawing a diagram, looking for a pattern, using a table, working backward) and communicating progress made and challenges encountered.

Sub-Strand: Understanding Time (UT)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	5	UM	UT	1	Read and record accurately in words and notations various times as display on the analogue and digital clocks.
MT	5	UM	UT	2	Work in small groups to read and interpret simple calendars, timetables and schedules.
MT	5	UM	UT	3	Solve a variety of problems involving time, using several strategies (trial and error, acting out, drawing a diagram, looking for a pattern, using a table, working backward) and communicating progress made and challenges encountered.

Sub-Strand: Money Works (MW)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	5	UM	MW	1	Read and write amounts of money up $10,000 dollars and show an understanding of the value of large amounts of money (up to $10,000) by stating realistic purchasing power a given amount of money.
MT	5	UM	MW	2	Use a variety of strategies including concrete materials to add, subtract and multiply money involving dollars and cents not exceeding $1,000 (cents being multiples of 5, 10 and 25); and generate different combinations of notes that give the same amount of money up to $1,000.
MT	5	UM	MW	3	Read, write and interpret price of items; and use a variety of strategies to calculate the total cost (not exceeding $1,000) of set of items; and make change from amounts up to $100 and explain the effectiveness of approaches used.
MT	5	UM	MW	4	Use the terms cost price, selling price, profit and loss as related to buying and selling and make application to simple situations to illustrate the meaning/value of these terms.
MT	5	UM	MW	5	Use several strategies to create and solve problems involving money transactions.

STRAND: GEOMETRIC THINKING (GT)

Sub-Strand: Points & Lines (PL)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	5	GT	PL	1	Use drawings to explain the concept of dimension as used in geometry to describe shapes.
MT	5	GT	PL	2	Explain why a point is zero dimensional but line segments, rays and lines are one dimensional.
MT	5	GT	PL	3	Use examples to illustrate and distinguish between parallel and intersecting lines; and vertical and horizontal lines.

Sub-Strand: Understanding Angles (UA)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	5	GT	UA	1	Use the terms acute angle, right angle, obtuse angle, straight angle and reflex angle in relation to quarter turn, and half turn, whole turn [e.g. an obtuse angle is more than a quarter turn (90°) but smaller than a half turn (180°)].
MT	5	GT	UA	2	Recognize that two quarter turns equal half turn and reason that if a quarter turn equals 90° then two quarter turns equal half turn which is 180° and associate this reasoning with the concept of a straight angle measuring 180°.
MT	5	GT	UA	3	Begin to use a simple one scale protractor with readings given in multiples of 5 degrees to draw and measure angles to the nearest ten degrees (10°).
MT	5	GT	UA	4	Apply knowledge of the angular properties of triangles, squares and rectangles to estimate and calculate missing angles.
MT	5	GT	UA	5	Use a variety of strategies (drawing, trial and error; looking for patterns; practical work) to respond to problems involving angles.

Sub- Strand: Plane Shapes (PS)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	5	GT	PS	1	Continue to classify 2-D shapes in terms of their angular and linear properties and explain reasons on which classification was done; and continue to use terms (such as opposite sides, parallel sides, opposite angles) to describe properties of plane shapes.
MT	5	GT	PS	2	Describe a polygon as a closed figure bounded by straight sides; name and sketch polygons with up to six sides.
MT	5	GT	PS	3	Classify quadrilaterals as (squares, rectangles, parallelograms, trapeziums, kites); and explain the common properties of the shapes in each group.
MT	5	GT	PS	4	Classify triangles based on the property of: (1) number of equal sides (three equal sides, two equal sides, no equal sides) and (2) having or not having a right angle and explain the common features of the triangles in each group.
MT	5	GT	PS	5	Describe the diameter of a circle in terms of the radius and the radius in terms of the diameter.
MT	5	GT	PS	6	Describe, extend and generate simple geometric patterns involving plane shapes; and use a variety of strategies to solve problems related to 2-D shapes.

Sub- Strand: Solid Shapes (SS)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	5	GT	SS	1	Use mathematics language such as (curved surface, flat faces, square face, rectangular face, circular face, curved edges) to accurately to describe properties of 3-D shapes.
MT	5	GT	SS	2	Work in small groups to discuss, sketch and illustrate predictions of nets of given cubes and cuboids; and compare the actual nets of the shape with stated predictions.
MT	5	GT	SS	3	Use a table to note differences in terms of properties between cubes and cuboids and cones and cylinders.
MT	5	GT	SS	4	Use a variety of strategies to explore and solve problems based on 3D shapes and their nets.

Sub-Strand: Directional Sense (DS)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	5	GT	DS	1	Draw and label the axes of the first quadrant using a scale of 1cm to 1 unit; and use such information to identify, describe and represent the position of points and 2-D shapes within the first quadrant of the Cartesian Plane.
MT	5	GT	DS	2	Work in small group to construct 2D shapes; and identify, describe and represent translation in the first quadrant of the Cartesian Plane, using grid paper and computer programs.
MT	5	GT	DS	3	Use a variety of strategies to solve problems relating to position and direction.

STRAND: DATA HANDLING (DH)

Sub- Strand: Data Collection (DC)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	5	DH	DC	1	Ask questions suitable for collecting relevant data; and accurately record responses.
MT	5	DH	DC	2	Collect data from interviews, observations, questionnaires, direct measures and simple experiments.
MT	5	DH	DC	3	Continue to use tally charts and simple tables to count and record occurrences and construct organized collected data.

Sub- Strand: Data Representation (DR)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	5	DH	DR	1	Continue to use simple tables to display collected data; and label columns and rows of tables accurately and give table a suitable title.
MT	5	DH	DR	2	Construct pictographs and bar graphs on grid paper using simple scales (one to one; one to two; one to five); and appropriately label axes and giving graphs a title that matches the data display.
MT	5	DH	DR	3	Represent the same data in a variety of ways (table, pictograph and bar graph) and comment on the effectiveness of each method.

Sub- Strand: Data Interpretation (DI)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	5	DH	DI	1	Read and interpret data presented in different forms (tables, picture graphs, bar graphs and line graphs.
MT	5	DH	DI	2	Ask and answer questions based on information presented in tables, bar graphs, pictographs, and line graphs.
MT	5	DH	DI	3	Work in small, using various strategies to determine the range, mode, median and mean of a set of a small set of data.

THE LEARNING STANDARDS – GRADE 6

General Overview: Grade 6

Introduction

The standards to be achieved by Grade 4 pupils in mathematics are outlined in the next few pages. This section is designed to give principals, instructional leaders, teachers, and parents a clear picture of the learning engagements of pupils at this level. The expected knowledge, skills, attitude and mathematical processes in which pupils will be engaged are emphasised under four content strands of Number Sense (NS), Understanding Measurement (UM), Geometric Thinking (GT) and Data Handing (DH).

CONTENT STANDARDS – GRADE 6

Number Sense (NS)

The emphasis at this level is to guide pupils to consolidate efforts at working effectively with whole numbers, fractions and decimals.

MT.6.CS.NS.1:	*Pupils can use a variety of tools and strategies to demonstrate understanding of whole numbers up to 1 000 000.*
MT.6.CS.NS.2:	*Pupils can classify numbers into different types.*
MT.6.CS.NS.3:	*Pupils can round whole numbers to nearest ten, hundred, and thousand.*
MT.6.CS.NS.4:	*Pupils can demonstrate their operational sense through using multiple strategies to add and subtract up to 5-digit numbers.*
MT.6.CS.NS.5:	*Pupils can demonstrate operational sense through using multiple strategies to multiply and divide two- and three-digit numbers by two- and three-digit numbers.*
MT.6.CS.NS.6:	*Pupils can use a variety of tools and strategies to demonstrate understanding of and ordering of fractions with denominators up to 12.*
MT.6.CS.NS.7:	*Pupils can generate sets of three equivalent fractions with denominators being multiples of the smallest denominator.*
MT.6.CS.NS.8:	*Pupils can demonstrate understanding of decimals up to thousandths.*

MT.6.CS.NS.9:   *Pupils can apply knowledge of the multiplicative relationship to compare quantities and solve two-step problems.*

MT.6.CS.NS.10:   *Pupils can construct understanding through developing the ability to describe and generate a variety of whole number patterns and formulate related generalizations.*

Understanding Measurement (UM)

The focus is to challenge pupils to develop skills in measuring attributes of length, area, capacity, mass, time and money. Pupils use a variety of strategies to solve two steps problems involving the different attribute of measurement.

MT.6.CS.UM.1:   *Pupils can demonstrate understanding through reading, estimating, measuring, comparing, and recording measurement of the attributes of length, area, capacity, mass, time, and money.*

MT.6.CS.UM.2:   *Pupils can choose appropriate instruments and units to measure given attributes and give reasons to justify their choice.*

MT.6.CS.UM.3:   *Pupils can deduce and state the relationship between units and use their knowledge to convert form one unit to another larger unit (using measures that are equivalent to whole or fractional parts – half, quarter, tenths).*

MT.6.CS.UM.4:   *Pupils can formulate generalizations that can be used to calculate the perimeter of rectangles and squares.*

MT.6.CS.UM.5:   *Pupils can formulate efficient ways to count unit squares to determine area of rectangles and squares.*

MT.6.CS.UM.6:   *Pupils can read and record time to the nearest minute on both analog and digital clocks.*

MT.6.CS.UM.7:   *Pupils can read and write money amounts up to $10 000 in words and symbols.*

MT.6.CS.UM.8:   *Pupils can demonstrate understanding through performing addition and subtraction with total amounts up to $1 000.*

Geometric Thinking (GT)

MT.6.CS.GT.1:   *Pupils can distinguish among line segment, ray and line in terms of their dimensions.*

MT.6.CS.GT.2:   *Pupils can demonstrate understanding of terms such as acute, right, obtuse, straight, reflex, and vertically opposite, to describe angles based on their size in relation to 90^0, 180^0, and 360^0.*

MT.6.CS.GT.3:   *Pupils can classify quadrilaterals based on common relationships between pairs of sides, number of lines of symmetry, and as squares, rectangles, rhombus, and parallelograms.*

MT.6.CS.GT.4:   *Pupils can identify parts of the circle and compare the diameter with other parts of the circle, e.g. radius, circumference, and chord.*

MT.6.CS.GT.5:   *Pupils can identify points and draw basic plane shapes in the first quadrant of the Cartesian plane.*

MT.6CS.GT.6:   *Pupils can describe ad create geometric patterns based on repeating, growing, or shrinking patterns.*

Data Handling (DH)

MT.6.CS.DH.1:   *Pupils can collect and record information about a variety of current issues that are of interest to them, using tables and tally charts to organize information.*

MT.6.CS.DH.2:   *Pupils can represent collected data using appropriate simple table, pictographs, bar graphs and line graphs.*

MT.6.CS.DH.3:   *Pupils can construct understanding through reading, interpreting, and drawing conclusions based on data presented in tables and graphs.*

MT.6.CS.DH.4   *Pupils can demonstrate understanding of the range, mode, and median of a simple data set and use knowledge relating to data handling to solve related problems.*

Mathematical Process Skills to be Emphasised

Learning engagements associated with the standard approach outlined are directly tied to pupils having regular focused opportunities to construct understanding of the following mathematics process skills.

Problem Solving	The emphasis is on pupils DOING mathematics by having the opportunity to approach learning tasks in a variety of appropriate strategies, and to reflect on the effectiveness of tools and strategies used and the challenges and progress made.
Reasoning	Pupils develop the attitude of readily presenting logical justification to support choice made in selection of tools and strategies in response to learning tasks; checking the reasonableness of results obtained; and using multiple examples to verify tentative statements and test generalizations.
Communicating	As a critical feature in fostering a culture of social learning and the development of clarity of thought, pupils engage in asking questions of theirs and others' mathematical thinking and ways of working; readily share thoughts; and use mathematics vocabulary to communicate mathematical ideas orally and in the written form.
Connecting	Pupils make a conscious effort to connect mathematical ideas across mathematical concepts, skills and processes; across past, present and future learnings; across in-class/school and out of class experiences.
Representing	Pupils develop a way of working that reflects multiple ways of recording interpreting and modelling and representing concepts. They make use of oral, visual and written forms of communication and make use of symbols charts, graphs, diagrams, drawings, tables and words to express mathematical thoughts

PERFORMANCE STANDARDS – GRADE 6

At the completion of Grade 6, pupils who demonstrate understanding will:

STRAND: NUMBERS AND NUMBER SENSE (NM)

Sub-Strand: Understanding Numbers (UN)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	6	NS	UN	1	Read, write, count, expand, and compare numbers up to seven digits, using a variety of tools and models (such as number line, place value chart, bar model); and differentiate among face value, place value and total value of each digit
MT	6	NS	UN	2	Round numbers to nearest ten, hundred and thousand, using a variety of tools and models (such as number line, place value chart, bar model).
MT	6	NS	UN	3	Create and solve problems involving ordinal numbers
MT	6	NS	UN	4	Use a variety of tools and strategies to generate, model and classify types of whole numbers (odd, even, prime, composite, and squares); and explain the common features among the numbers in each group, and strategies used.
MT	6	NS	UN	5	Use a variety of strategies to generate factors, common factors, highest common factors, multiples, common multiples, lowest common multiples of a set of whole numbers; and explain strategies employed.
MT	6	NS	UN	6	Use a variety of tools and strategies to represent, compare and order decimal numbers represented in tenths and hundredths.
MT	6	NS	UN	7	Use a variety of tools and strategies to represent, compare, classify and order fractions (proper, improper, mixed numbers) with like and unlike denominators up to 12.
MT	6	NS	UN	8	Use knowledge of percent (10%, 20%, 25%, 50%, 75% and 100%) as a tool to formulate estimation of quantities.

Sub-Strand: Operational Sense (OS)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	6	NS	OS	1	Use a variety of mental and written strategies to add, subtract, multiply and divide whole numbers.
MT	6	NS	OS	2	Work in small groups to investigate the results of the four operations on even and odd numbers and use results to formulate related generalizations.
MT	6	NS	OS	3	Use examples to illustrate the relationship between addition and subtraction; multiplication and division; and use knowledge of these relationships to check correctness of addition, subtraction, multiplication and division results.
MT	6	NS	OS	4	Create and solve a variety of one and two step problems involving addition, subtraction, multiplication and division; and develop the skill of checking the reasonableness of worked solutions against initial estimations.
MT	6	NS	OS	5	Use a variety of tools and strategies including the calculator to add and subtract decimal numbers to hundredths; and multiply and divide decimal numbers to tenths by whole numbers.
MT	6	NS	OS	6	Use the calculator and other tools to investigate results, and formulate generalizations when whole numbers are multiplied by 0.1 and 0.01, and decimal numbers are multiplied and divided by 10, and 100.
MT	6	NS	OS	7	Use concrete and pictorial models to represent, compare and generate sets of equivalent fractions with denominators up to 12.
MT	6	NS	OS	8	Use a variety of tools and strategies to add and subtract two fractions (proper, improper mixed numbers) where one denominator is a multiple of the other.
MT	6	NS	OS	9	Use pictorial models and questions to interpret multiplication of a whole number by a fraction and the product of a pair of simple fractions (for e.g. ¼ × ½ may be interpreted as 'what is one-half of one-quarter?'; 3 × 2/3 may be interpreted as 'what is two-thirds of three?').
MT	6	NS	OS	10	Count forward in fractional parts by halves, thirds, quarters, fifths, sixths, eighths and tenths beyond one whole; and count forward in decimal by tenths and hundredths using numbers expressed to up to two decimal places.

Sub-Strand: Proportional Reasoning (PR)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	6	NS	PR	1	Work in small groups, using concrete materials and calculator, to investigate and note the relationship among percent, decimal numbers and fractions (with denominators 2, 4, 5, 10, 20, 25, 50 and 100).
MT	6	NS	PR	2	Illustrate and explain the concept of percent larger than 100%; find a percent of a quantity; express one quantity as a percent of another; and convert among percent, fraction and decimal.
MT	6	NS	PR	3	Read, represent, simplify and interpret ratio as related to comparison of two quantities of the same type found in real-life contexts.
MT	6	NS	PR	4	Use a variety of strategies and models to Interpret and explain the relationship that exists among a ratio, percent, fraction and decimal, and use this knowledge to convert from one to the others.
MT	6	NS	PR	5	Share a quantity into two parts according to a given ratio.
MT	6	NS	PR	6	Use a variety of strategies to solve real life problems involving fractions, percent and ratio. And reflect on the progress made and challenges encountered.

Sub-Strand: Number Patterns (NP)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	6	NS	NP	1	Describe (in words), complete and extend given whole number patterns generated by counting forward, backward, doubling, halving, adding, subtracting, or multiplying or dividing by a constant.
MT	6	NS	NP	2	From analyzing results obtained from working out sets of computations, involving addition, subtraction, multiplication, division, and brackets, formulate generalizations related to the order of operation.
MT	6	NS	NP	3	Construct and solve simple equations in which a symbol is used to represent an unknown quantity (e.g. "When 3 is added to a number, the result is 15. What is the number to which 3 was added? This problem may be translated into the following equation $n + 3 = 15$).
MT	6	NS	NP	4	Express and solve missing number problems, using symbols to represent the missing number; generate pairs of whole numbers which satisfy an equation with two unknowns (e.g. a + 4 = b + 5 has possible solutions of a= 3; b = 2; a= 1; b = 0).

STRAND: UNDERSTANDING MEASUREMENT (UM)

Sub-Strand: Linear Measurement (LM)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	6	UM	LM	1	Select, use and justify choice of instrument and unit (millimetre, centimetre, metre and kilometre) to measure length and distance and explain strategy used.
MT	6	UM	LM	2	Work in small groups, use knowledge of relationship between units of length to convert from a larger unit to smaller unit (metres to centimetres; and kilometre to metre) using measures that are equivalent to whole or fractional parts (halves, quarters and tenths) parts of the larger unit.
MT	6	UM	LM	3	Work in small groups, use the approximate equivalence of 1 inch ≈ 2.5 centimetre to produce other equivalent measures between whole inch measures and centimetre up to 1 yard (3feet) ≈ 90 centimetres.
MT	6	UM	LM	3	Determine the perimeter of regular and irregular plane shapes.
MT	6	UM	LM	4	Begin to use algebraic thinking in conjunction with other strategies to determine one or two missing sides in a plane shape given the perimeter and information about the other sides.

Sub-Strand: Measuring Area (MA)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	6	UM	MA	1	Determine the area of right angled triangles by counting unit squares and relate the area of right angled triangle to its corresponding rectangle (with sides equal to base and height of the triangle).
MT	6	UM	MA	2	Determine the total area by counting unit squares enclosed by compound shapes (made up of rectangles, squares and right angled triangles).
MT	6	UM	MA	3	Work in small groups to investigate situations relating to rectangles with same perimeter but different area.

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	6	UM	MA	4	Solve one and wo step problems involving the area of rectangles and squares using several strategies (trial and error, acting out, drawing a diagram, looking for a pattern, using a table, working backward) and compare the effectiveness of the different strategies.

Sub-Strand: Measuring Capacity (MC)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	6	UM	MC	1	Select, use and justify choice of unit (millilitre and litre) used to estimate, measure and record capacity, and recognize that containers with different shapes have the same capacity.
MT	6	UM	MC	2	Use knowledge of relationship between litre and millitre to convert from litre to milliliter, measures that are equivalent to whole or fractional parts (halves, quarters and tenths) of a litre.
MT	6	UM	MC	3	Use the approximate equivalence of 1 gallon ≈ 3.8 litres to produce other equivalent measure between whole gallon (multiples of 10 up 100) and litres.
MT	6	UM	MC	4	Continue to practice reading and interpreting labels on commonly used packages to tell the capacity (in litre and millitre) of containers; and deduce that containers of different shapes could have the same capacity.
MT	6	UM	MC	5	Use a variety of strategies to solve problems related to capacity; and explain and compare strategies used.

Sub-Strand: Measuring Mass (MM)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	6	UM	MM	1	Select, use and justify choice of unit (gram and kilogram) used to estimate, measure and record mass; and recognize that objects with the same mass can be of different shapes and sizes.
MT	6	UM	MM	2	Use knowledge of relationship between kilogram and gram to convert from kilogram to gram using measures that are equivalent to whole or fractional parts (halves, quarters and tenths) of a kilogram.
MT	6	UM	MM	3	Use the approximate equivalence of 1 kilogram ≈ 2.2 pounds to generate other equivalent measures between whole kilogram and pound.
MT	6	UM	MM	4	Continue to practice reading and interpreting labels on commonly used packages to tell the mass (in gram and kilogram) of objects; and deduce that objects of different shapes could have the same mass.
MT	6	UM	MM	5	Use a variety of strategies to solve problems related to mass and explain strategies used.

Sub-Strand: Understanding Time (UT)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	6	UM	UT	1	Tell the time accurately using words and different notations (am /pm and 24-hour).
MT	6	UM	UT	2	Measure and calculate elapsed time using a stop watch and start/stop time respectively; and speak of progress made and challenges encountered.
MT	6	UM	UT	3	Use a variety of strategies (trial and error, acting out, drawing a diagram, looking for a pattern, using a table, working backward) to solve problems involving time.

Sub-Strand: Money Works (MW)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	6	UM	MW	1	Read and write amounts of money up to $100,000 dollars and show an understanding of value of a large amounts of money (up to $100,000) by stating purchasing power the amount.
MT	6	UM	MW	2	Use a variety of strategies, including concrete materials, to perform the four operations on money; and generate different combination of notes that give the same amount of money up to $1,000.
MT	6	UM	MW	3	Read, write and interpret price of items; and use a variety of strategies to calculate the total cost (not exceeding $10,000) of set of items and make change from amounts up to $1,000 and explain the effectiveness of the strategies used.
MT	6	UM	MW	4	Use the terms cost price, selling price, profit, loss, discount, tax, and interest as related to buying and selling; and apply different strategies in simple situations to determine and compare the value of these terms.
MT	6	UM	MW	5	Round money amounts to the nearest 5-cent; and justify strategies used in deciding when to 'round up' and when to 'round down'.
MT	6	UM	MW	6	Use several strategies to create and solve problems involving money transactions.

STRAND: GEOMETRIC THINKING (GT)

Sub-Strand: Points & Lines (PL)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	6	GT	PL	1	Recognize that line segments, rays and lines are one dimensional while a plane is two dimensional.
MT	6	GT	PL	2	Use examples to illustrate and distinguish between parallel and intersecting; and vertical and horizontal lines.

Sub-Strand: Understanding Angles (UA)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	6	GT	UA	1	Use terms (such as acute, right angle, obtuse, straight and reflex) to describe and classify angles based on their sizes.
MT	6	GT	UA	2	Continue to apply knowledge of measure and types of angles and the angular properties of triangles, squares and rectangles to estimate and calculate missing angles.
MT	6	GT	UA	3	Recognize that four quarter turns equal a whole turn; and connect this knowledge with the fact that the sum of angles at the center of a circle equals 360º [(e.g. use cut-outs of the angles of a rectangle to show that each angle is a quarter turn (90º) and that the four angles together form a whole turn (90º)].
MT	6	GT	UA	4	Use a variety of strategies (drawing, trial and error; looking for patterns; practical work) to respond to problems involving angles.

Sub-Strand: Plane Shapes (PS)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	6	GT	PS	1	Describe a polygon as a closed figure bounded by straight sides; name and sketch polygons with up six sides
MT	6	GT	PS	2	Classify quadrilaterals based on their linear properties (rectangles, squares, parallelograms, trapeziums, kites); and explain reasons for classifications.
MT	6	GT	PS	3	Determine the number of lines of symmetry of given shapes
MT	6	GT	PS	4	Classify triangles based on their linear and angular properties (right angled, obtuse angled; equilateral, isosceles and scalene).
MT	6	GT	PS	5	Work in small groups to investigate and discuss the relationship of the diameter and other parts of the circle (twice the radius; longest chord; divides circle into two semi-circles; line of symmetry of circle).
MT	6	GT	PS	6	Apply knowledge of properties of 2-D shapes to calculate missing angles and sides.
MT	6	GT	PS	7	Use a variety of strategies to solve problems related to 2-D shapes.

Sub-Strand: Solid Shapes (SS)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	6	GT	SS	1	Continue to use mathematics language (such as parallel faces, circular faces, opposite faces, curved surface, flat faces, curved edges) to describe and compare properties of 3D shapes.
MT	6	GT	SS	2	Work in small groups to investigate different outlines of nets for cubes and cuboids; note and explain patterns observed in the different arrangements of the faces put together to form the net of cubes and cuboids.
MT	6	GT	SS	3	Work in small groups to make predictions and compare predictions with results when a given 3D shape is cut parallel to one of its faces.
MT	6	GT	SS	4	Use a variety of strategies to explore and respond to problems based on 3D shapes and their nets.

Sub-Strand: Directional Sense (DS)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	6	GT	DS	1	Identify, describe and represent the position of points within the first quadrant of the Cartesian Plane.
MT	6	GT	DS	2	Use pencil and paper and computer software to construct 2D shapes and translate these shapes on coordinated grid paper.
MT	6	GT	DS	3	Use knowledge of properties of triangles, and quadrilateral to predict the position(s) of one or two missing vertices of these shapes drawn within the first quadrant of the Cartesian plane.
MT	6	GT	DS	4	Work in small groups to predict position and size of a shape before translation or reflection; carry out the translation or reflection; and discuss the result with their predictions.
MT	6	GT	DS	5	Use and follow simple instructions relating to directions to draw plane shapes (e.g. discuss the type of shape form by moving 3 cm to the right, followed by 3 cm upwards, followed by 3cm to the right, followed by 3 cm downwards).
MT	6	GT	DS	6	Use a variety of strategies to solve problems relating to position and direction.

STRAND: DATA HANDLING (DH)

Sub- Strand: Data Collection (DC)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	6	DH	DC	1	Continue to ask questions suitable for collecting relevant data; identify the population from which data will be collected and accurately record responses to questions.
MT	6	DH	DC	2	Continue to collect data from interviews, observations, questionnaires, simple experiments and direct measures.
MT	6	DH	DC	3	Use tally charts and compute facility (spreadsheets, Microsoft excel) to organize collected data.

Sub- Strand: Data Representation (DR)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	6	DH	DR	1	Construct a two-way table with appropriate labelling of rows and columns to organize raw data.
MT	6	DH	DR	2	Use grid paper and computer software (Excel program) to create tables, simple vertical and horizontal bar graphs and simple line graphs.
MT	6	DH	DR	3	Select an appropriate method (table, picture graph, bar graphs or line graph) and suitable scale for representing data and give reasons for choice.

Sub- Strand: Data Interpretation (DI)

Subject	Grade	Strand	Sub-Strand	Standard #	Performance Standards
MT	6	DH	DI	1	Read and interpret data presented in tally charts, tables, pictographs, bar graphs, and line graphs.
MT	6	DH	DI	2	Identify trends in data presented in tables, pictographs, bar charts
MT	6	DH	DI	3	Use suitable strategies to determine the value of the range, median, mode and mean of a **small** set of data (***emphasis is NOT computation***); and use these values to make relevant comment about the data set.
MT	6	DH	DI	4	Work in small groups to identify patterns and trends in data and make inferences about from data based on these observations.