Mathematics

in the

National Curriculum

Grade 3 (Revised syllabus)

Mathematics in the National Curriculum

National Institute of Education

Curriculum Development Division

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Contents

Introduction

Rationale

As we embark on to information and technology era, we require individuals, who are able to think critically about complex issues, analyze and adapt to new situations, solve problems of various kinds, and communicate their thinking and ideas effectively. The study of mathematics equips students with knowledge, skills and values that are essential for successful and rewarding participation in an information and technology-based society. Learning mathematics results in more than a mastery of basic skills. It equips students with a concise and powerful means of communication. Mathematical structures, operations, processes, and language provide students with a framework and tools for reasoning, justifying conclusions, and expressing ideas clearly. To learn mathematics in an effective way, students need classroom experiences that help them develop mathematical understanding; learn important facts, skills, and procedures; develop the ability to apply the processes of mathematics; and acquire a positive attitude towards mathematics. Through mathematical activities that are practical and relevant to their lives, students develop mathematical understanding, problem-solving skills, that they can apply in their daily lives and, eventually, in the workplace. Mathematics is a powerful learning tool which helps the students to develop the ability to use mathematics to extend and apply their knowledge in other curriculum areas, including science, music, and language.

Overview

Mathematics is a one of the main Key Learning Areas identified in the National Curriculum Framework. Knowledge, skills, values and attitudes taught through this subject would be a tool for the pupils to function and excel in all aspects of life. It also helps to think logically, be creative, solve problems and appreciate the aesthetics of Allah (SWT)'s creation. Mathematics is divided into many branches such as arithmetic, geometry, algebra, and trigonometry.

Primary

At this level, students learn basic mathematical knowledge, skills and understanding. These include basic understanding of the number system, computational skills, and the ability to solve simple problems related to their day to day life. Emphasis is also given to practical understanding of the ways in which information is gathered and presented.

Lower Secondary

At this level, students learn basic mathematical principles and its application for problem solving. Use mathematics as a mode of communication, with special attention on the use of clarity of expressing concepts, in acquiring a base that will assist students in their further study of mathematics and in other fields. Students' confidence is developed by helping them to feel for numbers, patterns and relationships, and places a strong emphasis on solving problems and presenting and interpreting results. Students also learn how to communicate and reason using mathematical concepts.

Higher Secondary

At this level, students construct rigorous mathematical arguments and proofs through use of precise statements, logical deduction and inference and by the manipulation of mathematical expressions, including the construction of extended arguments for handling substantial problems and hence acquiring a base that will assist students in their further study of mathematics and in other fields.

The Vision

Along with the other subjects in the National Curriculum, mathematics curriculum contributes to the development of the student in all aspects. It aims to achieve the vision along with the eight principles identified, incorporating the key competencies and also relating to effective pedagogical approaches emphasized in the National Curriculum.

The Mathematics curriculum is structured in such a way that it paves the road to achieve the vision of the National Curriculum.

The National Curriculum envisions the development of:

• successful individuals who are motivated to learn and explore; who are inquisitive and eager to seek, use and create knowledge.

• confident and competent individuals who have a firm belief in Islam, a strong sense of self and cultural identity, and believe in their own capabilities; and

• responsible and productive contributors to their own family, their local community and the global society.

The main goals of mathematics education are to prepare students to:

• use mathematics confidently to solve problems

• communicate and reason mathematically

• appreciate and value mathematics

• make connections between mathematics and its applications

• commit themselves to lifelong learning

• become mathematically literate adults, using mathematics to contribute to society Mathematics learning experiences assist students to develop and understand mathematical concepts along with process skills and the pedagogical approaches, emphasize students to participate in practical hands-on experiences, to explore and find ways to solve real life problems using mathematical knowledge and skills. During this process of solving problems, the students are required to pose questions, predict and find answers for themselves and develop themselves as successful learners who are eager to learn and explore more.

Mathematics provides ample opportunities for students to develop their critical thinking skill along with values that would build their self-confidence and self-esteem. Students will be given

opportunities to relate learning beyond their classroom, such as working on authentic tasks. Engagement and involvement in these ensures that student acquire the knowledge, skills and values to be competent citizens in the society.

A blend of the above mentioned experiences ensure that students are fully equipped to as active participants in the ever changing world.

The Principles

The National Curriculum identifies eight fundamental principles that need to be taken into account when designing and implementing learning and other school activities. Mathematics curriculum is also designed to take into account these principles. The teaching learning of Mathematics highly emphasizes linking Mathematics and Islam. Essentially, mathematics provides the understanding of Allah's creation and accepting the natural beauty of such creations through the study of inquiry, based on experiments and investigations. Facts, figures and theories contribute to the understanding of various mathematical concepts. Linking these to Islam strengthens the Islamic faith in students.

The Principles underlying mathematics curriculum

Mathematics curriculum recognizes that all students do not necessarily learn mathematics in the same way, using the same resources, and within the same time frames. It aims to challenge all students by including expectations that require them to use higher-order thinking skills and to make connections between related mathematical concepts and between mathematics, other disciplines, and the real world.

It is based on the belief that students learn mathematics most effectively when they are given opportunities to investigate ideas and concepts through problem solving, and are then guided carefully into an understanding of the mathematical principles involved. The acquisition of operational skills remains an important focus of the curriculum.

The Key Competencies

The eight key competencies outlined in the National Curriculum encompasses knowledge, skills, values and attitudes and dispositions to be explicitly taught in various key learning areas and through various school activities.

The mathematics curriculum provides a rich context in which these key competencies can be developed. The strands in the syllabus involve a lot of opportunities for students to explore mathematical knowledge, ask questions, use higher order thinking to analyse and solve issues. In addition, the curriculum allows students to design and invent new things based on their prior knowledge and using their creative thinking. It asks students to understand abstract concepts which require a high level of cognition.

The key competency, thinking critically and creatively is very much part and parcel of the mathematics curriculum which encompasses many of the aspects highlighted. Students are expected to be adaptable to change and be equipped with thinking and creative abilities to face the challenges

of the future. These include a wide range of cognitive skills and intellectual dispositions such as using a wide range of techniques to create ideas, working creatively with others, reasoning effectively, solving problems, and making judgments and decisions.

In addition, students are given many opportunities to be creative and think critically; use broad in-depth analysis of evidence to make decisions and communicate their beliefs clearly and accurately. They also use skills such as comparing, classifying, reasoning, hypothesizing, analyzing, and synthesizing which help them gain confidence in their ability to learn and make judgments. These individuals are innovative, flexible and apply what they learn to new or different situations and solve problems in innovative ways.

At the same time, the mathematics curriculum provides many opportunities for students to Understand and manage self by developing motivation and goal setting skills. They acquire the ability to plan, implement plans and evaluate one's performances which are aspects of self-management and are essential in developing an enterprising attitude in students.

In addition, students get the opportunity to identify what is important to them and direct their attention and efforts towards those things, by setting personal goals. They also develop an eagerness to pursue personal excellence in all aspects of life.

Moreover, students are required to use language, symbols and text which is one of the most fundamental competencies individuals need to acquire in order to be active and contributing members of a society. In addition, students are required to explore and interpret symbolic representations as well as visual texts to make meaning in various contexts. Hence, there would be many opportunities to develop the key competency of making meaning.

How is Mathematics structured

In this learning area, learning is structured and organized under FOUR MAIN STRANDS throughout all key stages. They are namely, numbers and algebra, measurements and geometry, chance and data and mathematical process skills. From key stages 3 (lower secondary) onwards, an in-depth study of those strands and sub strands will be discussed with the students. In key stage 5 (higher secondary) students can choose a specific area of mathematics under 3 different branches, namely pure mathematics, statistics and mechanics.

Strand 1: Mathematical Process Skills

The mathematical processes identified are:. reasoning, communication and connection, problem solving and application and mathematical thinking skills. The mathematical processes can be seen as the processes through which students acquire and apply mathematical knowledge and skills. These processes are interconnected. Problem solving and communication in Mathematics have strong links to all the other processes. A problem-solving approach encourages students to reason their way to a

solution or a new understanding. As students engage in reasoning, teachers further encourage them to make conjectures and justify solutions, orally and in writing. The communication and reflection that occur during and after the process of problem solving help students not only to articulate and refine their thinking, but also to see the problem they are solving from different perspectives. This opens the door to recognize the range of strategies that can be used to arrive at a solution.

Developing mathematical thinking is important as it facilitates students in developing problem-solving skills which are categorized as one of the most important skills for students' in real life. Effective problem solving in mathematics class as well as real life situations require mathematical skills such as classifying, comparing, sequencing, generalizing and analyzing. Through problem solving, students develop mathematical thinking skills. It opens up students' minds to think about various strategies in order to solve a problem and choose the best among many strategies to arrive at a conclusion or solution of the problem, thus helping broaden their thinking ability.

The mathematical processes cannot be separated from the knowledge and skills that students acquire throughout the year. Students must solve problems, communicate, reason, reflect and use mathematical thinking skills as they develop the knowledge, the understanding of concepts, and the skills required in all the strands in every grade. The development of mathematical knowledge is a gradual process. A continuous, cohesive strategies throughout the grades is necessary to help students develop an understanding of the "big ideas" of mathematics – that is, the interrelated concepts that form a framework for learning mathematics in a coherent way. Similarly, in-depth understanding of Mathematical knowledge, concepts and skills ensure that students develop holistically, and relating these concepts and processes to their real life, preparing them for life and to reach for personal excellence.

Therefore, in order to develop process skills in students, it is important to use well planned mathematics lessons that focus on the development these skills. Additionally, continuously assessing the developments of process skills in students, providing constructive feedback and conducting appropriate intervention is equally important to achieve the outcomes of the process strand.

Strand 2: Numbers and algebra:

Students learn number concepts, number properties, algebra and problem solving & puzzles. Students develop a sense of numbers, their properties, four basic operations involving fractions and money. Students will explore, estimate and manipulate numbers to carry out day to day activities.

Strand 3: Measurement and geometry:

In this strand, students would learn mensuration and time. This strand would equip the students to estimate, measure and calculate perimeter, area or volume of various things accurately and master in 3D & 2D shapes, positions, directions and angles.

Strand 4: Chance and handling data:

Students learn about handling data under this strand. Statistics is a topic that comes under handling data. Students would be able to represent and interpret different data collected in a more meaningful manner.

Outcomes

Outcomes are statements of knowledge, understanding, skills and values expected to be achieved by students at the end of a given stage.

All outcomes are of equal importance. The presentation of the outcomes does not imply a sequence of teaching and learning activities.

Indicators

An indicator is an example of the behaviour that students may display as they work towards the achievement of the syllabus outcomes. Indicators reflect and describe aspects of knowledge, understanding, skills and values.

An indicator may describe part or all aspects of an outcome. Outcomes and indicators together assist teachers in identifying student's current achievement and in planning future learning experiences.

Planning, Teaching and Assessing Mathematics

The Planning Stage

When planning a program in mathematics, teachers must take into account considerations in a number of important areas.

The following are some key features to consider in planning mathematics education:

Teaching Approaches

Students in a mathematics class typically demonstrate diversity in the ways they learn best.

It is important, therefore, that students have opportunities to learn in a variety of ways –individually, cooperatively, independently, with teacher's direction, through hands-on experience, and through examples followed by practice. In addition, mathematics requires students to learn concepts and procedures, acquire skills, learn and apply mathematical processes.

These different areas of learning may involve different teaching and learning strategies. It is assumed, therefore, that the strategies teachers employ will vary according to both the object of the learning and the needs of the students.

In order to learn mathematics and to apply their knowledge effectively, students must develop a solid understanding of mathematical concepts. Research and successful classroom practice have shown that an investigative approach, with an emphasis on learning through problem solving and reasoning, best enables students to develop the conceptual foundation they need.

When planning mathematics programs, teachers will provide activities and assignments that encourage students to search for patterns and relationships and engage in logical inquiry.

Teachers need to use rich problems and present situations that provide a variety of opportunities for students to develop mathematical understanding through problem solving.

All learning, especially new learning should be embedded in well-chosen contexts for learning – that is, contexts that are broad enough to allow students to investigate initial understandings, identify and develop relevant supporting skills, and gain experience with varied and interesting applications of the new knowledge. Such rich contexts for learning open the door for students to see the "big ideas", or key principles and concepts of mathematics, such as a pattern or relationship. This understanding of key principles will enable and encourage students to use mathematical reasoning throughout their lives.

Effective instructional approaches and learning activities draw on students' prior knowledge, capture their interest, and encourage meaningful practice both inside and outside the classroom.

Students' interest will be engaged when they are able to see the connections between the mathematical concepts they are learning and their application in the world around them and in real-life situations.

Students will investigate mathematical concepts using a variety of tools and strategies, both manual and technological. Manipulatives are necessary tools for supporting the effective learning of mathematics by all students. These concrete learning tools invite students to explore and represent abstract mathematical ideas in varied, concrete, tactile, and visually rich ways. Moreover, using a variety of manipulatives help deepen and extend students' understanding of mathematical concepts. For example, students who have used only base ten materials to represent two-digit numbers may not have as strong a conceptual understanding of place value as students who have also bundled craft sticks into tens and hundreds and used an abacus.

Manipulatives are also a valuable aid to teachers. By analysing students' concrete representations of mathematical concepts and listening carefully to their reasoning, teachers can gain useful insights into students' thinking and provide support to help enhance their thinking.

Fostering students' communication skills is an important part of the teacher's role in the mathematics classroom. Through skillfully led classroom discussions, students build understanding and consolidate their learning. Discussions provide students with the opportunity to ask questions, make conjectures, share and clarify ideas, suggest and compare strategies, and explain their reasoning. As they discuss ideas with their peers, students learn to discriminate between effective and ineffective strategies for problem solving.

Students' understanding is revealed through both oral communication and writing, but it is not necessary for all mathematics learning to involve a written communication component.

Young students need opportunities to focus on their oral communication without the additional responsibility of writing. Whether students are talking or writing about their mathematical learning, teachers can prompt them to explain their thinking and the mathematical reasoning behind a solution or the use of a particular strategy by asking the question "How do you know?". And because mathematical reasoning must be the primary focus of students' communication, it is important for teachers to select instructional strategies that elicit mathematical reasoning from their students.

Promoting Positive Attitudes Towards Mathematics

Students' attitudes have a significant effect on how they approach problem solving and how well they succeed in mathematics. Teachers can help students develop the confidence they need by demonstrating a positive disposition towards mathematics. Students need to understand that, for some mathematics problems, there may be several ways to arrive at the correct answer. They also need to believe that they are capable of finding solutions. It is common for people to think that if they cannot solve problems quickly and easily, they must be inadequate. Teachers can help students understand that problem solving of almost any kind often requires a considerable expenditure of time, energy and a good deal of perseverance. Once students have this understanding, teachers can encourage them to develop the willingness to persist, to investigate, to reason and explore alternative solutions, and to take the risks necessary to become successful problem solvers.

Cross-Curricular and Integrated Learning

The development of skills and knowledge in mathematics is often enhanced by learning in other subject areas. Teachers should ensure that all students have ample opportunities to explore a subject from multiple perspectives by emphasizing cross-curricular learning and integrated learning, as follows:

a) In cross-curricular learning, students are provided with opportunities to learn and use related content and/or skills in two or more subjects. Students can use the concepts and skills of mathematics in their science or social studies lessons. Similarly, students can use what they have learned in science to illustrate or develop mathematical understanding. For example, in Grade 6, concepts associated with the fulcrum of a lever can be used to develop a better understanding of the impact that changing a set of data can have on the mean.

b) In integrated learning, students are provided with opportunities to work towards meeting expectations from two or more subjects within a single unit, lesson, or activity. By linking expectations from different subject areas, teachers can provide students with multiple opportunities to reinforce and demonstrate their knowledge and skills in a range of settings. Also, the mathematical process expectation that focuses on connecting encourages students to make connections between mathematics and other subject areas. For example, students in

Grade 2 could be given the opportunity to relate the study of location and movement in the Geometry and Spatial Sense strand of mathematics to the study of movement in the

Structures and Mechanisms strand in science and technology. Similarly, the same students could link their study of the characteristics of shapes in Visual Arts to the properties shapes in their work in geometry.

Recommended time allocation for teaching Mathematics Syllabus

Key Stage	Contact Time/Weeks	Minimum Contact Time/Year
Key Stage 1 (Grade 1, 2 & 3)	225 minutes (5 periods/week)	137hrs (182 periods of 45 min)

The above table shows the allocated time for a week with 5 periods of 45 minutes for key stage 1 and 2. At key stage two, teachers need to organize learning activities by thematically connecting outcomes or indicators from various strands.

Assessment Practices

Assessment is an integral part of teaching and learning. Assessment is the ongoing systematic process of gathering and using evidence of student learning to make informed decisions regarding student achievement. Thus, the main purpose of assessment is to improve student learning.

Three major types of assessments:

Assessment for learning (formative assessment)

It is used for purposes of greater achievement. Classroom assessment should provide opportunities for students to become actively involved in their learning and achievement. In this type of assessment, student knows what they need to do in order to be successful and know what is considered as 'good work'.

Assessment for learning is criterion referenced where students compare their work with a criterion. The criteria are based on the outcomes and indicators mentioned in the Mathematics Syllabi.

In addition to this, students, peers and teachers provide appropriate and ongoing feedback. Through feedback students identify their strengths and areas for improvement. This helps students to redirect their efforts and energy in making plans on ways to improve learning.

As for teachers, this provides the opportunity to change instruction in accordance with the student's needs.

Assessment as learning (formative assessment)

Assessment as learning is student driven whereby students are actively involved in their own learning. This is done through continuous self-assessments whereby students identify areas to improve. Students are required to reflect and critically evaluate their work.

Assessment of learning (summative assessment)

This is usually addressed through summative assessment. This includes topic assessment at the end of a topic and term exams. (Note: for the foundation and key stage one there will be NO term exams or tests). However, students' summative assessment can be done to check the level of understanding of the students. The information gathered through the summative process should be used formatively to enhance student progress.

In order to gather evidence of student learning the following are some of the methods that can be used:

- Informal assessment- student and teachers make judgments about their learning based on discussions.
- Formal assessment- students and teachers making judgments based on success criteria that are shared by students and the teacher before the learning task is carried out.
- Observation – use of checklists, rating scales and rubrics
- Self and peer assessment
- Quizzes
- Tests
- Sample student work
- Projects
- Reports
- Journals/Logs
- Performance reviews
- Portfolios

Scope and Sequence

STRAND 1: MATHEMATICAL PROCESS SKILLS

#	Mathematical Processes	Grade 1	Grade 2	Grade 3
MPS1	Reasoning, Communication and Connection	Observe patterns, similarities and differences, develop mathematical ideas and make links between ideas. Describes mathematical situations and methods using everyday and mathematical language, actions, materials, diagrams and symbols Supports conclusions and explain the process by demonstrating how answers were obtained.	Uses appropriate terminology to describe, and symbols to represent mathematical ideas. Checks accuracy of a solution and explains the process using appropriate terminology and symbols and represent, mathematical ideas. Supports conclusions and explain the process by demonstrating how answers were obtained	Uses appropriate terminology to describe, and symbols to represent mathematical ideas. Gives a valid reason for supporting one possible solution over another.
MPS2	Problem Solving and application	Uses objects, actions, trial and error and diagrams to explore mathematical problems, identify what is known and unknown in the problem. Apply concepts and skills to solve problems posed in mathematics class as well in real life contexts. Interprets the solution. Does the answer make sense? Is it reasonable?	Selects and uses appropriate strategies. Apply concepts and skills to solve problems posed in mathematics class as well in real life contexts. Interprets the solution. Does the answer make sense? Is it reasonable?	Selects and applies appropriate problem-solving strategies,. Apply concepts and skills to solve problems posed in mathematics class as well in real life contexts. Interprets the solution. Does the answer make sense? Is it reasonable? Explore other methods of finding the solution.

MPS3	Mathematical Thinking skills	Use Mathematical thinking skills such as; - Classifying - Comparing - Sequencing - Generalizing	Use Mathematical thinking skills such as; - Classifying - Comparing - Sequencing - Generalizing - Analyzing	Use Mathematical thinking skills such as; - Classifying - Comparing - Sequencing - Generalizing - Analyzing

STRAND 2: NUMBERS AND ALGEBRA

Sub-strand	Grade 1	Grade 2	Grade 3
Number Concept	- Connect number names, numerals and quantities up to 100 in English, in Dhivehi and write numbers up to 100, recognize the value of zero and the place value of numbers up to 100, use ordinal numbers up to 10th, estimate quantities up to 20.	- Connect number names, numerals and quantities up to 999 in English, 9999 in Dhivehi and write numbers up to 999. recognise the value of numbers up to 999, use ordinal numbers up to 31st, estimate quantities up to 100.	- Connect number names, numerals and quantities up to 9999 in English and in Dhivehi and write numbers up to 9999, recognise the value of numbers up to 9999, estimate quantities up to 1000, read names of Arabic Indic (Hindu Arabic, Eg: ٠.١.٢.٣.٤.٥.٦.٧.٨.٩) numerals including zero up to 30.
	- Recognize, copy, continue and create simple patterns using sounds, actions, colours, objects, numbers and pictures and explain the sorting rule, explore, identify and describe number patterns formed by skip counting (2's and 10's).	- Recognize, copy, continue and create simple patterns, explore, identify and describe number patterns formed by skip counting forwards or backwards (2's, 5's and 10's) and explore the properties of odd and even numbers (up to 50).	- Describe, copy, predict and extend simple patterns and identify term to term rule for a simple number sequence, explore, identify and describe number patterns formed by skip counting forwards or backwards (2's, 5's, 10's, 3's, 100's and 1000's) and explore the properties of odd and even numbers up to 100.
Addition and Subtraction	- Explore and explain the connection between addition and subtraction using strategies. - Solve simple problems involving addition and subtraction of whole numbers to 20, using a	- Recognize and use commutative principle, solve problems involving addition (up to 2-digit numerals) with answers to 100 and the corresponding	- Solve problems involving addition (up to 3-digit numerals) with answers to 999 and the corresponding subtraction by,

	variety of concrete materials, drawings and strategies (counting on, partitioning, rearranging parts) and develop mental strategies and use estimation.	subtraction by using personal strategies for adding and subtracting with and without the support of manipulatives, develop mental strategies and use estimation and solve 2 step word problems. - Demonstrate and explain the effect of adding zero to or subtracting zero from any number.	using personal strategies for adding and subtracting with and without the support of manipulatives. - Describe and apply mental mathematics strategy(s) for adding 2-digit numerals and use estimation.
	- Identify and order notes of different denominations up to MVR 100 and carry out simple transactions involving money up to 20 and explain the process.	- Identify the values of notes and coins of different denominations up to MVR 100 and carry out simple transactions involving money up to 100 and explain the process.	- Carry out transactions involving money up to MVR 500 and explain the process.
Multiplication and Division	- Make equal groups of objects and describe using 'number of groups', 'number in each group' and 'groups of'.	- Demonstrate an understanding of multiplication as repeated addition, division as repeated subtraction and recognize the relationship between multiplication and division. - Demonstrate an understanding of multiplication facts of 2, 5 and 10 and related division facts and solve one step word problems.	- Demonstrate an understanding of commutative law and multiplication facts of 2, 3, 4, 5, 6, 7, 8, 9 and 10 and related division facts. Demonstrate an understanding of multiplication (2- or 3-digit numerals by 1-digit numerals) to solve 1 or 2 step word problems. Demonstrate an understanding of multiplication (2- or 3-digit numerals by 1-digit numerals) to solve problems by estimating products. Demonstrate an understanding of division (1-digit divisor and up to 2-digit dividend) to solve

			problems by relating division to multiplication. - Demonstrate an understanding of division (1-digit divisor and up to 2-digit dividend) to solve problems by estimating quotients.
Fractions, Decimals and Percentages	- Reads, represents, writes and models halves and quarters.	- Recognize, read and represent 1/2, 1/4, 1/3, 3/4, 2/3 using concrete materials and describe fractions in everyday situations. - Compare unit fractions using concrete materials and explore that the greater the denominator, the smaller the unit fraction.	- Recognize equivalent fractions and locate unit fractions on a number line with denominators not exceeding 10. Add, subtract, multiply and divide whole numbers to halves and quarters using concrete materials.

STRAND 3: MEASUREMENT AND GEOMETRTY

Length, Mass and Capacity	- Demonstrate an understanding of length, mass and capacity by comparing two or more objects using arbitrary units and use related vocabulary in the process. Use estimation in measuring length, mass and capacity.	- Demonstrate an understanding of measuring length, mass and capacity by using standard units (cm, m, l, g, kg). - Suggest a suitable unit and equipment to estimate or measure length, mass and capacity. Use estimation in measuring length, mass and capacity.	- Demonstrate an understanding of the relationship between standard units (cm, m, km l, ml g, kg). - Demonstrate an understanding of measuring length, mass and capacity by using standard units (cm, m, km l, ml, g, kg).

			- Suggest a suitable unit and equipment to estimate or measure length, mass and capacity. - Use estimation in measuring length, mass and capacity.
Time	- Use vocabulary related to time; read and tell time to the nearest half hour; describe duration using months, weeks, days and hours.	- Use vocabulary related to time; estimate the duration of an event in time units, read and record time to the nearest quarter hour.	- Read, tell and record time to the minute and investigate the relationship between units of time. Demonstrate an understanding of the months of the Hijri calendar.
Perimeter, Area and Volume	-	-	- Demonstrate an understanding of perimeter of regular shapes by using centimetre or metre. - Explains the meaning of area, Estimates and measures the area of simple shapes.
2D and 3D shapes	- Recognise, name, sort, draw and model of basic 2D shapes (circle, triangle, rectangle and square) and describe them using its properties.	- Identify basic shapes and make models of new shapes using cut outs of circle, triangle, rectangle and square, semi-circle, quarter circle. - Recognize, name and make cube, cuboid, cone and cylinder using 2D shapes and explore the difference between 2D and 3D shapes.	- Recognise the number of corners and sides of 2D shapes, vertices, edges, and faces of 3D shapes. - Recognise symmetrical objects, shapes and pictures
Positions and directions	- Describes clockwise and anti-clockwise direction and the positions and directions using everyday language. Gives simple	- Describes simple directions and draws landmarks of an informal map of a	- Finds geographic north, interpret and describe the location and

	directions, follows short paths and builds simple paths.	familiar place and describe positions and directions using everyday language.	direction using a square grid and cardinal compass points. - Draws simple, familiar paths or informal maps, describes and finds the position of a place or point on a grid of squares.
Angles	- Recognise and discuss about movements and demonstrate turns; turn about a point, lines, whole turns and half turns.	- Identify 'angles' with two arms and vertex in practical situations and recognize that the length of arms does not affect the size of the angle. Recognize and describe turns using the language ‘full turn’, ‘half turn’, ‘quarter turn’, ‘three-quarter turn’, ‘clockwise’ and ‘anticlockwise’.	- Identify right angles, straight lines and the relationship between right angles and straight lines.

STRAND 4: CHANCE AND HANDLING DATA

Handling Data	- Collect and sort data according to the attributes of different objects. Display data in table forms and interpret the information presented.	- Collect, sort and display data in simple forms including representation of data with objects and drawings where one object or drawing represents one data value (pictographs without scale) and interpret the information presented.	- Collect, sort and display data in tables using tally marks and display data using Venn diagrams and bar charts. - Interprets and evaluates data displays, including tables, picture graphs, Venn diagrams and bar charts

GRADE 3 SYLLABUS DETAILS

GRADE 3

Strand 1: Mathematical Process Skills (Mps)

	Indicators: **This is evident when the student:**
MPS1 Reasoning, communication and connection **Outcome MPS301:** Recognise and use connections among mathematical concepts, between mathematical concepts and other disciplines and communicate mathematical thoughts, situations and methods using relevant vocabulary and tools.	a. Uses appropriate terminology to describe, and symbols to represent mathematical ideas. b. Gives a valid reason for supporting one possible solution over another.
MPS 2 Problem solving and application **Outcome MPS302:** Acquire the necessary mathematical concepts and skills to solve problems in mathematics and everyday life.	a. Selects and applies appropriate problem-solving strategies,. b. Apply concepts and skills to solve problems posed in mathematics class as well in real life contexts. c. Interprets the solution. Does the answer make sense? Is it reasonable?
MPS 3 Mathematical thinking skills **Outcome MPS303:** Use mathematical thinking in Mathematics class and real life contexts.	a. Use Mathematical thinking skills such as; classifying, comparing, sequencing, generalizing, gnalyzing in Mathematics class and real life contexts.

Strand 2: Numbers and Algebra (NA)

Sub-strand: Number concept (N)

Outcome NAN304 Connect number names, numerals and quantities up to 9999 in English and in Dhivehi and write numbers up to 9999.	**Indicators:** a. Count and write numbers in numerals up to 9999 numbers in English and Dhivehi. b. Counts larger collections by grouping them.
Outcome NAN305 Recognise the value of numbers up to 9999.	**Indicators:** a. Recognise what each digit represents in a 4 digit number (Eg: use abacus, number cards, number line). b. Compare numbers up to 4 digit numbers using related vocabulary and symbols. (Eg: more than, less than). c. Partitions 4-digit numbers in different ways (Eg: 6052 = 6000 + 50 + 2).
Outcome NAN306 Estimate quantities up to 1000.	**Indicators:** a. Estimate quantities to 1000 and use appropriate vocabulary in estimation. (Eg: about, not less than, almost ….)
Outcome NAN307 Read names of Arabic Indic (Hindu Arabic, Eg: ٠.١.٢.٣.٤.٥.٦.٧.٨.٩) numerals including zero up to 30.	**Indicators:** a. Identify Arabic Indic numerals up to 30.
Outcome NAN308 Describe, copy, predict and extend simple (increasing and descreasing) patterns and identify term to term rule for a simple number sequence.	**Indicators:** a. Recognise, copy and continue simple number patterns that increase and decrease (Eg; 3, 6, 9….) and describe the pattern rule. b. Identify the missing element(s) in a repeating pattern.
Outcome NAN309 Explore, identify and describe number patterns formed by skip counting forwards or backwards (2's, 5's, 10's, 3's, 100's and 1000's).	**Indicators:** a. Count forward and backward by 2's, 3's, 5's,10's, 100's and 1000's using a variety of tools and strategies.

(Eg: move with steps; skip count on a number line; place counters on a hundreds chart; connect cubes to show equal groups; count groups of pennies).

Outcome NAN310

Explore the properties of odd and even numbers up to 100.

a. Explore the properties of odd and even numbers (up to 100).

Sub-strand: Addition and Subtraction (A)

Outcome NAA311

Solve problems involving addition (up to 3-digit numerals) with answers to 999 and the corresponding subtraction by using personal strategies for adding and subtracting with the support of manipulatives and visual models.

Indicators:

a. Solve 3 step word problems involving addition and subtraction.
b. Solve a problem involving a missing addend or subtrahend, and describe the strategy used.
c. Use models/diagrams in solving addition and subtraction problems (Eg; Ten frames, base ten blocks, part part whole method, number line, model diagrams).
d. Give reasons in choosing the personal strategy for solving a particular problem.

Outcome NAA312

Describe and apply mental Mathematics strategy(s) for adding 2-digit numerals and use estimation in problem solving.

Indicators:

a. Use models, tables and diagrams in solving addition and subtraction problems.
b. Use estimation in addition and subtraction.
c. Add 2-digit numerals using a mental mathematics strategy and explain the reasoning.

"adding from left to right"	"taking one addend to the nearest multiple of ten"	"using doubles"	Compensation

(e.g., to determine the sum of 23 + 46, think 20 + 40 and 3 + 6).	strategy (e.g., to determine the sum of 28 + 47, think 30 + 47 – 2 or 50 + 28 – 3).	strategy (e.g., to determine the sum of 24 + 26, think 25 + 25; to determine the sum of 25 + 26, think 25 + 25 + 1 or doubles plus 1).	taking one addend to the nearest multiple of ten and then compensating.

Outcome NAA313

Carry out transactions involving money up to MVR 500 and explain the process.

Indicators:

a. Pays appropriate amounts and determines appropriate change in shopping, up to MVR.500.
b. Solve word problems involving addition, subtraction, multiplication and division of money.
(Exclude combinations of MVR and laari in money transactions).

Sub-strand: Multiplication & Division (M)

Outcome NAM314

Demonstrate an understanding of commutative law and multiplication facts of 2, 3, 4, 5, 6, 7, 8, 9 and 10 and related division facts.

Indicators:

a. Identify multiples of 2, 3, 4, 5, 6,7,8 and 9 up to tenth multiple using a 100 square grid.
b. Explore the principle of commutative law (exclude name of the law) of multiplication.
c. Write multiplication facts using manipulatives, diagrams and visual aids up to 10 and related division facts.

Outcome NAM315

Demonstrate an understanding of multiplication (2- or 3-digit numerals by 1-digit numerals) to solve 1 or 2 step word problems.

Indicators:

a. Solve 1 or 2 step multiplication problem (2 or 3-digit numerals by 1-digit numerals) and explain the process.
b. Use models/diagrams and tables in solving multiplication and division problems

Outcome NAM316	Indicators:
Demonstrate an understanding of multiplication (2- or 3-digit numerals by 1-digit numerals) to solve problems by estimating products.	a. Estimate a product using a personal strategy (e.g., 2 × 243 is close to or a little more than 2 × 200, or close to or a little less than 2 × 250).

Outcome NAM317	Indicators:
Demonstrate an understanding of division (1-digit divisor and up to 2-digit dividend) to solve problems.	a. Solve 1 or 2 step division problem (1-digit divisor and up to 2-digit dividend) with or without using concrete materials. b. Solve 1 or 2 step division problem (1-digit divisor and up to 2-digit dividend) by relating division to multiplication.

Outcome NAM318	Indicators:
Demonstrate an understanding of division (1-digit divisor and up to 2-digit dividend) to solve problems by estimating quotients.	a. Estimate a quotient using a personal strategy (e.g., 86 ÷ 4 is close to 80 ÷ 4 or close to 80 ÷ 5).

Sub-strand: Fractions, Decimals and Percentages (F)

Outcome NAF319	Indicators:
Recognize equivalent fractions and locate unit fractions on a number line with denominators not exceeding 10.	a. Recognize different equivalent fractions. (Eg: 2⁄8 equals b. 1⁄4, 4⁄8 equals 2⁄4 or 1⁄2, five tenths as one half, five fifths as one whole, one half and two quarters will make one whole, two quarters are the same as one half). c. Locate unit fractions on a numberline. d. Compare and order unit fractions.

Outcome NAF320	Indicators:
Add, subtract, multiply and divide whole numbers to halves and quarters using concrete materials and visual diagrams.	a. Carry out addition of simple fractions using concrete materials (Eg: one half and two quarters will make one whole, two quarters are the same as one half) and visual diagrams. b. Add, subtract, multiply and divide whole numbers to halves and quarters using concrete materials (Eg: Use paper cups/plates or fraction cards) and visual diagrams.

Strand 3: Measurement and Geometry (MG)

Sub-strand: Length, Mass and Capacity (L)

Outcome MGL321	**Indicators:**
Demonstrate an understanding of the relationship between standard units (cm, m and km, l and ml, g and kg) and carry out conversion of units.	a. Correctly uses the abbreviations, cm, m, km l, ml g, kg. b. Convert from compound to smaller unit and vice versa. (Eg: Kilometres, metres and centimetres, / kilograms and grams, / litres and millilitres).

Outcome MGL322	**Indicators:**
Demonstrate an understanding of measuring length, mass and capacity by using standard units (cm, m, km l, ml, g, kg).	a. Correctly uses the abbreviations, cm, m, km l, ml, g, kg. b. Measures lengths in km, cm and m, mass in g and kg, capacity in ml and l.

Outcome MGL323	**Indicators:**
Suggest a suitable unit and equipment to estimate or measure length, mass and capacity.	a. Explains the importance of standard units. b. Estimate and measure; - Length in m/cm/km - Mass in kg/g - Capacity in l/ml c. Selects the appropriate unit and appropriate equipment to measure length, mass and capacity of objects. d. Solve simple word problems involving length, mass and capacity.

Outcome MGL324	**Indicators:**
Use estimation in measuring length, mass and capacity.	a. Estimate length, mass and capacity before measuring and use appropriate vocabulary.

Sub-strand: Time (T)

Outcome MGT325	**Indicators:**
	a. Tell and write time to 1 minute.

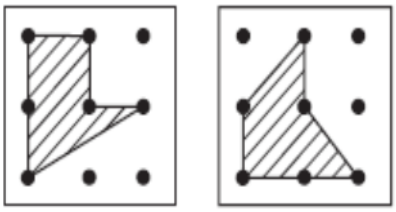
Read, tell and record time to the minute and explore the relationship between units of time and carry out conversion of hours to minutes and vice versa.	b. Conversion of hours to minutes and minutes (give minutes in multiples of 60) to hours (Eg: How many hours are there in 120 minutes?, how many minutes are there in 2 hours 10 minutes?). c. Uses a stopwatch to measure and record duration of events in hours, minutes and seconds. d. Recognizes the difference between am and pm on digital clock.
Outcome MGT326	**Indicators:**
Demonstrate an understanding of the months of the Hijri calendar.	a. Names and orders the months of the year (Islamic or Hijri). b. Reads and writes the date of a particular day using Hijri calendar.

Sub-Strand: Perimeter, Area and Volume (P)

Outcome MGT327	**Indicators:**
Demonstrate an understanding of perimeter of regular shapes by using centimetre or metre.	a. Uses the term “perimeter” to describe the total distance around a shape. b. Estimates and measures the perimeter of regular, simple shapes in cm and m.
Outcome MGT328	**Indicators:**
Explains the meaning of area, Estimates and measures the area of simple shapes.	a. Explains the meaning of area. b. Finds areas by counting squares. c. Compares area of shapes by placing one shape on top of another. d. Measures areas of flat shapes using arbitrary units.

Sub-strand: Shapes (S)

Outcome MGS329	**Indicators:**
Recognise the number of corners and sides of 2D shapes, vertices, edges, and faces of 3D shapes, and sketches different views of cube, cuboids, cylinders and spheres.	a. Identify the number of corners, the number of sides, (whether the sides are straight or curved) and identifies vertices, edges, and faces of 3D shapes. b. Makes different polygons using pin board and elastic bands.



c. Draws hexagons, heptagons, octagons, and quadrilaterals.
d. Explain the difference between regular and irregular two-dimensional shapes.
e. Identifies 3D shapes from pictures of them in different positions and orientations.
f. Makes skeleton models of cubes and cuboids using different materials (Eg; straw) and sketches 3D objects (cubes and cuboids) using isometric dot paper.
g. Sketches top, front and side views of cube, cuboids, cylinders and spheres.

Outcome MGT330	**Indicators:**
Recognise symmetrical objects, shapes and pictures and draw lines of symmetry.	a. Identify symmetry from the environment (symmetrical shapes, objects, designs) b. Complete and describe designs and pictures that have a vertical, horizontal or diagonal line of symmetry

Sub-strand: Positions and directions (P)

Outcome MGP331	**Indicators:**
Finds geographic north, interpret and describe the location and direction using a square grid and cardinal compass points.	a. Describe Recognises and uses the four compass directions N, S, E, W. b. Describes position of one place relative to another. (Eg: Villingili is west of Male). c. Describes a path on square grids using N, S, E, and W. d. Identifies and describes the direction of Qibla. e. Describes and finds the position of a square on a square grid with rows labeled by numerals and columns labeled with letters.

Outcome MGA332	**Indicators:**
Draws simple, familiar paths or informal maps, describes and finds the position of a place or point on a grid of squares.	a. Draws a familiar path (Eg: the road from home to school, home to mosque). b. Makes and describes right-angled turns, including turns between the four compass points.

	c. Uses a grid to locate places. (Eg: What is at A5 on the island map? The Prayer Room, Where is the office? C2).
Outcome MGA333 Identify right angles, straight lines and the relationship between right angles and straight lines.	**Indicators:** a. Recognise right angles from the environment (Eg; right angles in the corners of a room, book, cube, windows). b. Compare and identify angles that are bigger than right angles and smaller than right angles. c. Recognises that a straight line is equivalent to two right angles. (Exclude use of the terms 'acute', 'obtuse' and 'reflex' angles).

Strand 4: Chance and Handling Data (CD)

Sub-strand: Handling Data (H)

Outcome CDH334 Collect, sort and display data in tables using tally marks and display data using Venn diagrams and bar charts.	**Indicators:** a. Classifies data (objects, numbers or shapes) according to one criterion and displays on a Venn diagram. b. Collects data and makes a simple table using tally marks (Eg: data collected on favourite drinks).
Outcome CDH335 Interprets and evaluates data displays, including tables, picture graphs, Venn diagrams and bar charts.	**Indicators:** a. Classifies data Interpret and answer questions based on a set of data.(Eg: Which day had most/least story books?, How many story books in the whole week?, Why do you think there are different numbers of story books brought on different days?, Would next week's graph of story books be the same or different? Why)?