Mathematics in The National Curriculum

Key Stage 1 (Grades 1, 2 and 3)
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Foreword

May Almighty Allah bestow his blessings and mercy upon Mohamed, his messenger (PBUH), who personified his life as a curriculum throughout his life through the exemplary conduct and behaviours. May Almighty Allah also grant blessings and mercy upon his companions and household.

The year 1979 was an insightful year as the government of Maldives strategized to mainstream the primary school education. This led to the development of the first syllabi for grades 1 to 5 in the Maldives in 1980, following which the revision of the syllabi in 1982. The crafting and implementation of the 1st National Curriculum for primary grades 1-5 was done in 1984. An effort was then made to revise the curriculum in 1997 and was completed by the year 2000.

The 2nd revision of the 1st curriculum commenced in 2006, during which it was realised that enormous changes were needed to the curriculum. A decision for curriculum reform was made to address the needs and demands of the country, and bring rise to the development of the 2nd national curriculum framework.

The 2nd national curriculum is developed based on the changes that have taken place in the society, from practices of the past to the current needs, with a vision for a better tomorrow. It aims to build a knowledgeable future generation, highly skilled to cater the needs of the 21st century, with a focus on nurturing attitudes and values. The curriculum also intends to inculcate the main competencies outlined, such as practicing Islam. Other competencies include self-management, critical thinking, creative thinking, human relations, healthy life styles, sustainable practices and ICT literacy. The curriculum also intends to produce students who possess the 21st century skills, and are healthy both physically and also spiritually, to be responsible towards the progression of the Maldivian society.

Key Stage 1 Mathematics is focused on laying the foundation of thorough knowledge of mathematical principles and skills required, with an emphasis on developing students’ values and attitudes, alongside with lifelong skills. The main objective of teaching mathematics is for students to acquire basic and fundamental skills which will help them in studying mathematics with other disciplines, and utilizing it in solving day-to-day problems in real life situations.

I hereby take this opportunity to extend my sincere gratitude and heartfelt appreciation to each and every individual for the tireless effort, commitment and dedication in developing the National Curriculum Framework and this syllabus. I pray that the Almighty Allah bless them for their commitment and contribution.

Last but not least, it is my sincere hope that this syllabus be beneficial for the students and teachers in the Republic of Maldives.

Adam Shareef Umar
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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.
Mathematics in the National Curriculum

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 Vision

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.

Process Skills

Attention to the processes that support effective learning of mathematics is also considered to be essential to a well organised mathematics program. Seven mathematical processes are identified: problem solving, reasoning and proving, reflecting, selecting tools and computational strategies, connecting, representing, and communicating. 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. By seeing how others solve a problem, students can begin to reflect on their own thinking (a process known as “metacognition”) and the thinking of others, and to consciously adjust their own strategies in order to make their solutions as efficient and accurate as possible.

The mathematical processes cannot be separated from the knowledge and skills that students acquire throughout the year. Students must solve problem, communicate, reason, reflect, and so on, 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 program 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, ensuring relevance to students and preparing them for life and to reach for personal excellence.

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 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, making meaning.
How is Mathematics Structured

In Mathematics students learn the process of enquiry, discovery and verification and to apply mathematical ideas, rules and procedures to particular situations and problems.

The Strands

In this learning area, learning is structured and organized under FIVE MAIN STRANDS throughout all key stages. They are namely, numbers, measurements, spatial sense & geometry, and chance and data.

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: Numbers

Students learn number concepts, four basic operations involving fractions and money. Students will explore, estimate and manipulate numbers to carry out day to day activities.

Strand 2: Measurement

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.

Strand 3: Shape and Space

Under this strand, students would master in 3D & 2D shapes, positions, directions and angles.

Geometry and trigonometry come under this strand. Students would be able to visualize spatial aspects of things and perceive them better.

Strand 4: Chance and 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.

Strand 5: Patterning and Algebra

Under patterning and algebra students would learn sequences, number properties, algebra and problem solving & puzzles. Students’ confidence is built by helping them to develop a feel for numbers, their properties, and the relationships. Algebra is one of the very important topics that students learn in their entire schooling, which broadens their thinking skills.
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 behavior that students may display as they work towards the achievement of 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, through examples followed by practice. In addition, mathematics requires students to learn concepts and procedures, acquire skills, and 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 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. Manipulative 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 and 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 symmetrical shapes in Visual Arts to the creation of symmetrical shapes in their work in Geometry and Spatial Sense.
**Recommended Time Allocation**

Recommended time allocation for teaching Mathematics Syllabus

<table>
<thead>
<tr>
<th>Key Stage</th>
<th>Contact Time/Weeks</th>
<th>Minimum Contact Time/Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Key Stage 1 (Grade 1, 2 &amp; 3)</td>
<td>225 minutes (5 periods/week)</td>
<td>137hrs (182 periods of 45 min)</td>
</tr>
</tbody>
</table>

The above table shows the allocated time for a week is 2 hours and 15 minutes for key stage 1.

**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 used:

**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 students’ level of understanding. 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: Numbers

<table>
<thead>
<tr>
<th>Sub-strands</th>
<th>Grade 1</th>
<th>Grade 2</th>
<th>Grade 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number Concept</strong></td>
<td>Counts, orders, read, and represent numbers up to 100 in Dhivehi and English and estimates in the range of 0 to 30.</td>
<td>Counts, orders, read, and represent numbers up to 3-digits (999) in Dhivehi and English and estimates in the range of 0 to 50.</td>
<td>Counts, orders, read, and represent numbers up to 4-digits (9999) in Dhivehi and English and justify estimation in the range of 0 to 100. Read and write Arabic Indic (Hindu Arabic) numerals.</td>
</tr>
<tr>
<td><strong>Addition and Subtraction</strong></td>
<td>Uses a range of mental strategies and informal recording methods for addition and subtraction involving one and two-digit numbers.</td>
<td>Uses a range of mental strategies and informal recording methods for addition and subtraction involving up to three-digit numbers.</td>
<td>Uses a range of mental strategies and informal recording methods for addition and subtraction involving up to four-digit numbers.</td>
</tr>
<tr>
<td><strong>Multiplication &amp; Division</strong></td>
<td>Uses a range of mental strategies and concrete materials for multiplication and division and solve 1 step word problems.</td>
<td>Uses a range of mental and written strategies for multiplication and division and solve 2 step word problems.</td>
<td>Uses a range of mental and written strategies for multiplication and division and solve 2 step word problems.</td>
</tr>
<tr>
<td><strong>Money</strong></td>
<td>Identifies coins and notes with different face values and carry out simple transactions and solve 1 step word problems explaining the process.</td>
<td>Identifies coins and notes with different face values and carry out simple transactions and solve 2 step word problems explaining the process.</td>
<td>Identifies coins and notes with different face values and carry out simple transactions and solve 3 step word problems explaining the process.</td>
</tr>
<tr>
<td><strong>Fractions, Decimals and Percentages</strong></td>
<td>Recognise, read and write simple fractions in practical contexts.</td>
<td>Recognise, read, write, and compare, make estimations in simple fractions.</td>
<td>Recognise, read, write, and compare, make estimations in simple fractions and carry out four operations involving simple fractions.</td>
</tr>
</tbody>
</table>
## Strand – 2: Measurements

<table>
<thead>
<tr>
<th>Sub-strands</th>
<th>Grade 1</th>
<th>Grade 2</th>
<th>Grade 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Length</strong></td>
<td>Estimates, measures, compare and records lengths using appropriate arbitrary units and relevant vocabulary.</td>
<td>Measure length using suitable unit and equipment.</td>
<td>Measure length using suitable unit and equipment.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Use relationships between familiar units.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Draw and measure lines accurately.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Record and estimates from scales to a suitable degree of accuracy.</td>
<td></td>
</tr>
<tr>
<td><strong>Mass</strong></td>
<td>Estimates, measures, compare and records mass (weight) using appropriate arbitrary units and relevant vocabulary.</td>
<td>Measure mass (weights) using suitable unit and equipment.</td>
<td>Measure mass (weights) using suitable unit and equipment.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Relationships between familiar units.</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Capacity</strong></td>
<td>Estimates, measures, compare and records capacity using appropriate arbitrary units and relevant vocabulary.</td>
<td>Suggest a suitable unit to estimate or measure capacity of different sizes.</td>
<td>Measure capacity using suitable unit and equipment.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Relationships between familiar units.</td>
<td></td>
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<tr>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Perimeter, Area and Volume</strong></td>
<td>Estimates and measure the perimeter and area of simple shapes.</td>
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<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Measure the area of simple shapes using arbitrary units.</td>
<td></td>
</tr>
<tr>
<td><strong>Time</strong></td>
<td>Sequence events and uses everyday language to describe the duration of the day and events.</td>
<td>Estimate the duration of an event in time units.</td>
<td>Estimate the duration of an event in time units.</td>
</tr>
<tr>
<td></td>
<td>Measure the duration of events using arbitrary units.</td>
<td>Read, tell and record time to the nearest quarter hour.</td>
<td>Read, tell and record time to the nearest five minutes.</td>
</tr>
<tr>
<td></td>
<td>Read, tell and record time to the nearest half hour.</td>
<td>The months of the Gregorian calendar.</td>
<td>The months of the Hijri calendar.</td>
</tr>
<tr>
<td></td>
<td>The seven days of the week.</td>
<td>Calendar and relationship between the units of time.</td>
<td>Calendar and relationship between the units of time.</td>
</tr>
<tr>
<td></td>
<td>Relationship between the units of time.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Strand – 3: Shape and Space

<table>
<thead>
<tr>
<th>Sub-strands</th>
<th>Grade 1</th>
<th>Grade 2</th>
<th>Grade 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>3D Shapes</strong></td>
<td>Recognise, name, sort, and make models of 3D objects and describe them using everyday language.</td>
<td>Recognise, name, sort, and make models of 3D objects and describe them using everyday language.</td>
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<td><strong>2D Shapes</strong></td>
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<td><strong>Positions and Directions</strong></td>
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<td>Describe positions, give and follow directions of short paths and draws simple paths or informal maps.</td>
<td>Describe positions, give and follow directions of short paths and draws simple paths or informal maps. Find geographic north, interpret and describe location and direction. Describe movements, and understand angle as a measure of turn.</td>
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<tr>
<td><strong>Angles</strong></td>
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<td>Identify angles, recognise and make right angles.</td>
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<td></td>
<td>Make turns to clockwise and anticlockwise directions.</td>
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### Strand – 4: Chance and Handling Data

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<td>Solve a given problem by collecting, sorting, classifying and organising data as a list or a tabulated form.</td>
<td>Solve a given problem by collecting, sorting, classifying, organising, representing and interpreting data in simple tables or diagrams. Construct and interpret pictographs and bar charts.</td>
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**Mathematics in the National Curriculum**

**Key Stage 1**

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### Strand – 5: Patterning and Algebra

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<td>Recognise, copy and continue simple patterns, create them using familiar materials, predict and extend them. Recognise odd and even numbers.</td>
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GRADE 1 SYLLABUS DETAILS
GRADE 1

Strand – 1: Numbers (N)

Sub-strand: Number Concept (N1)

Topic: Counting

Outcome N1.1:
Count numbers up to 100 in Dhivehi and English. Skip-counts forwards or backwards. Count reliably a set of objects.

Indicators:
This is evident when the student:

a. Demonstrates the one-to one correspondence between number and objects when counting.

b. Counts a set of objects up to 100.

c. Counts larger collections by grouping in tens, then fives or twos.

d. Skip-counts forwards or backwards by ones, twos, fives and tens, from a given number.

Topic: Place Value and Ordering

Outcome N1.2:
Recognise the value of numbers up to 100.

Indicators:
This is evident when the student:

a. Represents numbers up to 100 using concrete materials.

b. Identify the number that comes after, before or between a given numbers up to 100.

c. Compares numbers up to 100 in different ways.
   Eg: more than, less than and equal to etc.

d. Orders and positions numbers up to 100 on...
   Eg: hundred square grid, number line

e. Forms different numbers, given any two number cards excluding zero.
   Eg: largest number and smallest number

f. Partitions 2-digit numbers (up to 99) in different ways, including into multiples of 10 and 1.

g. Reads, writes and says whole numbers up to 100 in figures and words.

h. Records numbers up to two digits using expanded notation.
   Eg: 35 = 30 + 5

i. Recognises that the position of a digit gives its value, in relation to 2-digit numbers and knows what each digit represents.

j. Says the name and writes the numeral for the number that is 1 or 10 more or less than a given 1 digit or 2 digit number.

k. Uses ordinal numbers to tenth.
**Topic: Estimating and Rounding**

**Outcome N1.3:**
Use the vocabulary of estimation; and makes an estimation of objects.

**Indicators:**

This is evident when the student:

a. Estimates a number of objects up to about 30.

b. Uses the appropriate vocabulary in estimation.

*Eg: about, not less than, almost ....*

---

**Sub-strand: Addition and Subtraction (N2)**

**Topic: Understanding Addition and Subtraction**

**Outcome N2.1:**
Demonstrate and use the operation of addition and subtraction and the related vocabulary.

**Indicators:**

This is evident when the student:

a. Demonstrates that addition is combining two or more groups and subtraction is taking group/s of things away from another.

b. Relates addition to counting on.

c. Relates subtraction as finding the difference between and "how many more to make ..." (complementary addition).

d. Recognises that subtraction is the inverse of addition.

e. Recognises that adding and subtracting zero leaves a number unchanged.

f. Responds rapidly to oral questions phrased in a variety of ways such as.

*Eg: 3 add 1, add 2 to 4, 6 plus 3, what is the sum/total of 2 and 8?*

g. Responds rapidly to oral questions phrased in a variety of ways such as.

*Eg: take away 2, Take 2 from 7, 7 subtract 3, Subtract 2 from 11*

h. Finds the value of the missing term(s) in addition or subtraction sentences.

*Eg: 3 + 5= 8, 2 + ?= 5, 5 - ? + 2, 8 - ?= 6, 5 = ? - 2*

i. Records addition and subtraction sentences using +, – and =.

j. Recognises that addition can be done in any order but not subtraction.

k. Uses the commutative principle (not the name) in addition.

*Eg: 2 + 3 = 5 or 3 + 2 = 5*

l. Uses associative principle (not the name; pair up in any order that is easier to add) in adding three 1-digit numbers.

*Eg: 4 + 1 + 5 = (4 +1) + 5 or (5 + 4) + 1*

m. Creates simple addition and subtraction stories.

*Eg: Tell a story which could be represented by 5 + 6 or 10 – 3*

n. Solve 1 step word problems involving addition and subtraction.
**Topic: rapid recall of addition and subtraction facts**

**Outcome N2.2:**
Derive and recall doubles of all numbers up to 10. Recalls all addition and subtraction facts up to 5.

**Indicators:**

This is evident when the student:

a. Derives and recalls doubles of all numbers from 1+1 to 10+10.

b. Responds rapidly to oral questions phrased in a variety of ways.

_Eg: double 4, half of 6, two fives_

c. Derives and recalls all pairs of numbers with a total of 10.

_Eg: \( \underline{3} + 4 = 10, \underline{5} + \underline{5} = 10 \)

d. Recalls all addition and subtraction facts for all numbers up to 5.

**Topic: Mental calculation strategies of addition and subtraction**

**Outcome N2.3:**
Count on to find the sum of two numbers. Partition into ones and use in addition. Find a small difference by counting up. Identify and use near doubles in addition. Derive new facts using number facts already known.

**Indicators:**

This is evident when the student:

a. Counts on from the larger number to find the sum of two numbers.

_Eg: 3+8 (start from 8 and say 9, 10, 11)_

b. Partitions 6, 7 or 8 into “5 and a bit” then recombine for efficient mental calculations. (U+U)

c. Finds a small difference by counting up (recognises that when two numbers are close together, it is easier to find a difference by counting up, not counting back).

_Eg: 13–9_

d. Identifies and uses near doubles using doubles already known to speed up addition. (up to 10)

e. Adds 9 to single-digit numbers by adding 10 then subtracting

_Eg: 6 + 9 = 6 + 10 – 1_

f. Develop and recognises a pattern such as:

_Eg: 7 + 0 = 7, 6 + 1 = 7, 5 + 2 = 7 OR 10 – 0 = 10, 10 – 1 = 9, 10 – 2 = 8._

g. Given three numbers, say or write four different sentences relating these numbers.

_Eg: given 2, 7 and 9, say or write: 7 + 2 = 9, 2 + 7 = 9, 9 – 2 = 7, 9 – 7 = 2_

h. Uses known number facts of addition and subtraction to derive new facts.
### Sub-strand: Money (N3)

**Topic: Money**

**Outcome N3.1:** Recognise, sort and order coins and notes with different face values. Carry out simple transactions. Solve 1 step word problems involving money and explain the process.

**Indicators:**

**This is evident when the student:**

- a. Recognises coins and notes of different values up to MVR. 100.
- b. Sorts and describes money up to MVR. 100.
- c. Sorts coins and notes into Rufiyaa and Laari up to Rf. 100
- d. Orders a collection of Laari up to 50 L according to the face value.
- e. Orders a collection of Rufiyaa up to MVR. 100 according to the face value.
- f. Exchanges money for goods in a play situation by paying the exact amount 5, 10, 20, 50 or 100 respectively up to MVR. 100. (exclude combinations of Rufiyaa and Laari E.g: MVR.7.25).
- g. Works out how to pay an exact sum using smaller notes and coins (exclude combinations of Rufiyaa and Laari).
- h. Shows different ways of making up MVR.20, using MVR.1, MVR.2 and MVR. 5.
- i. Begins to use right notation for Rufiya and laari.  
  
  E.g: MVR and L
- j. Pays appropriate amounts and determines appropriate change in shopping, up to MVR.20. (exclude combinations of Rufiyaa and Laari)
- k. Partitions money values up to MVR. 20, using MVR.10 notes and MVR.1 coins.
- l. Solves 1 step word problems in the context of money, and explain how the problem was solved.

### Sub-strand: Fractions, Decimals and Percentages (N4)

**Topic: Fractions**

**Outcome N4.1:** Recognise, read and write simple fractions in practical contexts.

**Indicators:**

**This is evident when the student:**

- a. Makes halves and quarters by folding paper.
- b. Recognises halves and quarters of shapes.
- c. Reads and writes one half (1/2) and one quarter (1/4) using numbers.
- d. Begins to position halves on a number line.  
  
  E.g: place 5 1/2 on a number line, and recognise that it lies mid-way between 5 and 6.
- e. Begins to recognise and find one half and one quarter of small number of objects.
- f. Orders three containers according to their capacity.
- g. Suggests things that could be measured using jugs, condensed milk tin, bottle caps etc.
h. Makes simple measuring devices.
   *Eg: Put a vertical strip on a large jar to measure cups full. Use the jar to measure the capacity of some smaller containers*

i. Records capacity of containers as the number and type of unit used.
   *Eg: 5 cups, 7 tins, 3 jugs*
Strand – 2: Measurement (M)

Sub-strand: Length (M1)

Topic: Length

Outcome M1.1:
Understand and use the vocabulary related to length; estimate, measure, compare and record lengths using the appropriate arbitrary units.

Indicators:
This is evident when the student:

a. Uses everyday language to describe lengths and distances.
   *Eg: high, low, far, near............

b. Makes direct comparisons (side by side, no counting) of two or more objects in a variety of contexts and describes them as taller or the tallest, shorter or the shortest, longer or the longest.

c. Estimates and measures lengths and distances by placing arbitrary units end-to-end without gaps or overlaps.

d. Compares lengths of two objects by counting the units.

e. Suggests things that could be measured using rulers, matchsticks, metre sticks etc.

Sub-strand: Mass (M2)

Topic: Mass

Outcome M2.1:
Understand and use the vocabulary related to mass; estimate, measure, compare and record mass (weight) using the appropriate arbitrary units.

Indicators:
This is evident when the student:

a. Describe objects in terms of their weight using everyday language
   *Eg: heavy, light, easy to lift....

b. Determines the weight of an object as heavier than or lighter than another object by hefting.

c. Compares two or more objects and determines which one is heavier or the heaviest, lighter or the lightest by hefting.

d. Determines which of two objects is heavier or lighter by using an equal arm balance (direct comparison).

e. Estimates, measures, and records weight of objects with arbitrary units using an equal arm balance.

f. Orders the weight of three objects
   *Eg: pebble, sponge, toy, by hefting. Checks by using an arm balance.

h. Suggest things that could be measured using shells, matchboxes filled with sand (taped up) etc.

i. Record weights as the number and type of unit used
   *Eg: 5 shells, 7 sand matchboxes.
Sub-strand: Capacity (M3)

Topic: Capacity

Outcome M3.1:
Understand and use the vocabulary related to capacity; estimate, measure, compare and record using the appropriate arbitrary units. Suggest a suitable measuring equipment.

Indicators:

This is evident when the student:

a. Describes capacities of containers using everyday language.  
   *Eg: “full”, “empty”, “a lot”, “a little”, “more”, “less”, “the same”*

b. Compares capacities of two or more containers by direct comparison and describes as “holds most”, “holds least”.

c. Compares capacities by pouring water/sand from one container into another.

d. Recognises that two containers of different shape may hold the same amount.

e. Counts, compares and records the number of cups or cartons of water/sand needed to fill different containers.

f. Estimates and measures the capacity of containers using arbitrary units.

Sub-strand: Time (M4)

Topic: Time

Outcome M4.1:
Use everyday language to describe time, sequence events, measure the duration of events using arbitrary units. Read, tell and record time to the nearest half hour. Know the seven days of the week. Find the relationship between the units of time.

Indicators:

This is evident when the student:

a. Uses and responds to terms “before”, “now”, “after”, “yesterday”, “today”, “tomorrow” etc.

b. Identifies and states fathis, hendhunu, mendhuru, haveeru, reygandu and dhanvaru from a set of picture cards.

c. Orders familiar events in a day or week, or in a story.  
   *Eg: Own daily activities “woke up”, “got dressed”, “had breakfast”.*

d. Measures the duration of events using arbitrary units.  
   *Eg: clapping, snapping fingers, counting.*

e. Names and orders the days of the week and identifies week-days and weekend days.

f. Reads and tells time to the hour and half hour using analogue clocks.

g. Identifies the time (to the nearest hour and half hour) of everyday events.  
   *Eg: “Lunch time is 12 o’clock”, “Bedtime is Half past 8”.*

h. Matches an event to a particular day.  
   *Eg: “We have PE on Tuesday” or “We go for Juma prayers on Fridays”.*

i. Recognises that: 1 week = 7 days, 1 day = 24 hours

j. Makes estimates and checks using a simple timer in PE or in other activities.  
   *Eg: What can you do while the sand runs through the timer?*
**Strand – 3: Shape and Space (SS)**

**Sub-strand: 3D Shapes (SS1)**

**Topic: 3D Shapes**

**Outcome SS1.1:** Recognise, name, sort, and make models of 3D objects and describe them using everyday language.

**Indicators:**

**This is evident when the student:**

a. Begin to use everyday language to describe features of 3D shapes (cubes, cuboids, cylinders, spheres and cones) and sort in different ways on their attributes such as faces, corners and edges.

b. Collects examples of cubes, cuboids, cylinders, spheres and cones and match them to name labels.

c. Selects cubes, cuboids, cylinders, spheres and cones from a collection of 3D objects.

d. Recognises and describes 3D objects displayed differently.
   
   *Eg: objects in a feely bag*

 e. Begins to relate 3D shapes to pictures of them.

 f. Places 3D objects on a paper, observes from vertically above and draws the shape.

**Sub-strand: 2D Shapes (SS2)**

**Topic: 2D Shapes**

**Outcome SS2.1:** Recognise, name, sort, and make models of 2D objects and describe them using everyday language.

**Indicators:**

**This is evident when the student:**

a. Uses everyday language to describe features of 2D shapes

   *Eg: circles, rectangles, squares and triangles.*

b. Collects examples of circles, rectangles, squares and triangles and match them to name labels.

c. Sorts and describes sorted shapes using everyday language.

d. Chooses shapes to exhibit two or more attributes

   *Eg: a large and blue square, a small thick yellow circle.*

e. Builds up various compound shapes using 2D shapes.

f. Builds up various shapes by placing two appropriate tangram pieces.

g. Makes squares, rectangles and triangles using straws or iloshi.

h. Draws a recognisable square, rectangle, circle and triangle.

i. Makes symmetrical shapes by tearing and cutting folded papers.
Sub-strand: Positions and Directions (SS3)

**Topic: Position and Direction**

**Outcome SS3.1:**
Use everyday language to describe positions and directions, give directions and follow short paths and build paths, describe positions.

**Indicators:**

This is evident when the student:

a. Identifies own left and right body parts.
   *Eg: right hand, left eye*

b. Responds to placement instructions.
   *Eg: stand behind, beside, between, in front of, opposite to a tree*

c. Describes where an object is placed.
   *Eg: under the table*

d. Describes a short path on square grids using forward, turn left/right.

e. Describes where objects are using left and right.
   *Eg: the windows are on my left*

f. Describes the position of an object on a large sheet of paper.
   *Eg: at the bottom, near the middle, at the edge*

g. Moves in response to simple instructions.
   *Eg: four steps forward and turn to left*

h. Builds a path with sticks and counters
   *Eg: the road from home to school*

Sub-strand: Angles (SS4)

**Topic: Angles**

**Outcome SS4.1:**
Recognise and talk about movements and make turns.

**Indicators:**

This is evident when the student:

a. Identifies objects that turn about a point
   *Eg: spinning tops, taps, wheels, fans, the hands of clock, the blades of scissors*

b. Identifies objects that turn about a line.
   *Eg: door, the pages of a book, a hinged lid*

c. Recognises and make whole turns and half turns.
   *Eg: make 2 whole turns to your left, make a half turn to your right*

d. Make things that turn, such as a simple clock with hands.
Topic: Handling Data

Outcome CH1.1: Solve a given problem by collecting, sorting and organising information in simple ways.

Indicators:

This is evident when the student:

a. Sorts objects/pictures according to a common feature.

b. Makes and organise a list.
   
   *Eg: subjects you study, all the days of the week, names with seven letters*

c. Collects data and make and organise a table.
   
   *Eg: color of taxis passing by*

d. Responds to questions such as
   
   *Eg: Who can hold most shells?*

e. OR, Who can hold more shell than Ali?)

f. Collects information by voting or sorting, then represent it by drawing or placing objects or pictures.
   
   *Eg: use towers of bricks or linking cubes, placing a brick or cube on the correct tower*

g. Responds to questions such as,
   
   *Eg: How many children did we ask? OR, Which ice cream did children like best? OR, How do you know?*
### Strand – 5: Patterning and Algebra (PA)

### Sub-strand: Sequences and Properties of Numbers (PA1)

#### Topic: Number Sequences

**Outcome PA1.1:** Identify, create, predict and extend patterns using familiar materials

**Indicators:**

- **This is evident when the student:**
  - a. Copies and continues simple patterns actions or sounds.
    
    *Eg: clap-clap-stamp.*
  - b. Continues simple patterns made from variety of materials, shapes, pictures or letters. *Eg: a a b c a a b c a a b c a, OR green blocks alternating with red blocks*
  - c. Recognises and extends number sequences with differences of 1 or 2.
    
    *Eg: 7, 8, 9, __, 11, 12, __, __, 15, OR 8, 7, 6, 5, __, 3, __, __*
  - d. Corrects errors in simple patterns using a variety of materials, shapes, or pictures.
  - e. Creates simple patterns using a variety of materials, shapes, or pictures.
    
    *Eg: using children in the class: boy, girl, boy, OR a necklace beginning with two leaves, three flowers, one bud, OR using stamps and stamp pads for students to create patterns*
  - f. Uses addition facts to generate simple patterns in hundred square grid.

#### Topic: Properties of Numbers

**Outcome PA1.2:** Recognise odd and even numbers

**Indicators:**

- **This is evident when the student:**
  - a. Recognises odd and even numbers to at least 30 "as every other number".

### Sub-strand: Investigations, Puzzles and Problems (PA2)

#### Topic: Investigations Puzzles and Problems

**Outcome (PA2.1):** Solve simple mathematical problems and puzzles and explain the process.

**Indicators:**

- **This is evident when the student:**
  - a. Solves simple mathematical problems and puzzles. (Refer to: Mathematical investigations, puzzles and problems in the teacher’s guide)
  - b. Explains methods by reasoning how the problem was solved.
GRADE 2 SYLLABUS DETAILS
GRADE 2

Strand – 1: Numbers (N)

Sub-strand: Number Concept (N1)

Topic: Counting

Outcome N1.1:
Count numbers up to 3-digits (999) in Dhivehi and English. Skip-count forwards or backwards. Count reliably a set of objects.

Indicators:
This is evident when the student:

a. Counts a set of objects to at least 100.
b. Counts larger collections by grouping them.
c. Skip-counts forwards or backwards by ones, twos, fives, tens, threes and hundreds, from a given number.

Topic: Place Value and Ordering

Outcome N1.2:
Recognise the value of numbers up to 3-digits (999).

Indicators:
This is evident when the student:

a. Represents numbers (largest number, smallest number and different combinations given any three number cards) up to 3-digits using different materials.

   Eg: abacus, number cards

b. Identify the number that comes after, before or between given numbers up to 999.

c. Compares numbers up to 999 in different ways.

   Eg: more than, less than and equal to

d. Orders and positions numbers up to 999 onwards.

   Eg: hundred square grids, number line

e. Forms different numbers, given any three number cards.

   Eg: largest number and smallest number

f. Partitions 3-digit numbers in different ways, including into multiples of 100, 10 and 1

g. Reads, writes and says numbers up to 3-digits in figures and words.

h. Records numbers up to three digits using expanded notation.

   Eg: 489 = 400 + 80 + 9.

i. Recognises that the position of a digit gives its value, in relation to 3-digit numbers and knows what each digit represents.

j. Says the name and writes the numeral for the number that is 1, 10 or 100 more
or less than a given 1 to 3 digit number.

k. Reads and uses the ordinal number names and symbols up to “thirty first”

**Topic: Estimating and Rounding**

**Outcome N1.3:** Use the vocabulary of estimation; and makes an estimation of objects.

**Indicators:**

This is evident when the student:

- a. Estimates a number of objects up to about 50.
- b. Uses the appropriate vocabulary in estimation.

*Eg: about, not less than, not more than, almost.*

**Sub-strand: Addition and Subtraction (N2)**

**Topic: Understanding Addition and Subtraction**

**Outcome N2.1:** Demonstrate and use the operation of addition and subtraction and the related vocabulary.

**Indicators:**

This is evident when the student:

- a. Relates addition to counting on steps along a number line.
- b. Relates subtraction as finding the difference between and complementary addition.
- c. Recognises that subtraction is the inverse of addition.
- d. Recognises that adding and subtracting zero leaves a number unchanged.
- e. Responds rapidly to oral or written questions phrased in a variety of ways, such as,

  *Eg: 27 add 10, Add 60 to 30, 4 plus 18*

- f. Responds rapidly to oral or written questions phrased in a variety of ways, such as,

  *Eg: 7 take away 3, Take 30 from 70, 14 subtract 2*

- g. Finds the value of the missing term(s) in addition or subtraction sentences.

  *Eg: 31 – 7= , 20 = 12 + , + = 35, 8 = 17 – , – 15 = 45*

- h. Records addition and subtraction sentences using +, – and =.
- i. Recognises that addition can be done in any order but not subtraction.
- j. Uses the commutative principle (not the name) in addition.

  *Eg: 2 + 3 = 5 or 3 + 2 = 5*

- k. Uses associative principle (not the name; pair up in any order that is easier to add) in adding three 1-digit numbers.

- l. Creates simple addition and subtraction stories.

  *Eg: Tell a story which could be represented by 35 + 16 or 25 – 3*

- m. Solve 2 step word problems involving addition and subtraction.
Topic: Rapid recall of Addition and Subtraction Facts

Outcome N2.2:
Derive and recall:
- doubles of all numbers up to 15,
- doubles of multiples of 5 up to 50; all pairs of numbers that totals 20, and all pairs of multiples of 10 that totals 100. Recalls all addition and subtraction facts up to 10.

Indicators:
This is evident when the student:

a. Derives and recalls doubles of all numbers from 1+1 to 15+15.

b. Derives and recalls doubles of multiples of 5 from 5+5 to 50+50.

Eg: 35+35=70

c. Derives and recalls all pairs of numbers with a total of 20.

Eg: 16+4 = 20, 16 + 4 = 20

d. Derives and recalls all pairs of multiples of 10 that total 100.

Eg: 10 + 20 = 100, 10 + 20 = 100

e. Recalls all addition and subtraction facts for all numbers up to 10

Topic: Mental Calculation Strategies of Addition and Subtraction

Outcome N2.3:
Count on to find the sum of two numbers. Partition into ones and uses in addition. Add several numbers. Find a small difference by counting up. Identify and uses near doubles in addition. Derive new facts using number facts already known.

Indicators:
This is evident when the student:

a. Counts on from the larger number to find the sum of two numbers.

Eg: 5+16 (start from 16 and say 17, 18, ..... 21

b. Adds three numbers by using strategies such as:

c. look for pairs that make 10 and do these first;

d. start with the largest number.

e. Partitions 6, 7, 8 and 9 into "5 and a bit" then recombines for efficient mental calculations. (U+U)

f. Finds a small difference by counting up (recognises that when two numbers are close together, it is easier to find a difference by counting up, not counting back).

Eg: 82–79

g. Identifies and uses near doubles using doubles already known to speed up addition. (up to 15).

h. Adds or subtracts 11 or 21, 9 or 19, to / from any two-digit number.

i. Identifies and uses near doubles using doubles already known to speed up addition. (up to 10)

j. Adds 9 to single-digit numbers by adding 10 then subtracting

Eg: 6 + 9 = 6 + 10 – 1

k. Develop and recognises a pattern such as:

Eg: 3 + 5 = 8, 13 + 5 = 18, 23 + 5 = 28 OR 4 – 3 = 1, 14 – 3 = 11, 24 – 3 = 21

l. Recognise and use the patterns such as,

Eg: 4 + 3 = 7, 40 + 30 = 70, 400 + 300 = 700
m. Given three numbers, say or write four different sentences relating to these numbers.

Eg: Given 2, 7 and 9, say or write: 7 + 2 = 9, 2 + 7 = 9, 9 – 2 = 7, 9 – 7 = 2

n. Uses known number facts of addition and subtraction to derive new facts.

Topic: Pencil and paper procedures of Addition and Subtraction

Outcome N2.4:

Develop written methods for addition, building on mental methods.

Indicators:

This is evident when the student:

a. Uses the method counting on in multiples of 10 or 1 in adding TU&U, TU&TU.

Eg: 86+57 = 86+50+7 = 136+4+3 = 143

b. Uses the method adding the most significant digits first in adding TU&TU

c. Uses the method counting up from the smaller to the larger number (complementary addition) in subtracting TU&U, TU&TU.

Eg: 84 –56 = ?, 56+4+20+4 = 84

d. Uses the compensation (take too much, add back) method in subtracting TU & U, TU&TU.

Eg: 84 –56 = ?, 84 –60+4 = 28

Sub-strand: Multiplication & Division (N3)

Topic: Understanding Multiplication and Division

Outcome N3.1:

Represent the operation of multiplication or division and their relationship to addition and subtraction. Solve 1 step word problems involving multiplication or division and explain the process.

Indicators:

This is evident when the student:

a. Uses appropriate vocabulary to support multiplication and division.

b. Relates repeated addition to multiplication.

Eg: 5 added together 3 times is 5 + 5 + 5, or 3 lots of 5, or 3 times 5, or 5 × 5 or 3 × 5.

c. Describes an array.

Eg: array of 8 objects = 2x4 or 4x2

d. Recognises that multiplication by 1 leaves a number unchanged.

e. Shares a number of items into equivalent groups (sharing equally).

Eg: 6 cups are shared equally between 2 people. How many cups does each one get?

f. Makes equal groups of objects (Grouping).

Eg:

a) There are 18 apples in a box. How many bags of 3 apples can be filled?

b) Count from zero in tens, for example, to 60. How many tens did you count?

c) Interpret 8 ÷ 2 as ‘how many 2s make 8?’
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3. Recognises from arranging arrays that multiplication can be done in any order.
   
   *Eg: 4 lots of 2 and 2 lots of 4 are the same.*

4. Begin to recognise that division is the inverse of multiplication.

5. Responds rapidly to oral or written questions such as.
   
   *Eg: two fives, double 5, 6 times 2, 5 multiplied by 2, multiply 4 by 2*

6. Responds rapidly to oral or written questions phrased in a variety of ways, such as.
   
   *Eg: share 18 between 2, divide 6 by 3, how many tens make 80?*

7. Finds the value of the missing term(s) in multiplication or division sentences.
   
   *Eg: 3 × 2 = ☐, 30 ÷ 2 = ☐*

8. Records multiplication and division sentences using ×, ÷ and =.

9. Recognises that multiplication can be done in any order but not division.

10. Uses the commutative principle (not the name) in multiplication.

11. Creates simple multiplication and division stories.
   
   *Eg: tell a story which could be represented by 3 × 5 or 16 ÷ 2*

12. Solves 1 step word problems involving multiplication and division.

13. Explains how an answer to a multiplication or division problem was obtained.

**Topic: Rapid Recall of Multiplication and Division**

**Outcome N3.2:**

Derive multiplication facts and the related division facts for 2, 3, 4, 5 and 10. Recall or derive rapidly doubles and halves.

**Indicators:**

This is evident when the student:

- Derives multiplication facts for 2, 3, 4, 5 and 10 times-tables and the related division facts.

- Responds rapidly to oral or written questions phrased in a variety of ways, such as.

  *Eg: six twos, 3 times 2, 5 multiplied by 2*

- Derives quickly.

  *Eg: doubles of numbers 1 to 15, doubles of 5, 10, 15... to 50, halves of even numbers to 20*

- Responds quickly to oral or written questions phrased in a variety of ways, such as.

  *Eg: double 8, double 35, half of 18, Twice 6, Sarah spent half of her Rf 16. How much did she spend?*

- Recalls multiplication tables of 2, 5 and 10.
Sub-strand: Money (N4)

Topic: Money

Outcome N4.1:
Recognise, sort and order coins and notes with different face values. Carry out simple transactions. Record money amounts and solves 2 step word problems and explains the process.

Indicators:
This is evident when the student:

a. Recognises coins and notes of different values up to MVR.500.
b. Sorts and describes money up to MVR.500.
c. Sorts coins and notes into Rufiyaa and Laari up to MVR.500.
d. Orders a collection of Laari up to 50 L according to the face value.
e. Orders a collection of Rufiyaa up to MVR.500 according to the face value.
f. Exchanges money for goods in a play situation by paying the exact amount up to MVR.500.
g. Begins to recognise that MVR.1 = 100 L
h. Works out how to pay an exact sum using smaller notes and coins.
i. Shows different ways of making up to MVR.100 using smaller coins and notes.
j. Uses numbers and appropriate unit(s) to record the value of a set of coins and notes.
k. Pays appropriate amounts and determines appropriate change in shopping, up to MVR.50.
l. Starts converting amounts of money.
   Eg: Rufiyaa to Laari, and Laari to Rufiyaa.
m. Partitions money values up to MVR.50, using MVR. 10 notes and MVR. 1 coins.
   Eg: MVR. 23 = MVR. 10 + MVR. 10 + MVR. 1 + MVR. 1
n. Solves 2 step word problems in the context of money, and explain how the problem was solved.

Sub-strand: Fractions, Decimals and Percentages (N5)

Topic: Fractions

Outcome N5.1:
Recognise, read, write, and compare, make estimations in simple fractions.

Indicators:
This is evident when the student:

a. Makes sixths and eights by folding paper.
b. Recognises halves, quarters, thirds, three quarters, two thirds and tenths as fractions of shapes.
c. Reads and writes fractions as 1/2, 1/4, 1/3, 3/4, 2/3.
   Eg: read and write 1/4 as quarter, 2/3 as two thirds.
d. Recognises that two halves or four quarters will make one whole.
e. Recognises different equivalent fractions.
   Eg: two halves, four quarters, or one half and two quarters will make one
whole, two quarters are the same as one half, one half is equivalent to five tenths, ten tenths make one whole, one whole is three quarters plus one quarter, three tenths plus seven tenths, one quarter is half of one half.

f. Estimates and marks 1/2, 1/4, 3/4 and tenths to the blank fraction strip with a paper clip.

g. Begins to recognise a given fraction on a number line.

Eg: one half is greater than one quarter, one half is less than three quarters, three quarters lies between one half and one whole.

h. Recognises and find one half and one quarter of small number of objects.
Strand – 2: Measurement (M)

Sub-strand: Length (M1)

Topic: Length

Outcome M1.1:
Understand and use the vocabulary related to length; suggest a suitable unit to estimate or measure length. Know and use relationships between familiar units. Draw and measure lines accurately.

Indicators:

This is evident when the student:

a. Uses vocabulary related to measures ‘length’
   Eg: thin, thick, narrow the same.

b. Explains the importance of standard units in measuring lengths and distances.

c. Identifies objects that are longer than, shorter than and approximately same as 1 metre, 1 centimetre and 10 centimetres.

d. Estimates and measures distances to the nearest metre.

e. Estimates and measures lengths of objects in centimetre.

f. Suggests things that could be measured using metres, centimetres.
   Eg: the height of a door, the length and width of a notebook, the length of the classroom.

g. Uses a ruler to draw and measure lines to the nearest centimeter.

h. Recognises that 100 cm is 1 m.

i. Uses the abbreviation for metre (m) and centimetre (cm) in recording the measurements.

j. Makes simple measuring devices.
   Eg: make a paper tape measure to measure with.

Sub-strand: Mass (M2)

Topic: Mass

Outcome M2.1:
Understand and use the vocabulary related to mass (weight); suggest a suitable unit and equipment to estimate and measure mass. Know and use relationships between familiar units.

Indicators:

This is evident when the student:

a. Uses vocabulary related to measures ‘mass’ (weight).
   Eg: heavy, light, easy to lift, difficult to lift.

b. Explains the importance of standard units.

c. Recognises objects that have a weight more than, less than, or about 1 kilogram.

d. Makes a weight set with modeling clay. (a 100 g ball, a 50 g ball, three 10 g balls).

Eg: 100 g balls, 50 g balls & 10 g balls) using an equal arm balance.

e. Estimates and measures weight of objects with modelling clay / plasticine balls.

f. Orders the weight of two or more objects by hefting.
Eg: checks by using a balance.


g. Orders objects of different weight by weighing the objects using an equal arm balance.

h. Selects the appropriate unit (kg, g) and the appropriate equipment (balance, scale, bathroom scale) to measure weight of objects.

i. Begins to recognise that 1000 g is 1 kg.

j. Uses the abbreviation for kilogram (kg) and gram (g) in recording weight of objects.

Sub-strand: Capacity (M3)

Topic: Capacity

Outcome M3.1:
Understand and use the vocabulary related to capacity; suggest a suitable unit to estimate or measure capacity. Know and use relationships between familiar units.

Indicators:
This is evident when the student:

a. Uses vocabulary related to measures (capacity).

b. Recognises that two containers of different shape may hold the same amount.

c. Counts, compares and records the number of cups or cartons (100 ml) of water/sand needed to fill different containers.

d. Explains the importance of standard units.

e. Identifies from range of containers those that have a capacity of more than, less than and about 1 litre.

f. Estimates and measures the capacity of containers to the nearest litre and 100 millilitres using a measuring cylinder.

g. Orders three or more containers according to their capacity.

h. Suggests things that could be measured using litres, millilitres.

i. Calibrates a clear container using cups/cartons (100 ml) up to 10 cups/cartons.

j. Begins to recognise that 1 litre is 1000 millilitres.

k. Uses the abbreviation for litre (l) and millilitre (ml) in recording capacities.

Sub-strand: Time (M4)

Topic: Time

Outcome M4.1:
Use vocabulary related to time. Estimate the duration of an event in time units. Read, tell and record time. Read calendar and find the relationship between the units of

Indicators:
This is evident when the student:

a. Uses vocabulary related to time.

Eg: hour, minute.

b. Names and orders the months of the year (Gregorian).

c. Reads and tells time to the hour, half hour and quarter hour using analogue clocks.
time. Read, tell and record time to the nearest quarter hour. Know the months of the Gregorian calendar.

d. Reads and tells time using digital clocks.

e. Matches an event to a particular month.

   *Eg: Independence day in July, Teachers’ day in October, Children’s day in May.*

f. Reads and writes the date of a particular day.

g. Recognises different units of time and its conversions. (1 week = 7 days, 1 day = 24 hours, 1 hour = 60 minutes, 1 minute = 60 seconds).

h. Makes estimates and checks using a timer in PE or in other activities.

   *Eg: who takes least/most time to hop across the school playground, what takes about 10 seconds, 1 minute, 1 hour?*

i. Uses a stopwatch to measure and record duration of events in hours, minutes and seconds.
**Strand – 3: Shape and Space (SS)**

**Sub-strand: 3D Shapes (SS1)**

**Topic: 3D Shapes**

**Outcome SS1.1:**
Recognise, name, sort, and make models of 3D objects and describe them using everyday language.

**Indicators:**

This is evident when the student:

a. Uses mathematical vocabulary to describe 3D objects (cubes, cuboids, cylinders, spheres and cones) and sort in different ways on their attributes such as faces, corners and edges.

b. Collects examples of cubes, cuboids, cylinders, spheres and cones and match them to name labels.

c. Identifies vertices, edges, and faces of 3D objects.

d. Selects cubes, cuboids, cylinders, spheres and cones from a collection of 3D objects.

e. Recognises and describes 3D objects displayed differently.

Eg: objects in a feely bag.

f. Relates 3D shapes to pictures of them.

g. Uses cubes to make ‘single-layered’ solids from pictures.

h. Places 3D objects on a paper, observes from vertically above and draws the shape.

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**Sub-strand: 2D Shapes (SS2)**

**Topic: 2D Shapes**

**Outcome SS2.1:**
Recognise, name, sort, and make models of 2D objects and describe them using everyday language.

**Indicators:**

This is evident when the student:

a. Uses mathematical vocabulary to describe 2D shapes (circles, rectangles, squares, triangles, pentagons, hexagons, heptagons and octagons).

b. Collects examples of circles, rectangles, squares, triangles, pentagons, hexagon and octagon and match them to name labels.

c. Sorts a set of flat shapes according to properties.

Eg: the numbers of corners, the number of sides, whether the sides are straight or curved.

d. Chooses shapes to exhibit two or more attributes.

Eg: a small and blue hexagon, a big thin yellow triangle.

e. Builds up various compound shapes using 2D shapes.

f. Builds up various shapes by placing three appropriate tangram pieces.
g. Makes new shapes by combining four and five squares.

h. Draws a recognisable square, rectangle, circle and triangle.

i. Begins to recognise and draws at least one line of symmetry of a shape which has more than one line of symmetry.

j. Makes symmetrical designs using ink and paper.

k. Completes a symmetrical pattern by making or drawing the other half of it.

_Eg: using a pegboard._

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**Sub-strand: Positions and Directions (SS3)**

**Topic: Position and Direction**

**Outcome SS3.1:**
Describe positions, directions, give directions and follow short paths and draws simple paths or informal maps.

**Indicators:**

_This is evident when the student:_

a. Identifies positions of things in the immediate environment.

_Eg: tv is right of the book shelf._

b. Responds to instructions, such as “move clockwise” and “anti-clockwise”.

c. Describes clearly where an object is located

_Eg: the joalifathi is behind the house, next to the tree._

d. Describes a short path on square grids using forward, turn left/right.

e. Describes the location of object using several descriptors.

_Eg: the books are on the second shelf and third from the left._

f. Uses squared paper and a counter to move from a square near the centre of the paper to a square near the edge.

_Eg: describing the route as 3 squares along and 2 squares down, or 3 squares to the left and 2 square up._

g. Moves in response to instructions.

_Eg: move 2 steps forward, turn anticlockwise to the tree, go forward 7 steps._

h. Draws a familiar path.

_Eg: the road from home to school._

i. Draws some land marks when drawing an informal map of own street.

_Eg: houses, mosques, shops._

j. Gives instructions for someone else to follow to find a route through simple maze drawn on squared paper.
Sub-strand: Angles (SS4)

Topic: Angles

Outcome SS4.1:
Identify angles, recognise and make right angles and make turns to clockwise and anticlockwise directions.

Indicators:

This is evident when the student:

a. Identifies angles found in the environment.

b. Recognises that a right angle represents a quarter turn.

c. Folds paper to make a right angle and use it to find right angles.
   *Eg: right angled corners in the classroom.*

d. Recognises and use whole, half and quarter turns, both clockwise and anticlockwise.

e. Uses geo-strips to make and draw half and quarter turns from the same starting point of different orientations.

f. Recognises that a square and a rectangle have right angles at each corner/vertex.
Strand – 4: Chance and Handling Data (CH)

Sub-strand: Handling Data (CH1)

Topic: Handling Data

Outcome CH1.1:
Solve a given problem by collecting, sorting, classifying and organising data as a list or a tabulated form.

Indicators:

This is evident when the student:

a. Classifies numbers and organise them in lists and simple tables.

   *Eg: all the multiples of 10 from 0 to 100, six different numbers that are less than 50, all the even numbers from 12 to 28.*

b. Collects data and makes a simple table.

   *Eg: data collected on favourite drinks.*

c. Responds to questions related to a given data.

   *Eg: what is the most common number of letters in a name, how many names have more than 5 letters, how many names have fewer than 5 letters?*

d. Collects data using various activities, and make a simple pictogram, where one symbol represents one unit.

   *Eg: collects data by a show of hands.*

e. Responds to questions based on a set of data.

   *Eg: how many children are in bed by half past seven, how many children go to bed at 8 o’clock, are more children in bed by half past seven than after half past seven, how many children altogether in the class?*
Strand – 5: Patternning and Algebra (PA)

Sub-strand: Sequences and Properties of Numbers (PA1)

Topic: Number Sequences

Outcome PA1.1: Recognise, copy and continue simple patterns, create them using familiar materials, predict and extend them.

Indicators:

This is evident when the student:

a. Continues simple patterns made from variety of shapes.

Eg: shapes of: big square, triangle, triangle, big square, triangle, triangle OR triangle, circle, square, triangle.

b. Recognises and extends number sequences with differences of 1, 2 or 3.

Eg: 0, 1, 2, 3, __, 5, 6, __, __, 10, 11, 12, __ OR 22, 21, 20, __, __, 17, 16, __, __, __, __, 12.

c. Describe simple patterns.

Eg: This pattern is made from a square and a circle repeating.

d. Corrects errors in simple patterns using a variety of shapes.

e. Creates simple patterns using a variety of shapes.

Eg: shapes of: big square, triangle, triangle, big square, triangle, triangle OR triangle, circle, square, triangle.

f. Uses addition facts to generate patterns in hundred square grids.

g. Uses multiplication facts to generate patterns in hundred square grids (multiples of 2, 3, 4, 5 and 10).

h. Describes number patterns in a hundred square grids.

Topic: Properties of Numbers

Outcome PA1.2: Recognise odd and even numbers.

Indicators:

This is evident when the student:

a. Recognises and continues sequences of odd and even numbers.

Sub-strand: Investigations, Puzzles and Problems (PA2)

Topic: Investigations Puzzles and Problems

Outcome PA2.1: Solve simple mathematical problems and puzzles and explain the process.

Indicators:

This is evident when the student:

a. Solves simple mathematical problems and puzzles. (Refer to: Mathematical investigations, puzzles and problems in the teachers resource guide)

b. Explains methods by reasoning how the problem was solved.
GRADE 3 SYLLABUS DETAILS
## Grade 3

### Strand – 1: Numbers (N)

#### Sub-strand: Number Concept (N1)

### Topic: Counting

**Outcome N1.1:**
Count numbers up to 4-digits (9999) in Dhivehi and English. Skip-count forwards or backwards.

**Indicators:**
- **This is evident when the student:**
  a. Skip-counts forwards or backwards by ones, twos, fives, tens, threes, hundreds and thousands, from a given number.

### Topic: Place Value and Ordering

**Outcome N1.2:**
Recognise the value of numbers up to 4-digits (9999).

**Indicators:**
- **This is evident when the student:**
  a. Represents numbers up to 4-digits using pictorial and symbolic materials.
    
    *Eg: Abacus, Number discs and place value charts.*
  b. Identify the number that comes after, before or between given numbers up to 9999.
  c. Compares numbers up to 9999 in different ways.
    
    *Eg: more than, less than and equal to.*
  d. Orders and positions numbers up to 9999 on.
    
    *Eg: number line.*
  e. Forms different numbers, given any four number cards.
    
    *Eg: largest number and smallest number.*
  f. Partitions 4-digit numbers in different ways, including into multiples of 1000, 100, 10 and 1.
  g. Reads, writes and says numbers up to 4-digits in figures and words.
  h. Records numbers up to four digits using expanded notation.
    
    *Eg: 6052 = 6000 + 50 + 2.*
  i. Recognises that the position of a digit gives its value, in relation to 4-digit numbers and knows what each digit represents.
  j. Says the name and writes the numeral for the number that is 1, 10, 100 or 1000 more or less than a given 1 to 4 digit number.
Topic: Estimating and Rounding

**Outcome N1.3:**

Use the vocabulary of estimation; make and justify estimates of numbers. Round off whole numbers.

**Indicators:**

This is evident when the student:

a. Estimates a number of objects up to about 100.

b. Uses the appropriate vocabulary in estimation.

*Eg: about, not less than, not more than, almost.*

c. Rounds any positive integer less than 1000 to nearest 10.

**Topic: Other Numerals**

**Outcome N1.4:**

Read and write other numerals.

**Indicators:**

This is evident when the student:

a. Reads and writes numbers in Arabic Indic (Hindu Arabic) numerals up to 30.

*Eg: ٩,٨,٧,٦,٥,٤,٣,٢,١,٠.*

**Sub-strand: Addition and Subtraction (N2)**

**Topic: Understanding Addition and Subtraction**

**Outcome N2.1:**

Demonstrate and use the operation of addition and subtraction and the related vocabulary.

**Indicators:**

This is evident when the student:

a. Relates addition to counting on steps along a number line.

b. Relates subtraction as finding the difference between and complementary addition.

c. Recognises that subtraction is the inverse of addition and uses this to check the results.

d. Recognises that adding and subtracting zero leaves a number unchanged.

e. Responds rapidly to oral or written questions phrased in a variety of ways.

*Eg: 94 add 10, add 60 to 14, 70 plus 50, what is the sum/total of 26 and 9?*

f. Responds rapidly to oral or written questions phrased in a variety of ways.

*Eg: 15 take away 8, take 8 from 15, 63 subtract 40, subtract 8 from 15, subtract 40 from 95.*

g. Finds the value of the missing term(s) in addition or subtraction sentences.

*Eg: \( \underline{\square} + \underline{\square} + \underline{\square} = 27, 5 + \underline{\square} + 16 = 49, 105 - \underline{\square} = 34 \)*

h. Records addition and subtraction sentences using +, – and =.

i. Recognises that addition can be done in any order but not subtraction.

j. Uses the commutative principle (not the name) in addition and identifies that this principle cannot be used in subtraction.

k. Uses associative principle (not the name; pair up in any order that is easier to
add) in addition.

l. Creates simple addition and subtraction stories.
m. Solve 3 step word problems involving addition and subtraction.

Topic: Rapid Recall of Addition and Subtraction Facts

Outcome N2.2:
Derive and recall: doubles of all numbers up to 20, and doubles of multiples of 5 up to 100; all pairs of multiples of 5 or 100 that totals 100 or 1000 respectively. Know by heart and recalls all addition and subtraction facts up to 20.

Indicators:
This is evident when the student:

a. Derives and recalls doubles of all numbers from 1+1 to 20+20.
b. Derives and recalls doubles of multiples of 5 from 5+5 to 100+100.
   Eg: 85 +85 = 170.
c. Derives and recalls all pairs of numbers with a total of 30.
   Eg: 4 + 4 = 30, 1 + 29 = 30.
d. Derives and recalls all pairs of multiples of 5 that total 100.
   Eg: 15 + 15 = 100, 10 + 90 = 100.
e. Derives and recalls all pairs of multiples of 100 that total 1000.
   Eg: 200 + 200 = 1000, 50 + 500 = 1000.
f. Recalls all addition and subtraction facts for all numbers up to 20.

Topic: Mental calculation strategies of addition and subtraction

Outcome N2.3:
Count on to find the sum of two numbers. Partition into tens and ones to use in addition. Add several numbers. Find a small difference by counting up. Identify and uses near doubles in addition. Derive new facts using number facts already known.

Indicators:
This is evident when the student:

a. Counts on from the larger number to find the sum of two numbers.
   Eg: 12 +25  add 10 to 25 and say 35, now count and say 36, 37.
b. Adds several small numbers by using various strategies.
   Eg: look for pairs that make 10 and do these first, start with the largest number, look for pairs that make 9 or 11, and add these to the total by adding 10 and then adjusting by 1.
c. Partitions two digits numbers into tens and units, adds the tens first. (TU+TU).
d. Finds a small difference by counting up (recognises that when two numbers are close together, it is easier to find a difference by counting up, not counting back).
   Eg: 504 – 498
e. Identifies and uses near doubles using doubles already known to speed up addition (up to 20).
f. Adds or subtracts 11 or 21, 9 or 19, to / from any three-digit number.
g. Develop and recognises a pattern.
   
   Eg: $14 + 3 = 17$, $14 + 13 = 27$, $14 + 23 = 37$, OR $68 - 5 = 63$ OR $68 - 15 = 53$, $68 - 25 = 43$.

h. Recognise and use patterns.

   Eg: $4 + 8 = 12$, $40 + 80 = 120$, $400 + 800 = 1200$.

i. Given three numbers, say or write four different sentences relating to these numbers.

   Eg: using only the numbers $15$, $17$, $32$, $34$, $49$, write as many different addition or subtraction sentences as you can.

j. Uses known number facts of addition and subtraction to derive new facts.

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**Topic: Pencil and paper procedures of Addition and Subtraction**

**Outcome N2.4:**

Develop written methods for addition and subtraction, building on mental methods.

**Indicators:**

This is evident when the student:

a. Uses the method counting on in multiples of $10$ or $1$ in adding TU&U, TU&TU.
   
   Eg: $86 + 57 = 86 + 50 + 7 = 136 + 4 + 3 = 143$

b. Uses the method counting on in multiples of $100$, $10$ or $1$ in adding HTU & TU, HTU & HTU.
   
   Eg: $356 + 427 = 356 + 400 + 20 + 7 = 756 + 20 + 7 = 776 + 7 = 783$.

c. Uses the method adding the most significant digits first in adding TU&U, TU&TU.
   
   Eg: $67 + 24 = 80 + 11 = 91$.

d. Uses the method adding the least significant digits first in adding TU&U, TU&TU (preparing for ‘carrying’).

e. Uses the method counting up from the smaller to the larger number (complementary addition) in subtracting TU&U, TU&TU.

f. Uses the compensation (take too much, add back) method in subtracting TU&U, TU&TU.

**g.** Uses the decomposition method in subtracting TU&U, TU&TU (preparing for efficient standard method).

   Eg: $81 - 57 = [(80 + 1) - (50 + 7) = (70 + 11) - (50 + 7) = (20 + 4) = 24)]$

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**Sub-strand: Multiplication & Division (N3)**

**Topic: Understanding Multiplication and Division**

**Outcome N3.1:**

Represent the operation of multiplication or division and their relationship to

**Indicators:**

This is evident when the student:

a. Uses appropriate vocabulary to support multiplication and division.

b. Relates repeated addition to multiplication.
addition and subtraction. Solve 1 step word problems involving multiplication or division and explain the process.

c. Describes an array.

d. Relates multiplication to scaling (a number of times as wide, tall).

*Eg: Take the blue ribbon. Find the ribbon that is 4 times as long. Make a red tower 5 cubes high. Make a blue tower 3 times as high.*

e. Recognises that multiplication of zero results in zero.

f. Shares a number of items into equivalent groups.

g. Relates grouping or repeated subtraction to division.

*Eg: 35 ÷ 5 as how many 5s make 35.*

h. Recognises and uses the property that multiplication can be done in any order but not division.

*Eg: 5 × 8 = 8 × 5, but that 16 ÷ 2 is not the same as 2 ÷ 16.*

i. Recognises that division is the inverse of multiplication.

j. Begins to understand the operations of multiplication and division and their relationship to each other to addition and subtraction.

k. Responds to oral or written questions.

*Eg: two tens... double 2... 3 times 4... 9 multiplied by 2... multiply 5 by 8... is 20 a multiple of 5?*

l. Responds to oral or written questions phrased in a variety of ways.

*Eg: Share 18 between 2, Divide 25 by 5, How many fives make 45? How many MVR 5 notes do you get for MVR 35? How many lengths of 10 m can you cut from 80 m of rope? Is 35 a multiple of 5?*

m. Gives a remainder as a whole number.

*Eg: 16 ÷ 3 is 5 remainder 1, 75 ÷ 10 is 7 remainder 5, 46 = 10 × 4 + □, 17 = 5 × 3 + □.*

n. Responds to oral or written questions, such as finding how many are left or how much is left when amounts are shared.

*Eg: share 18 between 5, divide 25 by 10, cut as many lengths of 10 cm as you can from 81 cm of tape.*

o. Finds the value of the missing term(s) in multiplication or division sentences.

*Eg: 3 × 2 = □, □ × 4 = 8, □ × □ = 16, 56 ÷ 7 = □, 72 ÷ 9 = □.*

p. Records multiplication and division sentences using ×, ÷ and =.

q. Recognises that multiplication can be done in any order, but not divided.

r. Uses the commutative principle (not the name) in multiplication and identifies that this principle cannot be used in division.

s. Creates simple multiplication and division stories.

*Eg: Tell a story which could be represented by 8 × 7 or 63 ÷ 7.*

t. Solves 2 step word problems involving multiplication and division.

u. Explains how an answer to a multiplication or division problem was obtained.
Topic: Rapid Recall of Multiplication and Division

Outcome N3.2:
Derive multiplication facts and the related division facts from 2 to 10. Recall or derive rapidly doubles and halves.

Indicators:
This is evident when the student:

a. Derives multiplication facts for 2, 3, 4, 5, 6, 7, 8, 9 and 10 times-tables and the related division facts.

b. Responds to oral or written questions phrased in a variety of ways.
   Eg: six fives, 3 times 5, 5 multiplied by 3, multiply 4 by 5, how many fives in 35?, divide 30 by 5.

c. Derives doubles.
   Eg: doubles of all numbers 1 to 20, doubles of 5, 15, 25... up to 100, doubles of 50, 100, 150, 200... up to 500, and the corresponding halves.

d. Responds to oral or written questions phrased in a variety of ways.
   Eg: double 19... double 75... double 350..., half of 36... half of 150... half of 700..., 1/2 of 600... 1/2 of 34... twice 85, Anil spent half of his MVR 250 savings. How much did he spend? How many are there in half a dozen?

e. Recalls multiplication tables of 2, 3, 4, 5 and 10.

Topic: Mental Calculations Strategies of Multiplication and Division

Outcome N3.3:
Derive new facts, using closely related facts already known, and doubling or halving. Use known number facts and place value to multiply or divide mentally.

Indicators:
This is evident when the student:

a. Given three numbers, such as 7, 5 and 35, says or writes four different multiplication or division statements relating the numbers.
   Eg: 7 × 5 = 35, 5 × 7 = 35, 35 ÷ 5 = 7, 35 ÷ 7 = 5

b. Uses related facts and doubling or halving to derive new facts.
   Eg: to multiply by 4, double and double again; to multiply by 5, multiply by 10 and halve; work out the 8 times-table facts by doubling the 4 times-table facts.

c. Explains how to find quarters by finding half of one half.
   Eg: one quarter of 28 is 7, ie; one half of 28 is 14 and half again is, one quarter of 100 is 25, ie; one half of 100 is 50 and half again is 25, one quarter of 600 is 150, ie; one half of 600 is 300 and half again is 150, one quarter of 140 is 35, ie; one half of 140 is 70 and half again is 35.

d. Describes the effect of multiplying and dividing by 10.
   Eg: using an abacus to develop patterns, 1, 10, 100; 2, 20, 200; 3, 30, 300; 4, 40, 400...

e. Uses known number facts to carry out simple multiplications and divisions.
Sub-strand: Money (N4)

Topic: Money

Outcome N4.1:
Recognise, sort and order coins and notes with different face values. Carry out simple transactions. Record money amounts and solve 3 step word problems and explains the process.

Indicators:
This is evident when the student:

a. Orders a collection of coins and notes according to face value.
b. Exchanges money for goods in a play situation.
c. Recognises that MVR. 1 = 100 L
d. Works out how to pay an exact sum using smaller notes and coins.
e. Shows different ways of making up to MVR.500 using smaller coins and notes.
f. Uses numbers and appropriate unit(s) to record the value of a set of coins and notes.
g. Pays appropriate amounts and determines appropriate change in shopping, up to MVR.100.
h. Converts amounts of money.
   Eg: Rufiyaa to Laari, and Laari to Rufiyaa.
i. Partitions money values up to MVR. 100, using MVR. 10 notes and MVR. 1 coins.
   Eg: MVR. 23 = MVR. 10 + MVR. 10 + MVR. 1 + MVR. 1 + MVR. 1
j. Solves 3 step word problems in the context of money, and explain how the problem was solved.

Sub-strand: Fractions, Decimals and Percentages (N5)

Topic: Fractions

Outcome N5.1:
Recognise, read, write, and compare, make estimations in simple fractions. Relates fractions as a part of a whole.

Indicators:
This is evident when the student:

a. Makes twelfths and sixteenths by folding paper.
b. Recognises unit fractions,
   Eg: 1/2, 1/3, 1/4, 1/5, 1/10 and use them to find fractions of shapes.
c. Recognises simple fractions that are several parts of a whole.
   Eg: 3/4, 2/3, or 3/10.
d. Reads and writes fractions represented numerically up to 9/10.
   Eg: read and write 3/10 as three tenths, 2/5 as two fifths.
e. Recognises two halves, three thirds, four quarters will make one whole.
f. Begins to recognise the equivalence between halves, quarters and eighths.
   Eg: 2/8 equals 1/4, 4/8 equals 2/4 or 1/2, 6/8 equals 3/4; tenths and fifths, 2/10 equals 1/5, thirds and sixths, 2/6 equals 1/3 and 4/6 equals 2/3.
g. Begins to recognise simple equivalent fractions.
Eg: five tenths and one half, five fifths and one whole.

h. Estimates and marks 1/2, 1/4, 3/4 tenths and fifths.

i. Recognises and compares fraction.

Eg: represent on a number line and compares that, one half is greater than one quarter; one half is less than three quarters; three quarters lies between one half and one whole.

j. Recognises and finds one half, one quarter and three quarters of a small number of objects.

Topic: Fraction Operations using Visualisation

Outcome N5.2:
Recognise fractions equivalent to 1.
Carry out four operations involving simple fractions.

Indicators:
This is evident when the student:

a. Renames fractions where the numerator and denominator are the same as 1.
   Eg: 3/3 =1 (use paper cups/plates)

b. Begins to recognise pairs of simple fractions with a total of 1.
   Eg: use fraction strips or fraction circles.

c. Adds and subtracts wholes, halves and quarters.
   Eg: use paper cups/plates or fraction cards.

d. Multiplies halves and quarters by whole numbers.
   Eg: use paper cups/plates or fraction cards.

e. Divides whole numbers by halves and quarters.
   Eg: use paper cups/plates or fraction cards.
Strand – 2: Measurement (M)

Sub-strand: Length (M1)

Topic: Length

Outcome M1.1:
Understand and use the vocabulary related to length. Know and use relationships between familiar units. Draw and measure lines accurately. Suggest a suitable unit and measuring equipment, record estimates and readings from scales to a suitable degree of accuracy. Solve problems involving length and distances.

Indicators:

This is evident when the student:

a. Uses vocabulary related to measures ‘length’
   
   *Eg: thin, thick, narrow the same.*

b. Identifies objects that are longer than, shorter than and approximately same as 1 metre, 1 centimetre and 10 centimetres.

c. Estimates and measures lengths and distances in m and cm.

d. Suggest things that could be measured using kilometres, metres, centimetres.
   
   *Eg: how far it is to Male’ or Kulhudhufusi or Addu, the height of a door, the length and width of a notebook, the length of the classroom.*

e. Draws straight lines of given lengths in centimetres.

f. Recognises that: 1 km = 1000 m, 1 m = 100 cm.

g. Uses correctly the abbreviations km, m, cm.

h. Begins to read the numbered divisions on a scale, and interprets the divisions between them.
   
   *Eg: on a scale from 0 to 25 with intervals of 1 shown, but only the divisions 0, 5, 10, 15 and 20 numbered.*

i. Records lengths and distances using decimal notation as a decimal of metres.
   
   *Eg: 240 cm as 2.40 m.*

j. Begins to recognise that 3.5 m represents three and a half metres, and that 3.05 m is 3 metres and 5 centimetres.

k. Converts metres to centimetres.

l. Uses standard units to measure and solve problems in a variety of contexts.
   
   *Eg: use a ruler or tape measure to measure the hand span and round the wrist of a partner, measuring to the nearest half centimeter, compare with own measurements.*

m. Solves problems involving length in a variety of contexts, using standard units.
**Sub-strand: Mass (M2)**

**Topic: Mass**

**Outcome M2.1:**
Understand and use the vocabulary related to mass (weight); suggest a suitable unit and equipment, record estimates and readings from scales to a suitable degree of accuracy, know and use relationships between familiar units and solve problems involving mass.

**Indicators:**

**This is evident when the student:**

a. Uses vocabulary related to measures ‘mass’ (weight).
   
   *Eg: heaviest, lightest.*

b. Recognises objects that have weight more than, less than, or about 1 kilogram.

c. Estimates and measures masses of objects in kilograms and grams using a kitchen scale.

d. Orders the mass of two or more objects by hefting.
   
   *Eg: checks by using a balance.*

e. Orders objects of different masses by weighing the objects using a kitchen scale.

f. Selects the appropriate unit (kg, g) and the appropriate equipment (balance, scale, bathroom scale) to measure masses of objects.

g. Recognises that 1000 g is 1 kg.

h. Uses the abbreviation for kilogram (kg) and gram (g) in recording masses of objects.

i. Begins to read the numbered divisions on a scale, and interprets the divisions between them.
   
   *Eg: On a scale from 0 to 25 with intervals of 1 shown, but only the divisions 0, 5, 10, 15 and 20 numbered.*

j. Records masses of objects using decimal notation as a decimal of kilograms.
   
   *Eg: 2350 g as 2.350 kg.*

k. Weighs different amounts of water
   
   *Eg: 1 litre, half a litre, 100 ml, 2 litres) and finds their relationship with mass.*

l. Solve problems involving mass in a variety of contexts, using standard units.

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**Sub-strand: Capacity (M3)**

**Topic: Capacity**

**Outcome M3.1:**
Understand and use the vocabulary related to capacity; suggest a suitable unit to estimate or measure capacity; record estimates and readings from scales to a suitable degree

**Indicators:**

**This is evident when the student:**

a. Uses vocabulary related to measures (capacity).

b. Recognises that two containers of different shape may hold the same amount.

c. Identifies from range of containers those that have a capacity of more than, less than and about 1 litre.

d. Estimates and measures the capacity of containers to the nearest litre and millilitres using a measuring cylinder.
of accuracy. Know and use relationships between familiar units. Solve problems involving capacity.

e. Orders three or more containers according to their capacity.
f. Suggests things that could be measured using litres, millilitres.
g. Finds and describes the relationship between millilitre, cubic centimetre and litre.
h. Uses the abbreviation for litre (l) and millilitre (ml) in recording capacities.
i. Begins to read the numbered divisions on a scale, and interpret the divisions between them.
   (Eg: on a scale from 0 to 25 with intervals of 1 shown but only the divisions 0, 5, 10, 15 and 20 numbered).
j. Records capacities using decimal notation as a decimal of litres.
   Eg: 1500 ml as 1.50 l.
k. Solve problems involving capacity in a variety of contexts, using standard units.

Sub-strand: Perimeter, Area and Volume (M4)

Topic: Perimeter

Outcome M4.1:
Know the meaning of perimeter. Estimate and measure the perimeter of simple shapes.

Indicators:
This is evident when the student:

a. Uses the term “perimeter” to describe the total distance around a shape.
b. Estimates and measures the perimeter of flat shapes / places in centimetres and metres.

Topic: Area and Perimeter

Outcome M4.2:
Know the meaning of area. Measure the area of simple shapes using arbitrary units. Estimate and measure the area of simple shapes.

Indicators:
This is evident when the student:

a. Uses vocabulary related to area.
b. Compares area of shapes by placing one shape on top of another.
c. Covers surfaces with identical shapes without gaps or overlaps.
d. Measures areas of a flat surfaces (regular and irregular shapes) using arbitrary units.
e. Explains the reason why area is measured in square units.
f. Makes a metre square using news paper.
g. Finds areas by counting squares.
h. Forms different shapes of equal area.
i. Measures, compares, and records areas using a square-centimetre grid overlay.
Sub-strand: Time (M5)

Topic: Time

Outcome M5.1:
Use vocabulary related to time. Estimate the duration of an event in time units. Read, tell and record time to the nearest five minute. Read calendar and find the relationship between the units of time. Know the months of Hijri calendar.

Indicators:

This is evident when the student:

a. Uses vocabulary related to time.
   
   Eg: second, to, from.

b. Names and orders the months of the year (Islamic or Hijri).

c. Reads the time to 5 minutes on an analogue clock and a 12-hour digital clock, and use the notation 9:40.

d. Reads and tells time using digital clocks.

e. Uses this year’s calendar (Gregorian) to work out.
   
   Eg: which day of the week is 10 May, the date of the third Wednesday in July, the number of days from 26 February to 20 March, the number of weeks from 18 September to 13 November.

f. Reads and writes the date of a particular day using Hijri calendar.

g. States the five prayer times to the nearest hour or half hour.

h. Recognises different conversions related to time.
   
   Eg: 1 solar year = 365 days or 52 weeks or 12 months, 1 lunar year (Hijri) = 354 days.

i. Makes estimates and checks using a timer in PE or in other activities.
   
   Eg: the greatest and least time taken to run 200m

j. Uses a stopwatch to measure and record duration of events in hours, minutes and seconds.
Strand – 3: Shape and Space (SS)

Sub-strand: 3D Shapes (SS1)

Topic: 3D Shapes

Outcome SS1.1: Recognise, name, sort, and make models of 3D objects and describe them using everyday language.

Indicators:

This is evident when the student:

a. Uses mathematical vocabulary to describe 3D objects (cubes, cuboids, cylinders, spheres, hemisphere, cones, prism and pyramid) and sort in different ways on their attributes such as faces, corners and edges.

b. Collects examples of cubes, cuboids, cylinders, spheres, hemisphere, cones, prism and pyramid and match them to name labels.

c. Finds the number of vertices, edges, and faces of 3D objects.

d. Selects cubes, cuboids, cylinders, spheres, hemisphere, cones, prism and pyramid from a collection of 3D objects.

e. Recognises and describes 3D objects displayed differently.

  Eg: objects in a feely bag.

f. Identifies 3D shapes from pictures of them in different positions and orientations.

g. Uses cubes to build ‘double-layered’ solids from pictures.

h. Makes skeleton models of cubes and cuboids using iloshi and modelling clay.

i. Recognises that 3D objects look different from different views.

j. Sketches top, front and side views of cuboids, cylinders and spheres.

k. Sketches 3D objects (cubes and cuboids) using isometric dot paper.

Sub-strand: 2D Shapes (SS2)

Topic: 2D Shapes

Outcome SS2.1: Recognise, name, sort, and make models of 2D objects and describe them using everyday language.

Indicators:

This is evident when the student:

a. Uses mathematical vocabulary to describe 2D shapes (circles, rectangles, squares, triangles, pentagons, hexagons, heptagons, octagons, quadrilaterals and semi circles).

b. Collects examples of circles, rectangles, squares, triangles, pentagons, hexagon, octagon, quadrilateral and semi-circle and match them to name labels.

c. Sort a set of flat shapes according to properties.

  Eg: the numbers of vertices or sides, whether the sides are the same length, whether or not at least one angle is a right angle, whether or not a shape has a line of symmetry.

d. Arranges attribute blocks so that the next block has one difference in attribute to the previous one.
e. Builds up various shapes by placing four appropriate tangram pieces.

f. Makes different polygons using pin board and elastic bands.

![Tangram Pieces](image)

g. Draws a recognisable pentagons, hexagon and octagons.

h. Makes symmetrical patterns with two lines of symmetry at right angles by folding and cutting paper.

i. Recognise and draws more than one line of symmetry of a shape which has more than one line of symmetry and recognises shapes with no lines of symmetry.

j. Sketches the reflection of a simple 2-D shape in a mirror line along one edge, using a mirror to help complete it.

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**Sub-strand: Positions and Directions (SS3)**

**Topic: Position and Direction**

**Outcome (SS3.1):**

Describe positions, directions, give directions and follow short paths and draws simple paths or informal maps. Find geographic north. Interpret and describe location and direction using a square grid and cardinal compass points. Describe movements, and understand angle as a measure of turn.

**Indicators:**

**This is evident when the student:**

a. Identifies directions of things in the living environment.
   
   *Eg: Dharumavantha is west of Majeedhiyya.*

b. Uses a compass to find North.

c. Recognises and uses the four compass directions N, S, E, W.

d. Make and describe right-angled turns, including turns between the four compass points.

e. Describes position of one place relative to another.
   
   *Eg: Villingili is west of Male.*

f. Describes a path on square grids using N, S, E, and W.

g. Describes and finds the position of a square on a square grid with rows labeled by numerals and columns labeled by letters.

h. Uses squared paper and a counter to move, for example, from A3 to C1, describing the route as two squares east and two squares south.

i. Draws a familiar path.
   
   *Eg: the road from home to school.*

j. Draws some landmarks when drawing an informal map of own district / ward.
   
   *Eg: houses, mosques, shops.*

k. Uses regions on a grid to locate places.
   
   *Eg: What is at A5 on the island map? The Prayer Room, Where is the office? C2.*
l. Gives a series of instructions for moving from one place to another
   
   Eg: from the classroom to the library.

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**Sub-strand: Angles (SS4)**

**Topic: Angles**

**Outcome SS4.1:**
Identify angles, recognise and make right angles and make turns to clockwise and anticlockwise directions.

**Indicators:**

- **This is evident when the student:**
  
  a. Uses paper right angle to identify angles less than, greater than or same as a right angle.
  
  b. Sorts 2D shapes according to whether they have all, some or no right angles.
  
  c. Sorts angles of different sizes i.e. sectors of different radii.
  
  d. Identifies and marks the size of angles as small or big in a given polygon.
  
  e. Uses a paper right angle to draw right angles and to identify right angles in 2-D shapes and in the environment.
  
  f. Compare angles with a right angle.
  
  g. Recognises that a straight line is equivalent to two right angles.
  
  h. Orders angles of different sizes by superimposing.
Strand – 4: Chance and Handling Data (CH)

Sub-strand: Handling Data (CH1)

Topic: Handling Data

Outcome CH1.1:
Solve a given problem by collecting, sorting, classifying, organising, representing and interpreting data in simple tables or diagrams. Construct and interpret pictographs and bar charts.

Indicators:

This is evident when the student:

a. Classifies objects, numbers or shapes according to one criterion and displays on a Carroll or Venn diagram.

b. Collects data and makes a simple table using tally marks.
   Eg: data collected on favourite drinks.

c. Responds to questions related to a given data.
   Eg: Which is the most/least popular?, Who voted either for this or for that?, Which colour had fewer than 5 votes?, Would the table be the same if we asked Grade 6?, How might the table change if everyone had 2 votes?, Who might find it useful to know what colours children like?

d. Collects data using various activities, and make a simple pictogram, where one symbol represents two units.
   Eg: collects data by a show of hands.

e. Responds to questions based on a set of data.
   Eg: Do most children walk to school?, More children walk than come by bike. How many more?, How many children altogether in the class?, How would the graph be different; if it were a rainy day...? or December...? if there were buses...? if we asked Grade 6...?

f. Draws simple bar charts, with the vertical axis labeled in ones, then twos.

g. Responds to 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?
Strand – 5: Patterning and Algebra (PA)

Sub-strand: Sequences and Properties of Numbers (PA1)

Topic: Number Sequences

Outcome PA1.1:
Describe, copy, predict and extend simple patterns. Create simple patterns using familiar materials. Describe the term to term rule for a simple number sequence.

Indicators:
This is evident when the student:

a. Makes and records different stick patterns and predicts the number of sticks needed for later terms.
   Eg:
   | Squares | 1 | 2 | 3 | 4 | 5 |
   | Sticks  | 4 | 7 | 10 |
   b. Describes and extends simple number sequences.
   Eg: 3, 6, 9, 12; The rule is: +3, The next three numbers are __, __, __, 5, 10, 15, 20, The rule is ___ The next three numbers are __
   c. __, __
   90, 80, 70, 60: The rule is ______; The next three numbers are __, __, __
   26, 28, 30, 32; The rule is ________; The next three numbers are __, __, __
   d. Corrects errors in simple number sequences.
   e. Creates simple number sequences.
   Eg: 1, 3, 5, 7, 9 OR 180, 175, 170, 165, 160.
   f. Creates as many numbers as possible in a given sequences.
   Eg:
   The first number of the sequence is 60. Numbers increase by 3.
   The first number of the sequence is 230. Numbers decrease by 10.
   g. Uses multiplication facts to generate patterns in a hundred square grids. (From multiples of 2 up to 10).
   h. Describes number patterns in a hundred square grids.

Topic: Properties of Numbers

Outcome PA1.2:
Recognise odd, even numbers and multiples.

Indicators:
This is evident when the student:

a. Recognises and continues sequences of odd and even numbers.
   b. Recognises multiples of 2, 3, 4, 5 and 10 up to the tenth multiple.
Sub-strand: Investigations, Puzzles and Problems (PA2)

Topic: Investigations Puzzles and Problems

Outcome PA2.1: Solve simple mathematical problems and puzzles and explain the process.

Indicators:

This is evident when the student:

a. Solves simple mathematical problems and puzzles. (Refer to: Mathematical investigations, puzzles and problems in the teacher's guide)

b. Explains methods by reasoning how the problem was solved.
### Sample Lesson Plan

<table>
<thead>
<tr>
<th><strong>Subject:</strong> Mathematics</th>
<th><strong>Grade:</strong> 1</th>
<th><strong>Duration:</strong> 90 mins.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strand: Shapes &amp; Space</td>
<td>Sub-strand: 2D Shapes</td>
<td></td>
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<tr>
<td><strong>Key Competencies:</strong></td>
<td><strong>Shared Values:</strong></td>
<td></td>
</tr>
<tr>
<td>• Thinking critically &amp; creatively</td>
<td>• Values relating to self</td>
<td></td>
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<tr>
<td>• Relating to people</td>
<td>• Values relating to others</td>
<td></td>
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<tr>
<td>• Understanding and managing self</td>
<td></td>
<td></td>
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<tr>
<td>• Sustainable learning</td>
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</tbody>
</table>

**Prior Knowledge:**
- Uses mathematical vocabulary to describe 2D shapes (circles, rectangles, squares, triangles, hearts, ovals, crescents, arrows, stars).
- Collects examples of circles, rectangles, squares, triangles, hearts, ovals, crescents, arrows, stars and match them to name labels.
- Sorts a set of flat shapes according to its properties.

**Learning Outcome SS2.1:**
- Recognise, name, sort, and make models of 2D objects and describe them using everyday language.

**Learning Indicators:**
- Uses everyday language to describe features of 2D shapes (Eg: circles, rectangles, squares and triangles).
- Collects examples of circles, rectangles, squares and triangles and match them to name labels.

**Materials Needed:**
- Different types of shapes (circles, rectangles, squares, triangles, hearts, crescents, arrows, stars, pentagons, hexagons, heptagons and octagons),
- Clay
- Sample toy house (2D/3D),
- Traceable shapes (table to complete name of the shapes & number of sides),
- Coloured 2D shapes
<table>
<thead>
<tr>
<th>Duration</th>
<th>Teaching &amp; Learning</th>
<th>Resources / Material needed</th>
<th>Differentiated Instruction</th>
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<tbody>
<tr>
<td>7 mins</td>
<td><strong>Introduction:</strong></td>
<td>Sample toy house (2D/3D) Traceable shapes</td>
<td>Manipulatives (Three-dimensional teaching aids and visuals that teachers use to help students with the concepts to represent abstract ideas. Helps ADHD (a condition of the brain that affects a person’s ability to pay attention) students stay focused, and helps students with cognitive challenges. Students who have difficulty in understanding the questions: rephrase the questions.)</td>
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<td>Introduce the topic by showing a toy house which is built by using different shapes.</td>
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<td></td>
<td>Sample toy house:</td>
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<td>- Discuss the use of shapes in daily life. Direct the discussion by asking questions:</td>
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<td></td>
<td>- Can you build a house like this? How? (Critical thinking)</td>
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<td>- How would you make your house? (Sustainable practices, creative thinking)</td>
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<td></td>
<td>- What are the shapes you can see?</td>
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<td>- Do you see these shapes from outside? Direct for a discussion! What are they? So on.</td>
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<td>Make students realize that there is a shape in everything (natural as well as man-made) and its importance in daily life. (Making meaning)</td>
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<td>5 mins</td>
<td><strong>Recall Prior knowledge:</strong></td>
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<td>- Distribute a traceable shape (circles, rectangles, squares, triangles, ovals, hearts, crescents, arrows, stars) to each student. Have students:</td>
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<tr>
<td></td>
<td>1. <strong>Trace the shape.</strong></td>
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<td>2. <strong>Name three examples of places where one might find this shape.</strong></td>
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<td>3. <strong>Discuss about the examples where the shapes can be seen.</strong></td>
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<td></td>
<td>4. <strong>Discuss about the attributes and names of the shapes.</strong></td>
<td></td>
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</tr>
<tr>
<td>8 mins</td>
<td><strong>Share learning intention with students:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Uses mathematical vocabulary to describe 2D shapes (circles, rectangles, squares, triangles, pentagons, hexagons and octagons).</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>- Collects examples of circles, rectangles, squares, triangles, pentagons, hexagon, heptagon and octagon and match them to name labels</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Duration: 15 mins

**Negotiate the success criteria with the students:**

<table>
<thead>
<tr>
<th>I will be a high-flyer if I can</th>
<th>[ ]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Describe 2D shapes (circles, rectangles, squares, triangles, pentagons, hexagons, heptagons and octagons).</td>
<td>[ ]</td>
</tr>
<tr>
<td>Place the shapes in the right group when my teacher tells me the name of each group</td>
<td>[ ]</td>
</tr>
</tbody>
</table>

- = I could do this and I am confident that I can do it again
- = I could not do this fully and I am not confident that I can do it again
- = I could not do this

**Resources / Material needed:**

Group work and oral presentation: Will accommodate ADHD students by teaching social skills to help students learn to interact socially and work cooperatively. Provides opportunities for mixed ability group work, which helps ELL (English language learners) students with modeling of age-appropriate language skills. Students who have difficulty working collaboratively: Use flexible grouping strategies.

### Duration: 10 mins

**Developmental Activities:**

- **Activity 1:**
  
  Show pentagons, hexagons, heptagons, octagons and brainstorm students:
  
  - Name examples of places where you might find this shape (connecting).
  - What are the differences between the shapes you know before and these shapes?
  - What are the differences between these four shapes?
  - What do you think would be the names of these shapes?

  Ask students to work out/discuss the answers of the above questions in groups (Establish ground rules of the group work, relating to people).

**Resources / Material needed:**

Coloured 2D shapes

Traceable shapes (table to complete name of the shapes & number of sides)

**Differentiated Instruction:**

Students who have difficulty finding the main idea:

Reduce the amount of information presented at one time, use alternative forms of expression, give more time, let students count the sides on their own and direct them by encouraging their work.
<table>
<thead>
<tr>
<th>Duration</th>
<th>Teaching &amp; Learning</th>
<th>Resources / Material needed</th>
<th>Differentiated Instruction</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 mins</td>
<td>Provide a set of shapes to each group. Provide a table to fill</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Name of the shape (Guess)</strong></td>
<td><strong>Number of sides</strong></td>
<td></td>
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<td></td>
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<td></td>
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<tr>
<td></td>
<td>Ask each group to present their work (communicating). Discuss about the different names students have guessed for different shapes. Have a discussion to compare their guessed names and real names of the shapes (critical thinking). Let each group give an explanation for their names (communicating, reasoning &amp; proving, reflecting).</td>
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</tr>
<tr>
<td></td>
<td><strong>Activity 2:</strong> Board Activity: Paste the shapes on the board. Ask students to guess why the name “pentagon” is given to the shape which has 5 sides, “hexagon” 6 sides, heptagon 7 sides and octagon 8 sides. Discuss the meaning of the words; Tri-3 Quadra-4 Penta-5 Hexa-6 Hepta-7 Octa-8 Help students come up with the fact that the name of each shape is given on the basis of the number of sides that the</td>
<td></td>
<td>Games: Helps ADHD students stay focused, and helps students with cognitive challenges. Real world experiences: Helps ADHD students stay focused.</td>
</tr>
<tr>
<td>Duration</td>
<td>Teaching &amp; Learning</td>
<td>Resources / Material needed</td>
<td>Differentiated Instruction</td>
</tr>
<tr>
<td>----------</td>
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<td>-----------------------------</td>
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</tr>
<tr>
<td>13 mins</td>
<td><strong>Activity 3:</strong></td>
<td></td>
<td>Allow additional time for students who need it as well as enrichment activities for those who finish early. It Helps those with cognitive challenges.</td>
</tr>
<tr>
<td></td>
<td>Play a game to practice remembering the names of the shapes. When the teacher says triangle, students claps three times, means three sides are there in a triangle, when the teacher says hexagon, students clap six times, so on. And when the teacher claps three times, students say triangle and so on (communicating). Give a set of shapes to each group and ask them to sort those shapes into groups (selecting materials). Ask from each group to explain how they have sorted the shapes into groups (reflecting, communicating, proving &amp; reasoning).</td>
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<td></td>
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<tr>
<td>12 mins</td>
<td><strong>Activity 4:</strong></td>
<td></td>
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<td></td>
<td>An outdoor walk to show shapes from the environment. Discuss about the various shapes it can be seen from their environment (Connecting, sustainable learning).</td>
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<td></td>
</tr>
<tr>
<td>10 mins</td>
<td><strong>Closure:</strong></td>
<td>Clay</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ask each student to make a pentagon, hexagon, heptagon and octagon using clay (creative thinking). Have a discussion to talk about the whole lesson (Reflection). Assess individual students’ works.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Assessment:**

**Assessment Opportunities:**

- Assessing the students during presentations.
- Assessing how students work within groups.
- Assessing individual students’ works by teacher.
- Self and peer assessment during group work.

Providing feedback should be an ongoing process in which teachers communicate information to students that helps them better understand what they are to learn, what high-quality performance looks like, and what changes are necessary to improve their learning.

- Provide feedback that addresses what is correct and elaborates on what students need to do next.
• Provide feedback appropriately in time to meet students' needs.
• Provide feedback that is criterion referenced.
• Engage students in the feedback process.

Sample Rubric:

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Mathematical vocabulary to describe 2D shapes (Communication)</td>
<td>Inaccurately uses the mathematical vocabulary to describe 2D shapes</td>
</tr>
<tr>
<td>Collects examples of circles, rectangles, squares, triangles, hearts, ovals, crescents, arrows, stars and match them to name labels.</td>
<td>Demonstrates little or no knowledge of Collecting examples of circles, rectangles, squares, triangles, hearts, ovals, crescents, arrows, stars and match them to name labels.</td>
</tr>
</tbody>
</table>

Extension Options:

Playing games

• Give each child a different shape and call out directions, such as, "everyone who has a square jump 4 times."

• Treasure hunt - in the classroom, or weather permitting the playground, hide shapes and ask the children to search for them.

• Pictures - give the children different shapes cut out of paper or card. They then stick them onto a larger sheet, creating a person, house or abstract art.

• Drawing buildings using shapes or making buildings using 3D shapes

Links to Other Key Learning Areas:

• Creative Arts, English & Dhivehi
Teacher Reflection:

- **Background Information for the teacher:** Plants, animals, formations of the earth, such as rocks, and the human body is made up of different shapes. Looking for shapes helps students observe similarities and differences between themselves and the environment, and helps them recognize various shapes. These shapes form patterns. The natural world contains an infinite variety of patterns of which students are often unaware. All living things create patterns. Patterns are also constantly being created by simple physical laws like waves on the ocean or clouds in the sky.

- The ability to accurately identify shapes is a foundational mathematical skill, and it is quite rewarding for children because their world is full of shapes. Understanding shapes will enable students to be more in tune with the world around them and see the connections between objects, as well as being better able to appreciate artistic works.

- **Differentiated Learning:** It is impossible to look at any classroom and pretend that all students are alike. Instead, focus on the differences that exist, value the diversity, and allow each student the opportunity to shine. Teachers should be open to different approaches and strategies. Students want the chance to be original, resourceful, or ingenuous. Plan different activities the teacher can conduct in the class depending on the differences it exists in the class.
Glossary of Terms

Abacus: a simple device for calculating, consisting of a frame with rows of wires or grooves along which beads are slid.

Analogue clocks: a clock which has moving hands and hours marked from 1 to 12 to show you the time.

Arbitrary: non standard

Associative principle: $4 + 1 + 5$ is same as $(4 + 1) + 5$ or $(5 + 4) + 1$

Commutative principle of addition: $3 + 4$ is same as $4 + 3$

Complementary addition: $10 - 4 = ?$, how much added to 4 will make 10; ie 6

Decimals relating to or using powers of 10 or base 10.

 Decomposition breaking a number into smaller parts

Fractions a ratio of two integers, or any number that can be expressed as such a ratio, $\frac{m}{n}$, where $m$ is not a multiple of $n$, and $n$ is not zero or one.

Geometry the elementary study of the properties and relations of constructible plane figure.

Half turn refers to performing a 180 degree rotation

Hefting lift or carry (something heavy)

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

Journal somebody's written daily record of personal experiences, rather more elaborate and detailed than a diary.

Logs any detailed record of events.

Negative numbers all the real numbers which are less than 0.

Ordinal numbers a number defining the position of something in a series, such as ‘first’, ‘second’, or ‘third’. Ordinal numbers are used as adjectives, nouns, and pronouns.

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

Partitioning divide into parts. Eg: partition 9 into 5 and a bit is same as 5 and 4
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentages</td>
<td>a proportion, ratio or rate expressed with a denominator of 100.</td>
</tr>
<tr>
<td>Portfolios</td>
<td>a collection of drawings, paintings or other pieces of work by an artist, photographer etc.</td>
</tr>
<tr>
<td>Positive numbers</td>
<td>all the real numbers which are greater than 0.</td>
</tr>
<tr>
<td>Probability</td>
<td>the probability of an outcome (or event) is a measure of how likely that outcome is.</td>
</tr>
<tr>
<td>Skip counting</td>
<td>counting with specific intervals, eg; 2, 4, 6</td>
</tr>
<tr>
<td>Symmetrical</td>
<td>made up of exactly similar parts facing each other or around an axis; showing symmetry.</td>
</tr>
<tr>
<td>Tangram</td>
<td>a Chinese geometrical puzzle consisting of a square cut into seven pieces which can be arranged to make various other shapes.</td>
</tr>
<tr>
<td>Trigonometry</td>
<td>the branch of mathematics concerned with the properties of the trigonometric functions and their application to the determination of the sides and angles of triangles used surveying navigation.</td>
</tr>
<tr>
<td>Turn</td>
<td>move or cause to move in a circular direction wholly or partly around an axis or point. Eg; 360°</td>
</tr>
</tbody>
</table>