PRIMARY MATHEMATICS SYLLABUS

CLASS 4

MINISTRY OF EDUCATION AND HUMAN RESOURCE DEVELOPMENT

BARBADOS

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RATIONALE

There is a need for all primary school pupils in Barbados today to experience a shift in emphasis in the teaching/learning process in mathematics from that which was practised twenty or even five years ago. The rapid advances in computer technology, the easy accessibility of inexpensive calculators, the implementation of the project, EduTech 2000 and the ever-increasing rate of change in all aspects of society require that pupils develop new skills and attitudes to meet these demands.

It is no longer sufficient that pupils develop proficiency in computation and in applying that computation to their day-to-day problems. By the time these pupils reach adolescence and adulthood in the twenty-first century, they will be faced with new problems and challenges. It is crucial, therefore, that these pupils be a part of an environment which allows them to **think, reason, and solve problems** using as much of the available technology as possible. Pupils of different ages think, reason and solve problems at different levels, but all pupils are capable of rational thought, reasoning and solving problems.

This Primary Mathematics Syllabus supports the new initiatives of the Ministry of Education, which stress that:

- the child-centred approaches be used in conjunction with the traditional teacher-centred approaches
- problem-solving should be the focus of mathematics instruction
- reasoning about mathematics should be used to help pupils make sense of mathematics, rather than just memorizing rules and procedures
- mathematics is an ideal subject for the development of critical-, creative- and decision-making skills of the pupils from at a very early age
- manipulatives are powerful tools that can help pupils link the concrete experiences to pictorial representations and finally to abstract symbols to build mathematical understanding
- mathematics should be connected to other subject areas and to the pupils' everyday experiences to make it meaningful
- information technology, namely, calculators and computers, be used as tools to help pupils explore and develop concepts and solve problems
- instruction using the multi-media approach, visual, auditory and tactile/kinesthetic should be used to reach all pupils

- assessment should be multi-faceted and evaluate what pupils can do and understand

Through the piloting and implementation of this syllabus and the feedback and consultation from teachers and other educators, modifications will be made to ensure that this document is user-friendly to all teachers of mathematics in primary schools in Barbados.

OBJECTIVES FOR THE PRIMARY MATHEMATICS SYLLABUS

The general objectives for the primary mathematics syllabus are to help pupils:

- acquire a range of mathematical techniques and skills
- develop an awareness of the importance of accuracy in computation
- develop an awareness of mathematics in their environment
- cultivate the ability to apply mathematical knowledge to the solutions of problems in their daily lives
- cultivate the ability to think logically, creatively and critically
- use technology to explore mathematical situations.

FORMAT OF THE SYLLABUS

In addition to the syllabuses for Classes 1-4, this document contains the following sections: Scope and Sequence, Attainment Targets and Suggested Activities and Assessment Procedures. Highlighted in the syllabus are the integration of technology into instruction and the development of critical, creative and decision-making skills. Both areas were already in use but are now being highlighted because of the need to have all pupils computer literate and to be critical and creative in their thoughts and actions.

The nature of mathematics instruction requires that concepts are introduced in the earlier stages and developed in the later stages. The *Scope and* Sequence therefore, indicates the classes in which a topic is to be introduced and developed. The ν indicates in which class the topic/skill/concept should be introduced and the 4indicates that the concept has to be developed and maintained in these classes.

The *Attainment Targets* are presented as a list of objectives and indicate what each pupil should be able to achieve at the end of the school year. It is understood that because of varying abilities and aptitudes, some pupils might be able to achieve a higher standard than that which is set and some may not be able to complete all the objectives for the particular age group. The targets for a particular class represent the objectives that should be achieved at that level, in addition to those of the lower classes.

The *Suggested Activities* included in the syllabus will ensure that pupils use and apply mathematics to promote mathematical reasoning, make decisions and analyse data. In addition, the proposed tasks meet both the individual needs of the pupils as well as provide activities for group work, thereby facilitating collaboration between pupils, teachers and parents, while consolidating instruction and developing the necessary skills.

Assessment is a fundamental part of the teaching and learning process. It should measure not only what the pupils know and can produce, but should provide more authentic information about the learner. Further, continuous assessment is essential in monitoring the progress of pupils and teachers are therefore encouraged to use mathematics profiles to record each child's progress. To this end a variety of assessment methods should be utilised including achievement tests, portfolio assessment, journals and discussions.

The *Integration of Technology* is integral to mathematics instruction and can be beneficial in areas such as computation, geometry, data handling and problem solving. The use of technology is particularly effective in reducing the fear and anxiety associated with learning mathematics, since it allows the pupils to focus less speed and memorization and more on the processes necessary to obtain the solutions.

Teachers are encouraged to use strategies and methodologies to develop *Critical Thinking and Problem Solving Skills.* The mathematics classroom should provide the opportunity for pupils to formulate problems from everyday situations, use concrete materials, reason logically and use a variety of problems solving strategies.

SCOPE AND SEQUENCE FOR CLASS 4

ν **Begin teaching the concept/skill**
4 **Maintain and develop concept/skill**

		CLASSES			
		1	**2**	**3**	**4**
1.0	**PROBLEM SOLVING STRATEGIES AND SKILLS**				
1.0.1	Problem solving as it relates to everyday situations	ν	4	4	4
1.0.2	Problem solving steps	ν	4	4	4
1.0.3	Problem solving strategies	ν	4	4	4
1.0.4	Estimation strategies	ν	4	4	4
1.0.5	Interpretation of data and diagrams	ν	4	4	4
2.0	**NUMBER CONCEPTS**				
2.0.1	Mental computations and estimation techniques	ν	4	4	4
2.0.2	Read and write numbers	ν	4	4	4
2.0.3	Comparison of numbers	ν	4	4	4
2.0.4	Addition of whole numbers	ν	4	4	4
2.0.5	Subtraction of whole numbers	ν	4	4	4
2.0.6	Multiplication of whole numbers	ν	4	4	4
2.0.7	Division of whole numbers	ν	4	4	4
2.0.8	Solution of basic problems using the four basic operations	ν	4	4	4
2.0.9	Odd/Even numbers	ν	4	4	4

ν **Begin teaching the concept/skill**
4 **Maintain and develop concept/skill**

	CLASSES			
	1	**2**	**3**	**4**
2.0.10 Value of a number	ν	4	4	4
2.0.11 Place Value of a number	ν	4	4	4
2.0.12 Prime and Composite numbers		ν	4	4
2.0.13 Factors		ν	4	4
2.0.14 Multiples		ν	4	4
2.0.15 Squares and square roots			ν	4
2.1 PROPERTIES OF NUMBERS				
2.1.1 The commutative property	ν	4	4	4
2.1.2 The associative property	ν	4	4	4
2.1.3 The identity property under addition	ν	4	4	4
2.1.4 The identity property under multiplication	ν	4	4	4
2.1.5 Multiplication by zero	ν	4	4	4
2.1.6 The order of operations (BODMAS)			ν	4
3.0 FRACTIONS AND DECIMALS				
3.0.1 The concept of a fraction	ν	4	4	4
3.0.2 Written symbols for fractions	ν	4	4	4
3.0.3 Operations with fractions	ν	4	4	4
3.0.4 The concept of a decimal			ν	4
3.0.5 Decimal notation			ν	4
3.0.6 Operations with decimals			ν	4
3.0.7 The relationship between fractions and decimals			ν	4

ν **Begin teaching the concept/skill**
4 **Maintain and develop concept/skill**

		CLASSES			
		1	**2**	**3**	**4**
4.0	**RATIO AND PROPORTION**				
4.0.1	The concept of ratio and proportion			ν	4
4.0.2	Ratios as fractions			ν	4
4.0.3	Simplification of ratios			ν	4
5.0	**PERCENTAGES**				
5.0.1	The concept of a percentage			ν	4
5.0.2	The relationship between fractions, decimals and percentages			ν	4
5.0.3	Operations with percentages			ν	4
6.0	**MEASUREMENT**				
6.0.1	Non-standard units of measurement	ν	4	4	4
6.0.2	Standard units of measurement	ν	4	4	4
6.0.3	The metric system	ν	4	4	4
6.1	**Linear**				
6.1.1	Determining length	ν	4	4	4
6.1.2	Instruments for measuring length	ν	4	4	4
6.1.3	Units for measuring length	ν	4	4	4
6.1.4	Perimeter of shapes	ν	4	4	4

ν **Begin teaching the concept/skill**
4 **Maintain and develop concept/skill**

		CLASSES			
		1	**2**	**3**	**4**
6.2	**Area**				
6.2.1	Units for measuring area			ν	4
6.2.2	Area of regular shapes			ν	4
6.2.3	Area of irregular shapes			ν	4
6.2.4	Surface area			ν	4
6.3	**Mass**				
6.3.1	Units for measuring mass		ν	4	4
6.3.2	Mass of objects		ν	4	4
6.4	**Capacity**				
6.4.1	Units for measuring capacity		ν	4	4
6.4.2	Capacity of various containers		ν	4	4
6.5	**Time**				
6.5.1	Times of the day	ν	4	4	4
6.5.2	Periods of time – year, month, day, etc.	ν	4	4	4
6.5.3	Instruments used for measuring time	ν	4	4	4
6.5.4	Choice of instruments for measuring time	ν	4	4	4
6.5.5	Measurement of elapsed time			ν	4
6.5.6	Relationship between units of time			ν	4
6.6	**Money**				
6.6.1	The local currency	ν	4	4	4
6.6.2	The use of coins and notes	ν	4	4	4
6.6.3	The relationship between coins and bills	ν	4	4	4
6.6.4	Buying and selling			ν	4
6.6.5	Currency conversions			ν	4

ν **Begin teaching the concept/skill**

4 **Maintain and develop concept/skill**

		CLASSES			
		1	**2**	**3**	**4**
7.0	**GEOMETRY**				
7.0.1	Properties of two-dimensional shapes	ν	4	4	4
7.0.2	Properties of three-dimensional shapes	ν	4	4	4
7.0.3	Line, point, ray and line segment	ν	4	4	4
7.0.4	Types of lines (horizontal parallel etc.)		ν	4	4
7.0.5	Lines of symmetry		ν	4	4
7.0.6	Types of angles			ν	4
7.0.7	Measurement of angles				ν
7.0.8	Types of quadrilaterals				ν
7.0.9	Types of triangles			ν	4
7.0.10	The circle			ν	4
8.0	**SET THEORY**				
8.0.1	Definition of a set	ν	4	4	4
8.0.2	Description of a set	ν	4	4	4
8.0.3	Elements in a set	ν	4	4	4
8.0.4	Types of sets		ν	4	4
8.0.5	Diagrams of sets			ν	4
9.0	**DATA HANDLING**				
9.0.1	Data collection and representation	ν	4	4	4
9.0.2	Averages of given data (mean, mode)	ν	4	4	4
9.0.3	Probability terms			ν	4
9.0.4	Probability of outcomes			ν	4
9.0.5	Predictions			ν	4

CLASS 4

Recognize and utilize number concepts as applied to other areas of Mathematics

Number Concepts

The pupils should be able to:

- read and write numbers up to 9 999 999
- read and write place value or numerical value of any 7 digit numbers
- compare and order numbers up to 9 999 999
- determine the place value of a digit in numbers up to 9 999 999
- perform the four basic operations on numbes up to 9 999 999
- identify prime numbers up to 100
- distinguish between factors and multiples
- determine factors and multiples for a given number
- identify and use the Highest Common Factor of no more than three numbers
- identify and use Lowest Common Multiple of no more than three numbers
- express a given number as a product of its prime factors
- identify squares of numbers up to the number 12
- build number sequences
- multiply a whole number by on, two- and three-digit numbers;
- divide a whole number by one-and two-digit number
- estimate answers to problems by rounding off numbers to the nearest 10, 100, 1 000 and 10 000

Understand and utilize the concepts of fractions and decimals. Further, to be able to apply these concepts to solve every day problems.

Fractions and Decimals

The pupils should be bale to :

- perform the four operations with decimals and fractions
- convert a fraction to a decimal and vice versa
- solve problems involving decimals
- solve problems involving fractions

Apply the principles involved to solve everyday problems

Ratio and Proportion

The pupils should be bale to :

- solve problems involving ratios
- solve problems in involving proportions utilizing different problem-solving techniques
- demonstrates a working knowledge of percentages
- integrate concepts and skills learnt in other s areas to assist in solving worded problems

Develop skills needed to accurately perform tasks involved in measurement

Measurement

The pupils should be bale to :

- determine the area and perimeter of regular and irregular shapes
- determine a dimension given another dimension and either the area or perimeter of a regular shape
- measure mass using the appropriate unit
- measure capacity using the appropriate unit
- tell time in minutes past and minutes to the hour
- combine money coins and notes of values equivalent to $100
- determine the change to be received from a given from a given sum money to purchase items
- solve problem involving money
- solve problems based on units of measurement

Differentiate between shapes, lines and angles. Utilize concepts and skills previously developed in these areas.

Geometry

The pupils should be able to:

- identify and define lines, angles and vertices
- identify and differentiate between different types of angles
- compare angles
- classify triangles as equilateral, right angled or isosceles

- classify quadrilaterals as either square, rectangles or parallelogram
- show the relationship between the radius and the diameter

Utilize the concept of sets to interpret diagrams and solve problems

Venn Diagram

The pupils should be able to:

- identify the intersection and union of two sets
- use Venn diagrams to illustrate sets
- use Venn diagrams to list the elements in a set
- use Venn diagrams to solve problems involving no more than two sets

Utilize tally charts as well as any other method to collect and record data. Also to demonstrate the ability to read co-ordinates.

The pupils should be able to :

- perform experiments and record data
- display recorded data on different types of graphs
- locate places on a map
- plot co-ordinates on a grid
- predict the likely outcome of an event

CLASS 4

TOPIC	OBJECTIVES	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
NUMBER CONCEPTS	*Pupils should be able to:* Read and write numbers up to 9 999 999 using words and symbols. Write the value and/or place value of any digit in a seven-digit number. Compare and order numbers up to 9 999 999. Identify prime numbers up to 100. Distinguishing between factors and multiples. Determine factors and multiples for a given number. Express a given number as a product of its prime factors. Identify squares of numbers up to the number 12 and the corresponding square roots.	Read the water meter at different times and find the amount of water used. Number riddles e.g. The number has three digits The tens digit is one more than the hundreds digit The ones digit is the sum of the tens and hundreds digit Rounded to the nearest hundred, the number is 300. Use the calculator to observe number patterns and rules in mathematics. For example: For any multiple of three, the digits add to give 3, 6 or 9. 18: 1 + 8 = 9 372: 3 + 7 + 2 = 12; and 1 + 2 = 3	Quizzes Written exercises Quizzes Discussion	Flash cards Multiplication tables Number charts Hundred chart Calculator

CLASS 4

TOPIC	OBJECTIVES	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
FRACTIONS AND DECIMALS	Build number sequences using whole numbers, fractions and decimals in ascending and descending order. Multiply whole numbers by one, two- and three-digit numbers. Divide whole numbers by one- and two-digit numbers. Estimate answers to problems by rounding off numbers to the nearest 10, 100, 1 000, and 10 000. Divide a decimal fraction by a whole number and vice versa Divide a decimal fraction by a decimal fraction. Express a common fraction as a decimal fraction and vice versa.	Complete problem solving exercises such as: Complete: 1, 3, 9, 27, ____, ____, ____. 2.0, 2.2, 2.4, 2.6, ___, ____, ___ Teams of pupils are given cards with a digit on each and one student has a card with a decimal point. The teacher calls a decimal number and each team must form the number. The team that forms the number first wins. The number may also be given as the sum or product of two numbers.	Written exercises Simulations Games	Calculator Worksheets Flash cards Game cards
MEASUREMENT	Determine the perimeter of regular and irregular shapes by	Create plans of the school by using scale drawings. Establish the		

CLASS 4

TOPIC	OBJECTIVES	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
	(i) measuring and (ii) calculating. Determine the area of a regular and irregular shapes by (i) measuring and (ii) (ii) calculating. Determine the length of a rectangle given the perimeter and the width. Determine the length of a rectangle given the area and the width. ***Review the concepts of mass, capacity, money and time as outlined in the Class 3 syllabus.***	relationship between the area of the plan and the actual area Use a calibrated container to make a water clock that tells time in minutes. Repeat the activity with a container that has a smaller diameter. What do you notice? Draw out a running track 50 metres long and measure the time that it takes pupils to run 50 metres. Determine the speed of each pupil. A visitor from Trinidad went to the bank and changed TT $360. She received $120 in Barbadian currency. What was the exchange rate?	Observation Discussion Written exercises Simulation Discussion Oral presentations	Rulers Measuring tape Drawing instruments Discarded containers Watch / clock Stop watch Paint Calculators Coins and bills
GEOMETRY	Identify and give the meanings of: (i) a line segment (ii) a line (iii) a ray (iv) an angle	Design charts that explain the difference between the concepts identified.	Written reports Oral presentations	Squared paper Drawing tools

CLASS 4

TOPIC	OBJECTIVES	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
DATA HANDLING	(v) a vertex Identify and describe: (i) a right angle (ii) an acute angle (iii) an obtuse angle (iv) a reflex angle Classify triangles as equilateral, right-angled or isosceles. Classify quadrilaterals as square, rectangle or parallelogram. Identify the parts of a circle: circumference, chord, diameter, radius, center. Calculate the radius of a circle given the diameter and vice versa. Show initiative in developing appropriate activities. Collect and record data on an area of interest. Represent the data using: (i) pictographs	Photograph buildings or objects that contain the angles identified. Produce a booklet that contains a definition and at least three examples of each angle. (Pictures may also be taken from the computer) Using string, Investigate the relationship between the circumference and diameter of the circle by measuring these dimensions on a range of circles. Use co-ordinates to find countries on the map. Represent the locations of the	Discussion Booklet Illustrations Demonstration Observation Illustration / Diagrams	Digital camera Computer with Internet access. Squared paper String Two dimensional shapes Circles Objects with a circular face Squared paper Computer Maps

CLASS 4

TOPIC	OBJECTIVES	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
	(ii) bar graphs (iii) line graphs (iv) co-ordinate graphs (v) pie charts Use probability to determine the outcome of an event. Use probability to make predictions.	pupils in the classroom, using co-ordinates.		

APPENDIX

SUGGESTED TEXTS

PUPILS

Caribbean Primary Mathematics Levels 1-6 - Ginn
Nelson Primary Maths for Caribbean Schools 1-4 - Errol Furlonge
Steps To Common Entrance Mathematics 1 -3 Walter Phillips
Steps To Common Entrance Mathematics Text book Walter Phillips
Steps To Common Entrance Mathematics Workbook Walter Phillips

TEACHERS

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JOURNALS

Mathematics Teacher. Reston, VA: National Council of Teachers of Mathematics.

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