

MATHEMATICS

SYLLABUS

FOR THE PRIMARY SCHOOL



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Introduction

The ni-Vanuatu student must learn to **read, write, count** and must also learn to know the world about him.

- read, and also understand what he has to read;
- write, and also be capable of expressing what he has to say;
- to count, and also resolve problems of everyday life.

The school must enable him acquire knowledge and methods, and must forge adults capable of exercising their judgement to understand words, things and people.

Mathematics

In ancient times, men needed to resolve the practical problems of everyday life. Very old documents on Egyptian papyrus dating from about 1 700 years before Christ have been found. They contain problems of daily life concerning the sharing of loaves of bread, seeds or animals, with their arithmetical solution.

Nowadays, in the universities, teams of mathematicians continue carrying out research. It is thanks to their discoveries that it has been possible to invent computers, calculators, go to the moon, and soon to Mars.

Mathematics is included as one of the basic subjects learnt at school because it meets a necessity of life.

The teaching of mathematics makes an effective contribution to the intellectual development of children and prepares them for practical and professional life by enabling them to acquire techniques for resolving the problems suggested by everyday life.

Mathematics continuously asks of students very conflicting performances: on the one hand, it requires the mastery of many automatic tasks and, on the other hand, it makes massive demands on the functions of reasoning and abstraction.

The universe of mathematics is not closed in on itself, one finds it in all areas, science, statistics, commerce, industry and modern technology, agriculture, arts ...

Mathematics is both a pleasure and a diversion. Mathematical games and puzzles are found in magazines and newspapers.

The syllabus

The syllabus is for the teachers, the reference document round which the work is organised for the students. The teacher must refer to it regularly and use all its ideas.

Whenever possible, the new ideas are introduced through concrete situations of everyday life. The teaching methods chosen by the teacher must further the activity of the student and develop his/her capacities for creation and invention. Working in groups is favoured.

Presentation

At the beginning of the book, a general table shows, for each theme, how the acquisition of knowledge is spread out over the six years.

In the section of the syllabus for each year, the objectives, with a list of what the students are to have learnt by the end of the year, are set out in the first part. Examples are given and the limits of the programme defined in the second part.

Further information on the teaching of mathematics is given at the end of the book.

Timetable

The subject of mathematics is timetabled for 6 hours a week in each of the years, that is, an average of 72 minutes per day.

It is advisable for the time allowed each day to be broken up into two or three sessions, each taking place in a different part of the day.

Methods

At all levels of the primary school, the teaching of mathematics is based on the activities carried out by the students.

Knowledge is built up by successive steps:

- starting from the observation and analysis of situations taken from their surroundings or from their lives or from their centres of interest,
- drawing out the mathematical concepts,
- recognising them and using them in varied situations.

The children themselves build up their knowledge while developing their spirit of curiosity about life.

For every question, there are different depths of understanding. The teacher adapts the exercises to the level of the students, he takes into account differences which exist between them, and is alert to the whole group of students reaching out to understand and master new ideas.

Whole numbers

	Year 1	Year 2	Year 3
Numeration	to 20	to 100	to10 000
	<ul style="list-style-type: none">- Decimal numeration- Reading and writing in figures	<ul style="list-style-type: none">- Decimal numeration- Reading and writing in figures or in words- Distinguish betewwn cardinal numbers and ordinal numbers	
number order	<ul style="list-style-type: none">- Comparison of two numbers, use of thesigns: = 0 ≠	<ul style="list-style-type: none">- Comparison and ordering of two numbers, use of the signs: = , ≠ , < , >- Interpolation of a number- Estimation of a number- Writing of a sequence of numbers in ascending and descending order	
	<ul style="list-style-type: none">- Ordering of two numbers, use of the signs: < or >	<ul style="list-style-type: none">- Sequence of numbers, counting in 2s, in 10s, in 5s... starting from any given number.	<ul style="list-style-type: none">-Sequence of numbers counting in 10s, in 3s, in 20s,... starting from a given number.- odd and even numbers
Operations with all the numbers known by the pupils	<ul style="list-style-type: none">- Decomposition by addition of a number- Addition- “Incomplete” addition of the type: a + = b	<ul style="list-style-type: none">Decomposition by addition of a numberAddition with carrying- Subtraction without or with carrying- “Incomplete” addition and subtraction of the type: - a + = b or a - = bConstruction, use and memorization of addition and subtraction tables	<ul style="list-style-type: none">Decomposition by addition of a numberAddition and subtraction- meaning, properties- with carrying- memorization of tablesMultiplication: first approach, double, triple...multiplication of a 2 or 3 digit number by 2, 3, 4, 5, or 10.
Order of operations			<ul style="list-style-type: none">Addition of three or more numbersBrackets: first use in a sequence of additions and subtractions:
	<ul style="list-style-type: none">At each stage of learning,,<ul style="list-style-type: none">- estimation of the result of an operation- mental calculation		
At each stage of learning, everyday problems using what the students have learnt			

Whole numbers

	Year 4	Year 5	Year 6
Numeration	To 1 000 000	to 1 000 000	Over one million
	<ul style="list-style-type: none"> - Decimal numeration - Reading and writing in figures or in letters - Distinction between cardinal numbers and ordinal numbers 		
number order	<ul style="list-style-type: none"> - Comparison and ordering of two numbers, use of the signs: = , ≠ , < , > - Interpolation of a number - Estimation of a number - Writing of a sequence of numbers in ascending or descending order 		
	<ul style="list-style-type: none"> - Sequence of numbers, counting in 2s, in 10s, in 5s, in 100s, in 1 000s.... starting from a given number 	<ul style="list-style-type: none"> - Sequence of numbers, counting in 5s, in 100s, in 1 000s.... starting from a given number - Writing in Roman figures of numbers below 39 	<ul style="list-style-type: none"> - Sequence of numbers, counting in 5s, in 100s, in 1 000s.... starting from a given number - Writing of numbers in Roman figures
Operations	Decomposition by addition of a number Addition and subtraction - with carrying - memorization of tables Multiplication of 2 or 3 digits by 2 digits - memorization of all tables Division by a single digit	Decomposition by addition of a number Addition and subtraction - with carrying - memorization of tables Multiplication: - 3 digits by 2 digits - memorization of all tables (revision) Division by two digits	Decomposition by addition of a number Addition, subtraction, multiplication, division: methods of working Multiples and divisors - Rules of divisibility by 2, by 5, by 10, by 3, by 9 - Prime numbers
Order of operations	Order of addition and subtraction Brackets: use in calculation of series of additions and of subtractions	Order of addition, subtraction and multiplication Brackets: use in calculation of a series of operations	Order of operations with brackets Conventions and priorities of operations with brackets present
	At each stage of learning, - estimation of the result of an operation - mental calculation		
Proportion	first approach	use for solving problems	Percentages Map scales Speed
At each stage of learning, everyday problems using what the students have learnt			

Fractional numbers

	Year 1	Year 2	Year 3
fractions		Introduction to the notion of sharing: half, double	Notion of sharing: half - double, third - triple, quarter - quadruple
Operations		Give in an intuitive fashion a half of a given quantity	
Problems.	At each stage of learning, everyday problems the resolution of which necessitates the use of operations learnt by the students		

Decimal numbers			
	Year 4	Year 5	Year 6
decimals		vocabulary: tenth, hundredth Reading and writing of decimals in letters and figures Interpolation by two consecutive whole numbers (which follow) Ordering, using the signs < or >	Decimal numeration, vocabulary: tenth, hundredth, thousandth .. Reading and writing of decimal numbers Ordering, signs < or > Interpolation and rounding
Operations	Addition and subtraction of two numbers not necessarily having the same number of digits after the decimal point		
		Multiplication of a decimal by a whole number	Multiplication of two decimals Division of a decimal by a whole number
Problems	At each stage of learning, everyday problems the resolution of which necessitates the use of operations learnt by the students		

Fractional numbers			
	Representation of a fraction by a drawing, significance of a fraction		
fractions	Idea of sharing linked to the study of division On a drawing, note the equality of two simple fractions such as: $\frac{1}{2} = \frac{2}{4}$	Vocabulary: numerator, denominator, fraction line... Comparison of two fractions with the same denominator, use of signs > and < Equal fractions	Vocabulary Comparison of two fractions with the same denominator, use of signs > and < Rule: $\frac{a}{b} = \frac{a \times c}{b \times c}$ - Simplification. - Equal fractions
Operations with fractions	Simple calculations relating to half, third, quarter	Addition of two fractions with the same denominator	Addition and subtraction of two fractions with the same denominator Multiplication of a fraction by a whole number
Problems	At each stage of learning, everyday problems the resolution of which necessitates the use of operations learnt by the students		

Geometry

	Year 1	Year 2	Year3
Orientation	Open curves, closed curves In front of, behind Left, right Inside, outside; inner, outer On, under; above, below High, low; high up, low down To the left of, to the right of Far from, close to Before, after Between		
Solids		Vocabulary: cube, rectangular prism, sphere, cylinder. Counting the faces of a solid	Cube, rectangular prism: Vocabulary: vertices, edges, faces, opposing faces Counting of the faces
Plane shapes	Straight lines, curves Broken line Description of square, rectangle, triangle, circle	Square and rectangle - Vocabulary: vertex, side, diagonal - Symmetry: looking for axes of symmetry	Idea of angle, right angle, acute, obtuse Parallel lines Perpendicular lines Line symmetry
Geometric drawing	Drawing of lines using a ruler Drawing of lines with one or both ends known Linear patterns, tessellation	Drawing on squared paper Square and rectangle Drawing on plain paper Precise drawing of lines Linear patterns, tessellation	Drawing on squared paper - Axis of symmetry - Symmetry of a shape - Enlargement or reduction of shapes with the help of different- sized squares Drawing on plain paper - Perpendicular lines using a set-square.
Drawing on plain paper may be done in an exercise book without following the squares. Each student should have the use of set-square. If the school does not possess any, they can be made by carefully folding a piece of paper; only the right angle is needed.			

Geometry

	Year 4	Year 5	Year 6
Orientation			
Solids	Cube, rectangular prism: Net (development) Representation in perspective in a drawing	Cube and rectangular prism: properties, different nets Cylinder: observation, base, height	Cube, rectangular prism, cylinder
Plane shapes	Angles right, acute, obtuse; interior or reflex. Square and rectangle: sides, angles, vertices, axes of symmetry Other quadrilaterals: parallelogram, rhombus Triangle: sides, vertices, angles	Parallelism, orthogonality Polygon: vertex, side, diagonal. Quadrilaterals: trapezium, parallelogram, rhombus Triangle: in general and different kinds Heights of triangle Circle: vocabulary, properties Axial symmetry	Polygon, regular polygons Triangle: right-angled, isosceles, equilateral Angle: bisector Circle
Geometric drawing	Drawing on squared paper of the symmetry of a shape Drawing on plain paper, with ruler and set-square - Perpendicular lines - Parallel lines - Square and rectangle with known measurements	Drawing a circle knowing - the centre and the radius - a diameter Construction of point symmetry, with or without squared paper Construction of a triangle with known side measurements.	<ul style="list-style-type: none"> • Drawing on squared paper of all the shapes in the syllabus • Drawing on plain paper Construction of an angle with a protractor Construction of a triangle with known measurements (angles and sides) Construction of height of triangle Construction of a regular hexagon within a circle
Drawing on plain paper may be done in an exercise book without following the squares. Every student should have the use of a set-square. If the school does not possess any, they can be made by carefully folding a piece of paper; only the right angle is needed.			

Measurement

	Year 1	Year 2	Year 3
	At each stage of learning, everyday problems using what the students have learnt		
Length	Idea of length Comparison of the length of different objects Ordering of objects by length	Comparison of the length of different objects directly by superimposing them, or indirectly, by using a piece of string, ... Ordering of objects by length	Units: metre, decimetre and centimetre conversion of metre into decimetres or of metre into centimetres Perimeter of square and rectangle
Area			
Volume			
Mass Capacity	Idea of mass Comparison of the mass of different objects Ordering of objects by mass	Mass: Ordering of objects, from heaviest to lightest and inversely. Capacity: Comparison of the capacity of various receptacles	Mass: Use of a balance, the kilogram Capacity: Comparison of the capacity of various objects, the litre
Money	Recognize the numbers: 1, 2, 5, 10, 20, on coins	Calculation of the value of a collection of coins and notes. Grouping of coins and notes needed to make a given sum	Coins and notes Price of an object, exchange: change money, give change. Problems
Time	In coordination with the language and social studies courses, learning of the words: day, night; days of the week, months of the year.		Familiarisation with the notion of time, duration Use of the calendar Telling the time.

Measurement

	Year 4	Year 5	Year 6
	At each stage of learning, everyday problems using what the students have learnt		
Length	Length: units and conversions which do not use decimals Perimeter of square and rectangle	Length: units and conversion Perimeter of polygons and circle	Length: units and conversion
Area	Area: comparison of plane surfaces using squared paper Units: m^2 , dm^2 , cm^2 Calculation of the area of a square and a rectangle using squared paper	Area: units, conversion Area of square, rectangle, triangle, and of complex shapes by decomposition into simple shapes	Area: units (from km^2 to mm^2 , and the units of land measurement) and conversions. Area of circle, trapezium, rhombus, parallelogram..., and of complex shapes by decomposition into simple shapes
Volume	Volume: comparison of different solids by volume	Volume: units, conversion Calculation of volume of a cube and rectangular prism	volume: units, conversions
Mass Capacity	Mass: units kg, hg, dag, and g. Conversions Capacity: units l, dal, hl, dl, cl. Conversions	Mass: units, hundredweight (quintal) and tonne Conversion of units Capacity: units and conversion	Mass: units and conversion (from mg to tonne) Capacity: units and conversion (ml hl) $1l = 1 dm^3$
Money	Use of money: changing money, giving change	Calculation of a price Problems using the ideas: purchase price, cost price, sale price, charges, taxes, profit, loss without using percentages	First approach to percentage, taxes (interest, , reductions, taxation ...) Applying percentage to a sum of money
Time	Conversion of units of duration: year, month, week, day, hour, minute. Use of calendar Telling the time with minutes on a clock with hands	Precise telling of time units of duration: hour, minute, second Addition, subtraction of duration expressed in hr, min., sec. or in years, months, weeks...	Units of duration: conversions: hour - minute - second. Solution of problems of duration, using the notion of speed

Mathematics Programme

Year 1

I. Objectives

Throughout the year, the action of the teacher is intended to guide the student to:

- construct the concept of a whole number in its two aspects: cardinal and ordinal
- understand the principle of the decimal place-value numeration system
- identify addition situations
- understand and use spatial relationships
- begin to construct the concepts of length and mass
- acquire dexterity in the use of pencil and ruler
- analyze a problem situation and use a mathematical model to resolve it

At the end of the year, the student should:

1) know

- the numbers from 0 to 20, their decimal writing in figures, their decomposition by addition
- the vocabulary for spatial positions

2) be capable of:

- reproducing a simple rhythm and continuing a sequence according to a given rhythm.
- classifying or ordering the elements of a set of objects
- comparing the number of elements of a set of objects
- recognizing the number of elements in a set of objects
- reading and writing in figures and words the numbers from 0 to 20
- decomposing or composing by addition a number from 0 to 20
- expressing a situation involving addition as an equation
- understanding and using spatial relationships
- comparing lengths and masses
- making drawings with the help of a ruler

Mathematics Programme

Year 2

I. Objectives

Throughout the year, the action of the teacher is intended to guide the student to:

- reinforce the concept of a whole number in its two aspects: cardinal and ordinal
- understand the principle of decimal place-value numeration
- identify addition situations
- identify subtraction situations
- understand and use spatial relationships
- begin work on line symmetry
- reinforce the concepts of length and mass
- begin to construct the idea of capacity
- use money
- acquire dexterity in the use of pencil and ruler
- analyze a problem situation and use a mathematical model to resolve it.

At the end of the year, the student should:

1) know

- the numbers to 100:
 - their written form in numerals and words;
 - their decomposition by addition;
- the vocabulary of spatial and temporal positions;
- the properties of the rectangle and square.

2) be capable of:

- reproducing a simple rhythm and continuing a sequence following a given rhythm
- comparing and ordering numbers
- recognizing the number of elements in a set of objects
- reading and writing in numerals and words the numbers up to 100
- decomposing or composing through addition a number below 100
- expressing an addition situation by an equation
- expressing a subtraction situation by an equation
- understanding and using spatial relationships

Mathematics Programme

Year 3

I. Objectives

Throughout the third year, the action of the teacher is intended to guide the student to:

- reinforce the concept of a whole number in its two aspects: cardinal and ordinal
- understand the principle of decimal place-value numeration (*Decimal numeration is the same as base ten numeration*)
- clarify the meaning of addition and subtraction
- recognize the properties of these operations
- be able to add and subtract whole numbers using conventional methods
- master the addition tables
- discover the different meanings of multiplication
- recognize the properties of multiplication
- be able to multiply whole numbers using a method of calculation
- begin division
- construct geometric shapes and solids
- classify plane shapes and solids
- carry out geometric transformations on shapes: line symmetry, translations, enlargements
- know the units of measurement of length, mass and capacity
- discover the idea of double - half in units of measurement
- understand and use money
- tell the time and measure duration
- acquire dexterity in the use of pencil, ruler and set-square
- analyze a problem situation and use a schematic model to resolve it

At the end of Year 3, the student should:

1) know

- the numbers to 999: their writing in decimal form in figures and words, their decomposition by addition
- the properties of addition, subtraction and multiplication
- the addition table to 9
- the multiplication table to 5
- the characteristics of a square, rectangle and triangle
- the characteristics of a rectangular prism

-
- the characteristics of a cube
 - the types of lines: parallel, perpendicular, vertical, horizontal, oblique
 - the units of measurement of length, area, volume, mass, capacity, time, money

2) be capable of

- reading and writing in figures and words the numbers to 999
- decomposing and composing through addition a number to 999
- expressing a situation involving addition, subtraction or multiplication as an equation
- adding and subtracting numbers with and without carrying
- multiplying a two- or three-digit number by a single-digit number with or without carrying
- using line symmetry
- making translations, enlargements and reductions of figures
- drawing parallel and perpendicular lines
- comparing lengths, masses, capacities
- telling the time

Mathematics Programme

Year 4

I. Objectives

Throughout the fourth year, the action of the teacher, in mathematics, is intended to guide the student to:

- reinforce the concept of whole numbers
- estimate numbers
- be able to carry out addition and subtraction of whole numbers using conventional methods
- discover the different meanings of multiplication
- recognise the properties of multiplication
- be able to carry out multiplication of whole numbers using a method of calculation
- master all the multiplication tables
- begin division
- be able to carry out division of whole numbers using a method of calculation
- construct straight lines, geometric planes and solids: square, rectangle, triangle, angle, cube, rectangular prism, regular cylinder
- classify plane shapes and solids
- carry out geometric transformations on symmetrical shapes, translations, enlargements and reductions
- know the units of measurement of length, mass, capacity, area, volume, angle
- understand and use money
- tell the time and measure duration
- analyse a problem situation and use a schematic model to resolve it

At the end of the fourth year, the student should:

1) know

the numbers to 1 000 000

- their decomposition by addition
- the properties of addition, subtraction and multiplication;
- all multiplication tables
- the types of lines: parallel, perpendicular, vertical, horizontal, oblique
- the approach to proportion
- the properties of a square, rectangle and triangle
- the properties of a rectangular prism

- the properties of a cube
- the properties of a regular cylinder
- the units of measurement of length, area, volume, mass, capacity, time, money

2) be capable of

- reading and writing in figures and words the numbers to 1 000 000
- decomposing and composing through addition a number up to a million;
- expressing a situation involving addition, subtraction or multiplication as an equation;
- expressing a situation as an addition, subtraction, multiplication or division;
- adding and subtracting numbers with or without carrying;
- multiplying a two or three-digit number by a one-digit number with or without carrying;
- dividing a two or three-digit number by a single-digit number with or without a remainder;
- using line symmetry;
- carrying out translations and reductions of shapes with the help of squared paper;
- drawing parallel and perpendicular lines with the help of a set-square;
- comparing lengths, areas, volumes, masses, capacities;
- telling the time.

Mathematics Programme

Year 4

I. Objectives

Throughout the fourth year, the action of the teacher, in mathematics, is intended to guide the student to:

- reinforce the concept of whole numbers
- estimate numbers
- be able to carry out addition and subtraction of whole numbers using conventional methods
- discover the different meanings of multiplication
- recognise the properties of multiplication
- be able to carry out multiplication of whole numbers using a method of calculation
- master all the multiplication tables
- begin division
- be able to carry out division of whole numbers using a method of calculation
- construct straight lines, geometric planes and solids: square, rectangle, triangle, angle, cube, rectangular prism, regular cylinder
- classify plane shapes and solids
- carry out geometric transformations on symmetrical shapes, translations, enlargements and reductions
- know the units of measurement of length, mass, capacity, area, volume, angle
- understand and use money
- tell the time and measure duration
- analyse a problem situation and use a schematic model to resolve it

At the end of the fourth year, the student should:

1) know

the numbers to 1 000 000

- their decomposition by addition
- the properties of addition, subtraction and multiplication;
- all multiplication tables
- the types of lines: parallel, perpendicular, vertical, horizontal, oblique
- the approach to proportion
- the properties of a square, rectangle and triangle
- the properties of a rectangular prism

-
- the properties of a cube
 - the properties of a regular cylinder
 - the units of measurement of length, area, volume, mass, capacity, time, money

2) be capable of

- reading and writing in figures and words the numbers to 1 000 000
- decomposing and composing through addition a number up to a million;
- expressing a situation involving addition, subtraction or multiplication as an equation;
- expressing a situation as an addition, subtraction, multiplication or division;
- adding and subtracting numbers with or without carrying;
- multiplying a two or three-digit number by a one-digit number with or without carrying;
- dividing a two or three-digit number by a single-digit number with or without a remainder;
- using line symmetry;
- carrying out translations and reductions of shapes with the help of squared paper;
- drawing parallel and perpendicular lines with the help of a set-square;
- comparing lengths, areas, volumes, masses, capacities;
- telling the time.

Mathematics programme

Year 6

I. Objectives

Throughout the sixth year of the primary school, the action of the teacher, in mathematics, is intended to guide the student to:

- consolidate their knowledge of the use of the different properties of operations on whole numbers
- reinforce what he has learnt in relation to the four operations on whole numbers using conventional methods
- construct geometric plane and solid shapes
- carry out geometric transformations on these shapes: symmetry, enlargement and reduction
- deepen his understanding of measurements of length, mass, capacity, area, volume, angle
- master and use units of measurement of time and duration;
- understand voluminous mass and density
- reinforce dexterity in the use of geometric instruments
- analyze a problem situation and use a schematic model to resolve it
- encourage the awakening of the intellectual faculties, of logical reasoning, and of attitudes of research

By the end of the year, the student should:

1) have mastered:

- high numbers:
 - their writing in figures and letters
 - their decomposition by addition
- operations on high numbers
- the characteristics of a rectangle, square, triangle, parallelogram, rhombus, trapezium
- the characteristics of a rectangular prism and cube
- the units of measurement of length, mass, capacity, time, volume

2) be capable of:

- reading and writing high numbers in figures and letters
- decomposing and composing high numbers through addition
- expressing a situation involving addition, subtraction or multiplication as an equation
- adding or subtracting high numbers without or with carrying
- multiplying a number of more than three digits by a number with more than three digit without or with carrying
- carrying out operations of addition, subtraction, multiplication with decimals
- comparing fractions, carrying out operations of addition, subtraction and multiplication on fractions
- using line symmetry
- carrying out enlargements and reductions of shapes
- drawing geometric shapes incorporating parallel and perpendicular lines
- drawing geometric shapes incorporating the idea of scale
- solving problems relating to measurements of length, using a scale
- solving problems relating to measures of mass, capacity, area, volume
- carry out elementary operations on measurements of time, duration and speed