MINISTRY of EDUCATION

SECONDARY SCHOOL MATHEMATICS

LEVEL 7

CURRICULUM GUIDE

Foreword

It is acknowledged that thorough planning is essential for effective teaching and learning. Such planning is even more critical today when one considers the limited resources, both human and material, which are available.

The Ministry of Education, through the Secondary School Reform Project (SSRP), has developed curriculum materials that have been designed to improve the quality, equity and efficiency of secondary education. The curriculum materials include Levels 7-9 curriculum guides and teachers' guides for Language Arts, Mathematics, Science, Social Studies, Reading and Practical Activities for Science. These materials have been tested in secondary-age schools nationwide and are considered useful in providing teachers with a common curriculum framework for planning, monitoring and evaluating the quality of teaching and learning. The curriculum materials also provide a basis for continuous student assessment leading to the National Third Form Examination (NTFE).

The initial draft curriculum materials have been subjected to evaluation, by respective Heads of Departments, from all ten Administrative Regions and Georgetown and they have been subsequently revised to reflect the views expressed by teachers.

The revised curriculum materials are now published as National Curriculum documents to provide consistency and support for teachers in the process of planning for an effective delivery of the curriculum. All secondary teachers must ensure that they make good use of these curriculum materials so that the quality of teaching and learning can be improved in all schools.

Ed Caesar
Chief Education Officer

PREFACE

This is the Revised Curriculum Guide for Level 7. This document fulfils the objective of making **Mathematics** accessible to all students at Level 7. Hence teachers of Level 7 students should make a conscious effort to see how best they could utilize the ideas contained to plan for instruction. This document can serve as a focal point for departmental and regional subject committee meetings, where methodologies and strategies for both teaching and assessing are deliberated on. Lessons should be delivered in an environment in which there is opportunity for active and creative participation by both students and teacher. This Guide has a direct focus on an integrated approach to curriculum delivery, in which the teacher is not unduly restricted by the subject content. The student's total development as a person should be of foremost concern to the teacher.

In the curriculum process, feedback is a necessary condition for change and improvement, and I would urge all of our mathematics teachers to provide such feedback to the curriculum staff as they visit to provide support that will enhance your classroom teaching.

Mohandatt Goolsarran
Head
Curriculum Development and Implementation Unit
National Centre for Educational Resource Development
MARCH 2002

ACKNOWLEDGEMENTS

The following persons were involved in writing and revising the Level 7 Curriculum Guide:

Jean Holder-Lynch	Vice Principal (Administration) Cyril Potter College of Education
Joan Persaud	Deputy Headmistress Annandale Secondary School
Mohan Lall Sookdeo	Deputy Headmaster Charity Primary School
Dirk McAulay	Brickdam Secondary School
S. Binda	Queenstown Community High School (Retired)
Shirley Klass	Subject Specialist, Mathematics, NCERD (Retired)
Alicia Fingal	Assistant Chief Education Officer, Primary (Retired)
Flavio Camacho	Subject Specialist Mathematics (SSRP)
Joseph Mckenzie	Senior Subject Specialist Mathematics (SSRP)

LANGUAGE OF SETS

Topic	**Objectives**				**Content**	**Activities/ Materials/ Strategies**	**Evaluation**	***Areas of Integration***
	Skills	**Knowledge**	***Understanding***	**Attitude**				
Description of Sets		Describe a set.			Common ways of describing a set: • **Verbal Description, e.g.** The months of the year beginning with the letter J.	Small group activities: • Describing a set verbally.	Can students describe a set: • verbally?	Agriculture Science, e.g. describing a set of agriculture tools. Home Economics, e.g. describing a tea set.

Topic	Objectives				Content	Activities/ Materials/ Strategies	Evaluation	*Areas of Integration*
	Skills	**Knowledge**	**Understanding**	**Attitude**				
					• **Tabulation or Listing, e.g.** {January, June, July} When listing sets: - a comma is placed between one element and the next. - an element is not repeated. - the elements are enclosed in curly brackets, etc.	• Describing a set by listing the elements.	• by listing the elements?	Environmental Education, e.g. listing trees according to their usage.

Topic	*Objectives*				Content	Activities/ Materials/ Strategies	Evaluation	*Areas of Integration*
	Skills	**Knowledge**	***Understanding***	**Attitude**				
					• **Using a Loop, e.g.**  	• Drawing a loop around the elements.	• by drawing a loop around the elements?	Environmental Education, e.g. grouping of tourist resorts, pollutants, solid waste, etc.
Well-defined Sets			Differentiate between sets that are well defined and sets that are not well defined.	Appreciate the characteristics of a well-defined set.	Well defined sets, e.g. • A set of all the letters of the English alphabet = {a, b, c, d… z} • A set of all even numbers between 0 and 11 = {2, 4, 6, 8, 10}	Displaying well-defined sets.	Can students differentiate between sets that are well defined and sets that are not well defined?	Agriculture Science, e.g. Edible Roots = {carrots, radish, cassava, sweet potatoes}

Topic	*Objectives*				Content	Activities/ Materials/ Strategies	Evaluation	*Areas of Integration*
	Skills	***Knowledge***	***Understanding***	**Attitude**				
Elements of a Set	Use the symbols "$\in$" and "$\notin$".	List the elements of a set.	Differentiate between the symbols "$\in$" and "$\notin$".		Elements of a set. The symbols "$\in$" and "$\notin$".	Specifying the elements of a set by listing them. Discussing the meaning of the symbols "$\in$" and "$\notin$" Using the symbols "$\in$" and "$\notin$" to show membership and non-membership of sets.	Can students: • list the elements of a set? • differentiate between the symbols "$\in$" and "$\notin$"? • use the symbols "$\in$" and "$\notin$" to show membership and non-membership of sets?	Agriculture Science, e.g. Listing the tools used for harvesting. Agriculture Science, e.g. trowel is not an element of the set of harvesting tools can be written as: trowel $\notin$ {harvesting tools}
The Empty Set	Use the symbols { } or ∅.	Identify the empty set.		Appreciate the concept of the empty set.	The empty set The symbols that represent the empty set are { } or ∅.	Displaying examples of the empty set. Using the symbols { } or ∅ to represent the empty set.	Can students: • identify the empty set? • use the symbols { } or ∅ to represent the empty set?	Language, e.g. oral discussion on the characteristics of the empty set.

Topic	*Objectives*				Content	Activities/ Materials/ Strategies	Evaluation	*Areas of Integration*
	Skills	**Knowledge**	***Understanding***	**Attitude**				
Finite & Infinite Sets		Identify finite and infinite sets.			A set is finite if it is possible to list or count all its elements, e.g. A = (a, b, c, …z} A set is infinite if it is not possible to list or count all its elements, e.g. B = {points on a line}	Showing on chart examples of: • finite sets • infinite sets	Can students identify • finite sets? • infinite sets?	**Finite sets:** Environmental Education, e.g. Set B = {Passion fruit simutu, baby pumpkin, water-melon} **Infinite sets:** Environmental Education, e.g. {Number of sand grains on the sea shore in Guyana}

Topic	*Objectives*				Content	Activities/ Materials/ Strategies	Evaluation	*Areas of Integration*
	Skills	**Knowledge**	***Understanding***	**Attitude**				
Equal Sets		Identify equal sets.			Equal sets: two sets A and B	Displaying examples of	Can students identify equal	Social Studies, e.g. Set A = {All

					are said to be equal, if and only if they have the same elements, e.g. A = {2, 3, 4} B = {4, 2, 3} A = B	equal sets.	sets?	denominations of the Guyana Currency} Set B = {$1000, $500, $100, $20} Set A = Set B.
Equivalent Sets		Identify equivalent sets.			Equivalent sets: two sets are equivalent if they have the same number of elements, e.g. A = {2, 3, 4} B = {c, d, k} A ⇔ B	Displaying examples of equivalent sets.	Can students identify equivalent sets?	Environmental Education, e.g. A = {Animals from which craft items are obtained} B = {Craft items obtained from animals in set A} A ⇔ B

Topic	*Objectives*				Content	Activities/ Materials/ Strategies	Evaluation	*Areas of Integration*
	Skills	**Knowledge**	**Understanding**	**Attitude**				
	Use the symbol "⇔".				The symbol "⇔", e.g. Set A is equivalent to Set B is written as A ⇔ B.	Using the symbol "⇔" to represent equivalent sets..	Can students use the symbol "⇔" to represent equivalent sets?	
Subsets of a Set	Construct subsets of a given set.		Differentiate between a set and subsets of the set.	Enjoy writing down the subsets of a set.	Subsets of a set, e.g. A = {a, b, c} Subsets of A are: {a, b, c}, {a}, {b}, {c}, ∅.	Small group activities: • writing the subsets of given sets. • observing the difference between a set and the subsets of a set.	Can students • write down all the subsets of a given set? • differentiate between a set and subsets of the set?	Social Studies, e.g. collecting, classifying and identifying subsets of given groups.
Universal Set		Identify universal sets. Describe universal sets.	.		Universal set The universal set is represented by the symbol U.	Showing on chart examples of the universal set. Describing universal sets.	Can students: • identify the universal set? • describe universal sets? ***Unit Test***	Environmental Education, e.g. U = {The environment} Social Studies, e.g. U = {The Amerindian tribes in Guyana}

NUMBER THEORY

Topic	***Objectives***				**Content**	**Activities/ Materials/ Strategies**	**Evaluation**	***Areas of Integration***
	Skills	**Knowledge**	***Understanding***	**Attitude**				
Integers		Identify integers.			The set of integers includes positive and negative whole numbers and zero, e.g. {…-3, -2, -1, 0, 1, 2, 3, …} The set of integers is denoted by Z.	Showing on chart examples of the set of integers.	Can students: • identify the set of integers?	
	Use the symbols "<" and ">".				The symbols "<" (is less than) and ">".(is greater than)	Using the symbols "<" and ">" to compare numbers.	• use the symbols "<" and ">" to compare numbers?	
	Order numbers on a number line.			Follow the order relationship of integers.		Discussing the ordering of numbers on a number line.	• follow the order relationship of integers?	Language, e.g., describing the relationship between numbers on a number line.
	Predict the pattern of a sequence.				Number sequences.	Discussing number sequences. Developing a rule for a pattern.	• predict the pattern of a sequence?	

Topic	*Objectives*				Content	Activities/ Materials/ Strategies	Evaluation	*Areas of Integration*
	Skills	**Knowledge**	***Understanding***	**Attitude**				
Odd and Even Numbers		List odd and even numbers.			Odd and even numbers. Odd numbers give a remainder of 1 when divided by 2. The odd numbers are 1, 3, 5, 7, … Even numbers can be divided by 2 without a remainder. Zero is usually regarded as an even number. The even numbers are 0, 1, 2, 3, …	Listing odd and even numbers.	Can students: • list odd and even numbers?	
			Differentiate between odd and even numbers.			Discussing the difference between odd and even numbers.	• differentiate between odd even odd numbers?	

Topic	*Objectives*				Content	Activities/ Materials/ Strategies	Evaluation	*Areas of Integration*
	Skills	**Knowledge**	***Understanding***	**Attitude**				
Factors		List the factors of a number.		Practise finding factors of numbers.	Factors of numbers, e.g. {1, 2, 3, 6, 12} are factors of 12.	Small group activities: Listing the factors of given numbers. Encouraging students to practise finding factors of numbers.	Can students list the factors of a number? Do students practise finding factors of numbers?	
Multiples		List the multiples of a number.		Practise finding the multiples of numbers.	Multiples of numbers, e.g. the multiples of 12 are 24, 36, 48, …	Small group activities: Listing the multiples of given numbers. Encouraging students to practise finding the multiples of numbers.	Can students list the multiples of a number? Do students practise finding the multiples of numbers?	

Topic	*Objectives*				Content	Activities/ Materials/ Strategies	Evaluation	*Areas of Integration*
	Skills	**Knowledge**	***Understanding***	**Attitude**				
Prime & Composite Numbers		Identify prime and composite numbers. List prime and composite numbers.			Prime and composite numbers. A prime number has exactly two different factors, namely 1 and itself. Some of these are: 2, 3, 5, 7, … Composite numbers have more than 2 different factors. Some of these are: 4, 6, 8, 10, …	Discussing/ observing the special features of prime and composite numbers. Listing prime and composite numbers.	Can students: • identify prime numbers? • identify composite numbers? • list prime and composite numbers?	Language, e.g. the description of prime and composite numbers.
Prime Factors			Express a composite number as a product of prime factors.		Prime factors of a number, e.g. the prime factors of 6 = {2, 3} Composite number expressed as a product of prime factors, e.g. $6 = 2 \times 3$.	Expressing composite numbers as a product of prime factors.	Can students express a composite number as a product of prime factors?	

Topic	*Objectives*				Content	Activities/ Materials/ Strategies	Evaluation	*Areas of Integration*
	Skills	**Knowledge**	***Understanding***	**Attitude**				
Indices		Write the product of a number in index form.		Obtain satisfaction from writing the product of numbers in index form.	Product of a number in index form, e.g. $2 \times 2 \times 2 = 2^3$	Writing the product of a number in index form.	Can students write the product of a number in index form?	
			Express a number in index form.	do	Expression of a number in index form, e.g. $4 = 2^2$.	Expressing numbers in index form.	Can students express a number in index form?	Environmental Education, e.g. the area of a classroom expressed in index form: 64 m^2.
Highest Common Factor (HCF)			Determine the HCF of numbers.		Highest Common Factor.	Small group activities: • Finding the HCF of given numbers.	Can students: • find the HCF of numbers?	
			Determine the LCM of numbers.	.	Lowest Common Multiple.	• Finding the LCM of given numbers.	• find the LCM of numbers?	
Lowest Common Multiple (LCM)				Practise finding the HCF and LCM of numbers.		Encouraging students to practise finding the HCF and LCM of numbers.	Do students practise finding the HCF and LCM of numbers?	

Topic	*Objectives*				Content	Activities/ Materials/ Strategies	Evaluation	*Areas of Integration*
	Skills	**Knowledge**	***Understanding***	**Attitude**				
Commutative Law		Identify the commutative law.		Appreciate the commutative law.	The Commutative Law for + and ×. Examples: $2 + 3 = 3 + 2$ $2 \times 3 = 3 \times 2$ The commutative law does not apply to subtraction and division.	Showing on chart examples of the commutative law.	Can students identify the commutative law?	
Associative Law		Identify the associative law.		Appreciate the associative law.	The Associative Law for + and ×. Examples: $2 + (3 + 4) = (2 + 3) + 4$ $2 \times (3 \times 4) = (2 \times 3) \times 4$ The associative law does not apply to subtraction and division.	Showing on chart examples of the associative law.	Can students identify the associative law?	

Topic	*Objectives*				Content	Activities/ Materials/ Strategies	Evaluation	*Areas of Integration*
	Skills	**Knowledge**	***Understanding***	**Attitude**				
			Differentiate between the commutative and associative laws.			Discussing the difference between the commutative and associative laws.	Can students differentiate between the commutative and associative laws?	
The Distributive Law	Use the distributive law to simplify calculations.	Identify the distributive law.			The Distributive Law, e.g. $4 \times (6 + 3) =$ $(4 \times 6) + (4 \times 3) =$ $24 + 12 = 36.$ The law has two operations, multiplication and addition.	Showing on chart examples of the distributive law. Using the distributive law to simplify calculations.	Can students: • identify the distributive law? • use the distributive law to simplify calculations? ***Unit Test***	

COMPUTATION 1

Topic	*Objectives*				Content	Activities/ Materials/ *Strategies*	Evaluation	*Areas of Integration*
	Skills	**Knowledge**	***Understanding***	**Attitude**				
Rational Numbers		Identify rational numbers.	.		The rational numbers are made up of the set of fractions together with the set of integers. The symbol for the set of rational numbers is **Q.**	Discussing/ observing rational numbers.	Can students identify rational numbers.	
			Add and subtract with rational numbers.	Appreciate adding and subtracting with rational numbers.	Addition and subtraction with rational numbers, e.g. $\frac{1}{5}+\frac{1}{4}=$ $\frac{1\times4}{5\times4}+\frac{1\times5}{5\times4}=\frac{9}{20}$ $\frac{1}{4}-\frac{1}{5}=$ $\frac{1\times5}{4\times5}-\frac{1\times4}{4\times5}=\frac{1}{20}$	Small group activities: Adding and subtracting with rational numbers.	Can students add and subtract with rational numbers?	

Topic	*Objectives*				Content	Activities Materials *Strategies*	Evaluation	*Areas of Integration*
	Skills	**Knowledge**	***Understanding***	**Attitude**				
			Multiply and divide with rational numbers.	Appreciate multiplying and dividing with rational numbers.	Multiplication and division with rational numbers, e.g. $9 \div 3 = 9 \times \frac{1}{3}$ $= 3$	Small group activities: Multiplying and dividing with rational numbers.	Can students multiply and divide with rational numbers?	
Fractions & Decimals			Change fractions to decimals. Change decimals to fractions.	Appreciate changing fractions to decimals accurately. Appreciate changing decimals to fractions accurately.	Conversion of fractions to decimals, e.g. $\frac{3}{4} = 0.75$. Conversion of decimals to fractions, e.g. $0.65 = \frac{6}{10} + \frac{5}{100} = \frac{65}{100} = \frac{13}{20}$	Small group activities: • Changing fractions to decimals. • Changing decimals to fractions.	Can students change: • fractions to decimals? • decimals to fractions?	Integrated Science, e.g. the conversion of a fraction of a litre to a decimal of a litre and vice versa. Agriculture Science, e.g. planning for the cultivation of crops.

Topic	*Objectives*				Content	Activities/ Materials/ Strategies	Evaluation	*Areas of Integration*
	Skills	**Knowledge**	***Understanding***	**Attitude**				
						Strategies		
			Add decimals. Subtract decimals.	Practise adding and subtracting decimals.	Addition of decimals. Subtraction of decimals.	Small group activities: • Adding decimals. • Subtracting decimals. Encouraging students to practise adding and subtracting decimals.	Can students • add decimals? • subtract decimals? Do students practise adding and subtracting decimals?	

Topic	*Objectives*				Content	Activities/ Materials/ Strategies	Evaluation	*Areas of Integration*
	Skills	**Knowledge**	***Understanding***	**Attitude**				

			Multiply a decimal by a decimal. Divide a decimal by a decimal.	Practise multiplying and dividing a decimal by a decimal.	Multiplication of decimals, e.g. $0.6 \times 0.4 = 0.24$ Division of decimals, e.g. $4.48 \div 0.4 =$ $\frac{4.48}{0.4} =$ $\frac{4.48 \times 10}{0.4 \times 10} =$ $\frac{44.8}{4} = 11.2$	Small group activities: • Multiplying a decimal by a decimal. • Dividing a decimal by a decimal. Encouraging students to practise multiplying and dividing a decimal by a decimal.	Can students • multiply a decimal by a decimal? • divide a decimal by a decimal? Do students practise multiplying and dividing a decimal by a decimal? **Unit Test**	

MEASUREMENT 1

Topic	***Objectives***				**Content**	**Activities/ Materials/ Strategies**	**Evaluation**	***Areas of Integration***
	Skills	**Knowledge**	***Understanding***	**Attitude**				
SI System of Units		Identify SI units of length.			SI units of length, e.g. kilometre hectometre decametre metre	Showing on chart: • SI units of length.	Can students: • identify SI units of length?	

					decimetre centimetre millimetre.			
		Identify the prefixes used in SI units of length.			Prefixes used in SI units of length, e.g. kilo, hecto, deca, deci, centi, milli.	• prefixes used in SI units of length.	• identify prefixes used in SI units of length?	
		Identify the symbols used for SI units of length.			Symbols used for SI units of length, e.g. km, hm, dam. m, dm, cm, mm.	• symbols used in SI units of length.	• identify the symbols used in SI units of length?	

Topic	*Objectives*				Content	Activities/ Materials/ Strategies	Evaluation	*Areas of Integration*
	Skills	**Knowledge**	***Understanding***	**Attitude**				
			Convert a measurement from one SI unit to another.		Converting measurement from one SI unit to another. To convert measurement from one SI unit to another, it is necessary only to multiply or divide by a power of 10, e.g. 8 m = $8 \times (10 \times 10)$ cm = 800 cm.	Converting a measurement from one SI unit to another.	Can students: • convert a measurement from one SI unit to another?	
	Estimate and measure line segments.			Appreciate the need for accurate measurements.	Estimation and measurement of line segments.	Estimating and measuring line segments.	• estimate and measure line segments accurately?	Integrated Science, e.g. measuring the length of objects.

Topic	*Objectives*				Content	Activities/ Materials/ Strategies	Evaluation	*Areas of Integration*
	Skills	**Knowledge**	***Understanding***	**Attitude**				
Perimeter of Regular Shapes			Explain the meaning of the word perimeter. Calculate the perimeter of regular plane shapes.		Perimeter of regular plane shapes. Calculation of the perimeter of regular plane shapes.	Discussing perimeter. Calculating the perimeter of regular shapes by finding the length of one side and then multiplying it by the number of sides.	Can students: • explain the meaning of the word **perimeter**? • calculate the perimeter of regular plane shapes?	
Perimeter of Irregular Shapes			Calculate the perimeter of irregular shapes.		Calculation of the perimeter of irregular shapes.	Calculating the perimeter of irregular shapes.	Can students calculate the perimeter of irregular shapes?	Agriculture Science, e.g. calculating the perimeter of the school's agriculture plot.

Topic	*Objectives*				Content	Activities/ Materials/ Strategies	Evaluation	*Areas of Integration*
	Skills	**Knowledge**	***Understanding***	**Attitude**				
Area		Calculate the area of a square, rectangle and triangle. Calculate the area of irregular shapes.		 Enjoy calculating the area of irregular shapes.	Area of a square, rectangle and triangle. Area of irregular shapes.	Calculating the area of squares, rectangles and triangles. Drawing irregular shapes on graph paper and finding their areas by counting the squares that fall inside the shapes.	Can students: • calculate the area of squares, rectangles and triangles? • calculate the area of irregular shapes? ***Unit Test***	Agriculture Science, e.g. calculating the area occupied by the school's agriculture plot.

ALGEBRA 1

Topic	*Objectives*				Content	Activities/ Materials/ Strategies	Evaluation	*Areas of Integration*
	Skills	**Knowledge**	***Understanding***	**Attitude**				

Addition of Directed Numbers						Small group activities: Using semi circular cards labelled:	Can students:	Language, e.g. writing short stories on lesson taught.
			Add a positive integer to a positive integer.	Appreciate adding a positive integer to a positive integer correctly.	Addition of positive integers, e.g. $(^{+}4) + (^{+}2) = (^{+}6)$	• "+" to add a positive integer to a positive integer.	• add a positive integer to a positive integer correctly?	
			Add a negative integer to a negative integer.	Appreciate adding a negative integer to a negative integer correctly.	Addition of negative integers, e.g. $(^{-}4) + (^{-}2) = (^{-}6)$	• "-" to add a negative integer to a negative integer.	• add a negative integer to a negative integer correctly?	

Topic	*Objectives*				Content	Activities/ Materials/ Strategies	Evaluation	*Areas of Integration*
	Skills	**Knowledge**	***Understanding***	**Attitude**				
			Add a positive integer to a negative integer.	Appreciate adding a positive integer to a negative integer correctly.	Addition of a positive integer to a negative integer, e.g. $(^{+}7) + (^{-}3) = (^{+}4)$ $(^{-}7) + (^{+}3) = (^{-}4)$	• "+" and "-" to add a positive integer to a negative integer,	• add a positive integer to a negative integer correctly?	
		Recognise that adding an integer and its opposite is equal to zero.			An integer + its additive inverse = zero = identity element for addition, e.g. $(+2) + (^{-}2) = (0)$.	• "+" and "-" to add an integer and its opposite.	Do students recognise that adding an integer and its opposite is equal to zero?	
			Add integers in any order.	Appreciate adding two integers in any order correctly.	Addition of integers in any order. It does not matter in which order the addition is done the answer is the same. Integers are called directed numbers.	Using the number line to add two integers in any order.	Can students add two integers in any order?	

Topic	*Objectives*				Content	Activities/ Materials/	Evaluation	*Areas of Integration*
	Skills	**Knowledge**	***Understanding***	**Attitude**		**Strategies**		
Subtraction of Directed Numbers						Small group activities: Using semi circular cards labelled:	Can students:	
			Subtract a positive integer from a positive integer.	Appreciate subtracting a positive integer from a positive integer correctly.	Subtraction of a positive integer from a positive integer, e.g. $(^{+}13) - (^{+}9) = (^{+}4)$	• "+" to subtract a positive integer from a positive integer.	• subtract a positive integer from a positive integer correctly?	
			Subtract a negative integer from a negative integer.	Appreciate subtracting a negative integer from a negative integer correctly.	Subtraction of a negative integer from a negative integer, e.g. $(^{-}4) + (^{-}2) = (^{-}6)$	• "-" to subtract a negative integer from a negative integer.	• subtract a negative integer from a negative integer correctly?	
			Subtract a positive integer from a negative integer.	Appreciate subtracting a positive integer from a negative integer correctly.	Subtraction of a positive integer from a negative integer, e.g. $(^{-}3) - (^{+}7) = (^{-}10)$	• "+" and "-"to subtract a positive integer from a negative integer.	• subtract a positive integer from a negative integer correctly?	

Topic	*Objectives*				Content	Activities/ Materials/ Strategies	Evaluation	*Areas of Integration*
	Skills	**Knowledge**	***Understanding***	**Attitude**				
			Subtract a negative integer from a positive integer.	Appreciate subtracting a negative integer from a positive integer correctly.	Subtraction of a negative integer from a positive integer, e.g. $(^{+}7) - (^{-}3) = (^{+}10)$	• "+" and "-"to subtract a negative integer from a positive integer.	• subtract a negative integer from a positive integer correctly?	
Use of Symbols		Identify symbols that represent a number of items/articles. Identify variables, coefficient, constants.			Use of symbols. A variable is usually a letter, e.g. in 5b + 4, b is the variable. A coefficient is the number in front of the variable, e.g. in 5b + 4, 5 is the coefficient of b. The value of a constant does not change, e.g. in 5b + 4, 4 is the constant.	Showing on chart examples of the ways in which symbols can be used to represent the addition of two like sets, e.g. 3 bowls + 2 bowls = 5 bowls can be represented as 3b + 2b = 5b. Showing on chart examples of variables, coefficients and constants in algebraic expressions.	Can students: • identify symbols that represent a number of items/ articles? • identify variables coefficients and constants in algebraic expressions?	Integrated Science, e.g. using symbols to identify quantity, constants and variables.

Topic	*Objectives*				Content	Activities/ Materials/ Strategies	Evaluation	*Areas of Integration*
	Skills	**Knowledge**	***Understanding***	**Attitude**				
	Use symbols to represent ideas.				The use of symbols to represent ideas, e.g. Jo is 13 years old. How old will he be in **y** years time, can be represented by 13 + y.	Using symbols to represent ideas.	Can students use symbols to represent ideas?	
Addition and Subtraction of Algebraic Terms			Add and subtract algebraic expressions with like terms.	Enjoy adding and subtracting algebraic expressions with like terms.	Addition and subtraction of algebraic expressions with like terms, e.g. 2a + 4a = (2 + 4)a = 6a 4a –2a = (4 – 2)a = 2a	Adding and subtracting Algebraic expressions with like terms.	Can students add and subtract algebraic expressions with like terms?	Language, e.g. writing a letter to a friend explaining concepts learnt or a paragraph explaining what was learnt and asking possible questions.

Topic	*Objectives*				Content	Activities/ Materials/ Strategies	Evaluation	*Areas of Integration*
	Skills	**Knowledge**	***Understanding***	**Attitude**				
			Add and subtract algebraic expressions with unlike terms.	Obtain satisfaction from adding and subtracting algebraic expressions with unlike terms.	Addition and subtraction of algebraic expressions with unlike terms, e.g. 2a + 2b + 2a + b = 2a + 2a + (2b + 2b = (2 + 2)a + (2 + 1)b = 4a + 3b 6c – 3 – 2c + 10d = 6c – 2c + 10d – 3d = (6 – 2)c + (10 – 3)d = 4c + 7d	adding and subtracting algebraic expressions with unlike terms.	Can students add and subtract algebraic expressions with unlike terms?	

Topic	*Objectives*				Content	Activities/ Materials/ Strategies	Evaluation	*Areas of Integration*
	Skills	**Knowledge**	***Understanding***	**Attitude**				
Multiplication of Algebraic			Multiply algebraic expressions with		Multiplication of algebraic	Multiplying algebraic	Can students:	

Terms			like terms. Multiply algebraic expressions with unlike terms.	 Practise multiplying algebraic expressions with like and unlike terms.	expressions with like terms e.g. $2a \times 4a = (2 \times a) \times (4 \times a) = 2 \times 4 \times a \times a = 8a^2$. Multiplication of algebraic expressions with unlike terms, e.g. $3a \times 3b \times 2a = 6a^2 \times 3b = 18a^2b$.	expressions with like terms. Multiplying algebraic expressions with unlike terms Encouraging students to practise multiplying algebraic expressions with like and unlike terms.	• multiply algebraic expressions with like terms? • multiply algebraic expressions with unlike terms? Do students practise multiplying algebraic expressions with like and unlike terms?	

Topic	*Objectives*				Content	Activities/ Materials/ Strategies	Evaluation	*Areas of Integration*
	Skills	**Knowledge**	***Understanding***	**Attitude**				
Division of Algebraic Terms		.	Divide algebraic terms.		Division of algebraic terms, e.g. (i) $a \div b = \frac{a}{b}$ (ii) $(a \div 5ab) = \frac{a}{5ab} = \frac{1}{5b}$ (iii) $a^4 \div a^2 = \frac{a \times a \times a \times a}{a \times a} = a^2$	Dividing algebraic terms.	Can students divide algebraic terms?	
				Practise dividing algebraic terms.	Encouraging students to practise dividing algebraic terms.		Do students practise dividing algebraic terms?	

Topic	Objectives				Content	Activities/ Materials/ Strategies	Evaluation	Areas of Integration
	Skills	Knowledge	Understanding	Attitude				
Substitution			Determine the value of an algebraic expression by replacing variables with numerical values.		Substitution	Guiding students through steps to be taken when substituting numerical values for variables, e.g. when m = 2, the value of $3m^3$ is $3 \times 2 \times 2 \times 2 = 24$	Can students determine the value of an algebraic expression by replacing variables with numerical values? ***Unit Test***	

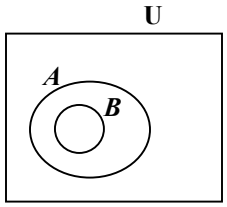
SET OPERATIONS

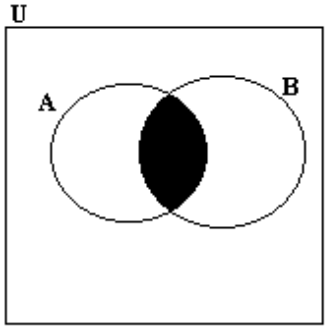
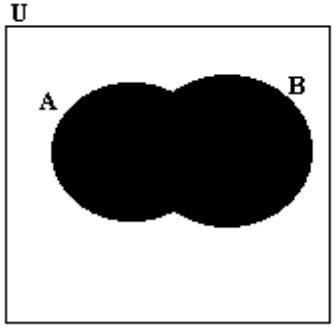
Topic	*Objectives*				Content	Activities/ Materials/ Strategies	Evaluation	*Areas of Integration*
	Skills	Knowledge	*Understanding*	Attitude				

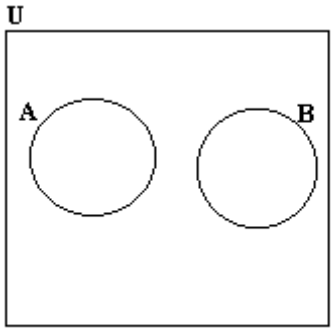
Intersection of Sets		Identify common elements in two sets. Identify the symbol that represents the intersection of two sets. List the elements in the intersection of two sets.			Common elements in two sets. The symbol that represents the intersection of sets, that is '$\cap$'. The elements in the intersection of two sets, e.g. S = {s, c, h, o, l} H = {h, o, l, y} S $\cap$ H = {h, o, l}	Showing on chart: • examples of common elements in two sets. • the symbol that represents the intersection of sets. Listing the elements in the intersection of two sets.	Can students: • identify common elements in two sets? • identify the symbol that represents the intersection of two sets? • list the elements in the intersection of two sets?	Social Studies, e g. Identifying commonalities in two sets of specimens.
Disjoint Sets		Identify disjoint sets.			Disjoint sets: sets that have no elements in common.	Showing on chart examples of disjoint sets.	Can students identify disjoint sets?	Social Studies, e.g. Set A = {Rose Hall, Georgetown, New Amsterdam} Set B = {Ann's Grove, Golden Grove}

Topic	*Objectives*				Content	Activities/ Materials/ Strategies	Evaluation	*Areas of Integration*
	Skills	**Knowledge**	***Understanding***	**Attitude**				
Union of Sets			Combine the elements of two sets to form a new set.		Joining two sets to form a new set.	Combining the elements of two sets to form a new set and noting the number of elements in each set.	Can students: • combine the elements of two distinct sets to form a new set?	
		Identify the symbol that represents the union of sets.			The symbol that represents the union of sets, that is '$\cup$'.	Showing on chart the symbol that represents the union of sets.	• identify the symbol that represents the union of sets?	
		List the elements in the union of two sets.			The elements in the union of two sets, e.g. P = {1, 2, 3, 4} Q = {0, 1, 2} S $\cup$ H = {0, 1, 2, 3, 4}	Listing the elements in the union of two sets.	• list the elements in the union of two sets?	Integrated Science, e.g. grouping to make a compound/mix with specification given.

Topic	*Objectives*				Content	Activities/ Materials/ Strategies	Evaluation	*Areas of Integration*
	Skills	**Knowledge**	***Understanding***	**Attitude**				
The Complement of a Set		List the elements in the complement of a given set.	Differentiate between the universal set, a subset and the complement of the subset.		Complement of a set, e.g. U = {0. 1, 2, 3} A = {0, 2} A′ = {1, 3}	Listing the elements in the complement of a set. Discussing the difference between the universal set, a subset and the complement of the subset.	Can students: • list the elements in the complement of a given set? • differentiate between the universal set, a subset and the complement of the subset?	Environmental Education, e.g. U = {Solid waste in the home environment} A = {Bio degradable solid waste in the home environment} A′ = {Non-bio degradable solid waste in the home environment}

Topic	*Objectives*				Content	Activities/ Materials/ Strategies	Evaluation	*Areas of Integration*
	Skills	**Knowledge**	***Understanding***	**Attitude**				
Venn Diagrams	Draw Venn diagrams to show subsets, intersection of sets, union of sets, disjoint sets.			Enjoying drawing Venn diagrams.	Venn diagrams, e.g.  B is a subset of A. $B \subset A$	Small group activities: Drawing Venn diagrams to show: • subsets	Can students draw Venn diagrams to show: • subsets?	

Topic	*Objectives*				Content	Activities/ Materials/ Strategies	Evaluation	*Areas of Integration*
	Skills	**Knowledge**	***Understanding***	**Attitude**				
					 Intersecting Sets	• intersection of sets.	• intersection of sets?	Social Studies, e.g. drawing Venn diagram to show the intersection of people working in different offices.
					 Union of sets	• union of sets.	• union of sets?	

Topic	*Objectives*				Content	Activities/ Materials/ Strategies	Evaluation	*Areas of Integration*
	Skills	**Knowledge**	***Understanding***	**Attitude**				
					 Disjoint Sets	• disjoint sets	• disjoint sets? **Unit Test**	Environmental Education, e.g. U = {Vine Plants} A = {Fruit bearing vines in Guyana} B = {Non-fruit bearing vines in Guyana} A and B are disjoint sets.

COMPUTATION 2

Topic	*Objectives*				Content	Activities/ Materials/ Strategies	Evaluation	*Areas of Integration*
	Skills	**Knowledge**	***Understanding***	**Attitude**				
Percentage		Recognise the difference between fractions, decimals and percentage.	Convert fractions and decimals to percentages and vice versa.	Appreciate the accurate conversion of fractions to percentages and vice versa.	Percentage: a fraction with 100 as the denominator.	Showing on chart examples of fractions, decimals and percentages and drawing students' attention to the difference between them. Small group activities: Expressing rational numbers as: • fractions • decimals • percentages and vice versa. Flash cards showing fractions being converted to decimals to percentages and vice versa can be distributed.	Can students: • recognise the difference between fractions, decimals and percentages? • convert fractions and decimals to percentages and vice versa.	Agriculture Science, e.g. composition of the soil. Home Economics, e.g. a recipe giving the percentage of each ingredient.

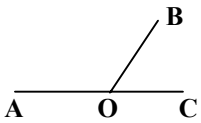
Topic	*Objectives*				Content	Activities/ Materials/ Strategies	Evaluation	*Areas of Integration*
	Skills	**Knowledge**	***Understanding***	**Attitude**				
Ratio			Demonstrate an understanding of ratio as a comparison between two quantities that are related to each other. Share quantities in a given ratio.	Enjoy sharing quantities in given ratios.	Expression of ratios as fractions in their simplest form, e.g. 1 to 2=1:2 $=\frac{1}{2}$. Share quantities in given ratios.	Using examples from the students' environment, e.g. buttons, shapes, scores from games and finding representation of the objects in terms of quantity. Expressing ratios as fractions in their simplest form. Demonstrating the sharing of quantities in given ratios. Actual money could be used.	Can students demonstrate an understanding of ratio as a comparison between two quantities that are related to each other? Can students share quantities in a given ratio?	Agriculture Science, e.g. fertilizer application in a given ratio mixture per hectare.
Average			Calculate the average or mean of a given set of numerical information.		Average	Small group activity, e.g. using a scale to measure the mass of each group member and calculating the average or mean mass of the group.	Can students use a scale to measure mass and calculate the average or mean mass of a group of objects? ***Unit Test***	Agriculture Science, e.g. the calculation of mean floor space per bird when caring for growing broilers.

GEOMETRY 1

Topic	*Objectives*				Content	Activities/ Materials/	Evaluation	*Areas of Integration*
	Skills	**Knowledge**	***Understanding***	**Attitude**				

						Strategies		
Mathematical Instruments		Identify the mathematical instruments: ruler, compasses, protractor, set squares.	Select mathematical instruments according to their use.	Appreciate the use of mathematical instruments.	Mathematical instruments The use of mathematical instruments, e.g. Ruler is used to measure and draw straight lines. A pair of compasses is used to draw arcs and circles. Protractor is used to measure angles up to 180°. Set squares are used to draw vertical and parallel lines.	Showing samples of mathematical instruments: ruler, compasses, protractor, set squares. Selecting mathematical instruments according to their use.	Can students: • identify the mathematical instruments: ruler, compasses, protractor, set squares? • select mathematical instruments according to their use?	Technical Drawing, e.g. identifying ruler, compasses, protractor, set squares.

Topic	*Objectives*				Content	Activities/ Materials/ Strategies	Evaluation	*Areas of Integration*
	Skills	**Knowledge**	***Understanding***	**Attitude**				
Lines and Angles		Identify horizontal lines, perpendicular lines, vertical lines, parallel lines, oblique lines.			Horizontal lines, perpendicular lines, vertical lines, parallel lines, oblique lines.	Showing on chart examples of horizontal lines, perpendicular lines, vertical lines, parallel lines, oblique lines. Small group activities:	Can students • identify horizontal lines, perpendicular lines, vertical lines, parallel lines, oblique lines?	Technical Drawing, e.g. drawing and measuring lines.
	Draw horizontal lines, perpendicular lines, vertical lines, parallel lines, oblique lines.			Enjoy drawing horizontal lines, perpendicular lines, vertical lines, parallel lines, oblique lines.		• drawing horizontal lines, perpendicular lines, vertical lines, parallel lines, oblique lines.	• draw horizontal lines, perpendicular lines, vertical lines, parallel lines, oblique lines?	
	Classify lines as horizontal, perpendicular, vertical, parallel, oblique.					• classifying lines as - horizontal, perpendicular, vertical, parallel, oblique.	• classify lines as horizontal, perpendicular, vertical, parallel, oblique?	

Topic	*Objectives*				Content	Activities/ Materials/ Strategies	Evaluation	*Areas of Integration*
	Skills	**Knowledge**	***Understanding***	**Attitude**				
		Name an angle.	.		Angles	Naming given angles, e.g.  Angle BOC may be written as ∠BOC, $B\hat{O}C$, $\hat{O}$.	Can students: • name an angle?	
		Identify an acute angle, right angle, obtuse angle, straight angle, reflex angle**.**			Acute angle, right angle, obtuse angle, straight angle, reflex angle.	Showing on chart examples of acute angles, right angles, obtuse angles, straight angles, reflex angles**.**	• identify acute angles, right angles, obtuse angles, straight angles, reflex angles?	
	Draw an acute angle, right angle, obtuse angle, straight angle, reflex angle.			Enjoy drawing an acute angle, right angle, obtuse angle, straight angle, reflex angle.		Small group activities e.g. • drawing acute angles, right angles, obtuse angles, straight angles, reflex angles.	• draw an acute angle, right angle, obtuse angle, straight angle, reflex angle?	*Technical Drawing, e.g. drawing angles.*

Topic	*Objectives*				Content	Activities/ Materials/ Strategies	Evaluation	*Areas of Integration*
	Skills	**Knowledge**	***Understanding***	**Attitude**				
	Classify angles according to their size.				Classification of angles according to size, e.g. Acute angle – less than 90° Right angle – exactly 90° Obtuse angle – more than 90° Straight angle – exactly 180° Reflex angle – greater than 180° but less than 360°.	• classifying angles according to size.	Can students: • classify angles according to their size?	
	Measure an angle using a protractor.			Appreciate the accurate measurement of an angle.	Measurement of angles.	Measuring given angles using a protractor.	• measure an angle using a protractor?	Technical Drawing, e.g. measuring angles using a protractor.

Topic	*Objectives*				Content	Activities/ Materials/ Strategies	Evaluation	*Areas of Integration*
	Skills	**Knowledge**	***Understanding***	**Attitude**				
Polygons		Recognise regular polygons by shape. Name polygons.			Polygons - closed figures bounded by line segments. Names of some polygons, e.g. Triangle – a polygon with three sides. Quadrilateral – a polygon with four sides. Pentagon - a polygon with five sides. Hexagon – a polygon with six sides. Heptagon- a polygon with seven sides. Octagon – a polygon with eight sides. Nonagon – a polygon with nine sides. Decagon – a polygon with ten sides.	Showing on chart examples of regular polygons. Naming polygons according to the number and nature of their sides:	Can students: • recognise regular polygons by shape? • name polygons according to the number and nature of their sides?	

Topic	*Objectives*				Content	Activities// Materials/ Strategies	Evaluation	*Areas of Integration*
	Skills	**Knowledge**	***Understanding***	**Attitude**				
		List the properties of regular polygons.				Listing the properties of regular polygons.	Can students: • list the properties of regular polygons?	
	Draw shapes of regular polygons.					Drawing shapes of regular polygons.	• draw the shapes of regular polygons?	Technical Drawing e.g.. constructing regular polygons.
			Calculate the size of the interior angles of a regular polygon.			Calculating the size of the interior angles of a regular polygon.	• calculate the size of the interior angles of a regular polygon?	
			Calculate the sum of the interior angles of a regular polygon.			Calculating the sum of the interior angles of a regular polygon.	• Can students calculate the sum of the interior angles of a regular polygon?	.

Topic Area	*Objectives*				Content	Activities/ Materials/ Strategies	Evaluation	*Areas of Integration*
	Skills	**Knowledge**	***Understanding***	**Attitude**				
Circles		Identify a circle.			Circle A circle is closed figure. Each point on the circumference is equidistant from the centre of the circle. It is circular in shape.	Distributing different objects with circular shapes, e.g. $5 coins, boot polish containers for observation by students.	Can students: • identify a circle?	
		List the properties of a circle.				Listing the properties of a circle.	• list the properties of a circle?	Language, e.g. writing sentences to describe the properties of a circle.
	Draw a circle using a pair of compasses.			Enjoy drawing circles.		Drawing circles using a pair of compasses..	• draw a circle using a pair of compasses?	
		Name parts of a circle.			Parts of a circle: arc, chord, diameter, radius, tangent, sector segment.	Naming the parts of a circle.	• name parts of a circle?	

Topic	*Objectives*				Content	Activities/ Materials/ Strategies	Evaluation	*Areas of Integration*
	Skills	**Knowledge**	***Understanding***	**Attitude**				
Constructions	Construct the perpendicular bisector of a line.			Enjoy constructing the perpendicular bisector of lines.	Perpendicular bisector of a line.	Constructing the perpendicular bisector of straight lines using ruler and compasses only.	Can students: • construct the perpendicular bisector of a line using ruler and compasses only?	Technical Drawing, e.g. • constructing the perpendicular bisector of a straight line.
	Bisect a given angle.			Enjoy bisecting angles.	Bisection of angles.	Bisecting angles using ruler and compasses only.	• bisect a given angle using ruler and compasses only?	• bisecting angles.
	Construct angles of 90°, 45°, 60° and 30°			Enjoy constructing angles of 90°, 45°, 60° and 30° using ruler and compasses only.		Constructing angles of 90°, 45°, 60° and 30° using ruler and compasses only.	Can students construct angles of 90°, 45°, 60° and 30° using ruler and compasses only?	• constructing angles of 90°, 45°, 60° and 30°.

Topic Area	*Objectives*				Content	Activities/ Materials/ Strategies	Evaluation	*Areas of Integration*
	Skills	**Knowledge**	**Understanding**	**Attitude**				
						Small group activities:	*Can students construct a triangle given:*	Technical Drawing .e.g.
	Construct a triangle given the lengths of the three sides.			Enjoy constructing triangles with ruler and compasses only.	Construction of triangles.	Constructing triangles given: • the lengths of the three sides using ruler and compasses only.	• the length of the three sides using ruler and compasses only?	• the construction of triangles.
	Construct a triangle when two sides and the included angle are given.					• two sides and the included angle.	• two sides and the included angle?	
	Construct a quadrilateral.			Enjoy constructing quadrilaterals.	Construction of quadrilaterals.	Constructing quadrilaterals from given information.	Can students construct a quadrilateral from given information? ***Unit Test***	• the construction of quadrilaterals.

RELATIONS

Topic	***Objectives***				**Content**	**Activities/ Materials/ Strategies**	**Evaluation**	***Areas of Integration***
	Skills	**Knowledge**	***Understanding***	**Attitude**				
Relations		Identify a relation.			Relations	Showing on chart examples of relations.	Can students identify a relation?	
Arrow Diagrams	Draw an arrow diagram.	Identify an arrow diagram.		Appreciate arrow diagrams.	Arrow diagrams. The objects and image in any particular relation can be shown on an arrow diagram. The arrow always leaves the object in the domain and points to the image in the range.	Showing on chart arrow diagrams. Drawing arrow diagrams.	Can students: • identify an arrow diagram? • draw an arrow diagram?	

Area	*Objectives*				Content	Activities/ Materials/ Strategies	Evaluation	*Areas of Integration*
	Skills	**Knowledge**	***Understanding***	**Attitude**				
	Classify relations.				Types of relations: One-to-one - each object has only one image. Many-to-one - two or more objects have the same image. One-to-many - one object has more than one image. Many-to-many - one object has more than one image and also two or more objects.	Classifying relations according to the way in which the objects and images are related.	Can students classify a relation?	

Topic	*Objectives*				Content	Activities/ Materials/ Strategies	Evaluation	*Areas of Integration*
	Skills	**Knowledge**	***Understanding***	**Attitude**				
Ordered Pairs		List the members of the domain for a set of ordered pairs. List the members of the range for a set of ordered pairs. List ordered pairs from an arrow diagram. List sets of ordered pairs that satisfy a relation. Write the rule of a relation.			Ordered pairs	Small group activities: • Listing the members of the domain for a set of ordered pairs. • Listing the members of the range for a set of ordered pairs. • Listing all the ordered pairs shown on an arrow diagram. • Writing sets of ordered pairs that satisfy given relations. • Writing the rule of a relation.	Can students: • list the members of the domain for a set of ordered pairs? • list the members of the range for a set of ordered pairs? • list the ordered pairs shown on an arrow diagram? • write sets of ordered pairs that satisfy a relation? • write the rule of a relation?	

Topic	*Objectives*				Content	Activities/ Materials/ Strategies	Evaluation	*Areas of Integration*
	Skills	**Knowledge**	***Understanding***	**Attitude**				
Co-ordinates		Recognise the co-ordinate plane.		Appreciate the co-ordinate plane.	The co-ordinate plane is sometimes called a rectangular grid.	Drawing a number line using 0 and positive integers from 1 to 6 and negative integers form –1 to 6. Up turning the paper and drawing another number line intersecting the first at right angles and using 0 and the positive integers from 1 to 6 and from –1 to –6. 0 remains at the same point. When the two lines come together this way they form a co-ordinate plane.	Can students recognise a co-ordinate plane.	

Topic	*Objectives*				Content	Activities/ Materials/ Strategies	Evaluation	*Areas of Integration*
	Skills	**Understanding**	***Knowledge***	**Attitude**				
			Identify ***x***-co-ordinates, y-co-ordinates and the origin.		***x***-co-ordinates, y-co-ordinates, origin.	Showing on chart: X = {-6, -5, -4, …4, 5, 6} and Y = {-6, -5, -4, … 4, 5, 6}. Pointing out that the elements of X are called the ***x***-co-ordinates and the elements of Y are called the y-co-ordinates. The point at which the x and y are both 0 is called the origin.	Can students: • identify the x and y co-ordinates?	
	Plot points on a co-ordinate plane. Locate points on a co-ordinate plane.			.	Points on a co-ordinate plane, e.g. (2, 3) (0,0)	Guiding students in plotting points on a co-ordinate plane. Guiding students in locating given points on a co-ordinate plane.	• plot points on a co-ordinate plane? • locate points on the co-ordinate plane?	

Topic	*Objectives*				Content	Activities/ Materials/ Strategies	Evaluation	*Areas of Integration*
	Skills	**Knowledge**	***Understanding***	**Attitude**				
Graphs	Construct the graph of a relation represented by ordered pairs.			Enjoy drawing graphs of relations represented by ordered pairs.	Graph of a relation represented by ordered pairs.	Small group activities: • plotting ordered pairs of the given relation on a co-ordinate plane. • joining the points corresponding to each ordered pair.	Can students construct the graph of a relation represented by ordered pairs? ***Unit Test***	Integrated Science, e.g. drawing the rainfall graphs for different locations.

STATISTICS

Topic	*Objectives*				Content	Activities/ Materials/ Strategies	Evaluation	*Areas of Integration*
	Skills	**Knowledge**	***Understanding***	**Attitude**				
Pictographs		Identify pictographs.		Appreciate pictographs.	Pictographs: an attractive way of presenting numerical information. The pictures give a quick and easy meaning to statistical data.	Using chart to show examples of pictographs.	Can students: • identify a pictograph?	
	Construct pictographs to illustrate given information.			Enjoy constructing pictographs.	Construction of pictographs.	Guiding students in constructing pictographs to illustrate given information.	• construct a pictograph?.	Social Studies, e.g. constructing a pictograph to illustrate Amerindian tribes in Guyana.
	Interpret pictographs.				Interpretation of pictographs.	Interpreting the information illustrated on a pictograph.	• interpret pictographs?	

Topic	*Objectives*				Content	Activities/ Materials/ Strategies	Evaluation	*Areas of Integration*
	Skills	**Knowledge**	***Understanding***	**Attitude**				
				Willing to discuss information illustrated on pictographs.		Discussing information illustrated on pictographs.	Are students willing to discuss information illustrated on pictographs?	
Bar Chart		Identify bar charts.		Appreciate bar charts.	Bar Charts Another way of displaying information is on a bar chart. A bar chart has a heading. A scale is usually on the vertical axis. The bars do not touch. The length of the bars represent numerical information.	Using chart to show examples of bar charts.	Can students identify a bar chart?	

Topic	*Objectives*				Content	Activities/ Materials/ Strategies	Evaluation	*Areas of Integration*
	Skills	**Understanding**	***Knowledge***	**Attitude**				
	Construct bar charts to illustrate given information. Interpret bar charts.			Enjoy constructing bar charts. Willing to discuss information illustrated on bar charts.	Construction of bar charts. Interpretation of bar charts.	Guiding students in constructing bar charts to illustrate given information. Interpreting bar charts. Discussing information illustrated on bar charts.	Can students: • construct bar charts? • interpret the information illustrated on a bar chart? • Are students willing to discuss the information illustrated on a bar chart?	Agriculture Science, e.g. constructing bar charts to show the major components of the soil.
Pie Charts		Identify pie charts.		Appreciate pie charts.	Pie Chart: a circle graph in which sections of the circle represent fractions, degrees, percentages.	Using chart to show examples of pie charts.	Can students identify a pie chart?	

Topic	*Objectives*				Content	Activities/ Materials/ Strategies	Evaluation	*Areas of Integration*
	Skills	**Knowledge**	***Understanding***	**Attitude**				
	Construct pie charts from given information. Interpret pie charts.			Enjoy constructing pie charts.	Construction of pie charts. Interpretation of pie charts.	Calculating each section of the circle in degrees or percentages from given information. Representing the information on the circle. Interpreting information represented on pie charts.	Can students: • construct a pie chart? • use pie charts to answer questions and solve problems? ***Unit Test***	Agriculture Science, e.g. construction of a pie chart to show the composition of a loam soil.

GEOMETRY 2

Topic	*Objectives*				Content	Activities/ Materials/ Strategies	Evaluation	*Areas of Integration*
	Skills	**Knowledge**	***Understanding***	**Attitude**				

Common Solids		Recognise common solids.			Common solids: cube, cuboid, pyramid, cylinder, sphere. The general characteristics of common solids: The faces may be flat or curved. An edge is the line where two faces meet. Edges may be straight or curved. A vertex is the point where three or more edges meet.	Displaying models of common solids such as: cube, cuboid, pyramid, cylinder, sphere. Observing the general characteristics of common solids. Manipulating models of common solids.	Can students: • recognise common solids?	Language, e.g. writing descriptions of a cube, cuboid, pyramid, cylinder, sphere.
			Select common solids.			Selecting common solids from among models of various objects.	• select common solids?	

Topic	*Objectives*				Content	Activities/ Materials/ Strategies	Evaluation	*Areas of Integration*
	Skills	**Knowledge**	***Understanding***	**Attitude**				
Properties of Common Solids		List the properties of cube, cuboid, pyramid, cylinder, sphere.			Properties of common solids: cube, cuboid, pyramid, cylinder, sphere, e.g. • A cube has 6 square faces, 12 straight edges and 8 vertices. • A cuboid has 6 rectangular faces, 12 straight edges and 8 vertices. • A pyramid with n-sided base will have n triangular faces meeting at a point. • A cylinder has 2 plane faces and one curved surface. It has 2 curved edges and no vertices.	Having students examine the faces, edges and vertices of common solids and listing what they observe.	Can students list the properties of common solids?	

Topic	*Objectives*				Content	Activities/ Materials/ Strategies	Evaluation	*Areas of Integration*
	Skills	**Knowledge**	***Understanding***	**Attitude**				
				Willing to discuss the properties of common solids.		Discussing the properties of common shapes.	Are students willing to discuss the properties of common solids?	
Drawing Common Shapes	Draw the skeleton views of common solids. Draw the nets of common solids.			Enjoy drawing the skeleton views of common solids.	Skeleton views of common solids. Nets of common solids.	Small group activities: • drawing the skeleton views of a cube, cuboid, pyramid, cylinder, sphere. • drawing the nets of solids. • matching net with name of solid. • folding nets to make models of solids.	Can students: • draw the skeleton views of a cube, cuboid, pyramid, cylinder, sphere? • draw the net of common solids? • match the net with name of solid? • fold a net to make a model of a solid? **Unit Test**	Technical Drawing, e.g. drawing the skeleton views of common solids. Technical Drawing, e.g. drawing the nets of common solids.

ALGEBRA 2

Topic	*Objectives*				Content	Activities/ Materials/ Strategies	Evaluation	*Areas of Integration*
	Skills	**Knowledge**	***Understanding***	**Attitude**				
Verbal Statements and Symbolic Expressions			Convert verbal statements into symbolic expressions.	Practise converting verbal statements into symbolic expressions.	Conversion of verbal statements into symbolic expressions, e.g. if the length of a rectangle is $\boldsymbol{x}$ cm and the width y cm, then an expression for the perimeter of the rectangle can be: Perimeter = $(\boldsymbol{x} + \boldsymbol{x} + y + y)$ cm $= (2\boldsymbol{x} + 2y)$ cm	Converting verbal statements into symbolic expressions. Encouraging students to practise converting verbal statements into symbolic expressions.	Can students convert verbal statements into symbolic expressions? Do students practice converting verbal statements into symbolic expressions?	
The Distributive Law	Apply the distributive law to simply algebraic expressions.				The distributive laws: $(a \times b) + (c \times b) = b(a + c)$ $(a \times b) - (c \times b) = b(a - c)$	Applying the distributive law to simplify algebraic expressions, e.g. $(3 \times y) + (4 \times y) = y(3 + 4) = 7y$	Can students apply the distributive law to simplify algebraic expressions?	

Topic	*Objectives*				Content	Activities/ Materials/ Strategies	Evaluation	*Areas of Integration*
	Skills	**Knowledge**	***Understanding***	**Attitude**				
Equations		Identify simple equations. Solve simple equations in one unknown.			Simple equations, e.g. $2a = 12$	Using chart to show examples of simple equations. Solve simple equations by: (a) inspection, e.g. if $y + 4 = 12$, then $y = 8$ (b) balancing, e.g. $2a + 4 = 12$ $2a + 4 - 4 = 12 - 4$ $\frac{2a}{2} = \frac{8}{2}$ $a = 4$ Encouraging students to practise solving simple equations in one unknown.	Can students solve simple equations by: • inspection? • balancing? Do students practise solving simple equations in one unknown?	

Topic	*Objectives*				Content	Activities/ Materials/ Strategies	Evaluation	*Areas of Integration*
	Skills	**Knowledge**	***Understanding***	**Attitude**				
Inequations	Use the symbols < and > to convert verbal statements into algebraic expressions.	Identify inequations .			Inequations, e.g. 12 > 11 or 11 < 12. The use of the symbols < and > in the conversion of verbal statements into algebraic expressions, e.g. if the length of a rectangle is one cm and the width 4 cm less than the length, then the statement can be expressed by the inequation (a – 4) < a.	Observing examples of inequations. Using the symbols < or > to convert verbal statements into algebraic expressions.	Can students: • identify an inequation? • use the symbols < and > to convert verbal statements into algebraic jhexpressions?	Enviromental Education,e.g. Number of predators < Number of Prey in an environment. Number of insects > Number of humans on the earth.

Topic	*Objectives*				Content	Activities/ Materials/ Strategies	Evaluation	*Areas of Integration*
	Skills	**Knowledge**	***Understanding***	**Attitude**				
Indices		Identify the base and index of an expression.			Indices	Showing on chart examples of indices and pointing out the base and index.	Can students: • identify the base and index of an expression?	
			Write algebraic expressions in index form.		Algebraic expressions in index form, e.g. $3 \times a \times a \times a = 3a^3$.	Writing algebraic expressions in index form.	• write algebraic expressions in index form?	
	Use the laws of indices to manipulate expressions with positive indices.				Multiplication and division of expressions with the same base, e.g. $8^2 \times 8^2 \times 8^2 = 8^{2+2+2} = 8^6$ $8^6 \div 8^2 = 8^{6-2} = 8^4$.	Using the laws of indices to: • multiply indices with the same base. • divide indices with the same base.	• use the laws of indices to manipulate expressions with positive indices? ***Unit Test***	

CONSUMER ARITHMETIC

Topic	*Objectives*				Content	Activities/ Materials/ Strategies	Evaluation	*Areas of Integration*
	Skills	**Knowledge**	***Understanding***	**Attitude**				
Profit			Explain the concept cost price, selling price and profit.		Cost price, selling price and profit.	Explaining cost price, selling price and profit. Demonstrating that if the selling price of an article is greater than the cost price, then there is a profit.	Can students explain the concepts of cost price, selling price and profit?	
						Calculating:	Can students calculate:	
			Calculate profit.		Profit = Selling Price – Cost Price.	• profit.	• profit?	Agriculture Science, e.g. finding the profit made after a sale of chickens.
			Calculate cost price given selling price and profit.		Cost price = Selling Price – Profit.	• cost price given selling price and profit.	• cost price given selling price and profit?	
			Calculate selling price.		Selling price = Cost Price + Profit.	• selling price.	• selling price?	

Topic	*Objectives*				Content	Activities/ Materials/ Strategies	Evaluation	*Areas of Integration*
	Skills	**Knowledge**	***Understanding***	**Attitude**				
Loss			Explain the concept of loss. Calculate loss. Calculate cost price given selling price and loss. Calculate selling price given cost price and loss.		Loss = Cost Price – Selling Price.	Discussing the concept of loss. Demonstrating that if the selling price of an article is less than the cost price, then there is a loss. Calculating: • loss • cost price given selling price and loss. • selling price given cost price and loss.	Can students: • explain the concept of loss? • calculate loss? • cost price given selling price and loss? • selling price given cost price and loss? ***Unit Test***	

MEASUREMENT 2

Topic	***Objectives***				**Content**	**Activities/ Materials Strategies**	**Evaluation**	***Areas of Integration***
	Skills	**Knowledge**	**Understanding**	**Attitude**				
Volume			Explain the concept of volume.		Volume: The amount of three dimensional space a solid occupies.	Discussing the concept of volume.	Can students: • explain the concept of volume?	
			Calculate the volume of cubes and cuboids.		Volume of a cube = l^3 Volume of a cuboid = $l \times b \times h$	Making models of cubes and cuboids and calculating their volume.	• calculate the volume of a cube and cuboid?	Industrial Arts, e.g. calculating the volume of cubes and cuboids.
	Solve problems involving volume.					Solving problems involving volume.	• solve problems involving volume?	
Mass			Explain the concept of mass.		Mass is the amount of matter in an object. The mass of an object remains the same no matter where the object is located.	Discussing the concept of mass.	Can students explain the concept of mass?	Home Economics, e.g. finding the mass of flour or sugar or butter for baking cakes or bread.
	Solve problems involving mass.				The basic unit of mass is the gram.	Solving problems involving mass.	Can students solve problems involving mass?	

Topic	Objectives				Content	Activities/ Materials/ Strategies	Evaluation	*Areas of Integration*
	Skills	**Knowledge**	**Understanding**	**Attitude**				
Temperature	Read the temperature of water.			Appreciate the use of the thermometer to read temperature.	Temperature: the measure of hotness or coldness of an object. The SI unit for measuring temperature is degree Celsius (°C)	Reading the thermometer after immersing it in hot or cold water.	Can students read temperature?	
Time	Read the time on 12-hour and 24-hour clocks. Solve problems involving time.		Change 12-hour clock times to 24-hour clock times and vice versa.		Time	Reading the time on 12-hour, and 24-hour clocks. Changing 12-hour clock times to 24-hour clock times and vice versa. Let students solve problems involving time.	Can students: • read time on 12-hour, and 24-hour clocks? • change 12-hour clock times to 24-hour clock times and vice versa? • solve problems involving time? ***Unit Test***	