REPUBLIC OF TRINIDAD AND TOBAGO

MINISTRY OF EDUCATION

GORTT/IBRD BASIC EDUCATION PROJECT

STANDARDS OF PERFORMANCE

For Primary School Mathematics

September 1998

PREFACE

The Primary School Mathematics Standards complements the recently revised 1998 Primary School Mathematics Syllabus. It is to be used in conjunction with the Syllabus.

Considered as integral to improving the quality of the teaching and learning of mathematical knowledge and skills in our primary schools is the setting of standards by and against which students' performance and achievement can be properly assessed and evaluated.

All teaching/learning activities, all instructional programmes or syllabuses, whether they relate to Mathematics or to other subjects, must be performance-driven, outcome-based and learner-centred. The standards described in the following pages promote, reflect, support and reinforce this teaching/learning requirement.

The performance standards formulated for the various components on strands of the 1998 Primary School Mathematics Syllabus are intended to serve the following purposes:

- Provide objective criteria, that is, performance standards for measuring, assessing and evaluating students' performance and progress towards the achievement of the designated learning outcomes
- Help promote achievement of the educational policy goal of equity. The standards described in the following pages are considered appropriate and attainable by all pupils - regardless of gender, religious belief, ethnic background, socio economic status, social class or ability. The standards are set to challenge and motivate students to do their best in achieving the learning outcomes
- Provide the basis for adopting/modifying the learning outcomes and instructional programme to meet the needs, and abilities and pace of learning of the individual pupil. All students can be successful if they are provided with the opportunities to meet with success
- Achieve the policy goal of **quality education for all students.** If and when they are attained by all students, these standards constitute clear criteria 'for determining the presence or absence of quality in Mathematics education at the primary level
- Provide for accountability. Parents/guardians, the local and national communities, all the tax-payers need to know and have the right to know precisely what all students are expected to know and be able to do upon completion of the various stages of their school career. By describing in some detail what all students are expected to achieve their learning, the performance standards for Mathematics offer a clear basis for assessing and evaluating not only pupil achievement and progress but also for determining the effectiveness and efficiency of our schools in helping pupils to achieve these outcomes successfully
- Facilitate the teachers' assessing and evaluating pupil performance and communicating with a pupil's parent or guardian regarding level of performance
- Help teachers and pupils focus on learning outcomes/results. The standards for Mathematics will help both teachers and pupils to keep consistently in view the desired ends of learning/teaching, the specific purpose of all their activities and interactions – the standards of performance and learning the pupils are expected to achieve.

- Promote partnership Teachers must work closely with pupils and their parents or guardians, as well as with other professionals within the system in order to achieve the specified outcomes of teaching/learning. The clarity of the descriptions of expected student achievement (i.e. the standards) in various aspects of the Mathematics Syllabus will help determine in what specific ways the various educational partners - school administrators, corporate citizens, non-governmental organisations (NGO's), etc - can assist schools in achieving the schools' learning outcomes.

- Better prepare primary school students to meet the demands of secondary schooling - the next educational stage for most of the pupils (at present almost 70%) completing primary school. For those students who will not be continuing their formal education, achievement of the standards established for this level should enable them to be functionally numerate, to cope with life situations, and even to resume their formal education if they so desire.

It should be noted here that orientation meetings with district and school administrators and personnel, as well as with teachers, will be held to explain and discuss these Standards prior to their introduction in the school system.

The Ministry of Education also wishes to take this opportunity to acknowledge with gratitude the invaluable contribution of all those individuals who helped to produce this document publication of which was made possible through the Ministry of Education/World Bank Basic Education Project.

Finally, the Ministry of Education strongly urges all teachers to make full use of the Standards. They will find them both extremely useful and professionally rewarding.

Teachers are also encouraged to submit to the Division of Curriculum Development their comments regarding the appropriateness of the standards for describing pupil performance as well as how they used the standards in programme and lesson planning, assessment and reporting of pupil performance.

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August 1998

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INTRODUCTION

A Framework for the Primary' School Mathematics Standard Document (1998).

Assessment as defined in the Encyclopedia of Educational Evaluation is a process of gathering information to meet a broad range of evaluation needs. It is different from testing in that it uses multiple indicators and sources of evidence. The broad range of evaluation needs includes making instructional decisions, monitoring students' progress and evaluating achievement in terms of defined criteria.

The Primary School Mathematics Syllabus articulates what mathematics pupils need to know and to some extent what teachers are to do to help pupils develop their mathematical knowledge.

For the purpose of this document the term standard is taken to be a statement that can be used to judge quality. Standards are statements about what is valued. The purpose of adopting standards is:-

- to ensure quality
- to indicate goals
- to guide and promote change

The standard document presents a set of standards by which both pupils' performances and the Primary School Mathematics programme can be evaluated.

The document is presented under four sections:-

SECTION I: ASSESSMENT STRATEGIES

There is a new awareness in education about assessment. There is the tendency to move away from procedures which focus on ranking pupils on a particular trait and to move assessment towards procedures which emphasise obtaining information from a variety of balanced and equitable sources. This section will highlight some of the strategies which attest to this reformed version of assessment.
The NCTM Standards for assessment call for a change of emphasis in many aspects of pupils' assessment. These assessment standards are reproduced below

Recommendations for Student Assessment

	Increased Attention Should be given to:	Decreased Attention Should be given to:
1.	Assessing what students know and how they think	Assessing what students do not know about mathematics.
2.	Having assessment be an integral part of teaching	Having assessment be simply counting correct answers on tests for the sole purpose of assigning grades.
3.	Focusing on a broad range of mathematical tasks and taking a holistic view	Focusing on a large number of specific and isolated skills
4.	Developing problem situations that require the application of a number of mathematics ideas	Using exercises or word problems requiring only one or two skills
5.	Using multiple assessment techniques, including written, oral, and demonstration formats	Using only written tests
6.	Using calculations, computers, and manipulatives in assessment	Excluding calculators, computers, and manipulatives from the assessment process

Source: Curriculum and Evaluation Standards for School Mathematics (NCTM 1989, p. 191

The first recommendation draws attention to what pupils know and how they think. This also includes knowing what is their disposition or attitude towards mathematics. Ibis is followed by a recommendation which requires that assessment results inform and influence practice.

The third and fourth recommendations combine to present a broader view of assessment. This perspective calls for assessing mathematics learning beyond facts and procedures.

The fifth recommendation suggests the use of a variety of assessment techniques. This recommendation will be elaborated upon through discussions on a variety of assessment techniques.

The sixth recommendation relates to the connection between instruction and learning. It suggests that when manipulatives are used for instruction. Pupils should be assessed using manipulatives. Calculators are part of the pupils' environment and it is reasonable to expect them to be assessed on calculator tasks.

There are several assessment strategies available; these are presented below:-

- **Performance Assessment**
  Performance Tasks often mirror the real world. They are open-ended and require time for a resolution of the problem. Projects and investigations are examples of performance tasks

  In order to assess these tasks teachers may be required to observe and conduct interviews. Performance tasks often culminate in. a product which is the result of a set of procedures. Assessment of both product and procedure will have to be undertaken. Performance tasks provide information about pupils' ability to:-

- use mathematical concepts and skills;
- provide reasoned arguments;
- formulae questions;
- propose alternative solutions to problems;
- work cooperatively or as individuals;
- communicate mathematical concepts ideas, principles;
- Design and conduct surveys.

Observations

This strategy has been considered as one of the most effective ways of gathering data. Systematic observation of pupils entails:-

- constructing checklists;
- making notes for the purpose of developing anecdotal records.

Data collected through the use of observational technique can provide information about the pupils':

- learning styles;
- strengths and weaknesses related to the task;
- interests and habits;
- social development.

Observation is an engaging task and may require teachers to:-

- plan well in advance what is to be observed;
- limit observation to individuals or small groups;
- limit observations to one or two attributes or characteristics;
- conduct observations in naturalistic settings.

Questioning

Observation is complemented and enlightened by asking questions. Questioning provides a means of involving the pupils in the process of assessment and at the same time allowing teachers to access more of the pupils' thinking.

It is convenient to think of questions as being either product or process questions. Product questions require short answers which can be judged as right or wrong. Process questions on the other hind, are those which ask for explanation, for generalisations or for patterns to be recognised and described. Each type of question has its purpose and can contribute to comprehensive assessment.

Conferences and Interviews

Interviewing is a combination of questioning and observations. This technique is usually done with a single pupil in an informal setting. It is an effective, means to collect information on the pupils' thinking and at the same time provide the pupil with some special attention. Successful interviewing requires one to establish rapport with the pupil, accept responses without judging and negotiate positions.

Interviewing requires the drawing up of a basic outline of what one wants to find out. The outline ought to reflect what questions will be asked, when and how the responses will be recorded. Interview/Conferences can access the pupi1s ability to:-

- justify thinking;
- explain processes used to arrive at solutions;
- suggest alternative problem Solving strategies.

Investigations

The idea of investigations is fundamental to the study of mathematics itself: to an understanding of the ways in which mathematics can be used to extend knowledge and to solve problems in many fields (Crockcroft 1982). An investigation arises out of problems formulated by pupils.

The value of investigational work lies in the reporting of the methods used and the results or products obtained.

Investigation can provide useful information about pupils' ability to:-

- formulate problems;
- devise plans;
- propose strategies;
- collect and organize data;
- Recognize patterns and form generalisations.

Journals

The NCTM Standards call for greater emphasis on communication in mathematics; pupils' writing affords an effective means of assessing the ability to communicate' Journals provide an opportunity to access pupils' ability to communicate mathematical information. When pupils keep journals they may be assigned tasks which require them to:-

- formulate, organize, internalize and evaluate concepts, ideas and procedures;
- clarify thinking;
- reflect on new learning;
- express their feelings towards mathematics.

Portfolios

A mathematics portfolio is a collection of pupils' work. Maintaining a portfolio provides evidence of pupils' growth and development in mathematics over a period of time.

A mathematics portfolio might include such items as solutions to special problem tasks, reports on investigations and projects. Items may be expressed through a variety of media e.g. manuscripts, photographs, audios and videos, print-outs, models, etc.

Portfolios are in effect showcases of pupils' work. Portfolios can provide data to assess pupils' ability to communicate mathematics through descriptions, reports, analyses of problem situations, reflections on aspects of mathematical interest.

Portfolio assessment requires that decisions be made on what will be included, where they will be stored and how feed back will be given. Instruments for assessing portfolios include ranking, rating, checklists product scales and scoring rubric.

Self Assessment

Pupils are often the best assessors of their own work and feelings. Self assessment promotes the development of metacognitive abilities (the ability to reflect critically on one's own reasoning). When pupils assess their own work the responsibility for their learning becomes theirs.

Complementary to self assessment is pupils' assessment of their peers' work. In doing so they will have the opportunity to compare other pupas' solutions to their own, noting whether solutions make sense, seem easier or different or even lead to dead-ends.

Self assessment allows the teachers to observe the pupils:-

- change in disposition towards mathematics;
- growth of self worth;
- Expanding control of mathematics.

Attitude inventories are useful instruments for assessing pupils' feelings a bout Mathematics.

Note:
Using a variety of strategies for pupils' assessment ought not to be viewed as appendages to instruction; rather it should be integrated into regular classroom at this point; teachers must understand that if the classroom assessment regimen is not designed and planned carefully, there will be no guarantee that the assessment of pupils will be reliable and valid. As a consequence the standards of performance will be compromised.

SECTION II: COMPONENTS OF MATHEMATICS LEARNING

In this section there will be a review of those Components which are fundamental to pupils' mathematical growth and development. These components have been occupying prominent positions in the National Council of Mathematics Teachers (NCTM) recommendations. They are:-

- Problem Solving
- Reasoning
- Connections
- Dispositions

These components have been explored and described in the Primary School Mathematics Syllabus. It suits the purpose of this document to translate the component into Goals and Performance objectives as these relate to the Standards.

The NCTM document: Essential Mathematics for the 21st Century provided some guidelines for the programme of work set out in the Primary School Mathematics Syllabus. No one knows exactly what mathematics will be needed for the 21st Century hut it is more than likely that there will be a demand for persons who can:-

- reason mathematically and apply mathematical thinking to a whole range of problem situations;
- articulate and model mathematical solutions:
- link mathematics to technological advances.

The components of mathematics learning have been translated into a set of goals and performance objectives. These are presented below:-

- Mathematics as Problem Solving Goal: Pupils will learn mathematics through problem based activities.

Performance objectives; Pupils will:-

- use problem solving approaches to investigate and understand mathematics content;
- solve a wide variety of problems;
- interpret results 'With respect to original problem.

Mathematics as Communication

Goal: All pupils will communicate mathematically

Performance Objectives: Pupils will:-

- relate everyday language to mathematical language and symbols;
- read, write, talk about mathematics they encounter and use;
- relate materials, pictures, diagrams, graphs etc. to mathematical ideas.

Mathematics as Reasoning

Goals: All pupils will demonstrate mathematical reasoning.

Performance objectives: Pupils will:-

- explain their thinking by use of examples, facts, relationships,
- provide logical arguments to support answers and solutions.

Mathematical Connections

Goal: All Pupils will link mathematics to situations in every day life.

Performance objectives: Pupils will:

- make connections among the various topics in mathematics;
- link mathematics to their daily lives;
- apply mathematics in other curriculum areas,

Linking Mathematics to Calculators and Computers.

Technology is an integral part of the Mathematics programme. Teaching must be directed towards assisting pupils to cope with the rapidly changing world.

The NCTM position statement on calculators recommends that calculators should be used at all class levels. Computational skills are necessary and must be learned but calculators should be used whim computational skills are not the main focus of instruction. To use calculators effectively pupils must he able to estimate and to judge the reasonableness of their answers. Understanding of operations and knowledge of facts are prerequisites for calculator use. The use of calculators does require thinking and does not eliminate it.

The assessment standards refer to the use of calculators as facilitating:

- creating and solving problems;
- investigations of number patterns:
- estimation and approximation;
- movement between and among different number modes e.g. fractions, decimals percentages;
- Decision-making with respect to computational alternatives.

Computers are powerful instructional tools.

Tutorial programmes provide direct instruction for developing mathematical concepts and skills. These programmes have the capacity to introduce, explain, illustrate, pose questions and provide feedback. Drill and practice programmes allow pupils to interact directly with specific skills. These also provide reinforcement.

Simulations - Experiences which are .difficult to deal with directly can be illustrated via computers e.g. Spatial concepts.

The assessment standards can be linked to calculators and computers in that opportunities abound to assess pupils' ability to communicate, solve problems, be creative, etc.

SECTION III - CONTENT STRANDS

The Content Strands

These relate directly to the programme of work as set out in the Primary School Mathematics Syllabus. The content strands appear as:-

- Number sense and numeration
- Geometry: Spatial Sense, geometric properties and relationships
- Measurement and Estimation
- Statistics

In the Primary School Mathematics Syllabus; a rationale for each content strand has been presented. In the Standards document the strands are viewed from an assessment perspective. With this in mind, this section will translate each of the content strands into a set of goals followed by statements which relate the goals to assessment procedures.

NUMBER SENSE AND NUMERATION

Goal: All Pupils will demonstrate developing number sense.

Descriptive Statement: Number Sense is defined as an intuitive feel for numbers and a common sense approach to them. Number Sense involves an understanding of how the different types of numbers are related. It gives one the confidence to select which type of numbers is best suited to a situation. Number Sense allows one to use pattern-based thinking to understand extensions of the number system. A developed number sense facilitates estimation skills and expands the sense of magnitude of different number types.

Goal: All Pupils will understand, select and apply various methods of performing numerical operations.

Descriptive Statement: Numerical operations are an essential part of the Primary School Mathematics programme. Pupils must be able to select and apply various computational methods including mental as well as paper and pencil techniques.

Pupils must be come proficient in performing the four operations.

SPATIAL SENSE/GEOMETRY

Goal: All. Pupils will develop spatial sense and the ability to use Geometric properties and relationships to solve problems in Mathematics.

Descriptive Statement: Spatial sense is an intuitive feel for shape and space. At the primary level it involves the ability to recognise, visualise, represent and transform geometric shapes.

In a less formal way, it involves coming to grips with two and three dimensional space, through paper folding, flips, turns and slides. It links Geometry to art, nature, architecture, engineering, etc.

MEASUREMENT

Goal: All pupils will develop an understanding of measurement and use it to describe and analyse phenomena.

Descriptive Statement: Measurement provides a means to describe the world around us. Measurement involves the use of numbers to describe attributes like length, weight, temperature, etc. An understanding of how numbers are related to measurement units like centimetres, litres, etc is fundamental to the topic. In addition the use of the various instruments associated with obtaining measures of phenomena is critical for pupils' understanding of the world around them.

ESTIMATION AND APPROXIMATION

Goal: All pupils will use a variety of estimation strategies and recognize situation in which estimation is appropriate.

Descriptive Statement: Estimation is a process which can be mastered by pupils. It should he considered as natural part of all measurement activities. It involves an educated guess about a quantity or a measure.

It is tied in with outcomes in computation and the determination of reasonableness of results. An awareness of estimation as a means to approximate is an important consideration.

PATTERNS AND RELATIONSHIPS

Goal: All pupils will develop an understanding of patterns and relationships which they use to represent and explain real-world phenomena.

Descriptive Statements: Patterns and relationships run like a common thread through fabric of the mathematics programme.
In every class at the primary level pupils should be encouraged to investigate patterns and relationships which exist in their work in number and shape. Opportunities should be made available for exploration and creation of a variety or patterns and to use pattern based-thinking to explain real world phenomena.

STATISTICS

Goal: All pupils will develop an understanding of statistics and will use statistics to describe sets of data to model situations and to support arguments.

SECTION IV - ASSESSM ENT STANDARDS

This section will present the framework that will facilitate obtaining measures of pupils' performance in the objectives across the strands of the programme at the end of the classes, Standard 1 to Standard 5.

A description of the Components of the framework is as follows:-

- Outcomes from the Primary School Mathematics Syllabus.
  These outcomes have been derived from each of the content strands.

In the first place, the outcomes are stated in general terms, articulating what mathematical understanding pupils should have acquired and what skills they are expected to demonstrate.

Secondly, outcomes and stated in specific terms, amplifying the objectives expressed in the Syllabus document. Outcomes have been stated from Standard I to Standard 5.

- **Characteristics of Pupils' Performance**
  These appear as statements, holistic in nature about what is expected of the pupils at four levels of performance. The descriptions synthesize pupils' performance over the requisite knowledge and skills, in addition to their ability to perform in the essential components of mathematics learning viz problems solving, creativity, etc.

- **Sample Performance Indicators**
  These describe in specific terms what the pupils can do over four levels of performance; they are explicit statements about each of the objectives specified in the Syllabus and include a description of the degree of proficiency attained in the key components of mathematics learning.

- **Interpretation of the Standards**
  The Standards are based on the pupils mastering the material at each class. Mastery at each class is critical for success of the entire mathematics programme. It is important to interpret the standards strictly adhering to the principles of mastery at each class.

  The four levels of performance are to be interpreted as follows:-

  Level 1

  Pupils are not performing within the expected range of standards set for the class. The indication here is that the pupils are not ready to move forward.

Level II and III

Pupils at these levels are performing within the expected range of standards set for the class. Qualitatively, Level III denotes better performance than Level II. The Level III performer is less reliant on teachers' supervision and consistently produces good work.

Level IV

Pupils at this level are performing beyond the range of Standards set for the class.

The Standard of performance represents high but reasonable expectations and ought not to be compromised.

It is most important to note that the Standards of performance are indicators of performance and not descriptions of the pupils.

It must also be borne in mind that Mathematics is comprised of different Strands, each of which requires different abilities ego spatial, computational, reasoning etc. It is reasonable to expect that for anyone strand, levels of performance will vary.

Audience served by the Standards

The primary purpose of the standards is to provide information on levels of performance. Persons who will find the standards useful include pupils. Teachers. parents, administrators. Pupils will have clear statements of their performance and may proceed on a sound basis for self assessment.

Teachers will have data on which to base future teaching-learning plans in addition to references for reporting on pupils' performance to parents and administrators. Parents may use the Standard *as* a basis for performance evaluation and Curriculum change.

NUMBER - STANDARD I

Standards of Performance

END OF STANDARD - I		LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
Outcomes from the Primary School Mathematics Syllabus. By the end of Standard 1 pupils will:- • Apply counting skills and concepts of place-value to a variety of practical situations • Recognize and rationalize number patterns • Perform accurately the basic operations. • Understand the relative magnitude of simple fractions. • Read and write numerals to 100 • Sequence numbers up to 100 • Use personal strategies to identify patterns. • Construct and describe place-value representations of whole numbers to 99 • Apply computational procedures involving addition and subtraction to 99	Characteristics of student performance.	The pupil:- • Recognizes and counts numbers but experiences some difficulty in sequencing larger numbers • Depends, to a large extent, on teaching aids to observe patterns and to perform basic operations with whole numbers • Relies on manipulative to identify fractions. • Solves story problems with much assistance.	• Has a fair understanding of number and place-value. • Observes and extends patterns and performs operations with little assistance. • Attempts solutions to story problems but is not always accurate.	• Has a good understanding of number and place value. • Recognizes, extends and creates patterns. • Performs well with the basic operations. • Applies the operations to solving problems and uses a variety of pattern structures to do so.	• Has a sound understanding of the number system and represents this understanding through the use of concrete materials. • Possesses an intuitive sense of number and applies a variety of strategies to solving problems. • Uses pattern recognition and pattern creation as strategies for solving problems.

NUMBER - STANDARD I

Standards of Performance

END OF STANDARD - I		LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
• Perform multiplication as repeated addition, with and without manipulatives (one-digit by one-digit) • Build multiplication tables to 5. • Perform division (without remainders) of numbers less than 30 by divisors 2 to 5. • Solve simple problems involving the four operations. • Construct a variety of problems involving the four operations. • Classify even and odd numbers. • Identify simple fractions (112, 113, 114, 115)	Sample Performance Indicators	• Sequences numbers with prompting and assistance.	• Sequences consecutive numbers to 99.	• Sequences numbers to 99 beginning at a point in a forward or backward direction.	• Sequences numbers beyond 99 beginning at any point and observes patterns within the sequence.
		• Recognizes number patterns.	• Recognizes; describes and extends patterns.	• Recognizes, describes, extends and creates patterns.	• Develops repeated number patterns of increasing complexity and rationalizes these patterns.
		• Groups materials into bundles of ten and names the number for the given concrete representation of one and two-digit numbers.	• Names the number for given concrete, pictorial and symbolic representations of one and two-digit numbers.	• Names and renames quantities to 99 (e.g. 73 as 73 ones, 7 tens and 3 ones seventy-three, etc).	• Names and renames quantities to numbers beyond 99.
		• Adds and subtracts one and two-digit numbers (to 90) without regrouping but cannot recall basic number facts.	• Adds and subtracts one and two-digit numbers, (result less than 99), with and without regrouping. • Recalls few basic number facts.	• Adds and subtracts one and two-digit numbers with and without regrouping using a variety of strategies. • Recalls many basic number facts.	• Adds and subtracts numbers with more than two digits. • Interprets answers in relation to the problem. • Recognizes and describes patterns in relation to the basic number facts.
		• Demonstrates multiplication as repeated addition and constructs equal sets of objects; builds tables of two's and five's using concrete materials.	• Interprets, records and solves multiplication sentences (e.g. translates '3 sets of 5' to '3 x 5'). • Builds tables of2's, 3's, 4's and 5's using concrete materials.	• Interprets, records and solves multiplication sentences using various methods. • Builds table of2's, 3's, 4's and 5's and memorizes these facts.	• Interprets, records and solves multiplication sentences using a variety of methods. • Applies multiplication in solving story problems and builds tables beyond 5's.

NUMBER - STANDARD I

Standards of Performance

END OF STANDARD - I		LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
	Sample Performance Indicators	• Demonstrates division as repeated subtraction. • Performs equal sharing of concrete materials and groups objects in given amounts (e.g. 15 grouped in 3's gives 5 groups). • Solves division sentences with much assistance.	• Interprets, records and solves some division sentences.	• Interprets, records and solves division sentences using a variety of strategies, with some assistance.	• Interprets, records and solves division sentences using a variety of strategies. • Applies division in solving problems Applies division in solving problems multiplication and division.
		• Names some even and odd numbers moving in a forward direction only.	• Classifies and names most even and odd numbers and sequences these numbers moving in a forward and backward direction, with some errors.	• Classifies and names even and odd numbers and sequences these numbers beginning at any point in a forward or backward direction with few errors.	• Classifies and names even and odd numbers, predicts which numbers will divide exactly by 2 and states that these end in 0, 2, 4, 6 or 8. • Observes and creates patterns with even and odd numbers.
		• Identifies and names simple fractions by counting the number of equal parts in wholes.	• Identifies simple fractions concretely, pictorially and in written form.	• Identifies and names the family name of fractions e.g. five-fifths.	• Identifies and names the family name, some simple fractions with same denominator and constructs an informal, yet accurate defmition of a fraction.

NUMBER - STANDARD II

Standards of Performance

END OF STANDARD - II		LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
Outcomes from the Primary School Mathematics Syllabus. By the end of Standard II pupils will:- • Apply the concept of place value and counting skills to practice numbers up to 1000. • Perform accurately the basic operations of addition, subtraction, multiplication and division of a whole number in mechanical and story problems.	Characteristics of student performance.	The pupil • Has minimal understanding of counting, grouping numbers up to 1000 and describing place value representation of2-digit whole numbers. • Relies on concrete applications and needs assistance in performing the basic operations. • Solves story problems with a lot of assistance.	• Understands and remembers basic number facts and uses the established format for performing the mathematical operations.	• Has a good understanding of the relationship between counting, grouping and place value. • Performs mathematical operations in computational tasks and story problems, using a variety of strategies.	• Has the ability to make judgements based on results, using intuition and critical thinking skills. • Has a sound understanding of the numeration techniques.
More specifically pupils will.- • Read and write numbers up to 1000.	Sample Performance Indicators.	• Recites the names of numerals consecutively, but requires assistance at times.	• Reads and prints numerals to 999, with the assistance of teaching aids.	• Reads and writes numerals and number names up to 999. • Matches number names with numerals.	• Reads and names quantities beyond 1000. • Renames quantities beyond 999 using a variety of names.

NUMBER - STANDARD II

Standards of Performance

END OF STANDARD - II		LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
• Sequence numbers up to 1000.	Sample Performance Indicators	• Needs concrete models and pictorial representations of three-digit numbers to count a sequence of at least ten numerals in 2s, 5s, and IDs.	• Count in 2s, 5s and IDs a sequence of at least ten terms from any given value less than 1000, both upwards and downwards.	• Calculates missing values of sequences having values up to 1000 and counted in 2s, 5s IDs.	• Inserts missing values in any sequences beyond 1000, that is counted in 2s, 5s, 10s and extends work in sequences for number other than 2,5 and 10.
• Order numerals less than 1000.		• Rearranges a group of (less than 4) consecutive numbers in ascending order, but needs assistance to do so.	• Rearranges and writes any group of numbers in ascending order, making only a few errors.	• Rearranges groups of numbers in ascending and descending order. • Orders whole numbers up to 999 using the word "less than" and "more than".	• Orders numbers beyond 999 using the symbols "<" and ">".
• State the value of a digit in numbers up to 999.		• States, orally, the value of digits in numbers (less than 1000), using structured materials and requiring teacher's guidance.	• Writes the value of any digit in numbers <, 1000 with minimal use of structured materials.	• Discriminates between counting, grouping, ordering, and place value. • Writes a number up to 999 in expanded form.	• Applies place value concepts to numbers beyond 999. • Converts expanded notation into numerals.
• Perform addition with a result less than 1000.		• Recalls basic addition facts with the assistance of concrete materials and adds two or three numerals involving hundreds, but without regrouping and written in vertical form.	• Performs addition of two or three numbers written vertically, but which involve 2 or 3 trades.	• Adds numbers written in a variety of ways, in mechanical and story problems, with a few non-conceptual errors.	• Performs addition with numbers whose result is more than 999, and interprets the answer in relation to the problem.
• Apply computational procedures involving subtraction of whole numbers up to 999.		• Performs simple subtraction problems involving hundreds, but with no regrouping or zero involvement. • Relies on concrete manipulatives for assistance.	• Subtracts numbers that involve regrouping and one zero involvement written in various ways. • Applies subtraction facts to story problems with few non-conceptual errors.	• Subtracts numbers with more than 3-digits with or without regrouping and zero involvement from mechanical and story problems and interprets the answer in relation to the problem.	• Performs subtraction with numbers and interprets the answer in relation to the problem. • Solves subtraction problems mentally.

NUMBER - STANDARD II

Standards of Performance

END OF STANDARD - II		LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
• Perform multiplication of 1 and 2 – digit numbers by a number less than 10.	Sample Performance Indicators.	• Multiplies I-digit numbers by Multiplies I-digit numbers by with the assistance of concrete models, and repeated addition.	• Solves simple multiplication sentences with a two-digit number by a I-digit number with no regrouping or zero involvement. • Constructs and displays multiplication tables with some assistance from concrete models. • Connects the applications of repeated addition with array models.	• Multiplies 2-digit numbers by a I-digit number with zero involvement and regrouping. • Applies the commutative property. • Solves story problems involving multiplication and mechanical problems written in a variety of ways, with minimal errors.	• Multiplies 2 or more digit numbers by a l-digit number. • Applies multiplication facts in problem solving activities. • Investigates number patterns in multiplication tables/charts. • Recalls mentally most of the multiplication tables.
• Perform division of two-digit numbers by a one-digit divisor.		• Divides, under supervision, a quantity into smaller quantities by sharing or regrouping into a few equal groups (five or less groups), using concrete materials.	• Divides a quantity by sharing or grouping into less than 10 groups that are not evenly shared, using concrete models. • Divides simple division sentences having a two- digit number and a l-digit divisor, with or without a remainder.	• Relates division with multiplication. • Creates and solves simple division stories. • Observes patterns on a 1-100 number - square board having divided by 2, 5 and 10.	• Divides numbers with 3-digits or more by a l ' -digit divisor. • Makes inferences about patterns observed when the divisor is 2,5, 10. • Creates, solves and interprets the answers of story problems involving division.
• Identify and name fractions using word names and symbolic representation.		• Identifies and writes, with assistance, symbolically:- (i) unit fractions (i) non-unit fractions represented in linear and area models or pictorially.	• Constructs models by folding a whole into equal parts of2, 4 and 8 or assembles whole from equal parts. • Establishes the family word name of unit fractions by shading one part of the whole. • Writes the word name of non-unit fractions with the assistance of shading more than one part.	• Matches word names and symbolic representation of fractions with a denominator less than 8, when given pictorial or concrete models. • Builds charts having pictorial symbol and word names of fractions with a common family name.	• Writes word names of symbols and vice versa for fractions, not relying on concrete or pictorial models.

NUMBER - STANDARD II

Standards of Performance

END OF STANDARD - II		LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
• Make comparisons between two fractions.	Sample Performance Indicators.	• Compares two factions having the same denominator, shown pictorially or using concrete models.	• Compares fractions having different denominators using a "benchmark" and displayed with concrete models or diagrams. • Uses the words "less than" and "more than" to compare two fractions, after using the above criteria.	• Uses materials to overlay fractions with different denominators and makes comparisons using the symbols for "less than" and "more than," accurately.	• Creates given fractions larger or smaller than a given fraction. • Makes inferences about the size of fractions having same numerator but different denominators.
• Recognize equivalent fractions.		• Uses models to state orally the equivalence of a unit fraction with related denominators up to 10 and depends on teacher's assistance.	• Uses linear and area models and over-laying techniques to obtain the equivalent form(s) of non-unit fractions of given values.	• Experiments on his own, using linear and area models, to form equivalent fractions having the same denominator. • Records his findings in table form.	• Formulates rules and patterns to generate a set of equivalent fractions. • Calculates missing values for simple equivalent fractions from rules formulated.

NUMBER - STANDARD III

Standards of Performance

END OF STANDARD - III		LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
Outcomes from the Primary School .Mathematics Syllabus. By the end of Standard III pupils will:- • Apply counting skills and concepts of place value to a variety of practical situations. • Recognize and rationalize number patterns. • Perform accurately the basic operations to 9999. • Model the different types of fractions. • Add and subtract fractions.	Characteristics of student performance.	The pupil • Reads, writes and sequences numbers but continues to experience difficulty with larger numbers. • Relies on concrete models to perform operations with fractions. • Needs assistance in solving problems.	• Has a fair understanding of numbers and place value to 10000. • Observes and extends patterns and performs the basic operations with little assistance. • Solves problems but continues to experience some difficulty.	• Has a good understanding of number and place value to 10000. • Makes judgements about the reasonableness of computational results. • Solves problems involving the basic operations.	• Has an intuitive sense of number. • Has a sound understanding of the numeration system. • Develops and applies a variety of estimation and mental computation strategies. • Solves multi-step routine and non-routine problems.
• Read, write and sequence numbers to 10000.	Sample Performance Indicators.	• Needs assistance in reading and writing larger numbers. • Has not grasped the pattern in the number sequence and makes many errors with the larger numbers.	• Needs little assistance in reading and writing numbers. • Has an understanding of the number sequence and makes fewer errors in sequencing numbers.	• Has a good understanding of numbers to 10000. • Sequences numbers to 10000.	• Has mastered the reading and writing of numbers to 10 000. • Recognizes, describes and creates patterns in the number system.

NUMBER - STANDARD III

Standards of Performance

END OF STANDARD - III		LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
• Construct and describe place value, representations of whole numbers to 9999.	Standard Performance Indicators.	• Relies on concrete models to state values of digits. • May require teacher-prompts when making concrete representations of numbers.	• Uses concrete models to represent numbers, with little difficulty. Continues to use place-value headings as an assist in stating the value of each digit.	• Uses concrete models to represent any number to 10 000. • States the value of any digit in a number. • Writes numbers in expanded notation.	• Demonstrates flexibility in reading numbers e.g. 3400 is 3 thousand and 4 hundred or 34 hundred. • Solves problems involving the knowledge of place value to 9999. • Associates place values with other topics e.g. Money, Metric, Measures.
• Approximate. numbers to the nearest 10, 100, 1000.		• Needs the teacher's assistance to make approximations involving larger numbers and may need a visual assist e.g. the number line.	• Approximates numbers with fewer errors. May be unsure of his approximation and may seek assistance.	• Shows a good understanding of the approximation of whole numbers. • Applies the skill effectively to other strands in the curriculum e.g. approximating a linear measure.	• Solves problems involving the approximation to the nearest 10, 100, 1000. Problems may be related to other topics in the mathematics curriculum e.g. topics in Measurement.
• Apply computational procedures to add numbers to 9999.		• Adds numbers to 9999 with some regrouping errors. • Cannot make a reasonable estimate of the result of an addition problem. • Misaligns digits when rewriting an addition problem from horizontal to vertical.	• Adds numbers to 9999 with one or two regrouping steps. • Makes poor estimates of the result of addition problems. • Correctly aligns digits when rewriting an addition problem.	• Performs the addition algorithm accurately and consistently. • Makes a reasonable estimate of an addition problem. • Uses a calculator to verify estimates and paper and pencil computations.	• Develops strategies for addition and effectively communicates strategies. • Uses a variety of computational estimation strategies to make good estimates of the result of an addition problem. • Uses a calculator to independently explore relationships in addition.
• Perform subtraction from four digit numbers. • Solve problems involving subtraction.		• Demonstrates weaknesses in the subtraction algorithm e.g. difficulty with decomposition. • Needs concrete and visual models to assist in recalling some basic subtraction facts.	• Recalls some of the subtraction facts. • Shows a reasonable understanding of the subtraction algorithm. • Makes few errors e.g. re-grouping and use of zero. • Solves simple story problems involving subtraction.	• Recalls many of the subtraction facts using mental strategies. • Performs the subtraction algorithm with accuracy and consistency. • Solves story problems involving subtractions. • Orally explains the relationship between addition and subtraction. • Makes an estimate of the result of a subtraction problem.	• Performs subtraction using a variety of personally invented mental and written strategies and effectively communicates inventions. • Makes good estimates of the result of a subtraction. • Writes subtraction story-problems, making connections with other strands in the curriculum. • Recalls most of the basic subtraction facts.

NUMBER - STANDARD III

Standards of Performance

END OF STANDARD - III		LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
• Relate the multiplication concept to different representations (e.g. sets, arrays).	Sample Performance Indicators.	• Has a limited understanding of the multiplication concept. Understanding may be limited to only one representation e.g. sets. • Recalls few basic multiplication facts.	• Associates the concept of multiplication with both sets and array representations.	• Uses either set or array representations to explain the commutative and associative property of multiplication.	• Recognizes multiplication constructs in representations oilier than sets and arrays.
• Recall multiplication facts. Multiplication algorithm 2d x 2d.		• Performs the algorithm with assistance especially if not used for some time. May experience difficulty with zero and the larger multiplication facts. • Uses a calculator to multiply. Unlikely to monitor keying errors.	• Multiplies 2 d x 2d with few errors. • Solves simple problems involving skill. • Uses a calculator to perform multiplication and may identify when an error was made.	• Performs the multiplication algorithm with accuracy. • Makes reasonable estimates of the result of a multiplication. • Uses a calculator to verify estimates.	• Solves multi-step problems. • Writes problems using a variety of situations across strands. • Invents paper and pencil algorithms. • Uses calculator to predict and test patterns involving multiplication.
• Divide 2-digit and 3-digit numbers by l-digit numbers.		• Unlikely to monitor keying errors. motivation with the algorithm. • Experiences difficulty with multiple regrouping and zero involvement. • Omits steps when using the algorithm. • Is unable to validate result. • Needs assistance with solving division problems. • Performs division with a calculator. Is unlikely to monitor keying errors or validate result.	• Performs division using a calculator. Monitors keying errors. • Demonstrates division as repeated subtraction. • Makes systematic errors in the algorithm. If informed of an error pupil may independently identify error. • Usually verifies results. • Attempts division problems with reasonable success.	• Performs calculation, verifies estimates and paper and pencil calculation. • Performs the division algorithm making an occasional error. • Independently recognizes and corrects errors. • Makes a reasonable estimate of a division. • Solves division problems involving a variety of situations. • Uses a calculator to perform calculation, verify estimates and paper and pencil calculation.	• Continually monitors the reasonableness of his/her results. • Uses a variety of strategies to make estimates of 3d""" I d. • Writes division problems involving other topics. • Solves' multi-step problems involving skills to 3d""" Id. • Uses a calculator to independently explore patterns involving division.

NUMBER - STANDARD III

Standards of Performance

END OF STANDARD III		LEVEL l	LEVEL 2	LEVEL 3	LEVEL 4
• Differentiate between Proper fractions, Improper fractions and mixed numbers. • Convert mixed numbers to Improper fractions and vice versa.	Sample Performance Indicators.	• May correctly classify a fraction but is unable to explain its meaning. • Converts mixed numbers to Improper fractions with the use of manipulation and visuals.	• Uses concrete and visual representations to convert mixed numbers to improper fractions and may predict result before using concrete models.	• Mentally converts simple Improper fractions to mixed numbers and vice versa e.g. 3/2 = 11/2 • • Solves simple problems involving the converting of mixed numbers to Improper fractions.	• Identifies situations across strands where Improper fractions and mixed numbers are used. • Solves problems involving the converting of mixed numbers to Improper fractions. • Recognizes a pattern when converting mixed numbers to Improper fractions and vice versa.
• Use an algorithm to add and subtract fractions. • Solve a variety of problems involving the addition and subtraction of fractions.		• Needs assistance with the algorithm especially with the skill involving unlike denominators. • Requires additional practice in renaming fractions. • Relies on concrete and visual representations to communicate quantitative understanding of fractions. • Has difficulty justifying the reasonableness of results. • Unable to make a good estimate.	• Experiences some difficulty with calculations involving unlike denominators. • Adds, with few errors, calculations involving same denominators. • Makes a rough estimate of the result. • Solves simple problems involving the addition and subtraction of fractions.	• Performs calculations involving unlike denominators, with consistent result. • Automatically renames fractions. • Makes good estimates of the • results of the operations.	• Performs the operations of simple fractions mentally. • Uses a variety of invented strategies to perform calculations. • Writes problems involving the addition and subtraction of fractions - across strands and from everyday experiences. • Makes very good estimates of the results of a calculation. • Solves two-step problems involving the addition and subtraction of fractions.

NUMBER - STANDARD IV

Standards of Performance

END OF STANDARD IV		LEVEL l	LEVEL 2	LEVEL 3	LEVEL 4
Outcomes from the Primary School Mathematics Syllabus. By the end of Standard IV pupils will:- • Apply the concept of place value, use whole numbers, fractions and decimals in real life situations. • Perform accurately the four operations in whole numbers. • Solve story problems and make estimations.	Characteristics of student performance.	The pupil • Demonstrates a limited understanding of place value particularly in its application to larger numbers. Computational procedures are carried out with much assistance. • Solves simple one-step problems involving whole numbers, fractions and decimals.	• Demonstrates a fair understanding of place value and of the basic procedures in mental calculation and estimation. • Solves multi-step problems involving whole numbers, fractions and decimals.	• Has a good understanding of number and place-value. • Performs basic operations with whole numbers, fractions and decimals. • Solves problems using a variety of strategies.	• Skillfully performs operations with whole numbers, fractions and decimals and displays exceptional understanding of the number system. • Creates and solves a wide variety of problems.

NUMBER - STANDARD IV

Standards of Performance

END OF STANDARD IV		LEVEL l	LEVEL 2	LEVEL 3	LEVEL 4
• Associate number, numeral and word name of numbers to one million. • Sequence numbers to one million. • Construct and describe place- value representations of whole numbers to one million.	Sample Performance Indicators	• Experiences some difficulty in associating number, numeral and, word names of numbers, particularly the larger numbers. • Sequences numbers with prompting and assistance.	• Experiences little difficulty in associating number, numeral and word names to one million. • Sequences numbers with little assistance, moving in a forward direction.	• Associates number, numeral and word names of numbers to one million. • Sequences numbers beginning at any point moving in a forward or backward direction.	• Associates number, numeral and word names of numbers beyond one million. • Observes and describes patterns within the number system. • Sequences numbers beyond one million beginning at any point. • Observes and describes patterns within the sequence.

NUMBER - STANDARD IV

Standards of Performance

END OF STANDARD IV		LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
• Apply computational procedures involving addition and subtraction, (result less than one million). • Use the calculator as a mathematical tool. • Demonstrate an understanding of square numbers. • Explore patterns in square numbers. • Apply computational procedures involving square roots of whole numbers.	Sample Performance Indicators.	• States the value of digits in numbers to one million but needs guidance and assistance with larger numbers beyond 10000. • Rounds off whole numbers to the nearest ten thousand, hundred thousand and million, with a low degree of accuracy. • Adds and subtracts numbers, (result less than one million), without regrouping but makes many errors with regrouping. • Recalls few relevant number facts.	• Recognizes and describes the value of digits in numbers to one million. • Uses expanded notation with some degree of accuracy. • Rounds off whole numbers to the nearest ten thousand, hundred thousand and million, with some degree of accuracy. • Adds and subtracts whole numbers, (result less than one million), with and without regrouping with some errors. • Recalls some basic number facts.	• Recognizes and describes the value of digits in numbers to one million. • Uses expanded notation with a high degree of accuracy. • Rounds off whole numbers to the nearest thousand, hundred thousand and million with some degree of accuracy. • Adds and subtracts whole numbers with and without regrouping, using a variety of strategies. • Recalls relevant number facts.	• Applies place-value concepts to numbers beyond one million. • Constructs and describes representations of three numbers. • Observes patterns with the number system. • Rounds off whole numbers with a high degree of accuracy and can predict what the approximated number would be. • Adds and subtracts whole number, (with result beyond 1 million). • Explores and describes a wide variety of methods. • Estimates and checks answer independently.
		• Solves one-step problems involving addition and subtraction. • Experiences difficulty with solving multi-step problems. • Requires much assistance.	• Solves multi-step problems involving addition and subtraction, with some errors and with some assistance.	• Solves multi-step problems involving addition and subtraction using a variety of strategies.	• Solves multi-step problems involving addition and subtraction. • Creates story problems involving the use of these 2 operations. • Checks all solutions using skills such as approximation and use of different strategies.
		• Multiplies 3-digit by 2-digit numbers with many errors and much assistance. • Recalls few number facts. • Uses a calculator to verify results.	• Interprets records and solves multiplication sentences involving 3-digit by 2-digit numbers with some errors. • Recalls most number facts. • Uses a calculator to verify results.	• Interprets, records, and solves multiplication sentences with 3-digit by 2-digit numbers. • Recalls relevant number facts. • Uses a calculator adequately, to verify results.	• Interprets records, creates and solves multiplication sentences. • Estimates the size of the product. • Uses the calculator skillfully; to verify results.

NUMBER - STANDARD IV

Standards of Performance

END OF STANDARD IV		LEVEL l	LEVEL 2	LEVEL 3	LEVEL 4
	Sample Performance Indicators.	• Demonstrates division as repeated subtraction. • Solves simple one-step problems but experiences difficulty with two- digit divisors and three-digit dividends. • Uses manipulatives to form square arrays and lists some square numbers. • Demonstrates the use of the calculator but needs much prompting and assistance in recognizing patterns in square numbers. • Experiences difficulty in obtaining factors of given numbers and derives the square root of numbers with much assistance.	• Interprets, records and solves division problems with some assistance but makes no attempt to verify results or solutions. • Recognizes that all square numbers will form a square array (a square of dots). • Recognizes and extends patterns in square numbers. • Derives the square root of given numbers using the factor method, with some assistance.	• Interprets, records and solves division problems with little assistance. • Makes some attempt to estimate and verify answer but these attempts are not always logical. • Identifies most square numbers. • Recognizes, extends and creates patterns in square numbers. • Works independently. • Derives the square root of given numbers using the factor method with little assistance. • Explores alternative strategies for finding square root.	• Interprets, records, creates and solves division sentences and problems using a variety of methods. • Applies the relationship between multiplication and division. • Uses multiplication to verify results. • Identifies square numbers. • Predicts which numbers will be square. • Explores and creates patterns in square numbers via skilful use of the calculator. • Constructs number sequence to derive square numbers. • Derives the square root of numbers using the factor method. • Recognizes and describes alternative ways of finding square roots. • Observes, extends and creates patterns for finding square root.
• Express a fraction in an equivalent form by using the algorithm.		• Expresses a unit fraction in an equivalent form, with the assistance of linear and area models and paper folding.	• Uses set models to form equivalent fractions, given the denominator. • Lists equivalent fractions in a given pattern to form tables.	• Reduces given fractions to form equivalent fractions of given denominators. • Deduces the algorithm to calculate the equivalent fractions from tables generated. • Applies the algorithm to generate equivalent fractions making minimal errors.	• Applies, accurately, the algorithm to express the equivalent form of a fraction, given either the numerator or denominator of the equivalent form.

NUMBER - STANDARD IV

Standards of Performance

END OF STANDARD IV		LEVEL l	LEVEL 2	LEVEL 3	LEVEL4
• Add and subtract fractions and mixed numbers, • Order fractions	Sample Performance Indicators	• Converts a set of unit fractions to equivalent fractions of a common denominator, using manipulatives at times. • Adds and subtracts unit fractions using the equivalent forms. • Orders a set of fractions in ascending or descending order.	• Converts non-unit fractions to equivalent fractions with a common denominator. • Adds and subtracts unit and/or non-unit fractions, making few errors.	• Adds and subtracts fractions and mixed numbers using equivalent fractions, making few non- conceptual errors. • Orders a set of Proper and/or Improper fractions, with few errors.	• Adds and subtracts fractions and mixed numbers given in computational and story problems, with no errors. • Orders, Proper, Improper or mixed numbers, accurately
• Multiply a fraction by a whole number and calculate a fractional part of a set.		• Multiplies unit fractions by a whole number using repeated addition of fraction models, without teacher's guidance. • Multiplies non-unit fraction by whole number using repeated addition but with teacher's assistance. • Calculates the fractional part of a set using fraction models.	• Multiplies non-unit fractions by a whole number, using repeated addition of fraction models with few number facts errors.	• Multiplies fractions by whole numbers using the algorithm, making only an occasional error. • Calculates a fractional part of a whole number using established formats.	• Gives explanations of connections between repeated addition and multiplication by a whole number and the fractional part of a set. • Works problems given in story form, without errors.
• Divide a fraction.		• Divides simple non-unit fractions into equal sets, given real life situations and manipulatives.	• Needs fraction model to divide by folding or other strategies, a unit and/or non-unit fraction into a given number of equal parts. • Writes worked examples using symbolic form.	• Records results of division problem in a tabular format. • Observes tables for existing patterns. • Calculates given examples using the observed principles, but with few errors.	• Applies observed patterns to other story type problems created by the pupil, with no errors. • Makes generalisations and connections between division by a whole number and multiplication by the reciprocal of the number.

NUMBER - STANDARD IV

Standards of Performance

END OF STANDARD IV		LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
• Read, write and state place value of decimals (tenths, hundredths).	Sample Performance Indicators.	• May require assistance when attempting to make concrete representations of decimals, especially numbers to hundredths. • Experiences difficulty in reading some decimals e.g. .. 3.05. • Demonstrates uncertainty when ordering decimals. • Has limited understanding of the varied applications of decimals. • Has limited skill in making approximations, especially activities involving approximating hundredths to tenths. • Writes decimals in expanded form with assistance. • Enters correctly in a calculator a written decimal number.	• Makes concrete representations of most decimals but has difficulty communicating abstractly its quantitative meaning. • Reads and writes decimals with very few errors. • Orders decimals. • Identifies and corrects errors when indicated. • Connects decimals to common applications e.g. metric system. • Approximates decimals to the nearest tenths, hundredths, whole number with few errors. • Uses the place value headings as an assist when writing decimals in expanded form. Enters correctly a decimal number which has been read to him/her e.g. Pupil is asked to enter the number.	• Makes concrete representations of decimals. • Uses practical examples to communicate quantitative meaning of decimal. • Reads and writes decimals proficiently. • Orders decimals and recognizes patterns in decimal number sequences. • Relates decimals to a wide range of applications. • Approximates any decimal and effectively explains reasons for his/her approximations. • States the values of the digits in a decimal. • Writes fractions with denominators of 10 and 100 instantly in decimal form. • Uses the calculator to identify patterns in the number system	• Uses a variety of models and situations to communicate his/her understanding of decimals. • Reads decimals in different ways e.g. 0.37 is 3 tenths and 7 hundredths or 37 hundredths. • Recognizes, explains and creates number patterns involving decimals. Uses decimals effectively to communicate quantitative ideas. • Uses the skill of approximation routinely in other topics. • Solves simple problems involving problem value of decimals. • Writes fractions other than those with denominators of 10 and 100 in decimal form e.g. 13/50. • Explores and communicates a variety of number 'patterns using a calculator.
• Add and subtract decimal fractions.		• Requires further assistance with the algorithms. • Requires practice with manipulatives and use of appropriate language. • Misaligns digits when stating computational problems from horizontal to vertical formats. • Unable to make an estimate. • Uses a calculator to perform calculations but is unlikely to validate result.	• Performs calculations with few errors. • Tries to locate and correct errors. May refer to manipulatives. • Uses the correct format to write number problems. • Makes a 'rough' estimate of a calculation. • Perseveres with solving problems when encouraged. • Uses a calculator to perform calculations. Can often justify result.	• Produces a correct answer to calculations and gives a complete explanation to steps in procedure. • Makes a good estimate of a calculation. • Solves a variety of problems relating to decimals. • 'Uses a calculator and can quickly identify when an error has been made.	• Invents and explains paper and pencil and mental computation strategies. • Uses a variety of strategies to make estimates. • Solves multi-step problems involving a wide range of topics. • Uses a calculator to explore patterns and relationships involving the two operations.

NUMBER - STANDARD IV

Standards of Performance

END OF STANDARD IV		LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
• Express hundredths as percents and calculate the percent of a quantity.	Characteristics of student performance	• Represents accurately a given fraction in hundredths on a l0 x 10 grid. • Writes a fraction given in hundredth as a percent, with the assistance of the grid. • Uses the notation for percent. • Calculates the percent of a quantity given.	• Converts fractions expressed in hundredths to percent and vice versa, without use of models. Calculates a percent of a simple quantity, with little assistance.	• Calculates a percent of a quantity using the algorithm. • Solves real-life story problems, with few errors. • Converts percents to proper fractions, accurately.	• Creates and solves real life problems, with no errors. • Interprets the answers of the problems.
More specifically, pupils will • use the unitary method to solve problems on proportion.	Sample Performance Indicators	• The pupil solves simple problems, if presented with a worked example, similar to the problems being solved, or if given step-by- step guidance. • Needs further practical and real-life experiences to construct a deeper understanding of procedure. • Unable to explain reasonableness of results.	• Uses the method, with limited success. • Experiences difficulty in applying the method in unfamiliar situations or applications. • Explains reasonableness of the result, rarely.	• Uses the method consistently with single-step problems. • Sometimes experiences difficulty with problems involving multiple-steps or novel situations. • Has a good understanding of the reasonableness of the result.	• Consistently performs procedures across a wide range of applications and problem solving situations. • Monitors steps in procedure throughout. • Uses a calculator for problems which requires difficult calculations.

NUMBER - STANDARD V

Standards of Performance

END OF STANDARD V		LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
By the end of Standard V pupils will • Apply computational procedures involving the four operations. • Demonstrate understanding of fractions and decimals and use them in a number of practical applications. • Select appropriate strategies to solve problems involving whole numbers, fractions and decimals.	Characteristics of student performance.	The pupil • Demonstrates a limited understanding of place-value and carries out computational procedures with much guidance and assistance occasionally. • Uses a calculator to verify results.	• Demonstrates a fair understanding of place-value. • Requires some assistance in solving problems involving whole numbers, fractions and decimals. • Uses a calculator to verify results.	• Demonstrates a good understanding of place-value. • Works independently in solving problems involving whole numbers, fractions and decimals. • Makes suitable use of the calculators.	• Has a sound understanding of place-value. Performs, skillfully, operations on whole numbers, fractions and decimals. • Demonstrates appropriate problem-solving skills such as communicating, reasoning and estimating. • Makes appropriate use of the calculator but recognizes its limitation.

NUMBER - STANDARD V

Standards of Performance

END OF STANDARD IV		LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
More specifically, pupils will • Perform the four basic operations on whole numbers (up to one million). • Apply the four operations to solving problems. Construct a variety of problems involving number operations. • Use a variety of strategies in mental computation. Use the calculator as a mathematical tool.	Sample Performance Indicators.	• Applies computational procedures involving the basic operations to one-step problems only and often needs guidance in solving multi-step problems.	• Applies computational procedures involving the basic operations to multi-step problems.	• Applies computational procedures appropriately and solves problems using a variety of strategies.	• Applies computational procedures with great expertise. • Experiments with various strategies for solving a wide variety of problems.
• Multiply two fractions		• Multiplies two proper fractions that does not involve reduction, using the algorithm, but needs assistance using some representations e.g. area models.	• Multiplies two proper fractions and/or mixed numbers involving reduction with little assistance.	• Uses the algorithm to multiply proper fractions and/or mixed numbers in computational and story problems, making few errors with number facts.	• Multiplies two or more fractions using invented strategies. • Creates story problems involving multiplication and solves using algorithm.
• Divide two fractions		• Divides a whole number by a non-unit fraction given models and real-life situations. • Applies the algorithm to divide sample problems with mixed numbers, using manipulatives.	• Divides fraction by a whole number using few manipulatives	• Tabulates the results of worked examples and discuss patterns identified. • Applies patterns to further examples involving Proper fractions and mixed numbers.	• Constructs written reports on patterns. Applies to division of Proper fractions and mixed numbers.

NUMBER - STANDARD V

Standards of Performance

END OF STANDARD V		LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
• Express a fraction as a decimal.	Sample Performance Indicators.	• May rename a few fractions as a decimal e.g. 112 - 0.5) or rename a decimal (to tenths) to a fraction (e.g. 0.3 = 3/10). • Fails to think of a fraction as a division and hence is unable to use a calculator to express a fraction as a decimal. • Requires further practice with making connections between fractions and decimals using manipulatives and visuals e.g. number line.	• Renames fractions to decimals v and vice versa. • May use knowledge of equivalent fractions to express simple fractions as decimals e.g. 1 x 2 =2/10 = 0.2 5x2 • Is likely to think of a fraction as a division and may use a calculator to express a fraction as a decimal.	• Expresses fractions with denominators that are factors of 10 or 100. • Has constructed a procedure for expressing decimals to fractions. • Uses a calculator to express fractions as decimals.	• Uses a division algorithm to aid in expressing a fraction as a decimal.- • Uses a calculator to explore different types of decimals e.g. recurring decimals. • Applies the skill effectively in other topics e.g. money and metric measures.
• Multiply two decimals.		• Unlikely to produce a correct result independently. Omits steps or confuses sequence of steps in procedure. • Needs to follow closely a worked example involving a simple calculation e.g. 0.2 x 3. • Describes the steps in the procedure with support and guidance. • May use a calculator to perform calculation but cannot justify answer.	• Performs simple calculations e.g. 0.6 x 4 with some assistance. • May occasionally omit steps. • Unlikely to think about the problem quantitatively. • Makes a poor estimate. • Uses a calculator to perform calculation and may justify answer.	• Makes a generalisation relating to multiplication of a decimal fraction by 10. • Performs the algorithm with few errors. • Makes a reasonable estimate. • Uses a calculator to perform calculation and can justify answer.	• Has constructed generalisations e.g. multiplying numbers directly without using base ten fractions. • Uses estimation skills to predict placing of decimal point in answer. • Uses a calculator to confirm predictions made and to create and test new relationships.
• Divide a decimal by a whole number.		• May produce the correct answer but unable to explain steps. • Cannot make an estimate. • Needs further activities with base ten manipulatives.	• Has difficulty in explaining some steps e.g. regrouping. • Makes a crude estimate.	• Performs most of the steps in the algorithm correctly. • Explains each step using the appropriate language. • Makes a reasonable estimate and uses a calculator to verify estimate.	• Solves a wide variety of problems. • Uses a variety of strategies to make estimates. • Uses a calculator to explore examples involving recurring decimals. e.g. 4.1 + 3 • Applies skills across a wide range of topics.

NUMBER - STANDARD V

Standards of Performance

END OF STANDARD V		LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
• Divide a decimal by a decimal.	Sample Performance Indicators.	• Performs at a level which indicates that he/she lacks the basic understanding of the skill. • Needs to be slowly and systematically guided through each step in the procedure. • Uses a calculator to perform the operation but is unable to validate result.	• May solve some simple problems with assistance and by following a worked example e.g. 1.6 • Unlikely to make a reasonable estimate.	• Solves the simple problems efficiently e.g. 3.6 + 1.2. • Has some difficulty with the problems involving the higher sub skills. • Makes a reasonable estimate most of the time. • Uses a calculator to verify result.	• Solves a wide variety of problems (e.g. problem involving zero and recurring decimals). • May invent a strategy to perform skill. • Uses a calculator to explore the problems involving the higher sub skills e.g. non-terminating decimals.
• Make connections among decimals fractions and percent.		• Converts simple fractions to hundredths using a 10 x 10 grid. • Writes fractions with a denominator of 100 as a decimal fraction and then as a percent, but needs a lot of guidance to do so.	• Converts proper fractions to decimal fractions and then to a percent with little use of models and teachers' assistance.	• Converts fractions to decimal fractions and percent or vice versa. • Builds tables showing the comparison with a few inconsistencies.	• Solves problems involving all three modes with or without the use of a calculator. • Analyses a given table with missing values in either mode, and hence calculate the missing values.
• Calculate what percent of one quantity is another quantity.		• Writes the relationship between two quantities as a fraction, and then converts to a percent given the logical steps. • Uses a 10 x 10 grid with teacher's assistance.	• Writes as a fraction and then as a percent, with little assistance.	• Converts to a percent one quantity of another quantity in both computational and story problems, with few errors.	• Converts to a percent, as implied in story- type problems, without errors. • Creates problems and solves them.
• Apply the procedure of unequal sharing to real world problems. • Construct and describe a variety of situations involving unequal sharing.		• Demonstrates unequal sharing of quantities. • Compare quantities using set and linear models. • Solves problems with much assistance.	• Demonstrates and recognizes unequal sharing of quantities. • Solves problems with some assistance.	• Calculates the whole or part given another part, applying various strategies, with few inconsistencies.	• Identifies the relationship between the two parts and solves using various strategies.

NUMBER - STANDARD V

Standards of Performance

END OF STANDARD V		LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
• Calculate a whole quantity or part of a quantity given another part expressed as a percent.	Sample Performance Indicators	• Calculates the whole quantity given a part, using the unitary method" with much guidance from the teacher.	• Calculates the whole quantity, or part, using the unitary method, without the teacher's assistance.	• Compares quantities and recognizes unequal sharing of these quantities. Makes some attempt to solve problems in a variety of ways.	• Compares quantities. Applies unequal sharing to real-world situations. Solves problems using a variety of appropriate strategies.

GEOMETRY - STANDARD I

Standards of Performance

END OF STANDARD I		LEVEL l	LEVEL 2	LEVEL 3	LEVEL 4
Outcomes from the Primary School Mathematics Syllabus. By the end of Standard 1 pupils will:- • Classify, compare and name two and three dimensional shapes and recognize relationships of similarities and differences among them. • Construct 2-D and 3-d shapes and recognize 2-D and 3-D shapes in natural and man-made structures and patterns.	Characteristics of student performance.	The pupil • Uses language in a general way to express ideas about geometric objects (3D and 2D) and their ·relationships. • Shows little confidence with construction of shapes. • Has difficulty recognizing shapes.	• Uses correct geometric terminology to describe some specific properties and relationships of 2-D and 3-D shapes.	• Uses correct geometric terminology, • Demonstrates understanding of properties and relationships between 2-D and 3-D shapes.	• Explains and discusses geometric ideas, eloquently. • Displays understanding and creativity in varied constructions.
More specifically, pupils will:- • Identify and name 2- D and 3-D shapes from concrete or pictorial representations.	• Sample Performance Indicators	• Requires assistance to identify and name 3-D and 2-D shapes from a collection of items.	• Identifies and names 3-D and 2-D shapes from given concrete representations. • Provides explanations for their classification.	• Discriminates among various shapes to identify 3-D and 2-D shapes from pictorial representations.	• Compares and discusses similarities and differences of3-D and 2-D shapes without pictorial representations.

GEOMETRY - STANDARD I

Standards of Performance

END OF STANDARD I		LEVEL l	LEVEL 2	LEVEL 3	LEVEL 4
• Sort 2-D and 3-D shapes on the basis of common attributes	Sample Performance Indicators	• Sort 2-D and 3-D shapes into groups based on any common attribute,		• Sorts 2-D and 3-D shapes into groups	

GEOMETRY - STANDARD II

Standards of Performance

END OF STANDARD II		LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
Outcomes from the Primary School Mathematics Syllabus. By the end of Standard II pupils will • Explore and investigate certain properties of plane shapes and solids and describe their use in the real world. • Use the concepts of congruence and symmetry to create new shapes and construct patterns.	Characteristics of student performance	The pupil • Demonstrates a limited understanding of the properties of 2- D and 3-D shapes. • Shows little confidence with investigative activities. • Has some difficulty explaining concepts.	• Approaches tasks hesitantly and frequently requests assistance and verification. • Has some difficulty explaining concepts.	• Displays confidence while exploring and investigating 2-D and 3-D shapes. • Experiments with concepts of congruence and symmetry to create new shapes.	• Approaches tasks confidently and motivates others to take risks with their investigations. • Applies knowledge of properties of 2-D and 3-D shapes to create other shapes.
More specifically, pupils will • Draw, name and compare the faces of cubes, cuboids and cylinders.	Sample Performance Indicators	• Draws names and compares faces of cubes, cuboids and cylinders with assistance and motivation.	• Names, compares and draws faces of cubes, cuboids and cylinders, with some degree of accuracy.	• Correctly matches and accurately draws faces of cubes, cuboids and cylinders.	• Accurately constructs cubes, cuboids and cylinders from nets.
• Locate 2-D and 3-D shapes in the environment.		• Identifies 2-D and 3-D shapes in the environment.	• Identifies, with some assistance, 2-D and 3-D shapes from pictures in the environment.	• Explores the environment listing 2-D and 3-D shapes found therein.	• Describes the use of 2-D and 3-D shapes in construction.

GEOMETRY - STANDARD II

Standards of Performance

END OF STANDARD II		LEVEL l	LEVEL 2	LEVEL 3	LEVEL 4
• Investigate the composition of simple and compound figures by folding, cutting and combining plane figures to make new shapes.	Sample Performance Indicators.	• Begins the investigation of simple and compound figures.	• Shows partial understanding of the composition of simple and compound shapes.	• Folds squares and rectangles into triangles. Cuts off triangles and combines them to make other shapes, such as parallelograms.	• Approaches investigation, efficiently, to make and name new shapes correctly.
• Identify line symmetry in natural and man-made shapes and use it to predict the form of complete shapes.		• Identifies lines of symmetry, with some difficulty.	• Identifies line symmetry in 2-D but not in 3-D shapes.	• Identifies line symmetry correctly.	• Uses line of symmetrical and half-shape and visualizes or predicts the form of a complete shape. • Identifies objects such as airplanes and cars, which are symmetrical.

GEOMETRY - STANDARD III

Standards of Performance

END OF STANDARD III		LEVEL l	LEVEL 2	LEVEL 3	LEVEL 4
Outcomes from the Primary School Mathematics Syllabus. By the end of Standard III pupils will • Investigate, compare and describe the properties of certain 3-D shapes with respect to their edges, faces and vertices. • Experiment with constructing cubes and cuboids to explore their nets. • Use the concepts of line symmetry, slides and flips to explore the properties of certain plane shapes and to create patterns.	Characteristics of student performance.	The pupil • Demonstrates little confidence with investigative activities and inadequately describes properties of 3-D shapes. • Requires assistance to dismantle and construct 3-d solids from their nets. • Is unable to explore the properties of 2-D shapes using concepts of line symmetry slides and flips.	• Performs some of the tasks but requires teacher's direction/assistance during investigations and experiments. • Has difficulty describing processes used.	• Performs tasks accurately and confidently. • Clearly describes processes/concepts used. • Willing to experiment. • Explores and investigates properties of 3-D and 2-d shapes.	• Demonstrates clear understanding of properties of 3-D and 2-D shapes. • Takes risks while experimenting, exploring and investigating to create new arrangements of nets and patterns. • Clearly describes processes used.

GEOMETRY - STANDARD III

Standards of Performance

END OF STANDARD III		LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
More specifically, pupils will • Draw, name and compare the faces of cubes, cones, cuboids and triangular prisms.	Sample Performance Indicators.	• Requires assistance and motivation to draw, name and compare the faces of cubes, cones, cuboids, cylinders and triangular prisms.	• Correctly names and compares face of3-D shapes but requires assistance with the drawing 3-D shapes.	• Draws faces of 3-D shapes fairly accurately.	• Accurately constructs cubes, cuboids, cones, cylinders and triangular prisms from nets.
• Construct nets of cubes and cuboids and differentiate between them.		• Constructs nets of cubes and cuboids. • Has difficulty describing and differentiating between the nets.	• Constructs nets of cubes and cuboids from given models. • Describes the composition of the nets and differentiates between them with some assistance.	• Constructs nets of cubes and cuboids using stencils of plane shapes. • Confidently describes composition of nets. • Accurately differentiates between them.	• Investigates different arrangements of nets of cubes and cuboids. • Assembles/re-arranges faces to experiment with to determine whether they will form a cube/cuboid. • Explains why some arrangements will form a cube/cuboid while others will not.
• Describe the properties of cubes, cuboids, cones, cylinders and triangular prisms in terms of their edges, Vertices and faces.		• Identifies properties of 3-D shapes from concrete or skeleton models. • Partially describes properties.	• Identifies and describe properties of 3-D shapes from concrete and skeleton models.	• Identifies and describes properties of 3-D shapes from pictorial representations. Constructs a table to show the differences/similarities of the properties of these solids.	• Identifies and describes properties of other 3-D shapes from pictorial representations. • Analyses models and compares for strength and rigidity. Invents enrichment activities to reinforce description of solids by properties.
• Determine the number of lines of symmetry in plane shapes.		• Identifies one line of symmetry in plane shapes but does not investigate whether shape has more lines of symmetry.	• Draws and states number of lines of symmetry in given plane shapes such as squares and rectangles.	• Identifies lines of symmetry in plane shapes as horizontal, vertical or oblique and accurately represents them.	• Creates new shapes with more than one lines of symmetry and clearly explain why these lines are symmetrical. States reason for symmetry in everyday life.

GEOMETRY - STANDARD III

Standards of Performance

END OF STANDARD III		LEVEL l	LEVEL 2	LEVEL 3	LEVEL 4
• More specifically, pupils will • Discover which shapes tessellate and create tiling patterns by tessellating plane shapes	Sample Performance Indicators.	• Requires assistance and motivation to experiment with tessellation. • Shows lack of understanding as there are gaps/spaces in pattern formation.	• Identifies shapes which tessellate in a pattern but cannot state reason. • Creates tessellated pattern placing given together.	• Correctly identifies shapes which will and will not tessellate. • Gives a reasonable answer for conclusion. • Creates tessellated pattern by drawing, using one stencil/model	• Correctly identifies and discusses tessellation. • Visualises and constructs new shapes and uses it to create a tessellated pattern.
• Describe and construct simple repeated patterns by sliding and flipping plane shapes		• Describes pattern. • Incorrectly assembles patterns as there are spaces between shapes, • Reflects poor hand-eye coordination when flipping or sliding.	• Partially describes given patterns. • Presents, fairly accurately, assembled pattern of flips and slides.	• Gives accurate description of given patterns and assembled presentation.	• Gives eloquent description of given patterns. • Applies knowledge to produce creative puzzles and games.

GEOMETRY - STANDARD IV

Standards of Performance

END OF STANDARD IV		LEVEL l	LEVEL 2	LEVEL 3	LEVEL 4
Outcomes from the Primary School Mathematics syllabus. By the end of Standard IV pupils will • Investigate, compare and describe the properties of 3-D shapes, with respect to their edges, faces and vertices. • Experiment with dismantling and constructing cylinders and triangular prisms. • Use movements, such as slides, flips and turns to explore properties of plane shapes and create patterns. • Understand the concept of an angle and compare, represent estimate and measure angles, using a simple protractor.	Characteristics of student performance.	The pupil • Demonstrates little confidence with investigative activities. • Approaches tasks with uncertainty. • Requires assistance consistently. • Describes properties of shapes hesitatingly and inadequately.	• Performs some of the tasks but requires motivation and assistance with verbalizing concepts and processes.	• Performs tasks with a fair degree of accuracy. • Confidently describes concepts and processes used. • Willingly engages in experiments, investigations and explorations.	• Performs tasks accurately. • Demonstrates a clear understanding of properties of shapes. • Willingly takes risks while experimenting, exploring and investigating. • Researches and records ideas.

GEOMETRY - STANDARD IV

Standards of Performance

END OF STANDARD IV		LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
More specifically, pupils will:- • Describe the properties of cubes, cuboids, cylinders, pyramids and cones, in terms of their edges, vertices and faces.	Sample Performance Indicators.	• Needs assistance with drawing outlines of faces of 3-D shapes and with construction of frames. • Experiences difficulty with identifying properties. • Cannot describe properties.	• Draws reasonably fair representations of faces of3-D shapes. • Constructs frames with some level of accuracy. • Identifies properties. • Needs assistance with descriptions of properties.	• Draws fairly accurate representations of faces of 3-D shapes. • Constructs frames accurately. • Identifies and describes properties with confidence.	• Accurately outlines faces and constructs frames of 3-D shapes. • Confidently discusses properties of each 3-D shape • Constructs a 'Property - Table' to display this information. • Suggests uses of 3-D shapes in everyday life.
• Construct nets of cubes, cuboids, cylinders and triangular prisms and differentiate among them.		• Needs assistance to re-assemble discrete parts of open 3-D shapes into nets of the said 3-D shapes. • Needs prompts to describe the flat shapes which form part of a particular net.	• Re-assembles discrete parts of open 3-D shapes into the nets of said 3-D shapes. • Describes flat shapes which form part of a particular net.	• Draw nets of3-D shapes given models of open 3-D shapes. • Cuts nets into their discrete plan shapes, describes the parts and re-assembles to form 3-D shapes.	• Draws and cuts nets of3-D shapes into discrete plan shapes and investigates different arrangements for the nets of 3-D shapes. • Records these varied arrangements through drawings
• Use slides and flips to construct plane shapes and to create patterns.		• Demonstrates lack of hand-eye coordination in performing movements of sliding and flipping one shape. Completed pattern reflects jagged lines and spaces between shapes.	• Slides flip given shape to draw a fairly accurate outline of a new shape. • Creates a pattern, using a given shape, with few jagged lines and spaces.	• Performs movements, using a given shape, to create outlines of many new shapes. • Names some of these shapes. • Creates a fairly neat pattern, using a given shape.	• Dissects a given shape into smaller plane shapes and re-arranges using the movements of sliding or flipping to create new shapes and patterns. • Names new shapes and describes movements made.
• Determine the number of lines of symmetry in letters of the alphabet and numerals.		• Identifies one line of symmetry in letters of alphabet/numerals but does not investigate whether there are more lines of symmetry. Becomes confused when no lines of symmetry are found.	• Identifies symmetrical lines when using mirrors but requires teacher assistance to draw in lines of symmetry on the letters of the alphabet and numerals.	• Identifies and draws in lines of symmetry on letters of the alphabet and numerals, correctly. • Describes these lines as vertical. Horizontal or oblique.	• Creates games and puzzles using half-letters/half-numerals of symmetrical letters/numerals.

GEOMETRY - STANDARD IV

Standards of Performance

END OF STANDARD IV		LEVEL l	LEVEL 2	LEVEL 3	LEVEL 4
• Define and represent, by drawing angles and make a simple comparison between them.	Sample Performance Indicators.	• Partially defines an angle. Represents angles using concrete materials but experiences difficulty in arranging angles in ascending or descending order.	• Defines an angle using own terminology. • Draws angles but cannot explain differences among various types of angles.	• Defines an angle using a mixture of mathematical language and' own terminology. • Draws angles and orders according to size.	• Defines an angle naming all its attributes. • Draws an angle and then uses it to compare other angles.
• Recognize the degree as the standard unit for measuring angles and use quarter and half turns as benchmarks for estimating angles. • Verify results using proper protractors.		• Demonstrates uncertainty with regard to the standard unit for measuring angles. • Requires assistance to estimate size of angles and verify the results.	• States standard units for measuring angles. • Cannot describe the size of an angle unless a benchmark (paper-protractor) is used.	• Confidently states the standard unit for angle measurement. • Correctly estimates, describes and verifies the size of angles using paper-protractors.	• Researches and explains the idea of how 'degree' originated. • Correctly estimates size of angles without using bench marks/paper protractors.

GEOMETRY - STANDARD V

Standards of Performance

END OF STANDARD IV		LEVEL l	LEVEL 2	LEVEL 3	LEVEL 4
Outcomes from the Primary School Mathematics Syllabus. By the end of Standard V pupils will • Experiment with dismantling and constructing prisms and pyramids to compare their nets. • Classify and describe plane shapes using symmetric properties and properties of sides and angles. • Construct paper-protractors and use them to draw and measure angles.	Characteristics of student performance.	The pupil • Demonstrate little confidence with constructing , describing or identifying 3-D and 2-D shapes. • Requires teacher's assistance or direction to investigate, identify or list the properties of 3-D and 2-D shapes. • Becomes easily confused when faced with non-examples.	• Performs some task. Has difficulty analyzing 3-D shapes and visualizing the plane shapes that form these 3-D shapes. • Requires teacher assistance during investigations. • Experience difficulty describing processes.	• Performs tasks accurately if concrete models are available for verification. • Willingly experiments, explorers and investigates.	• Demonstrates a clear understanding of concepts and processes used. • Takes risk while experimenting.

GEOMETRY - STANDARD V

Standards of Performance

END OF STANDARD V		LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
More specifically, pupils will • Construct prisms and pyramids from their faces and dismantle them to observe and differentiate between their nets.	Sample Performance Indicators.	• Experiences difficulty with differentiating/identifying the nets of prisms and pyramids. • Requires teacher direction in order to select faces to construct these 3-D shapes. • Incorrectly names the completed models.	• Identifies the net of the cube, cuboid and cylinder. • Has difficulty identifying the nets of other prisms and pyramids. • Constructs models of cubes and cuboids. • Requires assistance to select the faces of other prisms and pyramids. • Names cube, cuboid and cylinder only.	• Differentiates/identifies the nets of all given prisms. Needs to experiment physically before identifying the nets of pyramids. • Constructs models of prisms and pyramids if completed model is available for verification. • Correctly identifies prisms and pyramids	• Identifies the nets of given prisms and pyramids given only visual representation. • Constructs models of prisms and pyramids without looking at models. • Correctly identifies prisms and pyramids and researches their history and use in the environment.
• Differentiate between straight and curved sides, convex and concave sides and parallel and non-parallel sides in stating the properties of plane figures.		• Differentiates between straight and curved sides. • Has difficulty identifying convex, concave, parallel and non-parallel sides. • Requires assistance to list the properties of common shapes and to construct them using concrete materials.	• Identifies straight, curved, convex, concave sides. • Requires some assistance to differentiate between parallel and non-parallel sides. • Constructs outlines of plane shapes if given models. • Lists some properties.	• Identifies straight, curved, convex, concave, parallel and non-parallel lines. • Constructs outlines of plane shapes if given models. • Lists properties of a particular shape or other given shapes.	• Correctly describes shapes by their characteristic properties, • Creates plane shapes given a 'property-list'. • Categorizes shapes with one or more common property.
• Name triangles as 'isosceles', equilateral and right-angled and deduce the special properties of these triangles.		• Sorts triangles given criteria such as 3 equal sides or one right angle. • Cannot identify triangles by name.	• Identifies the right-angled and equilateral triangles and lists their properties. Cannot name the isosceles and scalene triangles.	• Identifies all the triangles by matching them to their special properties. • Represents these triangles using concrete materials and drawings.	• Correctly describes the different triangles by listing their properties. • Constructs these triangles using proper-protractors and rulers. • Deduces the relationship between size and angle and the length of the side opposite the angle.

GEOMETRY - STANDARD V

Standards of Performance

END OF STANDARD V		LEVEL l	LEVEL 2	LEVEL 3	LEVEL 4
• Determine, by investigation, the number of lines of symmetry in polygons.	Sample Performance Indicators.	• Identifies one line of symmetry in plane shapes. Does not investigate whether the shape has more lines of symmetry. Becomes confused if the shape does not have a symmetrical line.	• Draws and states the line of symmetry in regular shapes.	• Correctly identifies and represents line symmetry in regular and irregular shapes. • Describes these lines as horizontal, vertical, or oblique.	• Creates new shapes and patterns with more than one line of symmetry and clearly explains why these lines are symmetrical. • Identifies occupations which use the concept of line symmetry.
• Construct and verify the size of a given angle.		• Represents angles using concrete materials. • Requires assistance to determine the size of an angle. • Cannot represent a given angle on paper.	• With guidance, constructs given angles. • Requires some assistance to verify the size of an angle.	• Draws a fairly accurate representation of a given angle. • Verifies size by using paper-protractor.	• Accurately constructs and verifies the size of given angles. • Records results. • Draws polygons and patterns using paper-protractors as tools to construct various angles. • Discusses the uses of angles in everyday life.

STATISTICS - STANDARD I

Standards of Performance

END OF STANDARD I		LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
• Outcomes from the Primary School Mathematics Syllabus. • By the end of Standard I pupils will • Collect, organize, display and interpret data presented on a pictograph (using different scale factors e.g. 1-, 2, 5).	Characteristics of student performance	The pupil • Collects and organizes the data according to specific criteria, with guidance. • Constructs the pictograph, only after assistance is given. (Using 1: 1 scale factor). • Interprets inaccurately the results on the pictograph.	• Collects and organizes data with little assistance. • Constructs the pictograph with some assistance (using scale factor 1:1). • Partially interprets the results and gives a few reasons, with interpretations.	• Collects and organizes data accurately according to specific criteria. • Accurately constructs the pictograph (without assistance) using the scale factor 1: 1 • Accurately interprets the result providing sound reasoning.	• Works independently to collect and organize relevant data. • Gives reasoned interpretations. • Constructs pictograph using own design and scale, justifying their use. • Develops convincing argument to support the interpretation.
• More specifically, pupils will • Select an area of interest, from personal preference, for data collection	Sample Performance Indicators.	• With guidance, selects an area of personal interest for data collection purposes.	• Needs little guidance in selecting an area of personal interest for data collection purposes.	• Selects the interest of a given situation and collects the relevant data without assistance.	• Selects interest areas and conducts appropriate surveys to collect the relevant data.
• Organize data in tally form and frequency table.		• Organizes data on tally charts and/or frequency tables but does these under constant supervision.	• Organizes data on tally charts and frequency tables with some degree of accuracy.	• Accurately organizes the data on tally and frequency tables.	• Compares different ways of organizing data and justifies the method used.
• Represent data on Pictograph using different scale factors: 1, 2, 5.		• Needs assistance in constructing the pictograph using the 'many to one' scale factor.	• Constructs the pictograph with little guidance using the 'many to one' scale factor.	• Accurately constructs the pictograph using the given scale factor.	• Displays data on pictograph(s) using multiple scale factors, justifying each scale selected.

STATISTICS - STANDARD I

Standards of Performance

END OF STANDARD I		LEVEL l	LEVEL 2	LEVEL 3	LEVEL 4
• Interpret data and make recommendations.	Sample Performance Indicators.	• Interprets data and makes recommendations only after prompts. Unable to identify the mode.	• Interprets data accurately, to some degree, and makes some recommendations. • Identifies the mode.	• Provides sound reasoning for the interpretation and recommendations. • Identifies the mode.	• Makes inferences and recommendations based on analyzed of data and develop convincing arguments to support them. • Identifies the mode and its usefulness.
• Compare and contrast data on pictograph and picture graph.		• Has difficulty in recognizing the similarities/differences between the pictograph and a picture graph.	• Recognizes some of the differences/similarities.	• Points out the similarities/differences between the two groups.	• Recognizes the usefulness of each graph and discusses when it may be appropriate to use each type.

STATISTICS - STANDARD II

Standards of Performance

END OF STANDARD II		LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
Outcomes from the Primary School Mathematics Syllabus. • By the end of Standard II pupils will • Gather, organize, interpret and display data on the Block graph (using different scale factors e.g. 2, 5 and 10).	Characteristics of student performance	The pupil • Gathers, organizes, displays and interprets data as these relate to the block graph but does so under constant supervision. • Has difficulty in constructing the block graph.	• Needs some assistance to gather, organize and display the data and partially interprets the result on block graph. • Constructs the block graph with assistance.	• Needs little or no help to gather, organize and display specified data. • Provides sound reasoning for the interpretation of the results. • Constructs graph using given scale factor.	• Gathers, organizes and displays data of his /her own choice. • Accurately interprets the result(s) providing sound reasoning and uses own scale factor to accurately construct the graph.
• More specifically, pupils will • Gather data related to their personal preference.	Sample Performance Indicators.	• Gathers data only with guidance.	• Needs some assistance in gathering the required data.	• Uses some initiative to gather the data	• Gathers data using his own method of collection and justifies use of method.
• Organize and summarize data into categories.		• Organizes and summarizes the data with guidance (tally chart and frequency table contain errors). • Finds difficulty in determining categories.	• Organizes and summarizes the data, with some assistance, on tally chart and frequency table.	• Organizes and summarizes the data accurately on tally chart and frequency table.	• Organizes and summarizes the data using methods that are appropriate.
• Read and interpret the result on the block graph.		• Partially answers questions based on the result but cannot identify the mode.	• Answers some questions based on the result and may be able to identify mode.	• Correctly interprets the result and provides sound reasoning for the interpretation.	• Accurately interprets the results with sound arguments. • Formulates new questions based on the results. • Makes connections to topics in Social Studies, etc.

STATISTICS - STANDARD II

Standards of Performance

END OF STANDARD II		LEVEL l	LEVEL 2	LEVEL 3	LEVEL 4
• Compare and contrast the block graph with other forms of graphs/display done in previous classes e.g. pictograph, object graph.	Sample Performance Indicators.	• Has difficulty in identifying the similarities and differences among all the graphs studied in previous classes.	• Identifies most of the similarities and differences among the graphs already studied.	• Identifies the differences and similarities among the graphs already studied.	• Identifies the differences and similarities and determines which graph would be appropriate for data collected.
• Make Recommendation(s) to solve problem situations, where use of data is required (using the block graph) to provide result.		• Finds difficulty in grasping what is involved in problem situations. • Has to be given guidance in using the block graph as a means to solve problems.	• Makes some recommendations based on the result but is unsure about reasons for recommendations.	• Makes appropriate recommendations to assist in solving the problems. • Provides reasons for recommendations.	• Makes appropriate recommendations and suggestions which will help to alleviate problems in future.

STATISTICS - STANDARD III

Standards of Performance

END OF STANDARD III		LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
Outcomes from the Primary School Mathematics Syllabus. By the end of Standard III pupils will • Interpret/analyze the data presented on a variety of bar graphs. • Collect and organize data. • Display and analyze the result.	Characteristics of student performance	The pupil • Interprets the data presented on the bar graphs. • Collects and organizes data. • Displays and analyzes data. • Requires constant assistance and supervision to complete the above tasks.	• Interprets the graph. • Collects and organizes data. • Displays and analyses the result. • Requires guidance to complete the above tasks.	• Interprets the data presented on the various bar graphs. • Collects and organizes the data accurately. • Displays and analyzes results giving sound reasons for the display and method of analysis.	• Interprets the data. • Evaluates the different presentation (i.e. vertical bars, horizontal etc). • Collects and organizes the data using a variety of techniques e.g. interviews, observations, etc. • Displays and analyses the result using an appropriate graphical technique. • Justifies format for displays and method for analyzing data.
More specifically, pupils will • Interpret data from a variety of bar graphs presented (horizontal or vertical forms) using different scale factors.	Sample Performance Indicators,	• Has difficulty interpreting the data from the bar graph and requires supervised assistance.	• Has little difficulty in interpreting the information presented on the graphs but tries to overcome the difficulties.	• Interprets accurately the information presented on each graph and lists the results.	• Interprets and analyses the data on each graph and critically comments on the format presentation of the bar graphs.
• Formulate problem statements		• Needs help to formulate the problem statement.	• Needs a little assistance to formulate the problem statement.	• Formulates problem statement of the given situation.	• Formulates problem statements arising out of familiar situations.
• Collect data.		• Collects data with constant guidance.	• Needs some guidance to collect the relevant data.	• Collects data in the prescribed manner.	• Collects data using a variety of techniques e.g. questionnaires, interviews, observations, etc.

STATISTICS - STANDARD III

Standards of Performance

END OF STANDARD III		LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
• Organize data.	Sample Performance Indicators.	• Organizes the data but does so committing many errors.	• Organizes the data with few errors.	• Organizes the data correctly for the given task.	• Compares different ways of organizing the data.
• Display data on bar graphs.		• With constant guidance, displays the data on the bar chart.	• Constructs the graph with some difficulty.	• Constructs the bar graph using the given scale factor.	• Constructs bar chart using own scale factor and justifying its use.
• Analyze result and make recommendations		• Analyses and makes recommendations after prompts. • May be unable to recognize the mode.	• Analyses and makes recommendation with little assistance. • Recognizes the mode.	• Analyses the data and makes recommendations based on the analysis. • States the mode.	• Makes reasoned predictions. • Poses questions based on the result.

STATISTICS - STANDARD IV

Standards of Performance

END OF STANDARD IV		LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
Outcome from the Primary School Mathematics Syllabus. • By the end of Standard IV pupils will • Interpret data and communicate decisions made from information • Displayed on the Pie Chart.	Characteristics of student performance.	The pupil • With help interprets information on these graphs but is unable to communicate decision on information displayed.	• Needs some assistance in interpreting and communicating decisions on data represented.	• Accurately interprets and communicates the information displayed.	• Critically evaluates the results and suggests ways for which the survey may be used.
More specifically, pupils will • Estimate the relative size of each sector.	Sample Performance Indicators.	• Cannot give a reasonable estimation of the size of each sector.	• Produces a fair estimation of the size of each sector.	• Provides good estimates of the actual size of each sector.	• Provides very good estimates of the actual size of each sector.
• Verify the size of each sector by:- (a). measurement (b). calculation		• Has great difficulty to verify the size of each sector either through measurement or calculation.	• Verifies size of sector but needs assistance with calculations involved.	• Verifies the size of each sector through measurement and calculation.	• Verifies the size of each sector giving possible reason(s).
• Rank orders the sectors e.g. largest, smallest.		• Needs assistance to rank order the sectors.	• Orders sectors with very little errors.	• Rank orders the sectors.	• Rank orders the sectors and provides arrangements of doing so.

STATISTICS - STANDARD IV

Standards of Performance

END OF STANDARD IV		LEVEL l	LEVEL 2	LEVEL 3	LEVEL 4
• Interpret the data and draw conclusions.	Sample Performance Indicators.	• Needs guidance in order to interpret the data presented on the pie chart(s).	• Interprets data and draws conclusions with little help	• Calculates the mean. • Interprets the data and draws conclusions giving possible reasons.	• Explains which measure of central tendency best represents data collected. • Interprets and analyses the relationship among the sectors. • Argues a case for the use of the pie chart and/or other graphical forms e.g. bar- graph, pictograph, etc.

STATISTICS - STANDARD IV

Standards of Performance

END OF STANDARD V		LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
Outcome from the Primary School Mathematics Syllabus. By the end of Standard V pupils will • Design survey(s) to solve problem(s) that involves the use of statistical data. • Communicate findings and recommendations.	Characteristics of student performance.	The pupil • Has great difficulty designing the survey.	• Has little difficulty to design the survey.	• Designs the survey using specific instructions.	• Designs survey of own choice. • Predicts the response to the survey question.
More specifically, pupils will • Construct appropriate method for collecting numerical data e.g. Questionnaire, checklist, etc.	Sample Performance Indicators	• Constructs method for collecting of data but needs constant supervision.	• Needs little assistance in constructing an appropriate method for data collection.	• Constructs appropriate method to collect data.	• Uses an appropriate technique for collecting data and provides reasons for selecting techniques.
• Organize data e.g. in arrays (descending or ascending), frequency table, etc.		• Organizes the data committing many errors.	• Organizes the data making few errors.	• Organizes the data according to specific instructions.	• Chooses own method of organizing data, and justifies choice of method.

STATISTICS - STANDARD IV

Standards of Performance

END OF STANDARD IV		LEVEL l	LEVEL 2	LEVEL 3	LEVEL 4
• Display data on appropriate type of graph	Sample Performance Indicator.	• Needs assistance in displaying the data appropriately.	• Needs little assistance to display the data on the appropriate graph.	• Selects the appropriate type of graph to represent the data.	Selects type of graph and appropriate scale factor to represent the data.
• Interpret result:- (a). find mean, mode. (b). draw conclusions. (c). make Recommendations.		• Makes errors when interpreting the result, has difficulty in communicating results.	• Interprets most of the results accurately, but has some difficulty in communicating results.	• Uses statistical language to effectively discuss findings and recommendations. • Finds mean, mode.	Interprets graph accurately. Presents findings in a report. Questions the effect of the result of limited sample size. Compares data gathered from different sources on the same question/problem.

MEASUREMENT – STANDARD I
(Money included)

Standards of Performance

END OF STANDARD I		LEVEL l	LEVEL 2	LEVEL 3	LEVEL 4
Outcomes from the Primary School Mathematics Syllabus. By the end of Standard I pupils will • Measure, estimate, record and verify measurement using arbitrary units and some standard units. . • Recognize that money is the unit of measure for trade (buying and selling). • Demonstrate an understanding of the value of money through use in shopping situations.	Characteristics of student performance	The pupil • Uses only arbitrary units to perform measurement tasks. • Selects appropriate tools for these tasks. • Has difficulty estimating measurements using arbitrary units. • Records and communicates results of measurement activities with teacher's assistance. • Recognizes that money is the unit of measure for trade, only through a wide variety of shopping situations. • Demonstrates understanding of- the value of money, with assistance.	• Demonstrates good techniques in using tools/instruments of in using tools/instruments of with assistance, results in arbitrary and standard units. Estimates satisfactorily. Records and communicates results of measurement activities, satisfactorily. Demonstrates understanding of money as unit of trade but needs assistance with demonstration of the value of money.	• Uses tools/instruments in measurement activities skillfully. Identifies and uses standard units appropriately. Recognizes the value of estimation and estimates reasonably. Applies measurement principles to practical problems. Communicates effectively on results of measurement activities. Demonstrates clear understanding of the value of money in shopping situations.	• Applies measurement principles and concepts with a high level of proficiency in other topics and curriculum areas as well as in real- life situations. Solves practical problems involving measurement, independently. Extends understanding of the money –value to real-life situations involving estimation. Demonstrates further skills in the use of money.
More specifically, pupils will • Select appropriate tools/instruments and measure length, area, capacity, weight/mass and time using standard and arbitrary unit.	Sample Performance Indicators	• Measures length, area, capacity, weight/mass and time using appropriate tools and a variety of units with assistance.	• Measures length, area, capacity, weight/mass and time using appropriate tools/instruments with some degree of accuracy.	• Demonstrates a good level of proficiency in the use of instruments. Performs measurement tasks with precision.	• Performs measurement tasks with a high level of proficiency.

MEASUREMENT – STANDARD I
(Money included)

Standards of Performance

END OF STANDARD I		LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
• Estimate to predict the results of measurement	Sample Performance Indicators	• Relies on guessing to predict results of measurements of length; area; capacity and weight/mass.	• Estimates using comparison with familiar objects (does not rely completely on 'wild guesses'), with some assistance.	• Judges the reasonableness of the estimates in measurement activities.	• Devises various strategies for estimation tasks.
• Use appropriate units of measurement for length, area, capacity, weight/mass, time		• Uses a wide variety of arbitrary units of measurement, with assistance.	• Attempts to explain the need for a common unit of measurement. Uses appropriate units, with few errors.	• Explains the need for a standard unit. Recognizes and uses the standard units satisfactorily.	• Demonstrates complete understanding of the need to replace arbitrary units with standard units. • Uses standard units and sub-units with high level of proficiency.
• Record and communicate the results of measurement activities.		• Records and communicates the results of measurement tasks, ineffectively.	• Records and communicates results with little assistance.	• Records and communicates results of measurements tasks and problems, efficiently.	• Records and communicates results of measurement tasks with a high level of proficiency.
• Recognize the difference between estimation and precise measurement.		• Has difficulty in identifying the difference between estimation and precise measurement.	• Identifies the difference between estimation and precise/measurement with assistance.	• Explains on his own, the difference between an estimation and a precise measurement.	• Identifies situations in real life when estimations and/or precise measurements are required.
• Develop vocabulary associated with time (duration).		• Uses vocabulary of time, inadequately.	• Uses vocabulary of time, adequately.	• Displays thorough understanding of concept of time through language.	• Extends vocabulary of time to other curriculum areas and real-life experiences.
• Recognize the clock (standard analog and digital) as the instrument to measure time.		• Identifies the analog and its features and functions with assistance.	• Describes features and functions of both analog and digital clocks satisfactorily.	• Recognizes clearly, the link between analog and digital clock displays.	

MEASUREMENT – STANDARD I
(Money included)

Standards of Performance

END OF STANDARD I		LEVEL l	LEVEL 2	LEVEL 3	LEVEL 4
• Read and record time to the hour on both analog and digital devices	Sample Performance Indicators	• Reads and records time, to the hour, (on both analog and digital) with teacher's assistance, at all times.	• Reads and records time to the hour (on analog and digital) independently, sometimes.	• Reads time to the hour (analog and digital) consistently and displays time on constructed clocks. Solves practical problems involving time.	• Relates time to the hour to everyday experiences. • Creates problems involving time to the hour, extends telling of time to the half hour etc
• Combine coins up to 100 cents and notes up to $100, that are equivalent to a stated sum of money		• Needs assistance to combine coins and notes to form an amount equivalent to a stated sum.	• Combines coins and notes for an equivalent value but has difficulty in forming different combinations for a given sum.	• Combines coins and notes to form equivalent sums confidently and accurately. Forms different combinations of coins for a given sum with little or no difficulty.	• Explores different combinations and lists these, searching for patterns amongst them. • Articulates how useful skills in combining coins and notes for a given value can be, in real-life situations.
• Participate in shopping situations, buying, selling, making bills and providing change.		• Needs assistance to participate in shopping situations involving transactions in which giving of change is included.	• Demonstrates understanding of shopping problems and makes few errors in money transactions.	• Works well on shopping problems. • Performs money transactions skillfully.	• Assists in creating lists for shopping. • Estimates how much money will be needed for shopping.

MEASUREMENT – STANDARD II
(Money included)

Standards of Performance

END OF STANDARD II		LEVEL l	LEVEL 2	LEVEL 3	LEVEL 4
Outcomes from the Primary School Mathematics Syllabus. By the end of Standard II pupils will • Recognize the basic units of measures of length, distance, perimeter, area, capacity, weight/mass, time and trade (money). • Demonstrate understanding of the value of money through participation in trading situations.	Characteristics of student performance	The pupil • Performs measurement tasks involving length/distance, perimeter, area, capacity, weight/mass, time and money transactions with assistance. • Selects appropriate instruments and units for measurement tasks with assistance. • Estimates and approximates with low levels of proficiency • Performs simple money transactions with teacher's assistance.	• Selects approximate units and performs measurement tasks with little assistance. • Demonstrates good techniques in use of instruments. Estimates and approximates satisfactorily. • Performs more complex money transactions with assistance.	• Uses measuring instruments skillfully and performs measurement tasks with precision. • Applies measurement principles, including estimation and approximation, to solve a wide variety of practical problems. • Performs complex money transactions satisfactorily.	• Applies measurement principles in all areas of the curriculum and in everyday life. • Formulates and solves problems involving measurement principles, including estimation and approximation. • Derives formulae to simplify measurement tasks. • Demonstrates high level of understanding of money transactions in real-life situations.
• Select and use appropriate instruments for measurement situations e.g. rulers, measuring cups, equal and balance, clocks.	Sample Performance Indicators	• Measures length, perimeter, area, capacity, weight/mass and time using appropriate instruments, with assistance.	• Selects appropriate instruments to perform measurement task with little assistance.	• Selects appropriate instruments without assistance, to perform measurement tasks. • Constructs simple measuring devices.	• Evaluates the effectiveness and precision of various standard and constructed measuring instruments.

MEASUREMENT - STANDARD II
(Money Included)

Standards of Performance

END OF STANDARD - II		LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
• Identify, select and use according to size basic standard units e.g. Centimetre, metre; square centimetre, litre, kilogram.	Sample Performance Indicators	• Identifies, selects and uses units/sub-units of measurement according to size/type with teacher's assistance.	• Expresses the results of measurement tasks in appropriate units/sub-units, with few errors.	• Expresses the results in correct units/sub-units consistently.	• Evaluates the appropriateness of units for different types of measurement tasks.
• Demonstrate an understanding that all measurements are not exact.		• Demonstrates a lack of understanding that measurements are not precise.	• Demonstrates some level of understanding that all measurements are not precise.	• Demonstrates a clear understanding that measurements/measuring instruments are subject to errors.	• Identifies sources of error in performing measurements in other curriculum areas e.g. Science.
• Estimate familiar linear dimensions, weight/mass, area and capacity.		• Estimates length/distance/width etc, perimeter, area, capacity, weight/mass only with referents and/or with teacher's familiar objects.	• Estimates, satisfactorily, measurements using past experiences/comparisons with familiar objects.	• Judges the reasonableness of estimates made or given in measurement activities.	• Devises and evaluates the effectiveness of a variety of strategies for estimating measurements.
• Appropriate measurements of linear dimensions, area, capacity, weight/mass.		• Approximate measurements accurately and independently, sometimes.	• Approximate measurements accurately and independently, sometimes.	• Approximates measurements accurately and independently.	• Approximates measurement accurately and independently, without exception.
• Record and Communicate results of measurement activities.		• Records and communicates the results of measurement tasks, with little assistance.	• Records and communicates the results of measurement tasks, with little assistance.	• Records and communicates results of measurement tasks, effectively.	• Communicates results of measurement tasks with a high level of efficiency.

MEASUREMENT- STANDARD II
(Money Included)

Standards of Performance

END OF STANDARD - II		LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
• Identify differences among estimation measurement and approximation.	Sample Performance Indicators	• Identifies the differences among estimation measurement and approximation with teacher's prompting and assistance.	• Attempts to explain the differences among estimation measurement and approximation in a given task.	• Explains clearly, the differences between estimation measurement and approximation in a given task.	• Determines when an estimation, measurement and/or approximation is needed in real life measurement situations.
• Draw lines of given lengths.		• Draws lines of given lengths using ruler, inaccurately i.e. positions ruler incorrectly, etc.	• Draws lines of given length using ruler, with some degree of accuracy.	• Draws lines of given length using ruler, with precision.	• Draws regular and irregular shapes of various dimensions (given or otherwise) accurately.
• Demonstrate conservation of capacity.		• Demonstrates conservation of capacity, with teacher's assistance.	• Demonstrates some level of understanding of conservation (capacity).	• Demonstrates clear understanding of conservation of capacity.	• Creates and solves problems involving conservation of capacity.
• Read time to the half-hour on both analog and digital devices.		• Reads time to half hour, with assistance at all times.	• Reads time to the half hour independently, sometimes.	• Reads time to the half-hour. • Displays time on constructed clocks (analog and digital). • Solves a variety of problems involving half-hours independently.	• Relates time to everyday experiences. • Relates and solves problems involving time. • Extends the reading of time to quarter hours or beyond.
• Participate in money transactions involving buying, selling and making bills.		• Makes a bill for items purchased but requires assistance for most parts.	• Makes bill for items purchased in which measures of length, weight and capacity are involved but needs some assistance.	• Works efficiently on problems involving bills. • Provides clear statements for items purchased.	• Compares real life bills and comments on how well these are written. • Makes suggestions for improvement of bills.

MEASUREMENT - STANDARD III
(Money Included)

Standards of Performance

END OF STANDARD - III		LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
Outcomes from the Primary School Mathematics Syllabus. By the end of Standard III pupils will • Extend their understanding of the process of measurement. • Extend their understanding of the concept of length, perimeter, area, volume, capacity, weight/mass and time. • Perform money transactions in which rates and profit and loss are involved.	Characteristics of student performance	The pupil • Performs measurement tasks, uses appropriate tools/instruments with some assistance. • Has difficulty developing and using simple formulae to solve problems in measurement. • Estimates and approximates, with assistance. • Performs money transactions involving rates and profit and loss with guidance.	• Performs measurement tasks using appropriate tools/instruments with little assistance. • Estimates and approximates using various strategies. • Develops and applies simple formulae. with some assistance. • Performs money transactions involving rates, profit and loss with some assistance.	• Uses measuring tools/instruments skillfully and performs measurement tasks with precision. • • Selects and applies suitable strategies for estimating. • Independently develops formulae and applies them to a wide variety of practical problems. • Performs money transactions accurately and independently.	• Evaluates the effectiveness of various measuring instruments/tools. • Applies measurement principles in all areas of curriculum and in everyday life. • Creates and solves a variety of problems involving use of formulae. • Makes accurate inferences arising out of money transactions involving rates, profit and loss in real life situations.
• Develop and use formulae to calculate the perimeter and area of squares, rectangles.	Sample Performance Indicators	• Calculates the perimeter and area of squares and rectangles when given respective formulae with assistance.	• Develops and applies formulae to calculate perimeter and area of squares, and rectangles, satisfactorily.	• Differentiates clearly, between the concepts of perimeter and area and applies appropriate formulae for calculating measurements. • Expresses results in appropriate unites .	• Develops and applies formulae for calculating perimeter and area of a variety of2 - and 3 - dimensional figures.

MEASUREMENT- STANDARD III
(Money Included)

Standards of Performance

END OF STANDARD - III		LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
• Recognize the kilometre as the standard unit for measuring long distances.	Sample Performance Indicators.	• Develops the relationship between the kilometre, metre and centimetre with teacher's centimetre with teacher's	• Uses the relationship between kilometre, metre and centimetre to solve simple problems. • Estimates long distances in kilometres, with assistance.	• Applies the relationship between kilometre, metre and centimeter efficiently in solving problems. • Estimates long distances in kilometres and determines reasonableness of answers with a high level of proficiency.	• Applies the concept of the kilometre to real-life experiences, • Creates and solves problems involving the standard units (kilometre, metre, centimetre).
• Calculate and estimate. volume using non-standard and standard units.		• Counts the number of cubes (non-standard and standard) used to pack boxes etc. • Estimates the volume with teacher's assistance.	• Makes a good effort to define volume and explain the need for a standard unit. • Estimates and measures volume using standard units, with assistance.	• Defines and measures volume independently. • Estimates and determines the reasonableness of answers with a high level of proficiency. • Uses the standard units Uses the standard units	• Solves practical problems involving volume, • Estimates and measures the volume of irregular 3 - D figures. • Applies concept of volume to other Curriculum areas.
• Estimate and measure capacity using arbitrary units e.g. teaspoon, cup, etc and millilitres.		• Measures capacity using arbitrary units and standard units (milliliters) with some degree of accuracy. • Estimates capacity with teacher's assistance.	• Demonstrates good techniques in using measuring devices. • Estimates capacity in both arbitrary and standard units satisfactorily.	• Uses measuring devices skillfully and with a high level of accuracy. • Selects appropriate strategies for estimating capacity and determines reasonableness of answers.	• Constructs simple devices for measuring capacity. • Determines situations when an estimate is all that is needed.
• Measure, estimate and appropriate weights to the nearest kilogram.		• Measures weight using appropriate scales, balances and units/sub-units. • Estimates weight with low levels of accuracy. • Approximates weights to the nearest kilogram, with some assistance.	• Estimates and measures weight satisfactorily. • Approximates weight to the nearest kilogram, satisfactorily.	• Estimates weight in real-life situations with a high level of proficiency. • Identifies situations in which an approximation of weight is all that is needed.	• Constructs balances and standard weights and use to estimate and measure weights of objects in their environment.

MEASUREMENT- STANDARD III
(Money Included)

Standards of Performance

END OF STANDARD - III		LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
• Read and record ,time using both analog and digital clocks involving quarter hour situations.	Sample Performance Indicators.	• Reads and records time to quarter hour before and after the hour on both analog and digital devices, with teacher's assistance at all times.	• Reads and records time involving quarter hours independently, sometimes.	• Accurately reads and records time involving quarter hours consistently. • Solves a variety of real-life problems involving quarter hours. • Relates time on analog and digital displays, independently.	• Relates time to everyday experiences. • Creates and solves problems involving time. • Extends the reading of time to five and one –minute intervals or beyond.
• Demonstrate conservation of length, area, volume.		• Demonstrates conservation of length with teacher's assistance,	• Demonstrate conservation of length satisfactorily. • Demonstrates conservation of area and volume with assistance.	• Displays a clear understanding of the concept of conservation (lengths, area and volume) and applies to real-life situations.	• Extends the. concept of conservation to real- life experiences. • Creates and solves problems involving conservation.
• Use rates in money transactions in which time is involved.		• Calculates the amount of money due when rates for rental or for' work done are given but needs guidance to do so.	• Calculates rental and wages due given the rates involved in the transactions, but needs some assistance.	• Calculates accurately the sums involved in problems on rental and wages. • Provides reasons for 'shopping around' for better rates.	• Articulates about the advantages of 'shopping around' for best rates and draws freely from real life problems for support
• Participate in trading situations and calculate profit and loss.		• Calculates sums of money in profit and loss situations with assistance and is unable to connect these results as they affect the persons involved.	• Calculates sums involved in profit and loss situations and provides few comments about the results.	• Calculates accurately sums involved in profit and loss situations and comments on levels of personal savings made by 'shopping around'.	• Uses results of calculation to speculate on levels of profit or loss made through a variety of transactions.

MEASUREMENT- STANDARD IV
(Money Included)

Standards of Performance

END OF STANDARD - IV		**LEVEL 1**	**LEVEL 2**	**LEVEL 3**	**LEVEL 4**
Outcome from the Primary School Mathematics Syllabus. By the end of Standard Four pupils will • Extend their understanding of standard units/sub- units. • Develop and use formulae to calculate perimeter, area and volume. • Estimate and approximate measurements of length, area, volume, weight/mass and time. • Solve problems involving the calculation of wages salaries and interests.	Characteristics of student performance	The pupil • Uses standard units/sub-units appropriately. with teacher's assistance. • Has difficulty developing formulae and uses formulae in a rote manner. • Estimates and approximates measurements. With assistance. • Solves problems involving the calculation of wages, salaries and interests. with guidance.	• Identifies the relationship between standard units and their sub-parts, with little assistance. • Develops and uses formulae with teacher's assistance. • Estimates and approximates measurements satisfactorily. • Calculates wages, salaries and interest, with some assistance.	• Uses the relationship between standard units and their sub-parts efficiently to solve practical problems. • Develops and uses formulae independently in problems. • Devises appropriate strategies for estimation/approximation. • Accurately calculates wages, salaries, interest comparing situations.	• Applies measurement principles to solve real- life problems involving use of formulae. • Applies measurement principles including estimation/approximation to other curriculum areas. • Compares salaries (interests on loans/investments in real life situations).
• Use the relationship' among units/sub-units in measurement activities.	Sample Performance Indicators	• Selects the appropriate units/sub-units with assistance but has difficulty in converting from one unit to another.	• Selects the appropriate units/sub-units and converts from one unit to another using decimal notation where applicable, with some assistance.	• Selects the appropriate units/sub-units and accurately converts from one unit to another, using decimal notation.	• Explains the relationship between units/sub- units and determines which are to be used in real-life situations.

MEASUREMENT- STANDARD I
(Money Included)

Standards of Performance

END OF STANDARD - IV		LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
• Calculate circumference using properties of the circle.	Sample Performance Indicators.	• Demonstrates understanding of the relationship between diameter and circumference with teacher's assistance in practical activities.	• Uses the relationship between diameter and circumference to calculate, estimate and approximate circumference, with some assistance.	• Uses the relationship between diameter and circumference to calculate circumference in problem situations.	• Applies the relationship to estimate and find diameter of circles of known circumference.
• Calculate the area of triangle using formula.		• Demonstrates understanding of the relationship between area of triangles and associated rectangle with teacher's assistance in practical activities.	• Uses the relationship to develop formula to estimate and calculate area of triangle, with assistance.	• Calculates area of triangle in problem situations independently	• Solves real life and complex problems involving calculation of area of triangle.
• Calculate the areas of larger surfaces in square metres.		• Demonstrates understanding of the relationship between diameter and circumference with teacher's assistance in practical activities.	• Uses the relationship to develop formula to estimate and calculate area of triangle, with assistance.	• Uses the relationship between diameter and circumference to calculate circumference in problem situations.	• Applies the relationship to estimate and find diameter of circles of known circumference.
• Calculate volume of cube/cuboid using formulae.		• Demonstrates understanding of the relationship between length, breadth, height and volume of cube/cuboid with teacher's assistance in practical activities.	• Uses the relationship between length, breadth, height and volume to develop formula to calculate volume of cube/cuboid, with assistance.	• Estimates and calculates volume of cube/cuboid using formula in problem situations.	• Solves real life and more complex problems involving calculation of volume of cube/cuboid.
• Measure weight/mass in &rams, using appropriate instruments.		• Recognizes the need for a smaller unit. • With assistance, demonstrates understanding of the relationship between grams/kilogram in practical activities.	• Estimates and measures weight/mass of familiar light objects and records measurements with some degree of accuracy.	• Uses the relationship between grams/kilogram/half-kilogram etc, to solve problems in weight/mass, accurately. • Identifies items in environment whose weights are expressed in grams. • Estimates weight in grams efficiently.	• Compare weights of items expressed in kilograms and grams in real-life and draw conclusions on the reasons why these items are packaged according to these weights.

MEASUREMENT- STANDARD IV

(Money Included)

Standards of Performance

END OF STANDARD - IV		LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
• Read and record time on both digital and analog to the minute and in five inute intervals.	Sample Performance indicators	• Reads and records time to the minute and in five minute intervals, with teacher's assistance. • Demonstrates understanding of the relationship between hour, half-hour, quarter hour and one-minute and five- minute intervals, with assistance.	• Reads and records time to the minute and in five-minute intervals with little assistance. • Uses the relationship between time intervals to estimate time, with assistance.	• Reads and records time to the minute and in five-minute intervals accurately and solves practical problems involving time • Estimates time intervals efficiently. .	• Relates time to everyday life. • Formulates and solves problems involving time.
• Calculate wages and salaries.		• Calculates wages and salaries, with assistance.	• Calculates wages and salaries with some assistance; finds difficulty in comparing earnings in different situations.	• Calculates accurately, wages and salaries in a variety of situations, comparing earnings of different situations and making choices out of findings.	• Uses the results of calculating wages to draw conclusions on earnings from different occupations. • Discusses the discrepancies in earnings in real-life situations.
• Calculate interest on savings and loans through simple interest.		• Calculate interest in some money transactions, with assistance, but is unable to comment on their relevance to real world situations.	• Calculate interest in money transactions with some assistance and comments, on an intuitive level, about the situation looked at.	• Calculates accurately interest on a variety of money transactions, gives reasons for rates of interest and how one can benefit from these.	• Uses the results of calculation of interests to discuss investments. • Makes suggestions about the soundness of simple transactions.

MEASUREMENT- STANDARD V

(Money Included)

Standards of Performance

END OF STANDARD - V		LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
Outcomes from the Primary School Mathematics Syllabus. By the end of Standard Five pupils will • Extend their proficiency in measurement, estimation and approximation of distance, length, perimeter, area, volume, capacity, weight, time and amounts of money using standard units of measurement, solve simple and complex problems involving-measurements using a variety of problem solving strategies.	Characteristics of students performance	The pupil • Demonstrates some ability to estimate and approximate in measurement situations, using appropriate units with assistance. • Solves simple problems using various strategies involving the use of formulae with teacher's assistance.	• Estimates and approximates in measurement situations using a variety of strategies and appropriate units, with little assistance. • Solves a variety of simple problems involving formulae satisfactorily.	• Analyses estimation strategies and selects appropriate ones with suitable units, efficiently. • Formulates and accurately solves, using appropriate strategies, a variety of problems involving use of formulae and a variety of two-dimensional and three-dimensional figures.	• Applies all measurement principles to other topics and curriculum areas and in real life problem situations. • Creates and solves complex problems involving two or more topics of measures. • Evaluates the effectiveness of various strategies used for problem-solving.

MEASUREMENT- STANDARD V

(Money Included)

Standards of Performance

END OF STANDARD - V		LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
More specifically, pupils will • Calculate radius and diameter of circle.	Sample Performance Indicators	• Demonstrates understanding of the relationships among diameter, radius and circumferences with assistance.	• Uses these relationships to estimate and calculate length of diameter and radius, given length of circumference of a variety of circles, with some assistance.	• Uses these relationships to estimate, calculate and approximate lengths of diameter and radius in real life problem situations.	• Creates and solves complex problems involving the calculation of circumference, diameter and radius.
• Calculate perimeter and area of compound shapes		• Recognizes simple shapes within compound shapes, with teacher's assistance. • Calculates perimeter and area with some errors.	• Uses the concept of conservation, various strategies and formulae to calculate perimeter arid area of compound shapes with little assistance. • Expresses answers in appropriate units, with little or no assistance.	• Solves simple real-life problems involving perimeter and area of compound shapes accurately. • Creates regular shapes of given perimeter and area.	• Constructs irregular shapes with given perimeter and area and uses these to create problems. • Solves more complex real-life problems involving perimeter and area of compound shapes
• Solve problems in volume and capacity		• Solves simple problems in volume and capacity including the relationship between litres and cubic centimetres, using a variety of problem solving strategies, with teacher's assistance. • Selects appropriate units with assistance.	• Selects appropriate strategies to solve problems in volume/capacity and the relationship between them, with little assistance. • Expresses answers in appropriate units with little or no assistance.	• Creates and solves simple and complex problems accurately using the concepts of volume/capacity with rates involving time and money, and other topic areas in mathematics.	• Investigates real life problems involving volume and capacity and devises strategies for and solves them. • Applies concepts of volume and capacity to other curriculum areas.

MEASUREMENT- STANDARD V

(Money Included)

Standards of Performance

END OF STANDARD - V		LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
• Solve problems associated with weight/mass.	Sample Performance Indicators.	• Solves problems using a variety of problem- solving strategies involving weight/ mass, with assistance. • Selects appropriate units, with assistance.	• Selects appropriate strategies to solve problems associated with weight/mass, with little assistance. • Expresses answers in appropriate units, with little or no assistance.	• Creates and solves accurately, simple and complex problems associated with weight/mass and other topic areas in mathematics e.g. money.	• Applies concepts of weight/mass to other curriculum areas e.g. Science. • Investigates real-life situations e.g. market, grocery and compares the weight of items to the cost, to determine acceptable/non-acceptable rates.
• Solve problems involving time.		• Demonstrates understanding of relationships among sub- units of time and applies these to problem solving situations, with teacher's assistance.	• Solves routine and non-routine problems involving time and other areas such as distance and money, using a variety of problem- solving strategies with some assistance.	• Solves simple and complex problems involving time and distance/time and money etc., accurately and independently.	• Applies principles of time to other curriculum areas e.g. Social Studies and Science. • Applies knowledge and skills to solving real life problems involving time and other factors.
• Calculate sums involved in hire purchases.		• Calculates sum of money due to complete a hire purchase agreement, with assistance.	• Calculates the sums due on hire purchase agreements for such activities, but needs some assistance.	• Calculates, accurately, such sums of money due on hire purchase arrangements. • Comments on the relationship, on installments and repayment time.	• Uses the results on hire purchase problems to support the arguments for and against purchases made through hiring or payment by cash.
• Use concept of percentages in money transactions e.g. sales, value added tax, etc.		• Uses percent in money transactions with assistance but shows little interest in how these relate to real-life.	• Solves problems involving percent in many transactions, but requires assistance. • Comments intuitively on the transactions made.	• Solves problems, efficiently, involving percent and money. • Provides some reasons for issues related to problems.	• Uses the results of transactions involving percent and money to comment on the issues related to problems e.g. sales, gimmicks, discounts, etc.

ACKNOWLEDGEMENT

This Draft Standards for Primary School Mathematics would not have been produced without commitment expertise and the effort of members of the Standards Team.

The Ministry of Education of Trinidad and Tobago wishes to express its sincere appreciation to the following individuals:-

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Special thanks is extended to the Education Project Coordinating Unit who worked very diligently to prepare the Standards Document for publication.