YEAR 5

Ministry of Education
Malaysia

Integrated Curriculum for Primary Schools
CURRICULUM SPECIFICATIONS

MATHEMATICS

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YEAR 5

Curriculum Development Centre
Ministry of Education Malaysia

2006

RUKUNEGARA

DECLARATION

OUR NATION, MALAYSIA, being dedicated

- to achieving a greater unity of all her peoples;

- to maintaining a democratic way of life;

- to creating a just society in which the wealth of the nation shall be equitably shared;

- to ensuring a liberal approach to her rich and diverse cultural traditions;

- to building a progressive society which shall be oriented to modern science and technology;

WE, her peoples, pledge our united efforts to attain these ends guided by these principles:

- BELIEF IN GOD

- LOYALTY TO KING AND COUNTRY

- UPHOLDING THE CONSTITUTION

- RULE OF LAW

- GOOD BEHAVIOUR AND MORALITY

National Philosophy of Education

Education in Malaysia is an ongoing effort towards further developing the potential of individuals in a holistic and integrated manner so as to produce individuals who are intellectually, spiritually, emotionally and physically balanced and harmonious, based on a firm belief in God. Such an effort is designed to produce Malaysian citizens who are knowledgeable and competent, who possess high moral standards, and who are responsible and capable of achieving a high level of personal well-being as well as being able to contribute to the betterment of the family, the society and the nation at large.

PREFACE

Science and technology plays a crucial role in meeting Malaysia's aspiration to achieve developed nation status. Since mathematics is instrumental in developing scientific and technological knowledge, the provision of quality mathematics education from an early age in the education process is critical.

The primary school Mathematics curriculum as outlined in the syllabus has been designed to provide opportunities for pupils to acquire mathematical knowledge and skills and develop the higher order problem solving and decision making skills that they can apply in their everyday lives. But, more importantly, together with the other subjects in the primary school curriculum, the mathematics curriculum seeks to inculcate noble values and love for the nation towards the final aim of developing the holistic person who is capable of contributing to the harmony and prosperity of the nation and its people.

Beginning in 2003, science and mathematics will be taught in English following a phased implementation schedule, which will be completed by 2008. Mathematics education in English makes use of ICT in its delivery. Studying mathematics in the medium of English assisted by ICT will provide greater opportunities for pupils to enhance their knowledge and skills because they are able to source the various repositories of knowledge written in mathematical English whether in electronic or print forms. Pupils will be able to communicate mathematically in English not only in the immediate environment but also with pupils from other countries thus increasing their overall English proficiency and mathematical competence in the process.

The development of a set of Curriculum Specifications as a supporting document to the syllabus is the work of many individuals and experts in the field. To those who have contributed in one way or another to this effort, on behalf of the Ministry of Education, I would like to thank them and express my deepest appreciation.

(DR. HAILI BIN DOLHAN)

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Malaysia

INTRODUCTION

Our nation's vision can be achieved through a society that is educated and competent in the application of mathematical knowledge. To realise this vision, society must be inclined towards mathematics. Therefore, problem solving and communicational skills in mathematics have to be nurtured so that decisions can be made effectively.

Mathematics is integral in the development of science and technology. As such, the acquisition of mathematical knowledge must be upgraded periodically to create a skilled workforce in preparing the country to become a developed nation. In order to create a K-based economy, research and development skills in Mathematics must be taught and instilled at school level.

Achieving this requires a sound mathematics curriculum, competent and knowledgeable teachers who can integrate instruction with assessment, classrooms with ready access to technology, and a commitment to both equity and excellence.

The Mathematics Curriculum has been designed to provide knowledge and mathematical skills to pupils from various backgrounds and levels of ability. Acquisition of these skills will help them in their careers later in life and in the process, benefit the society and the nation.

Several factors have been taken into account when designing the curriculum and these are: mathematical concepts and skills, terminology and vocabulary used, and the level of proficiency of English among teachers and pupils.

The Mathematics Curriculum at the primary level (KBSR) emphasises the acquisition of basic concepts and skills. The content is categorised into four interrelated areas, namely, Numbers, Measurement, Shape and Space and Statistics.

The learning of mathematics at all levels involves more than just the basic acquisition of concepts and skills. It involves, more importantly, an understanding of the underlying mathematical thinking, general strategies of problem solving, communicating mathematically and inculcating positive attitudes towards an appreciation of mathematics as an important and powerful tool in everyday life.

It is hoped that with the knowledge and skills acquired in Mathematics, pupils will discover, adapt, modify and be innovative in facing changes and future challenges.

AIM

The Primary School Mathematics Curriculum aims to build pupils' understanding of number concepts and their basic skills in computation that they can apply in their daily routines effectively and responsibly in keeping with the aspirations of a developed society and nation, and at the same time to use this knowledge to further their studies.

OBJECTIVES

The Primary School Mathematics Curriculum will enable pupils to:

1 know and understand the concepts, definition, rules sand principles related to numbers, operations, space, measures and data representation;

2 master the basic operations of mathematics:

- addition,
- subtraction,
- multiplication,
- division;

3 master the skills of combined operations;

4 master basic mathematical skills, namely:

- making estimates and approximates,
- measuring,
- handling data
- representing information in the form of graphs and charts;

5 use mathematical skills and knowledge to solve problems in everyday life effectively and responsibly;

6 use the language of mathematics correctly;

7 use suitable technology in concept building, acquiring mathematical skills and solving problems;

8 apply the knowledge of mathematics systematically, heuristically, accurately and carefully;

9 participate in activities related to mathematics; and

10 appreciate the importance and beauty of mathematics.

CONTENT ORGANISATION

The Mathematics Curriculum at the primary level encompasses four main areas, namely, Numbers, Measures, Shape and Space, and Statistics. The topics for each area have been arranged from the basic to the abstract. Teachers need to teach the basics before abstract topics are introduced to pupils.

Each main area is divided into topics as follows:

1 Numbers
- Whole Numbers;
- Fractions;
- Decimals;
- Money;

2 Measures
- Time;
- Length;
- Mass;
- Volume of Liquid.

3 Shape and Space
- Two-dimensional Shapes;
- Three-dimensional Shapes;
- Perimeter and Area.

4 Statistics
- Data Handling

The Learning Areas outline the breadth and depth of the scope of knowledge and skills that have to be mastered during the allocated time for learning. These learning areas are, in turn, broken down into more manageable objectives. Details as to teaching-learning strategies, vocabulary to be used and points to note are set out in five columns as follows:

Column 1: Learning Objectives.

Column 2: Suggested Teaching and Learning Activities.

Column 3: Learning Outcomes.

Column 4: Points To Note.

Column 5: Vocabulary.

The purpose of these columns is to illustrate, for a particular teaching objective, a list of what pupils should know, understand and be able to do by the end of each respective topic.

The **Learning Objectives** define clearly what should be taught. They cover all aspects of the Mathematics curriculum and are presented in a developmental sequence to enable pupils to grasp concepts and master skills essential to a basic understanding of mathematics.

The **Suggested Teaching and Learning Activities** list some examples of teaching and learning activities. These include methods, techniques, strategies and resources useful in the teaching of a specific concepts and skills. These are however not the only approaches to be used in classrooms.

The **Learning Outcomes** define specifically what pupils should be able to do. They prescribe the knowledge, skills or mathematical processes and values that should be inculcated and developed at the appropriate levels. These behavioural objectives are measurable in all aspects.

In **Points To Note**, attention is drawn to the more significant aspects of mathematical concepts and skills. These aspects must be taken into accounts so as to ensure that the concepts and skills are taught and learnt effectively as intended.

The **Vocabulary** column consists of standard mathematical terms, instructional words and phrases that are relevant when structuring activities, asking questions and in setting tasks. It is important to pay careful attention to the use of correct terminology. These terms need to be introduced systematically to pupils and in various contexts so that pupils get to know of their meaning and learn how to use them appropriately.

EMPHASES IN TEACHING AND LEARNING

The Mathematics Curriculum is ordered in such a way so as to give flexibility to the teachers to create an environment that is enjoyable, meaningful, useful and challenging for teaching and learning. At the same time it is important to ensure that pupils show progression in acquiring the mathematical concepts and skills.

On completion of a certain topic and in deciding to progress to another learning area or topic, the following need to be taken into accounts:

- The skills or concepts acquired in the new learning area or topics;

- Ensuring that the hierarchy or relationship between learning areas or topics have been followed through accordingly; and

- Ensuring the basic learning areas have or skills have been acquired or mastered before progressing to the more abstract areas.

The teaching and learning processes emphasise concept building, skill acquisition as well as the inculcation of positive values. Besides these, there are other elements that need to be taken into account and learnt through the teaching and learning processes in the classroom. The main emphasis are as follows:

1. Problem Solving in Mathematics

Problem solving is a dominant element in the mathematics curriculum for it exists in three different modes, namely as content, ability, and learning approach.

Over the years of intellectual discourse, problem solving has developed into a simple algorithmic procedure. Thus, problem solving is taught in the mathematics curriculum even at the primary school level. The commonly accepted model for problem solving is the four-step algorithm, expressed as follows:-

- Understanding the problem;
- Devising a plan;
- Carrying out the plan; and
- Looking back at the solution.

In the course of solving a problem, one or more strategies can be employed to lead up to a solution. Some of the common strategies of problem solving are:-

- Try a simpler case;
- Trial and improvement;
- Draw a diagram;
- Identifying patterns and sequences;
- Make a table, chart or a systematic list;
- Simulation;
- Make analogy; and
- Working backwards.

Problem solving is the ultimate of mathematical abilities to be developed amongst learners of mathematics. Being the ultimate of abilities, problem solving is built upon previous knowledge and experiences or other mathematical abilities which are less complex in nature. It is therefore imperative to ensure that abilities such as calculation, measuring, computation and communication are well developed amongst students because these abilities are the fundamentals of problem solving ability.

People learn best through experience. Hence, mathematics is best learnt through the experience of solving problems. Problem-based learning is an approach where a problem is posed at the beginning of a lesson. The problem posed is carefully designed to have the desired mathematical concept and ability to be acquired by students during the particular lesson. As students go through the process of solving the problem being posed, they pick up the concept and ability that are built into the problem. A reflective activity has to be conducted towards the end of the lesson to assess the learning that has taken place.

2. Communication in Mathematics

Communication is one way to share ideas and clarify the understanding of Mathematics. Through talking and questioning, mathematical ideas can be reflected upon, discussed and modified. The process of reasoning analytically and systematically can help reinforce and strengthen pupils' knowledge and understanding of mathematics to a deeper level. Through effective communications pupils will become efficient in problem solving and be able to explain concepts and mathematical skills to their peers and teachers.

Pupils who have developed the above skills will become more inquisitive gaining confidence in the process. Communicational skills in mathematics include reading and understanding problems, interpreting diagrams and graphs, and using correct and concise mathematical terms during oral presentation and written work. This is also expanded to the listening skills involved.

Communication in mathematics through the listening process occurs when individuals respond to what they hear and this encourages them to think using their mathematical knowledge in making decisions.

Communication in mathematics through the reading process takes place when an individual collects information or data and rearranges the relationship between ideas and concepts.

Communication in mathematics through the visualization process takes place when an individual makes observation, analyses it, interprets and synthesises the data into graphic forms, such as pictures, diagrams, tables and graphs.

The following methods can create an effective communication environment:

- Identifying relevant contexts associated with environment and everyday life experiences of pupils;

- Identifying interests of pupils;

- Identifying teaching materials;

- Ensuring active learning;

- Stimulating meta-cognitive skills;

- Inculcating positive attitudes; and

- Creating a conducive learning environment.

Oral communication is an interactive process that involves activities like listening, speaking, reading and observing. It is a two-way interaction that takes place between teacher-pupil, pupil-pupil, and pupil-object. When pupils are challenged to think and reason about mathematics and to tell others the results of their thinking, they learn to be clear and convincing. Listening to others' explanations gives pupils the opportunities to develop their own understanding. Conversations in which mathematical ideas are explored from multiple perspectives help sharpen pupils thinking and help make connections between ideas. Such activity helps pupils develop a language for expressing mathematical ideas and appreciation of the need for precision in the language. Some effective and meaningful oral communication techniques in mathematics are as follows:

- Story-telling, question and answer sessions using own words;

- Asking and answering questions;

- Structured and unstructured interviews;

- Discussions during forums, seminars, debates and brain-storming sessions; and

- Presentation of findings of assignments.

Written communication is the process whereby mathematical ideas and information are shared with others through writing. The written work is usually the result of discussions, contributions and brain-storming activities when working on assignments. Through writing, the pupils will be encouraged to think more deeply about the mathematics content and observe the relationships between concepts.

Examples of written communication activities are:

- Doing exercises;

- Keeping scrap books;

- Keeping folios;

- Undertaking projects; and

- Doing written tests.

Representation is a process of analysing a mathematical problem and interpreting it from one mode to another. Mathematical representation enables pupils to find relationship between mathematical ideas that are informal, intuitive and abstract using their everyday language. Pupils will realise that some methods of representation are more effective and useful if they know how to use the elements of mathematical representation.

3. Mathematical Reasoning

Logical reasoning or thinking is the basis for understanding and solving mathematical problems. The development of mathematical reasoning is closely related to the intellectual and communicative development of the pupils. Emphasis on logical thinking during

mathematical activities opens up pupils' minds to accept mathematics as a powerful tool in the world today.

Pupils are encouraged to predict and do guess work in the process of seeking solutions. Pupils at all levels have to be trained to investigate their predictions or guesses by using concrete materials, calculators, computers, mathematical representation and others. Logical reasoning has to be infused in the teaching of mathematics so that pupils can recognise, construct and evaluate predictions and mathematical arguments.

4. Mathematical Connections

In the mathematics curriculum, opportunities for making connections must be created so that pupils can link conceptual to procedural knowledge and relate topics in mathematics with other learning areas in general.

The mathematics curriculum consists of several areas such as arithmetic, geometry, measures and problem solving. Without connections between these areas, pupils will have to learn and memorise too many concepts and skills separately. By making connections pupils are able to see mathematics as an integrated whole rather than a jumble of unconnected ideas. Teachers can foster connections in a problem oriented classrooms by having pupils to communicate, reason and present their thinking. When these mathematical ideas are connected with real life situations and the curriculum, pupils will become more conscious in the application of mathematics. They will also be able to use mathematics contextually in different learning areas in real life.

5. Application of Technology

The application of technology helps pupils to understand mathematical concepts in depth, meaningfully and precisely enabling them to explore mathematical concepts. The use of calculators, computers, educational software, websites in the internet and available learning packages can help to upgrade the pedagogical skills in the teaching and learning of mathematics.

The use of teaching resources is very important in mathematics. This will ensure that pupils absorb abstract ideas, be creative, feel confident and be able to work independently or in groups. Most of these resources are designed for self-access learning. Through self-access learning, pupils will be able to access knowledge or skills and information independently according to their pace. This will serve to stimulate pupils' interests and responsibility in learning mathematics.

APPROACHES IN TEACHING AND LEARNING

Various changes occur that influence the content and pedagogy in the teaching of mathematics in primary schools. These changes require variety in the way of teaching mathematics in schools. The use of teaching resources is vital in forming mathematical concepts. Teachers can use real or concrete objects in teaching and learning to help pupils gain experience, construct abstract ideas, make inventions, build self confidence, encourage independence and inculcate cooperation.

The teaching and learning materials that are used should contain self-diagnostic elements so that pupils can know how far they have understood the concepts and skills. To assist the pupils in having positive

attitudes and personalities, the intrinsic mathematical values of exactness, confidence and thinking systematically have to be absorbed through the learning areas.

Good moral values can be cultivated through suitable context. For example, learning in groups can help pupils develop social skills and encourage cooperation and self-confidence in the subject. The element of patriotism can also be inculcated through the teaching-

learning process in the classroom using planned topics. These values should be imbibed throughout the process of teaching and learning mathematics.

Among the approaches that can be given consideration are:

- Pupil centered learning that is interesting;

- The learning ability and styles of learning;

- The use of relevant, suitable and effective teaching materials; and

- Formative evaluation to determine the effectiveness of teaching and learning.

The choice of an approach that is suitable will stimulate the teaching and learning environment in the classroom or outside it. The approaches that are suitable include the following:

- Cooperative learning;

- Contextual learning;

- Mastery learning;

- Constructivism;

- Enquiry-discovery; and

- Futures Study.

ASSESSMENT

Assessment is an integral part of the teaching and learning process. It has to be well-structured and carried out continuously as part of the classroom activities. By focusing on a broad range of mathematical tasks, the strengths and weaknesses of pupils can be assessed. Different methods of assessment can be conducted using multiple assessment techniques, including written and oral work as well as demonstration. These may be in the form of interviews, open-ended questions, observations and assignments. Based on the results, the teachers can rectify the pupils' misconceptions and weaknesses and at the same time improve their teaching skills. As such, teachers can take subsequent effective measures in conducting remedial and enrichment activities to upgrade pupils' performance.

LEARNING OBJECTIVES *Pupils will be taught to…*	SUGGESTED TEACHING AND LEARNING ACTIVITIES	LEARNING OUTCOMES *Pupils will be able to…*	POINTS TO NOTE	VOCABULARY
1 Develop number sense up to 1 000 000	• Teacher pose numbers in numerals, pupils name the respective numbers and write the number words. • Teacher says the number names and pupils show the numbers using the calculator or the abacus, then pupils write the numerals. • Provide suitable number line scales and ask pupils to mark the positions that representt a set of given numbers.	(i) Name and write numbers up to 1 000 000.	Write numbers in words and numerals. Emphasise reading and writing numbers in extended notation for example : 801 249 = 800 000 + 1 000 + 200 + 40 + 9 or 801 249 = 8 hundred thousands + 1 thousands + 2 hundreds + 4 tens + 9 ones.	numbers numeral count place value value of the digits partition decompose estimate check compare
	• Given a set of numbers, pupils represent each number using the number base blocks or the abacus. Pupils then state the place value of every digit of the given number.	(ii) Determine the place value of the digits in any whole number up to 1 000 000.		count in … hundreds ten thousands thousands
	• Given a set of numerals, pupils compare and arrange the numbers in ascending then descending order.	(iii) Compare value of numbers up to 1 000 000.		round off to the nearest… tens hundreds thousands ten thousands hundred thousands
		(iv) Round off numbers to the nearest tens, hundreds, thousands, ten thousands and hundred thousands.	Explain to pupils that numbers are rounded off to get an approximate.	

Topic 1: WHOLE NUMBERS

Learning Area : ADDITION WITH THE HIGHEST TOTAL OF 1 000 000

LEARNING OBJECTIVES *Pupils will be taught to…*	SUGGESTED TEACHING AND LEARNING ACTIVITIES	LEARNING OUTCOMES *Pupils will be able to…*	POINTS TO NOTE	VOCABULARY
2 Add numbers to the total of 1 000 000	• Pupils practice addition using the four-step algorithm of: 1) Estimate the total. 2) Arrange the numbers involved according to place values. 3) Perform the operation. 4) Check the reasonableness of the answer. • Pupils create stories from given addition number sentences.	(i) Add any two to four numbers to 1 000 000.	Addition exercises include addition of two numbers to four numbers • without trading (without regrouping). • with trading (with regrouping). Provide mental addition practice either using the abacus-based technique or using quick addition strategies such as estimating total by rounding, simplifying addition by pairs of tens and doubles, e.g. **Rounding** 410 218 → 400 000 294 093 → 300 000 68 261 → 70 000 **Pairs of ten** 4 + 6, 5 + 5, etc. **Doubles** 3 + 3, 30 + 30, 300 + 300, 3000 + 3000, 5 + 5, etc.	number sentences vertical form without trading with trading quick calculation pairs of ten doubles estimation range

LEARNING OBJECTIVES *Pupils will be taught to…*	SUGGESTED TEACHING AND LEARNING ACTIVITIES	LEARNING OUTCOMES *Pupils will be able to…*	POINTS TO NOTE	VOCABULARY
	• Teacher pose problems verbally, i.e., in the numerical form or simple sentences. • Teacher guides pupils to solve problems following Polya's four-step model of: 1) Understanding the problem 2) Devising a plan 3) Implementing the plan 4) Looking back.	(ii) Solve addition problems.	Before a problem solving exercise, provide pupils with the activity of creating stories from number sentences. A guide to solving addition problems: **Understanding the problem** Extract information from problems posed by drawing diagrams, making lists or tables. Determine the type of problem, whether it is addition, subtraction, etc. **Devising a plan** Translate the information into a number sentence. Determine what strategy to use to perform the operation. **Implementing the plan** Perform the operation conventionally, i.e. write the number sentence in the vertical form. **Looking back** Check for accuracy of the solution. Use a different startegy, e.g. calculate by using the abacus.	total sum of numerical how many number sentences create pose problem tables modeling simulating

3

LEARNING OBJECTIVES *Pupils will be taught to…*	SUGGESTED TEACHING AND LEARNING ACTIVITIES	LEARNING OUTCOMES *Pupils will be able to…*	POINTS TO NOTE	VOCABULARY
3 Subtract numbers from a number less than 1 000 000.	• Pupils create stories from given subtraction number sentences. • Pupils practice subtraction using the four-step algorithm of: 1) Estimate the sum. 2) Arrange the numbers involved according to place values. 3) Perform the operation. 4) Check the reasonableness of the answer.	(i) Subtract one number from a bigger number less than 1 000 000.	Subtraction refers to a) taking away, b) comparing differences c) the inverse of addition. Limit subtraction problems to subtracting from a bigger number. Provide mental sutraction practice either using the abacus-based technique or using quick subtraction strategies. Quick subtraction strategies to be implemented: a) Estimating the sum by rounding numbers. b) counting up and counting down (counting on and counting back)	number sentence vertical form without trading with trading quick calculation pairs of ten counting up counting down estimation range modeling successively
	• Pupils subtract successively by writing the number sentence in the a) horizontal form b) vertical form	(ii) Subtract successively from a bigger number less than 1 000 000.	Subtract successively two numbers from a bigger number	

LEARNING OBJECTIVES *Pupils will be taught to…*	SUGGESTED TEACHING AND LEARNING ACTIVITIES	LEARNING OUTCOMES *Pupils will be able to…*	POINTS TO NOTE	VOCABULARY
	• Teacher pose problems verbally, i.e., in the numerical form or simple sentences. • Teacher guides pupils to solve problems following Polya's four-step model of: 1) Understanding the problem 2) Devising a plan 3) Implementing the plan 4) Looking back.	(iii) Solve subtraction problems.	Also pose problems in the form of pictorials and stories.	create pose problems tables

LEARNING OBJECTIVES *Pupils will be taught to…*	SUGGESTED TEACHING AND LEARNING ACTIVITIES	LEARNING OUTCOMES *Pupils will be able to…*	POINTS TO NOTE	VOCABULARY
4 Multiply any two numbers with the highest product of 1 000 000.	• Pupils create stories from given mulitplication number sentences. e.g. 40 500 × 7 = 283 500 "A factory produces 40 500 batteries per day. 283 500 batteries are produced in 7 days" • Pupils practice multiplication using the four-step algorithm of: 1) Estimate the product. 2) Arrange the numbers involved according to place values. 3) Perform the operation. 4) Check the reasonableness of the answer.	(i) Multiply up to five digit numbers with a) a one-digit number, b) a two-digit number, c) 10, 100 and 1000.	Limit products to less than 1 000 000. Provide mental multiplication practice either using the abacus-based technique or other multiplication strategies. Multiplication strategies to be implemented: **Factorising** 16 572 × 36 = (16 572 × 30)+(16 572 × 6) = 497 160 + 99 432 = 596 592 **Completing 100** 99 × 4982 = 4982 × 99 = (4982 × 100) − (4982 × 1) = 498 200 − 4982 = 493 218 **Lattice multiplication**	times multiply multiplied by multiple of various estimation lattice multiplication

	1	6	5	7	2	×
	0 / 3	1 / 8	1 / 5	2 / 1	0 / 6	3
5	0 / 6	3 / 6	3 / 0	4 / 2	1 / 2	6
	9	6	5	9	2	

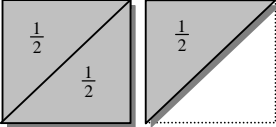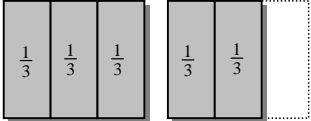| LEARNING OBJECTIVES *Pupils will be taught to…*	SUGGESTED TEACHING AND LEARNING ACTIVITIES	LEARNING OUTCOMES *Pupils will be able to…*	POINTS TO NOTE	VOCABULARY
	• Teacher pose problems verbally, i.e., in the numerical form or simple sentences. • Teacher guides pupils to solve problems following Polya's four-step model of: 1) Understanding the problem 2) Devising a plan 3) Implementing the plan 4) Looking back. (Apply some of the common strategies in every problem solving step.)	(ii) Solve problems involving multiplication.	A guide to solving addition problems: **Understanding the problem** Extract information from problems posed by drawing diagrams, making lists or tables. Determine the type of problem, whether it is addition, subtraction, etc. **Devising a plan** Translate the information into a number sentence. Determine what strategy to use to perform the operation. **Implementing the plan** Perform the operation conventionally, i.e. write the number sentence in the vertical form. **Looking back** Check for accuracy of the solution. Use a different startegy, e.g. calculate by using the abacus.	Times Multiply multiplied by multiple of estimation lattice multiplication

LEARNING OBJECTIVES *Pupils will be taught to…*	SUGGESTED TEACHING AND LEARNING ACTIVITIES	LEARNING OUTCOMES *Pupils will be able to…*	POINTS TO NOTE	VOCABULARY
5 Divide a number less than 1 000 000 by a two-digit number.	• Pupils create stories from given division number sentences. • Pupils practice division using the four-step algorithm of: 1) Estimate the quotient. 2) Arrange the numbers involved according to place values. 3) Perform the operation. 4) Check the reasonableness of the answer. **Example for long division**	(i) Divide numbers up to six digits by a) one-digit number, b) 10, 100 and 1000, c) two-digit number,	Division exercises include quptients a) without remainder, b) with remainder. Note that "r" is used to signify "remainder". Emphasise the long division technique. Provide mental division practice either using the abacus-based technique or other division strategies. Exposed pupils to various division strategies, such as, a) divisibility of a number b) divide by 10, 100 and 1 000.	divide dividend quotient divisor remainder divisibility

Example for long division:

```
          1  3  5  6  2   r   20
   35 |  4  7  4  6  9  0
        3  5
        ─────
        1  2  4
        1  0  5
        ────────
           1  9  6
           1  7  5
           ────────
              2  1  9
              2  1  0
              ────────
                 9  0
                 7  0
                 ──────
                 2  0
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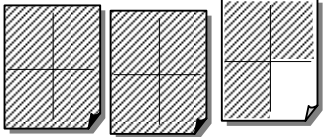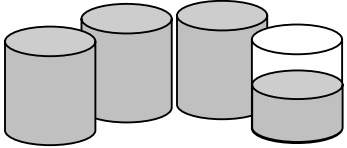
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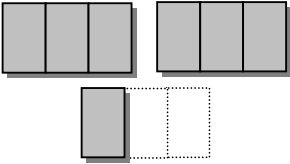| LEARNING OBJECTIVES *Pupils will be taught to…*	SUGGESTED TEACHING AND LEARNING ACTIVITIES	LEARNING OUTCOMES *Pupils will be able to…*	POINTS TO NOTE	VOCABULARY
	• Teacher pose problems verbally, i.e., in the numerical form or simple sentences. • Teacher guides pupils to solve problems following Polya's four-step model of: 1) Understanding the problem 2) Devising a plan 3) Implementing the plan 4) Looking back. (Apply some of the common strategies in every problem solving step.)	(ii) Solve problems involving division.		

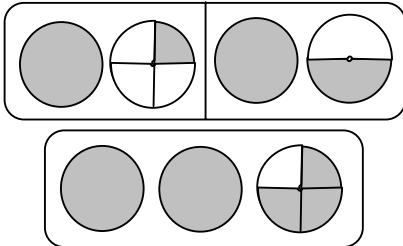| LEARNING OBJECTIVES *Pupils will be taught to…*	SUGGESTED TEACHING AND LEARNING ACTIVITIES	LEARNING OUTCOMES *Pupils will be able to…*	POINTS TO NOTE	VOCABULARY
6 Perform mixed operations involving multiplication and division.	• Pupils create stories from given number sentences involving mixed operations of division and multiplication. • Pupils practice calculation involving mixed operation using the four-step algorithm of: 1) Estimate the quotient. 2) Arrange the numbers involved according to place values. 3) Perform the operation. 4) Check the reasonableness of the answer. • Teacher guides pupils to solve problems following Polya's four-step model of: 1) Understanding the problem 2) Devising a plan 3) Implementing the plan 4) Looking back. (Apply appropriate strategies in every problem solving step.)	(i) Calculate mixed operation on whole numbers involving multiplication and division. (ii) Solve problems involving mixed operations of division and multiplication..	For mixed operations involving multiplication and division, calculate from left to right. Limit the result of mixed operation exercises to less than 100 000, for example a) $24 \times 10 \div 5 =$ b) $496 \div 4 \times 12 =$ c) $8\ 005 \times 200 \div 50 =$ Avoid problems such as a) $3 \div 6 \times 300 =$ b) $9\ 998 \div 2 \times 1000 =$ c) $420 \div 8 \times 12 =$ Pose problems in simple sentences, tables or pictorials. Some common problem solving strategies are a) Drawing diagrams b) Making a list or table c) Using arithmetic formula d) Using tools.	Mixed operations

Learning Area : **IMPROPER FRACTIONS**

LEARNING OBJECTIVES *Pupils will be taught to…*	SUGGESTED TEACHING AND LEARNING ACTIVITIES	LEARNING OUTCOMES *Pupils will be able to…*	POINTS TO NOTE	VOCABULARY
1 Understand improper fractions.	• Demonstrate improper fractions using concrete objects such as paper cut-outs, fraction charts and number lines. • Pupils perform activities such as paper folding or cutting, and marking value on number lines to represent improper fractions.	(i) Name and write improper fractions with denominators up to 10. (ii) Compare the value of the two improper fractions.	Revise proper fractions before introducing improper fractions. Improper fractions are fractions that are more than one whole. "three halves" $\frac{3}{2}$ The numerator of an improper fraction has a higher value than the denominator. The fraction reperesented by the diagram is "five thirds" and is written as $\frac{5}{3}$. It is commonly said as "five over three".	improper fraction numerator denominator three over two three halves one whole quarter compare partition

Learning Area : **MIXED NUMBERS**

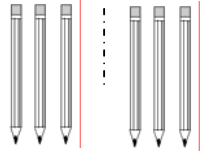| LEARNING OBJECTIVES *Pupils will be taught to…*	SUGGESTED TEACHING AND LEARNING ACTIVITIES	LEARNING OUTCOMES *Pupils will be able to…*	POINTS TO NOTE	VOCABULARY
2 Understand mixed numbers.	• Teacher demonstrates mixed numbers by partitioning real objects or manipulative. • Pupils perform activities such as a) paper folding and shading b) pouring liquids into containers c) marking number lines to represent mixed numbers. e.g. $2\frac{3}{4}$ shaded parts. $3\frac{1}{2}$ beakers full.	(i) Name and write mixed numbers with denominators up to 10. (ii) Convert improper fractions to mixed numbers and vice-versa.	A mixed number consists of a whole number and a proper fraction. e.g. $2\frac{1}{2}$ Say as 'two and a half' or 'two and one over two'. To convert improper fractions to mixed numbers, use concrete representations to verify the equivalence, then compare with the procedural calculation. e.g. $\frac{7}{3} = 2\frac{1}{3}$ $\quad 3\overline{)7}^{\,2R1}$ $\quad\frac{6}{1}$	fraction proper fraction improper fraction mixed numbers

LEARNING OBJECTIVES *Pupils will be taught to…*	SUGGESTED TEACHING AND LEARNING ACTIVITIES	LEARNING OUTCOMES *Pupils will be able to…*	POINTS TO NOTE	VOCABULARY
3 Add two mixed numbers.	• Demonstrate addition of mixed numbers through a) paper folding activities b) fraction charts c) diagrams d) number lines. e.g. $$1\frac{1}{4}+1\frac{1}{2}=2\frac{3}{4}$$ • Create stories from given number sentences involving mixed numbers.	(i) Add two mixed numbers with the same denominators up to 10. (ii) Add two mixed numbers with different denominators up to 10. (iii) Solve problems involving addition of mixed numbers.	Examples of mixed numbers addition exercise: a) $2+\dfrac{1}{3}=$ b) $2\dfrac{3}{5}+\dfrac{4}{5}=$ c) $1\dfrac{2}{7}+2\dfrac{4}{7}=$ The following type of problem should also be included: a) $1\dfrac{8}{9}+3\dfrac{1}{3}=$ b) $1\dfrac{1}{2}+1\dfrac{1}{2}=$ Emphasise answers in simplest form. $1\dfrac{8}{9}+3\dfrac{1}{3}$ $=1\dfrac{8}{9}+3\dfrac{1\times 3}{3\times 3}$ $=1\dfrac{8}{9}+3\dfrac{3}{9}$ $=4\dfrac{11}{9}$ $=5\dfrac{2}{9}$	mixed numbers equivalent simplest form denominators multiples number lines diagram fraction charts

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LEARNING OBJECTIVES *Pupils will be taught to…*	SUGGESTED TEACHING AND LEARNING ACTIVITIES	LEARNING OUTCOMES *Pupils will be able to…*	POINTS TO NOTE	VOCABULARY
4 Subtract mixed numbers.	• Demonstrate subtraction of mixed numbers through a) paper folding activities b) fraction charts c) diagrams d) number lines e) multiplication tables. • Pupils create stories from given number sentences involving mixed numbers.	(i) Subtract two mixed numbers with the same denominator up to 10.	Some examples of subtraction problems: a) $2\dfrac{3}{5} - 2 =$ b) $2\dfrac{4}{7} - \dfrac{3}{7} =$ c) $2\dfrac{3}{4} - 1\dfrac{1}{4} =$ d) $3 - 1\dfrac{1}{9} =$ e) $2\dfrac{1}{8} - 1\dfrac{3}{8} =$ Emphasise answers in simplest form.	simplest form multiply fraction chart mixed numbers multiplication tables.

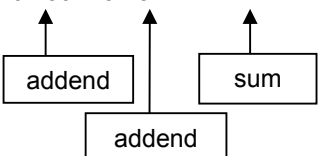| LEARNING OBJECTIVES *Pupils will be taught to…*	SUGGESTED TEACHING AND LEARNING ACTIVITIES	LEARNING OUTCOMES *Pupils will be able to…*	POINTS TO NOTE	VOCABULARY
		(ii) Subtract two mixed numbers with different denominators up to 10. (iii) Solve problems involving subtraction of mixed numbers.	Include the following type of problems, e.g. $1\frac{1}{2} - \frac{1}{4}$ $= 1\frac{1\times2}{2\times2} - \frac{1}{4}$ $= 1\frac{2}{4} - \frac{1}{4}$ $= 1\frac{1}{4}$ Other examples a) $1\frac{7}{8} - \frac{1}{2} =$ b) $3\frac{4}{5} - \frac{7}{10} =$ c) $2\frac{1}{4} - \frac{2}{3} =$ d) $5\frac{1}{6} - 3\frac{3}{4} =$ Emphasise answers in simplest form.	simplest form equivalent multiples number sentences mixed numbers equivalent fraction

15

LEARNING OBJECTIVES *Pupils will be taught to…*	SUGGESTED TEACHING AND LEARNING ACTIVITIES	LEARNING OUTCOMES *Pupils will be able to…*	POINTS TO NOTE	VOCABULARY
5 Multiply any proper fractions with a whole number up to 1 000.	• Use groups of concrete materials, pictures and number lines to demonstrate fraction as equal share of a whole set. • Provide activities of comparing equal portions of two groups of objects. e.g. $\frac{1}{2}$ of 6 = 3 $\frac{1}{2}$ of 6 pencils is 3 pencils. $\frac{1}{2} \times 6 = \frac{6}{2} = 3$	(i) Multiply whole numbers with proper fractions.	Emphasise group of objects as one whole. Limit whole numbers up to 3 digits in mulplication exercises of whole numbers and fractions. Some examples multiplication exercise for fractions with the numerator 1 and denominator up to 10. a) $\frac{1}{2}$ of 8 b) $\frac{1}{5} \times 70 =$ c) $\frac{1}{8} \times 648 =$	Simplest form Fractions Denominator Numerator Whole number Proper fractions Divisible

LEARNING OBJECTIVES *Pupils will be taught to…*	SUGGESTED TEACHING AND LEARNING ACTIVITIES	LEARNING OUTCOMES *Pupils will be able to…*	POINTS TO NOTE	VOCABULARY
	$6 \times \dfrac{1}{2}$ or six halves. 6 × ½ of an orange is… $\frac{1}{3}+\frac{1}{3}+\frac{1}{3}+\frac{1}{3}+\frac{1}{3}+\frac{1}{3}=3$ oranges. • Create stories from given number sentences.	(ii) Solve problems involving multiplication of fractions.	Some multiplication examples for fractions with the numerator more than 1 and denominator up to 10. e.g. a) $\dfrac{2}{3}$ of 9 b) $49 \times \dfrac{5}{7}$ c) $\dfrac{3}{8} \times 136$	Multiply fractions Whole number Divisible Denominator Numerator Proper fractions

LEARNING OBJECTIVES *Pupils will be taught to…*	SUGGESTED TEACHING AND LEARNING ACTIVITIES	LEARNING OUTCOMES *Pupils will be able to…*	POINTS TO NOTE	VOCABULARY
1 Understand and use the vocabulary related to decimals.	• Teacher models the concept of decimal numbers using number lines. e.g. 8 parts out of 1 000 equals 0.008 23 parts out of 1 000 is equal to 0.023. 100 parts out of 1 000 is 0.100 • Compare decimal numbers using thousand squares and number line. • Pupils find examples that use decimals in daily situation.	(i) Name and write decimal numbers to three decimal places. (ii) Recognise the place value of thousandths. (iii) Convert fractions of thousandths to decimal numbers and vice versa. (iv) Round off decimal numbers to the nearest a) tenths, b) hundredths.	Decimals are fractions of tenths, hundredths and thousandths. e.g 0.007 is read as "seven thousandths" or 'zero point zero zero seven'. 12.302 is read as "twelve and three hundred and two thousandths" or 'twelve point three zero two'. Emphasise place value of thousandths using the thousand squares. Fractions are not required to be expressed in its simplest form. Use overlapping slides to compare decimal values of tenths, hundredths and thousandths. The size of the fraction charts representing one whole should be the same for tenths, hundredths and thousandths.	decimals place value chart thousandths thousand squares decimal point decimal place decimal fraction mixed decimal convert
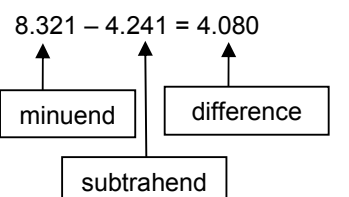
LEARNING OBJECTIVES *Pupils will be taught to…*	SUGGESTED TEACHING AND LEARNING ACTIVITIES	LEARNING OUTCOMES *Pupils will be able to…*	POINTS TO NOTE	VOCABULARY
2 Add decimal numbers up to three decimal places.	• Pupils practice adding decimals using the four-step algorithm of 1) Estimate the total. 2) Arrange the numbers involved according to place values. 3) Perform the operation. 4) Check the reasonableness of the answer. • Pupils create stories from given number sentences.	(i) Add any two to four decimal numbers up to three decimal places involving a) decimal numbers and decimal numbers, b) whole numbers and decimal numbers, (ii) Solve problems involving addition of decimal numbers.	Add any two to four decimals given number sentences in the horizontal and vertical form. Emphasise on proper positioning of digits to the corresponding place value when writng number sentences in the vertical form. 6.239 + 5.232 = 11.471 ↑ addend ↑ addend ↑ sum	decimal numbers vertical form place value decimal point estimation horizontal form total

Learning Area : **SUBTRACTION OF DECIMAL NUMBERS**

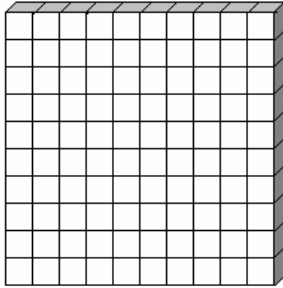| LEARNING OBJECTIVES *Pupils will be taught to…*	SUGGESTED TEACHING AND LEARNING ACTIVITIES	LEARNING OUTCOMES *Pupils will be able to…*	POINTS TO NOTE	VOCABULARY
3 Subtract decimal numbers up to three decimal places.	• Pupils subtract decimal numbers, given the number sentences in the horizontal and vertical form. • Pupils practice subtracting decimals using the four-step algorithm of 1) Estimate the total. 2) Arrange the numbers involved according to place values. 3) Perform the operation. 4) Check the reasonableness of the answer. • Pupils make stories from given number sentences.	(i) Subtract a decimal number from another decimal up to three decimal places. (ii) Subtract successively any two decimal numbers up to three decimal places. (iii) Solve problems involving subtraction of decimal numbers.	Emphasise performing subtraction of decimal numbers by writing the number sentence in the vertical form. Emphasise the alignment of place values and decimal points. Emphasise subtraction using the four-step algorithm. The minuend should be of a bigger value than the subtrahend. 8.321 – 4.241 = 4.080 minuend / subtrahend / difference	vertical place value decimal point estimation range decimal numbers

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Learning Area : MULTIPLICATION OF DECIMAL NUMBERS

LEARNING OBJECTIVES *Pupils will be taught to…*	SUGGESTED TEACHING AND LEARNING ACTIVITIES	LEARNING OUTCOMES *Pupils will be able to…*	POINTS TO NOTE	VOCABULARY
4 Multiply decimal numbers up to three decimal places with a whole number.	• Multiply decimal numbers with a number using horizontal and vertical form. • Pupils practice subtracting decimals using the four-step algorithm 1) Estimate the total. 2) Arrange the numbers involved according to place values. 3) Perform the operation. 4) Check the reasonableness of the answer. • Pupils create stories from given number sentences.	(i) Multiply any decimal numbers up to three decimal places with a) a one-digit number, b) a two-digit number, c) 10, 100 and 1000. (ii) Solve problems involving multiplication of decimal numbers.	Emphasise performing multiplication of decimal numbers by writing the number sentence in the vertical form. Emphasise the alignment of place values and decimal points. Apply knowledge of decimals in: a) money, b) length, c) mass, d) volume of liquid.	vertical form decimal point estimation range product horizontal form

Learning Area : DIVISION OF DECIMAL NUMBERS

LEARNING OBJECTIVES *Pupils will be taught to…*	SUGGESTED TEACHING AND LEARNING ACTIVITIES	LEARNING OUTCOMES *Pupils will be able to…*	POINTS TO NOTE	VOCABULARY
5 Divide decimal numbers up to three decimal places by a whole number.	• Pupils practice subtracting decimals using the four-step algorithm of 1) Estimate the total. 2) Arrange the numbers involved according to place values. 3) Perform the operation. 4) Check the reasonableness of the answer. • Pupils create stories from given number sentences.	(i) Divide a whole number by a) 10 b) 100 c) 1 000 (ii) Divide a whole number by a) a one-digit number, b) a two-digit whole number, (iii) Divide a decimal number of three decimal places by a) a one-digit number b) a two-digit whole number c) 10 d) 100. (iv) Solve problem involving division of decimal numbers.	Emphasise division using the four-steps algorithm. Quotients must be rounded off to three decimal places. Apply knowledge of decimals in: a) money, b) length, c) mass, d) volume of liquid.	divide quotient decimal places rounded off whole number

Learning Area : PERCENTAGE

LEARNING OBJECTIVES *Pupils will be taught to…*	SUGGESTED TEACHING AND LEARNING ACTIVITIES	LEARNING OUTCOMES *Pupils will be able to…*	POINTS TO NOTE	VOCABULARY
1 Understand and use percentage.	• Pupils represent percentage with hundred squares. • Shade parts of the hundred squares. • Name and write the fraction of the shaded parts to percentage.	(i) Name and write the symbol for percentage. (ii) State fraction of hundredths in percentage. (iii) Convert fraction of hundredths to percentage and vice versa.	The symbol for percentage is % and is read as 'percent', e.g. 25 % is read as 'twenty-five percent'. The hundred squares should be used extensively to easily convert fractions of hundredths to percentage. e.g. a) $\dfrac{16}{100}$ = 16% b) 42% = $\dfrac{42}{100}$	percent percentage

LEARNING OBJECTIVES *Pupils will be taught to…*	SUGGESTED TEACHING AND LEARNING ACTIVITIES	LEARNING OUTCOMES *Pupils will be able to…*	POINTS TO NOTE	VOCABULARY
2 Relate fractions and decimals to percentage.	• Identify the proper fractions with the denominators given.	(i) Convert proper fractions of tenths to percentage. (ii) Convert proper fractions with the denominators of 2, 4, 5, 20, 25 and 50 to percentage. (iii) Convert percentage to fraction in its simplest form. (iv) Convert percentage to decimal number and vice versa.	e.g. $$\frac{5}{10} \to \frac{5}{10} \times \frac{10}{10} = \frac{50}{100} \to 50\%$$ $$\frac{7}{25} \to \frac{7}{25} \times \frac{4}{4} = \frac{28}{100} \to 28\%$$ $$35\% \to \frac{35}{100} = \frac{35}{100} \div \frac{5}{5} \to \frac{7}{20}$$	

Topic 5: MONEY

Learning Area : MONEY TO RM100 000

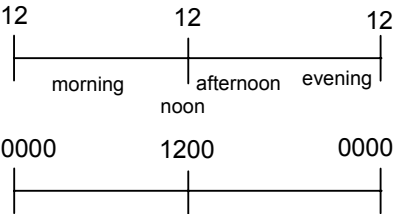| LEARNING OBJECTIVES *Pupils will be taught to…*	SUGGESTED TEACHING AND LEARNING ACTIVITIES	LEARNING OUTCOMES *Pupils will be able to…*	POINTS TO NOTE	VOCABULARY
1 Understand and use the vocabulary related to money.	• Pupils show different combinations of notes and coins to represent a given amount of money.	(i) Read and write the value of money in ringgit and sen up to RM100 000.		RM sen note value

2 Use and apply mathematics concepts when dealing with money up to RM100 000.	• Pupils perform basic and mixed operations involving money by writing number sentences in the horizontal and vertical form.
	
	• Pupils create stories from given number sentences involving money in real context, for example,
	
	  a) Profit and loss in trade
	
	  b) Banking transaction
	
	  c) Accounting
	
	  d) Budgeting and finance management
		(i) Add money in ringgit and sen up to RM100 000.
		
		(ii) Subtract money in ringgit and sen within the range of RM100 000.
		
		(iii) Multiply money in ringgit and sen with a whole number, fraction or decimal with products within RM100 000.
		
		(iv) Divide money in ringgit and sen with the dividend up to RM100 000.
		
		(v) Perform mixed operation of multiplication and division involving money in ringgit and sen up to RM100 000.
			When performing mixed operations, the order of operations should be observed.
			
			Example of mixed operation involving money,
			
			$RM62\,000 \div 4 \times 3 = ?$
			
			Avoid problems with remainders in division, e.g.,
			
			$RM75\,000.10 \div 4 \times 3 = ?$
				total
				
				amount
				
				range
				
				dividend
				
				combination

LEARNING OBJECTIVES *Pupils will be taught to…*	SUGGESTED TEACHING AND LEARNING ACTIVITIES	LEARNING OUTCOMES *Pupils will be able to…*	POINTS TO NOTE	VOCABULARY

	• Pupils solve problems following Polya's four-step algorithm and using some of the common problem solving strategies.	(vi) Solve problems in real context involving money in ringgit and sen up to RM100 000.	Pose problem in form of numericals, simple sentences, graphics and stories.
			
			Polya's four-step algorithm
			
			  1) Understanding the problem
			
			  2) Devising a plan
			
			  3) Implementing the plan
			
			  4) Checking the solution
			
			Examples of the common problem solving strategies are
			
			• Drawing diagrams
			
			• Making a list
			
			• Using formula
			
			• Using tools	

Learning Area : READING AND WRITING TIME

LEARNING OBJECTIVES *Pupils will be taught to…*	SUGGESTED TEACHING AND LEARNING ACTIVITIES	LEARNING OUTCOMES *Pupils will be able to…*	POINTS TO NOTE	VOCABULARY
1 Understand the vocabulary related to time.	• Pupils tell the time from the digital clock display. • Design an analogue clock face showing time in the 24-hour system.	(i) Read and write time in the 24-hour system. (ii) Relate the time in the 24-hour system to the 12-hour system.	Some common ways to read time in the 24-hour system. e.g. Say : Sixteen hundred hours Write: 1600hrs Say: Sixteen zero five hours Write: 1605hrs Say: zero hundred hours Write: 0000hrs	ante meridiem post meridiem analogue clock digital clock. 24-hour system 12-hour system

LEARNING OBJECTIVES *Pupils will be taught to…*	SUGGESTED TEACHING AND LEARNING ACTIVITIES	LEARNING OUTCOMES *Pupils will be able to…*	POINTS TO NOTE	VOCABULARY
	• Pupils convert time by using **the number line** 12 12 12 |————|————| morning afternoon evening noon 0000 1200 0000 |————|————| **the clock face** 	(iii) Convert time from the 24-hour system to the 12-hour system and vice-versa.	Examples of time conversion from the 24-hour system to the 12-hour system. e.g. a) 0400hrs ↔ 4.00 a.m. b) 1130hrs ↔ 11.30 a.m. c) 1200hrs ↔ 12.00 noon d) 1905hrs ↔ 7.05 p.m. e) 0000hrs ↔12.00 midnight **a.m.** ante meridiem refers to the time after midnight before noon. **p.m.** post meridiem refers to the time after noon before midnight.	a.m p.m

Learning Area : RELATIONSHIP BETWEEN UNITS OF TIME

LEARNING OBJECTIVES *Pupils will be taught to…*	SUGGESTED TEACHING AND LEARNING ACTIVITIES	LEARNING OUTCOMES *Pupils will be able to…*	POINTS TO NOTE	VOCABULARY

2 Understand the relationship between units of time.	• Pupils convert from one unit of time
	
	• Pupils explore the relationship between centuries, decades and years by constructing a time conversion table.
		(i) Convert time in fractions and decimals of a minute to seconds.
		
		(ii) Convert time in fractions and decimals of an hour to minutes and to seconds.
		
		(iii) Convert time in fractions and decimals of a day to hours, minutes and seconds.
		
		(iv) Convert units of time from
		
		   a) century to years and vice versa.
		
		   b) century to decades and vice versa.
			Conversion of units of time may involve proper fractions and decimals.
			
			  a) 1 century = 100 years
			
			  b) 1 century = 10 decade
				century
				
				decade

Topic 6: TIME

Learning Area : BASIC OPERATIONS INVOLVING TIME

Year 5

LEARNING OBJECTIVES *Pupils will be taught to…*	SUGGESTED TEACHING AND LEARNING ACTIVITIES	LEARNING OUTCOMES *Pupils will be able to…*	POINTS TO NOTE	VOCABULARY

3 Add, subtract, multiply and divide units of time.	• Pupils add, subtract, multiply and divide units of time by writing number sentences in the horizontal and vertical form.
	
	e.g.
	
	    5 hr 20 min 30 s
	+ 2 hr 25 min 43 s
	――――――――――――
	
	    4 hr 45 min 12 s
	- 2 hr 30 min 52 s
	――――――――――――
	
	    2 hr 15 min 9 s
	× 7
	――――――――――――
	
	4 ⟌ 13 hours 13 minutes
		(i) Add time in hours, minutes and seconds.
		
		(ii) Subtract time in hours, minutes and seconds.
		
		(iii) Multiply time in hours, minutes and seconds.
		
		(iv) Divide time in hours, minutes and seconds.
			Practise mental calculation for the basic operations involving hours, minutes and seconds.
			
			Limit
			
			a) multiplier to a one-digit number,
			
			b) divisor to a one-digit number and
			
			c) exclude remainders in division.
				multiplier
				
				divisor
				
				remainders
				
				minutes
				
				hours
				
				seconds
				
				days
				
				years
				
				months

Topic 6: TIME

Learning Area : DURATION

LEARNING OBJECTIVES *Pupils will be taught to…*	SUGGESTED TEACHING AND LEARNING ACTIVITIES	LEARNING OUTCOMES *Pupils will be able to…*	POINTS TO NOTE	VOCABULARY
4 Use and apply knowledge of time to find the duration.	• Pupils read and state information from schedules such as: a) class time-table, b) fixtures in a tournament c) public transport, etc • Pupils find the duration the start and end time from a given situation.	(i) Identify the start and end times of are event. (ii) Calculate the duration of an event, involving a) hours, minutes and seconds. b) days and hours (iii) Determine the start or end time of an event from a given duration of time. (iv) Solve problems involving time duration in fractions and/or decimals of hours, minutes and seconds.	Expose pupils to a variety of schedules. Emphasise the 24-hour system. The duration should not be longer than a week.	duration schedule event start end competition hours minutes 24-hour system period fixtures tournament

LEARNING OBJECTIVES *Pupils will be taught to…*	SUGGESTED TEACHING AND LEARNING ACTIVITIES	LEARNING OUTCOMES *Pupils will be able to…*	POINTS TO NOTE	VOCABULARY
1 Measure and compare distances.	• Teacher provides experiences to introduce the idea of a kilometre. e.g. Walk a hundred-metre track and explain to pupils that a kilometre is ten times the distance. • Use a simple map to measure the distances to one place to another. e.g. a) school b) village c) town	(i) Describe by comparison the distance of one kilometre. (ii) Measure using scales for distance between places.	Introduce the symbol 'km' for kilometre. Relate the knowledge of data handling (pictographs) to the scales in a simple map. represents 10 pupils. represents 5 km 1 cm	kilometre distance places points destinations between record map scale

LEARNING OBJECTIVES *Pupils will be taught to…*	SUGGESTED TEACHING AND LEARNING ACTIVITIES	LEARNING OUTCOMES *Pupils will be able to…*	POINTS TO NOTE	VOCABULARY
2 Understand the relationship between units of length.	• Compare the length of a metre string and a 100-cm stick, then write the relationship between the units. • Pupils use the conversion table for units of length to convert length from km to m and vice versa.	(i) Relate metre and kilometre. (ii) Convert metre to kilometre and vice versa.	Emphasise relationships. 1 km = 1000 m 1 m = 100 cm 1 cm = 10 mm Practice mental calculation giving answers in mixed decimals.	measurement relationship

Topic 7: LENGTH

Learning Area : BASIC OPERATIONS INVOLVING LENGTH

LEARNING OBJECTIVES *Pupils will be taught to…*	SUGGESTED TEACHING AND LEARNING ACTIVITIES	LEARNING OUTCOMES *Pupils will be able to…*	POINTS TO NOTE	VOCABULARY
3 Add, subtract, multiply and divide units of length.	• Pupils demonstrate addition and subtraction involving units of length using number sentences in the usual conventional manner. e.g. a) 2 km + 465 m = _____ m b) 3.5 km + 615 m = _____ km c) 12.5 km – 625 m = _____ m • Pupils multiply and divide involving units of length. e.g. a) 7.215 m ×1 000 = _____km b) 2.24 km ÷ 3 = _____m Create stories from given number sentence.	(i) Add and subtract units of length involving conversion of units in a) kilometres , b) kilometres and metres. (ii) Multiply and divide units of length in kilometres involving conversion of units with a) a one-digit number, b) 10, 100, 1 000. (iii) Identify operations in a given situation. (iv) Solve problems involving basic operations on length.	Give answers in mixed decimals to 3 decimal places. Check answers by performing mental calculation wherever appropriate.	add subtract conversion mixed decimal multiply quotient
-				

LEARNING OBJECTIVES *Pupils will be taught to…*	SUGGESTED TEACHING AND LEARNING ACTIVITIES	LEARNING OUTCOMES *Pupils will be able to…*	POINTS TO NOTE	VOCABULARY
1 Compare mass of objects.	• Pupils measure, read and record masses of objects in kilograms and grams using the weighing scale and determine how many times the mass of an object as compared to another.	(i) Measure and record masses of objects in kilograms and grams. (ii) Compare the masses of two objects using kilogram and gram, stating the comparison in multiples or fractions. (iii) Estimate the masses of objects in kilograms and grams.	Emphasise that measuring should start from the '0' mark of the weighing scale. Encourage pupils to check accuracy of estimates.	read weighing scale divisions weight weigh compare record compound
2 Understand the relationship between units of mass.	• Pupils make stories for a given measurement of mass. e.g. Aminah bought 4 kg of cabbages and 500 g celery. Altogether, she bought a total of 4.5 kg vegetables.	(i) Convert units of mass from fractions and decimals of a kilogram to grams and vice versa. (ii) Solve problems involving conversion of mass units in fraction and/or decimals.	Emphasise relationships. 1 kg = 1000 g Emphasise mental calculations. Emphasise answers in mixed decimals up to 3 decimal place. e.g. a) 3 kg 200 g = 3.2 kg b) 1 kg 450 g = 1.45 kg c) 2 kg 2 g = 2.002 kg	measurement relationship

Learning Area : COMPARING VOLUME

LEARNING OBJECTIVES *Pupils will be taught to…*	SUGGESTED TEACHING AND LEARNING ACTIVITIES	LEARNING OUTCOMES *Pupils will be able to…*	POINTS TO NOTE	VOCABULARY
1 Measure and compare volumes of liquid using standard units.	• Pupils measure, read and record volume of liquid in litres and mililitres using beaker, measuring cylinder, etc. • Pupils measure and compare volume of liquid stating the comparison in multiples or factors.	(i) Measure and record the volumes of liquid in a smaller metric unit given the measure in fractions and/or decimals of a larger uniit. (ii) Estimate the volumes of liquid involving fractions and decimals in litres and mililitres. (iii) Compare the volumes of liquid involving fractions and decimals using litres and mililitres.	Capacity is the amount a container can hold. Emphasise that reading of measurement of liquid should be at the bottom of the meniscus. $1\ell = 1000\text{ m}\ell$ $\frac{1}{2}\ell = 0.5\ \ell = 500\text{ m}\ell$ $\frac{1}{4}\ell = 0.25\ \ell = 250\text{ m}\ell$ $\frac{3}{4}\ell = 0.75\text{ m}\ell = 750\text{ m}\ell$ Encourage pupils to check accuracy of estimates.	read meniscus record capacity measuring cylinder water level beaker measuring jug divisions

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Learning Area : RELATIONSHIP BETWEEN UNITS OF VOLUME

LEARNING OBJECTIVES *Pupils will be taught to…*	SUGGESTED TEACHING AND LEARNING ACTIVITIES	LEARNING OUTCOMES *Pupils will be able to…*	POINTS TO NOTE	VOCABULARY
2 Understand the relationship between units of volume of liquid.	• Engage pupils in activities that will create an awareness of relationship. • Pupils make stories from a given number sentence involving volume of lquid.	(i) Convert unit of volumes involving fractions and decimals in litres and vice-versa. (ii) Solve problem involving volume of liquid.	Emphasise relationships. $1\,\ell = 1\,000\,\text{m}\,\ell$ Emphasise mental calculations. Emphasise answers in mixed decimals up to 3 decimal places. e.g. a) $400\,\text{m}\,\ell = 0.4\,\ell$ b) $250\,\text{m}\,\ell = \frac{1}{4}\,\ell$ c) $4750\,\text{m}\,\ell = 4.75\,\ell$ $\quad = 4\frac{3}{4}\,\ell$ d) $3\frac{2}{5}\,\ell = 3.4\,\ell$ $\quad = 3400\,\text{m}\,\ell$ $\quad = 3\,\ell\,400\,\text{m}\,\ell$ Include compound units.	measurement relationship

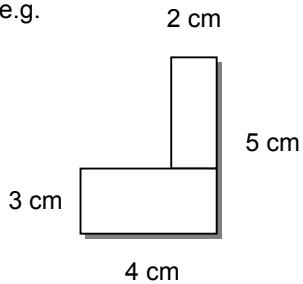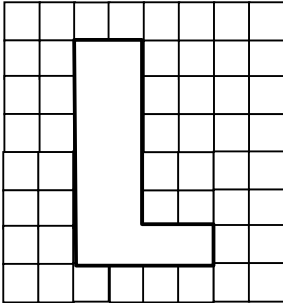| LEARNING OBJECTIVES *Pupils will be taught to…*	SUGGESTED TEACHING AND LEARNING ACTIVITIES	LEARNING OUTCOMES *Pupils will be able to…*	POINTS TO NOTE	VOCABULARY
3 Add and subtract units of volume.	• Pupils carry out addition up to 3 numbers involving mixed decimals in litres and millitres .	(i) Add units of volume involving mixed decimals in a) litres, b) mililitres, c) litres and mililitres. (ii) Subtract units of volume involving mixed decimals in a) litres, b) mililitres, c) litres and mililitres.	Emphasise answers in mixed decimals up to 3 decimals places. e.g: a) 0.607 ℓ + 4.715 ℓ = b) 4.052 ℓ + 5 ℓ + 1.46 ℓ = c) 642 m ℓ + 0.523 ℓ +1.2 ℓ = Practice mental calculations.	measurement relationship
4 Multiply and divide units of volume.	• Pupils demonstrate division for units of volume in the conventional manner. • Pupils construct stories about volume of liquids from given number sentences.	(iii) Multiply units of volume involving mixed number using: a) a one-digit number, b) 10, 100, 1000, involving conversion of units. (iv) Divide units of volume using a) up to 2 digit number, b) 10, 100, 1000, involving mixed decimals.	Give answers in mixed decimals to 3 decimals places, e.g. 0.0008 ℓ round off to 0.001 ℓ. Avoid division with remainders. Make sensible estimations to check answers.	

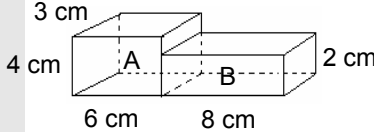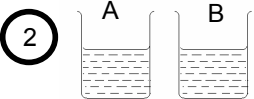| LEARNING OBJECTIVES *Pupils will be taught to…*	SUGGESTED TEACHING AND LEARNING ACTIVITIES	LEARNING OUTCOMES *Pupils will be able to…*	POINTS TO NOTE	VOCABULARY
		(v) Divide unit of volume using: a) a one-digit number, b) 10, 100, 1000, involving conversion of units. (vi) Solve problems involving computations for volume of liquids.		

Learning Area : **COMPOSITE TWO-DIMENSIONAL SHAPES**

LEARNING OBJECTIVES *Pupils will be taught to…*	SUGGESTED TEACHING AND LEARNING ACTIVITIES	LEARNING OUTCOMES *Pupils will be able to…*	POINTS TO NOTE	VOCABULARY
1 Find the perimeter of composite 2-D shapes.	• Use measuring tapes, rulers or string to measure the perimeter of event composite shapes.	(i) Measure the perimeter of the following composite 2-D shapes. a) square and square, b) rectangle and rectangle, c) triangle and triangle, d) square and rectangle, e) square and triangle, f) rectangle and triangle. (ii) Calculate the perimeter of the following composite 2-D shapes. a) square and square, a) rectangle and rectangle, b) triangle and triangle, c) square and rectangle, d) square and triangle, e) rectangle and triangle. (iii) Solve problems involving perimeters of composite 2-D shapes.	Emphasise using units in cm and m. e.g. 2 cm 5 cm 3 cm 4 cm Emphasise using various combination of 2-D shapes to find the perimeter and area.	shape, combination, square rectangle, triangle, area, calculate

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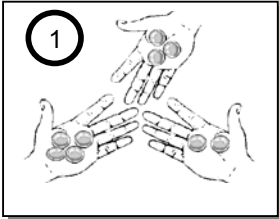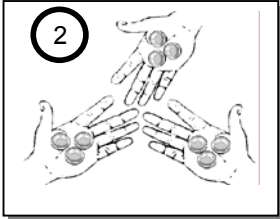| LEARNING OBJECTIVES *Pupils will be taught to…*	SUGGESTED TEACHING AND LEARNING ACTIVITIES	LEARNING OUTCOMES *Pupils will be able to…*	POINTS TO NOTE	VOCABULARY
2 Find the area of composite 2-D shapes.	• Pupils count the unit squares to find the area of composite 2-D shape on the grid paper.	(i) Measure the area of the following composite 2-D shapes. a) square and square, b) rectangle and rectangle, c) square and rectangle, (ii) Calculate the area of the following composite 2-D shapes. square and square, a) rectangle and rectangle, b) square and rectangle, (iii) Solve problems involving areas of composite 2-D shapes.	The units of area should be in cm² and m². Limit shapes to a combination of two basic shapes.	combination, square rectangle, triangle, area, calculate, 2-D shapes.

Learning Area : COMPOSITE THREE-DIMENSIONAL SHAPES

LEARNING OBJECTIVES *Pupils will be taught to…*	SUGGESTED TEACHING AND LEARNING ACTIVITIES	LEARNING OUTCOMES *Pupils will be able to…*	POINTS TO NOTE	VOCABULARY
1 Find the volume of composite 3-D shapes.	• Use any combinations of 3-D shapes to find the surface area and volume.	(i) Measure the volume of the following composite 3-D shapes a) cube and cube, b) cuboid and cuboid, c) cube and cuboid. (ii) Calculate the volume of the composite 3-D shapes following a) cube and cube, b) cuboid and cuboid, c) cube and cuboid. (iii) Solve problems involving volume of composite 3-D shapes.	 3 cm 4 cm A B 2 cm 6 cm 8 cm Volume of cuboid A = 3 cm $\times$ 4 cm $\times$ 6 cm Volume of cuboid B = 2 cm $\times$ 4 cm $\times$ 8 cm The combined volume of cubiod A and B = 72 cm^3 + 64 cm^3 = 136 cm^3 The units of area should be in cm and m.	shape, cube, cuboid, surface area, volume composite 3-D shapes

Learning Area : **AVERAGE**

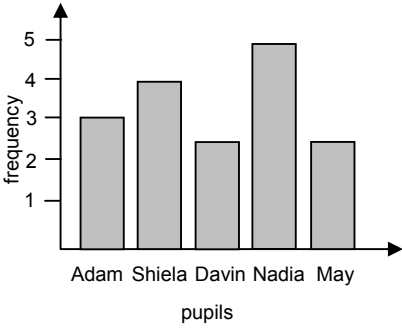| LEARNING OBJECTIVES *Pupils will be taught to…*	SUGGESTED TEACHING AND LEARNING ACTIVITIES	LEARNING OUTCOMES *Pupils will be able to…*	POINTS TO NOTE	VOCABULARY
1 Understand and use the vocabulary related to average.	• Prepare two containers of the same size with different volumes of liquid. • Equal the volume of liquid from the two containers. e.g. e.g. • Relate the examples given to determine the average using the formula.	(i) Describe the meaning of average. (ii) State the average of two or three quantities. (iii) Determine the formula for average.	The formula for average $$Average = \frac{total\ of\ quantity}{number\ of\ quantity}$$	average calculate quantities total of quantity number of quantities objects liquids volume

Learning Area : AVERAGE

LEARNING OBJECTIVES *Pupils will be taught to…*	SUGGESTED TEACHING AND LEARNING ACTIVITIES	LEARNING OUTCOMES *Pupils will be able to…*	POINTS TO NOTE	VOCABULARY
2 Use and apply knowledge of average.	• Calculate the average of two numbers. • Calculate the average of three numbers. • Pose problems involving real life situation.	(i) Calculate the average using formula. (ii) Solve problem in real life situation.	Emphasise the calculation of average without involving remainders. Emphasise the calculation of average involving numbers, money, time, length, mass, volume of liquid and quantity of objects and people. e.g. Calculate the average 25, 86 and 105. $$\frac{25+86+105}{3}=\frac{216}{3}=72$$	remainders number money time length mass volume of liquid people quantity of objects

Learning Area : ORGANISING AND INTERPRETING DATA

LEARNING OBJECTIVES *Pupils will be taught to…*	SUGGESTED TEACHING AND LEARNING ACTIVITIES	LEARNING OUTCOMES *Pupils will be able to…*	POINTS TO NOTE	VOCABULARY
1 Understand the vocabulary relating to data organisation in graphs.	• Discuss a bar graph showing the frequency, mode, range, maximum and minimum value. e.g. Number of books read by five pupils in February	(i) Recognise frequency, mode, range, maximum and minimum value from bar graphs.	Initiate discussion by asking simple questions. Using the example in the Suggested Teaching and Learning Activities column, ask questions that introduce the terms, e.g. 1) How many books did Adam read? (frequency) 2) What is the most common number of books read? (mode) 3) Who read the most books? (maximum)	frequency mode range maximum minimum data table score chart graph organise interpret
2 Organise and interpret data from tables and charts.	• Pupils transform data tables to bar graphs. 	(ii) Construct a bar graph from a given set of data. (iii) Determine the frequency, mode, range, average, maximum and minimum value from a given graph.	From the data table, What is the most common score? (mode) Arrange the scores for one of the tests in order, then determine the maximum and minimum score. The range is the difference between the two scores.	

Number of books read by five pupils in February (frequency axis, values 1–5; pupils: Adam, Shiela, Davin, Nadia, May)

Name	Reading test score	Mental Arithmetic test score
Adam	10	8
Davin	7	10
May	9	8

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