Nguzu Nguzu Mathematics

Teacher's Guide



Standard 4

Reprinted in 2004 with assistance from the New Zealand Agency for International Development (NZAID).

First edition 2002

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Mathematics Syllabus

PRIMARY MATHEMATICS SYLLABUS

STANDARDS FOUR TO SIX



MINISTRY OF EDUCATION AND TRAINING 2002



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Foreword

The development of this new Primary Mathematics Syllabus for Standards One to Six has arisen from a desire to make mathematics teaching and learning more relevant to the needs of children in Solomon Islands.

The syllabus reflects the principle that children learn by being involved in practical activity, for it is only through first hand experience and practical application of mathematics that children can later conceptualise the abstract.

The practical teaching methodology emphasised in the syllabus is of equal importance to the body of knowledge and skills it contains. A lecturing style of teaching is not an effective approach to teach mathematics concepts at the primary level.

The accompanying teaching and learning materials (teacher's in-service course, teachers' guides and pupils' texts, cards and games) place mathematics in a local context, using examples and situations which are familiar to Solomon Islands children and teachers.

The body of mathematical experiences, skills and knowledge contained in the syllabus is presented in a sequential arrangement, with later stages depending on the successful assimilation of earlier ones. The teacher is urged to carefully monitor the progress of the children, making sure that topics are fully understood before moving on to the next.

The teaching of two mathematics lessons each day has, in the past, led to fragmentation and confusion. The needs of the children have become overlooked by teachers who are more concerned with following the pre-written daily lessons. It is now considered more suitable that there should be one mathematics lesson per day, of about fifty minutes. This will allow time for exposition by the teacher as well as practical activity by the children. The daily lesson is not pre-written in the teacher's guide. Suggested activities are included and the teacher must plan the lesson to meet the specific needs of the class and the individual child.

As the Minister responsible for the provision of education services in Solomon Islands, I now endorse the approval of this syllabus for use in Primary Schools throughout Solomon Islands.

Honourable William Gigini

Minister for Education and Training

May 2001

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Rationale for the inclusion of mathematics in the primary curriculum

A knowledge of mathematics is essential for all Solomon Islands children if they are to fully participate in life, both at the present time and in the future.

Mathematics is not just something to be learned by children for later use in adult life. Mathematics is part of everyday life for children today. All children continually make judgements which are based upon their mathematical skills and understanding, such as judgements about quantity, distance, size, time and shape. Many children's games, activities and pastimes involve the use of mathematical skills and concepts.

As children grow into adults, the level of mathematical skills they require increases in range and sophistication. We do not know what the future holds for children currently in primary schools, but we do know that the world is changing at a rapid rate. In order to cope with these changes, children must be able to use their mathematical skills with confidence, they must be able to adapt their skills to suit different situations and they must be able to solve problems using many different strategies.

Throughout this Teacher's Guide, at the beginning of each unit, an explanation is given to the teacher to explain the importance of each of the objectives and to help to justify the inclusion of various topics. Teachers should always try to keep this rationale in mind when teaching, when providing learning experiences and when making assessments of pupils' progress in their understanding of the concepts and their ability to carry out the practical skills involved.

Aims of Mathematics Education

This syllabus has been developed in accordance with the following aims:

- 1. to introduce mathematical concepts through relevant first-hand experience in real situations, working from the real to the abstract
- 2. to make mathematics relevant to the local environment and culture
- 3. to involve the children in practical activities and games which are most relevant to their age and experience
- 4. to encourage the planning and presentation of lively, varied and interesting lessons
- 5. to encourage the children to use their mathematical skills in practical and problem solving situations
- 6. to encourage children to appreciate the aesthetic nature of mathematics
- 7. to encourage exploration and investigation
- 8. to encourage children to talk about their mathematics activities, describing what they do and why they do it, so as to deepen their understanding of mathematical concepts.

At the beginning of each unit in the Teacher's Guide, these aims are made more specific to help the teachers understand what pupils are expected to know and do.

Together with these specific aims, sequences of objectives are stated and these form the basis of the teaching methodology throughout the Teacher's Guide.

In other words,

Aims of Mathematics Education \Longrightarrow Aims for each Unit \Longrightarrow Sequence of Objectives for each Topic

Mathematical Themes and Topics

The body of mathematical concepts, skills and knowledge contained in this syllabus is divided into a number of Themes. These are:

- 1. Number
- 2. Shape
- 3. Graphs
- 4. Measurement
- 5. Time
- 6. Money

Within each theme there are a number of topics, which are numbered and arranged in sequence.

For example, in Standard Four the Shape theme contains four topics:

Topic 8: Two-dimensional shapes Topic 9: Three-dimensional shapes

Topic 10: Angles Topic 11: Location.

A clear understanding of Topic 8 is essential before progression is made to Topic 9.

Theme objectives tables showing the knowledge, skills and attitudes expected of children in each theme are included in this syllabus on pages 13-15. Also included are tables showing the expected content of the teaching programme, pages 16 - 27. Each topic in the published Teacher's Guide shows the aims and sequence of objectives for that topic. A Rationale is provided for the teaching of each Topic.

NB In the published syllabus 2001 Primary Mathematics Standard 1 - 6, Topic number 17 has been erroneously omitted from the list of Topics on page 24 in the Standard 5 syllabus. The Theme Measurement therefore begins with Topic number 18.

Four- term Arrangement of Units and Topics

The revised mathematics syllabus takes into account the fact that children learn at different rates and in different ways. For this reason, lessons are not pre-written and the four term arrangement gives the teacher enough flexibility to respond to the needs of the children and the circumstances of the class and school.

Four term arrangement tables are to be found in the teacher's guide. The arrangement below shows a suggested plan to cover all standard four topics in each theme over four terms. A period of about two weeks is appropriate for each topic or pair of topics. This arrangement is a suggestion only. It is not meant to be rigidly followed by every school or every class.

It is quite acceptable, for example, for teachers to plan their work around termly topics and to select the mathematics topics which fit with their general topic.

In a term's topic about food, for example, the mathematics content could include work on making graphs of the children's favourite foods, weighing kumara and role-playing buying and selling at the market.

Standard Four

Term 1	Term 2	Term 3	Term 4
Unit 1	Unit 5	Unit 9	Unit 13
Number	Measurement	Number	Measurement
Topic 1 & 2	Topic 14	Topic 5	Topic 15
Unit 2	Unit 6	Unit 10	Unit 14
Measurement	Number	Shape	Number
Topic 13	Topic 4	Topic 11	Topic 7
Unit 3	Unit 7	Unit 11	Unit 15
Shape	Money	Graphs	Time
Topic 8 & 9	Topic 19	Topic 12	Topic 17 & 18
Unit 4	Unit 8	Unit 12	Unit 16
Number	Shape	Number	Measurement
Topic 3	Topic 10	Topic 6	Topic 16

Standard Five

Term 1	Term 2	Term 3	Term 4
Unit 1	Unit 6	Unit 11	Unit 16
Number	Number	Number	Number
Topics 1 & 2	Topic 6	Topic 7	Topic 9
Unit 2	Unit 7	Unit 12	Unit 17
Shape	Measurement	Shape	Measurement
Topics 10 & 11	Topics 19 & 20	Topic 14	Topic 23
Unit 3	Unit 8	Unit 13	Unit 18
Number	Shape	Number	Time
Topics 3 & 4	Topic 12 & 13	Topic 8	Topic 25
Unit 4	Unit 9	Unit 14	Unit 19
Measurement	Measurement	Graphs	Money
Topic 18	Topic 21	Topic 16	Topic 26
Unit 5	Unit 10	Unit 15	Unit 20
Number	Time	Measurement	Shape
Topic 5	Topic 24	Topic 22	Topic 15

 $\underline{\text{NB}^*}$ There is no Topic 17 in the Standard Five syllabus

Standard Six

Term 1	Term 2	Term 3	Term 4
Unit 1	Unit 5	Unit 9	Unit 13
Number	Number	Number	Measurement
Topic 1	Topic 3	Topic 5	Topic 13
Unit 2	Unit 6	Unit 10	Unit 14
Measurement	Graphs	Shape and Space	Money
Topic 12	Topic 10	Topic 7	Topic 16
Unit 3	Unit 7	Unit 11	Unit 15
Number	Number	Shape and Space	Shape and Space
Topic 2	Topic 4	Topic 9	Topic 8
Unit 4	Unit 8	Unit 12	Unit 16
Shape and Space	Time	Graphs	Measurement
Topic 6	Topic 15	Topic 11	Topic 14

Scope and Sequence

The following pages contain the scope and sequence tables for Standards Four, Five and Six. Each scope and sequence table includes theme titles, numbered topics and the recommended teaching and learning objectives for each topic. The teaching methodology and suggested objectives are of equal importance to the content of the syllabus.

There are Theme Objectives Tables for each year (standard 4 - 6). These tables link up mathematical knowledge with the necessary skills that should be achieved and with important attitudes towards mathematics that should be developed. For example, under the theme Number it can be seen (page 13-15):

Knowledge	Skills	Attitudes
 the nature and structure of the place 	 reading, writing and ordering numbers up 	 the recognition that mathematics is
value number system 0 - 99,999	to 99,999	relevant to their daily lives

The content of these tables are important reference points for teachers when developing useful and relevant classroom experiences and when devising assessment opportunities to test if pupils have made appropriate progress. These tables should be referred to continuously when planning lessons and when discussing pupils' performance with the headteacher, the pupils and parents.

The Content of the Syllabus is listed for each Theme under the heading Topics and Objectives (page 16 - 27). These objectives are given also at the beginning of each teaching section in the Teacher's Guide from page 34 onwards. Teachers should use this guide by linking up the objectives with the methodology that is provided for each and every objective. The methodology has a number of features:

Advice is given in the section to help teachers devise the teaching aspects of their work. This advice usually consists of ideas for introducing the topic, the concrete materials that are relevant, important mathematics language and symbols (notation), appropriate activities for the teachers to do and suggestions for the blackboard layout or other means to make the lesson interesting, lively and meaningful.

The section is the basis for lesson planning

b This section is followed by a section which consists of advice to the teacher on how to follow up the teaching with the 'pupils activities'. The two sections are numbered to link with the objective. For example: T1 and C1 will relate to the first objective in the section. There may be more than one T1 and C1. They are then followed by T2 and C2. Answers to the pupil's book activities are also provided.

The teachers should be careful not to move on to the next T2 and C2 section until the previous T1 and C1 sections are well understood and practised.

- c Another important feature in the methodology is the use of games. Teachers should take time to arrange for pupils to play mathematical games such as Bingo and Time race and to ensure that pupils know why they are playing the game and what it is they are trying to learn and understand.
- **d** A great deal of attention is given to the use concrete materials. Teachers should always follow this sequence of learning in mathematics.

	\Rightarrow	Link materials to pictures, diagrams and mathematical	\Rightarrow	Practise procedures using notation
language		symbols		

Theme Objectives Tables

Themes	objectives:	Standard Four	
Themes	Children should have knowledge of	Children should have skills in	Children's attitudes should include
Numbers	the nature and structure of the place value number system 0 - 99,999 the concept of addition and subtraction of 3- and 4-digit numbers with and without regrouping and trading the concept of rounding whole numbers to the nearest ten, hundred and thousand the concept of even and odd numbers multiplying and dividing 2- and 3-digit numbers by a single number the concept of mixed number fractions, decimal fractions and fractional notations the meaning of the decimal points in money and measurement notation	reading, writing and ordering numbers up to 99,999 adding and subtracting numbers including regrouping and trading multiplying 2- and 3- digit numbers by a single digit using the multiplication table from 6 - 10 division by a single digit number using the standard notation developing mental addition and subtraction strategies recognising odd and even numbers rounding to the nearest ten, hundred and thousand recognising, comparing and ordering mixed number fractions, decimal fractions for money and measurement and the correct notation	the recognition that mathematics is relevant to their daily lives an appreciation of mathematics as a useful tool an appreciation of the structure and patterns of the odd and even number system the willingness to solve addition, subtraction, multiplication and division problems
Shape	5 to 8 sided regular two- dimensional shapes and their properties how certain two-dimensional shapes can fit together and make patterns the properties of three-dimensional solids folded and unfolded the appropriate words to explain angles as the measurement of a turn the concept of co-ordinates to describe a location in a map	recognising and naming regular shapes in the environment investigating properties and making simple patterns of regular shapes recognising, formulating and constructing nets of three-dimensional solids recognising and describing the relationship between shapes and angles finding a location on a map using two coordinates, a letter and a number	 an appreciation of the nature of regular shapes in the environment the recognition and appreciation of the properties and patterns in regular shapes a willingness to construct three-dimensional solids from nets an appreciation of different angles in regular shapes and how they fit together
Graphs	the use of vertical and horizontal graphs for illustrating and interpreting information	collecting data from tally charts and tables of information representing and reading data on vertical and horizontal bar graphs	an appreciation that information can be collected, represented and readily retrieved and interpreted from graphs
Measurement	estimating lengths, weights and capacity in measurement the standard units of measurement for lengths, areas, weight and capacity the concept of kilometre calculating areas using the standard notation in measurement the concept of probability	making accurate estimates in cm and m when measuring making accurate estimates in kg, g, and l, ml the use of standard units of measurement using measuring devices such as rulers, metres, sticks, containers and scales the use of the formula A = L x W to measure areas of squares and shapes made up of squares and rectangles using appropriate words such as, likely, unlikely and impossible to describe events in sentences	 an appreciation that an estimate is relevant prior to accurate measurement the recognition that there is a need for standard units to measure lengths, weights and capacity an appreciation that a special formula (A = L x W) is used to measure areas of shapes made up of squares and rectangles
Time	the concept of units of time in hours, minutes and seconds passage of time such as in hours and minutes, am and pm the 12 hour clock estimating, calculating, converting and recording events within the units of time	recognising and reading am and pm time recognising, saying and reading 12 hour clock in time tables and schedules recognising the relationship between units of time estimating, calculating, converting and recording events and passage of time using units of time	an appreciation that time is relevant to their daily lives an appreciation that measuring, recording and saying time intervals in seconds, minutes and hours is relevant in their daily lives
Money	the concept of decimal notation of money the way in which money is used in computation	recognising and recording the standard notation of money computing amounts, prices and change developing mental strategies to solve money problems	the recognition that money coins and notes are relevant in their daily lives an appreciation that problem solving with money is a useful tool in every day lives



Mathematics syllabus

• the recognition that computation is	 solving problems involving computation of money 	 money computation 	Money
 an appreciation that measuring, recording and saying 24 hour time intervals in seconds, minutes and hours is relevant in their daily lives. the recognition that devising non standard ways to measure time is useful in their daily lives 	using the standard notation of time reading, writing and saying the 24 hour timetables and schedules calculating time intervals in the 24 hour clock devising non standard ways of measuring time	 the 24 hour clock schedules and timetables measuring time using non standard units of measurement 	I
an appreciation that 24 hour time	temperature and keeping a record of air temperatures using fractions to describe the probability of an event	 using fractions to describe the probability of events the probability of ½ as the representation of 'even chance' 	Time
used to measure and calculate areas of triangles and volumes of boxes the recognition that there is a relationship between units of measurement in length, weight and volume an appreciation that scale drawings, plans, thermometers and probability are relevant in our daily lives	 scale scale scale using the appropriate formula for calculating volumes of boxes (V = L x B x H) in m³ and cm³ the use of formula A = L x W to calculate areas of squares and rectangles and composite shapes in cm² and m² the use of formula A rea = ½ base x height to calculate areas of a triangle the use of thermometer to measure 	 decimal notation as it relates to 0.5 = ½ the relationship between units of weight: g/ kg, kg/ tonnes the concept of weight and volume and their appropriate units of measurement calculating areas of squares, rectangles and triangles the use of degree Celsius as a measure of temperatine 	
collected, represented and readily retrieved and interpreted from line graphs the recognition that a line graph is another way of representing data collected from tables of information the recognition that standard units are necessary in measuring and calculating lengths, weights and volumes an appreciation that a special formula is	and vertical bar graphs reading and interpreting information in line graphs constructing line graphs from tables of information constructing line graphs using co-ordinates. calculating lengths including cm, mm and m and weights in grams and kilograms including 2.5 m, 3.5kg calculating distance on a map using a	ing nd	Measurement
 an appreciation of the presence of circles and circle patterns in their local environment the recognition of the properties of circles the appreciation of irregular shapes in the local environment an appreciation that reflection is a way of constructing irregular shapes an appreciation of the nature and the structure of two-dimensional shapes an willingness to construct pyramids and prisms from nets the recognition of pyramids and prisms in the local environment the recognition of angles in the local environment an appreciation that angle measurement and location are relevant in their daily lives 			Shape
Children's attitudes should include the recognition that mathematics is relevant to their daily lives an appreciation of mathematics as a useful tool an appreciation of the structure and patterns of negative and square numbers the recognition that algorithms are necessary in addition, subtraction, multiplication and division the willingness to solve addition, subtraction, multiplication and division problems the recognition that fractions, decimals and percentages are relevant in their daily lives	Children should have skills in Children should have skills in reading, writing and ordering numbers up to one million exploring, recognising and sequencing negative and square numbers adding and subtracting 5- and 6- digit numbers adding and subtracting 5- and 6- digit numbers multiplying 2- digit and 3- digit numbers by 2-digit numbers developing mental strategies in addition, subtraction and multiplication the use of division algorithm in division adding and subtracting fractions with the same denominator recognising, exploring and investigating relationships between fractions and percentage equivalence	Children should have knowledge of the nature and structure of the number system 0 - 1,000,000 the concept and properties of whole numbers and their place value addition and subtraction of 5- and 6-digits numbers multiplying 2- and 3-digit numbers by 2-digit numbers dividing by a single digit number with remainder the concept of equivalence in fractions and decimal fractions the concept of percentages	Themes Numbers



Mathematics Syllabus

Themes	objectives:	Standard Six	
Themes	Children should have knowledge of	Children should have skills in	達
Numbers	the nature and structure of a number system up to 5- and 6-digits adding and subtracting large numbers up to 5- and 6- digits the concept of estimates in addition and subtraction multiplying and dividing 3- and 4-digit numbers by 2 digit numbers calculating and solving problems involving more than one operation the concept of a negative answer calculation simplifying a fraction to its lowest form calculating fractions with like and unlike denominators the concept of rounding decimal fractions and their place value calculating percentages the concept of number ratio using a protractor for measuring and	reading, writing and ordering numbers up to 5- and 6-digit numbers and decimal fractions adding and subtracting 5- and 6-digit numbers making accurate estimates in addition and subtraction division and multiplication of 3- and 4-digit numbers by 2-digit numbers making calculations and solving problems using more than one operation making calculations which give negative answers reducing fractions to their simplest form adding and subtracting fractions with like and unlike denominators rounding, adding and subtracting decimal fractions and multiplying and dividing simple decimal fractions making simple calculations and solving problems involving percentages calculating increases and decreases involving percentages comparing values and expressing quantities using number ratio measuring and comparing angles using a	the recognition that mathematics is relevant to their daily lives an appreciation of mathematics as a useful tool the recognition that algorithms are useful in addition, subtraction, multiplication and division a willingness to use more than one operation in calculating and solving mathematical problems the recognition and appreciation of negative answers in subtraction the recognition of equal fractions and an appreciation for simplifying fractions to their simplest form an appreciation that percentages and ratios are useful in their daily lives the recognition that a protractor is a useful tool
	·		for measuring angles the recognition and appreciation of the different angles in triangles and quadrilaterals the recognition and appreciation of the properties and patterns in regular shapes a willingness to construct three-dimensional solids from nets an appreciation that plotting courses is a useful skill in their lives the recognition and appreciation of tessellation patterns around the local environment
Graphs	 the concept of pie charts as a method of representing data organising information on bar and line graphs 	reading information from pie charts drawing simple pie charts to display information reading, collecting and showing data on bar and line graphs calculating a total and average from bar and line graphs representing information such as population and weather on bar and line graphs	an appreciation that a pie chart is a useful tool for representing and organising information an appreciation that information can be collected, represented and readily retrieved from a pie chart, bar and line graph
Measurement	 the concept of speed, distance and time the commonly used weights, capacity and volumes for containers and drums decimal notation as it relates to 0.58 = 58/100 the probability of events 	using the appropriate formula to calculate distance, speed and time travelled; i.e. distance = speed x time recognising commonly used containers and their weights and capacities calculating and comparing volumes and solving problems involving capacity and weights using decimal notation, e.g. 2.53 m = 2 m 53 cm investigating the chances in an event	 an appreciation that the calculation of time, speed and, distance travelled is a useful tool in their daily lives the recognition that there is a need for a standard formula to calculate time, speed and distance travelled the recognition and appreciation of commonly used containers for weight and capacity an appreciation that solving problems in appreciation that solving problems an appreciation that solving problems a willingness to investigate, observe and predict chances of events using probability
Time	time and its use in the calendar and different part of the world	using the calendar to express the date explaining and differentiating time: years, decades and centuries investigating time zones	the recognition of different terms in the units of time an appreciation that time is relevant to their daily lives an appreciation that time zones are relevant to an understanding of where they live
Money	 money calculations 	 adding, subtracting, multiplying and dividing money 	the recognition that calculating money is necessary and useful in their daily lives



Standard Four

Number	
Topics	Objectives
Revision and extension of Standard 3 work	 Reading, writing and counting numbers up to 9,999 Recognising the place value of digits, <i>eg that the 4 in 2,417 represents 4 hundreds</i> Ordering a set of 4 digit numbers Making the biggest number using 4 digits
2. Numbers to 99,999	 Reading, writing and counting numbers up to 99,999 Recognising the place value of digits Making the biggest number using 5 digits Rounding off numbers to the nearest ten, hundred and thousand Recognising odd and even numbers
3. Addition	 Developing strategies for mental addition Adding 3- and 4-digit numbers, with and without regrouping Solving problems using addition
4. Subtraction	 Developing strategies for mental subtraction Subtracting 3- and 4-digit numbers, with and without trading Solving problems using subtraction
5. Multiplication	 Revising multiplication tables for 2, 3, 4, 5 and 10 Multiplying 2- and 3-digit numbers by a 1-digit number without regrouping, eg 14 x 2, 21 x 4, 231 x 3 Multiplying 2 and 3 digit numbers by a single digit number with regrouping, eg 25 x 3, 37 x 4, 349 x 2 Multiplying by 10 Making multiplication tables for 6, 7, 8 and 9 Using multiplication facts when working with larger numbers, eg knowing that if 3 x 6 = 18 then 3 x 60 = 180
6. Division	 Revising division by sharing Revising division by repeated subtraction Understanding the relationship between multiplication and division, <i>eg knowing that</i> 35 ÷ 5 = 7 because 5 x 7 = 35 Introducing standard notation for division, <i>7 eg</i> 5 35
7. Fractions	 Revising fractions of an object and of a quantity, eg 1/2 1/10 2/3 etc Finding fractions of a quantity by dividing, eg 1/3 of 45 = 45 ÷ 3 = 15 Introducing mixed number fractions, eg understanding that 4/3 = 1 1/3 Introducing decimal fractions and notation, eg \$3.85, 1m 63 cm = 1.63 m, 2 250 ml = 2.250 l, etc

	Standard Four
	Shape
Topics	Objectives
8. Two-dimensional shapes	 Introducing more regular shapes: pentagons, hexagons, octagons, etc Finding properties of regular shapes: number of sides and corners, lines of symmetry, parallel lines, etc Making simple patterns and tessellations with regular shapes
9. Three-dimensional shapes	 Revising properties of three-dimensional solids: faces, edges, corners Unfolding three-dimensional solids to form nets Constructing three-dimensional solids such as cubes, cuboids and cylinders from nets
10. Angles	 Recognising and drawing angles bigger and smaller than a right-angle Understanding angles as the measurement of a turn, including fractions of a turn, eg complete turns, half turns, quarter turns Using the words 'clockwise' and 'anti-clockwise' to describe the direction of a turn Recognising the relationship between compass directions, eg turning from North to East = ¼ turn
11. Location	1. Locating positions on a map using letter and number co-ordinates, eg (B,5), (C,8)



Standard Four	
Graphs	
Topics	Objectives
12. Bar graphs	Making vertical and horizontal bar graphs from data contained in tally charts and information tables
Measurement	
Topics	Objectives
13. Length	 Estimating lengths in cm and m, then measuring to check the accuracy of estimates Introducing kilometres Making calculations and solving problems in length, including perimeter
14. Weight and capacity	Estimating and measuring weights in kg and g Estimating and measuring capacity in I and mI Making calculations and solving problems in weight and capacity
15. Area	 Calculating the area of squares and rectangles by measuring and using the formula A = L x W (area = length x width) Using the formula A = L x W to calculate the area of shapes made up of rectangles and squares
16. Probability	Using words such as <i>certain</i> , <i>likely</i> , <i>unlikely</i> and <i>impossible</i> to describe the likelihood of an event, eg 'it is unlikely that it will rain today'; 'it is certain that the sun will rise tomorrow'

	Syllabus
	Standard Four
	Time
Topics	Objectives
17. am and pm	 Introducing am and pm time Understanding and using 12 hour timetables and schedules Calculating times, eg 'what time will it be 40 minutes after 3.30pm?'
18. Units of time	 Estimating units of time, eg counting in seconds and saying when a minute has passed Recording events within units of time, eg measuring pulse rates in one minute Converting units of time: hours to minutes, minutes to seconds
	Money
Topics	Objectives

Topics	Objectives
19. Decimal notation	1. Decimal notation of money, eg 3 dollars and 50 cents is the same as \$3.50 2. Computation of money (+, -), eg add the prices of items costing \$1.35 and \$2.90, and calculate the change from \$5.00 3. Solving problems involving price and quantity



Standard Five

Number

Number		
Topics	Objectives	
1. Whole numbers up to one million	Recognising and identifying place value in numbers up to one million Reading and writing numbers up to one million	
2. Number sequences	 Extending the number line to include negative numbers Recognising and continuing number sequences, including some that have negative numbers, <i>eg 5, 10, 15, 20, 25, 7, -3, 1, 5, 9, 13,</i>	
3. Addition	 Developing and practising strategies for mental addition Adding 5- and 6-digit numbers Making estimates in addition, <i>eg knowing that 108 + 189 is close to 300</i> Solving addition problems and puzzles 	
4. Subtraction	 Developing and practising strategies for mental sutraction Subtracting 5- and 6-digit numbers Making estimates in subtraction, <i>eg knowing that 347-150 is close to 200</i> Solving subtraction problems and puzzles 	
5. Multiplication	 Revising multiplication of 2- and 3-digit numbers by 1-digit numbers Multiplying 2- and 3-digit numbers by 2-digit numbers Revising multiplication tables and using multiplication facts in calculations Solving multiplication problems and puzzles 	
6. Division	 Dividing 2-digit numbers with remainders, <u>8</u>r1 eg 4)33 Dividing 2- and 3-digit numbers by 1-digit numbers Dividing 3- and 4-digit numbers by 1-digit numbers Finding the average of a set of numbers Solving problems involving calculation of average 	
7. Mixed computation	 Making calculations involving more than one operation, eg 27 + 36 - 15 = Making calculations involving more than one operation where brackets indicate the order of operations, eg (13 + 35) x 3 = 	

Standard Five

Number

	Number
Topics	Objectives
8. Fractions and decimals	 Recognising equivalent fractions, eg ¹/₂ = ²/₄ = ⁴/₈ Adding and subtracting fractions with the same denominator Exploring fraction and decimal equivalence, eg ¹/₁₀ = 0.1, ²/₅ = 0.4, 2 ½ = 2.5m Ordering a set of decimal numbers Adding and subtracting decimal numbers
9. Percentages	 1. Introducing percentages 2. Investigating fraction and percentage equivalence, eg ¹/₂ = ⁵⁰/₁₀₀ = 50%

Shape

Topics	Objectives
10. Circles	Drawing circles and circle patterns, eg by using tins and coins Identifying properties of a circle: radius, diameter and circumference Measuring the diameter and radius of circles Estimating and measuring the circumference of circles
11. Two-dimensional shapes	 Investigating irregular shapes Identifying properties of irregular shapes, including sides, angles, and symmetry Drawing reflections of irregular shapes using square grids
12. Three-dimensional shapes	Unfolding cartons and boxes to revise nets of cuboids Investigating pyramids and prisms Making pyramids and prisms from nets
13. Structures	 Understanding that some two-dimensional shapes are more rigid than others, eg that for construction, a triangle is stronger than a square Knowing how to strengthen simple two-dimensional and three-dimensional structures, eg by adding diagonals
14. Angles	 Introducing degrees as the standard measurement of angle, eg a right-angle = 90°, there are 360° in a circle Using a protractor to measure angles Classifying angles: acute, obtuse, reflex, etc
15. Location	Locating points on a map using number co-ordinates Finding points using 'x' and 'y' axes



Standard Five	
Graphs	
Topics	Objectives
16. Line graphs	 Reading and interpreting bar graph Reading and interpreting line graphs Constructing line graphs from tables of information Constructing line graphs using co-ordinates
Measurement	•
Topics	Objectives
18. Length	 Choosing appropriate units when measuring length Calculating length, including cm, m, mm and km Using decimal notation, eg 2.5 m = 2 ½ m Calculating distance on a map using a scale, eg 1:20, 1:100 Constructing scale drawings and plans
19. Weight	 Choosing appropriate units when measuring weight Understanding the relationship between units: grams/kilograms, kilograms/tonnes, Using decimal notation, eg 53.5 kg = 53 ½ kg Completing practical activities and problem solving using grams and kilograms
20. Volume	 Introducing the concept of volume Measuring volume using 1 cm³ units Using the formula for calculating the volume of boxes and containers, ie volume = lenght x breadth x height
21. Area	 Calculating the area of squares and rectangles in cm² and m² using the formula A = L x W (area = length x width) Calculating the area of a triangle by halving the area of a rectangle Introducing the formula for finding the area of triangles (area = ½ base x height) and parallelograms (area = base x height) Calculating the area of shapes made up of rectangles and squares and rectangles and triangles
22. Temperature	Understanding the use of degrees Celsius as a measure of temperature Using a thermometer to measure and keep a record of air temperature
23. Probability	 Using fractions to describe the probability of events, eg when throwing a dice, know that the probability of scoring a six is I in 6 or ¹/₆ Understanding that a probability of ½ represents an 'even chance'

	Syllabus
	Standard Five
	Time
Topics	Objectives
24. Twenty-four-hour clock	 Using 24-hour notation, eg knowing that 8:15am is written as 08:15 and 3:30pm is written as 15:30 in 24-hour notation Understanding and using 24 hour timetables and schedules Calculating time intervals, eg knowing that if a canoe journey begins at 09:45 and ends at 13:15, it has taken 3 hours and 30 minutes
25. Measuring time	Devising non-standard ways of measuring time, eg making a water clock
	Money
Topics	Objectives
26. Computation of money	1. Solving problems involving computation of money (+-x ÷), eg if items cost \$1.20 each, working out how many can be bought with \$20.00 and calculating the change 1. Solving problems involving computation of money (+-x ÷), eg if items cost \$1.20 each, working out how many can be bought with \$20.00 and calculating the change



Standard Six

Numbers	
Topics	Objectives
1. Whole number calculations	 Adding and subtracting large numbers, up to 5 and 6 digits Making estimates in addition and subtraction Multiplying, including multiplication of 3 and 4 digit numbers by 2 digit numbers Dividing 3- and 4-digit numbers by 2-digit numbers Making calculations and solving problems involving more than one operation Making calculations which give negative answers, eg 25 - 32 = -7
2. Fractions	 Recognising equivalent fractions and reducing fractions to their simplest form, eg ⁸/₁₂ = ⁴/₆ = ²/₃ Adding and subtracting fractions with the same denominator, eg ³/₆ + ²/₆ = ⁵/₆
3. Decimals	 Changing common fractions to decimal fractions, eg ³/₄ = 0.75 Recognising place value in decimal fractions, eg recognising that the 3 in 2.35 represents 3 tenths Rounding decimals to the nearest whole number and nearest tenth Adding and subtracting decimal fractions including tenths and hundredths, eg 2.53 + 0.75, 6.20-4.68 Multiplying decimal numbers by whole numbers Dividing the remainder in division calculations to give an answer including tenths, a.2 eg 5)16.00 / 15 / 10 Using decimal notation when recording measurements and money, eg 2.5 m, 2.85 m, 3.5 kg, etc
4. Percentages	 Making simple calculations involving percentages, eg 17 as a percentage of 50 = 34% 40 as a percentage of 200 = 20% Calculating a percentage increase, eg if the number of children in a school increases from 50 to 60 this is a 20% increase Solving problems involving percentages
5. Ratios	 Comparing values by using a number ratio, eg in a school where there are 75 children and 3 teachers, know that the ratio of children to teachers is 25:1 Knowing that quantities can be expressed as a ratio, eg the mixture of petrol and oil used in a chainsaw

Standard Six
Shape and Space
Objectives
 Measuring and comparing angles using a protractor Investigating the total of the angles inside triangles and quadrilaterals Plotting a course using bearings
 Classifying and naming different triangles: right-angled, equalateral, isosceles, scalene Drawing triangles from given instructions, eg 'draw a right-angled triangle with a base of 12cm and a height of 7cm'
Creating tessellating patterns using one or more two-dimensional shapes
Using nets to make three-dimensional solids from two-dimensional drawings 1. Using nets to make three-dimensional solids from two-dimensional drawings

Standard Six	
Graphs	
Topics	Objectives
10. Pie charts	Reading information from pie charts Drawing simple pie charts to display information
11. Bar and line graphs	 Collecting and showing data on bar and line graphs Reading information from bar and line graphs and calculating a total and average Representing information such as population and weather statistics on bar and line graphs
Measurement	
Topics	Objectives
12. Speed, distance and time	 Introducing the concept of speed and distance travelled Understanding and using the formula, distance = speed x time Calculating the time taken to cover a distance and the distance travelled in a given time
13. Weight, volume and capacity	 Recognising commonly used containers and their weight or capacity, <i>eg know the weight of a bag of rice, the capacity of a drum of petrol, etc</i> Calculating and comparing the volumes of different containers Solving problems involving capacity and weight
14. Probability	1. Investigating the probability of events, eg finding the probability (written as a fraction) of scoring 12 when throwing two dice and adding the numbers

	Syllabus
	Standard Six
	Time
Topics	Objectives
15. Investigating time	 Using a calendar Understanding longer units of time: years, decades, centuries Investigating time zones: knowing that other parts of the Pacific and the World have different time zones; working out the current time in another country
	Money
Topics	Objectives
16. Calculating money	1. Dividing and multiplying of money 2. Solving money problems, eg finding the average cost per kg of fish sold at a market A market I market

Assessment

Teachers should continually assess the progress of the children and base their lessons on the children's needs rather than on the need to follow the programme.

Assessments can be made during lessons by observation of the children as they perform classroom tasks, listening to their responses or by checking on their written work. This is often referred to as continuous or school-based assessment.

Assessments should be based on the objectives of the lesson, as written in the Teacher's Guide. The Teacher's Guide contains reminders for teachers to make assessments before moving on to a new objective in each topic. For example, at the end of each T and C section when all the activities for each objective are complete you will find an assessment reminder at the bottom of the page which looks like this:



Can all the pupils recognise the place value of digits and write them in expanded form?

This is a most important REMINDER because teachers are asked to make sure that ALL pupils have reached that level of understanding. This means that the assessment will take place continuously because not all pupils will progress at the same rate. Important tasks for the teachers include:

- what to assess; which concept or skill should be tested according to the pupils progress?
- when to assess; have the pupils had enough practice?
- how to assess; should the assessment or test include practical activities, problems and questions that test both memory and knowledge of procedures (algorithms)?
- why assess; is the assessment to be used for:
 - a) reporting and giving feedback to pupils
 - b) the headteacher's school profile
 - c) a report-back to parents
 - d) grading and selection purposes?
- what format; teachers can observe pupils, they can question them in class or as individuals and they can give pupils written exercises to perform.

Assessments (testing) should have a purpose and this should always be positive i.e. pupils, teachers, and parents should learn from the results and be able to take action on how best to make progress.

All of these tasks should be monitored against the objectives that are being tested. The outcomes (results) should be graded and recorded to indicate level of achievement and your satisfaction and this record should be updated regularly and made available for other people to see. The headteacher, pupils and parents and even other teachers should know how pupils are progressing measured against the sequence of objectives which are stated for each and every Topic.

At the end of each Topic section, there are two special subsections:

A. Extra activities Support

This supplementary part is designed to help teachers with further activities to strengthen understanding particularly for those pupils who may be having difficulties with understanding the concepts. Even pupils who are making good progress can be '*left alone*' to carry out the support activities.

B. Extra activities Extension

This section is mainly targeted towards pupils who require to be extended. The activities are usually more difficult and often require extra thinking and understanding but are ideal for pupils who have completed an activity in a particular Topic section and need further challenges to deepen their understanding and knowledge of mathematics. These pupils should also be monitored carefully to ensure that their special talents are recognised and acknowledged.

Tests

More formal opportunities other than continuous testing, conducted after each topic is complete, can be provided for at the end of each term in the Four-Term Arrangement. Many of the questions in the Pupil's Resource Book can be re-designed and used to help you in making up your own tests.

These tests will provide a '*summative overview*' of the pupil's progress and will contribute to the profile of the pupil's understanding and achievement in mathematics.

Traditionally, a '**summative**' test is a written test but it need not be entirely written. Practical tasks can be given but this will require extra classroom management to ensure that everyone performs the task and is observed and graded.

The written work can include simple multiple choice or completion questions to test memory, knowledge and procedural skill (algorithms) similar to those found in SISE each year. For example,

Multiple choice "To test Number Facts"

Nine necklaces of seven shells each require how many shells in total?

A. 7 B. 16 C. 63 D. 90 E. 97

Completion "To test knowledge of units in lengths" There are centimetres in 2 m 34 cm.

Problem "To test steps for solving a problem"

How many litres of water will remain if a 2,000 litre truck delivers one and a half kilolitres to a supermarket?

Practical task "To test ability and skills in 2 and 3-dimensional shapes" Use your ruler to draw the net of a cube that has faces measuring 6cm x 6cm. Cut around the net and fold it to show the 3-dimensional cube.

Remember all test items and tasks should link directly to the objective in the mathematics.

Finally all test results should be recorded. Below is a suggested table showing how pupils' results and progress can be recorded, averaged and graded. Teachers can devise their own suitable assessment records to show results for each pupil.

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S- Satisfactory (more practice needed but can move on with caution) NS- Not Satisfactory (not ready to progress, much more practice needed)																													
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In the Continuous Assessment Record Sheet, a Unit Average grade of the pupil's performance for each of the topic's objectives is given to indicate the level of achievement and how well a child has progressed in a particular topic. The Unit Average grade is taken by simply counting the majority number of Performance Range Grades obtained by each child for each topic. For example: J. Pazae's Average Grade for topics 1 and 2 is **G** (Good) because the record sheets show there are more **G**s than **S**s and **VG**s.

Each Unit Average can then be entered into a Termly Assessment Record Sheet which is shown in the Appendix of the Teacher's Guide page 228. Term Average can then be obtained and recorded in the same way taking into consideration grades for written term tests.

Pupils Assessment Records (as shown above) can be designed for each Theme and Topics to show:

- if the concepts have been understood more teaching and learning?
- when the understanding was complete ready to move on?
- level of achievement for grading purposes reached an acceptable standard?

It is very important to make test questions which relate to your teaching and learning objectives and then to: MARK GRADE and RECORD so that everyone including pupils, parents and teachers are clear about the level of achievement for each pupil.

In the Appendix to this Teacher's Guide (pages 232-235), sample tests are given. They show different types of questions, how to construct a test according to a Blue Print of specifications and a Marking Scheme for a well balanced test. Try to set your own test after you have taught two or three Topics. You will also be provided with blank copies of the above Continuous Assessment Record Sheet and a Termly Assessment Record Sheet (samples are on pages 227 and 228).

The Appendix also includes suggestions for the teacher to record assessments for each term and how these assessments can be averaged.

Suggested timetable for Standard 4 - 6

There should be just one daily mathematics lesson of about 50 minutes, depending on local circumstances and progress of the children. A lesson of this duration has the advantage over two shorter lessons of allowing more time for teacher presentation and pupil follow-up. One topic should be completed before a new topic is begun. Each lesson should contain a variety of activities to maintain the interest of the children. Teachers should assess the progress of the children and evaluate their lessons. They should plan the next lesson or vary their teaching methods depending on the results of their assessments and lesson evaluations. The following timetable is recommended.

Daily Timetable														
	Monday	Tuesday	Wednesday	Thursday	Friday	Duration								
7.45 - 8.00	Assembly and Registration													
8.00 - 8.20	20 Christian Education													
8.20 - 9.10	Mathematics													
9.10 - 10.30	English Language activities Reading and Discussion, Comprehension, Language study activities (spelling, grammar, word games, vocabulary) Handwriting													
10.30 - 11.00	Break Break													
11.00 - 11.40	English Language activities Oral and Writing activities													
11.40 - 12.20	Community Studies													
12.20- 12.55	Health Education	Science and	Art and Craft	Science and	Health Education	35 mins								
12.55 - 13.30	Physical Education	Agriculture (1hr 10 mins)	Music	Agriculture (1hr 10 mins)	Physical Education	35 mins								

Recommended teaching materials

The following recommended teaching materials for Standards One to Six are produced by the Curriculum Development Centre.

Primary In-service Training Manual.

A training manual has been developed to assist trainers at provincial level and other trainers at school base level. This manual will give assistance to trainers on how best to organise and plan for in-service workshops in mathematics. The manual contains ideas on aspects such as, classroom management, lesson planning, and assessment.

Teacher's Guides for Standards Four to Six.

These teacher's guides are designed to assist the teacher to plan interesting mathematics lessons containing a variety of practical activities to meet the needs of individual children. Aims, objectives, teacher's activities and children's activities are suggested for each topic.

Pupil's Books and Materials.

Pupils' books, cards, posters and games are provided for Standard Four. These are designed for the children to practise and consolidate their mathematical skills and knowledge in an active, interesting and relevant way. However, materials from the local environment can supplement varieties of resources that are needed to enable mathematical concepts to be understood in a practical way.

The Pupil's Book is designed to provide easy-to-read instructions where the level of language is accessible to the standard 4 pupils. The teacher is advised to use the many activities and exercises as a basis for further work as the needs of individual pupils become clearer during the year.

The Pupil's Book contains the following:

- exercises to practise and consolidate understanding in all six mathematical themes
- opportunities to develop a more practical approach to learning in mathematics
- problem solving situations to give a deeper understanding to mathematical concepts
- experiences to engage in games and puzzles that can extend pupils interest and enjoyment in mathematics

Teachers are advised to supervise the use of the Pupil's Book as a follow up to the learning provided by the teacher from the teacher's activities in the Teacher's Guide. The activities that the pupils undertake in the Pupil's Book can be observed and used as a strong basis for continuous assessments and grading.

Nguzu Nguzu Mathematics

Teacher's Guide



Standard 4



Number Topics 1 & 2: Numbers up to 99,999

Aim:

To further develop the pupils' understanding of the formation, order and sequence of numbers up to 99,999.

Sequence of objectives: Topic 1, To

- 1. revise reading, writing and counting numbers up to 9,999.
- 2. practise recognising the place value of digits, eg that the 4 in 2,417 represents 4 hundreds.
- 3. order a set of 4 digit numbers.
- 4. make the biggest number using 4 digits.

Sequence of objectives: Topic 2, To

- 1. teach reading, writing and counting of numbers up to 99,999.
- 2. recognise the place value of digits.
- 3. make the biggest number using 5 digits.
- 4. round off numbers to the nearest ten, hundred and thousand.
- 5. recognise odd and even numbers.

Rationale:

Numbers and the way they are used in every-day life need to be understood because they are an essential counting tool for everyone to become a useful member of the society. For this unit, the pupils should revise work on numbers up to 9,999 in Topic 1. In Topic 2, they will extend their knowledge of the tens, hundreds, thousands and ten thousands number system up to 99,999.



Revise the place value of numbers up to 9,999. Write a four digit number on the blackboard, for example, 2,549

Remember to point out to the pupils **the use of the comma**, to separate the thousands from the hundreds.

Materials: place value chart, number blocks, number cards 0-9

Use number blocks to make this number on a place value chart.

thousands	hundreds	tens	ones
2	5	4	9

Ask the pupils to read the whole number with you: *two thousand, five hundred and forty nine*

Ask the pupils
What does the digit 2
represent? (2 thousands)
What does the digit 5
represent? (5 hundreds)

Now ask the pupils to recognise totals
How many thousands? (2)
How many hundreds? (25)
How many tens? (254)
How many ones? (2,549)

Repeat this with other four digit numbers to recognise the place value and totals. Include some numbers with zeros in the hundreds, tens and ones columns.



Write some four digit numbers on the blackboard.

2,912 3,600 1,026 5,109 4,807 6,530

Ask different pupils from the class to make the numbers on a place value chart using number blocks. Materials: place value chart, number blocks

thousands	hundreds	tens	ones
1	0	2	6

Ask the pupils to tell you how many thousands, hundreds, tens and ones in each column. Read each number with the pupils. Also ask the pupils to recognise totals. For example, there are 10 hundreds in 1,026.

Now read out some four digit numbers, for example, three thousand, nine hundred and twenty six seven thousand, one hundred and thirteen one thousand, eight hundred and forty five thousand, six hundred and eight two thousand, five hundred nine thousand, and seventy five

Read the numbers slowly and clearly and ask the pupils to write down the four digits for each number in their exercise books.

Remind the pupils to use a comma, to separate the thousands from the hundreds.

3,926 The teacher should ensure that the pupils recognise:

7,113 (1) the value of each place value

(2) the total value for thousands, hundreds, tens and ones.

5,608 2,500

For example in **5**, **608** there are 56 hundreds, 560 tens, 5,608 ones

9,075

1,840

When the pupils have written each number, write them on the blackboard. Ask the pupils to read the numbers with you and check their answers.



Materials: blackboard, chalk

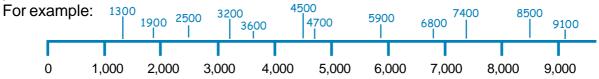
Draw this number line on the blackboard and place the numbers from 0 to 9,000 under the number line as shown.



Write the following numbers on the blackboard.

2,500	8,500	4,500	5,900	3,200	6,800
7,400	1,900	4,700	9,100	3,600	1,300

Ask individual pupils to choose a number from the list and mark where his/her number is positioned on the number line. Let them write the number on the mark.



Repeat this with everyone in the class. Check to see that the pupils are placing their numbers accurately in position.

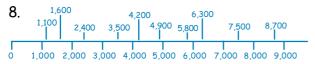


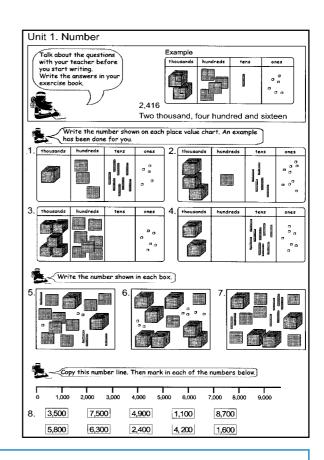
Ask the pupils to complete the activities on page 2 of their resource book.

They should write their answers in their exercise books.

Resource Book answers: page 2.

- 1. 1,385 one thousand, three hundred and eighty five
- 2. 3,159 three thousand, one hundred and fifty nine
- 3.5,706 five thousand, seven hundred and six
- 4. 2,097 two thousand, and ninety seven
- 5. 2,943 two thousand, nine hundred and forty three
- 6.7,208 seven thousand, two hundred and eight
- 7. 4,670 four thousand, six hundred and seventy







Can all the pupils read, write and count numbers up to 9,999 and place them on a number line?

Numbers up to 99,999



Materials: blackboard, chalk

Write some four digit numbers on the blackboard, for example:

2,715 6,059 9,120 5,429 3,605 1,894

Read each number with the pupils.

For each number, point to one of the digits and ask the pupils to tell you if it represents thousands, hundreds, tens or ones.

For example, if you point to the 7 in 2,715 the pupils should be able to tell you that this is **7 hundreds**.

Show the pupils that 2,715 can be written and expanded as follows:

2,000 + 700 + 10 + 5. Remember, pupils should also recognise that in this number there are 27 hundreds.

Repeat this example with other numbers and write them in an expanded way.



Write the following numbers on the blackboard:

3,846 9,312 1,477 6,521 5,189 7,295

Materials: blackboard, chalk

Ask the pupils to copy the numbers and write the thousands, hundreds, tens and ones which add together to make each one, for example:

3,846 = 3,000 + 800 + 40 + 6. Ask, how many hundreds are there? (38 hundreds)

Choose some more four digit numbers and this time ask the pupils to draw a place value chart in their books.

Let them write the digits for each number in their place value chart:

	thousands	hundreds	tens	ones
2,918	2	9	1	8
7,403	7	4	0	3
1,174	1	1	7	4
5,086	5	0	8	6
4,290	4	2	9	0
3,052	3	0	5	2



Can all the pupils recognise the place value of digits and write them in expanded form?



Prepare some sets of large number cards. The numbers should follow a sequence. For example:

8,299 8,301 8,300 8,298 8,302 Materials: sets of large number cards

7,000 6,997 7,001 6,999 6,998

Let the pupils sit on mats at the front of the classroom so that they can all see.

Ask the pupils to help you rearrange each set of cards so that they are in the right order, for example:

3,697

3,698

3,699

3,700

3,701

Ask questions such as,

What number comes before 3,697? What number comes after 3,701? What number is ten more than 3,700?



Write some sets of four digit numbers on the blackboard, for example:



Ask the pupils to copy the numbers and add the next four numbers in each sequence.

Next write the following sets of numbers on the blackboard:

Ask the pupils to write each set of numbers in order, from the smallest to the largest, for example:

1,437 1,487 2,487 2,489 5,287



Can all the pupils order a set of 4 digit numbers?



Prepare a set of large 0 - 9 cards.

Ask four pupils to stand at the front of the class. Give each pupil one of the 0 - 9 cards to hold.

Materials: a set of large 0 - 9 cards

Ask the rest of the class to help you read the four digit number: For example, it might be *nine thousand, five hundred and twenty six.*

Now ask the four pupils to change places.

Encourage the class to help you rearrange the four pupils so that they make the biggest possible four digit number, ie **9,652.**



Let the class read the new four digit number. Repeat this activity with four different pupils and a different set of four numbers.



Divide the class into groups of 4 or 5. Give each group a set of 1 - 9 cards. Select four numbers and write them on the blackboard, for example, **3**, **7**, **1** and **8**.

Materials: sets of 0 - 9 cards

Ask each group to make as many different four digit numbers as they can using these four numbers.

Let them write down all the numbers they make.

Ask them to make the biggest and smallest possible numbers.

Encourage the pupils to think of a 'rule' for making the biggest possible number,

ie putting the biggest digit in the thousands, the next biggest in the hundreds, the next biggest in the tens, and the smallest in the ones.



Can all the pupils make the biggest number using 4 digits?



Before introducing five digit numbers, revise place value notation with the pupils. Draw this place value chart on the blackboard.

ten thousands	thousands	hundreds	tens	ones

Materials: place value chart including ten thousands

Use the examples below to revise the place value notation. Point to the places in the chart as you explain this information.

The 1st place value is the units of one. (ones place)

The 2nd place is formed from the units of 10 ones. (tens place)

The 3rd place is formed from the units of 10 tens. (hundreds place)

The 4th place is formed from the units of 10 hundreds. (thousands place)

Tell the pupils that the 5th place value is the extension from the 4th place value.

Ask the pupils if they can tell you, how many units of one thousands make one unit of ten thousands? Encourage the pupils to answer as:

10 units of one thousand make one unit of ten thousand.

Write the five digit number, **17,945** on the place value chart. Point to each digit starting from the ones and say,

5 is in the ones place. Its value is 5 ones.

4 is in the tens place. Its value is 4 tens.

9 is in the hundreds place.

Its value is 9 hundreds, etc.

ten thousands thousands hundreds tens ones

1 7 9 4 5

Read and write the numbers in the place value chart and their values for the pupils to see.

For example: 1 ten thousand, 7 thousands, 9 hundreds, 4 tens, 5 ones.

Pupils should say: "Seventeen thousand, nine hundred and forty five".

Repeat this with some more five digit numbers and involve the pupils.



Ask the pupils to complete the activities in their resource book page 3.

Resource Book answers:

page 3.

1-23,167

(2 ten thousands, 3 thousands, 1 hundreds, 6 tens, 7 ones) 2-19.376

(1 ten thousands, 9 thousands, 3 hundreds, 7 tens, 6 ones) 3-95,401

(9 ten thousands, 5 thousands, 4 hundreds, 0 tens, 1 ones)

4-51,248

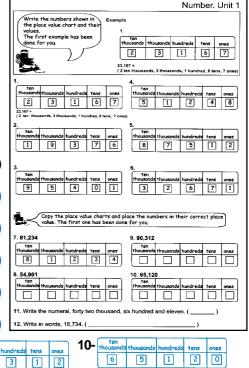
(5 ten thousands, 1 thousands, 2 hundreds, 4 tens, 8 ones) 5-87,512

(8 ten thousands, 7 thousands, 5 hundreds, 1 tens, 2 ones)
6-32 671

(3 ten thousands, 2 thousands, 6 hundreds, 7 tens, 1 ones)

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-	ten thousands	thousands	hundreds	tens	ones	8-	ten thousands	thousands	hundreds	tens	ones	9-	ten thousands	thousands	hundreds	tens	ones	10-	ten thousands	thousands	hundreds	tens	ones
	8	1	2	3	4		5	4	9	0	1		9	0	3	1	2		6	5	1	2	0
												,											







Talk about numbers containing five digits with the pupils, for example:

27,549 Say: twenty seven thousand, five hundred and forty nine.

Materials: place value chart including ten thousands

Point to each digit, beginning from the right, and ask the pupils to tell you which place each digit is in. For example,

the 9 is in the ones place, the 4 in the tens, the 5 in the hundreds, etc

Before explaining the fifth place, remind the pupils that

the tens place is formed from 10 ones,

the *hundreds* from 10 tens and so on.

So the fifth place is formed from 10 thousands and is called the ten thousands place.

ten thousands	thousands	hundreds	tens	ones	
2	7	5	4	9	

Use a place value chart with five columns or draw a place value chart on the blackboard. Repeat this with other five digit numbers.



Write some four and five digit numbers on a piece of paper and read it out to the pupils, for example:

six thousand, two hundred and seventy nine four thousand, six hundred and thirty thirty one thousand, five hundred and twenty nine seventeen thousand, three hundred and six eighty two thousand, six hundred and fifty forty thousand, nine hundred and eighty seven Materials: piece of paper with four and five digit numbers

Read the numbers slowly and clearly and ask the pupils to write down the digits for each number in their books:

6,279 4,630 31,529 17,306 82,650 40,987

When the pupils have written each number, write them on the blackboard. Ask the pupils to read the numbers with you and check their answers.



Can all the pupils read, write and count numbers up to 99,999?



Write a five digit number on the blackboard.

Ask pupils questions to discuss the number and the value of each digit. Write the numbers in words on the blackboard.

Materials: blackboard

For example: **10,382.**

What is this number? ten thousand, three hundred and eighty two.

What needs to be added to make 10,682? add 300 - three hundred.

What needs to be subtracted to make 10,352? subtract 30 - thirty.

What do you need to do to make 15,382? add 5,000 - five thousand.

What number will you make if you add 8? 10,390 - ten thousand, three hundred and ninety.

Take away 200 10,182 - ten thousand, one hundred and eighty two.

Add 200 10,582 - ten thousand, five hundred and eighty two.

Take away 4,000 6,382 - six thousand, three hundred and eighty two.

Repeat this example with other numbers.



Ask the pupils to write down numbers 1 to 10 in their exercise books.

Tell the pupils that you are going to write a number on the blackboard, say **22,754** and then give 10 instructions which they must apply to the number. Say each instruction slowly and repeat it twice.

The pupils must follow the instructions and write the answers only.

Materials: blackboard. childrens resource books

Write the number on the blackboard, for example: 22,754.

Read the following instructions to the pupils. The pupils must either add or subtract the digits from 22,754 each time you read the instruction. Tell them to write answers only using diaits.

The answers to number 1 would be 22,784 because 22,754 + 30 = 22,784

Instructions

1. Add 30

5. Add 6

9. Take away 2,000

6. Take away 54

10. Add 50,000

2. Take away 3

3. Add 3,000

7. Take away 20,000

4. Take away 300

8. Add 50

Topic 2

Ask the pupils to exchange books with the person who sits next to them. Go through 1 to 10 slowly again and ask pupils for answers. Explain each answer. Write the answers on the black board.

Answers		
1- 22,784	5- 22,760	9- 20,754
2- 22,751	6- 22,700	10-72,754
3- 25,754	7- 2,754	·
4- 22,454	8- 22,804	

When the pupils have finished doing this exercise, ask them to copy and complete the activity on page 4 of their resource book.

Let the pupils read the instructions carefully.

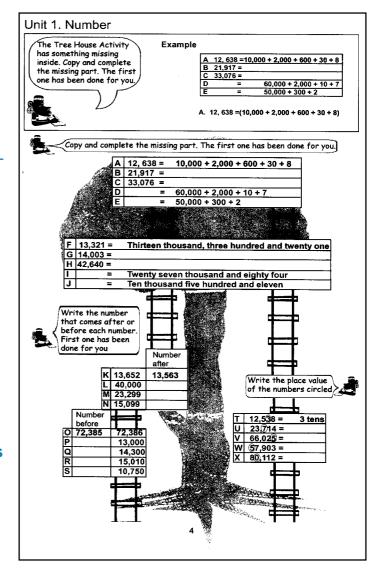
Help them understand the activity. Make sure the pupils know what to do before they start working. Some examples have been done for them.

Resource Book answers: page 4.

- A-10,000+2,000+600+30+8
- B-20,000+1,000+900+10+7
- C 30,000 + 3,000 + 70 + 6
- D-62,017
- E-50,302

F- Thirteen thousand, three hundred and twenty one

- G- Fourteen thousand and three
- H- Forty two thousand, six hundred and forty
- I-27,084
- J-10,511
- K-13,653
- L- 40,001
- M-23,300
- N 45 400
- N- 15,100
- O- 72,385 T- 3 tens
- P- 12,999 U- 7 hundreds
- Q- 14,299 V- 5 ones
- R- 15,009 W- 5 ten thousands
- S- 10,749 X- 0 thousands





Do all the pupils recognise the place value of digits and can they use the expanded form?



Prepare a set of large 0 - 9 cards.

Ask five pupils to stand at the front of the class. Give each pupil one of the 0 - 9 cards to hold.

Materials: a set of large number cards 0 - 9

Ask the rest of the class to help you read the five digit number: *twelve thousand, five hundred and ninety six.*

Now ask the five pupils to change places. Let the class read the new five digit number.

Ask the class to help you rearrange the five pupils so that they make the biggest possible five digit number, ie **96,521**.



Repeat this activity with different pupils and a different set of numbers.



Divide the class into groups of 5. Give each group a set of number cards 0 - 9. Select five numbers and write them on the blackboard: for example, **3**, **7**, **1**, **5** and **8**.

Materials: sets of number 0 - 9 cards

Ask each group to make as many different five digit numbers as they can using these five numbers.

Let them write down all the numbers they make.

Ask them to make the biggest and smallest possible numbers.

Encourage the pupils to think of a 'rule' for making the biggest possible number,

ie putting the biggest digit in the ten thousands, the next biggest in the thousands, the next biggest in the hundreds, and the next biggest in the tens, etc.



Can all the pupils make the biggest and smallest number using five digits?

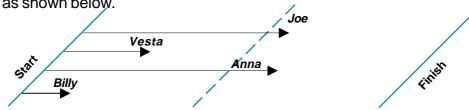


Introduce the concept of rounding off numbers to the nearest 10, 100 and 1,000.

Play the game 'Walk to the Nearest 10' to introduce the concept.

Materials: object for marking lines e.g. chalk, whistle

Mark or draw three straight lines on the floor and label the distance between as shown below.



10m 11m 12m 13m 14m 15m 16m 17m 18m 19m 20m

Select 4 pupils in the class to play the game.

The game is played by walking from *start* to *finish* as the whistle blows.

While the pupils walk from start to finish, the teacher blows the whistle. The pupils stop where they are and the game is to run to the nearest point, **START** or **FINISH**.

The child who runs too far to the wrong place is out of the game. The game continues again.

Let the whole class watch as the four pupils demonstrate the game. Ask these questions to introduce the concept of rounding off to the nearest ten and also to help the pupils understand how to play the game.

Billy has walked 11 m. Where is the nearest place?

Answer: (Start, so 11 m rounded off to the nearest 10 is 10 m)

This means that 11 rounded off to the nearest 10 is 10.

Anna has walked 16 m. Where is the nearest place?

Answer: (Finish, so 16 m rounded to the nearest 10 is 20 m)

This means that 16 rounded to the nearest 10 is 20, etc.

Remind the pupils that 15 is halfway between the two points, **START** and **FINISH**. If the pupils reach halfway the rule always is that they have to move on. Therefore, 15 rounded to the nearest 10 is 20.

Ask other groups of pupils to demonstrate the game again and ask questions about their nearest point and rounding off to the nearest 10.



Play the game with the rest of the pupils in the class.

Be sure that the pupils understand the rules and move to their nearest place as you blow the whistle to stop them from walking.

Materials: object for marking lines e.g. chalk, whistles

You could ask someone to blow the whistle for the game while you walk around checking the pupils during the game. Pupils who move to the wrong point should be out of the game. You can make the game interesting by increasing the distance for start to finish from 10 m to 30m. Then try 100 m to 200 m in the play ground.



Teach rounding off 2-, 3- and 4-digit numbers to the nearest 10, 100 or 1,000.

Materials: blackboard

Use this strategy to show pupils rounding off 2-, 3- and 4-digit numbers. For example:

66 rounded to the nearest ten is 70 13 rounded to the nearest ten is 10

Remind the pupils that the rule for rounding up and down numbers to nearest ten is:

If the ones digit in the number is 5 or more, then the number is rounded up.

For example:

66 is rounded up to 70

If the ones digit in the number is less than 5, then the number is rounded down.

For example:

13 is rounded down to 10

679 rounded to the nearest hundred is 700 437 rounded to the nearest hundred is 400

Remind the pupils that the rule for rounding up and down numbers to nearest hundred is:

If the tens and ones digit in the number is 50 or more, then the number is rounded up.

For example:

679 is rounded up to **700**

If the tens and ones digit in the number is less than 50, then the number is rounded down.

For example:

437 is rounded down to 400

Give pupils more examples of rounding off two-, three- and four-digit numbers using this strategy and remind them that the half way number for four-digit numbers is 500.



Practise rounding off numbers to nearest tens, hundreds and thousands. Start with the 2-digit numbers.

Materials: blackboard, pens, exercise books

Write this set of numbers on the blackboard. *10, 12, 13, 17, 20*Prepare instructions about the numbers. Give the pupil instructions to help them round off the numbers to the nearest 10. For example:

Write the numbers between 10 and 20 which are nearer to 10 than 20 (12, 13) Write the numbers between 10 and 20 which are nearer to 20 than 10 (17) Circle the numbers between 10 and 20 which are nearer to 10 than 20 (12, 13) What is 13 rounded to the nearest ten? (10) Round 17 to the nearest ten. (20) etc.

Repeat this example with these sets of numbers. Ask pupils similar questions to help them round these numbers to the following:

nearest tens.nearest hundreds.nearest thousands.30, 33, 37, 40100, 134, 180, 2002,000 2,005 2,019 2,550 3,00056, 57, 61, 69, 70300, 301, 342, 365, 400

Check to see that the pupils are rounding numbers correctly to the nearest 10, 100, 1,000.



Revise the strategy for rounding off numbers to 10 and 100. Write the number 156 on the blackboard and help the pupils round 156 to the nearest 10 and 100. Remind them about the rules for rounding off numbers. For example:

Materials: blackboard

156 is 160 rounded to the nearest ten. 6 is more than half way between two tens. If a number has 5, 6, 7, 8 or 9 ones, the number is rounded up to the next ten.

156 is 200 rounded to the nearest hundred. 56 is more than half way between two hundreds. If the tens are more than half way, the number is rounded up to the next hundred.

Repeat the example with, 982, 106 and 2,587. Round them to the nearest 10 and 100.

Extend the example by rounding off money to the nearest cents and dollars. For example:

 46ϕ rounded to the nearest ten cents is 50ϕ 34ϕ rounded to the nearest ten cents is 30ϕ 87ϕ rounded to the nearest ten cents is 90ϕ

\$1.25 rounded to the nearest dollar is \$1.00 \$2.55 rounded to the nearest dollar is \$3.00 \$6.40 rounded to the nearest dollar is \$6.00



Ask the pupils to complete the activities in their resource book, page 5 and 6.

In questions 3 to 10 of page 5, the pupils round the price of items to the nearest ten cents or nearest dollar.

Resource Book answers:

page 5.

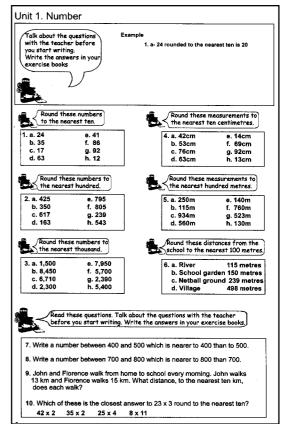
1. a- 60	b- 120	c- 5680	d- 1730
e- 50	f- 370	g- 80	h- 330
i- 830	j- 530	k- 620	I- 80
2. a- 600	b- 100	c- 6500	d- 700
e- 400	f- 400	g- 200	h- 900
i- 800	j- 400	k- 3,100	I- 700
3-90¢	4- \$2.50	5- \$1.60	6- \$3.20
7- \$16.00	8- \$24.00	9- \$6.00	10- \$8.00

Resource Book answers:

page 6.

1. a- 20	e- 40	2. a- 400	e- 800	3. a- 2,000	e-8,000
b- 40	f- 90	b- 400	f- 800	b- 8,000	f- 6,000
c- 20	g-90	c- 600	g- 200	c- 7,000	g-2,000
d- 60	h- 10	d- 200	h- 500	d- 2,000	h- 5,000

4. a- 40 cm e	e- 10 cm	5. a- 300 m	e- 100 m	6. a- 100 m
b- 50 cm f	- 70 cm	b- 100 m		b- 200 m
c- 80 cm g	g- 90 cm	c- 900 m		c- 200 m
d- 60 cm h	n- 10 cm	d- 600 m		d- 500 m



7- any number less than 450 8- any number more than 749 9- John 10km and Florence 20 km 10- 35 x 2



You can now help the pupils to use the rounding up and down rules to make approximations (estimates) to addition calculations before the addition is done using the algorithm. Show pupils the two examples.

Materials: blackboard

Find the estimate (approximate) to: **38 + 34.**

First round off to the nearest ten. **40 + 30 = 70** (approximate answer)

Now using the algorithm

1
38
+ 34
72

Approximate answer: 70. Correct answer: 72.

Find the estimate (approximate) to: **425 + 173.**

First round off to the nearest hundred. 400 + 200 = 600 (approximate answer)

Now using the algorithm 425

+ 173 598

Approximate answer: 600. Correct answer: 598.

Repeat the examples with some more additions below. Ask them to find the best approximation first by rounding off and then add using the algorithm. Let them compare the approximate and correct answers.

64 + 32 25 + 43 564 + 212 734 + 265



Ask the pupils to open their resource books on page 7.

Talk about the examples with the pupils.

Be sure that the pupils understand what to do in the activity before they start writing.

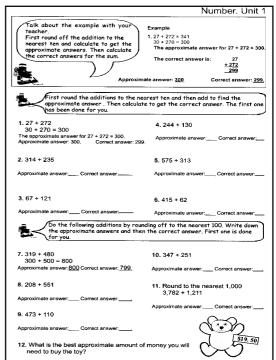
Ask the pupils to show their working in their exercise book and write the closest approximation.

Resource Book answers: page 7.

$$1-30+270=300$$
 (299) $6-420+60=480$ (477)

$$2-310 + 240 = 550 (549)$$
 $7-300 + 500 = 800 (799)$

$$3-70+120=190$$
 (188) $8-200+600=800$ (759)



11-4,000+1,000=5,000(4,993) 12-\$20.00



Can all the pupils round off numbers to the nearest ten, hundred and thousand?



Ask the pupils to come to the front so that they can all see the demonstration. Use stones to demonstrate even and odd numbers.

Materials: blackboard, object such as, counters, stones

Arrange 6 stones on the floor. Ask the pupils to put them in twos.

For example: 6 stones even Ask the pupils if there is one stone left over or not. In this case there is no left over stone so the number of stones is even. Remind the pupils that 6 is an even number.

Try with 7 stones. Arrange them in twos.



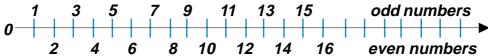
Ask the pupils if there is one stone left over or not. In this case there is one left over stone so the number of stones is odd.

Remind the pupils that 7 is an odd number.

Repeat this with other numbers such as, 8, 9, 10, 11, 12, etc.

Write a list of even and odd numbers on the blackboard as you continue with the examples. You can show this on a number line.

For example:



Explain that every second number beginning with 1 is an odd number and every second number beginning with 2 is an even number.



Write these numbers on the blackboard: 23, 36, 12, 45, 13, 60

Give out stones to the pupils and ask them to arrange them in twos.

Materials: objects such as. stones, counters

Let the pupils find out by arranging the stones in twos, which ones are odd numbers and which ones are even numbers.

Ask them to write these numbers into two groups. Even and odd. The pupils' work should be like this.

Even numbers	Odd numbers.
12	13
36	23
60	45

Encourage the pupils to try other numbers and add them to their lists.

Find out from the pupils and let them realise that whole numbers ending with, 0, 2, 4, 6 and 8 are even numbers and numbers ending with 1, 3, 5, 7 and 9 are odd numbers.

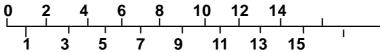
Check the pupils work after they have finished. Make a list of odd and even numbers on the blackboard.



Draw a number line on the blackboard. Ask the pupils to count in twos up to 50.

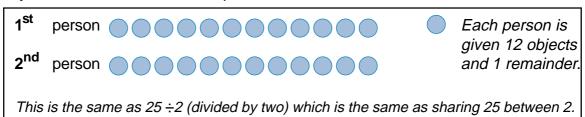
Materials: blackboard

Write the even numbers on top and the odd numbers below on the number line. For example:



Explain that the top numbers are even numbers. They are multiples of two. The bottom numbers are odd numbers.

Show the pupils how we can find whether a number is even or odd by sharing 25 objects equally between two. Use this example to demonstrate.



Explain that when a number cannot be divided equally by two, it is an odd number. If a number is divided equally by two then it is an even number.

Try dividing these numbers by two using the sharing method. Ask the pupils to say whether the number is even or odd. **25**, **38**, **14**, **47**, **13**, **100**. Introduce the short-cut methods for sharing. For example,

1				
	47÷2 can be shown like this			
	1 st person 20	3	1	Answer is 23 remainder 1.
	2 nd person 20	3		So 47 is an odd number.



Help the pupils to practise finding even and odd numbers by dividing by two, using the sharing method. Encourage them to try and find a good short cut. Materials: stones, pens, exercise books

Write these numbers on the blackboard. 24 58 79 333 436 653 848 1,240

Ask the pupils to divide each number by two. Estimate firstly a short-cut share. Remind them that if a number cannot be divided equally by two, it is an odd number. If a number is divided equally by two then it is an even number.

Also remind the pupils that any number that ends in 0, 2, 4, 6, 8, is even and any number that ends in 1, 3, 5, 7, 9, is odd.

Answers:

Even numbers Odd numbers 24, 58, 436, 848, 1,240 653, 333, 79



Extra activities Support

Prepare a set of cards with four digit numbers.



Materials: sets of large number cards, place value chart, number blocks

Work with groups of 4 or 5 pupils.

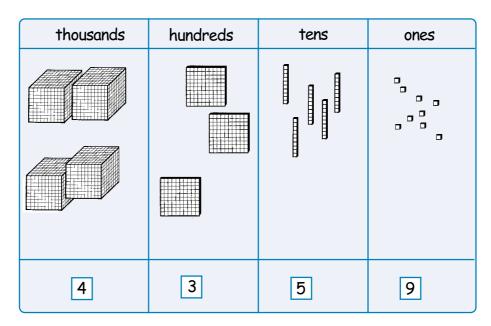
Spread out the cards and ask the pupils to tell you:

Which number is the smallest and which is the biggest?

Encourage the pupils to find the biggest number by looking for the one with the highest number in the thousands.

Let the pupils take turns to make the numbers using number blocks and a place value chart.





Ask the pupils to read each number and to arrange the number cards in order, from the smallest to the biggest.

1,561

2,800

3,617

4,067

4,359

7,920

Extra activities **Extension**

Materials: number cards 0-9

Choose four numbers and write them on the blackboard,

for example, **2**, **9**, **4** and **7**.

Ask the pupils to see how many different four digit numbers they can make using these four numbers.

Encourage the pupils to use a method to help them find the numbers, so that they will know when they have found them all.

For example, the pupils could begin by finding all the numbers beginning with a 2: Such as,

- 2,479
- 2,497
- 2,749
- 2,794
- 2.947
- 2,974

From this the pupils may be able to work out that, if there are six different numbers beginning with the digit 2, there will be 24 different numbers altogether. Ask the pupils,

how many numbers begin with 4?

how many numbers begin with 7?

how many numbers begin with 9?

how many numbers altogether?, etc.

Another way to think about this problem is shown below in four ways. For example,

1. There are four different ways to choose the first number to be in the thousands column. For example,

2, 4, 7 or 9

4.972

9.724

2. When the first number is chosen, there are three different ways of choosing the second number to be in the hundreds column.

For example,

2.497

2,**9**72

3 ways

3. Then there are two different ways for choosing the third number to be in the tens place.

For example,

2.4**9**7

2 ways

4. Finally there is only one way to choose the fourth number to be in the ones place.

For example,

247

2,47**9**

1 way

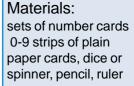
Therefore we can see that altogether, $4 \times 3 \times 2 \times 1 = 24$ ways which is the same as the first activity.

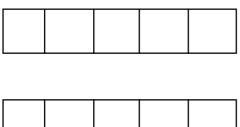
Think about the four steps. Help the pupils try them out. Try the method with another four digit numbers. This will help the pupils to practise their investigation skills.

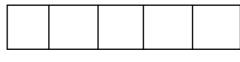
Extra activities **Support**

In groups of four or five, ask the pupils to play this game.

Give each player a plain strip paper card. Ask them to prepare their paper cards into grids like the one shown below.















The aim of the game is to make the largest 5 digit number.

The first player starts by rolling the dice or spinner. The number obtained is put anywhere on the grid. For example:

The next player takes a turn and enters his/her number.

When all players have had 5 turns each, their number will be complete.

Then all players check their numbers and decide who has made the largest number.

The player gets a point.

The pupils continue playing the game using the same strategy.

The teacher should help the pupils realise that a good strategy to win the game is to place the largest possible number in the left hand space on the grid.

Extra activities

Extension

Draw a 10 x 10 square grid on the blackboard.

Ask the pupils to copy the grid into their exercise books.

Encourage the pupils to find even and odd numbers inside the square grid.

The pupils could shade or circle even numbers and colour odd numbers.

Let the pupils check their work with someone who sits next to them after they have finished.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Materials: exercise books, pens, ruler, crayon

Use another grid to colour multiples of 2 and 3. Which numbers are coloured twice? What are they?

Ans: (multiples of six)



Measurement Topic 13: Length

Aim:

To develop the pupils' skills in estimating and measuring, and to enable them to make calculations involving standard units of length.

Sequence of objectives: To

- 1. estimate lengths in cm and m, then measure to check the accuracy of estimates.
- 2. introduce kilometres.
- 3. make calculations and solve problems in length, including perimeter.

Rationale:

Once the pupils become familiar with standard units like centimetres and metres, they should be able to estimate the length of objects. Measurement is a useful skill to have in real life, but can only be achieved when the children have learnt to measure accurately. This unit enables the children to estimate and measure lengths in practical activities, and allows them to make calculations based on measurements.



Remind the pupils of the standard units of length they have used in Standards two and three.

Talk about centimetres and metres, emphasising the

difference (a cm is a much smaller measurement than a metre) **relationship** (100 cm = 1metre)

between the two measurements.

Show the pupils a ruler marked in centimetres and a metre stick.

Choose some classroom objects and ask the pupils,

How would you measure the length and width of this book - in centimetres or metres? What is your estimate of the length of the book?

Repeat this with other examples,

the length of the blackboard,

the length of a piece of chalk, the length of the classroom,

Add some examples of your own.

the width of a desk,

the height of the doorway,

Materials:

metre stick, familiar objects for

measuring

centimetre ruler,

Each time, the pupils should be able to tell you whether they should use centimetres or metres. Question them about their choice of measurement: For example, Why would it not be sensible to measure the length of the classroom in centimetres? Why would we not use metres to measure the length of a piece of chalk?

The **accuracy** of the pupils' estimates is important. If their estimates are not reasonable, this will show you that they need more practice in measuring accurately.

In Standard 4 it is important to use the word *estimate* and not the word *guess*. To estimate a measurement, pupils compare an object with units of measurement that they know about. A guess is not based on any knowledge about measurement units.



Ask the pupils to work in groups of 3 or 4.

Give the pupils a variety of objects to measure, such as books, tins, pencils, sticks.

Let them use a ruler marked in centimetres or a thirty centimetre strip for measuring.

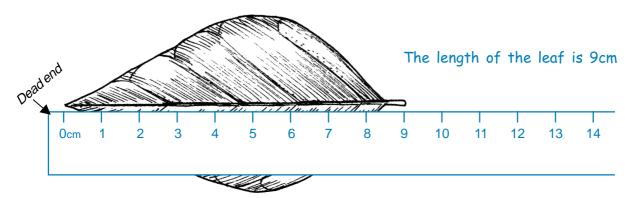
Copy the table below onto the blackboard:

Materials: objects to measure such as books, tins, sticks and other familiar objects; rulers marked in centimetres or thirty centimetre strips

Object	My Estimate	My Measurement	Error (difference)
1.			
2.			
3.			
4.			
5.			
6.			

Ask the pupils to copy the table into their exercise books.

They should estimate the length of each object first and then measure using a ruler or thirty centimetre strip. Check that they are measuring accurately. Remind them that if the ruler or strip has a 'dead end', this should not be counted when measuring.



When they have completed their estimates and measurements, ask the pupils to calculate the error in their estimates.

For example:

Object	My Estimate	My Measurement	Error (difference)
1.leaf	7 cm	9 cm	2 cm
2. book	20 cm	23 cm	3 cm
3. pencil	17 cm	17 cm	0 cm
4. stick	30 cm	26 cm	4 cm
5. tin can	15 cm	16 cm	1 cm
6. string	25 cm	22 cm	3 cm



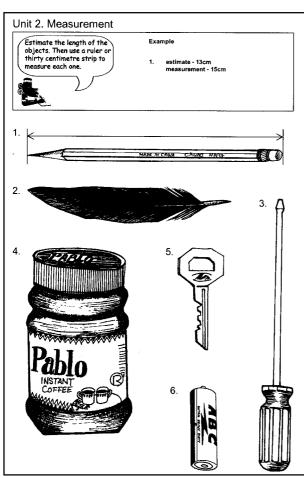
Talk to the pupils about the estimating and measuring they did in the first activity.

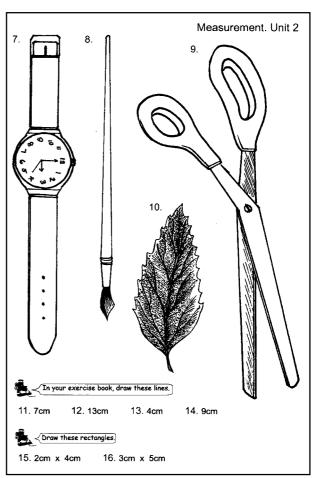
Ask them to tell you if they thought their estimates were accurate. For example, did they over-estimate or under-estimate?

Materials: objects to measure such as books, tins, sticks and other familiar objects; rulers marked in cm or thirty cm strips



Ask the pupils to complete the activities on pages 8 and 9 of their resource book. Let them estimate the length of each object before measuring it with a ruler or a thirty centimetre strip. They should make another table and list the objects as before. When the pupils come to questions 11 - 16, they should draw lines and rectangles in their exercise books according to the measurements given.





Resource Book answers: pages 8 and 9.

(Before measuring, the pupils should write an estimate for the length of each object.)

1. 15 cm 5. 6 cm 9. 21 cm Questions 11 to 16

2. 12 cm 6. 5 cm 10. 10 cm

3. 16 cm 7. 19 cm Check that the lines and rectangles the 4. 11 cm 8. 17 cm pupils have drawn are accurate.



Prepare some metre sticks from thin wooden poles or bamboo.

Show the pupils a metre stick and remind them that this unit is called one *metre*.

Ask the pupils to tell you how many centimetres make one metre. On the blackboard write: 100 cm = 1 m

Materials: metre sticks, centimetre rulers or thirty centimetre strips

Ask the pupils to estimate some lengths in metres, for example,

the width of the classroom, the length of a large table the height of the doorway, the distance from the door to the blackboard

Use other examples suitable for your classroom.

Ask two pupils to measure the length of the classroom using a metre stick. Remind them that for lengths that cannot be measured in whole metres, they will need to use metres and centimetres. For example, to measure the length of a window, they may need to use a metre stick and a ruler marked in centimetres.



Ask the children to work in groups of 2 or 3.

Let them use a metre stick and a centimetre ruler or thirty centimetre strip.

Ask each group to choose five or six things that they could measure in metres and centimetres.

The pupils should estimate the length only in metres first and then measure to get an accurate measurement.



For example,

the pupils might estimate the length of a mat to be 2 metres, and then use a metre stick and ruler to find that the actual measurement is 1 m 80 cm.

Ask the pupils to write their results in a table, for example:

	Estimate	Measurement
1. length of a mat	2 m	1 m 80 cm
2. height of the doorway		
3. width of the classroom		
4.		
5.		





Talk to the pupils about different units of measurement. Ask them:

Which units are best for measuring smaller objects such as a book or a pencil? Which are best for longer measurements such as the length of the classroom or a football pitch?

Now ask the children if they know about a unit of measurement **bigger than a metre**. For example,

What unit of measurement would you use to measure the distance between your village and the next village, or this island and the nearest one?

Introduce the *word* **kilometre** to the pupils. Show that this can be written as **km**. Explain that there are 1,000 metres in one kilometre. On the blackboard write:

1,000 m = 1 km

Help the children to think about how long one kilometre is.

Tell them that it is the distance they can walk in about 15 minutes.

Give the pupils some practical activities to do:

Let them walk for 15 minutes around the perimeter of the classroom. Give them a metre stick and ask them to measure 1,000 m using the perimeter of a football ground or from the school to a nearby place, such as the church.

Talk about some other local examples that the pupils will be familiar with. For example: you might know that it is about one kilometre to the next village, or two kilometres to the river. Practise estimating greater distances in metres.



On the blackboard, draw a table like the one below. Ask the pupils to copy it in their exercise books.

Less than one kilometre	About 1 kilometre	Between 1- 3 kilometres
from my home to school the length of the football pitch	from here to the next village	the distance to the river

Begin to write some examples of local distances that the pupils will be familiar with. For example, the distance from

their home to the school, their home to the river or beach, their village to the next village,

the school to the gardens, the school to the church or clinic,

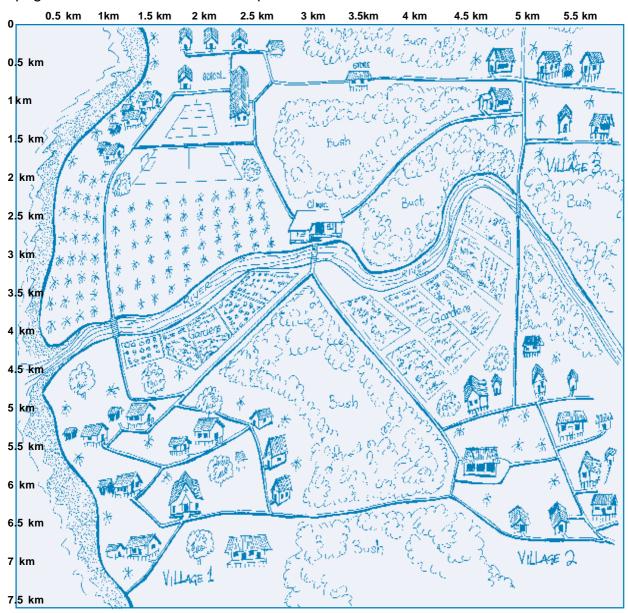
Ask the pupils to provide up to about 8 different examples.

With a partner, they should talk about each example and estimate whether it is less than one kilometre, about 1 kilometre or between 1 - 3 kilometres

When the pupils have finished, talk about the answers with the class.



Here is a simple sketch map of a village and its surrounding area. Work with the pupils and find some distances between the places. The pupils should open their resource book on page 83 to find a similar sketch map.



On the sketch map use a paper strip or string to check some distances between places in kilometres. Ask the pupils questions about the map, such as:

"How far is it from the school to the river? (3 km)
How far are the gardens from each of the villages?
What is the distance from the nearest village to the church?" etc.

Guide the pupils to identify the correct places and distances on the map using their paper strips or string. Remind the pupils that some of the answers for the distances will be different depending on from where they measure. Repeat this with other examples.

On the blackboard, draw a simple sketch map of your local area showing approximate measurements.

This might include the school, gardens, church, community meeting place, rivers and nearby villages. Ask the pupils questions about the map.



Ask the pupils to look at pages 10 and 11 of the children's resource book.

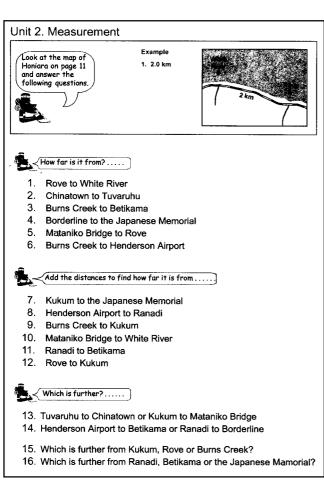
Talk about the map of Honiara and show the pupils how to find distances on the map. The numbers on the map show the distances in kilometres between the points marked with arrows, for example, the distance from Rove to White River is 2.0 kilometres.

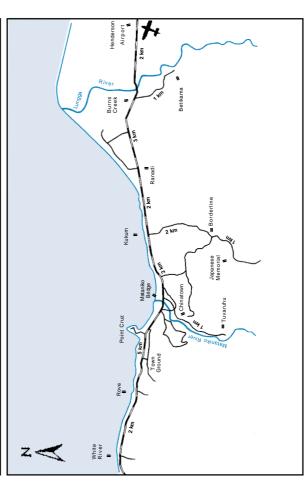
For questions 7 to 12, the pupils will need to add two distances to find the answer. For example,

to find the distance from Kukum to the Japanese Memorial, they will need to add the distance from Kukum to Borderline and the distance from Borderline to the

Memorial: 2 + 1 3 km

Monitor the pupils as they work and help them with the questions.





Resource Book answers: page 10

- 1. 2 km 2. 1 km 3. 1 km 4. 1 km 5. 5 km 6. 4 km 7. 3 km 8. 7 km 9. 5 km 10. 7 km
- 11. 4 km 12. 7 km 13. Kukum to Mataniko Bridge 14. Henderson Airport to Betikama
- 15. Rove 16. Japanese Memorial



Can all the pupils read a simple map and make measurements in kilometres?

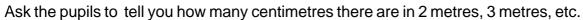


Show the pupils a builder's tape measure if you have one. Ask them to tell you who might use a tape measure like this, for example, a builder or a carpenter.

Materials: builder's tape

Show the pupils that the tape is marked in metres and centimetres. Ask the pupils to tell you how many centimetres there are in a metre. Write this on the blackboard:

$$1 m = 100 cm$$



$$2 m = 200 cm$$

 $3 m = 300 cm$ etc

If a carpenter is cutting a piece of wood that is longer than a metre, he might use metres and centimetres, or just centimetres.

For example, if the wood measures 1 m 30 cm, we can say 130 cm.

Show the pupils how to change measurements written in **m** and **cm** to measurements written in **cm**.

1 m 30 cm = 100 cm + 30 cm = 130 cm Repeat this with other examples.

For lengths of more than one metre written in **cm**, we can change them to **m** and **cm**. For example:

$$145 \text{ cm} = 100 \text{ cm} + 45 \text{ cm} = 1 \text{ m} 45 \text{ cm}$$

Ask the class to give some more examples.





Write the following questions on the blackboard.

Ask the pupils to copy them into their exercise books and fill in the missing numbers.

- 1. 200 cm = ____ m
- 7. $3 \text{ m} = \underline{} \text{ cm}$
- $2. 400 \text{ cm} = ___ \text{m}$
- 8. $5 \text{ m} = \underline{} \text{ cm}$
- 3. $170 \text{ cm} = \underline{\qquad} \text{ m} \underline{\qquad} \text{ cm}$
- 9. $1 \text{ m} 90 \text{ cm} = \underline{\hspace{1cm}} \text{cm}$
- 4. 210 cm = ____ m ___ cm
- 10. $2 \text{ m} 15 \text{ cm} = ___ \text{ cm}$
- 5. 165 cm = ____ m ___ cm
- 11. $4 \text{ m} 78 \text{ cm} = \underline{\hspace{1cm}} \text{cm}$
- 6. $305 \text{ cm} = ___ \text{ m} ___ \text{ cm}$
- 12. $6 \text{ m } 7 \text{ cm} = ___ \text{ cm}$



Ask the pupils to sit near the front of the classroom so that they can all see.

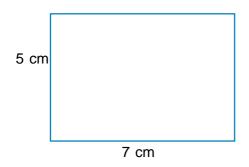
Show the pupils an exercise book or story book and demonstrate how to measure around the outside of the book using short equally sized sticks. Ask the pupils Materials: short sticks or matchsticks

How many sticks are needed to measure the outside of this book?

Can you remember the special name for the measurement around the book?.

Remind the pupils that the outside measurement around an object is called the **perimeter**.

Draw a large rectangle on the blackboard. Ask the pupils to imagine that the rectangle measures 7 cm x 5 cm. Label the rectangle with the measurements.



Ask the pupils to work out the perimeter of the rectangle by adding together the lengths of the four sides to find the total, ie 24 cm. (5 cm + 7 cm + 5 cm + 7 cm).

Repeat this with other shapes and ask the pupils to calculate the perimeter each time.



Divide the pupils into groups of 3 or 4.

Ask them to choose some different objects and measure to find the perimeter of each one. For example, they could find the perimeter of an exercise book, a school bag, the top of their desk, etc.

Materials: rulers or thirty centimetre strips, different objects to measure

If the object they are measuring is rectangular, encourage the pupils to **measure the length and the width** and then calculate the answer, rather than measuring all four sides.

For example, an exercise book measures 23 cm x 18 cm. Encourage them to think of different ways of finding the perimeter:

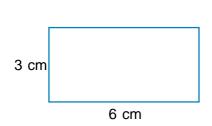
The perimeter of the exercise book is 82cm

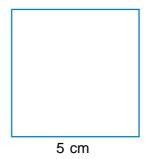
Extend this activity by asking the pupils to think about how they would find the perimeter of larger objects, such as the blackboard or a display board.

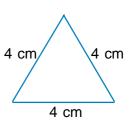


Remind the pupils of the word perimeter.

Draw some shapes such as squares, rectangles and triangles on the blackboard and label them with measurements, for example:







Point to each shape in turn and ask the pupils to tell you the length of the perimeter. Remind the pupils that the four sides of a square are the same length so the perimeter is equal to: $4 \times 5 \text{ cm} = 20 \text{ cm} (5 \text{ cm} + 5 \text{ cm} + 5 \text{ cm} + 5 \text{ cm} = 20 \text{ cm})$

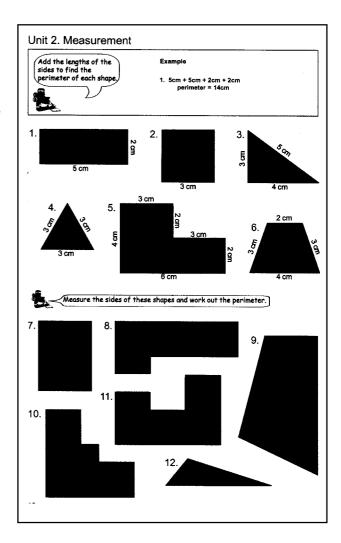


Ask the pupils to complete page 12 in their Pupils' Resource Book.

For questions 7 to 12 no measurements are given so the pupils need to measure the sides of the shapes carefully with a ruler or a thirty centimetre strip.

Resource Book answers: page 12.

1. 14 cm	7. 14 cm
2. 12 cm	8. 20 cm
3. 12 cm	9. 22 cm
4. 9 cm	10. 20 cm
5. 20 cm	11. 22 cm
6. 12 cm	12. 13 cm





Choose three children from the class and measure their heights against the height chart.

Record the results on the blackboard, for example:

Lindsay - 139 cm

Agnes - 152 cm

Stephen - 147 cm

Materials: a height chart marked in centimetres

Ask the children questions such as,

Who is the tallest?

Who is the shortest?

How much taller is Agnes than Stephen?

How much taller is Stephen than Lindsay? etc

Remind the children that these heights can be converted from centimetres into metres and centimetres. For example, Lindsay's height can be written as: **1 m 39 cm** Repeat this activity with other children from the class.



The pupils look at page 13 in their resource book.

Ask them to look at the table about the Girls High Jump Result. This will help them answer the questions.

Let them decide if they need to add or subtract. For example, in question 1, the pupils need to find the difference between the two heights.

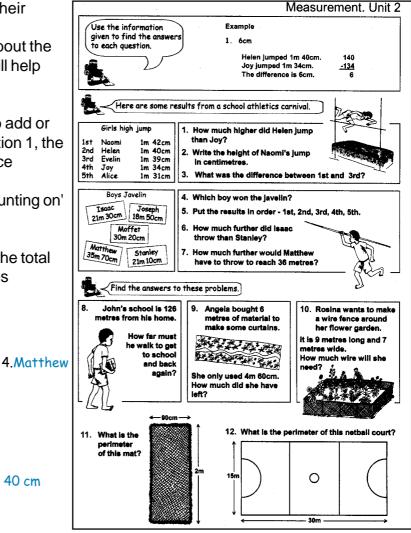
This involves subtraction or 'counting on' from 134 cm to 140 cm.

In question 8 they need to find the total distance walked so this involves addition.

Resource Book answers: page 13.

1.6 cm 2.142 cm 3.3 cm 4
5.1st Matthew 35 m 70 cm
2nd Moffet 30 m 20 cm
3rd Isaac 21 m 30 cm
4th Stanley 21 m 10 cm
5th Joseph 18 m 50 cm

6. 20 cm 7. 30 cm 8. 252 m 9. 1 m 40 cm 10. 32 m 11. 5 m 80 cm 12. 90 m





Can all the pupils make calculations and solve problems in length, including perimeter?

Extra activities

Support

Have the pupils practise estimating and measuring in centimetres and metres.

Let the pupils work in groups of five or six.

Give them rulers or measuring strips marked in centimetres.

Ask them to measure their heights.

The pupils should estimate first before they measure their heights.

Ask them to make a record like the one below for their activity.

Materials: rulers, measuring strips marked in centimetres, metre sticks

Name	My Estimate	My Measurement	Error (difference)
1. Lui	150cm	155cm	5cm
2. Kabiri	170cm	160cm	10cm
3. Ann	145cm	150cm	5cm
4. Tom	130cm	126cm	4cm
5. Mary			
6. Suzie			

Extra activities Extension

Let the pupils work in groups of two or three.

Give them sets of midribs or sticks, 10 centimetre long.

Ask the pupils to try and make different shapes where the perimeter has the same number of sticks.

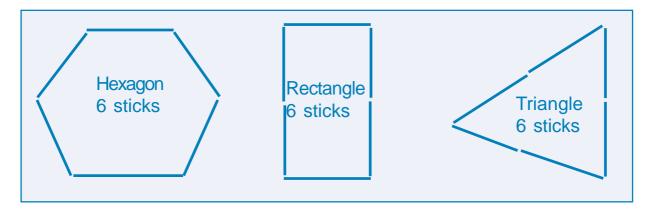
Start with 6 sticks.

How many possible shapes can they make?

Ask the pupils to draw the shapes in their exercise books.

Write the name of the shape and the number of sticks used.

Materials: sets of 10cm midribs or sticks, rulers



Encourage the pupils to try other numbers, such as, 3, 4, 5, 7, 8 etc.

What is the least and the greatest number of shapes they can make using the same number of sticks?

Shape Topics 8 & 9: **Two- and three-dimensional shapes**

Aim:

To extend pupils understanding of the names and properties of two- and three-dimensional shapes.

Sequence of objectives: Topic 8, To

- 1. introduce the pupils to more regular 2-dimensional shapes: pentagon, hexagon and octagon.
- 2. teach pupils to find properties of regular shapes: number of sides and corners, lines of symmetry, parallel lines.
- 3. teach pupils to investigate simple patterns and tessellations with regular shapes.

Sequence of objectives: Topic 9, To

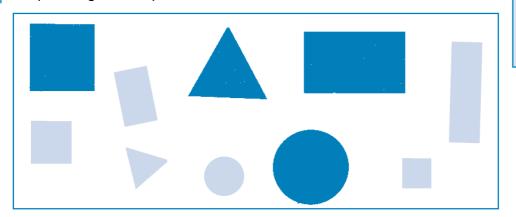
- 1. revise properties of 3-dimensional shapes: faces, edges, corners.
- 2. teach pupils to unfold 3-dimensional shapes to form nets.
- 3. teach pupils how to construct three-dimensional shapes from nets, such as cubes, cuboids, cylinders and other prisms.

Rationale:

This topic extends and broadens the pupils knowledge of 2-dimensional and 3-dimensional shapes and provides a useful base for understanding shapes in the environment. The pupils develop their understanding of the names and properties of shapes through investigation and practical activities. The activities may require the pupils to work in smaller groups giving pupils opportunities to discuss and share problems.



Prepare regular shapes cut from wood or card board.



Materials: regular shapes, cut from wood and card board

Revise mathematical names of regular shapes the pupils learned in standards 2 and 3. Start with these common shapes: **square**, **rectangle**, **triangle** and **circle**.

Show the pupils each shape. For example, a square.
Ask the pupils if they can remember the shapes' name from standards 2 and 3.

Encourage the pupils to describe the shape: **how many sides, corners, angles, edges, etc.** Ask the pupils to pick other shapes with square corners from their collection.

Two- and three-dimensional shapes

Ask the pupils to look around in the class and find more squares. These could be on drawings, one face of a three-dimensional shape or from one part of the classroom building.

Repeat this with other regular shapes such as: triangle, circle, rectangle.

Copy this table on the blackboard. On the table, draw each regular shape, write its name, write a description to describe the shape and write where the shape can be found.

Shape	name	description	examples
	square	a shape with four sides	window, face of a Chalk box,
	circle		
	rectangle		
	triangle		



Copy the table above onto the blackboard and ask the pupils to copy it into their exercise book.

Materials: blackboard, exercise books

Organise the pupils into smaller groups.

Ask them to look around the local environment for regular shapes: **square**, **rectangle**, **circle and triangle**.

The pupils must write where they find the shapes.

Give enough time for the pupils to hunt around the local environment.

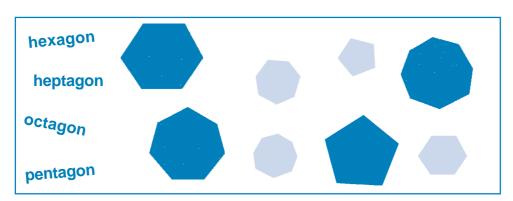
Make sure the pupils do not go too far from school, especially in towns or places where it is not really safe for them to go.

Encourage the pupils to find as many shapes as possible in the local environment.

Bring the pupils back to the classroom after some time and discuss what they found out.



Introduce more regular shapes: pentagon, hexagon, heptagon and octagon.



Materials: blackboard, regular shapes cut from wood and cardboard papers

Bring a collection of regular shapes cut from wood or cardboard. Display them in front of the class. Talk about the shapes with the pupils.

Show the pupils a shape from your collection. For example, a pentagon.

Ask questions about the shape. Try to get the pupils to respond by encouraging them to tell you the shape's name, the number of sides and the corresponding number of angles.

Write the shape's name and display it in the classroom for the pupils to see. Repeat this with other regular shapes: **hexagon**, **heptagon** and **octagon**.

Explain to the pupils that another name for a regular shape is **polygon** which means many angles.

Emphasise that all polygons have straight sides and enclose an area.

Find out more about other shapes with 9 and 10 sides. (nonagon, decagon).



The pupils work in groups of two or three.

Ask them to make regular shapes from geostrips.

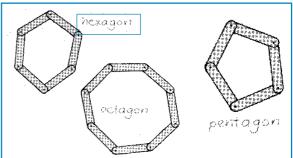
Materials: paper geostrips, glue or selotape, pens, papers, paper pins

Make sure that each group has enough paper strips, glue or selotape

Remind the pupils that regular shapes have straight sides and enclose a region.

Ask them to write names of shapes on a piece of paper and paste them against each shape.

The pupils could make a 9 and 10 sided regular shape.

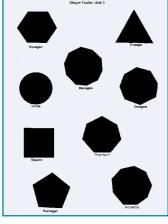




Prepare a collection of regular shape cards: pentagon, hexagon, heptagon, octagon, nonagon and decagon.

The teacher can also bring regular shapes from cut-off wood or cardboard.

Materials: regular shape cards, regular shape poster, regular shapes from cut-off wood or papers



Display your collections in front of the class.

Ask if anyone in the class can point to a shape with five sides. Encourage the pupils to say the name of the shape.

Repeat this with other regular shapes: hexagon, octagon, heptagon, nonagon and decagon.

Show pupils the regular shape poster.
Ask them to name each of the regular shapes in the poster.
Let them point to each shape.

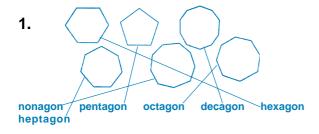
Encourage the pupils to look around the classroom and identify other regular shapes. These could be on drawings, face of a three-dimensional shape or from parts of the classroom building. Regular shapes have equal sides and equal angles.



The pupils complete the activities in their resource book page 14.

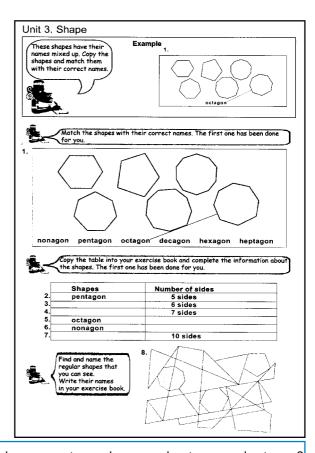
For number 8, the pupils should write the names of regular shapes only and not irregular shapes.

Resource Book answers: page 14.



2- 5 sides 5- 8 sides 3- hexagon 6- 9 sides 4- heptagon 7- decagon

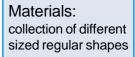
8- octagon, pentagon, hexagon, triangle, square.

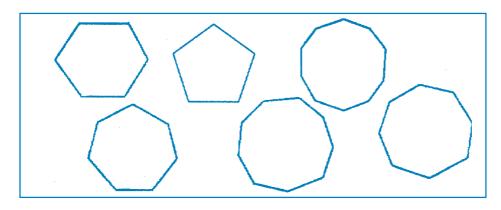


Can all the pupils recognise the properties of regular shapes: pentagon, hexagon, heptagon and octagon?



Bring a collection of different sized regular shapes: pentagon, hexagon, heptagon, octagon, nonagon and decagon.





Show the pupils your collection of regular shapes one by one. Ask the pupils to name and describe each shape.

The pupils may describe the number of corners, the shape's edge (all equal), the number of lines, the shape of the corners. (sharp or blunt)

Continue this process until the pupils are familiar with the names and properties of each shape.



Copy the table on the blackboard.

Ask the pupils to copy and complete the table in their exercise books.

Materials: blackboard, collection of different sized regular shapes

Shape	Number of sides	Number of corners
Pentagon	5	5
Hexagon		
Heptagon		
Octagon		
Nonagon		
Decagon		

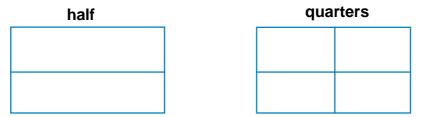
The pupils can count the corners and sides of the each regular shape to help them complete the table.



Remind the pupils of the ideas of symmetry and lines of symmetry on regular shapes.

Materials: A4 papers, scissors, cut-out shapes

Use an A4 paper. Explain that the paper is a rectangular shape. Fold the paper in half and quarters.



Unfold the paper. Show them the lines of symmetry where the folds are. Explain that the parts on each side of the folds are equal. Ask the pupils to tell you the number of symmetry lines in the shape.

Use this opportunity to explain lines of symmetry in common 2-dimensional shapes.

Use cut-out shapes from the Nguzu Nguzu cards to draw and cut out a pentagon shape on A4 paper. Show pupils the pentagon shape.



Ask the pupils to suggest ways of folding the shape to show lines of symmetry.

Fold the shape. Unfold and show them the lines of symmetry (5). Ask the pupils to tell you the number of symmetry lines in the shape.



Repeat this with one or two more common shapes. Ask the pupils to suggest how many different ways the shape can be folded to show symmetry lines. Write the number of lines.

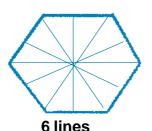


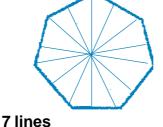
Draw and cut out enough common shapes from paper.

Ask the pupils to work in small groups. Give them regular shapes you have prepared from paper. Materials: pencils, A4 papers, scissors, regular shapes cut from paper

The pupils fold shapes into equal parts to find the lines of symmetry in the common shapes shown here. Encourage the pupils to fold the shape to show all lines of symmetry.

Let them count the lines of symmetry for each shape. Explain that these shapes are symmetrical.









The pupils should come to the front so that they can all see the demonstration. Prepare folded shapes and alphabet symmetrical

letters on cards.



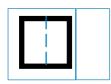


Materials: mirror, folded shapes and alphabet symmetry cards, blackboard



Show a folded square symmetry card. Ask the pupils to guess what the shape is.

Place the mirror along the line of symmetry. Let the pupils look at the reflection. Have them guess the shape.



Open the symmetry shape card to show the line of symmetry. Try placing the mirror at different positions to check other lines of symmetry in the square. Record the lines of symmetry.

Repeat this with other folded shapes and alphabet symmetry cards. Encourage the pupils to identify and count lines of symmetry.



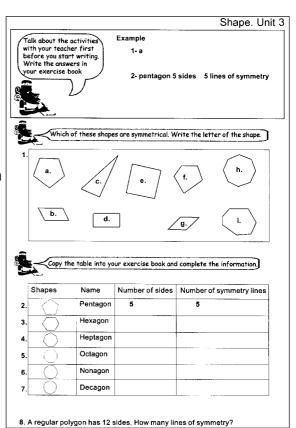
The pupils complete the activities in their resource book page 15.

They could draw lines on shapes or fold them to help them find out shapes that are symmetrical. Ask them do this on a separate piece of paper.

For question 2 to 8, help the pupils see the pattern between the number of sides and lines of symmetry. This will help them answer question 8. **Resource Book answers:** page 15.

1-a-d-e-h-g

shapes name	number of sides	symmetry lines
2- pentagon	5	5
3- hexagon	6	6
4- heptagon	7	7
5- octagon	8	8
6- nonagon	9	9
7- decagon	10	10



8-12 lines of symmetry



Can all the pupils find properties of regular shapes: number of sides, corners and lines of symmetry?



Copy these sequences of shapes onto the blackboard





Materials: blackboard





Ask them what shape should come next. Repeat this example using different patterns.



The pupils turn to page 16 in their resource book.

Ask them to look at the first pattern or sequence of shapes. What shape comes next?

Materials:pupils resource book, regular shapes prepared from card, paper, scissors

Ask them to draw the missing shape and write down its name in their exercise book. Repeat this with other patterns.

Resource Book answers: page 16.

1- hexagon

2- octagon

3- nonagon

4- circle/square

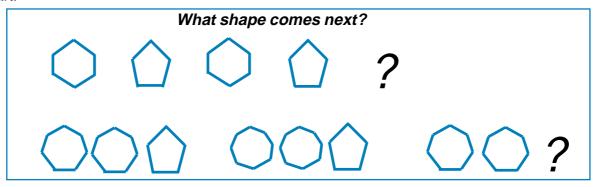
5- triangle

6- square

Let the pupils make their own shape patterns.

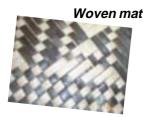
Give them regular shapes: pentagon, hexagon, heptagon, octagon, etc. prepared from cardboard.

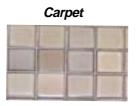
Ask them to draw around the cardboard shapes and cut them out. Paste the shapes to a chart.

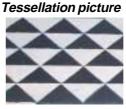




Collect certain items which show tessellations. For example: Shapes on the surface of a woven mat, carpet, tiles or tessellation pictures.







Materials: cut out regular shapes, objects with tessellation: ball, woven mat or basket, carpet

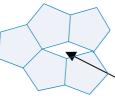
Discuss tessellation with the pupils. Talk about the shapes that tessellate in each item. Explain that tessellation refers to one particular shape being able to cover a surface or fit side by side perfectly without leaving gaps. For example, squares and rectangles as above. Ask the pupils what shapes they can see in each of the items. Do the shapes fit together? Why do they fit together?

Explain that the shapes fit together because they have straight sides and angles that fit without leaving any gaps. This is called **Tessellation**.

Demonstrate this for the pupils by putting regular shapes together. For example.



Say These hexagon shapes tessellate on their own. Why? They do not leave a gap.



Say
These pentagon shapes do not
tessellate on their own. Why?
They leave a gap which is a
rhombus.

Repeat this with more examples using other regular and irregular shapes



Teachers should provide regular shapes already cut enough for groups of three.

Ask the pupils to work in groups of three. Ask them to make tessellations using the regular shapes.

Materials: Nguzu Nguzu cut out regular shapes, pens, paper, crayons

Let them find out regular shapes that can tessellate and those that do not tessellate.

Encourage the pupils to draw around their shapes to show tessellations they have made.







?

Can all the pupils make simple patterns and tessellations with regular shapes and explain why?

Topic 9

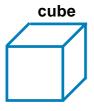


Bring a collection of three-dimensional objects into the classroom. Revise the name and properties of the shapes.

Show them the shapes. Ask them if they can tell you their names: cube, cuboid, sphere, cylinder and cone. Let them describe their faces, edges and corners. For example:

Materials:

A collection of threedimensional objects including cube, cuboid, cylinder, cone and sphere



each face is a flat surface and is a polygon. All the edges are straight

cylinder



has curved edges and two flat ends

Talk about their corners. Explain that the correct name is a vertex. Vertices are the corners where three or more edges meet in a 3-dimensional solid shape.

Count the vertices in the cubes and cuboids.

Repeat this with the pupils until they are familiar with the names and properties of the shapes.



1 flat face 1 curved face 1 vertex



Ask the pupils to work in pairs.

Let them look around in the local environment for three-dimensional objects.

Ask them to bring their collection inside the classroom and put them into groups.

For example,

tin shapes (cylinder), box shapes (cube / cuboid), ball shapes (sphere), spinning top shapes (cone).

Encourage the pupils to describe their three-dimensional object shapes using words such as, faces, edges and vertices.

Let them make labels with the names of the shapes and label the shapes.

Materials:

A collection of threedimensional objects including cube, cuboid, cylinder, cone and sphere





Display a collection of three-dimensional shapes in front of the class for the pupils to see.

Show them the shapes one by one. Ask them to tell you the names of each shape.

Ask the pupils questions about the shapes.

For example.

How many faces does it have?

What shape is each face?

How many corners (vertices) does it have?

How many edges?

Pass the shape around and let the pupils feel and see the edges, vertices and faces. Repeat this with other solid three-dimensional shapes.



Give the pupils enough three-dimensional objects, including cube, cuboid, cylinder, cone and sphere. Let them talk about the faces, vertices and edges of each shape.

The pupils could prepare a table in their exercise books and record the information.

Materials: collection of threedimensional objects including cube, cuboid, cylinder cone and sphere

Materials:

collection of threedimensional objects

including cube, cuboid, cylinder,

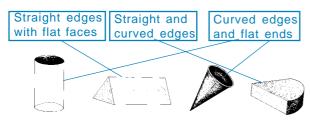
cone and sphere

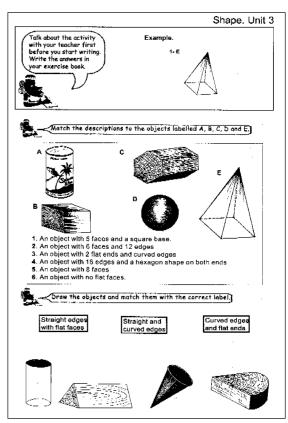
Shape	Faces	Vertices	Edges
cube	6	8	12
cuboid			
cylinder			
cone			
sphere			

The pupils turn to page 17 of their resource books and complete the activity.

Resource Book answers: page 17.

1-E 2-B 3-A 4-C 5-C 6-D





Can all the pupils recognise and describe properties of three-dimensional shapes: edges, faces and vertices?

Two- and three-dimensional shapes

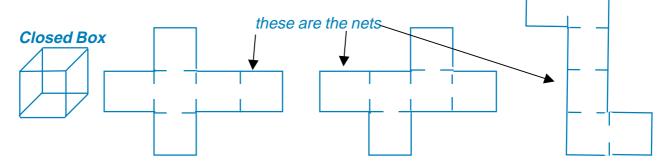


Show the pupils some empty boxes and cartons from the store.

Explain that the boxes and cartons have flat faces and straight edges. Show them the faces, edges and vertices.

Materials: empty tea boxes, chalk boxes, empty cartons from the store

Cut the cartons or boxes along those edges which make them flat. Show the pupils the nets.



The above box has three different nets. This depends on the edges that are cut.

Repeat this with other cartons and boxes. Work with the pupils and try to find other nets for the cartons or boxes.

Remember that to obtain the different nets of the box will depend on the different edges of the box that are cut. Show and count the nets of the cartons and boxes.



Ask the pupils to collect different types of empty cartons and boxes from the store and offices.

Bring the empty cartons and boxes into the classroom.

Ask them to unfold and cut where necessary the cartons and count the different nets obtained.

Let them do this with other empty cartons and boxes.

Encourage the pupils to count the number of different nets obtained from each carton and make a sketch or diagram of each box.

Materials: empty tea boxes, chalk boxes, empty cartons from the store





Nets of an open box



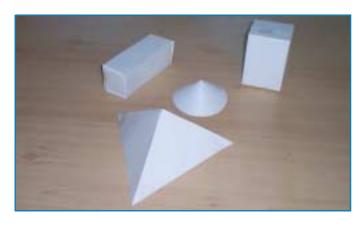
Can all the pupils cut and unfold 3-dimensional shapes to make their nets and count how many different nets can be made?



Prepare some three-dimensional shapes from folded paper and bring them into the class.

Ask the pupils if they can tell you the names of the shapes.

Materials: three-dimensional shapes made from folded paper

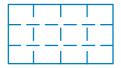


Let the pupils touch and feel their faces, edges, and vertices.

Unfold the shapes and let the pupils see the nets.

Demonstrate how to make three-dimensional shapes from nets by folding paper. Follow these instructions.

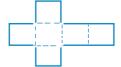
Net of a cube



Fold an A4 paper in quarters and thirds



Cut along the thick lines

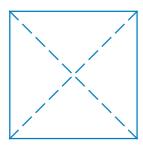


Fold along the dotted lines to form a cube

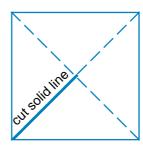


Use sellotape to join edges

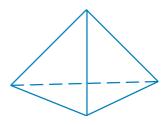
Net of an open triangular pyramid



Make a square. Then fold the paper diagonally



Cut along the line shown and bring two edges together to form an open triangular pyramid



Open triangular pyramid

Two- and three-dimensional shapes

Net of an open cone



Cut the paper into a circle



Fold the paper into four equal parts



Cut along the thick dotted line as shown

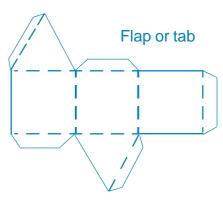


Move cut line until it reaches the dotted line to form an open cone

Now try and find out how to make large and small triangular prisms from these nets. Make your own instructions for the pupils to follow after you have found out how to make these nets.

Net of a large and small triangular prism





A good rule for flaps (tabs) is to place them on every 2nd edge as shown in the example. The flaps have to be carefully folded before using glue.



The pupils work in groups of two or three.

Give each group enough A4 paper, glue, scissors or razor blades.

Materials: A4 papers, glue, scissors, razor blades

Ask the pupils to make nets of three-dimensional shapes: cube, cuboid, cone, cylinder, pyramid and prism.

Let them construct the shapes from the nets they have made.

Help the pupils make the nets. They could look at the nets of some threedimensional shapes you have already made.

Let the pupils display their three-dimensional shapes inside the classroom.



Can all the pupils construct three-dimensional shapes such as cube, cuboid, and cylinders from nets?

Extra activities Support

Give the pupils paper, crayons, pencils and rulers.

Ask them to draw different tessellation patterns on pieces of paper.

Let them colour their tessellations and display them in the classroom.

Materials: paper, crayons, pencils, rulers



Encourage the pupils to look around the local environment in their own free time and collect objects with tessellation patterns.

These could be parts of broken carpets, floor tiles, woven mats or baskets.

Ask them to bring the objects into the classroom. Let them find out the shapes that tessellate and name them.

Talk about the patterns of tessellation and how the shapes are fitted together. Display the objects on the classroom wall.



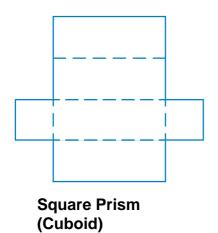
Extra activities

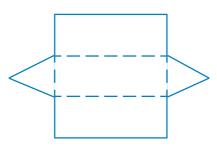
Extension

Ask the pupils to make nets of prisms.

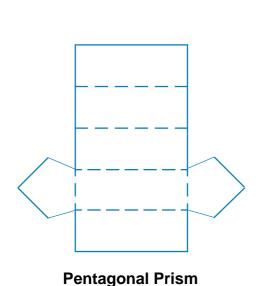
Draw the prism nets on the blackboard. Give the pupils papers to fold. Ask the pupils to draw the tabs on the correct place before folding.

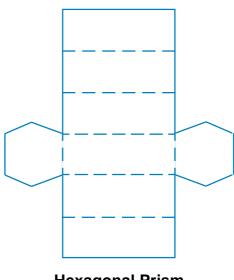
Let them fold the papers to make the three dimensional shapes from the nets. Encourage the pupils to work with someone who sits next to them. Help them with their work. Materials: papers, scissors or razor blades, glue, rulers





Triangular Prism





Hexagonal Prism

Ask the pupils to display their prisms in the classroom after they have finished.

Remind the pupils that a prism is named after the shape of the bottom and the top. For example, a triangular prism has a triangle shape at the top and bottom.

Number Topic 3: Addition

Aim:

To develop an understanding of mental addition skills and apply it to 3- and 4- digit numbers.

Sequence of objectives: To

- 1. teach the pupils to use mental addition strategies.
- 2. teach addition of 3- and 4-digit numbers with and without grouping.
- 3. practise solving problems using addition.

Rationale:

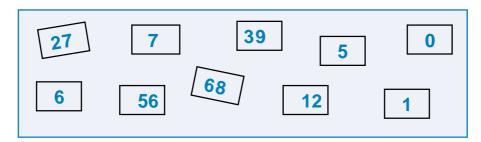
This unit will provide an opportunity for the pupils to develop strategies for quick mental computation in addition, without using objects or the written form. Their skills in developing mental strategies should help them in the addition of 3- digit and 4-digit numbers and for solving addition problems with and without using re-grouping. Pupils will need computational skills as they go through life.



Revise with the pupils mental addition of one and two digit numbers. Such as, 2 + 0, 4 + 2, 31 + 6, 16 + 7, 24 + 5, etc.

Materials: number cards 0-99

Use the number cards 0-99.



Begin the mental addition practice with one digit numbers.

Pick two number cards.

For example:

Show the two cards as you say the addition sum and ask the pupils to quickly work out the answers in their head without writing them.

Find out from the class who got the correct answer.

Check with the rest of the class if the child's answer is correct.

Repeat this example again using other one digit mental addition.

Encourage different pupils in the class to tell you the answer to the addition sums.

Addition answers as far as 20 are often referred to as NUMBER FACTS and eventually should be memorised.

Extend the mental addition practice to one and two digit numbers. For example:

Ask the pupils to find the quickest ways to add the two numbers.

Demonstrate these two examples of quick addition strategies to the pupils.

Example 2

$$27 + 5 = (20 + 7) + (0 + 5)$$

 $= (20) + (7 + 5)$
 $= 20 + 12$
 $= 32$

Repeat this with other examples using one and two digit numbers. Help the pupils do the addition mentally.



Help the pupils do mental addition of one and two digit numbers.

Ask the pupils to draw a rectangle grid with eight squares. Let them choose eight numbers between 0 - 50 and write them down in the boxes. For example:

Materials: exercise books, pens, addition bingo question cards

Prepare a set of one and two digit number addition guestions from the 'Addition Bingo Question Cards' for the rectangle grid.

Play addition bingo game with the pupils using the addition question cards.

The pupils listen as the teacher calls out an addition question, such as, 12 + 16 =

The pupils mentally add the two numbers,

for example,
$$12 + 16 = (10 + 2) + (10 + 6)$$

= $(10 + 10) + (2 + 6)$
= $20 + 8$
= 28

After a few minutes ask them to look at their rectangle and try to find out a total that matches with the addition sum.

If a pupil has the answer to the question, he/she should shade it.

28	6	121
2	9	3213

The first pupil to finish shading all the numbers on the card will shout Bingo.

The teacher checks to see that the pupil has got the correct answers. Repeat this with other number rectangles.



One useful strategy in mental addition is counting on.

Make a list of two digit numbers between 11 and 99 and write them on the blackboard. For example, 12, 38, 76, 25 etc.

Materials: empty tin such as Milo or milk, stones

Play this game with the pupils to practise counting on. Choose a number from the list, eg. 28 Say:

> There are 28 stones in the tin. How many will there be if I add 5 more?"

Encourage the pupils to say their answers.

After the pupils have said their answers, drop 5 stones into the tin one at a time.

Ask the pupils to count on, 5 more numbers from 28 as you drop the stones into the tin.

Check the pupil's answers.

Repeat this with other numbers and encourage the pupils to do counting on.



With the whole class, play a mental addition game to practise counting on.

Prepare a set of two digit numbers from 11 to 99. Each time call out a number to the pupils and write it on the blackboard, for example, '25'.

Think of any one digit number to add with 25. Say 25 and 7 makes what?

After a few seconds drop seven stones inside the tin one at the time.

Ask the pupils to calculate the answer in their heads by counting on.

The pupils do this by counting on 7 stones from 25 to get to the answer.

Let them write down their answers in their exercise books. Check the pupils' answers.

Repeat this with other numbers and check the pupils' answers at the end of each exercise.

Materials: empty tin such as, Milo or milk, stones



Prepare two digit number additions to enable pupils to see the relationship between addition and subtraction.

Write these additions on the blackboard. 14 + 55 22 + 24

Show the pupils four related ways of calculating the additions using addition and subtraction.

For example,

Repeat this with other examples.



Prepare enough addition statement cards with two digit numbers for oral questions. For example, 24 + 71 = 95. 16 + 23 = 39.

Materials: addition statement cards

Do mental addition activities with the pupils using the addition statement cards.

Show the addition statement card to the pupils.

Ask these addition questions and let the pupils mentally work out the answers using an inverse operation. For example,

Continue with other examples until the pupils can mentally work out the answers using the inverse operation.

Prepare enough addition number cards and give them to the pupils.

In groups of three, the pupils play mental addition. Someone in the group starts the game.

The child picks an addition question card and shows it to the pupils.

The pupils mentally work out the answer.

After a few seconds the group checks to see who got the correct answer.

Children take turns to pick the next card.

The game continues until all the cards are used.

6. 14 + ? = 27

Answers to addition activities



Can all the pupils use strategies for mental addition?



Revise addition of two and three digit numbers with the pupils. Such as, 24

+ 143

Help the pupils understand how to add the digits.

Use the place value chart and number blocks to explain this.

Make the ones and add them. Then record the total.

Materials: place value chart, number blocks ones, tens, hundreds

hundreds	tens	ones
		Make 4 ones
		Add 3 ones
1	6	7 Record the total

Emphasise the addition algorithm to the pupils as you show the process. Say,

What do we add first? (ones)
How many ones are being added
first? (four ones and three ones)

Say, "four ones and three ones make 7 ones".

Continue with tens and hundreds place value and repeat the example with other additions.



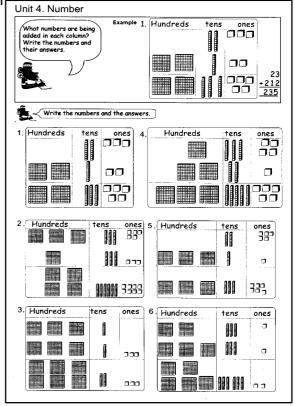
The pupils look at the place value chart in their resource book page 18.

Let them think of the numbers that are being added for each column in the place value chart .

Ask them to tell you the numbers and answers for each addition sentence.

Resource Book answers: page 18.

1. 23	4. 1 3 4
+ 2 1 2	+ 221
235	355
2.335	5. 25
+ 133	<u>+ 311</u>
468	<u>336</u>
3.310	6. 2 3 1
+ 313	+ 331
<u>623</u>	562





Give pupils further practice in addition of two and three digit numbers
Write these additions on the blackboard. 122 216 17

122 216 172 +413 + 212 + 113 Materials: place value chart, number blocks

Help the pupils understand how to add the digits. Explain the addition algorithm.

Use the place value chart and number blocks to show the process.

Start with 122 + 413.

Make the ones, add and record the total. Continue this with tens and hundreds.

Show the addition on the blackboard without using the place value chart and number blocks. Emphasise the addition algorithm.
Say,

What do we add first? (ones)

Three ones and two ones make
five ones.

What do we add next? (tens)

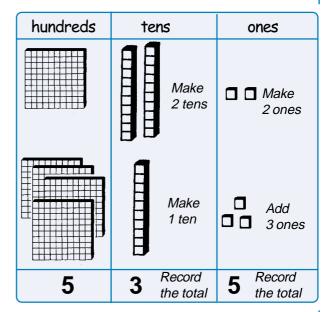
H.T.O

1 2 2

+ 4 1 3

5 3 5

One ten and two tens make three tens. Then one hundred and four hundreds make five hundreds. etc.



Repeat this example with other additions



Ask the pupils to complete the activities in their resource book page 19.

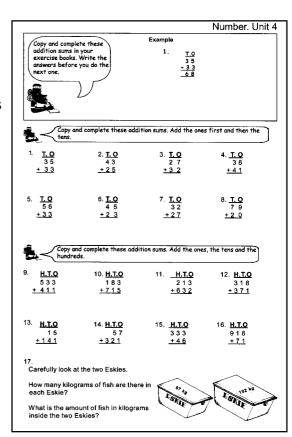
Let them add each sum and write down the answers neatly in their exercise books.

Encourage the pupils to try and do mental addition without using blocks and stones.

Resource Book answers: page19

1- 68	2- 68	3- 59	4- 79
5-89	6- 68	7- 59	8- 99
9- 944	10- 898	11- 845	12- 689
13-156	14- 378	15- 379	16- <mark>989</mark>

17- 199 kg





Teach addition of three digit and four digit numbers with re-grouping. Such as, 229 + 432, 1,317 + 273, etc.

Materials: place value chart, number blocks

Use the place value chart and number blocks to explain the addition algorithm and help the pupils to understand how to add the digits.

Make the ones and add them. Re-group to make tens if there are enough ones to make tens.

thouds	hunds	tens	ones
	6	6	1

Say , What do we add first? (**ones**:) Nine ones and two ones make eleven ones.

Are there enough ones to make a ten? Yes, **one ten and** one ones.

Re-group the ones to make six tens and leave one ones in the ones place, etc.

Repeat this with **tens, hundreds** and **thousands** place value and record the totals.



The pupils should now complete the activities in their resource book page 20.

Encourage them to do the separate additions mentally for each column.

Ask them to re-group numbers for tens, hundreds or thousands place value.

Use the algorithm in their exercise books.

Resource Book answers: page 20.

1. 792 5. 796	2. 882 6. 782	3. 991 7. 691	4. 598 8. 792
9. 952	10. 577	11. 718	12. 894
13- 9,650 16- 5,195	14	- 3,928	15- 4,821

Copy and comple addition sums in exercise books. Write the answe you do the next	your rs before	Example 1 HIQ 1 568 -224 792	
Copy and	l complete these addition	sums. Remeber to start	adding the ones,
then ten	s and the hundreds. Regr	oup to make the tens and	the hundreds.
^{1.} _H.T.O	^{2.} <u>H.T.O</u>	3 _{. H.T.O}	⁴ <u>. н.т.о</u>
568	359	2 4 7	1 0 9
+224	+523	+7 4 4	+4 8 9
^{5.} <u>H.T.O</u>	^{6.} <u>н.т.о</u>	⁷ <u>· н.</u> т.о	8 _{. H.T.O}
3 2 9	763	436	206
+4 6 7	+ 19	+255	+586
^{9.} _H.T.O	¹⁰ . _{H.T.O}	¹¹ . H.T.O	^{12.} H.T.O
3 2 5	563	463	6 0 6
+6 2 7	+ 14	+255	+2 8 8
¹³ .T.H.T.O	^{14.} T.H.T.O	^{15.} T.H.T.O	^{16.} T.H.T.
523	3536	3 4 3 6	763
+9127	+ 392	+1 3 8 5	+4432



Can all the pupils add 3 and 4 digit numbers with and without regrouping?



Help the pupils to practise solving problems involving addition.

Materials: blackboard, chalk

Write the information about 'John's weekly fish catch' on the blackboard. Talk about the daily and weekly fish catch with the children. Ask,

How many fish did John catch on Tuesday?
What was the total number of fish caught for the first three days?
How many fish did he catch in total on Friday and Saturday?
How many kilograms of fish altogether did he catch on on Wednesday and Thursday?

Discuss with the pupils what they need to do to find out the total. Emphasise the word 'total' as this will help the children apply addition to solve addition problems.

Repeat this with the fish weights. Talk about each day's catch and their total weights.

John's weekly fish catch chart		
Days	Amount	Weight
Monday	3	15kg
Tuesday		8kg
Wednesday	 5	19kg
Thursday	3	11kg
Friday	1	3kg
Saturday	4	10kg



The pupils turn to page 21 in their resource books.

Talk about the activities with the pupils first.

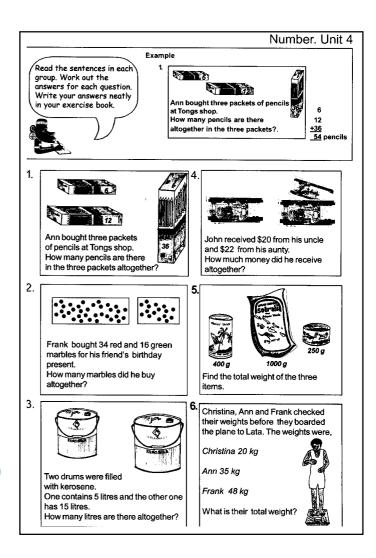
Help the pupils read and understand the sentences.

Discuss some of the questions.
Ask them to complete the addition activities and write the answers in their exercise books.

Resource Book answers: page 21.

- 1. 54 pencils 4. \$42
- 2. 50 marbles 5. 1,650 g (1.65 kg)
- 3, 20 I

6. 103 kg





Make up addition stories to tell the pupils. Write them on the blackboard. For example,

John went to the supermarket and spent \$5 for fruits and \$6 for vegetables. He bought a 10 kg bag of rice at \$28 and 5 packets of biscuits for \$3.

Help the pupils find ways to solve this problem. Ask questions to encourage them to think and use the word *altogether* as well as *total*. such as.

How much money did John spend in total for fruits and vegetables? How much did he spend altogether for a 10 kg rice and 5 packets of biscuits? What was the total amount of money he spent at the supermarket? etc.

Repeat this with other addition stories.



The pupils turn to page 22 in their resource books and answer the questions.

Talk about the example and the activities with the pupils first.

Ask them to find out the total cost for each set of items.

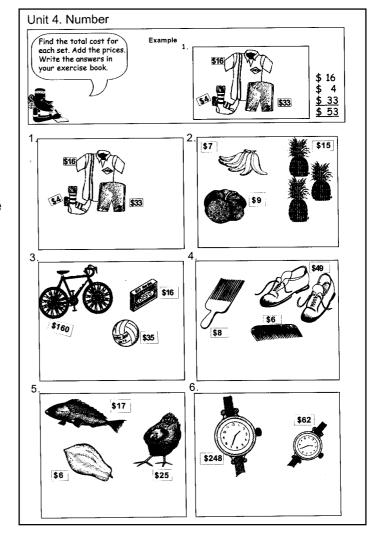
Let them add the prices and write the answers in their exercise books

Resource Book answers: page 22.

1. \$53 2. \$31

3. \$211 4. \$63

5. \$48 6. \$310





Talk about the items that the pupils would like to buy in shops and their prices. Write them on the blackboard, for example, Ice-Cream \$3.80, Vimto \$2.00, Twisties \$0.80, etc.

By using questions, encourage the pupils to talk about these items and their costs. Such as,

"How much money will I need for one Ice-Cream and a bottle of Vimto?"
How much is for one packet of Twisties, an Ice-Cream and a bottle of Vimto?" etc.

Help the pupils find ways to work out the answers to the questions. Show the addition on the blackboard. Say,

One Ice-Cream costs \$3.80
A bottle of Vimto costs \$2.00

We add these prices to find out the cost of the two items

\$3.80

+\$2.00 \$5.80

Repeat this with other examples.



Ask the pupils to complete the activities on page 23 in their resource books.

Let them read the advertisements about the prices and answer the questions below the advertisements.

Help the pupils look at the correct advertisements for each question.

Check that they are doing the right thing and help them with their addition.

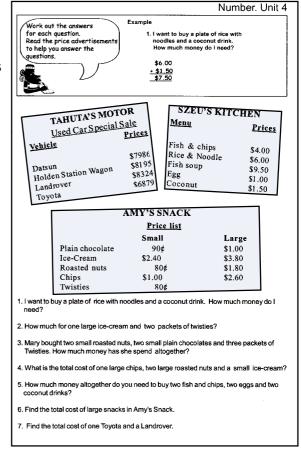
Resource Book answers: page 23.

1. \$7.50 4. \$8.60

2. \$5.40 5. \$13.00

3. \$5.80 6. \$9.20

7. \$15,203



Extra activities

Support

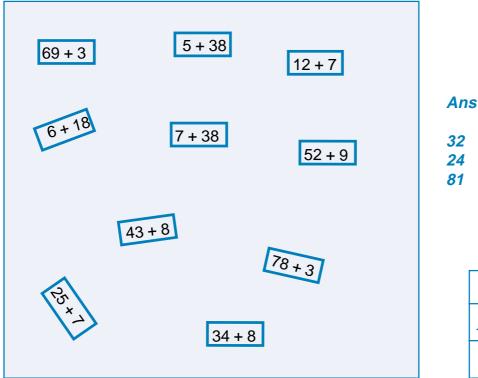
Help the pupils develop further understanding by practising more mental addition strategies.

addition cards, exercise books, pencils

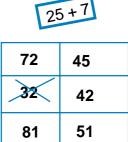
Materials:

Play addition bingo with the pupils

Prepare one and two digit number addition facts on cards.



Answers:



Provide pupils with a list of answers on the blackboard.

Ask the pupils to draw a square and divide it into 6 boxes. Select six numbers from the list of answers and copy them in their squares.

Each time call out an addition pair to the pupils.

The pupils look at their numbers in the square

and see if they have the answers to that addition.

If an answer appears in the square the children

cross it out. The first pupil who has all the numbers crossed out wins the game.

Repeat this game asking the children to play the game themselves in groups of five or six.

Extra activities Extension

Write magic squares on the blackboard.

Ask the pupils to add each row, column and diagonal. Ask,

What do you notice? Are the answers the same? What is the total for each row?

6	7	2
1	5	9
8	3	4

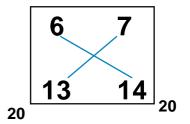
Materials: copies of school calendars

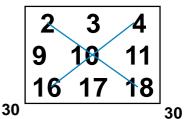
Prepare some of your own magic squares for the pupils to try. You can do this by adding the same number to each of the magic numbers.

Ask them to try adding the digits in the rows, columns and diagonals and find out their answers. What do they notice, are they the same? etc.

Give the pupils a copy of the school calendar. Let them take a block of dates from the calendar and add the pairs of numbers diagonally. For example,

Ju	June 1999				PUBLIC HOLIDAYS Queen's Birthday 12th Iriday 11th to be observed as Public Holiday Termotu Province 8th Central Province 29th	Sun Moa Tor Wed Thu Fri Sa Sun Moa Tor Wed Thu Fri Sa 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
L.Q. 7th	N.M. 14th	1	2	-/3	4	5
6	7	8	9	10 *	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	F.Q. 21st	F.M. 29th	





Ask,

What do you find?

Are the answers the same? What is the total? etc.

Ask the pupils to add other blocks of dates in the calendar and find out numbers that give the same answers when they add them diagonally.

Let them record the answers and check against their friends' answers. Discuss why the answers are the same?

Measurement Topic 14: Weight and Capacity

Aim:

To reinforce pupils' use of standard units of weight and capacity and to calculate and solve problems using weight and capacity units.

Sequence of objectives: To

- 1. teach pupils to estimate and measure weights using standard units including kilograms and grams.
- 2. teach pupils to estimate and measure capacity using standard units including litres and millilitres.
- 3. teach pupils to calculate and solve problems using weight and capacity.

Rationale:

This topic should be taught through practical activities. The pupils should be given enough opportunity to practise using standard units of weight and capacity. The activities require small groups of pupils especially where there are limited resources. Teachers need to prepare standard units of weight such as, 100g soap, 50g pablo coffee, 250g taiyo tin, 1 litre or half litre plastic bottles all taken from the environment. The standard units of capacity are litres and millilitres. The standard units of weight are, kilograms and grams. Pupils should be familiar with these metric units as they are used by the majority of countries in the world.



Prepare a good balance scale for this activity.

In this activity the teacher works with the pupils to make some 50 g and 100 g weights by filling suitable plastic bottles and cans with the correct amount of sand.

Use objects that display a standard unit of weight such as, **100 g** Lyla soap and **50 g** pablo coffee jar to measure weights such as, 100 g, 150 g, 200 g and 300 g from plastic bottles and cans.

Materials:

a good balance scale, store items weighing 50 g and 100 g, objects such as, shells, stones, sand and soil weighing 50 g to 100 g,



Mark the exact level of sand on the plastic bottles and cans to show the weights. Label the objects as: **150** g, **100** g, **200** g, **300** g, etc.

For example:







Pablo

50 a



Use these objects as the standard units for measuring other bottles and containers.

Weight and Capacity

Revise measuring weights using the newly made standard units of weight.

Put the 50 g pablo coffee jar and the schweppes plastic bottle on the balance scale. Fill the schweppes bottle with sand until it balances the 50 g pablo coffee jar.

Repeat this with a 100 g Lyla soap and another plastic bottle or can. Let the pupils hold the weights.

Let them feel and compare the 50 g weight and the 100 g weight.

Now repeat this with other newly made weights.

Chwepp

larino

ORANGE FLAVOUR

Show the pupils an object already filled with sand.

For example:



Ask the pupils to hold the object and estimate the weight. Write the pupils estimate on the blackboard.

Weigh the object on the balance scale against objects that weigh 100 g, 50 g and even more until they find the closest weight to the object.

Write the true weight of the object on the blackboard. *Tarino bottle weighs 300 g.*

Repeat this example with other objects.



In groups of three or four, the pupils estimate and find out the weights of labelled objects on the scale.

Let them prepare a table in their exercise books. The teacher could help by drawing it on the blackboard.

Encourage the pupils to estimate first the weights of each labelled object. Then ask them to balance the objects on the balance scale against newly made standard units until a balance is obtained.

Materials: a good balance scale, some 50 g and 100 g weights, collections of plastic bottles and cans labelled A, B, C,

etc. weighing 50 g to

100 g and more,

Cans / Plastic Bottles	Estimate	True Weight
Α	200 g	150 g
В		
С		
D		
E		
F		
G		
Н		



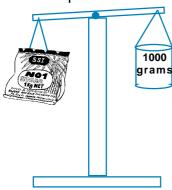
Introduce the standard unit of weight as a kilogram (kg). For example: 1,000 grams = 1 kilogram (kilo means 1,000)

Materials: plastic bags of rice. sugar, salt, etc. that weigh 1 kg, 5 kg, 10 kg, 15 kg, 20 kg

Prepare a good strong balance scale that will hold up to 5 kg. Make some 1,000 g and 500 g weights from suitable plastic bottles and cans with the correct amount of sand by balancing them against a

one kilogram weight such as, 1 kg sugar or salt. (Two 500 g weights should balance 1.000 a)

For example:



Fill the container with sand until it balances the 1 kg sugar. Check that the 1,000 g containers filled with sand are approximate or close to 1 kg.

Continue this with other containers from your collection. Give the pupils other kilogram weights to handle. Ask the pupils to estimate the weight in kilograms. Write the pupils estimate on the blackboard.

Check the true weight by balancing it against a known 1,000 g container.

Write the weights on the blackboard and emphasise that: **1,000** grams = 1 kilogram Repeat this with other containers and bags weighing, 2 kg, 2.5 kg, etc.



Copy this activity on the blackboard and ask the pupils to do the activities in their exercise books.

Materials: blackboard. chalk

The pupils may work in pairs or individually. Let them write 'g' for gram and 'kg' for kilogram.

Copy and fill in the spaces with their equivalent weights.

Example: 1,000 g = 1 kg | Example: 1,500 g = 1 kg 500 g

$$2. _{g} = 3 \text{ kg}$$

$$3.4,000 g = kg$$

4. ____g = 2 kg
$$600 g$$

Example: **500** $g = \frac{1}{2} kg$

8.
$$q = 3/4 \text{ kg}$$

Answers:

- 1. 2 kg
- 2. 3,000 g
- 3. 4 kg
- 4. 2,600 g
- 5. 1 kg 350 g
- 6. 3,750 g
- $7. \frac{1}{4} \text{ kg}$
- 8.750 g
- 9. 1 ¹/₄ kg or 1 kg 250 g
- 10. 2 ¹/₂ kg or 2 kg 500 g



Prepare standard weights of 50 g, 100 g, 500 g and 1,000 g.

The pupils should come close to the front to see the demonstration. Bring a balance scale and the collection of containers in front of the class.

Use the standard weights already prepared to make weights in grams and kilograms from the containers. Such as, 100 g, 250 g, 1 kg, 2 $^{1}/_{2}$ kg.

Measure 100 g of sand in an empty taiyo tin using standard weights of 50 g.

Materials: a balance scale, standard weights weighing 50 g, 100 g, 500 g and 1,000 g, plastic bags of rice, sugar, salt, etc. that weigh 1 kg, 5 kg, 10 kg, empty tins, containers, bowls, shells. sand

Show this to the pupils and explain that the weight of the taiyo tin is 100 g. Label the tayio tin 100 g.

Select a different container from the collection.

Measure 150 g weight using the 50 g and 100 g standard weights. Label the weight 150 g.

Repeat this example with other weights using a different standard weight. Measure bigger weights such as 1,300 g. Emphasise that 1,000 g is equal to 1 kg.

Label the weights in kilograms and grams. For example: 1,250 g = 1 kg 250 g



Give the pupils balance scales and enough standard weights already prepared from suitable bags and containers.

Ask the pupils to work in groups of three or four.

Let them measure different weights using containers and bags, such as, 50g, 100 g, 500 g, 1,000 g, 2,000 g, etc.

Ask the pupils to label the weights they have made.

Materials:
balance scales,
standard weights
weigh 50 g, 100 g,
500 g and 1,000 g,
plastic bags of rice,
sugar, salt, etc.
weighing 1k g, 5 kg,
10 kg, empty tins,
containers, bowls,
shells, sand



The amount of containers each group should weigh depends on their collections.

Let them label the weights in kilograms and grams if their measurements are more than 1,000 g.

For example: 2,500 g = 2 kg 500 g



Can all the pupils estimate and measure weights using standard units?



Use a 1 litre container marked in millilitres to prepare a 50 mL and a 100 mL measuring container.

Mark the water level in the containers. Label them 50 mL and 100 mL.

Revise the unit **millilitre** which the pupils learned in standard 3. Talk about things that are measured in millilitres with the pupils. Give examples of things bought in stores which show millilitres. For example, a can of Coke, bottle of Tarino, etc.

Materials:

1 litre container, collection of empty plastic bottles, tins, cans, jars, bowls, bucket of clean water

Revise the word 'capacity' which refers to the volume inside a container.

Bring a collection of different size containers.

Explain that you want to find out the capacity of each container using the 50 mL and the 100 mL containers.

Ask the pupils to estimate how many millilitres of water are contained in each container. Select a container from the collection. Use the 50 mL measuring container and measure its capacity.

Ask the pupils to count how many times 50 mL of water are needed to fill the other container.

Write the capacity on the blackboard. Repeat this with many other containers.



The pupils work in groups of 4 or 5.

Provide each group with the marked standard containers already prepared and a range of containers to find out their capacity.

Encourage the pupils to make estimates before actually measuring the containers.

Materials:

1 litre container, collection of empty plastic bottles, tins, cans, jars, bowls, bucket of clean water

Be sure that each group has enough varieties of different types of containers to measure. The amount of containers to be measured depends on your collection.

Label the containers A, B, C, D, E, etc.

The pupils can copy this table into their exercise books and fill it in as they do the activities.

Container	Estimate	My Measurement
Α		
В		
С		
D		

Remind the pupils to write in the units as they measure the capacity of their containers.

Materials:
1 litre containers

plastic bottles, mineral water bottles, 2, 4, 5, 10 litre

containers

Materials:

10 litres.

1 litre containers, larger containers

holding 2, 4, 5 and

such as cooking oil,



Bring a collection of containers measuring exactly 1,000 millilitres (1 L).

Use your 100 mL and 50 mL measuring containers to mark these 1 litre containers.

Repeat measuring the containers. The pupils should realise that these containers measure exactly 1,000 mL.

Explain to the pupils that another name for 1,000 mL is 1 litre.

If you have access to a 1 litre container, show it to the pupils and tell them that it is a standard unit for measuring capacity.

Use the 1 litre container to find out the capacity of bigger containers such as, buckets, water containers of about 5 litres, 10 litres, etc.





The pupils work in groups of 4 or 5.

They find out the capacity of containers holding more than 1 litre.

Provide each group with a 1 litre container.

Organise the larger containers around the classroom so that every group has access to them.

The groups move around the classroom, estimating and measuring the capacity of the prepared containers.

Help the pupils to prepare a table like this and record their results.

Containers	Estimates	Measured Capacity
Bucket		
Blue container		
White container		



Can all the pupils estimate and measure capacity using a standard unit of measurement?



Ask the pupils to bring empty containers such as, detergent boxes, bottles, cooking oil plastic bottles, tea and noodle packets, taiyo, milo and milk tins.

Remind them to clean out their containers carefully, especially those which have harmful chemicals inside.

Display empty containers, packets and boxes in front of the classroom. Show the pupils the measurement labels (weight and capacity) on the packets and containers.

Materials: empty containers such as, detergent boxes, cooking oil, schweppes, tea and noodle packets, empty milk, taiyo and milo tins

Ask the pupils questions to talk about the weights and capacity of the items. For example:

What is the capacity of the cordial bottle and a bottle of schweppes in millilitres? What is the weight of 2 packets of Niu washing powder in grams?

Repeat this activity with other items. Encourage everyone to respond to the questions.



The pupils complete the activities in their resource books page 24.

Let them write the answers in their exercise books.

Resource Book answers: page 24.

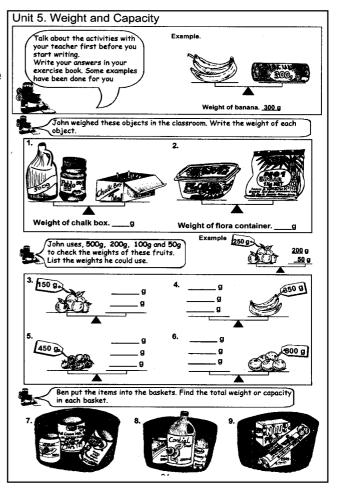
- 1. Weight of chalk box. <u>550</u> g.
- 2. Weight of flora container. 1,000 g.

3- 100 g - 50 g - 100 g - 200 g

5- 200 g - 200 g - 50 g - 50 g - 6- 500 g - 200 g - 100 g

7- 740 g **8-** 1,175 mL (1L 175 mL)

9-500 g





Bring empty containers, tins and plastic bottles which have measurements of weight or capacity on them.

(grams and kilograms, millilitres and litres).

Materials: empty containers, tins and plastic bottles

Include weights of more than 1 kilogram and capacity of more than 1 litre. Talk about the weight and capacity of the objects. Ask the pupils to find out the total weight or capacity of several objects when put together.

For example:

The total weight of 2 packets Niu washing powder?
The total capacity of 1 cordial bottle and 1 schweppes bottle?
The capacity of 2 bottles of cooking oil and 1 bottle black sauce?
Which items weigh ¹/₂ kg?
Which item do you think is lighter and which is heavier?

Repeat this with other items.

Encourage the pupils to look at the collection and answer the questions.



The pupils work in pairs and complete the activities in their resource book, page 25.

Ask them to look at the pictures and work out the answers to the questions.

Let them talk about the standard units in the items first before they start writing.

Resource Book answers: page 25.

- 1- Niu Powder
- 2- Dogs food
- 3- Schweppes cola, Cooking oil
- 4- Dogs food, Extra soap, Coffee
- 5- Dogs food, Biscuits, Niu powder
- 6-700 q
- 7-2,290 g
- 8- Cola





Can all the pupils make calculations and solve problems in weight and capacity?

Extra activities Support

The pupils work in small groups.

Ask them to bring a collection of different size containers, plastic bottles and packets with standard units in grams, kilograms, millilitres and litres.

Materials:
collection of different
size containers,
plastic bottles and
packets with
measurements of
weight and capacity,
bucket of clean water

Fill and measure each container using water to find out its capacity using standard measures in millilitres and litres.

Using the standard weights and a good balance scale (one that is strong), find the weight of the water in the container.

Prepare a table as shown below for the pupils to keep a record of their work. For example:

Containers	Weight of water	Capacity
1 tin taiyo	170 g	170 mL
1 bottles of schweppes		
1 bottle of cordial		
1 jar of coffee		

Help the pupils realise that the weight of 500 g is the same as 500 mL in capacity . So **1** g of water is the same as **1** mL.

Remind the pupils that the weights will not be exact since the container will add to the weight.

When the pupils have completed making a record of their work, they can be asked to examine the result in the table above.

Let them see that the weight of water in grams is always very close to the capacity in millilitres.

For example: 170 g in weight has the same capacity of 170 mL.

Extra activities

Extension

Bring a standard balance scale and some objects weighing 500 g and 100 g and some sand.

Materials: blackboard, balance scale, plastic of sand, 500g and 100g weights

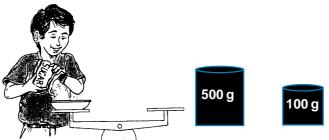
Write the following problems on the blackboard.

Ask the pupils to read the information and solve the problems.

Encourage the pupils to write out their work step by step.

For problem numbers 1 and 2, the pupils could use the objects and the balance scale to help them find out the answer to the problem.

1. Jacob had two weights. One 500 g weight and one 100 g weight. He had a balance and needed to weigh out 400 g of sugar. How can he do it? (Clue: think about where to place the 100 g).



- 2. How can Jacob now weigh 200 g of sugar? (Clue: use all 3 weights)
- 3. Each cup holds 100 mL of juice.

 How much juice does Mary need to give one cup each to 20 of her class mates? (2,000 mL)
- 4. For the feast we are preparing a shopping list.
 If a bottle of schweppes holds 300 mL, that is enough drink for 2 people. If I buy 15 L of schweppes
 - a) How many people can have a drink? (100)
 - b) How many bottles have we bought? (50)

The pupils could be encouraged to work individually or in groups of two or three for this problem.

Check the pupils work and ask them to explain how they solved the problems. Let them write down their steps in their exercise books after checking them.

Number Topic 4: Subtraction

Aim:

To develop subtraction skills.

Sequence of objectives: To

- 1. teach pupils to use mental subtraction strategies.
- 2. teach subtraction of 3 and 4 digit numbers, with and without trading.
- 3. teach pupils how to solve problems using subtraction.

Rationale:

In this topic pupils learn methods and strategies to use in mental subtraction. They develop subtraction skills with three and four digit numbers, with and without trading, and apply their subtraction skills to problem-solving. This is an essential skill for all pupils and adults especially to remember the number facts and use them mentally and in writing.



Begin by revising mental subtraction of single digits without trading. This should involve practising mental subtraction of numbers 0 - 9 from all numbers up to 19, without trading. These are often called

Materials: pupils' exercise books

Play subtraction bingo.

NUMBER FACTS.

Ask the pupils to draw a six-square bingo grid and write in any six numbers from 0 to 10.

Ask subtraction questions from the table below.

Mix up the questions at random.

If the pupils have the correct answer, they tick it. The first to tick all six answers wins.

Copy the questions onto cards and let the pupils play in groups. One could call out the questions while the others play bingo.

The answers are **only** for the person who reads the subtraction questions.

Number Facts Table Up to 10

				i i aoto ia	о.о ор tо .			
10-0= 10	9-0= 9	8-0= 8	7-0= 7	6-0= 6	5-0 =5	4-0= 4	3-0 =3	2-0= 2
10-1= 9	9 -1=8	8-1= 7	7-1= 6	6-1= 5	5 - 1= 4	4 - 1 =3	3-1= 2	2-1= 1
10-2= 8	9-2= 7	8 - 2= 6	7 - 2= 5	6-2= 4	5-2= 3	4-2= 2	3-2= 1	2-2 =0
10-3= 7	9-3= 6	8-3= 5	7 - 3= 4	6-3= 3	5-3= 2	4-3= 1	3-3 =0	
10-4= 6	9-4 =5	8-4= 4	7-4=3	6-4= 2	5-4= 1	4-4=0		1-0= 1
10-5= 5	9 - 5= 4	8-5= 3	7-5= 2	6-5= 1	5-5= 0			1-1= 0
10-6= 4	9-6= 3	8-6= 2	7-6= 1	6-6= 0				
10-7= 3	9 -7=2	8-7 =1	7-7= 0					
10-8= 2	9-8= 1	8-8 =0						
10-9= 1	9-9 =0							
10-10= 0								



Ask the pupils to complete the questions on page 26 of their resource book.

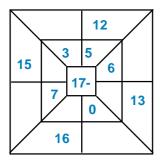
Materials: pupils' resource book, page 26

They should work out the answers mentally and write only the answers in their exercise books.

Monitor the pupils as they work and help those who need assistance.

Explain questions 5, 6 and 7. In number 5, the pupils subtract 5 from 17 to get the answer 12.

If the pupils cannot draw circles, they can use rectangles instead for questions 5, 6 and 7.

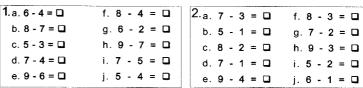


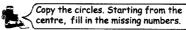
Ask early finishers to write ten subtraction sums with the answer 12, such as:

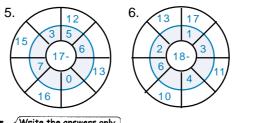
$$17 - 5 = 12$$

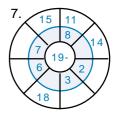
 $25 - 13 = 12$etc.

Unit 6. Number Talk about the questions with your teacher before 1. a-2 you start writing. Write the answers in your exercise book. Do these subtractions in your head. Write the answers only.









f. 25 - 2 = 🖵

g. 27 - 5 = 🔾

h. 24 - 3 = 🗆

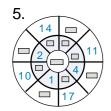
i. 28 - 6 = 🖵

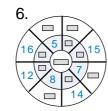
j. 29 - 3 = 🗖

√Write the answers only.

- 8. John had 15 peanuts. He ate 4. How many were left?
- 9. Mary saw 18 parrots. 5 were red. How many were green?
- 10. A fisherman caught 17 fish. He sold 5. How many did he keep?

Resource Book answers: page 26.





3. a - 11	f - 10	4. a - 14	f -
b - 12	g - 13	b - 12	g -
c - 10	h - 12	c - 17	ĥ-
d - 12	i - 11	d - 11	i -
e - 12	j - 13	e - 13	j -
7.		8- 11	
\langle		9- 13	
/12/	X4 -> -	10- 12	

23

22

21

22

26



Teach the pupils the 'Inverse' mental subtraction strategy.

Write 16 - 7 on the blackboard and ask the pupils to quickly work out the answer.

Explain that another quick way to get the answer for the subtraction is to do the inverse of subtraction. That is by adding 7 to a number which will give the total 16. For example:

$$7 + = 16$$
. which is the same as $? + 7 = 16$.

Write this on the blackboard to show the pupils. Ask the pupils what number can be added to 7 to get 16. Explain that 9 added to 7 makes 16.

Try this strategy with other subtractions such as, **15 - 7**, **14 - 5**, **17 - 9**, **12 - 5**, **13 - 8**.

Say each subtraction one at the time. Give the pupils a few minutes to mentally work out the answer. Encourage the pupils to add in order to get the answer.



Let the pupils play the Mental Subtraction Race

One Game in groups of five or less.

One pupil asks the questions.

The question cards are placed face down.

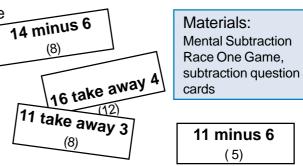
They pick a question card and read it out.

The others must mentally subtract and give the answer, using the strategy above.

The first pupil in the group to give the correct answer moves his/her counter one place along the race track.

The first player to reach the end of the race track is the winner.





FINISH			
	STAF	RT •	

Let the groups swap over and play again so that everyone has a chance to ask the questions.



Teach the pupils how to do mental subtraction from numbers up to 20, using 'The nearest ten' mental subtraction strategy.

Write the examples below on the blackboard and practise them with the pupils. For example,

17 - 8

17-8,

First, take away 7 ones from 17 to give us an easy number to the nearest ten. How much more do we have to subtract to make up to 8?
8 subtract 7 equals 1. This means that we have 1 more to take away.
10 take away 1 equals 9. The answer is 9. 17 - 7 = 10 8 - 7 = 1 10 - 1 = 9

15 - 9

15 - 9

Take away 5 ones from 15 to give us an easy number to the nearest ten. How much more do we have to subtract to make up to 9?

9 subtract 5 equals 4. This means that we have 4 more to subtract.

15 - 5 = 10
9 - 5 = 4
10 - 4 = 6

Show how the first step is always to take away the ones from the total to get to the nearest ten. Practise the strategy with these numbers. 16 - 8, 15 - 7, 14 - 5, 17 - 9, 12 - 5, 13 - 8.

Think of other ways of applying this mental strategy and practise it with the pupils. For example: 36 - 8 (First, 36 - 6 = 30. Second 8 - 6 = 2. Third 30 - 2 = 28)



Give the pupils further practice on mental subtraction using 'The nearest ten' strategy. Prepare the following subtractions on cards.

Materials: subtraction question cards

Read each subtraction one at the time.

Ask the pupils to mentally work out the answer for each subtraction,

Give time for the pupils to work out the answer to the subtraction before reading the next subtraction.

Encourage the pupils to work out the answers in their head. Check the pupils answers before moving on to the next subtraction.

Answers

11-5=6 21-6=15 16-9=7 13-5=8 17-8=9

12-3=9 15-8=7 14-7=7 14-4=10 14-6=8



Practise using "The nearest ten" mental subtraction strategy for numbers up to 99 with the pupils. Such as, 45 - 17, 74 - 8, 38 - 9, 44 - 12, 96 - 7, etc. For example:

45 - 17

First, take away 5 ones from 45 to give us an easy number to the nearest ten. How much more do we have to take away to make up to 17?

17 take away 5 equals 12. This means that we have 12 more to take away.

40 - 12 = 28

74 - 8

Take away 4 ones from 74 to give us an easy number to the nearest ten.

How much more do we have to take away to make up to 8?

8 take away 4 equals 4. This means that we have 4 more to take away.

70 take away 4 equals 66. The answer is 66.

Write the examples on the blackboard.

Remind the pupils that the first step is always to take away the ones to get to the nearest multiple of ten. Continue the strategy with other subtractions: 38 - 9, 44 - 12, 96 - 7



Ask the pupils to complete the activities in their resource book, page 27.

They should complete the subtractions using the strategy of first taking away the units, then taking away the remaining ones.

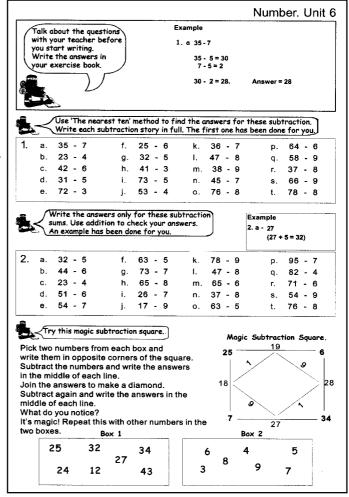
In the first section, they should write out the process as shown in the pupil's book.

In the second section they should work out the answers mentally and write the answers only.

Resource Book answers: page 27.

Subtraction stories

1. a- 28	f- 19	k- 29	p- 58
b- 19	g- 27	I- 39	q- 49
c- 36	h- 38	m- 29	r- 29
d- 26	i- 68	n- 38	s-57
e- 69	j- 49	o- 68	t-70
2. a- 27	f- 58	k- 69	p- 88
b- 38	g- 66	I- 39	q- 78
c- 19	h- 57	m- 59	r- 65
d- 45	i- 19	n- 29	s-45
e- 47	j- 8	o- 58	t- 68





Teach the pupils how to do mental subtraction using the 'counting on' mental subtraction strategy.

Demonstrate this on the blackboard. For example,

Materials: blackboard

48 - 26	
(count on from 26 to 30)	4
(count on from 30 to 48)	18
(add 4 + 18)	the answer is 22

Explain to the pupils that this strategy is sometimes known as 'shop keeper **subtraction**' because it is the way that traders often give and count change when a purchase is made.

Write the examples on the blackboard.

Show other examples, such as,



Let the pupils play the Mental Subtraction Race Two game in groups of five or less.

Write the answers on the back of each card.

One pupil asks the questions.

They pick a question card and read it out. Then they place it face up so that the players can see the question but not the answer.

The players must mentally subtract and give the answer, using the strategy above.

The answers can be checked by turning over the card.

The first player to give the correct answer moves his/her counter one place along the race track.

The first to reach the end of the race track is the winner.

Let the groups swap over and play again so that everyone has a chance to ask the questions.

Materials: Mental Subtraction Race Two game 35 - 16 62 take away 35 24 minus 16





Two more useful strategies in mental subtraction are, **estimating** and **checking**.

Materials: blackboard

Show the pupils how we can mentally work out the answer for a subtraction using estimating and checking by counting on to tens. For example:

74 - 18 = ____
 (estimate 70 - 20)
 (checking by counting on to tens)

 18 + 2 = 20
 18

 20 + 54 = 74

$$+ 56$$

 2 + 54 = 56
 74

Remind the pupils that when estimating answers in mental subtraction, the units between 0 and 4 are rounded **down** to their nearest ten, for example: (14 becomes 10, 54 becomes 50, etc.)

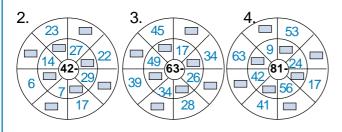
When units are between 5 and 9, they are rounded **up** to the nearest ten, for example: (17 becomes 20, 59 becomes 60, etc.)

Repeat this example with some more subtractions such as, 95 - 32, 32 - 17, 45 - 34, etc.



Ask the pupils to complete the activities in their resource book, page 28.

Resource Book answers: page 28.

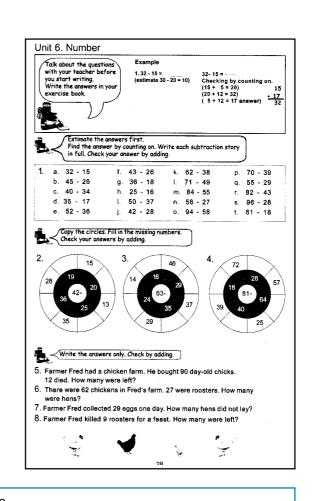


5- 78

6-35

7- 6

8- 18





Can all the pupils use mental subtraction strategies?



Revise subtraction of three and four digit numbers without trading.

Demonstrate on the blackboard.

Materials: blackboard

subtract the ones first, then the tens, then the hundreds.

Check the answer by adding

261 +321 582

7497 - 4251 3246 subtract the ones first, then the tens, then the hundreds, then the thousands. Check the answer by adding

+4251 7497

3246

Show other examples on the blackboard, such as,

537 - 215 956 - 630 388 - 162 5887 - 3542

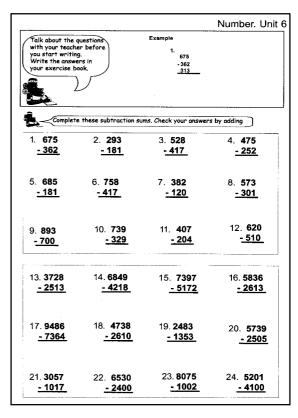
3919 - 3807 8673 - 2360



The pupils complete the activities in their resource book, page 29.

Resource Book answers: page 29.

1- 313	7- 262
2- 112	8- 272
3- 111	9- 193
4- 223	10- 410
5- 504	11- 203
6- 341	12- 110
13- 1,215	19- 1,130
14- 2,631	20- 3,234
15- 2,225	21- 2,040
16- 3,223	22- 4,130
17- 2,122	23- 7,073
18- 2,128	24- 1,101





Revise subtraction of three and four digit numbers with trading.

Demonstrate this on the blackboard. Show the subtraction 573 - 328.

573 - 328

Subtract the ones There are not enough ones to take away 8. 6 13 5 7 3 - 3 2 8

Trade a ten for ten ones.
There are six tens left.

6 13 5 **7 3** - 3 2 8

There are now 13 ones, 6 tens and 5 hundreds

13 take away 8 leaves 5.

Now take away the tens 6 take away 2 leaves 4.

Now take away the hundreds 5 take away 3 leaves 2.

Show other examples on the blackboard, such as,

351 567 - 215 - 139 615 - 207 767 <u>- 348</u>

456 - 318 967 - 418

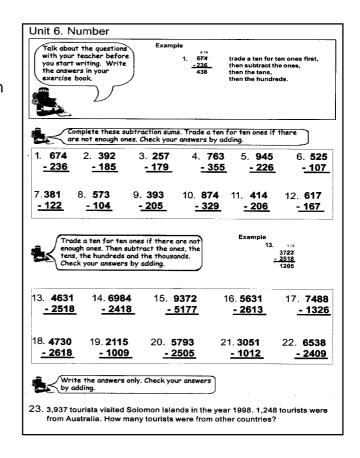
258 - 109



Ask the pupils to complete the activities in their resource book, page 30.

Resource Book answers: page 30.

1-438 7-259 2-207 8-469 3- 78 9-188 4-408 10-545 11-208 5-719 6- 418 12-455 19-1,106 13-2,113 14- 4,566 20-3,288 15-4,195 21-2,039 16-3.018 22-4,129 17-6,162 23-2,689 18-2,112





Practise subtraction of three and four digit numbers with and without trading.

Write these subtractions and demonstrate on the blackboard.

7497	Subtract the ones first,		3246
<u>- 4251</u> 3246	then the tens, then the hundreds, then the thousands.	Check the answer by adding	+4251 7497

10 6 4 7 3 - 3 2 8	Subtract the ones first. Not enough ones to take away 8, so change a ten for ten ones. There are six tens left.	6 13 4 7 3 Now there are 13 ones, 6 tens and 4 hundreds
6 13 4 7 3 - 3 2 8 1 4 5	Subtract the ones first, then the tens, then the hundreds.	Check the answer by adding 1 4 5 + 3 2 8 4 7 3

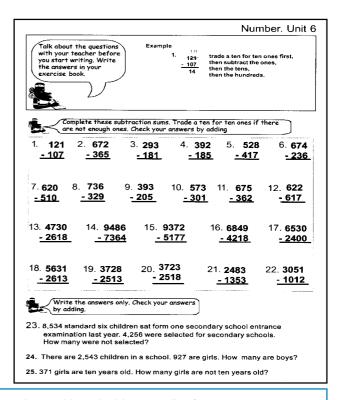
Show other examples on the blackboard, such as, 567 3582 - 139 - 2153



The pupils turn to page 31 of their resource book and complete the activities.

Resource Book answers: page 31.

1- 14	7- 110	13- 2,112
2- 307	8- 407	14- 2,122
3- 112	9- 188	15- 4,195
4- 207	10- 272	16- 2,631
5- 111	11- 313	17- 4,130
6- 438	12- 5	18- 3,018
19- 1,215 20- 1,205 21- 1,130 22- 2,039	23- 4,278 24- 1,616 25- 556	





Can all the pupils subtract 3-digit and 4-digit numbers with and without trading?



Make up subtraction stories to practise subtraction for 3 digit and 4 digit numbers. Write the subtraction story on the blackboard, for example,

Last Christmas, 2,581 people went to see the Tomoko canoe race at Gizo in Western Province. After three days 1,293 people returned to their homes. How many people remained to see the canoe race?

Help the pupils find ways to work out the answers to the questions.

Ask,

What does the question ask?

What do I need to know?

How do I find out the answers?

Do the subtraction.

2581

4 17 11

<u>- 1293</u>

1288

(Number of people who remained to see the canoe race)

(Number of people who first went to see the race and those who left after three days)

(Subtract people who left after three days from people who first went to see the race)

Check the answer by adding

1288

<u>+1293</u>

2581

Make up some more subtraction stories to practise 3-digit and 4-digit subtraction.



The pupils open their books on page 32 of their resource book and complete the activities.

Explain the first part of the activity to the pupils. Ask them to write their answers in their exercise books.

For question 6, 7 and 8, the pupils read the questions and work out their answers.

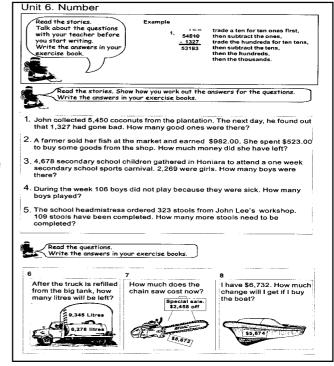
3-2,409

Resource Book answers: page 32.

1- 4,123 2- \$459

4-2,303 5-214

6-3,067 7-\$6,214 8-\$1,058





Can all the pupils solve subtraction problems using subtraction strategies?

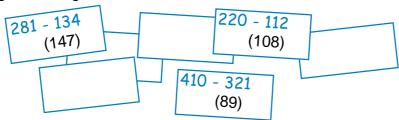
Extra activities Support

Have the pupils practise more estimation in mental subtraction. Remind them of some of the strategies they use for mental subtraction.

Materials: sets of subtraction cards.

Prepare enough three-digit number subtractions on cards.





Ask the pupils to work in groups of 4 or 5.

Spread out the cards face down.

One pupil picks a subtraction card and reads it to the pupils without the answer.

The other pupils in the group estimate the answer mentally.

The pupil then places the card face up to show the correct answer to the groups. Pupils with the right answer keeps the card. The game continues until all the cards are complete.

Let the groups swap over and play again so that the pupils have a chance to ask questions and answer the subtractions.

Extra activities Extension

Draw this subtraction grid on the blackboard.

Ask the pupils to copy the grid into their exercise books

Have the pupils subtract each number from the rows with the numbers from the columns.

For example:

$$17 - 5 = 12$$

Ask the pupils to tell you about the answers.

Columns

Rows

- 17 27 47 57 35 45 65

5 12

7 10

9
12

Draw the next subtraction grid and ask the pupils to try them out using the same strategy.

Let them find out the patterns in the answers.

Encourage the pupils to try other numbers using the same pattern.

	Colu ↓	mn	s					
Rows	-	18	28	48	58	36	46	66
—	5							
	7							
	9							
	12							



Money Topic 19: Decimal Notation

Aim:

To allow pupils to develop their understanding about the decimal notation of money.

Sequence of objectives: To

- 1. teach the pupils to recognise and record the decimal notation of money.
- 2. teach the pupils to add prices of items and calculate change.
- 3. teach the pupils to solve problems involving prices and quantity.

Rationale:

This topic should enable the pupils to understand the decimal notation of money. Pupils should realise that money coins and notes are relevant and useful in their daily lives. Understanding its value and use will enable them to know and use their local currency properly.

In this topic, pupils should be engaged in practical activities such as money games and classroom play. Materials such as, paper coins, notes, store and market items should be used to consolidate the pupils understanding of the new concepts.



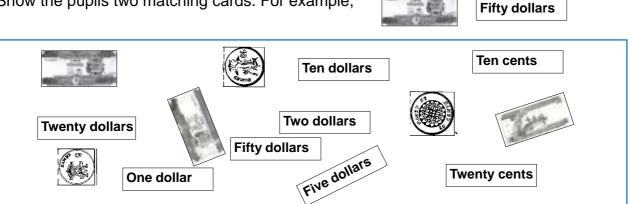
Materials: set of money cards

Begin by revising money recognition with the pupils.

Ask the pupils to come close to the front so that they can all see the demonstration.

Bring a set of money cards and place them face down on the table. Explain that the cards have their names and symbols written on them.

Show the pupils two matching cards. For example,



Ask someone in the group to pick two matching cards from the set of cards. If the cards match, let the child keep them. If the cards do not match, the child has to put them back in their same position.

Continue this by asking another child from the group to pick. Let every child have his or her turn to pick the cards.

When all the cards are complete, ask the pupils to count their cards to see who got the most cards.

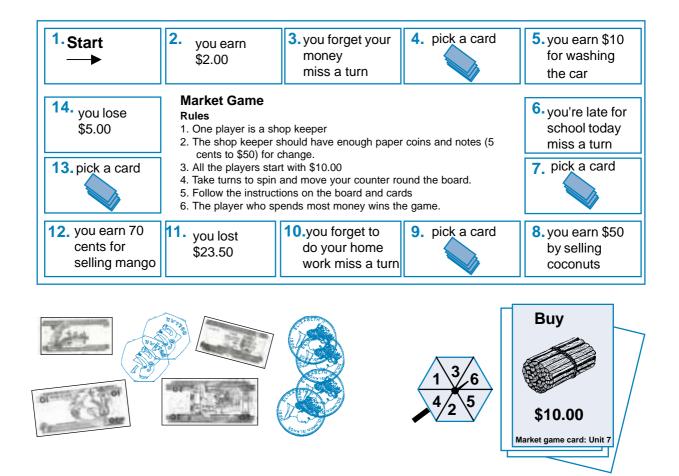


The pupils play a shopping game in groups.

Prepare enough 'shopping game' boards and instruction cards like the one below for groups of four pupils.

The pupils could be asked to make their own market game boards.

Materials: paper coins and notes, shopping game chart, instruction cards, market game cards, spinner, counter



Give enough paper coins, notes and market game cards for each group. Let the pupils follow the instruction in the game board to play the game.

Paper coins and notes from standard 1-3 could be used to provide the pupils with enough money cards.

The pupils should place the market game cards face down.

Work with the pupils and assist them during the game. Encourage them to take turns and play the game properly.

Ask the pupils to check their cards at the end of the game to find who's the winner.



Talk about the price of items that pupils often buy at their local store or market.

Ask the pupils if they can tell you the price of these items. Write the prices in words on the blackboard.

For example: Mango drink. Two dollars and fifty cents

or 2 dollars and 50 cents.

Show the pupils how the price can be written in figures (numbers) to show the decimal notation of money: **\$2.50**

Explain that the decimal in the figures replaces the word 'and' from the sentence. It is used to separate dollars and cents.

Repeat this example with the other prices.

Emphasise the importance of using decimal points to separate dollars and cents.

Encourage the pupils to read the prices in words and let them guess the correct figure (number, usually called notation).



Write the price list on a big sheet of paper or blackboard. For example:

Sugar: Three dollars and eighty cents (\$3.80)

No 1 Tea: One dollar and sixty cents

Family Tayio: 4 dollars and 50 cents

Cracker Biscuit: 3 dollars and 70 cents

Pineapple: Five dollars

Cucumber: Two dollars and fifty cents

Materials: blackboard, big sheet of paper

Read the prices one by one with the pupils. Ask them to suggest the correct notation for each price. Write the correct figure on the blackboard for the pupils to see.

Ask the pupils to copy the price list into their exercise books.

Let them think of other items that they could buy in the shops or market and add them to their list.

Encourage them to write the prices in words and in notation.



Bring a collection of items that pupils often buy in the shop or market. Display the items in front of the class.

Show the pupils a tin of milk. Ask the pupils how much the item might cost. Encourage the pupils to suggest the price.

collection of different items from the store or market

\$2.50

Cola

Materials:

Write the price on the blackboard.

For example: Nine dollars and seventy cents.

Ask someone in the class to suggest the correct notation for the price. Write the notation on the blackboard for the pupils to see: For example: **\$9.70**.

Repeat this example several times with other items.

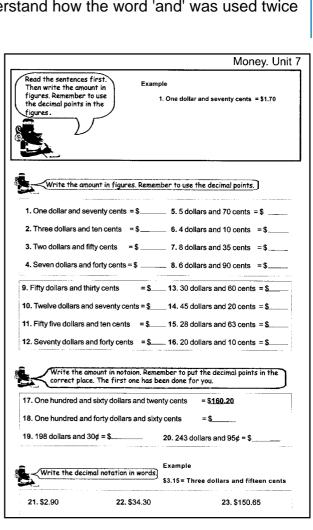


The pupils complete the activities in their resource book page 33. Ask the pupils to write the amount in figures.

For question 17 to 20, help the children to understand how the word 'and' was used twice in the sentences.

Resource Book answers: page 33.

- 1- \$1.70 2- \$3.10 3- \$2.50 4- \$7.40
- 5- \$5.70 6- \$4.10 7- \$8.35 8- \$6.90
- 9- \$50.30 10- \$12.70 11- \$55.10
- **15- \$28.63 16- \$20.10**
- **17- \$160.20 18- \$140.60 19- \$198.30**
- 20- \$243.95
- 21- Two dollars and ninety cents
- 22- Thirty four dollars and thirty cents
- 23- One hundred and fifty dollars and sixty five cents



Sunshine.



Label some items with prices and display them in front of the class. Talk about the prices with the pupils.

Ask.

Which item is the most expensive?
Which item is the least expensive?
Which items cost the same?
How much does the Lyla soap cost?
How much do the bananas cost? etc.

Materials: collection of different items from the store or market



Encourage the pupils to read the price labels.

Let them compare the prices. This will help them answer the questions. Ask someone from the class to arrange the prices in order from least to greatest.

Repeat this example using the other items from your collection.



The pupils open their resource book on page 34.

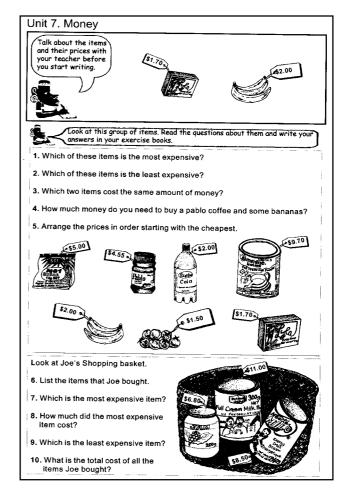
Talk about the questions with the pupils.

Encourage the pupils to look at the items and talk about their prices.

Help the pupils read the questions and complete the activities in their exercise books.

Resource Book answers: page 34.

- 1- **Sunshine milk (\$9.70)**
- 2- Tomatoes (\$1.50)
- 3- Cola Scwheppes and Bananas (\$2.00)
- 4- \$6.55
- 5- \$1.50, \$1.70, \$2.00, \$4.55, \$5.00, \$9.70
- 6- A bottle of Jam
 A tin of milk powder
 A tin of milo
- 7- Milk powder
- 8- \$11.00
- 9- Bottle of Jam 10- \$26.30





Can all the pupils recognise and record the decimal notation of money?



Show the pupils two items, such as a packet of No.1 Tea and a tin of Solomon Blue Taiyo.

Materials: Items such as, tea and soap packets, empty tins, plastic bottles or containers

Ask the pupils how much would each item cost. Write the prices on the blackboard in figures.

No.1 Tea \$1.20 Solomon Blue Taiyo \$2.50

Help the pupils to find out how much it would cost to buy the two items.

Encourage the pupils to suggest ways of finding the total cost.

Show them the process by adding the prices. For example: \$1.20

+ \$2.50 \$3.70

Repeat this example using other items from your collection.

Find out their prices with the pupils and help them add the prices to find the total cost.

Emphasise the addition algorithm when using, decimal points and placing of numbers in their correct place value when adding the prices. Remember the decimal point does not move.



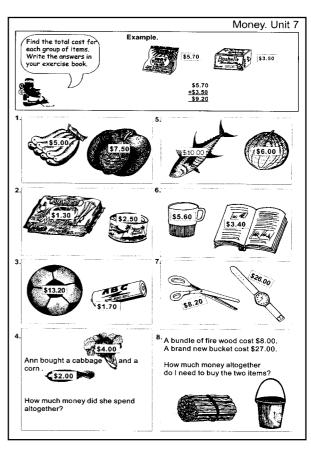
The pupils open their resource book on page 35.

Discuss the activities on the pupils page. Talk about the items and their prices with the pupils.

Ask the pupils to complete the activities in their exercise books. Let them find the total cost of items in each group.

Resource Book answers: page 35.

1- \$12.50	5- \$16.00
2- \$3.80	6- \$9.00
3- \$14.90	7- \$34.20
4- \$6.00	8- \$35.00





Teach the pupils to add the price of items and calculate the change from \$2.00, \$5.00 or \$10.00.

Encourage the pupils to use 'adding and subtracting' and 'counting on' strategies when calculating change. For example: a school ruler costs \$1.80 and a pencil costs \$0.90.

Find out with the pupils, how much change they would get from \$5.00 if they buy the two items together. Ask the pupils to suggest ways of calculating the change.

Show them these two strategies.

by adding and subtra	acting
Add the prices to find out the total cost of the items.	\$1.80 +\$0.90 \$2.70
Then subtract the total from \$5.00 to find the change.	\$5.00 - \$2.70 \$2.30

by counting on	\$1.80
Add the prices to find out	<u>+\$0.90</u>
the total cost of the items,	<u>\$2.70</u>
Then count on from \$2.70 in ten cents coins and doll	•

The change is: three 10¢ coins or 30¢ and one \$2.00 notes.

Play the shopping game (Extra activity Extension on page 127) with the pupils to give them further understanding of calculating change. This skill should be practised a lot. Discuss with the pupils, other possible coins and notes they would get from \$5, when using a counting on strategy.

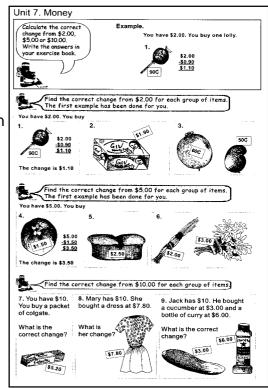


The pupils complete the activities in their resource book page 36.

Encourage the pupils to practise using counting on strategies to find out the correct change.

Resource Book answers: page 36.

1- \$1.10	6- \$0.00
2- \$0.10	7- \$4.80
3- \$0.90	8- \$2.20
4- \$3.50	9- \$1.00
5- \$2.50	





Can all the pupils add prices and calculate change from \$2, \$5 and \$10?



Tell the pupils this word problem.

Coconuts sold at the market cost \$1.50 for one. How much would it cost to buy 3 coconuts?

Materials: blackboard

Help the pupils solve the problem.

Ask them to suggest what they can do to find the answer to the question.

Show the pupils this example: 1 coconut costs \$1.50

 $2 \operatorname{coconuts} \operatorname{cost} \$1.50 + \$1.50 = \3.00

 $3 \operatorname{coconuts} \operatorname{cost} \$1.50 + \$1.50 + \$1.50 = \$4.50.$

Explain to the pupils that we find out how much it costs to buy 3 coconuts by adding the price of three coconuts. This can also be done by multiplying 3 coconuts with the cost of one coconut. i.e, $3 \times 1.50 = 4.50$

Ask the pupils to find out how much it would cost to buy 5 coconuts. The pupils could use addition or multiplication.

Repeat this example. Make up other simple word problems to give the pupils more practice.

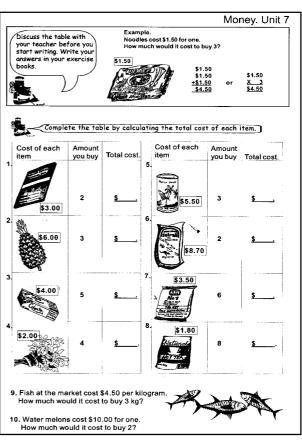


The pupils open their resource book on page 37 and complete the activities.

Discuss the table with the pupils. Help them to understand the activities.

Resource Book answers: page 37.

1- \$6.00	6- \$17.40
2- \$18.00	7- \$21.00
3- \$20.00	8- \$14.40
4- \$8.00	9- \$13.50
5- \$16 50	10- \$20 00





Prepare simple word problems about price and quantities. Write them on the blackboard. For example:

2 coconuts at the market cost \$2.00. 1 pineapple costs \$3.00.

Materials: blackboard

Talk about the items' price and quantities with the pupils. Ask questions to help the pupils find and organise information from the word problem. This will help them answer the questions. For example:

How much do 2 coconuts cost? (\$2.00)
How much does 1 pineapple cost? (\$3.00)
How much will it cost to buy 1 coconut? (\$1.00)
Which price do you think is most expensive? (\$3.00 for 1 pineapple)
Which price do you think is least expensive? (\$2.00 for 2 coconuts)
Which item do you think is the least expensive? (2 coconuts).

Explain why the price of 2 coconuts is cheaper than the price of 1 pineapple. Show them that 2 coconuts cost \$2.00. So to buy one coconut it will cost \$1.00. Demonstrate how we obtain \$1.00 for 1 coconut. *i.e.* \$2.00 divided by 2.

Repeat this example with these word problems. Help the pupils to compare the prices and say which is the least expensive item from each set.

1 kg of rice costs \$3.00, 2 kg of sugar cost \$8.00 3 kg of oranges cost \$9.00, 1 kg of lemons costs \$4.00

Ask questions to help the pupils find and organise information from the word problem by comparing prices per kg.



Write these simple word problems on the blackboard.

In groups of two or three ask the pupils to find out the least expensive item in each problem.

Which item is the least expensive per kg or per litre?

- 1. 1 kg of sugar at the cost of \$2.00 or 2 kg of flour for \$6.00
- **3.** 3 kg of rice for \$15.00 or 4 kg of sugar for \$12.00

- **2.** 2 kg of potatoes for \$6.00 or 2 kg of onions for \$8.00
- 4. 1,000 mL of orange drink for \$2.00 or 500 mL of lemon drink at \$1.00

Encourage the pupils to ask questions themselves and discuss ways to find out the answers for the problems. Help the pupils with their work.



Write this word problem on the blackboard.

Materials: blackboard

John and Tina bought fresh meat and fish for their evening meal. John spent \$5.00 for 2 kg of meat.

Tina spent \$6.00 for 3 kg of fresh fish. Which is the best price per kilogram (kg)?

Help the pupils solve the problem. Ask them to find out how much each one spent for 1 kg.

Demonstrate how the pupils could find out the cost of 1 kg. i.e. \$6 divided by 3. Let them compare the cost of 1 kg of fresh meat and one 1 kg fresh fish they bought to see who spent more and who spent less money. This will help them answer the question for the word problem.

Explain that the best price is **\$6.00 for 3 kg of fresh fish**, because one kg of fresh fish costs \$2.00 and 1 kg of meat costs \$2.50.

Repeat this example with some more simple word problems.



The pupils open their resource books on page 38.

Talk about the price list table with the pupils. Help them understand what to do.

Ask the pupils to complete the activities in their exercise books.

Resource Book answers: page 38.

1- \$17.10 2- \$6.30 3- \$11.20

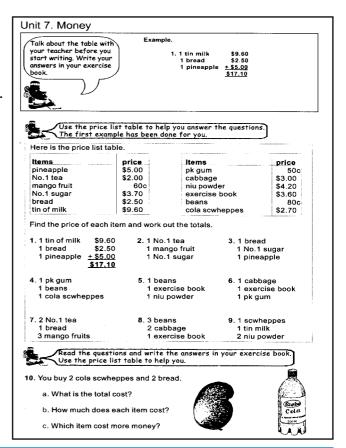
4- \$4.00 5- \$8.60 6- \$7.10

10. a- \$10.40

b- cola scwheppes \$2.70

- bread \$2.50

c- cola scwheppes



Can all the pupils solve problems involving prices and quantity?

Extra activities Support

Write the price list table and the questions below on the blackboard.

Group	A	Grou	рВ
Items	price	Items	price
Salt	\$3.00	Cucumber	\$2.30
No.1 tea	\$1.40	Peanuts	50c
Biscuit	60c	Pineapple	\$4.50
Butter	\$4.80	Pumpkin	\$2.70
Egg	\$1.00	Tomato	\$1.50
Tin of milo	\$9.00	Banana	\$2.00

- 1. List the items from group A which you can buy for \$2.00.
- 2. List the items from group A which you can buy for \$5.00
- 3. List the items from group A which you can buy for \$10.00
- **4.** Which item from group A costs \$9.00?

- **5.** List the items from group B which you can buy for \$2.00.
- 6. List the items from group B which you can buy for \$5.00
- 7. List the items from group B which you can buy for \$10.00
- **8.** Which 2 items from group B cost \$6.00 in total?

Find how much you will spend for the following items.

- 9. Tin of milo and banana.
- **11.** Cucumber and peanuts.
- 10. Egg, biscuit and No.1 tea.
- **12.** Pumpkin, butter and tomato.

Ask the pupils to work in groups of three to answer the questions in their exercise books.

Encourage the pupils to use the table to help them answer the questions.

Extra activities Extension

Make a classroom store to help the pupils practise calculating change from \$2.00 and \$5.00, using *counting on strategy.*

Let the pupils work in small groups.

Ask them to collect items for their classroom store from the local environment.

For example:

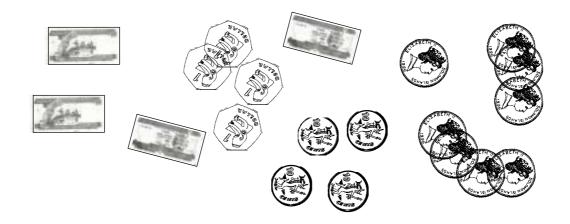
empty tins such as, milo and taiyo, tea and sugar pkts, twisties, etc.

Label the items with prices and display them in the classroom store.

Ask someone to be a store keeper.

Give the pupils enough 5 cents to \$1.00 paper coins and \$2.00, \$5.00 and \$10.00 paper notes.

Materials: collection of empty tins such as, milo and taiyo, tea and sugar pkts, twisties, etc. for the classroom store, paper coins and notes



Let them prepare a simple shopping list and encourage them to buy things from the classroom store listed in their shopping list.

Encourage the shop keeper to do counting on when giving out change to the pupils.

Discuss with the pupils, other possible coins and notes they would get from \$5, when using a counting on strategy.

Repeat the example with other store items. Encourage the pupils to use the strategies to calculate the change from \$2.00, \$5.00 or \$10.00.

Let the pupils swap over roles and ask someone to be the next store keeper.

Shape Topic 10: Angles

Aim:

To reinforce the concept of a right angle and to be able to make right angle turns using clockwise and anti-clockwise rotation.

Sequence of objectives: To

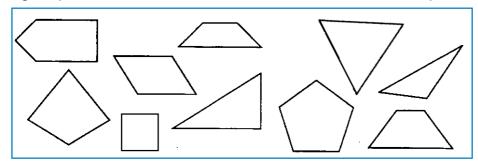
- 1. revise right angles and be able to recognise and draw angles smaller and bigger than a right angle.
- 2. understand angles as the measurement of a turn or a fraction of a turn.
- 3. teach the pupils to make and measure clockwise and anti-clockwise turns using a complete turn, a half turn, including a fraction of a turn.
- 4. recognise the relationship between compass points and use them to reinforce right angle turns.

Rationale:

In this topic the pupils reinforce and extend their understanding of right angles. The topic requires practical and demonstration activities by both the teacher and the pupils. Measurement of angles, rotation and compass point directions all constitute neccesary knowledge and skills for pupils and adults.



Bring shape cards in the classroom for demonstration, for example:



Materials: Nguzu Nguzu shape cards such as, square, triangle and other shapes

Let the pupils sit together on mats so that they can all see. Show the pupils the cardboard shapes in turn. First the square. Ask,

"What is this shape called?

How many corners are there in this shape?

Who can remember what we call the corners of a shape? (Vertex)

In this square the angles have a special name. Who can remember the name of these angles?" (Right angles)

Repeat this with another shape. Show the shape.

Ask,

"What is this shape called? (Triangle for example)

Who can see a right angle?

Who can come and point to the angle smaller than a right angle?

Who can show me a shape with an angle larger than a right angle?" etc.

Encourage the pupils to participate and check to see that the pupils respond to the questions correctly.



Ask the pupils to open their resource books on page 39.

Talk about the shapes and their angles with the pupils. Ask the pupils to look at the shapes and identify:

the angles smaller than a right angle, the angles bigger than a right angle and the right angles.

Let them count how many of each kind of angles there are.

Ask the pupils to copy the table below the shapes into their exercise books and fill in the missing information.

The first example has been done for them.

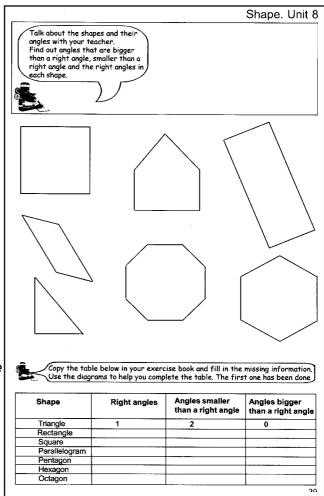
When the pupils have finished copying and filling in information in their exercise books, they can be asked to observe objects inside the classroom such as, exercise books, blackboard, desks, tables or other parts of the classroom building to find:

the right angles the angles smaller than a right angle and the angles bigger than a right angle

Encourage the pupils to identify the angles and discuss which part of the building or the classroom objects form the angle.

Ask them to add this on to their table and write a sentence to describe the angle.

Materials: children's resource books, classroom objects such as, exercise books



For example:

The roof of the classroom building is an angle smaller than a right angle. The two edge corner of the blackboard is a right angle, etc.

Resource Book answers: page 39.

Shape	Right angles	Angles smaller than a right angle	Angles bigger than a right angle	
Triangle	1	2	0	
Rectangle	4	0	0	
Square	4	0	0	
Parallelogram	0	2	2	
Pentagon	2	1	2	
Hexagon	0	0	6	
Octagon	0	0	8	



Take the pupils outside the classroom and demonstrate how you can make a 'Person Angle' to show,

a right angle,

an angle smaller than a right angle and an angle bigger than a right angle.

Ask two pupils to help you demonstrate the person angle.

Bring one piece of string of about 5 metres long. Let each of them hold one end of the string while you hold the string somewhere between.

Explain that you want to make an angle smaller than a right angle.

Show the pupils how they can move so that you can make the angle. Show pupils the angle you make.

Repeat this with the other angles instructing the pupils to move to different positions.



In groups of three the pupils practise making angles, using the 'Person Angle'.

Give each group a piece of string.

Explain that each time you call out an angle, the pupils should move around and try to make the angle. For example,

Who can make an angle bigger than a right angle?

Who can make an angle smaller than a right angle?

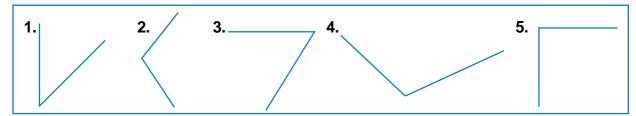
Who can make a right angle?

Who can make an angle that is two times bigger than a right angle? etc.

Repeat this activity several times. Move around the groups and check to see that the pupils are making the correct angles.

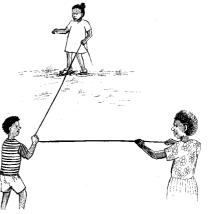
Copy these angles on the blackboard. Ask the pupils to copy them in their exercise books. Let them choose one of the following statements to write for each of the angles:

bigger than a right angle, smaller than a right angle, right angle.



- 1- Smaller than a right angle
- 2- Bigger than a right angle
- 3- Smaller than a right angle
- 4- Bigger than a right angle

Materials: one string of about 5 metres long



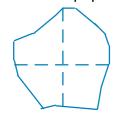
Materials: strings of about 5 metres long

5- Right angle



Revise making a square corner using a piece of paper. Show the pupils how to make a square corner using this instruction.

Materials: pieces of paper to fold

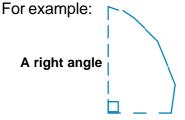


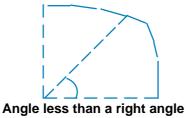


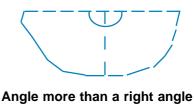
Square corner

Fold 2

Continue folding and unfolding the paper to get other angles such as, the angle less than a right angle and the angle more than a right angle. Show pupils the angles you make.







Draw some of the angles on the blackboard using the folded paper angles. Explain to the pupils the type of angles you draw.



Give pupils pieces of paper to fold. Ask them to fold the papers so that they can make a square corner. Let them continue folding the papers to get angles less or more than a right angle.

Check to see that the pupils are folding the papers accurately and that the corners are square. When the pupils have finished folding papers, ask them to do the following activities in their exercise books.

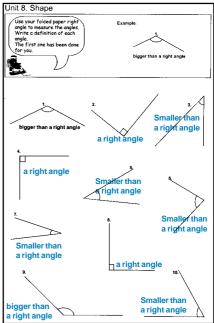
Materials: pieces of paper to fold, pencil, ruler pupils' resource book

Draw two right angles Draw two angles smaller than a right angle Draw two angles bigger than a right angle

Ask them to check the angles using a folded paper right angle of their own. Encourage them to write a definition of each angle. For example:



Ask the pupils to do the activity in the Pupils Resource Book page 40. Encourage them to use their folded paper angle to measure the angles. Ask them to write the definition of each angle.





Can all the pupils recognise and draw angles bigger and smaller than a right-angle?



Ask the pupils to sit together close to the front so that they can all see the demonstration.

Materials: classroom clock face for demonstration

Use the clock face hands to demonstrate angle turns to the pupils Show the pupils one right angle, two right angles, three right angles, etc.

Put both the Move one Move the hand Move one hand hand to the 3 from 3 to 6 hands on 12 from 6 to 9 Ask the pupils what Ask the pupils what Ask the pupils what angle the hand has angle the hand has angle the hand has moved through. moved through. moved through. (one right angle) (two right angles) (three right angles)

Repeat these examples. Show the pupils 4 right angles. Ask the pupils to count the number of turns and encourage them to tell you the correct angles.



Prepare enough clock faces for a group of four to five pupils.

Give clock faces to each group.

Ask the pupils to practise making right angle turns on the clock face.

Materials: classroom clock faces for demonstration

Ask someone in the group to move the hands.

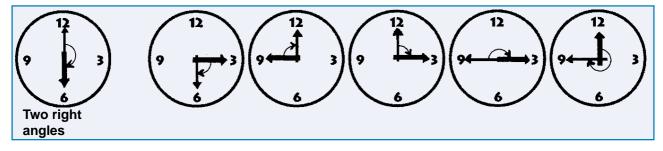
Let them have both the hands on 12 and move one hand to 3, 6, 9 and 12

Encourage the pupils to ask questions, such as:

What angle has the hand moved through?

Who can show me two right angles? etc.

Draw these clock faces on the blackboard. Ask the pupils to copy them into their exercise books. Let them write a definition to describe each angle on the clock face. The first example has been done.





Demonstrate angle turns as a fraction of a turn.

Show the pupils a full turn, a quarter turn, half a full turn, three quarter turn, etc. Face the class with one arm extended straight up and demonstrate these turns.

A full turn

Swing your arm in full turn and back again to the same position.

Explain that it is a full turn



A quarter turn

Swing your arm on the left side a quarter turn.



Explain that it is a quarter turn

Repeat this with other angle turns and ask the pupils to tell you what fraction of the full turn you made.

Choose someone in the class to come to the front. Ask them to extend their arms and give them an instruction.

For example:

Samson makes a quarter turn.

Ask the class, how many right angles has Samson turned through? Samson makes a three quarter turn.

Ask, how many right angles has Samson turned through?



In groups of four or five the pupils play 'Fraction turn' game to practise making angles, using their whole body or arms.

Select someone in the group to be the leader.

Ask the leaders to give some instructions about the turns the group should make. For example:

Make a quarter turn

Make two quarter turns

Make a half turn, etc.

Each time the leader gives the instruction the group responds by making the correct turn. Anyone who does not make the correct turn is out of the game.

The game continues until the leader completes all the instructions.

The winner is the one who makes all the turns correctly.

Walk around the group. Check the instructions and the turns the pupils make.



Can all the pupils make complete turns, three quarter turns, half turns and quarter turns and relate them to right angles?



Ask the pupils how many right angles were needed to make a complete turn or to get back to the start. (4 right angles)

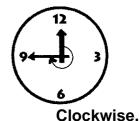
Materials: classroom clock face

Go through the turns again. This time introducing the new vocabulary.

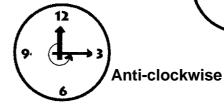
- 1 right angle turn is called a quarter turn
- 2 right angle turns are called a half turn
- 3 right angle turns are called a three quarter turn
- All the way round, 4 right angle turns is called a full turn.

Demonstrate these turns 'clockwise', using the clock face.

Emphasise that, the way the clock hands move is called **Clockwise**.



Move the hands in the opposite direction and explain this is called **Anti-clockwise**.



CIOCKW

Practise 'clockwise' and 'anti-clockwise' turns without using the clock face. Give instructions to help the pupils do this.

For example:

face the blackboard and turn 1 right angle anti-clockwise, etc.

Repeat this with other turns until the pupils are familiar with 'clockwise' and anti-clockwise to describe the turns.



Ask the pupils to complete the activities in their resource book, page 41.

The diagram in the resource book will help them complete the activity.

Demonstrate one example to help the pupils understand the activities.

Resource Book answers: page 41.

1- Window

5- Bed

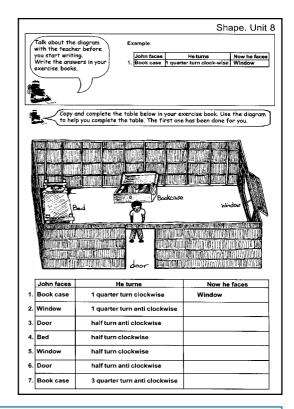
2- Book case

6- Book case

3- Book case

7- Window

4- Window





Can all the pupils use 'clockwise' and 'anti-clockwise' to describe and draw the direction of a turn?



Prepare a large compass with a pointer on a large sheet of paper.

Use the compass to demonstrate points of the compass. (*North, South, East and West*)



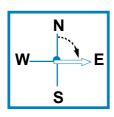
Materials: compass chart,

Turn the pointer and ask the pupils questions to help them understand these directions. Use vocabulary such as, half turn, a quarter turn, clockwise, etc. in your questions. For example:

Now it points to north.

I move a quarter turn clockwise, what is my new direction?

East



Now it points to north.

How many turns clockwise should I make to face south?

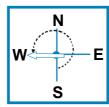
A half turn



Now it points to south.

I move three quarter turn anti-clockwise, what is my new direction?

West



Repeat these examples several times to different points. Ask questions as you turn the pointer. Encourage the children to tell you the correct point of the compass.



The pupils practise moving and turning to different compass points.

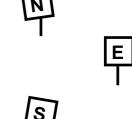
Take the pupils outside the class. Put them into groups of four or five. Give each group cards containing the main compass points. Ask them to place the compass points in their correct positions on the ground. i.e., N, E, S, W.

Materials: cards containing the main compass points (N, E, S, W)

Say that you're going to give them some instructions.

The group should try and move to face the correct points of the compass as instructed. For example:

Move a quarter turn clockwise from north
Move a quarter turn anti-clockwise from east
Move a half turn anti-clockwise from west
Move a half turn clockwise from south
Move a complete turn anti-clockwise from north
Move a complete turn clockwise from east



If someone in the group makes a mistake, he/she is out of the game.

Play the game again. Encourage the pupils to try and make the turns correctly.



Can all the pupils recognise the relationship between compass directions and describe them using right angle turns?

Extra activities

Support

Ask the pupils to play 'Compass Game'

In groups of four, the pupils play 'Compass Game'.

Prepare a large compass with a pointer on a square sheet of paper, 27 cm x 27 cm.

Materials: large compass chart compass game instruction cards, pencil, paper

Write these instructions for the compass game

on cards.



<u>Instructions for compass game</u>

1/2 turn anti-clockwise
1/2 turn clockwise
full turn clockwise
full turn anti-clockwise
1/4 turn clockwise
quarter turn clockwise
1/4 turn anti-clockwise
three quarter turn anti-clockwise
3/4 turn clockwise

Right angle turn clockwise ³/4 turn anti-clockwise 2 right angles turn clockwise half turn anti-clockwise 4 quarter turn clockwise four quarter turn anti-clockwise 1 and ¹/2 turn clockwise 1 and ¹/2 turn anti-clockwise ²/4 turn anti-clockwise

Place the large compass in the middle of the group. The pupils sit next to each other as shown in the diagram.

Shuffle the cards and spread them face down.

Start the game with the pointer on north. Child 1 picks a card and turns the pointer the correct number of turns as mentioned in the instruction.

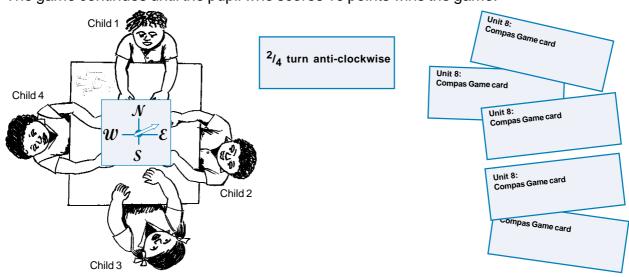
The pupils/teacher check that the child is right. If she /he is correct the child gets a point. For example:

Child 1	Child 2	Child 3	Child 4
	I	П	

2/4 turn anti-clockwise, the pointer will now face south.

The child to whom the pointer now faces takes a turn to pick the card and moves the pointer according to the instruction.

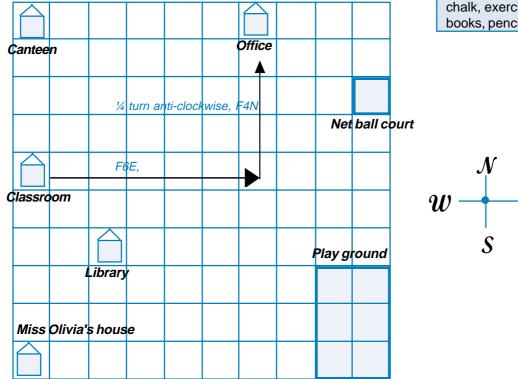
The game continues until the pupil who scores 10 points wins the game.



Extra activities Extension

Copy the map of the school buildings and the instructions below on the blackboard.

Materials: blackboard, chalk, exercise books, pencil, ruler



Instruction

Start	Directions	Finish
Classroom	F6E, ¼ turn anti-clockwise, F4N	Office
Office	F7S, ¼ turn anti-clockwise, F3E	
Library	F4N, 1/4 turn clockwise, F7E	
Play ground	F8W, ¼ turn anti-clockwise, F2S	
Miss. Olivia's house	F6E, ³ / ₄ turn clockwise, F9N	
Canteen	F2E, ¼ turn clockwise, F6S	

Ask the pupils to copy the map and the table into their exercise books.

Explain that they are going to find a pathway on the map using the instructions in the table. The instruction for the directions are indicated as:

F4N, which means, move forward 4 squares in the grid box towards **North**. **1 quarter turn clockwise**, which means, turn **clockwise** one right angle, etc.

The directions for each instruction in the table are written as:

F1N, 1/4 turn anti-clockwise, F3W, a quarter turn clockwise, F2N.

The first example has been done in the map and in the table for them.

Let the pupils complete part of the information in the table using the instructions and map.

Ask pupils questions about the map after checking their answers. For example:

What is the shortest path from the library to the netball court? How would you move from the play ground to the school canteen? What would be the shortest trip from the head teachers house to the office? Give

the directions. Is there more than one answer?

Number Topic 5: Multiplication

Aim:

To extend and develop multiplication skills to 2- and 3- digit numbers by 1- digit numbers.

Sequence of objectives: To

- 1. revise mulitplication tables for 2, 3, 4, 5, and 10 with the pupils.
- 2. teach the pupils to multiply 2- and 3- digit numbers by a 1- digit number without regrouping, eg 14 x 2, 21 x 4, 231 x 3.
- 3. teach pupils to multiply 2- and 3- digit numbers by a single digit number with regrouping, eg 25 x 3, 37 x 4, 349 x 2.
- 4. teach the pupils to multiply by 10.
- 5. make multiplication tables for 6, 7, 8 and 9.
- 6. teach the pupils to use multiplication facts when working with larger numbers, eg knowing that if $3 \times 6 = 18$ then $3 \times 60 = 180$.

Rationale:

In this topic, the pupils extend multiplication skills to 2- and 3- digits by 1- digit numbers. Pupils and teachers will be engaged in practical activities using materials such as the place value chart, counters, shells or stones. This will help the pupils consolidate the concept of regrouping the ones, tens and hundreds and the multiplication algorithm. Also pupils will become more familiar with all multiplication facts and commit them to memory which is a most important skill for everyone.



Remind pupils of multiplication facts such as, 2×3 , 3×2 , 2×4 , 4×2 , etc. Begin by revising the multiplication concept. Ask the pupils to come to the front so that they can all see the demonstration.

Materials:

counters, shells or stones, multiplication statement cards,

Arrange four stones in order. For example: Explain that there is one group of four stones.



1 group of four stones (1 four)

Arrange one more group of four stones and add to the first group.

Show the pupils that now there are two groups of four stones. Ask how many stones altogether are there in 2 groups of fours. (8 stones)



or

Explain that in short, '2 groups of four' is the same as '2 fours'. And this can be written as: $2 \times 4 = 8$

2 groups of four stones (2 fours)

Remind pupils that in multiplication, answers will be the same if the numbers are reversed.

2 <u>x 4</u> 8

Repeat this example. Write these multiplication statements on cards:

2 fours = 4 twos = 3 fives = 6 twos = 2 sixes =

Read and show the statement cards one by one. Make the arrays and ask the pupils to find out the total. Then write the multiplication sentence for each array on the blackboard.



Write these multiplication statements on cards.

 1 ten
 3 sevens

 3 fours
 2 sixes

 4 threes
 7 threes

 2 fives
 6 twos

 5 twos
 10 ones

Materials: multiplication statement cards, counters, shells or stones

Show the pupils each card one by one.

Ask the pupils to make an array for each statement to find the total. Let them write the multiplication sentences and the answer. Check that the pupils got their work correct before continuing on to the next one.

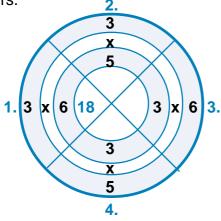
For example:

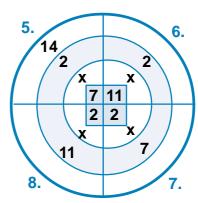


Multiplication statement card answers

$$1x 10 = 10$$
 $2 x 5 = 10$ $2 x 6 = 12$ $10 x 1 = 10$ $3 x 4 = 12$ $5 x 2 = 10$ $7 x 3 = 21$ $4 x 3 = 12$ $3 x 7 = 21$ $6 x 2 = 12$

Copy the multiplication facts wheels on to the blackboard. Ask the pupils to copy them into their exercise books and complete the answers. The first example has been done for them. If neccessary the pupils can make arrays to help them find the answers.





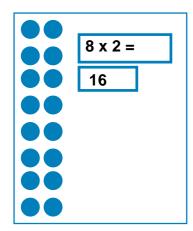
Multiplication fact wheel answers



Prepare a set of multiplication sentences on cards with their answers written on the opposite sides.

Materials: multiplication sentence cards, shells, stones

Ask three pupils to come to the front. Give them counters or shells.



Show a multiplication sentence card to the pupils. Ask the pupils to make an array and call out the correct answer.

Check the pupils' answers. If a child gets the answer right, give him / her the multiplication sentence card.

Continue with other multiplication sentences until all the cards are complete.

Count the pupils cards to see who got the most cards.

Repeat this example with other cards. Encourage other pupils in the class to come to the front and try the activity.



Prepare sets of multiplication sentences for tables 2, 3, 4 and 5 on cards. Write their answers on the opposite sides.

For example:

2 x 10 20

Materials: sets of multiplication sentence cards, pupils resource book

Organise the pupils into smaller groups. Give each group a set of multiplication sentence cards and ask them to play the 'Got the Most' game.

Each group chooses a leader. Each time, the leader picks out a card and calls out the multiplication sentence. The pupils mentally work out the answer and call it out to the group. The leader checks the pupils' answers against his / her answer. The first child to call out the correct answer keeps the card.

The game continues until all the cards are complete. The child with the most cards wins the game. Let the groups swap over and play again so that everyone has the chance to use a different set of cards.

The pupils can also play 'Snap' and 'Matching' games for this activity.

Ask the pupils to complete the activities in the pupils resource books page 42.

Talk about the examples with the pupils first. This will help them understand the activities.

Resource Book answers: page 42.



$$(2 \times 3 = 6)$$



$$(4 \times 5 = 20)$$

4.	4
••••	
••••	
$(5 \times 4 = 20)$	



	•		
(5 x	2	=	10)

	plete the	Example	,	
activities into exercise book example has b for you.	s. The first		1. 2 threes	2 x 3 = 6)
	w the multiplicat tement.	tion arrays and n		entence for each
1. 2 threes • • • • • • • (2		2. 3 twos	3	3. 4 fives
4. 5 fours		5. 2 fives	6	i. 5 twos
		activities in your		
	13. 3 x 8 =	14.8 x 3 =	15. 7 x 5 =	16. 5 x 7 =
12. 5 x 4 =				
	18.6 <u>x.5</u>	19. 9 _x.2	20. 2 _x 9	21. 4 x 8
17. 5 <u>x 6</u>				
17. 5 <u>x 6</u> 22. 8 <u>x 4</u> 7. Jane piled	23. 9 23. 2	<u>x 2</u> 24. 5	25. 8 x 5	<u>x 8</u> 26. 5
17. 5 <u>x 6</u> 22. 8 <u>x 4</u> 7. Jane piled inside the s	23. 9 x3 some cartons		25. 8 x 5	<u>x 8</u> 26 . 5

25-40

26-45

7- 8	8-8	9- 18	10- 18	11- 20
12- 20	13- 24	14- 24	15- 35	16- 35
17- 30	18- 30	19- 18	20- 18	21- 32

24-50

27. a- 3 b- 6 c- 18

22-32

23-27



Can all the pupils revise and remember multiplication facts times tables 2, 3, 4, and 5?



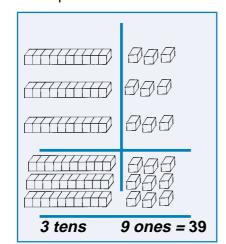
Introduce 2- digits by 1- digit number multiplication without regrouping. Such as, 3 x 13, 2 x 24, 3 x 31, etc.

Begin with the multiplication concept. Write 3 x 13 on the blackboard and show this on a place value chart.

Materials: blackboard, place value chart, stones, shells or counters, number blocks

Put 3 rows of 13 stones on the place value chart. *ie. 3 rows of 1 ten and 3 ones.*For example:

Talk about the rows of ones and tens in the



Talk about the rows of ones and tens in the place value. Start with the ones. Ask, How many rows of ones in ones place? (3) How many ones in each row? (3) How many ones altogether in ones place? (9) So 3 rows of 3 ones are 9 ones. (3 threes are 9).

Continue with the tens. Ask, How many rows of tens in tens place? (3) How many tens in each row? (1) How many tens altogether in tens place? (3) So 3 rows of 1 ten are 3 tens. (3 one tens are 3 tens or 30).

Write the total of tens and ones under each column and remind the pupils that: 3 multiplied by 13 is 39 and it is the same as: 3 x 13 = 39.

Explain that $3 \times 13 = 39$ can be written as:

<u>x 3</u> 39

13

Repeat this example with 2 x 24 and 3 x 31. Remind pupils that 'multiplied by' gives the same answer as 'times'.



Ask the pupils to work in groups of three or four. Give each group enough stones, shells or counters and a place value chart.

Write these multiplication sentences on the blackboard.

Materials: blackboard, place value charts, stones, shells or counters

$$34 \times 2 = \square$$
 $21 \times 4 = \square$ $32 \times 3 = \square$ $22 \times 4 = \square$ $21 \times 3 = \square$ $22 \times 4 = \square$ $21 \times 3 = \square$ $22 \times 4 = \square$ $23 \times 3 = \square$ $31 \times 3 = \square$ $32 \times 3 = \square$ $32 \times 3 = \square$

Ask each group to show the array for each multiplication sentence on the place value chart using stones or counters. Encourage them to tell you the total and let them write the multiplication sentence.

Do one multiplication at a time. Check to see that each group got the work correct before moving on to the next multiplication sentence.



Teach 2- digit by 1- digit number multiplication without regrouping. Use number blocks and the place value chart to demonstrate the concept.

Materials: counters, shells or stones, place value chart

Begin with **2 x 34**. Place 2 rows of 34 stones on the place value chart. ie. 2 rows of 3 tens and 4 ones.

Ask questions about the rows of stones in the place value chart. For example:

How many ones in each row? (4) How many rows of 4 ones are there? (2) How many ones altogether in ones place? (8) So 2 rows of 4 ones are 8 ones. (2 fours are 8).

Write the total of ones under the ones place and repeat this with the tens. Explain that 2 rows of 3 tens and 4 ones is 68.

Show the process on the blackboard without using the place value chart. Emphasise the multiplication algorithm:

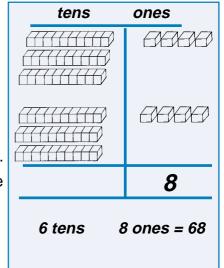
i.e, multiply the ones first and then the tens.

For example:

34 (2 times 4 ones is 8 ones)

<u>**x 2**</u> (2 times 3 tens is 6 tens)

68



Repeat this example with these multiplications: 4 x 52, 2 x 65 and 3 x 42. Emphasise the multiplication algorithm to the pupils.



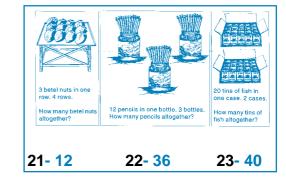
Write these multiplication sentences on the blackboard. Ask the pupils to copy and complete the answers in their exercise books.

1. 33 <u>x 3</u>	2. 25 <u>x 1</u>		5. 22 <u>x 4</u>	
7. 72 <u>x 3</u>	8. 93 <u>x 2</u>		11. 42 <u>x 4</u>	

Ask the early finishers to do the exercise on the pupils resource book, page 43.

Resource Book answers: page 43.

1-68 2-208 3-46 4- 128 5- 355 6- 129 7- 146 8-39 9- 45 10- 128 11- 105 12- 144 13-66 14-88 **15-368** 16- 108 **17- 246** 18-88 **19- 270** 20- 96





Teach 3- digit by 1- digit number multiplication without regrouping. Write this multiplication story on the blackboard.

Materials: blackboard

3 CEMA boats transported copra from Makira to Yandina. The boats loaded 233 bags of copra each. How many bags of copra altogether did they load?

Solve the problem with the pupils. Find out the number of boats and the number of copra bags each boat loaded. *i.e, 3 boats, each carrying 233 bags of copra.*

Ask the pupils to suggest ways of finding the answer to the question.

Explain that we do this by multiplying the number of boats by the number of copra bags each boat carried. For example:233

<u>x 3</u>	
<u>699</u>	233
	233
Show the pupils another way of doing this by adding.	<u>+ 233</u>
Repeat this example with some more multiplication stories.	_699



The pupils complete the activities in their resource book, page 44.

Talk about the example in the pupils page. Help them understand the multiplication stories.

Resource Book answers: page 44.

1- 396 2- 8	48 3- 1,068 n	nl
4- 600 eggs	5- 2,400	6- 396
7- 1,288	8- 267	9- 468
10- 624	11- 1,239	12- 2,000
13- 2,484	14- 864	15- 1,563
16- 628	17- 1,477	18- <mark>813</mark>
19- 1,800	20- 484	21- 3,000

23-666

	the activities eacher before riting. answers in	For each hill, t	ldren of Auki scho hey planted 3 pota ato vines are there	to vines.	s of potato.			
	Read the stories and answer the questions. The first example has been done for you.							
	ur children of A ney planted 3 po r?				:h			
	d 4 boxes of ma y mangoes wer				igoes.			
needed to	3. A plastic container holds 534 ml of water. How many millilitres of water are needed to fill 2 containers.							
there alto	vere filled with gether?	eggs. Each box	chad 100 eggs.	How many egg	gs were			
Сору	and complete th	e activities in yo	ur exercise book	s .				
5. 600 _x_4	6. 132 <u>x 3</u>	7. 322 _x_4	8. 267 <u>x 1</u>	9. 234 <u>x 2</u>				
10.312 <u>x 2</u>	11. 413 <u>x 3</u>	12. 400 <u>x 5</u>	13. 621 <u>x 4</u>	14. 432 <u>x 2</u>				
15. 521 <u>x 3</u>	16. 314 <u>x 2</u>	17. 211 <u>x 7</u>	18. 813 <u>x 1</u>	19. 200 <u>x 9</u>				
20. 121 <u>x 4</u>	21.600 <u>x 5</u>	22. 109 <u>x 1</u>	23. 111 <u>x 6</u>	24. 123 <u>x 2</u>				

Can all the pupils multiply 2- and 3- digit numbers by 1- digit numbers without regrouping?

24-246

22-109

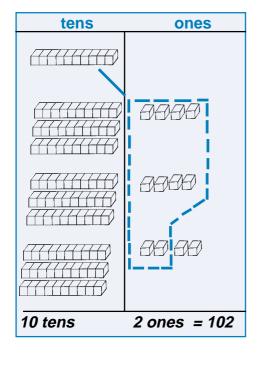


Introduce 2- digit by 1- digit number multiplication with regrouping.

Ask the pupils to come close to the front so that they can all see the demonstration. Bring enough stones, shells or counters in front.

Put 3 rows of 34 stones on the place value chart. i.e. 3 rows of 3 tens and 4 ones. For example:

Materials: blackboard, shells or stones, counters, place value chart, sticks, midribs, strings, number blocks



Ask, How many ones? (12 ones) Explain that 3 fours are 12.

How many tens? (9 tens) Explain that 3 groups of three tens are 9 tens.

Explain to the pupils that since there are enough ones to make a ten, the 10 ones can be regrouped for 1 ten and placed at the top of the tens column, in the same way as for addition.

Write the total of tens and ones in each column.

Write the array on the blackboard in figures and emphasise the multiplication algorithm and its system of recording to the pupils.

For example:

3 by 4 ones is 12 ones.

34 1 tens and 2 ones

 \times 3 by 3 tens is 9 tens.

102 add 1 ten to make 10 tens.

Repeat this example with other 2- digit by 1- digit numbers until the concept of regrouping is understood.



Organise the pupils into groups of four. Give them counters, shells or stones. Ask them to show these multiplication sentences using the place value chart and find out their totals.

1. ₂₃	2. 45	3. ₁₃	4.46	5. 37	
<u>x 4</u>	<u>x 2</u>	<u>x 5</u>	<u>x 3</u>	<u>x 2</u>	

Materials: blackboard, objects such as, shells stones, counters, place value chart.

Do one multiplication at a time.

Check to see that the pupils got the activity right before moving on to the next one.

Ask the pupils to copy the multiplication sentences into their exercise books and complete the answers.

Answers.

1-92

2-90

3-65

4- 138

5-74

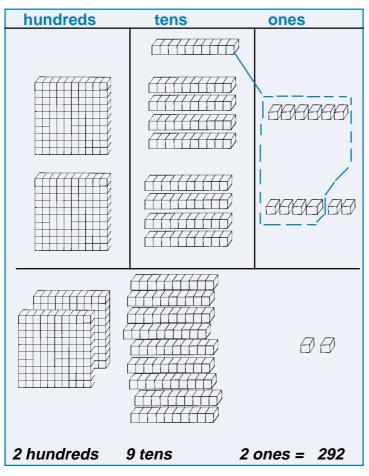


Introduce 3- digit by 1- digit number multiplication with regrouping of ones and tens.

Bring the pupils close to the front so that they can all see the demonstration. Bring number blocks and a place value chart for demonstration.

Materials: blackboard, number blocks (hundreds tens ones), place value chart.

Put 2 rows of 146 number blocks on the place value chart. i.e. 2 rows of 1 hundred, 4 tens and 6 ones. For example:



Ask,
How many ones? (12 ones)
Explain that 2 sixes are 12.

How many tens? (8 tens) Explain that 2 fours are 8.

How many hundreds? (2 hundreds) Explain that 2 ones are 2.

Explain that since there are enough ones to make a ten, the 12 ones can be regrouped for 1 ten and placed at the top of the tens column, in the same way as for addition.

Write the total of hundreds, tens and ones in each column.

Write the array on the blackboard in numbers and emphasise the multiplication algorithm and its system of recording to the pupils.

add 1 ten to make 9 tens 2 by 1 hundreds is 2 hundreds.

Repeat this example with these numbers: 214 317 413



The pupils open their resource books on page 45 and complete the activities.

Let them copy the multiplication sentences into their exercise books.

Materials: blackboard, pupils resource books

Copy and comp activities in yo exercise book. example has be for you.	ur The first	Examp	1. 1 412 <u>x 5</u> 2060		
1. 1 412 <u>x 5</u> 2060	2.713 <u>x 4</u>	3. 413 <u>x 5</u>	4. 216 _ <u>x 2</u>	5. 313 <u>x 6</u>	
6. 214 <u>x 7</u>	7. 413 <u>x 6</u>	8. 511 <u>x 9</u>	9. 327 <u>x 4</u>	10. 116 <u>x 2</u>	
11. 302 <u>x 8</u>	12. 327 <u>x 2</u>	13. 215 _x 5	14. 625 <u>x 3</u>	15. 812 <u>x 7</u>	
16. 323 <u>x 4</u>	17. 102 <u>x 9</u>	18. 515 <u>x 2</u>	19. 114 <u>x 5</u>	20. 219 <u>x 3</u>	
21. 513 <u>x 6</u>	22. 327 <u>x 3</u>	23. 212 <u>x 5</u>	24. 215 <u>x 2</u>	25. 214 _x 6	
Read	the stories and	l answer the ques	stions.		
	, there were 1			our class. Inside exercise books	
		tched 223 eggs er did the four tu		ame day.	
	5 3				

Write these multiplications on the blackboard.

27-892

Resource Book answers: page 45.

26- 660

1- 2,060	2- 2,852	3- 2,065	4- 432	5- 1,878
6- 1,498	7- 2,478	8- 4,599	9- 1,308	10- 232
11- 2,416	12- 654	13- 1,075	14- 1,875	15- 5,684
16- 1,292	17- 918	18- 1,030	19- 570	20- 657
21- 3,078	22- 981	23- 1,060	24- 430	25- 1,284



Teach 3- digit by 1- digit number multiplication with regrouping of tens and hundreds.

Begin with these multiplications. 241 173 331 $\frac{x \cdot 5}{x}$ $\frac{x \cdot 2}{x}$

Materials: blackboard, number blocks (hundreds tens ones), place value chart.

Continue to emphasise the strategies and language of multiplication and regrouping. Write the array on the blackboard in notation and emphasise the multiplication algorithm. For example:

Multiplying ones by ones first, then ones by tens and then ones by hundreds. Regroup the tens to make a hundreds if there are enough tens.

1 3
238
X 4
952

Repeat the example with other multiplications until the pupils understand the concept.



The pupils open their resource books on page 46 and complete the activities.

Let them copy the multiplication sentences into their exercise books.

Resource Book answers: page 46.

26-910

with your te	itart writing. ample has	Examp	1. 1. 140 <u>x 3</u> <u>420</u>	
Сору	and complete th	e activities. Write	the answers in	your exercise books
1 1. 140 <u>x 3</u> <u>420</u>	2. 372 <u>x. 4</u>	3. 331 <u>x 5</u>	4. 280 <u>x 2</u>	5. 821 <u>x 5</u>
6. 252 <u>x 2</u>	7. 323 <u>x 7</u>	8. 222 _x 8	9. 732 <u>x 4</u>	10. 161 <u>x 5</u>
11. 320 <u>x 9</u>	12. 632 <u>x 7</u>	13, 290 <u>x 5</u>	14. 251 <u>x 3</u>	15. 453 _x_2
16. 333 <u>x 7</u>	17. 821 <u>x 6</u>	18. 262 _x 2	19. 150 <u>x 3</u>	20. 152 <u>x 4</u>
21. 352 <u>x 2</u>	22. 380 <u>x 5</u>	23. 241 <u>x 7</u>	24. 251 <u>x 2</u>	25. 241 _x 4
Read 1	the story and an	swer the question.		
National last year Each sch How mar	y schools took Sports Carniva nool had 130 at ny athletes alto mpetition?			



25- 964

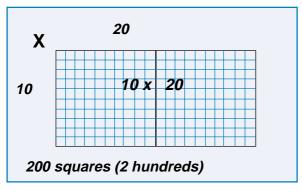
Can all the pupils multiply 2- and 3- digit numbers by 1- digit numbers with regrouping?



Teach the pupils multiplication by 10.

Make a rectangle that is 20 by 10 small squares, using the 100 number block square. For example:

Materials: blackboard, 100 number blocks, large chart papers



Explain that the sides are 10 by 20 small squares.

Ask the pupils if they can tell you the number of 100 blocks that have been used. (2)

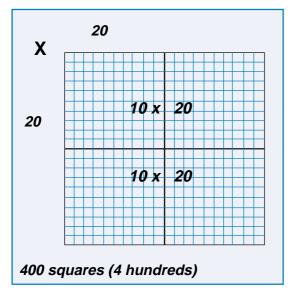
Ask, how many squares altogether are there? (2 hundreds)

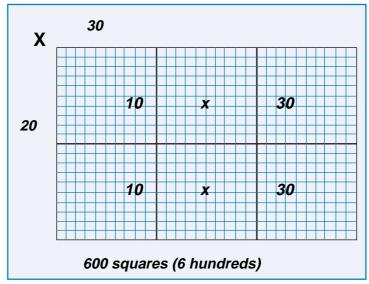
Show the multiplication algorithm for these rectangles on the blackboard. For example:

'The 20 moves one place to the left'

Repeat for 30 by 10, 50 by 10, etc. Remember that when a number is multiplied by 10 the number moves one place value to the left and a zero is placed in the empty space.

Now you can extend the multiplication to 20 by 20, 20 x 30, etc. Talk about the pictorial representation and show the multiplication algorithms for each rectangle.





For example:

30	30		30
X 20 same as	<u>x 10</u>	+	<u>x 10</u>
<u>600</u>	300		_300

Repeat this example with other multiplications until the pupils are familiar with multiplication by tens, twenties, thirties, etc.



The pupils open their resource books page 47 and complete the activities.

Talk about the different examples in the page with the pupils first and help them understand what to do.

In numbers 1 - 6, ask the pupils to write two multiplication sentences for each diagram, as in the first example.

For numbers 17 - 26, help the pupils understand, the algorithm which is, move one place to the left, multiply by the tens number putting a zero in the empty space in the ones column.

Assist the pupils with their work and help the less able pupils in the class.

Resource Book answers: page 47.





Number. Unit 9

x 20 600

10. 3 tens

x 8 tens

15.8

20.30

25. 7

x 60

<u>x 4</u> tens

11.7 tens

x 9 tens

16, 2 tens

21.90

26.60

x.10

Example

Write the multiplication sentence for each diagram.

X

Copy and complete the answers. An example has been done for you.

9. 5 tens

x 4 tens

x 2 tens

14.6

19. 3

x 40

x 10

8. 2 tens

x 6 tens

13.4 tens

<u>x 5</u>

18. 40

x 20 800

23.60

x 5 tens 15 hundreds

12. 3 tens

<u>x 3</u>

17. 20

22. 50

x 60

<u>x 2</u> 40

Discuss the activities with your teacher.
Talk about the differen

7- 15 hundreds 8- 12 hundreds

9- 20 hundreds

10-24 hundreds

11-63 hundreds

12-9 tens

13- 20 tens

14-12 tens

15- 32 tens

16-14 tens

17-40

18-800

19- 120

20 - 1,800

21-900

22-3,000

23-600

24-100

25-140

26-4,200

Can all the pupils multiply by tens, twenties, etc. using the algorithm of moving to the left and placing a zero in the empty space?





Construct the six times table with the pupils, by making groups of objects and drawing diagrams to show multiplication.

Materials: blackboard, chalk, chart paper, pen

Ask someone in the class to show you 3 groups of 6. Let the child come to the front and draw the diagram on the blackboard. For example:







Write the multiplication sentence: $3 \times 6 = 18$

Repeat this with other groups of six, such as, **2** groups of **6**, **4** groups of **6**, **8** groups of **6**, etc. until you reach 12 groups of 6.

Ask the pupils to help you make a table of all the '6 multiplication facts'.

 $1 \times 6 = 6$

 $2 \times 6 = 12$

 $3 \times 6 = 18$

 $4 \times 6 = 24$

 $5 \times 6 = 30$

 $6 \times 6 = 36$

 $7 \times 6 = 42$ $8 \times 6 = 48$

 $9 \times 6 = 54$

 $10 \times 6 = 60$

 $11 \times 6 = 66$ $12 \times 6 = 72$ Ask questions about the table, such as,

How many 6's make 12?

How many 6's make 42?

How many 6's make 6? etc.





Ask the pupils to construct their own table for 7, 8, 9 and 10. Let them write their tables in their exercise books.

Write some multiplication questions on the blackboard for tables 6, 7, 8 and 9. For example:

Materials: blackboard, chalk, pens, exercise books

Let the pupils use their tables to answer the questions.



Can all the pupils make multiplication tables for 6, 7, 8, 9, 10 and use them in multiplication?



Teach the pupils to use multiplication facts when working with larger numbers, such as, 2 x 80, 3 x 50, 4 x 72

Materials: blackboard

Write 2 x 80 on the blackboard. Ask someone in the class to tell the answer.

Help the pupils to use their multiplication facts to quickly find the answer for the multiplication.

For example, in 2 x 80, the pupils should know that: $2 \times 8 = 16$ so $2 \times 80 = 160$ because multiplying by 10 involves a move to the left.

Repeat this with 3 x 50 and 4 x 72. Show the pupils these examples.

$$3 \times 50$$
 50 4×72 72 $3 \times 5 = 15$ $\times 3$ $4 \times 7 = 28$ and $4 \times 2 = 8$ $\times 4$ so $3 \times 50 = 150$ 150 so $4 \times 72 = 288$.



Prepare multiplication sentences below on cards and do a mental exercise with the pupils. Show the cards one at a time and ask the pupils to mentally work out the answers using the above strategy.

You can play 'Multiplication Bingo' with the pupils using the multiplication sentences. Give pupils a list of possible answers which they can choose to write in their box if you decide to play multiplication bingo game.

Box for Bingo

 List of possible answers for multiplication bingo

 180 130 210 100 231 270

 320 128 132 148 120 150

Write these multiplications on the blackboard. Ask the pupils to copy them into their exercise books and complete the answers.

1 . 5 x 40 =	2 . 6 x 60=	3 . 2 x 80=	4 . 4 x 70=	5 . 3 x 20=
6 . 4 x 32=	7 . 3 x 92=	8 . 9 x 21=	9 . 3 x 43=	10 . 2 x 84=

Answers

1- 200 2- 360 3- 160 4- 280 5- 60

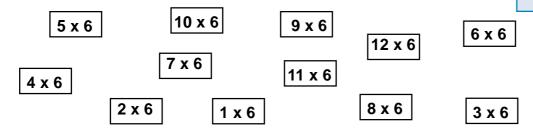
Can all the pupils use multiplication facts when working with larger numbers?

Extra activities Support

Play Multiplication Bingo with the pupils.

Write multiplication questions for 6 times table on cards.

Materials: Multiplication cards, pens, papers



Ask the pupils to draw a rectangle and divide them into six smaller squares. Let them choose any six numbers from their table of 6's and write them in the boxes. For example

example, 6 36 24 12 60 18

Play Multiplication Bingo with the pupils. Continue this with tables 7, 8 and 9.

Extra activities Extension

Draw the 100 square grid on the blackboard. Ask the pupils to copy the square grid into their exercise books.

Let them look for multiplication patterns on the 100 square grid.

Materials: blackboard, exercise books, pencils

Start with table 6. Shade all the answers for table 6.

Repeat this with other multiplication tables.

Encourage the pupils to share their work with other pupils in their class.

Encourage the pupils to think about these two questions after they have completed shading the numbers.

What do you notice when the 8's are shaded on top of the 6's?

What are these special numbers shaded twice?

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100



Shape Topic 11: Location

Aim:

To locate positions on a map or grid of squares using simple co-ordinates.

Sequence of objectives: To

1. teach children to locate positions on a grid of squares using letter and number co-ordinates, *eg* (*B*,*5*), (*C*,*8*).

Rationale:

In this topic children learn to locate a square on a grid by using co-ordinates which can include a letter and a number. This is an important mapping skill which the children practise through practical activities. It is the first stage in learning to read maps and accurately finding a point on a map or designing grids to show locations and important places within these locations.



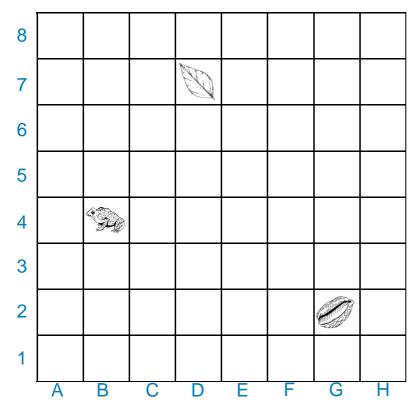
Begin the lesson by talking about traditional methods of locating places. For example, if a fisherman wanted to remember the location of a good fishing ground, he might use a point on the land such as a hill or a tree to mark the spot.

Ask the children if they can tell you any other methods of finding a place or remembering where something is.

Materials:

8 x 8 grid square drawn on the blackboard

Explain that if we have a grid of squares and we give a letter or number to each horizontal and vertical line or column, we can use this to locate a particular square.



Show the children how to use the letters and numbers to identify a square. We always begin with the letter or number along the bottom of the grid.

So the frog is in square B4. The letter and number are written inside brackets and separated by a comma (B,4).

The leaf is in square (D,7) and the shell is in square (G,2).

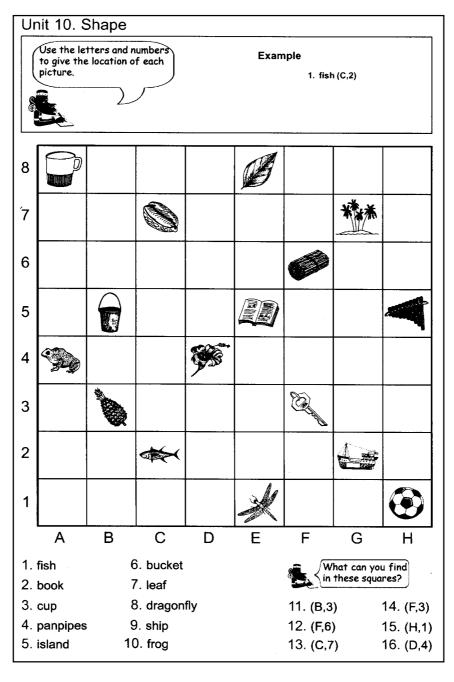
Draw more pictures inside the grid and ask the children to identify the squares using co-ordinates.



Ask the children to complete page 48 in the Pupil's Resource Book.

Explain that they must use the letters and numbers, which are called **co - ordinates**, to give the location of each picture.

Ask them to write their answers in their exercise books.



Resource Book answers: page 48.

1. fish (C,2)	6. bucket (B,5)
2. book (E,5)	7. leaf (E,8)
2 (4.0)	0 duana (f) (F 1

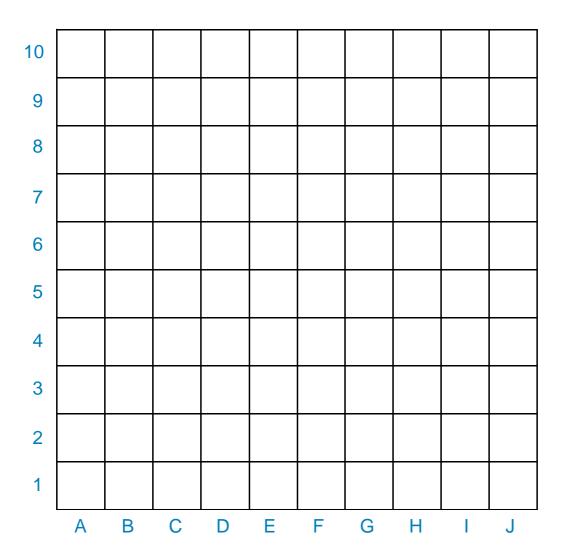
3. cup (A,8)
4. panpipes (H,5)
8. dragonfly (E,1)
11. (B,3) pineapple
14. (F,3) key
15. (H,1) football

5. island (G,7) 10. frog (A,4) 13. (C,7) shell 16. (D,4) flower



Draw a 10 x 10 grid on the blackboard, labelled with letters and numbers, like the one shown below.

Materials: 10 x 10 grid square drawn on the blackboard



Remind the pupils how to give the position of squares in the grid by using the letters and numbers.

Ask different pupils from the class to answer questions and follow instructions to draw pictures in the correct squares. Ask questions such as:

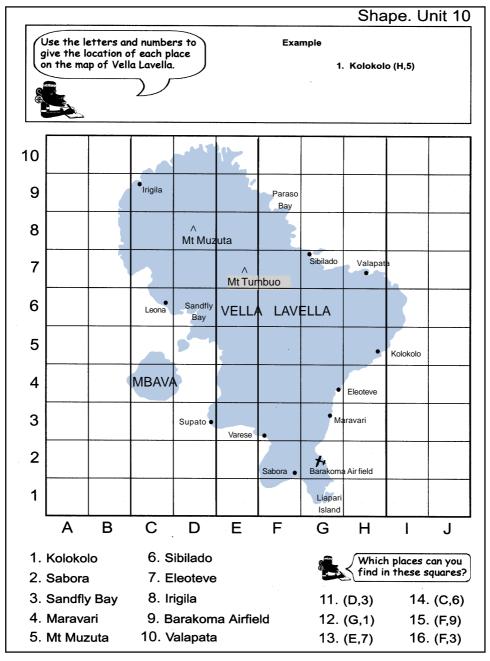
"Who can draw a circle in square (D,3)? Who can draw a fish in square (F,7)? Who can draw a canoe in square (B,6)?" etc

Let the children take turns to draw the pictures in the correct squares.



Ask the children to complete page 49 in the Pupils' Resource Book.

The children should look at the map of Vella Lavella in Western Province and then use the letters and numbers to answer the questions.



Resource Book answers: page 49.

- 1. Kolokolo (H,5)
- 2. Sabora (F,2)
- 3. Sandfly Bay (D,6)
- Maravari (*G*,3)
 Mt Muzuta (D,8)
- 6. Sibilado (G,7)
- 7. Eleoteve (G,4)
- 8. Irigila (C,9)
- 9. Barakoma Airfield (G,2)
- 10. Valapata (H,7)
- 11. (D,3) Supato
- 12. (G,1) Liapari Island
- 13. (E,7) Mt Tumbuo
- 14. (C,6) Leona
- 15. (F,9) Paraso Bay
- 16. (F,3) Varese

Can all the pupils find locations on a grid of squares using letter and number co-ordinates?

Extra activities Support

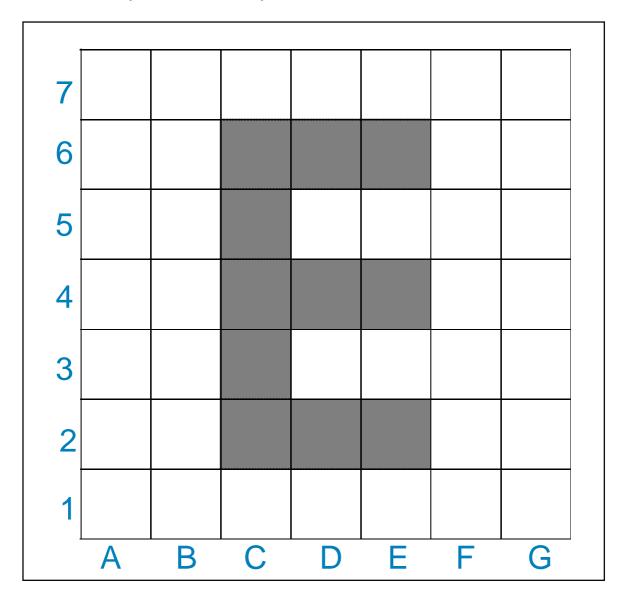
Ask the children to draw a 7 x 7 square grid in their exercise books. Let them add the letter and number co-ordinates.

Write a list of co-ordinates on the blackboard, for example:

(C,2)	(D,2)	(E,4)
(E,2)	(E,6)	(C,6)
(C,3)	(C,4)	(D,4)
(C,5)	(D,6)	

Ask the children to find these squares on their grid and carefully colour each one in turn. The picture they make should form a letter of the alphabet.

Ask them to tell you which letter they have drawn.

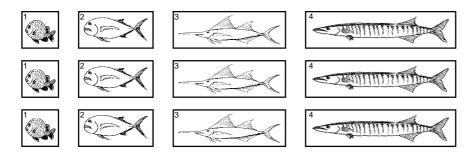


Repeat this activity with other letters of the alphabet and other patterns. Make your own list of co-ordinates to find other squares for letters such as, F, H, I, L, etc.

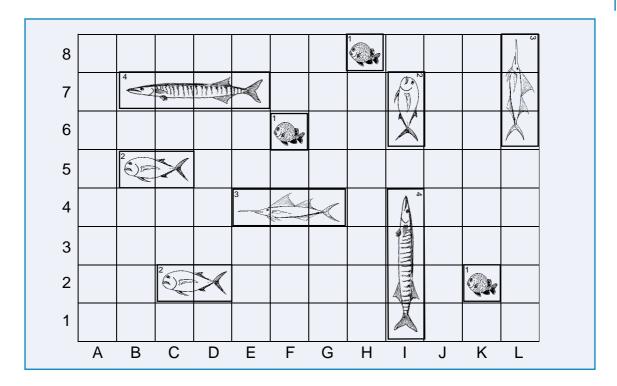
Extra activities Extension

Let the children play the Spear Fishing Game in twos. They will each need a game board and a set of ten fish cards. There are cards numbered 1, 2, 3 and 4. Each player will need enough of these cards:

Materials: Spear fishing game boards and cards



The players must sit so that they cannot see their opponent's board. Each player arranges their fish cards on their grid, either horizontally or vertically, so that they fit within the squares on the grid, for example:



The first player calls out a co-ordinate, for example (C,7). If the second player has a fish, or any part of a fish, covering that square it is a 'hit'. They must remove the fish from their board and show their opponent the size of fish that has been speared. If there is no fish covering square (C,7) it is a 'miss' and no fish is removed. The players take turns to call out a co-ordinate and try to spear a fish.

The winner is the first player to spear all of the opponent's fish. The teacher can set a time limit and the winner is the player who has speared the most fish within the time limit.

The children should learn that it is a good idea to keep a record of the co-ordinates they have called, so that they avoid repetition.



Graphs Topic 12: Bar Graphs

Aim:

To extend pupil's understanding of graphs, to use them to display a variety of data, and to be able to extract and interpret the data.

Sequence of objectives: To

1. teach the pupils to draw vertical and horizontal bar graphs from data contained in tally charts and information tables.

Rationale:

In this unit, pupils extend their knowledge of graphs by using and being able to produce vertical and horizontal bar graphs. The unit involves the pupils in practical activities which will give them the chance to collect and record relevant information contained in tally charts and information tables. The information is then presented in vertical and horizontal bar graphs where information can then be extracted and interpreted. This is an important skill since information in today's world is often shown in newspapers and reports in the form of graphs.



Revise simple tally charts and graphs from Standard Three. Conduct a class survey on the date of birth of the pupils. Find out the month in which they were born.

Materials: blackboard

Make a simple tally chart on the blackboard to show this information. For example,

	Standard Fou	r Pupils. Month of Birth	
January	ll.	July	1
February	IIII	August	1111
March	1	September	III
April		October	II.
May	II .	November	1111
June	Ш	December	III

Ask questions about the tally chart and help them find out the number of birthdays in each month, for example,

Which month has the highest number of birthdays?

Which month has the lowest number of birthdays?

Which months have the same number of birthdays?

How many people were born in the month of November? (6)

How many were born in the month of August? (5)

How many pupils took part in this survey? (33) etc.

Explain that the tallies represent the number of pupils born each month.

Write this on the blackboard for the pupils to see.

January 2

August — 5





Ask the pupils to work in groups of five or six.

In schools where there are few pupils in the class, the class could work together as one group.

Materials: black board, large sheet of paper, pencils

Ask each group to conduct a group survey.

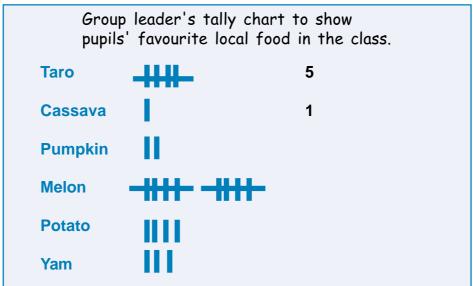
Let them collect information about favourite local foods in the class.

Encourage each group to find out from each member by asking them questions, such as,

"What is your favourite local food?"

The group leader should write down names of local foods on a piece of paper before asking each pupil the question.

Let each group record the information using a tally chart and ask them to write numbers beside the tally strokes. For example,



Ask questions and write some number story sentences about the survey. For example.

The favourite food in our class was the melon. 10 children out of our class of 25 chose melon. The least popular was cassava. Only one child chose cassava.

When the groups have completed their group survey, let them work individually or in small groups to gather more information from class members.

Encourage them to find out other information such as, each child's favourite subject at school, their favourite local bands, their favourite soccer clubs in town, number of boys and girls in their immediate family. Let them record the information using a tally chart.

Ask the pupils to copy their tally charts onto big sheets of paper and display them on the classroom wall.

Ask the pupils to write some number story sentences about each tally chart.

These could be displayed next to each chart.



Prepare a measuring strip from paper marked in centimetres. Fix the strip to the wall.

Materials: measuring strip marked in cm

Draw a height tally chart on the blackboard.

Select 15 pupils from the class and measure their heights using the measuring strip. Record the pupils heights on the chart using tally strokes. For example,

Standard 4 Pupils Height Tally Chart					
Heights	130 - 139 cm	140 - 149 cm	150 - 159 cm	160 - 169 cm	170 - 179 cm
Tally strokes		IIII	-###-1	==	П

Ask questions about the pupils heights.

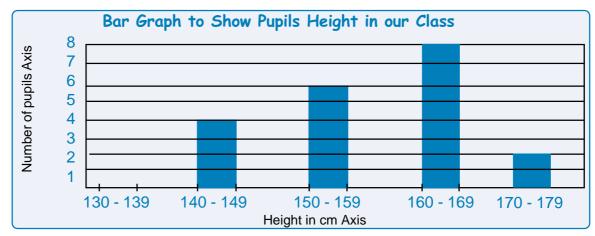
How many pupils are in between 140 - 149 cm tall? (4)

How many are in between 160 - 169 cm tall? (8)

What is the shortest height recorded?

How many pupils are in the shortest set? etc.

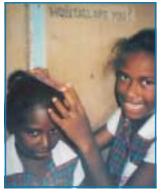
Draw a vertical bar graph and show the pupils how this information can be represented in the graph. Explain the information on the graph to the pupils. Explain **axis** and two **axes**.





Provide enough measuring strips for a group of five or six pupils. Draw the height tally chart ranging from 130 cm to 200 cm on the blackboard and ask the pupils to copy it into their exercise book.

Materials: measuring strips for groups of five or six, squared or lined paper



In groups of five or six, the pupils measure their heights. Let them record the heights in tally strokes on the blackboard. The pupils copy the whole class information onto their tally chart.

Ask the pupils to make their own vertical bar graphs using the information on the tally chart.

Help them plan what and where to put the information in the graph. They should make their graphs on squared or lined paper. Remind the pupils to put a title on their bar graph. Ask them to label the axes.

Materials:

paper

tally chart written on

a large sheet of



Prepare a tally chart on information based on the pupil's favourite local bands. For example,

Favourite Local Bands

Arm Rock Solid ## | 6

Ian Ronnie |||| 4

Ali Baba |||| 4

White Beach || 2

Gizo Street Jazz ## 5

Ask questions about the chart, such as,
"Which band is most people's favourite?
How many pupils like Arm Rock Solid?
How many like Ali Baba?

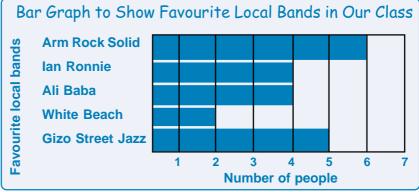
How many pupils took part in this survey? etc.

Write the numbers beside the tally strokes.

Draw a horizontal bar graph and show the pupils how the information can be represented on the graph.

Talk about the layout of the graph and the information with the pupils. Emphasise vocabulary such as *vertical* and *horizontal axis* as you explain the graph.

Explain that the Horizontal Bar Graph is similar to the Vertical Bar Graph.





The pupils open their Resource Books on page 50.

Let them look at the information chart about the Weekly Local String Band Hit Parade.

Ask the pupils questions about the charts, such as.

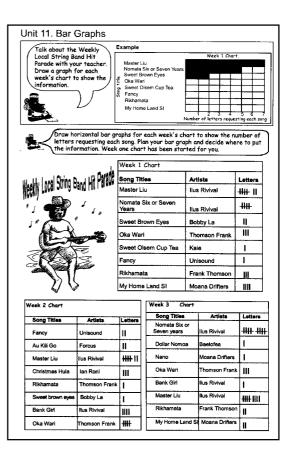
Which song is the favourite for week 1? How many people requested the song? Who is the artist?

Which songs have the same number of requests?

Repeat this with the week 2 and week 3 chart.

Ask the pupils to draw horizontal bar graphs for each week's chart to show the information.

Help the pupils with their graphs. Let them plan how many rows and columns are needed and let them label the axis. Encourage them to write the title of their graphs.





Prepare some simple sports results like the ones below.

The results may be based on different games played by Standard 4 pupils in your school.

Materials: blackboard, sports results on large sheets of paper

For example,

Class 4 B	Slue S	port	Resu	lt (Sc	occer)	
Teams	GP	W	D	L	PTS	
Parrot Frigate Seagull Hornbill	4 4 4 4	2 4 3 1	1 - 1 -	1 - - 3	7 12 10 3	

Class 4	Blue	Spor	t Res	sult (Netball)
Teams	GP	W	D	L	PTS
White Green Red Orange	4 4 4 4	- 3 4 2	- - -	4 1 - 2	- 9 12 6

Where this is not possible, the teacher could use the whole school sports results or ask for sports results from other classes. The teacher could produce an imaginary results sheet.

Put the information on large sheets of paper or write it on the blackboard for the pupils to see. Talk about the different information shown in the table with the pupils.

Explain what the initials used in the results mean.

For example,

GP - stands for games played by each team.

W - stands for games won by each team.

D - stands for games drawn by each team.

L - stands for games lost by each team.

PTS - stands for points won after each team has completed their games.

Ask questions to help the pupils understand this information.

For example,

How many games did the Parrot team play? (4)

How many games did they win? (2)

How many games did they lose? (1)

How many did they draw? (1)

What is the Parrot's total points after playing four games? (7)

How many points are scored when a team wins a game? (3)

How many points does a team score when they draw a game? (1)

How many points does a team score if they lose a game? (0)

How do you know? etc.

Repeat this with other examples.

Encourage the pupils to answer the questions using information from the information tables.



Ask the pupils to open their Resource Book on page 51.

Materials: rulers, pen, pencil

Talk about the two tables in the resource book with the pupils first. Explain the word SIFF to the pupils and how the League Competition is organised in Honiara.

Talk about table one.

Ask questions to help the pupils find out information such as, the number of games the teams played, their total points, games they won and games they lost.

When the pupils understand the information, ask them to do the activity for table 1 in the Resource Book.

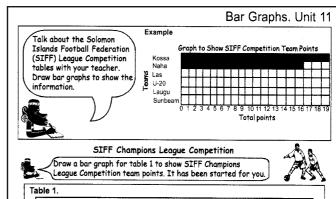
In table 2, the pupils read and answer the question themselves.

Help the pupils plan their graph. They need to select the correct information which they will use for their graph. Such as, the teams and their total points.

The pupils should decide whether to use a horizontal or a vertical bar graph.

Resource Book answers: table 2 page 51.

- 1. Augustine Peli and Patteson Daudau
- 2. Augustine Peli Las Patteson Daudau - Kossa
- 3. Moses Toata
- 4. 22 goals
- **5.9 goals**
- 6. 13 goals
- 7. Pupils graph for table 2 activity in the pupil's resource book may look like this.



Team Points	1				
Team	Games played	Won	Lost	Draw	Points
Kossa	7	6	0	1	19
Naha	7	5	1	1	16
Las	7	3	2	. 2	11
U-20	7	2	4	1	7
Laugu	7	1	5	- 1	4
Sunbeam	. 7	0	6	1 .	1

Read and answer the questions first. Then draw a bar graph to show each player's total score. Plan you bar graph and decide which information to use and where to put the information. Remember to give your bar graph a title and label the axes.

Goal Tally				
Player	Club	Round 1	Round 2	Number of Goals
Augustine Peli	Las	5	2	7
Patteson Daudau	Kossa	4	3	7
Noel Berry	Kossa	2	1 3 I	5
Severino Aefi	Las	5	-	5
Duddley Seda	Laugu	3	1	4
Moses Toata	Kossa	3	-	3

- 1. Which players scored the most goals during the competition?
- 2. Which clubs do they play for?
- 3. Who scored the least number of goals?
- 4. What is the total number of goals scored in round one games?
- 5. What is the total number of goals scored in round two?
- 6. Find the goal difference between round one and two total goals score
- 7. Draw a graph to show each players goal tally.





Can all the pupils make vertical and horizontal bar graphs from data on tally charts and information tables?

Extra activities Support

Encourage the pupils to conduct their own class survey and record the information on a tally chart.

Materials: pencils, paper, rulers

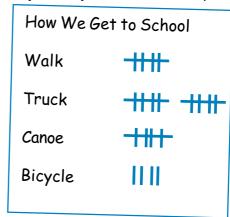
The pupils could work individually or in small groups.

They could collect information about:

How they get to school (walk, canoe, truck or bicycle).

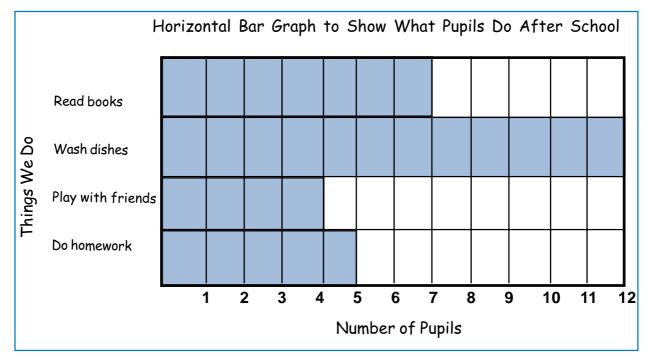
What they do after school (read, play with friends, do homework, wash dishes). People who live in their houses (sisters, brothers, father, mother, uncles, aunties).

Ask the pupils to make a proper record of their group survey on tally charts, for example,



Ask them to make a bar graph to show this information.

The pupils should decide whether their bar graph should be vertical or horizontal. Remind them to give the bar graph a title and label the axes. For example,



Encourage the pupils to write some number stories about their graph.

Extra activities Extension

Ask the pupils to conduct their own survey at home to find out the different types of animals that live in their village, compound or street.

Materials: pencils, paper

The pupils may decide to do this survey individually or with a class mate who lives near them.

Ask them to write the animals names on a chart or piece of paper.

Let them record their total numbers in tally strokes.

For example,

	Animals In	The Village	:	
Dog	Chicken	Cat	Goat	Cow
Ш	 	П	1	Ш

Ask them to make a bar graph on lined or square paper to show this information.

Remind them to give the bar graph a title and label the axes.

Encourage the pupils to write number stories describing their graphs.

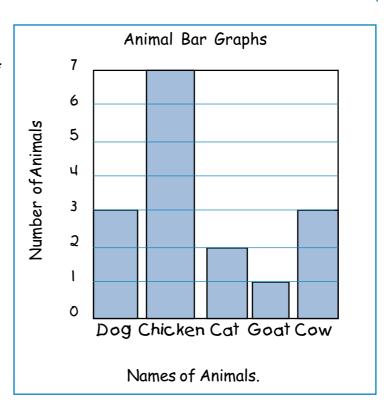
For example,

The are 16 animals in the village. 7 out of 16 are chickens. 3 out of 16 are dogs.

There is only one goat in our village.

Ask the pupils to bring their survey to school.

Display the pupils work in the class room and talk about the information in the charts and the bar graphs with the pupils.



Number Topic 6: Division

Aim:

To develop further skills in division.

Sequence of objectives: To

- 1. revise division by sharing.
- 2. revise division by repeated subtraction.
- 3. teach pupils the relationship between multiplication and division.
- 4. teach pupils the standard notation of division.

e.g.,
$$\frac{7}{5)35}$$

Rationale:

This topic will further develop the pupils understanding of the concept of division they learned in standard 3. The pupils will also learn and appreciate the relationship between multiplication and division and be introduced to the standard notation of division. Knowing the division facts and being able to carry out the simple steps of the division algorithm is important for everyone.



Show the class 24 stones or shells and say that you are going to share them among 4 pupils.

Materials: objects such as, stones or shells,

Ask 4 pupils to come to the front. Give out the stones or shells one at a time until there are none left. Let the rest of the class watch while you do the demonstration.

Share the objects among 4 pupils so that they have 6 each. Ask,

how many stones or shells does each one have? (6 stones / shells)

Emphasise the words 'divide' and 'divided by' to the pupils. Explain that 24 stones/ shells shared by 4 pupils is the same as dividing 24 into 4.

On the blackboard write, 24 divided by 4 is 6.

Then write the division sentence on the blackboard for 24 divided by 4: $24 \div 4 = 6$.

Repeat this with a different number of pupils and objects. For example:

16 stones among 4 pupils

20 shells among 5 pupils

30 shells among 6 pupils, etc.

Encourage the pupils to estimate how many each one would take before you share the objects.

Ask the pupils each time to tell you, how many stones or shells each child has. Write the division sentence for each example.



Ask the pupils to work together with someone who is sitting next to them and complete the activities in their resource books page 52. Materials: counting objects such as stones, shells, counters, pupils resource books

The pupils should divide the objects into groups to find out how many in each group.

Encourage the pupils to use stones/shells, counters to help them find the answers of each activity. Ask them to write the division sentence.



For example:

16 shells shared into 4 groups is 4 shells each.

This is the same as: $16 \div 4 = 4$

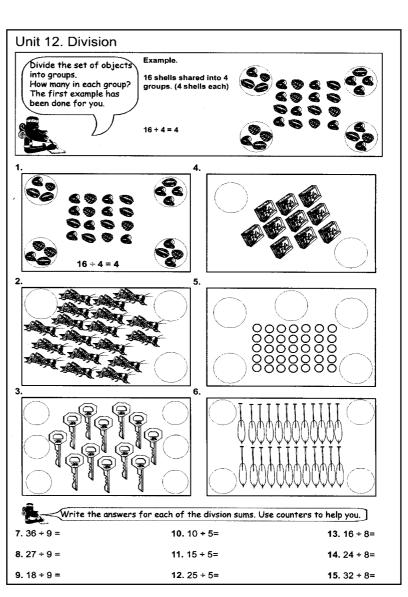
Ask them complete the rest of the activities in their exercise books.

Resource Book answers: page 52.

1-
$$16 \div 4 = 4$$
 4- $10 \div 2 = 5$

2-
$$18 \div 3 = 6$$
 5- $35 \div 5 = 7$

$$3-12 \div 6 = 2$$
 $6-24 \div 4 = 6$



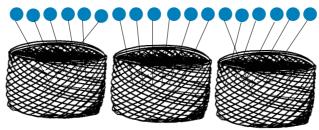


Draw 18 circles on the blackboard. Explain that you are going to share the circles into 3 baskets.

Materials: blackboard.

Show the pupils the concept of sharing by sharing the circles into the baskets. Draw a line from each circle to the basket to show the idea of sharing.

For example:



Ask:

how many circles are in each basket? (6) are there any circles left? (No) are the shares equal? (Yes)

Explain that 18 circles shared by 3 is 6 each.

Repeat this with another number of circles and baskets, such as

21 circles shared by 3 baskets

24 circles shared by 3 baskets, etc.

Encourage the pupils to estimate how many will be in each basket.



Ask the pupils to open their Resource books on page 53 and complete the activities.

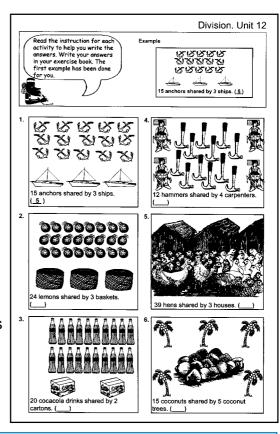
Resource Book answers: page 53.

1-5 4-3

2-8 5-13

3- 10 6- 3

Make more division exercises and give the pupils opportunities to practise the concept of sharing.





Can all the pupils do division by sharing?



Revise division as repeated subtraction.

The pupils should come close to the front so that they can all see the demonstration.

Materials: objects such as, counters, shells stones.

Bring 6 books and show them to the class. Explain that you are going to share the books in two's among three pupils until nothing is left.

Pick two books and give them to the first pupil.

Ask.

How many books are left? (4)

Repeat this with another pupil. Encourage the class to subtract each time as you give out the books and ask them to find out how many are left. Continue until no books are left to share.

For example: **6** books - 2 = 4 books - 2 = 2 books - 2 = 0 books.

Let the pupils show their share of books to the class. Ask.

How many books did each one receive? (2 each)
How many times do we have to subtract the books in 2's? (3)
This means that 6 books were shared in two's 3 times.

Therefore $6 \div 2 = 3$. Write this on the blackboard.



Explain that each time we share the books out, the total number of books reduces. This is called *Repeated Subtraction*.

Repeat this with a different number of objects such as: 8 stones shared in 2's, 10 stones shared in 5's, 12 stones shared in 3's, etc. Involve different pupils in the demonstration.



Give pupils further practice on division using repeated subtraction. Ask the pupils to collect enough objects to share.

Ask them to work in groups of two. Let them share the following amount of objects into 2's, 3's, 4's, 6's, etc.

Materials: 100 objects such as stones, shells or counters for each group

50 stones or shells into 2's, 5's, 10's.

35 stones or shells into 7's, 5's.

90 stones or shells into 30's,10's.

100 stones or shells into 4's, 5's, 10's, 50's

45 stones or shells into 5's, 9's.

80 stones or shells into 40, 4's, 10's, 8's.

20 stones or shells 2's, 4's, 5's, 10's.

Encourage them to write the division sentences for each one as they go along.

Encourage the pupils to continue subtracting when sharing the objects. Ask them to find out, how many 2's, etc. in each amount after completing sharing the objects.



Use a number line to revise division by repeated subtraction.

Materials: Blackboard.

Draw the number line on the blackboard. For example:

Show the pupils how you would get to '**0**' from number '**18**' by jumping in 3's. Ask,

How many jumps of 3 will I need to reach '0'? (6) For example:



Explain that there are 6 jumps of 3 in 18 to reach 0. Therefore 18 into 3's is 6. This is the same as: $18 \div 3 = 6$. or (18 - 3 = 15 - 3 = 12 - 3 = 9 - 3 = 6 - 3 = 3 - 3 = 0) Repeat this with jumps of 6 using the number line.

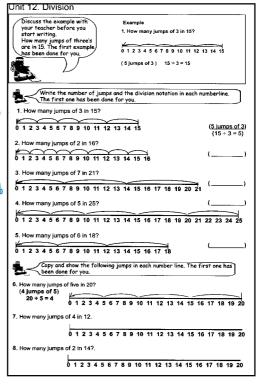
Ask someone in the class to draw the jumps on the number line and let them find out how many jumps of six there are in 18.



Ask the pupils to complete the activities on page 54 in their exercise books. Do the first example with the pupils before letting them do the rest of the activities.

Resource Book answers: page 54.

- 1- 5 jumps of 3 $15 \div 3 = 5$
- 6- 0.12345678910111213141516171819204 jumps of 5 $20 \div 5 = 4$
- 2-8 jumps of 2 $16 \div 2 = 8$
- 3- 3 jumps of 7 $21 \div 7 = 3$
- 8- 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 7 jumps of 2 14 ÷ 2 = 7
- 4- 5 jumps of 5 $25 \div 5 = 5$
- 5- 3 jumps of 6 $18 \div 6 = 3$





Write this division on the blackboard. **24** ÷ **8** =

Ask the pupils to estimate how many 8's there are in 24. Encourage the pupils to try and say the correct answer.

Materials: objects such as, stones or shells,

Show the pupils how we can work out how many 8's in 24 by repeatedly subtracting 8 from 24.

For example:

 $_{\mathbf{24}}$ Explain to the pupils that 8 is subtracted 3 times from 24 until nothing is left.

<u>16</u>

Therefore, there are three 8's in 24. which means that, $24 \div 8 = 3$.

<u>-8</u>

0

Repeat this example with 20 ÷ 10.

Write the division on the blackboard. Ask someone in the class to continue subtracting 10 from 20 until there's nothing more to subtract. Ask the class to tell you how many 10's in 20, etc. Continue this with other examples until the pupils understand the concept.



The pupils open their Resource Book on page 55 and complete the activities.

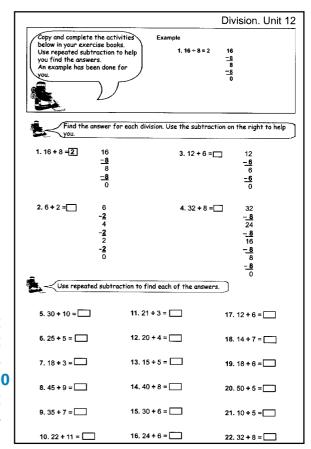
Encourage them to apply the repeated subtraction strategy to help them find the answers.

Let them write the answers to the divisions.

Resource Book answers: page 55.

1- 2	3- 2
2-3	4- 4

_		
5- 3	11- 7	17- 2
6- 5	12- 5	18- <mark>2</mark>
7- 6	13- <mark>3</mark>	19- 3
8- 5	14 - 5	20- 10
9- 5	15- <mark>5</mark>	21- 2
10- 2	16- 4	22- 4



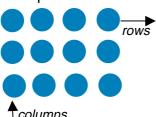




Teach the pupils the relationship between multiplication and division. In this activity, the teacher should help the pupils realise that understanding the division facts depends entirely on how well pupils master their multiplication facts.

Materials: objects such as, stones or shells,

Bring 12 counters or stones and arrange them into 3 rows of 4. For example:



Explain that there are 3 rows of stones and 4 columns. Ask,

How many stones are in each row? (4) How many stones are there in each column? (3) How many stones are there altogether? (12)

Show the pupils that there are 3 rows of 4 stones in 12, this can be written as: $3 \times 4 = 12$. Remind the pupils that 12 is the multiple of both 3 and 4. Relate this to division. Therefore if: $3 \times 4 = 12$ then $12 \div 3 = 4$ and $12 \div 4 = 3$

Try this example with 16 stones. Ask someone in the class to put them into 4 rows of 4. Let them find out how many 4's in 16.

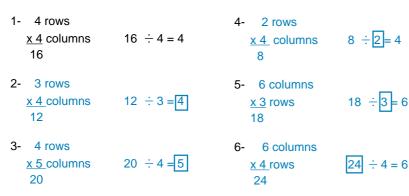
Ask questions to help the pupils find out the number of stones in each group. Write this on the blackboard and encourage the pupils to complete them.

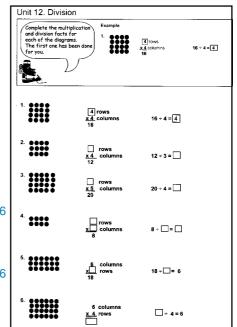
 $4 \times ? = 16$ therefore $16 \div 4 = ?$ Repeat this with more examples.



Ask the pupils to open their Resource Books on page 56 and complete the activities.

Resource Book answers: page 56.







Use multiplication facts from the times table 2, 3, 4 and 5 to teach the relationship between multiplication and division.

Materials: blackboard.

Write this division sum on the blackboard.

Ask the pupils to find out what we multiply by 3 to get 6.

Help the pupils realise that **6** is a multiple of both **2** and **3**, therefore if $2 \times 3 = 6$ then $6 \div 3 = 2$. Write this on the blackboard for the pupils to see. For example:

if
$$2 \times 3 = 6$$
 then $6 \div 3 = 2$ or $6 \div 2 = 3$

Give further practice for the pupils. Write the multiplication and division sums on the blackboard. Encourage the pupils to use 2, 3, 4 and 5 times tables to help them find the missing multiples and factors.

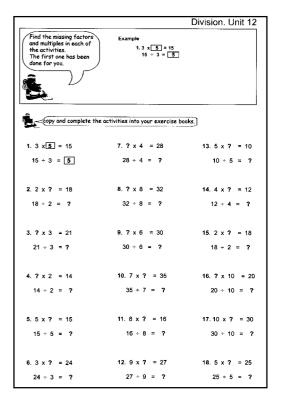
if $\square x 4 = 8$	then	8 ÷ 4 =
if $\square x 5 = 25$	then	25 ÷ 5 =
if	then	24 ÷ 3 =

$1 \times 3 = 3$
$2 \times 3 = 6$
$3 \times 3 = 9$
$4 \times 3 = 12$
$5 \times 3 = 15$
$6 \times 3 = 18$
$7 \times 3 = 21$
$8 \times 3 = 24$
$9 \times 3 = 27$
10 x 3 = 30
11 x 3 = 33
12 x 3 = 36



The pupils open their resource books on page 57 and complete the activities.

Resource Book answers page 57.



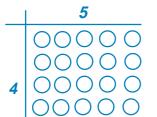




Introduce the standard notation and algorithm of division with the pupils.

Draw the pictorial representation diagram below on the blackboard.

Materials: blackboard.

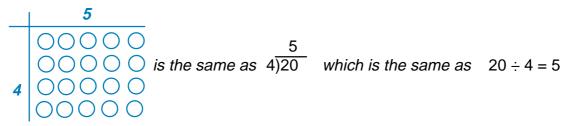


Explain to the pupils that there are 4 rows of 5 circles.

Ask, How many circles are there altogether in 4 rows of 5? (20) This means that 4 fives are 20.

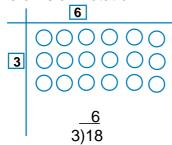
4 fives are 20.

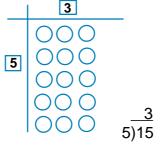
Relate this example to the standard notation of division. For example.

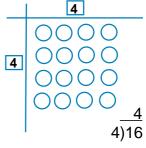


Repeat this with the pupils using the example below.

Ask pupils in the class to write the number missing in the diagram and also to complete the division notation.



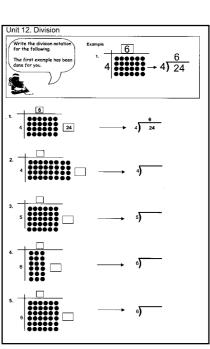






The pupils open their resource book on page 58 and complete the activities.

Resource Book answers: page 58.





Give the pupils further practice on standard notation of division. Write this division on the blackboard $18 \div 2$

Materials: blackboard

Ask someone in the class to find the factor multiplied by 2 to get 18.

Write the factor. The factor is nine. Explain that 2 multiplied by 9 gives 18.

Therefore:
$$18 \div 2 = 9$$

Relate this to the standard notation of division.

Such as:
$$18 \div 2 = 9$$

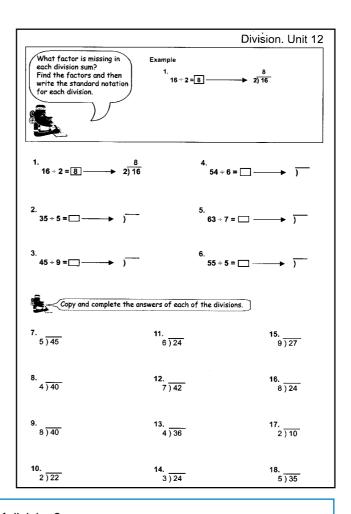
Repeat this example with the following division.

Work with the pupils to find the factors and then show the standard division notation for each one.



The pupils open their resources books on page 59 and complete the activities in their exercise books.

Resource Book answers: page 59.





Extra activities Support

Give further practice and revision of the multiplication and division facts with the pupils.

Ask the pupils to look at the Multiplication and Division Square Puzzle on page 84 in the Pupil's Resource Book.

Materials: pencils, paper or exercise books, rulers

42 ÷	6 56 ÷ 7	2 x 9	2 x 12	88 ÷ 11	3 x 9	22 ÷ 2
4 x 7	11 x 7	18 ÷ 3	3 x 8	60 ÷ 10	27 ÷ 9	2 x 7
14 ÷	2 3 x 4	54 ÷ 9	4 x 9	12 ÷ 2	30 ÷ 5	27 ÷ 9
3 x 1	2 24 ÷ 4	36 ÷ 6	42 ÷ 7	48 ÷ 8	6 x 8	54 ÷ 9
7 x 8	5 x 7	100 ÷ 10	55 ÷ 11	30 ÷ 2	50 ÷ 2	3 x 9
8 x 7	20 ÷ 2	10 x 4	80 ÷ 4	4 x 10	10 ÷ 2	7 x 7
28 ÷	4 80 ÷ 8	2 x 20	20 ÷ 2	65 ÷ 5	5 x 3	7 x 4
3 x 7	100 ÷ 20	33 ÷ 3	60 ÷ 12	7 x 9	5 x 9	18 ÷ 2
48 ÷ 1	2 11 x 5	16 ÷ 2	15 x 4	3 x 11	35 ÷ 7	77 ÷ 11
32 ÷	8 3 x 15	54÷ 6	45 ÷ 9	40 ÷ 8	8 x 5	28 ÷ 4
45 ÷	4 25 ÷ 5	2 x 11	15 ÷ 3	50 ÷ 10	3 x 5	8 x 4
49 ÷	7 3 x 9	15 ÷ 5	28 ÷ 7	21 ÷ 3	2 x 8	56 x 8
-						

Ask the pupils to copy the square into their exercise books.

Let them follow the instructions below and colour the multiplication and division facts in the square.

Colour all the multiples of 5 red.

Colour all the multiples of 6 green.

Leave other squares blank.

Ask the pupils to describe the picture in the square grid. (A red house with a green roof) Encourage the pupils to work out the answers to the multiplication and division by revising their multiplication and division facts.

The pupils could use the multiplication square in the Pupils Resource Book or tables to help them do the activity.

1	2	3	4	5	6	7	8	9	10	11	12
2	4	6	8	10	12	14	16	18	20	22	24
3	6	9	12	15	18	21	24	27	30	33	36
4	8	12	16	20	24	28	32	36	40	44	48
5	10	15	20	25	30	35	40	45	50	55	60
6	12	18	24	30	36	42	48	54	60	66	72
7	14	21	28	35	42	49	56	63	70	77	84
8	16	24	32	40	48	56	64	72	80	88	96
9	18	27	36	45	54	63	72	81	90	99	108
10	20	30	40	50	60	70	80	90	100	110	120
11	22	33	44	55	66	77	88	99	110	121	132
12	24	36	48	60	72	84	96	108	120	132	144

$1 \times 3 = 3$		$1 \times 4 = 4$
$2 \times 3 = 6$		$2 \times 4 = 8$
$3 \times 3 = 9$		$3 \times 4 = 12$
$4 \times 3 = 12$		$4 \times 4 = 16$
$5 \times 3 = 15$		$5 \times 4 = 20$
$6 \times 3 = 18$	\	$6 \times 4 = 24$
$7 \times 3 = 21$	\	$7 \times 4 = 28$
$8 \times 3 = 24$	1	$8 \times 4 = 32$
$9 \times 3 = 27$	1 1	$9 \times 4 = 36$
$10 \times 3 = 30$		$0 \times 4 = 40$
$11 \times 3 = 33$		$1 \times 4 = 44$ $2 \times 4 = 48$
$12 \times 3 = 36$		2 x 4 = 48

Extra activities Extension

Let the pupils play the Division Puzzle Game.

Ask the pupils to look at the Division Puzzle Game on page 85 of the Pupils Resource Book.

Materials: pencils, paper or exercise books, rulers

In pairs let them play the Division Puzzle game. The pupils have to trace the worm's route from the surface down to the bottom using white squares.

The rule is that, the worm only travels through white squares with numbers that are divisible by 5 or 6. For example, the first route with numbers divisible by 5 or 6 would be: **5, 35, 30, 54,.....etc.**

Ask the pupils to use their multiplication tables 5 or 6 or the multiplication square to help them.

Cr 3		Med								
		5					36			
	15		35			54			24	
		42		30						25
11	60		20		13			45		
\mathbb{N}		17		18			63			
W	18		16			54				16
					49			60		
		10					66		48	
				50						

Encourage the pupils to find out how many different routes the worm can travel? Let them shade or colour the routes using different colours.

Encourage the pupils to use their Multiplication Squares to help them with the activity.

1	2	3	4	5	6	7	8	9	10	11	12
2	4	6	8	10	12	14	16	18	20	22	24
3	6	9	12	15	18	21	24	27	30	33	36
4	8	12	16	20	24	28	32	36	40	44	48
5	10	15	20	25	30	35	40	45	50	55	60
6	12	18	24	30	36	42	48	54	60	66	72
7	14	21	28	35	42	49	56	63	70	77	84
8	16	24	32	40	48	56	64	72	80	88	96
9	18	27	36	45	54	63	72	81	90	99	108
10	20	30	40	50	60	70	80	90	100	110	120
11	22	33	44	55	66	77	88	99	110	121	132
12	24	36	48	60	72	84	96	108	120	132	144

1	2	3	4	5	6	7	8	9	10	11	12
2	4	6	8	10	12	14	16	18	20	22	24
3	6	9	12	15	18	21	24	27	30	33	36
4	8	12	16	20	24	28	32	36	40	44	48
5	10	15	20	25	30	35	40	45	50	55	60
6	12	18	24	30	36	42	48	54	60	66	72
7	14	21	28	35	42	49	56	63	70	77	84
8	16	24	32	40	48	56	64	72	80	88	96
9	18	27	36	45	54	63	72	81	90	99	108
10	20	30	40	50	60	70	80	90	100	110	120
11	22	33	44	55	66	77	88	99	110	121	132
12	24	36	48	60	72	84	96	108	120	132	144



Measurement Topic 15:

Area

Aim: To develop pupils understanding of how to calculate the area of single and composite shapes.

Sequence of objectives: To

- 1. calculate the area of squares and rectangles by measuring and using the formula, Area = Length x Width.
- 2. use the formula, $A = L \times W$ to calculate the area of composite shapes made up of rectangles and squares.

Rationale:

In Standard Three, children used square grids to calculate the area of simple shapes such as squares and rectangles more accurately. In this unit, the pupils will extend their knowledge of measuring and finding the area of squares and rectangles using the formula **A** = **L x W**. Understanding area is very important for people in different walks of life such as carpenters, business people, land owners, etc.

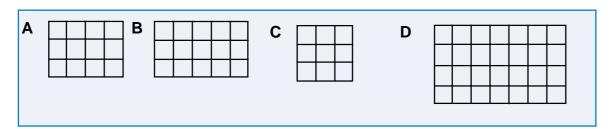


Revise finding areas with the pupils.

Provide pupils with a range of square and rectangle shapes drawn on square grid paper.

Where this is not possible, the teacher can draw simple square and rectangle shapes with grids on the blackboard, for example:

Materials: square centimetre grid papers, pencils, rulers



Talk about the number of square centimetres in each shape.

The pupils should be made aware that the squares in each shape are one centimetre square.

Help the pupils find out how many square centimetres cover the area of the shapes. Start with shape 'A'.

Ask,

How many square centimetres are in shape A?

Encourage the pupils to count the squares and to tell you how many square centimetres there are altogether. (12 square centimetres.)

Explain that 12 square centimetres is the area of shape A. This can be written as: 12 cm²

Repeat this with other shapes.



The pupils open their resource books on page 60 and complete the activities in their exercise books

Materials: children's resource book

Talk about the example with the pupils first before letting them do the activities.

Unit 13. Area **Resource Book** The squares in each shape are one centimetre square. Example answers: page 60 Find out the number of square centimetres covering 1-6 cm² each shape. $6 cm^2$ 2-9 cm² 3-4 cm² Find out the number of square centimetres covering each shape and write 4-12 cm² them in your exercise books. The first one has been done for you. 3 5-8 cm² 2 6-15-cm² 6 cm² 7-10 cm² 8-10 cm² 6 9- 10 cm²

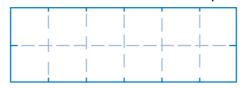


Practise working out the area of shapes without using square grids.

Draw shapes like this one on the blackboard. Put marks on their sides, for example:

Materials: square and rectangle shapes drawn on blackboard

Ask the pupils to be aware that the marks on the sides are one centimetre long. Show the pupils how to find square centimetres covering the area of the shape. Draw dotted lines between the marks. For example:



Ask,

How many rows of square centimetre are there? (2)

How many columns of square centimetres? (6)

How many square centimetres altogether? (12 square centimetres)

Encourage the pupils to count the square grids.

Explain to the pupils that another way of finding the square centimetres inside a square or rectangle shape is to

count the number of square centimetres in a row and count the number of square centimetres in a column then multiply the number of rows by the number of columns.

i.e. 6 rows x 2 columns = 12 square centimetres or 12 cm²

Repeat this example with other shapes having different lengths and widths such as, 3 cm x 4 cm, 4 cm x 5 cm, 7 cm x 5 cm, etc. Encourage the pupils to find out their areas.



Let the pupils practise counting squares in simple shapes such as squares or rectangles, to obtain areas.

Copy these measurements on the blackboard.

2 cm x 8 cm,	4 cm x 4 cm,
9 cm x 3 cm,	6 cm x 7 cm,
5 cm x 5 cm,	3 cm x 10 cm,

Materials: exercise books with square grids, pencils, rulers

Ask the pupils to use their rulers and draw shapes with the above measurements.

Encourage them to use exercise books with square grids.

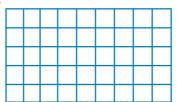
Let them find out the number of square centimetres which make up the area of each shape. Encourage them to count the squares or multiply the number of square centimetres in the rows and columns to find the areas.

Help the pupils with their work. Check to see that they are using both methods of working.



Draw this rectangle shape on the blackboard.

Explain that the rectangle has 9 square centimetres in each row and 5 square centimetres in each column.



Materials: simple square and rectangle shapes drawn on the blackboard

Help the pupils to find the total number of square centimetres in the rectangle. Encourage them to suggest ways to find the number of squares without counting them.

Ask the pupils to estimate the number of square centimetres inside the rectangle. Work out the answers for the pupils to see. For example,

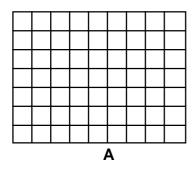
9 rows x 5 columns = 45 square centimetres.

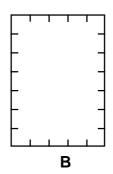
Show the pupils that this can be written as: $9 \text{ cm } \times 5 \text{ cm} = 45 \text{ cm}^2$ Explain that the part covered by the square centimetres in the shape is called the **Area**.

Repeat this example with more shapes with different lengths and widths.



Draw enough simple shapes like the ones below on the blackboard,





Materials: simple square and rectangle shapes drawn on the blackboard

Ask the pupils to find out the area of the shapes without counting the square centimetres. Let them find out

the number of square centimetres in each row first,

and the number of square centimetres in each column,

then multiply the number of rows by the number of columns to find the total number of square centimetres covering the area of the shape.

For example the total number of square centimetres covering the two shapes are:

Shape A- 63 cm²

Shape B- 35 cm²

Encourage the pupils to count the rows and the columns in each shape and multiply. Check to see that the children get the correct answers.



Teach the pupils how to calculate the area of a square and a rectangle using the formula, $A = L \times W$.

Materials: black board and chalk

Draw simple rectangles and squares like the one below on the

blackboard, for example:



Explain to the pupils that each square of the grid is one centimetre square.

The length of the rectangle is ten centimetres (10 cm) and its width is three centimetres (3 cm).

Explain that we can calculate the area of the **rectangle** shape by using length and width. Show the pupils how to do this:

(Area = length x width).
i.e. Area =
$$10 \text{ cm x } 3 \text{ cm} = 30 \text{ cm}^2$$

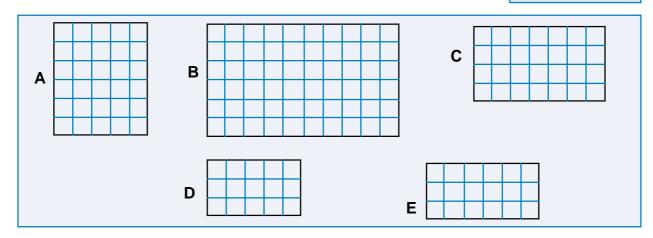
Repeat this example with many more shapes to show the pupils how to find the area using the formula: $A = L \times W$.



Draw these rectangles and squares on the blackboard.

Ask the pupils to copy the shapes into their exercise books. Let them find the area of each shape.

Materials: blackboard, chalk, exercise books, pens, rulers



Ecourage the pupils to use the formula for finding area: $A = L \times W$. Help the pupils with their work

Answers for Areas of shapes:

A- 30 cm² B- 60 cm² C- 28 cm² D- 15 cm² E- 18 cm²



Draw this square on the blackboard. Write its length and width.

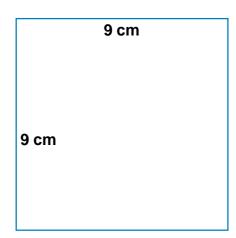
Explain that the square is 9 cm long and 9cm wide.

Show the pupils how to find the area of the shape using the formula, Area = Length x Width.

Explain that we calculate the length and the width of the shape to find the area.

Calculate the area of the shape on the blackboard using, $A = L \times W$. For example, **Area = Length x Width.** Area = $9 \text{ cm x } 9 \text{ cm} = 81 \text{ cm}^2$.

Repeat this example with some more shapes. Encourage the pupils to come to the front and calculate the area of the shapes on the blackboard, using the formula.





Ask the pupils to open their Resource Books on page 61 and complete the activity.

Let them find the area of each shape.

Encourage them to use the formula, Area = Length x Width. $(A = L \times W)$.

For question 7, 8 and 9 the pupils find the surface area of the items by calculating the given length and width.

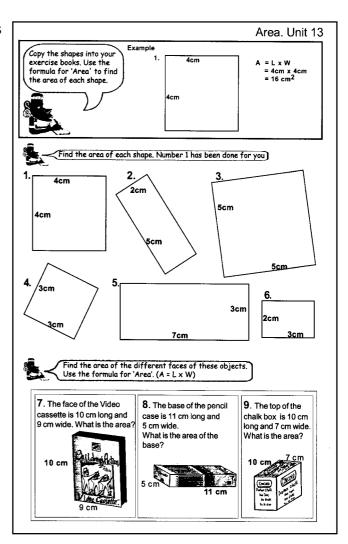
Resource Book answers: page 61.

- 1. 16 cm²
- 4.9 cm²

2. 10 cm²

- 5. 21 cm²
- 3. 25 cm²
- 6.6 cm²

- 7. 90 cm² 8. 55 cm²
- 9. 70 cm²

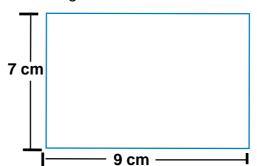




Prepare different sized squares and rectangles cut out from cardboard.

Ask the pupils to come to the front so that they can see the demonstration.

Use the ruler and demonstrate how to measure the length and width of a shape.



Materials: cut-out squares and rectangles from cardboard paper, ruler

Write the length and width of the shape on the blackboard.

Ask the pupils to estimate the area of the shape.

Calculate the area of the shape using the formula, $A = L \times W$. i.e. 9 cm x 7 cm = 63 cm²

Repeat this with other shapes.



Ask a child in the class to measure the length and width of a Nguzu Nguzu reading book.

Write the measurements on the blackboard.

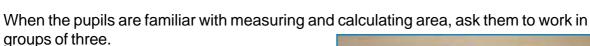
Encourage the pupils to estimate the area of the reading book.

Measure and record the length and width of the book. Multiply to find the area.

Repeat this example and encourage the pupils to take turns in measuring.

Materials:

cut-out squares and rectangles, exercise books, reading books, ruler



Give them cut-out shapes, exercise books and reading books.

Let them measure and find out the area of each item.

Check to see that the pupils are using the formula, $A = L \times W$ to find the area.



Materials:

objects to measure such as: reading

books, text books and exercise books,

pencils, rulers



Practise measuring and calculating the area of reading books and exercise books with the pupils.

Ask a child to come to the front.

Give the child a ruler and a book to measure.

Let the child measure the length and width of the book.

Write the measurements on the blackboard for other pupils to see.

Encourage the pupils to work out the area of the book using the formula, $\mathbf{A} = \mathbf{L} \mathbf{x} \mathbf{W}$. Work out the answer on the blackboard and check the pupil's answer.

Repeat this example. Encourage other pupils to take part in measuring objects.



The pupils open their Resource Books on page 62 and complete activities Materials: 1 to 6 in their exercise books.

Ask the pupils to find the area of the shapes using the formula, A = L x W. They must measure the length and width of the shapes first before calculating the area.

Materials: rulers, pencils, classroom objects such as, chalk boxes, books and empty cartons

For the next activity the pupils measure the length and width of each of the faces of some objects that they can find in their classroom and calculate their areas.

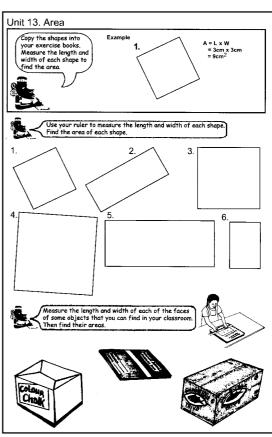
For example: objects such as, chalk box and empty cartons of biscuits and twisties.

Resource Book answers: page 62.

1-9 cm² 2-10 cm² 3-16 cm²

4- 25 cm² 5- 21 cm² 6- 6 cm²

Answers for the next activities should be done by the teacher and the pupils together.



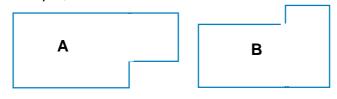


Can all the children calculate the area of square and rectangle shapes using the formula A = L x W?



Prepare cut-out composite shapes from paper made up of squares and rectangles for the demonstration, for example,

Materials: cut-out composite shapes, ruler, pen



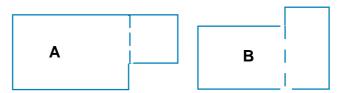
Where this is not possible, the teacher can draw composite shapes on the blackboard for demonstration.

Show the pupils the composite shapes.

Help them recognise shapes that make up the composite shape.

Encourage the pupils to suggest squares and rectangles that make up the composite shape.

Draw a line in the correct place, inside the composite shape. This will help them identify the two rectangles, for example,



Ask the pupils to name the shapes. For example, shape **A** is made up of a rectangle and a square. Shape **B** is made up of two rectangles, etc. Write the name of the shapes on the blackboard. Repeat this activity with one or two more composite shapes.

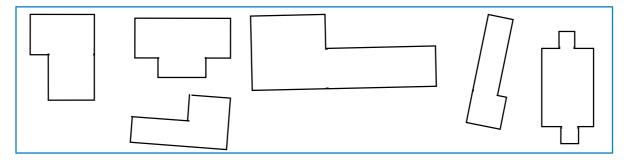


Ask the pupils to work in groups of two.

Encourage them to work with someone who sits next to them.

Materials: cut-out composite shapes, ruler, pen

Prepare enough cut-out composite shapes from cardboard or paper. Give the composite shapes to the pupils.



Help the pupils identify two shapes that make up the composite shape. Let them use their rulers to draw a line in the correct place inside each composite shape.

Ask the pupils to name the two shapes.

Repeat this with other shapes and encourage the pupils to compare their work with other groups.



Teach the pupils how to find the area of a composite shape using the formula, $\mathbf{A} = \mathbf{L} \times \mathbf{W}$.

Materials: paper, ruler, pen

The pupils should come close to the front to see the demonstration.

Draw this composite shape on paper or on the blackboard. Ask the pupils to imagine that it is a house plan.

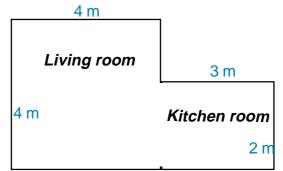
Explain that we will find the areas of the plan using the formula, A = Lx W.

Encourage the pupil to suggest ways to find out the length and width of the plan.

Show the pupils what to do.

Draw a line to identify the two rooms first.

Measure the length and width of each room.



Explain to the pupils that 1 cm on the plan represents 1 metre actual measurement. Remind the pupils that 1 metre can be written as 1 m.

So the living room is 4m long and 4m wide.

The area of the living room is: $L \times W = 4 \text{ m} \times 4 \text{ m} = 16 \text{ m}^2$.

The area of the kitchen is: $L \times W = 3 \text{ m} \times 2 \text{ m} = 6 \text{ m}^2$.

The total area of the house plan is: $16 \text{ m}^2 + 6 \text{ m}^2 = 22 \text{ m}^2$. Repeat this with other examples.



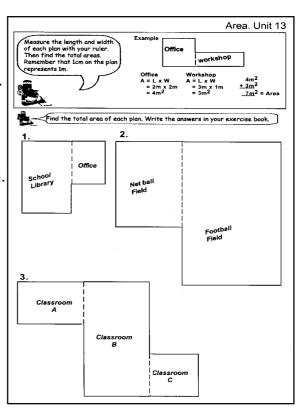
The pupils open their Resource Books on page 63. Explain that the diagrams are building and playground plans.

Talk about the different plans with the pupils. Ask the pupils to find out the total area of each plan. Use a ruler to measure.

Remind them that 1 cm represents 1 m. Encourage them to use the formula for area, A = L x W.

Resource Book answers: page 63.

```
1. 15 m<sup>2</sup> + 6 m<sup>2</sup> = 21 m<sup>2</sup>
2. 24 m<sup>2</sup> + 60 m<sup>2</sup> = 84 m<sup>2</sup>
3. 12 m<sup>2</sup> + 32 m<sup>2</sup> + 9 m<sup>2</sup> = 53 m<sup>2</sup>
```





Practise measuring and finding the total area of composite shapes.

Prepare composite shapes with different measurements in centimetres. These can be made from cut-out paper or drawn on a chart.

Materials: composite shapes from papers or drawn on a chart, ruler, pen

Dining Hall

Ask the pupils to come close to the front so that they can all see the demonstration.

Explain that you want to find out the total area of each composite shape. Ask the pupils to suggest what should be done first before finding the total area of the plan.

Unit 13. Area

Talk about the plan with your teacher.

your teacher. Write the answers in your exercise book. Number 1 has been done

Demonstrate how to find out the total area of each composite shape. Use the formula and apply the methods used previously such as drawing lines to make single shapes either a square or rectangle.



The pupils open their Resource Books on page 64 and complete the activities.

First talk about the school plan with the pupils. It is a site plan of the school buildings, playing grounds and demonstration farm areas.

Show the pupils what to measure. Ask them to find out the total area of each part.

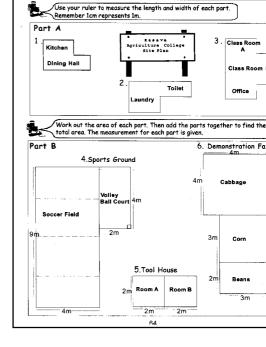
In part A, the pupils use their ruler to measure the length and width of each plan before working out the total area.

Remind pupils that 1 cm represents 1 m. Ask them to draw lines where necessary.

In part B, let them work out the total area of each plan. The measurements have been given.

Encourage the pupils to use the formula, $A = L \times W$.

> **Resource Book answers:** page 64.





- 1. $2 \text{ m}^2 + 3 \text{ m}^2 = 5 \text{ m}^2$
- 2. $4 \text{ m}^2 + 2 \text{ m}^2 = 6 \text{ m}^2$
- 3. $6 \text{ m}^2 + 2 \text{ m}^2 + 2 \text{ m}^2 = 10 \text{ m}^2$ 6. $16 \text{ m}^2 + 9 \text{ m}^2 + 6 \text{ m}^2 = 31 \text{ m}^2$
- 4. $36 \text{ m}^2 + 8 \text{ m}^2 = 44 \text{ m}^2$
- 5. $4 \text{ m}^2 + 4 \text{ m}^2 = 8 \text{ m}^2$

Can all the children use the formula, A = L x W to calculate the area of a composite shape?

Extra activities Support

In groups of 4 the pupils play the matching game.

Prepare 10 pairs of flash cards with shape areas and measurements for each group (20 cards in all). For example:

4 cm x 3 cm

54 cm²

9 cm x 6 cm

5 cm x 2 cm

10 cm x 6 cm

12 cm²

10 cm²

Materials: sets of flash cards with area and measurements of lengths and widths

The cards are shuffled and spread face down on the table.

The pupils take turns to turn over 2 cards. They must match a Length x Width card and an Area card.

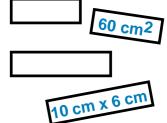
If the two cards match, the child keeps them. If the cards do not match, the child turns them over but leaves them in the same place. If the child wins a pair he / she has another turn.

If the child's cards do not match, it is the next players turn.

The game continues until all the cards are used.

The child with the most cards is the winner.

Encourage the pupils to swap cards with other groups and play the game again.



Extra activities Extension

In groups of 3 or 4, the pupils find the area of their classroom or other school buildings.

Ask the pupils to use their 1 metre sticks to measure the length and width of the classroom.

Materials: metre sticks marked in centimetres

Explain that when the 1 metre stick measures half or more than a half, the pupils should round it up to the next nearest metre length. If the measurement is less than half a metre they should round down to the nearest metre below. Let the pupils record the measurements in their exercise books.

Encourage them to use the formula, $A = L \times W$ to find the area of the classroom buildings. Let them write their answers in m^2 .

Ask the pupils to look at the areas they have measured and to write number stories for example,

Mr Afu's Classroom floor is the biggest in our school. It is 40 m^2 . The smallest room in our school is the store room. It is only 9 m^2 . etc

Number Topic 7: Fractions

Aim:

To develop understanding of mixed numbers and decimal fractions and fractions of a quantity.

Sequence of objectives: To

- 1. revise fractions of an object and of a quantity. $eg \frac{1}{2} \frac{1}{10} \frac{2}{3} etc.$
- 2. find the fraction of a quantity by dividing. $eg^{1/3}$ of $45 = 45 \div 3 = 15$
- 3. introduce mixed number fractions. eg. understanding that $\frac{4}{3} = \frac{11}{3}$
- 4. introduce a decimal fraction and its notation. e.g 3 dollars and 85 cents = \$3.85, 1.53m = 1m 53cm, 1.5l = 1l 500ml, etc.

Rationale:

Understanding fractions is an essential skill for pupils. There are many instances in every day life where fractions are needed such as measuring, sharing, counting money, and discussion and writing.

In this unit the pupils extend their understanding of fractions to mixed number fractions, decimal fractions and notation. They are also introduced to finding a fraction of a quantity. Practical activities such as cutting objects, shading diagrams and use of concrete materials will enable the pupils understand the concepts.



Revise the concept of common fraction notation with the pupils. such as: 1/2 means one part of two equal parts,

1/3 means one part of three equal parts, etc.

Materials: papers, pencils, blackboard

Draw a rectangle and divide it into two equal parts. Shade one half of the rectangle.



Ask,

How many parts are there? (2)

Are they equal? (Yes)

What is the name of each part? 1/2 (half)

What part of the rectangle is shaded? (1 part of 2 equal parts)

Write the fraction notation on the shaded part.

Ask the pupils if they know what $\frac{1}{2}$ means: i.e. $\frac{1}{2}$ means one part of two equal parts.

Repeat this with other common fractions such as, $\frac{1}{3}$, $\frac{1}{5}$, $\frac{1}{4}$, $\frac{1}{10}$, etc.

Give pupils cut-out shapes from paper or card.

Let them fold the paper into different equal parts, such as, halves, thirds, fifths, sixths, Show them that they are the same size.

Ask them to shade one part of each fraction and write the fraction notation. For example:



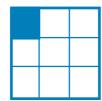
Repeat this with other fractions. Encourage the pupils to name the parts and write the fraction notation.

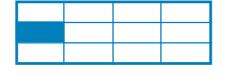


Draw these shapes on the blackboard. Have one part of each shape shaded.

Materials: blackboard, pupils' resource book







Ask someone in the class to say what fraction of the shape has been shaded. For example:

one part of eight equal parts

Write the fraction notation of the shaded part on the blackboard.



Repeat this with other shapes. Encourage other pupils in the class to participate.

Ask the pupils to complete the activities on page 65 of their resource book.

Talk about the activities with the pupils before they begin writing.

Resource Book answers: page 65.

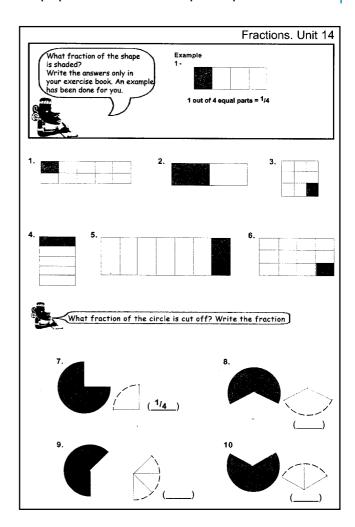
1- 1/10 2- 1/2

4- 1/5

7- 1/4

9-3/8

10- ²/₆





Draw different shapes on the blackboard and divide them into equal parts such as, thirds, fourths, fifths, sixths.







Materials: blackboard

Shade different parts of each shape and ask the pupils to identify the shaded parts.

Ask.

How many equal parts? (3) What is each part called? (third) What fraction of the circle is shaded?

(1 out of 3 equal parts)

What fraction of the circle is unshaded? (2/3)

Write the fraction notation for the shaded part. 1/3

Shade two thirds and continue the questions with the pupils.

Ask.

What part of the circle is shaded?

(2 out of 3 equal parts)

What part of the circle is unshaded? etc. Write the fraction notation for the shaded part. 2/3

Repeat this with other shapes. Help the pupils compare and recognise fraction parts and practise how to say and write the correct fraction.



Help the pupils identify fractions and their quantities. Give each child a rectangular piece of paper.

Let them fold the paper into halves and shade one half. Ask,

How many equal parts are there? (2)

How many halves in a whole? (2)

What fraction of the whole rectangle is shaded? (one half)

Now let them fold the rectangle into quarters (fourths). Ask.

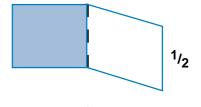
How many equal parts are there? (4)

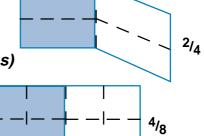
How many quarters (fourths) in a whole? (4)

What fraction of the whole rectangle is shaded? (two fourths)

Continue folding the paper into eight equal parts, asking questions about its shaded fraction.

Materials: rectangular shapes made from paper





Write the fraction notation for the shaded parts on the blackboard.

Encourage the pupils to compare fraction parts and explore their relationship:

ie. How many quarters in a half?, how many eighths in a quarter?, etc.

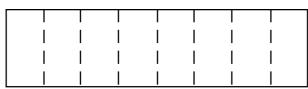
Repeat the activity with other fractions. Help pupils identify fraction parts and the correct way to say and write them.



Develop further understanding of common fractions: 2/3, 2/4, 3/6, etc, with the pupils.

Materials: blackboard

Draw a large rectangle on the blackboard. Divide the rectangle into eight equal parts.

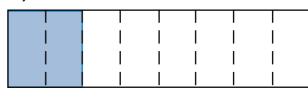


Ask, What do we call eight equal parts? (eighths)

Ask someone in the class to shade the rectangle to show 2 eighths.

Explain that since we have two parts shaded, this is called 2 eighths.

Write ²/₈ on the blackboard.



Repeat this example with, 3 eighths, 4 eighths and 5 eighths



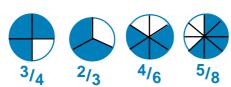
Ask the pupils to open their resource book on page 66 and complete the activities.

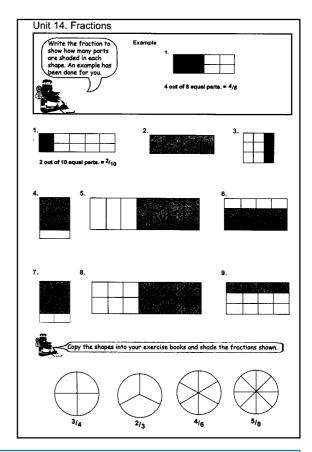
Talk about the example in the activity with the pupils first.

Let them complete the activities in their exercise book.

Resource Book answers: page 66.

1-
$$\frac{2}{10}$$
 2- $\frac{2}{2}$ = 1 Whole 3- $\frac{3}{9}$







Can all the pupils identify and recognise fractions of an object?



Teach the pupils how to find a fraction of a quantity (whole) by dividing.

Bring 12 objects into the classroom and show them to the pupils. Select two pupils to come to the front and share the objects equally between them.

Materials: objects such as shells, stones, counters

Ask the class questions. Such as,

How many objects are there altogether? (12) How many objects did each one get? (6)

Are the shares equal? (yes)

What fraction of the objects did each one get? (half)

6 is ¹/₂ of 12

What did we do to make the shares equal (share them equally between two)

Show the pupils that finding half of something is the same as dividing by 2.

For example. $\frac{6}{1/2} \times 12 = 2) \frac{6}{12}$

Repeat this example with some more pupils in the class, using 10 and 14 objects. Extend the activity to other fraction parts such as, thirds, fourths and fifths. Work with the pupils to find a third (1/3) of:

15 bananas, (5) 24 guavas (8) and 12 leaves (4) by dividing by 3



Let the pupils practise finding fractions of objects using the division and sharing strategy.

Ask the pupils to work in smaller groups. Give each group a set of 30 objects. Let them find the following fractions of the objects:

Materials: objects such as shells, stones, counters

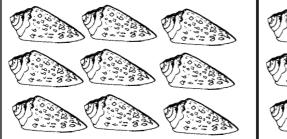
(1/2) half of 18, (1/3) one third of 18, (1/6) one sixth of 18

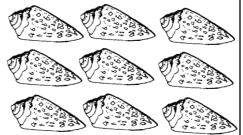
Encourage the pupils to use sharing and division to help them find the fractions.

For example: half of 18

Sharing objects

Division 9 2)18





Let the pupils continue with thirds, and sixths.

Encourage the early finishers to try and find half and one quarter of: **16 and 20 objects.** Remind the pupils that to find half of a quantity, we divide by 2, to find a third of a quantity, we divide by 3, etc.



Give the pupils further practice on finding fractions of a quantity using the division strategy.

Materials: blackboard, objects such as, banana or fruits

Noel.

Berry

Begin the activity with simple stories. Such as,

Joel bought six bananas from the market. He shared them between Berry and Noel.

Demonstrate the story using objects. For example:

Ask the pupils questions about the story. For example,

How many bananas did Joel buy from the market? (6)

How many pupils shared the bananas? (2)

How many bananas did each one get? (3)

Are the shares equal? (yes)

How did Joel make the shares equal? (divide by 2)

What fraction of the bananas did each one get? (half)

Remind the pupils how we find a half of 6 bananas. That is by dividing by 2.

For example.

(1/2) half of 6 = 2) (half of 6 is 3)

Repeat this example with other simple stories and extend the activity to thirds. Work with the pupils to find a third (1/3) of 6 bananas by dividing by 3.



Ask the pupils to open their resource books and complete the activity on page 67.

Help the pupils with the examples first before asking them to do the activities.

For question 7 and 8, the pupils read the sentences and try to work out the answers to the questions.

Resource Book answers: page 67.

1-6 2-8

3- 12

4-6

5-4

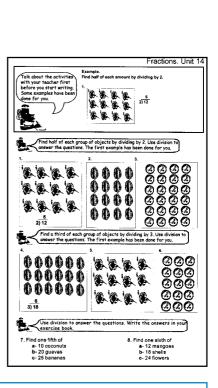
6- 5

7. a- 2 b- 4 8. a- 2

c- 5

b- 3 c- 4

Can all the pupils find a fraction of a quantity using sharing and division strategy?





Use two sheets of squared paper and fold them into quarters. Materials: Unfold the papers and show the pupils the parts. A4 papers, scissors, Ask, blackboard How many equal parts are there in one whole square? (4) What is each part called? (quarter) etc. Explain that 4 equal parts make one whole and this can be written as: $\frac{4}{4}$ or 1 whole. Repeat this with other fractions such as, thirds, fifths, sixths, etc. Cut out the guarters from the two squared papers. Show the pupils the parts. Name them and write the fraction symbols on the blackboard. For example: one quarter $(^{1}/_{4})$ two quarters (2/4)three quarters ($^{3}/_{4}$), etc Put 5 quarters together to make 1 whole and 1/4. For example, Ask, how many quarters altogether are there? (5 quarters) how many quarters make 1 whole square? (4 quarters) 11/4. Show the pupils that there is 1 whole and 1 quarter in 5 quarters. Explain that another way of writing this is: 11/4. This is a **mixed number**. Continue this example with 6/4 and 7/4. Emphasise the mixed number fractions such as, 6/4 = 1.2/4 and 7/4 = 1.3/4. The pupils work in small groups to practise making common and Materials: mixed number fractions, using folded sheets of paper. A4 papers, blackboard Give each group enough A4 papers. Ask them to fold two A4 papers into thirds and let them cut out the parts. Ask each group to use the parts and make these fractions: $\frac{4}{3}$ and $\frac{5}{3}$. Ask the pupils questions about the parts. Such as, how many thirds altogether are there?(4 thirds) ⁴/₃ | how many thirds in one whole? (3 thirds) how many wholes and thirds? (1 and $\frac{1}{3}$) Encourage the pupils to say the common fraction and mixed number fraction. Write these fractions on the blackboard for the pupils to see. For example, $\frac{4}{3} = \frac{11}{3}$ Repeat this example 5_{13} with these fractions.



Bring some fruits from the local environment. Cut them into six equal parts.

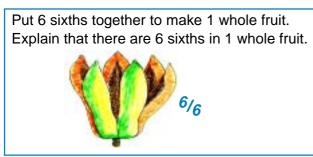
Show pupils the parts and name them. Such as,

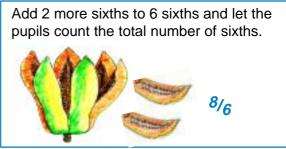






Materials: Fruits from the local environment, sharp knife for cutting





Ask the pupils questions as you add the sixths. For example: How many wholes or sixths are there in 6 sixths? (1 whole or 6 sixths) How many wholes and sixths are there in 8 sixths? (1 whole and 2 sixths) etc.

Show the pupils another way of writing these fractions as mixed numbers: For example, $\frac{8}{6} = 1^{2}/_{6}$. $\frac{6}{6} = 1$ whole.

Repeat this strategy with other fractions such as, $\frac{9}{6}$, $\frac{10}{6}$, $\frac{11}{6}$ and $\frac{6}{4}$, $\frac{5}{4}$.



Let the pupils work in groups of three or four.

Give each group objects cut into different parts, such as, quarters, fifths, and sixths.

Ask them to make these fractions from the parts: 6/4, 6/5, 8/6 and 8/5.

Materials: objects from the local environment such as fruits, materials for cutting

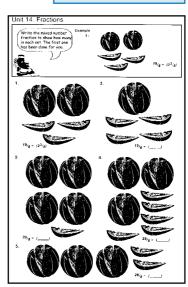
Encourage them to tell you another way of naming the fractions they make. For example,

$$6/_4 = 1^{2}/_4$$
, $6/_5 = 1^{1}/_5$, etc. Check the groups' work.

After the pupils have done their group activities, ask them to open their resource books on page 68 and complete the activities in their exercise books.

Resource Book answers: page 68.

5- *3²/₈*



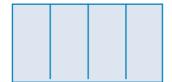


Draw shapes such as a square and rectangle on the blackboard and divide them into different equal parts.

Materials: blackboard

Shade parts of the shapes and help the pupils to recognise a mixed number fraction in this diagram.

For example,





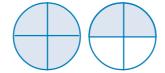
Ask,

How many quarters make one whole? (4 quarters) How many quarters are shaded altogether? (6 quarters) What fraction of the rectangles are shaded? (6/4 or 1 $^{2}/_{4}$)

Draw these shapes on the blackboard. Repeat the example using the shapes.















The pupils should complete the activities in their resource books on page 69 and 70.

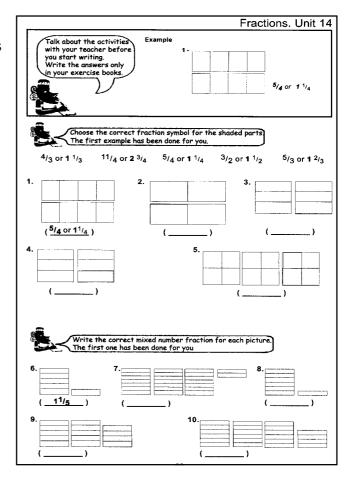
Resource Book answers: page 69.

- 1- 5/4 or 11/4 2- 3/2 or 11/2
- 3- ⁵/₃ or 1²/₃
- 4- 4/3 or 1¹/3
- 5- 11/4 or 23/4
- 6-11/5
- 7-3²/₇

- 8-11/6
- 9- 2 4/5 10- 3 4/6

Resource Book answers: page 70.

- 1- 2 1/a
- 7- 2 ²/₄
- 2- 3 6/8 5- 1 1/2
- 3- ₁2/₃ 6- 1 ⁴/₅





Draw shapes on the blackboard and divide them into different equal parts. For example.

Materials: blackboard, chalk



Ask someone in the class to come to the front and shade $1^2/7$. Check with the other pupils in the class to see if the pupil is correct.

Ask,

How many equal parts are shaded altogether? (9) What fraction of the 2 rectangles is the shaded part? (9/7) or 12/7)

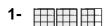
Repeat this example with other fractions such as: $1^{1}/4$, $1^{2}/5$, $2^{4}/6$, etc. Encourage other pupils in the class to come to the front and shade the fractions.



Ask the pupils to open their resource books on page 71 and complete the activities.

For activity 6 - 9, encourage the pupils to draw their own shapes in their exercise books and shade the fractions.

Resource Book answers: page 71.





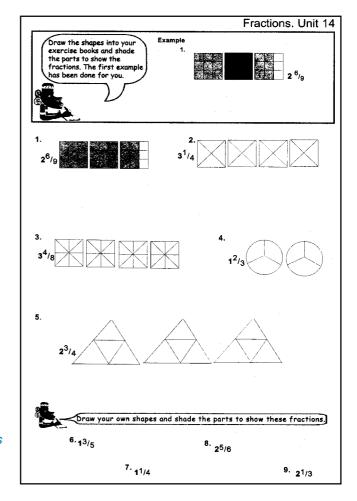








The answers for questions 6-9 may vary. The pupils may draw different shapes and shade the parts to show the fraction. Be sure that the shaded parts show correct fractions.





Can all the pupils read, write, say and recognise mixed number fractions?



Teach the pupils the decimal fraction and its notation.

Begin by introducing the decimal notation in money. Talk about the prices of items sold in shops and market places.

Write these prices on the blackboard.

Solbrew - 4 dollars and 50 cents.

Cabbage - 3 dollars and 80 cents, etc.

Show the pupils that another way of writing 4 dollars and 50 cents is \$4.50. Repeat this with other prices.

Explain that the decimal point between the numbers takes the place of the word 'and'.

Use other examples of decimals such as in length and weight to introduce the idea.

Measure some objects in the classroom building, measuring more than one metre. Write the measurements on the blackboard and show the pupils another way of writing them. For example:

1 metre and 63 centimetres can be written as: 1.63 m

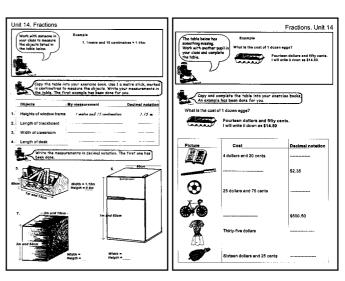
1 metre and 70 centimetres can be written as: 1.70 m, etc.

Continue this example with decimal notations as in capacity. Such as: 2 L and 250 mL. (2.25 L)



The pupils open their resource books on page 72 and 73 and complete the activities in their exercise books.

Provide pupils with 1 metre stick, marked in centimetres to use for the first activity.



Materials: blackboard, 1 m

stick, marked in cm

Resource Book answers: page 72.

5- 1.15 m / 0.6 m

6- 0.95 m / 1.65 m

7-3.10 m / 3.54 m

Resource Book answers: page 73.

2 dollars and 35 cents. \$4.20. \$25.75 500 dollars and 50 cents,

\$35.00, \$16.25

Can all the pupils understand, say and write decimal fractions and notation for money and measurements?



Extra activities **Support**

In pairs the pupils play 'Fraction Matching Game'.

Give out the Fraction Matching Game cards to the pupils. Let them spread the cards on the table with the writing face down. Materials: Fraction matching game cards

The pupils take turns to pick two cards and try to match them. If the two cards match the child keeps them.

1 1/2

If the two cards do not match, they are placed face down again.

The next child takes his / her turn to choose.

Continue until all the cards are complete. The child with the most cards wins the game.

Encourage the pupils to think of other ways to play the game.

One and a half

Extra activities Extension

Copy this activity on the blackboard and ask the pupils to complete the answers in their exercise books.

Write the following in decimal notation

1. 23 L and 250 mL

2. 25 m and 89 cm

3. 14 kg and 300 g

4. 17 dollars and 12 cents

5. 2 dollars and 1 cent

6. 33 cents

Write the following in words

7. \$40.40

8. 21.05 m

9. 53.5 L

10. 52.055 kg

11. \$105.50

12. 200.10 m

13. 400.75 L

14. 14.304 kg

Change to decimal notation:

15. Forty-three metres and 50 centimetres

16. Twenty kilograms and 250 grams

17. Five litres and 750 millilitres

18. Fifty-eight metres and 25 cm

19. Six kilograms and 500 grams

20. Ten litres and 500 millilitres

Make a list of items in the correct column in the tables below. An example is done for number 21.

21.	Less than 1.50 m in height Teacher's table	More than 1.50 m in height My dad
22.	Less than 10 kg	More than 10 kg

Less than 20 L

More than 20 L

23.

Time Topics 17 and 18: am and pm, Units of Time

Aim

To introduce the 12 hour clock units of time and use them in calculations, estimation and recording.

Sequence of objectives: Topic 17, To

- 1. teach the pupils am and pm time.
- 2. teach the pupils to read and use a 12 hour time table and schedules.
- 3. teach the pupils to calculate time. eg what time will it be 40 minutes after 3.30pm?

Sequence of objectives: Topic 18, To

- 4. teach the pupils to estimate units of time.

 eg counting in seconds and saying when a minute has passed
- 5. teach the pupils to record events within units of time.
- 6. teach the pupils to convert units of time from hours to minutes, minutes to seconds.

Rationale:

This unit will widen the pupils' knowledge of the 12 hour clock and enable them to use calculation and estimation skills through a variety of activities such as, recording and converting events within the units of time.

Information such as, school time tables, shipping schedules and 12 hours classroom clocks should be made available to assist the pupils in learning. Being able to read and tell times, understand time schedules and changes in time are all essential to every-day life.



Introduce am and pm time to the pupils.

Begin talking about different activities people do at home and when these activities actually take place. Such as:

time for breakfast, 7 o'clock in the morning, time to go to school, 7.30 in the morning, dinner time, 6 o'clock in the evening, time to sleep, half past eight at night, etc.

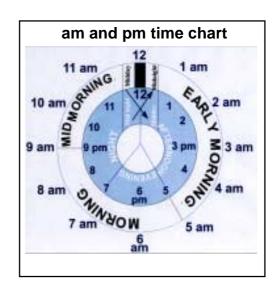
Show pupils the 'time chart' and begin introducing 'am' and 'pm' to the pupil.

Explain that parts of the day have different names. For example:

midday, afternoon, evening, night, midnight, early morning, morning and mid morning

Times between midnight and midday are called **am** and times between midday and midnight are called **pm**.

Materials: am and pm time chart, classroom clock



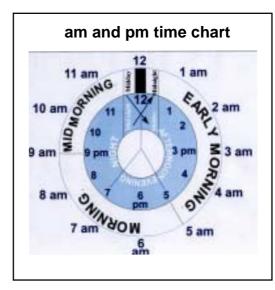
Explain to the pupils that **am** comes from the word **ante meridian**, a latin word which refers to the time before (**ante**) the sun reaches at the top of the sky and pm comes from the word **post meridian** which refers to the time after (**post**) the sun begins to go down.

Talk to the pupils about the times and parts of the day between midnight - midday and midday - midnight, to explain more about 'am' and 'pm'. Use the am and pm chart to demonstrate these examples.

For example:

1 o'clock early morning is '1 am'
3 o'clock early morning is '3 am'
11 o'clock mid morning is 11 am
1 o'clock afternoon is '1 pm'
What is 2 o'clock in the afternoon?
What is 10 o'clock at night?
What is 10.30 am?

Point to these times on the time chart as you ask pupils questions. Continue the activity using 'am' and 'pm' in your examples.





Bring the Nguzu Nguzu activitiy chart and display it in front of the class.

Talk about the activities in the activity chart with the pupils.

Encourage them to read the information about each activity and say whether it happens at 'am' or 'pm' time.

Ask the pupils questions and say why they think each activity happens at the times they suggested.

Activity Chart answers:

The ship departed at 2 o'clock early in the morning.

(2 o'clock am)

The helicopter lands at the school ground at 10 o'clock mid morning. (10 o'clock am)

The pupils watched a video at 7 o'clock in the evening.

(7 o'clock pm)

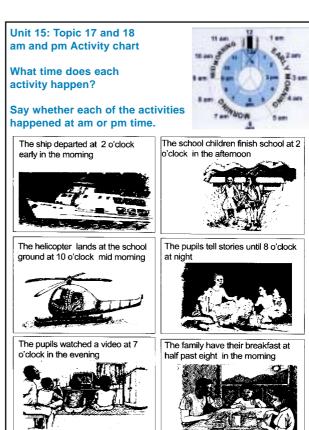
The school children finish school at 2 o'clock in the afternoon. (2 o'clock pm)

The pupils tell stories until 8 o'clock at night.

(8 o'clock pm)

The family have their breakfast at half past eight in the morning (8.30 am)

Materials:
Nguzu Nguzu am
and pm activity chart





Use a 12 hour classroom clock to demonstrate 'am' and 'pm' time.

Show pupils the classroom clock. Explain that the clock face only shows 12 hours.

Materials: am and pm time chart, classroom clock

Set the hour and minute hands to 2 o'clock. Ask the pupils to tell the time.



Explain that the time in the clock face does not tell us whether it is am or pm.

To show this we use am and pm.

Write this on the blackboard to show the pupil. For example:

2.00 pm.

Set the time to 8 o'clock and say that it is 8 o'clock in the morning. Ask someone in the class to say whether 8 o'clock in the morning is 8 am or 8 pm.

Repeat this example. Set the time to 7 o'clock, 1 o'clock and 3 o'clock. Read the time to the pupil using language such as:

7 o'clock at night, 1 o'clock early morning, 3 o'clock afternoon, etc.

Ask the pupils to say whether it is am or pm.



Ask the pupils to open their resource books on page 74 and 75 and complete the activities in their exercise books.

On page74, the pupils study the events in the resource book and decide whether the time of the event is *am* or *pm*.

For the first and second part of activities on page 75, the pupils read the events and the story and write the correct time each event took place.

Some suggested answers have been given.

Resource Book answers: page 74.

Unit 15. Time The activities in the disposed program of the program of the different more progr

Resource Book answers: page 75.

washing- 7.00 am playing soccer- 4.00 pm lunch - 12.00 noon dinner- 6.00 pm

1- 2.00 pm

2- 6.00 pm 4- 12.00 am 6- 2.00 am 7- 8.00 am

Can all the pupils read, write, say and understand am and pm time?





Introduce 12 hour time schedules to the pupils.

Copy a simple school master time table on a large sheet of paper. Include am and pm. Display the table in front of the class.

Materials: time schedule tables such as, school master time table

Time	Monday	Tuesday	Wednesday	Thursday	Friday			
8.00 am	-	Assembly	Asse	mbly				
8.30 am	Bible	Knowledge		Bible Knowledge				
9.00 am	Teach	ing and Lea	rning	Teaching and Learning				
10.30 am	Break		Break	(Break			
11.00 am	Teach	ing and Lea	rning	Teaching and	d Learning			
1.00 pm	Sport	Activities		Sport Activities				
1.30 pm	5	Standard 1,	2 and 3 classes	3 classes finish				
2.00 pm		Standard 4,	5 and 6 classes	s finish				

Explain that the school time table shows what we usually do each day and when each of the activities begin and end.

Talk about the activities and ask pupils questions about the time schedules.

For example:

When does morning assembly begin?

What is the start time for school break?

Which classes finish school at 1.30 pm? etc.

Encourage the pupils to use the time table and respond to the questions.



Ask the pupils to devise a simple time schedule for the following, using am and pm.

Bus time schedules, After school time schedules,

Plane time schedules Sunday service time schedules.

Sunday ser	Sunday service time schedules.				
Time	Activities				
8:30 am					
9:30 am					
10:00 am					

Encourage the pupils to work in pairs or in groups of three. Ask them to share their work with other groups. Check the pupils work and let them display the time schedules on the clssroom wall.



Draw simple time schedules for shipping, SIEA or Solair. Copy the schedules on the blackboard or a large sheet of paper for discussion with the pupils.

Materials: time schedule tables such as, shipping schedules.

For example:

IDC Shipping Schedule. (June 2002)						
Date:	Ship	Depart	Arrive			
4/6/ 02	M.V Isabella	ETD Hon, 6am	ETA Kia, 2 pm			
7/6/02	M.V Isabella	ETD Buala, 8pm	ETA Hon, 1am			
5/6/02	M.V Fern	ETD Hon, 6pm	ETA Kaivanga, 3am			
8/6/02	M.V Fern	ETD Kia, 11am	ETA Hon, 4pm			

Talk about the schedules and explain the information used in the schedule, such as, ETD, ETA, am and pm. Explain that ETD means, expected time the ship will depart from the port and ETA means, expected time the ship will arrive at the new port.

Ask pupils questions about the ship's departure and arrival time. Encourage the pupils to find information from the schedule to answer the questions.



Ask the pupils to open their resource books on page 76.

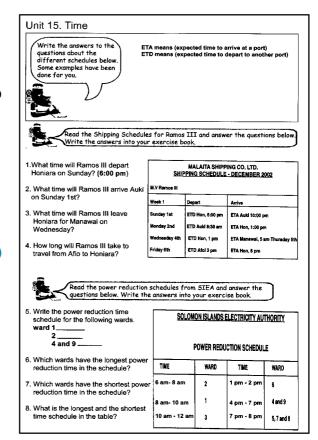
Talk about the activities with the pupils first. Make sure that the pupils understand the information in the activities and know what to do before they start writing.

Ask them to write the answers to the activities in their exercise books.

Resource Book answers: page 76.

1- 6.00 pm	5- ward 1-	(8 am - 10 am)
2- 10.00 pm	ward 2-	(6 am - 8 am)
3- 1 pm	ward 4 and	I 9 - (4 pm - 7 pm)
4- 5 hours	6- wards-	4 and 9
	7- wards-	5, 6, 7, 8
	8- Longest 3 I	nours

- Shortest 1 hour





Can all the pupils read and use a 12 hour time table and schedules?



Demonstrate calculating time using a 12 hour clock.

Set the time to 1 o'clock and ask someone in the class to say the time.



Materials: Nguzu Nguzu classroom clock

Move the minute hand from 12 to 3 so that the time reads quarter past one. Ask .

What is the time now? (quarter past 1)

What length of time passes when the minute hand moves from 12 to 3? (15 minutes)

What's the time, 15 minutes after 1 o'clock? (quarter past 1)



Repeat this strategy. Set the time to 2 o'clock.

Ask the pupils, what time it will be 20 minutes after 2 o'clock. (20 minutes past 2)

Encourage the pupils to calculate the length of time from 2 o'clock to 20 minutes past 2 and say the time.



Work with the pupils in the class to demonstrate the times on the clock face.

Materials: Nguzu Nguzu classroom clock

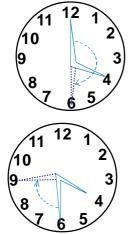
Set the time at 10 o'clock and ask someone in the class to read the time. Ask,

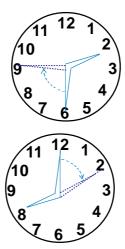
what time will it be 15 minutes after 10 o'clock? (quarter past 10)

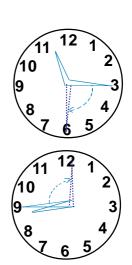
Move the minute hand 15 minutes after 10 o'clock to show quarter past 10. Encourage the pupils to calculate the length of time from 10 o'cock to quarter past 10 and tell how many minutes have past.



Ask them to read the time aloud for other pupils to hear. Repeat this process with the set of times below.









Make up simple stories and ask questions about them to demonstrate the concept of calculating and giving the correct time. For example:

Materials: daily school time tables

John finished school at quarter past 2 pm. He walked for 15 minutes back to his home. When did he arrive at his home?

Use a classroom clock to demonstrate the different times mentioned in the story. Ask questions about, when John had finished school, the length of time he walked from school to his home, etc. This will enable the pupils to calculate time and give the correct answers to the question in the story. Tell the the pupils the correct time.

Repeat this example with other simple stories. For example:

The standard 4 pupils at Boromole school finish class at 2.30 pm and spend 15 minutes cleaning around their classroom. What time do they finish cleaning up?



Ask the pupils to open their resource books on pages 77 and 78 and complete the activities.

Resource Book answers: page 77.

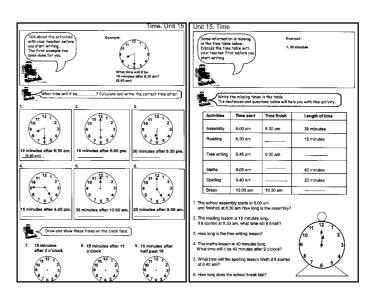
1-8:40 am 2-6:15 pm

3-7:00 pm 4- 5:00 pm

5- 12:30 am 6-5:20 am

8-





Resource book answers page 78.

1-30 minutes

6-30 minutes

2-8:45 am

3-15 minutes

4-9:40 am

5- 10:00 am



Can all the pupils calculate the length of time and duration of time in a 12 hour period?

Topic 18 Units of Time



Help the pupils estimate length of time in seconds and minutes.

Give pupils objects such as stones or shells to count.

Ask them to count the objects within 60 seconds.

Watch the time as the pupils count the objects. Stop the pupils after

counting objects, such as, stones and shells, real watch or clock

Materials:

60 seconds and explain that the counting takes 1 minute, which is the same as 60 seconds. Be sure that the pupils should see a watch or clock 'ticking' seconds if possible.

The teacher could obtain a real clock with ticking seconds from other colleagues or from anyone in the community.

Repeat counting objects in seconds and increase the period to 120, 180 seconds, etc. Remind the pupils how many minutes pass after every 60 seconds of counting.

Let the pupils compare the lengths of time to understand and recognise how long 1 minute (60 seconds) is, 2 minutes (120 seconds), etc.

Encourage certain activities that pupils can do within 1 min, 2 min, 3 min, etc. For example:

Walk to and from inside the class for 60 seconds (1min). Read a rhyme or poem, or stand up for 1 minute, etc.

Help the pupils realise that counting from 1 to 60 in a regular speed is approximately 60 seconds or 1 minute.



In groups the pupils play counting objects to practise estimating time in seconds or minutes.

Materials: counting objects, such as, stones and shells, real watch or clock

Give each group enough objects to count.

The teacher sets a time, for example 60 seconds and asks each of the groups to count as many stones as they can within the given time.

After 60 seconds or 1 minute, the pupils stop counting and find out the number of stones they count within the given time. The group with the most stones wins the game. The game is repeated until all the objects are counted.

Let the pupils continue doing other activities, such as, closing their eyes, hopping to and fro or standing still up for an estimated number of seconds or minutes.

Encourage someone in the group to check the time while the pupils do the activities. The group leader should check the time and say whether the pupils' estimate is exact, approximate, or nearly correct.

Encourage all pupils in the class to participate.



Practise estimating time in seconds and minutes with the pupils.

Ask the pupils to estimate how many minutes and seconds it would take to walk 3 times around their classroom.

Materials: a real hand watch or classroom wall clock blackboard, chalk

Write the pupil's estimate on the blackboard and let them walk around the classroom 3 times.

Check the time while the pupils do this and stop them after they have completed 3 rounds.

Discuss whether the estimate was correct, or whether it was over or under.

Repeat this with another activity. Ask the pupils to walk from their classroom to the nearest building and back again while you check the time.

Let them make their estimate first before they do the activity.

Check to see whether the estimate is correct.

Explain to the pupils how the second hand and the minute hand work.



Write these activities on the blackboard.
Ask the pupils to work in small groups and try these activities.

Materials: a real hand watch or classroom wall clock blackboard, chalk

Ask each group to estimate first how long it would take to do each activity and let them find out the correct length of time.

Give the pupils a real classroom clock or watch to use.

Ask someone to watch the time while the rest of the group do the activities.

Activity	from	to	my estimate	time
walk	classroom	a tree 100 m away	2 minutes 120 seconds	3 minutes 180 seconds
hop	one netball goal	another netball goal		
crawl	the blackboard	the cupboard		
walk around the netball court 4 times				

Topic 18 Units of Time



Ask the pupils to estimate how long something would take, such as:

cooking a pot of rice washing a pot lighting a fire baking a tray of bread Materials: a real hand watch or classroom wall clock blackboard, chalk

Discuss this with the pupils and let them estimate how long each activity would take.



Ask the pupils to open their resource books on page 79 and complete the activities in their exercise books.

Discuss the activity with the pupils first before allowing them to start writing.

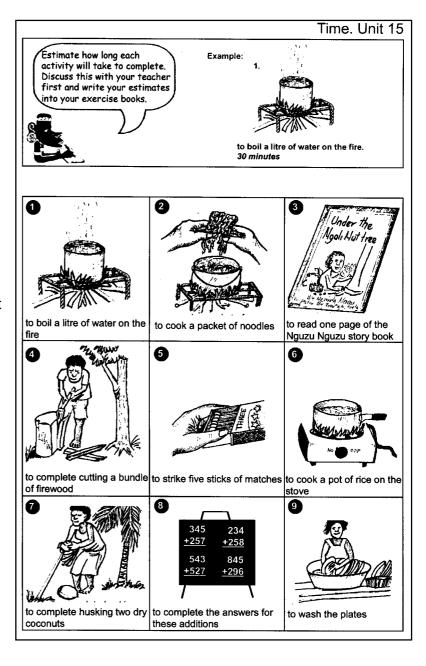
Let them discuss their personal experiences in carrying out activities.

Ask them to estimate how long it will take for them to do each activity.

Let them write the answers only in their exercise books.

The pupils' answers for this activity may be varied.

The teacher and the pupils can discuss the time length for each activity.





Can all the pupils estimate and calculate units of time in seconds and minutes?

Unit 15



Ask the pupils to come to the front so that they can all see the demonstration.

Explain that you are going to find out the length of time in an event using pulse beats.

Materials: a real hand watch or classroom wall clock blackboard, chalk

Show the pupils that the rate of the pulse beat can be measured in seconds in the clock.

Teach the pupils how to find and count their pulse rate.

Set the time. Ask the pupils to feel their pulse beat and practise counting their pulse beats. Now ask the pupils to count their pulse beats as you count seconds from the clock. Stop the pupils after 60 seconds and say that 1 minute has past. Find out the number of pulse beats each child has counted. This is called the pulse rate.

Show the pupils that, the pulse rate is equal to the number of pulse beats in a minute. For example, some pupils may have the pulse rate of 90. This means that there are 90 pulse beats in a minute. Other people may have faster pulse rates, of up to 100 per minute and some pulse beats may be as low as 60.



Ask the pupils to work with someone who sits next to them and find out the rate of the heart beat for 1 minute.

Explain to them that the heart rate is also the same as the pulse rate.

Let the pupils use their heart beats to find out how many beats there are in:

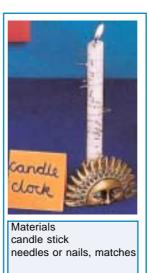
1 minute, 3 minutes, 4 minutes, etc.

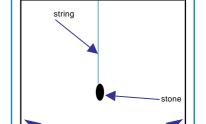
Encourage them to record their findings. Such as, **80 heart beats = 1 minute**, etc.

If you have time after this lesson, let the pupils do some practical activities. The pupils will be working in groups to develop some of these objects for measuring events within units of time.









Measuring Pendulum swing

one full swing to and fro is about one second.

Materials 3 sticks, string, stone Topic 18 Units of Time



The pupils should come to the front so that they can all see the demonstration.

Materials: a real hand watch or classroom wall clock blackboard, chalk

Ask the pupils to count their pulse beats while you walk to and fro from one end of the room to another. Let the pupils tell you how many pulse beats took place once you have completed your walk.

Repeat this again. Set the time. Ask the pupils to feel their pulse beat and count each beat while you and the pupils watch the time. Stop the pupils after 60 seconds and say that 1 minute has passed. Find out the number of pulse beats each child counts. Remind them that this is called the pulse rate. Let them know that they have used the method that nurses use in hospital to measure pulse rate.

Remind the pupils that the number of pulse beats in 1 minute is the pulse rate. Repeat this with other activities, such as, standing on one leg for 2 minutes, closing your eyes for 3 minutes, etc. These are variations which give practice in counting pulse beats over a period of time.



Ask the pupils to work with someone who sits next to them.

Let them measure different events using their pulse rates.

Materials: exercise books, pencils, ruler

Ask them to prepare a table like the one below in their exercise books. The pupils should decide events they would like to measure .

Events (activities)	My estimates	My measurements
Walk around the classroom building	70 pulse beats	80 pulse beats
2. Read a story book		
3		
4		

Encourage them to make an estimate first before they measure. Record the beats on the table and ask them to compare their work with other groups in the class.



Can all the pupils record events in seconds and minutes using pulse rates, water clocks and pendulums as units of time?

Unit 15



Teach the pupils to convert seconds to minutes, minutes to seconds.

Begin the lesson by demonstrating that certain actions take only a second.

Materials: a real watch or classroom wall clock blackboard, chalk

For example:

counting, walking, clapping, hopping, etc. at a regular speed.

These intervals will be close to seconds. So 60 hops would be approximately 60 seconds = 1 minute.

Write the result of the activities on the blackboard to show pupils the relationship between seconds and minutes.

For example: 60 seconds = 1 min, 120 seconds = 2 min, 180 seconds = 3 min, etc.

If you have a real clock or watch, use this to explain these relationships. Remind the pupils again that clocks have a second hand that moves faster than the minute and hour hand. When the second hand moves 60 seconds around the clock, the minute hand passes through 1 minute.

Demonstrate this using a real watch or classroom wall clock or a Nguzu Nguzu classroom clock. Move the second hand 60 seconds on the clock face and show one minute has past.

Write this on the blackboard: 60 seconds = 1 minute

Repeat this demonstration for 120, 180, 240 seconds, etc. and ask the pupils to convert these times to minutes. Such as, 120 seconds = 2 minutes, 180 seconds = 3 minutes.



Copy this activity on the blackboard.

Ask the pupils to copy and complete the activity into their exercise books.

6.
$$1^{1}/_{2}$$
 minutes = seconds

Answers:

1-1 minute

2- 120 seconds

3-3 minutes

4- 240 seconds

5-5 minutes

6-90 seconds



Topic 18 Units of Time



Teach the pupils to convert minutes to hours and hours to minutes. Write this statement on the blackboard: **60 minutes = 1 hour.**

Materials: Nguzu nguzu classroom wall clock blackboard, chalk

Explain and demonstrate the relationship between minutes and hours using a classroom clock. Tell the pupils that:

one hour is when the minute hand takes a complete turn 60 minutes around the clock face. From 7 o'clock to 8 o'clock is one hour.

Demonstrate this statement using a classroom wall clock. Set the time to 7 o'clock. Move the minute hand 60 minutes and say that it is one hour. Read the time to the pupils.

Repeat this example using a different set of times to futher demonstrate hours and minutes relationship. For example;

from 7 o'clock to 9 o'clock is 2 hours (120 minutes) from 9 o'clock to 12 o'clock is 3 hours (180 minutes) from 6 o'clock to 7:30 pm is 90 minutes (1 hour 30 minutes), etc.

Encourage the pupils to work out the correct hours and minutes in your examples.



Ask the pupils to open their resource books and complete the activities on page 80.

For numbers 11 - 17, make sure that the pupils understand and know how to read the time table before they start writing.

Ask the pupils to write the answers to the activities in their exercise books.

Resource Book answers: page 80.

1- 60 minutes
2- 180 minutes
3- 120 minutes
4- 4 hours
5- 5 hours
6- 90 minutes
7- 75 minutes
8- 100 minutes
9- 1 hour 10 min
10- 1 hour 20 min

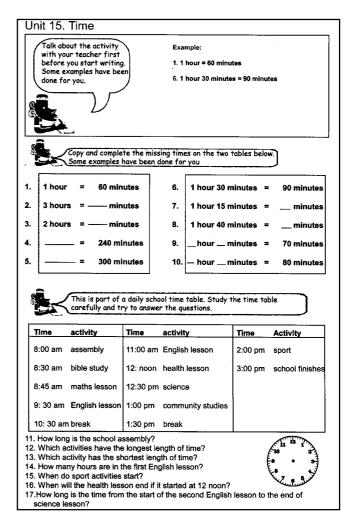
11- 30 minutes 16- 12:30 pm

12- English and Sport 17- 2 hours

13- Bible Study

14-1 hour

15- 2:00pm



Unit 15



Prepare two sets (set 1 and set 2) of Units of Time Matching Cards. Spread the cards on a table or on a flat surface area.

Materials: units of time cards

Ask two pupils to come to the front and try to match the units of time correctly. Set a time for them to do this. Such as, 60 seconds.

Stop the two pupils after 60 seconds and check to see that they have matched the units of time correctly.

Repeat this activity with other pupils in the class. Encourage the pupils to work as fast as they can within the given time.



The pupils work in groups of three or four and play a matching game with units of time.

Materials: sets of units of time cards for each group

1 minute

90 seconds

2 minutes

1 minute

30 seconds

Provide each group with a set of units of time cards to use. Ask the groups to race each other by quickly matching the units of time within a given time.

The cards are placed face down on a mat or on a flat surface area.

1 minute 60 seconds
1 minute 5 seconds 65 seconds

The group begins by opening a pair of cards and trying to match them.

If the pair of cards do not match, they are placed face up and a new card is picked.

The groups continue until all the cards are matched.

The group that finishes first wins the game.

Check to see that the group has matched the units correctly.

The teacher keeps the time and counts the seconds while the groups match the cards. Remind the groups how many minutes have past after every 60 seconds. Repeat the game. Ask the groups to swap over cards and play the game again.



Can all the pupils convert units of time: hours to minutes, minutes to seconds?

Extra activities Support

Play the game 'Race Against Time'.

Ask the pupils to work in groups of three or four.

Give each group a set of question cards and a clock face to use.

Materials: clock face, units of time question cards

Each group should select their group leader and players.

The group leader picks a question card and reads it to the players.

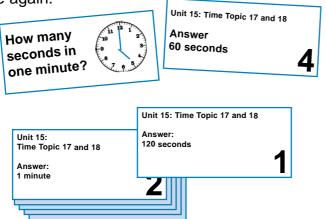
The players take turns to answer the question.

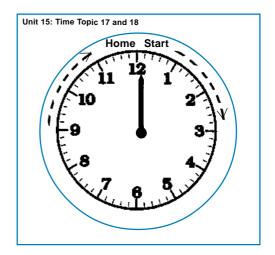
If a player answers the question correctly, he/she moves the clock hand to the next number. If she/he gets the question wrong, the clock hand does not move.

The next player takes a turn to answer the next question.

The first group to reach home wins the game.

Let the pupils swap over question cards and play the game again.





Materials:

or watch

real clock face

Extra activities Extension

Encourage the pupils to do some activities which will help them to estimate in seconds and minutes.

Copy this table on the blackboard and ask the pupils to copy them into their exercise books. Ask them to add some more activities into the table.

Encourage them to work in pairs and try the following activities. Let them make estimates in seconds and minutes first before measuring the correct time.

Activities	estimates in seconds and minutes	measurements in seconds and minutes
Walking from the library to the classroom	1 minute 40 seconds	1 minute 30 seconds
Running around the school play ground		

The pupils could use real clocks or watches to measure the correct time.



Measurement Topic 16: Probability

Aim'

To develop pupils understanding about the chances of events

Sequence of objectives: To

1. teach the pupils to use words such as, certain, likely, unlikely, probably and impossible to describe the likelihood of an event taking place.

e.g. 'it is unlikely that it will rain today'; 'it is fairly certain that the sun will rise at 6:30 am tomorrow'.

Rationale:

This topic will introduce the concept of probability to the pupils. Probability is the likelihood that something will happen. Pupils will be encouraged to make judgements and predictions about the likelihood of events that happen around their environment, such as, the patterns of weather, the seasons in plants and animals, the patterns of time, human activity, etc. Words such as certain, likely, probably, impossible, etc. will be used to describe these events. The topic provides useful skills for pupils to understand the ideas behind chance, impossibility and certainty.



Gather the pupils outside the classroom so that they can all look at the weather.

Let them spend two or three minutes outside observing the weather situation.

After some time, discuss the weather situation with the pupils.

Talk about some good or bad signs that they have observed from the sky, clouds, sun or from the movement of things around their environment. Ask each child some questions about their observation. For example;

What is the weather like today?

What have you seen in the clouds? Are they dark? Does this mean rain?

Do you think that it's likely to be raining this afternoon?

Why do you think it's likely to be raining this afternoon?, etc.

Repeat this example. Ask other pupils in the class about their observation of the sun. Encourage them to respond using words such as *certain*, *likely* and *unlikely* to describe what they have observed about the sun. For example;

I am **certain** that the sun will not shine today because dark clouds are covering the sky. **Or**

It is unlikely that the sun will shine today because dark clouds are covering the sky, etc.



In pairs ask the pupils to talk about their observation about the weather.

Let them say what they think the weather will be like in a few hours or tomorrow.

Encourage them to use, *certain, likely* and *unlikely* in their sentences to describe what the weather situation will be like in their opinion. For example:

I'm certain that it will be windy this afternoon because the plant leaves are moving. It is unlikely that the sun will shine brightly today because dark clouds have appeared in the sky,

It is likely that it will rain tonight because this is the rainy season, etc.

Help pupils with their sentences and encourage every one to participate in the activity.



Talk about other events such as, sports, travelling or how and when events take place through the passage of time, to further introduce the concept of probability.

Materials: blackboard

Make up sentences using words such as, *probably, likely, unlikely*

and *certain* to describe what you think might happen to these events. For example:

The ship will probably arrive late today because it left very late yesterday afternoon. I'm certain that there will be no school this afternoon because the teachers will have to attend an important meeting.

It is unlikely that the sports carnival will take place next year because there is no money.

The sun is almost certain to rise a little later tomorrow, etc.

Ask the pupils to describe some of these events using the words of probability. Help them practise their sentences and try them out with someone who is sitting next to them.

Repeat this example with the pupils. Talk about other events that pupils are familiar with.

Make a list of the new words (vocabulary) about probability on the board. Make sure the pupils have understood their meaning.



Ask the pupils to open their resource books on page 81. Talk about the events with the pupils.

Ask the pupils to think about the events in the picture and describe each one using words such as unlikely, likely, possible, probability, certain, etc.

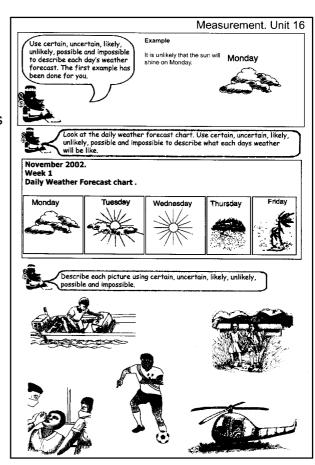
The pupils could describe an event in many different ways.

For example:

It is unlikely that the sun will shine brightly on Monday.



Encourage the pupils to participate in these activities.



Unit 16



Use this activity to further strengthen the concept of probability.

Materials: blackboard

Talk to the pupils about what is meant by *impossible*, *probable*, *possible* and *50/50* when events either cannot take place or could

take place. This is sometimes called a **PREDICTION** if you are not sure or a **CERTAINTY** if you are absolutely sure.

Make up sentences using words impossible, probable, possible, 50/50, prediction and certainty and explain what they mean. For example:

It is impossible for the sun to rise from the west. It is probable that my aunt will visit next week.

(This means it cannot ever happen)
(This means that it is likely)
(This means that it could happen)

It is possible that my favourite team will win.

There is a 50/50 chance that when I toss a coin,

it will fall heads. (This means that there is an equal likelihood)

Ask the pupils to make up their own sentences and write them on the board using a chart. For example:

Probability

Prediction or Certainty

Probable	it is probable that my brother will catch some fish today.
Impossible	·
Possible	
50/50	



Ask the pupils to open their resource books on page 82. Discuss with them the meaning

Extra activities

of **PREDICTION** and **CERTAINTY**.

Resource Book answers: page 82.

Events	Probability Words
The sun is blue	Impossible
Tomorrow	Certainty
l will be hungry in an hour	Probable
Malaria	Possible
Solomon Island Football will win Oceania Cup	Prediction
There are hundred cents in a SI Dollar	Certainty
The next born in my family will be a girl	50/50
Ship arrive	Probable
Walk to school	Certainty
Cyclone will come	Prediction
A coin will fall tails when tossed	50/50

your own words. The	your exercise books usi first example has been) *
		711
Events	Probability word	My sentence
The sun is blue	Impossible	It is impossible for the sun to be blue.
Tomorrow	Certainty	I am certain that tomorrow will come.
I will be hungry in an hour		
	Possible	
	Prediction	
There are hundred cents in a SI Dollar		
	50/50	
	Probable	
	Certainty	·
Cyclone will come		
A coin will fall talls when tossed		



Bring the following objects into the classroom. 4 stones, 7 shells and 3 seeds.

Show pupils the objects and put them together in a basket or box. Explain that there are a total of 14 objects inside the box.

Materials: shells, stones, seeds

Hold the box high so that no one is able to see inside.

Ask three pupils in the class to come forward and pick one object each from inside the box without looking at them. Record the number of times each object was picked. For example:

seeds	stones	shells
0	1	2
0	0	3

Repeat this a number of times. Help the pupils see which objects have more chances to be picked?

Talk about the chances of picking the objects with the pupils. Ask,

how many objects are there altogether? (14 objects) how many shells, stones and seeds? (7,4,3) which object do I have more chance of choosing from the box? Why?

Explain to the pupils that there are more chances of picking the shells because there are more shells than seeds and stones. There are seven chances out of 14 chances.



The pupils work in groups of three or four.

Give each group a container or box and a different amount of objects, such such as, 5 seeds, 10 stones and 3 shells

Materials: shells, stones, seeds, small containers or boxes



Ask the pupils to practise finding the chances of picking an object from the box. Encourage them to suggest first which object they think would be chosen most often.

Ask the pupils to pick the objects one at a time. Let them record and compare their results as shown above.

Encourage the pupils to talk about their result and say why a particular object is picked more than the others. Use words such as, likely and unlikely to describe the chances.

Let them try different amounts of objects and compare their results. What happens if the result is the same?



Can all the pupils use words such as certain, likely, unlikely, chance etc. to describe the likelihood of an event?

Extra activities

Support

Materials: 2 real 20 cent coins blackboard

By throwing two coins the pupils can investigate the chances of getting 2 heads compared to 1 head and 1 tail. You can explain that, it is more likely that 1 head (H) and 1 tail (T) will fall compared to 2 heads (HH) and 2 tails (TT), because the coins can fall either HT or TH. That means when you throw two coins, there are four possibilities (HH, TT, TH, HT).

Two out of four times a H and T will show. That is half the number of times. This means the chance of throwing a H and T is 2 out $4 = \frac{1}{2}$.

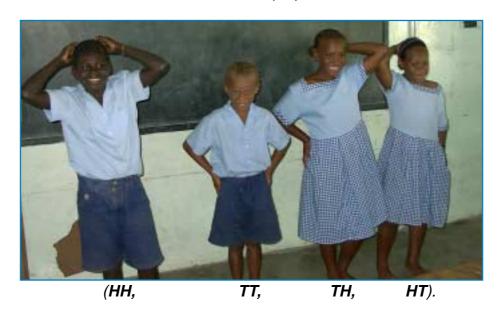
Play a game of heads and tails with the pupils. You need two coins to spin, which will land and show (HH), (TT), (HT) or (TH)

To play the game, first ask the class to guess how the coins will land. Such as, (HH), (TT) (HT) or (TH). Remember that TH and HT are really the same.

The pupils should be asked to all stand before the teacher spins the coins. They should place their hands in one of the following ways to show their guess.

For example:

both hands at the back of their heads (HH), one hand on head and another one behind the buttock (HT or TH), or both hands behind their buttocks (TT).



The teacher spins the two coins and shows the pupils how the coins have landed.

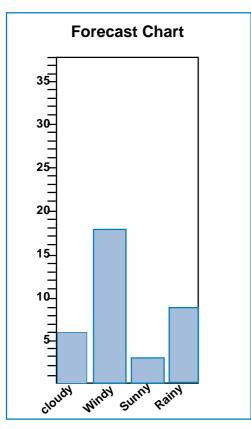
The child or pupils who guess wrongly sit down. The rest of the class continue guessing and playing until all the pupils except one sits down.

The pupil who stands last wins the game. Sometimes it happens that all the pupils will sit down on the last throw and therefore the game begins again for everyone until only one pupil is left.

Materials: blackboard, chart papers, crayon, ruler, pen marker

From the activity about throwing coins, you can see that the probabilty (chance) of throwing TT is 1 out of 4, which is the same as $^{1}/_{4}$.

Now draw the bar graph on the blackboard or on a big paper chart and discuss it with the pupils. For example:



Explain that the total number of pupils in the class is 36.

Talk about the number of guesses for each type of weather, made by the pupils, and relate this to the fraction notation idea. For example:

9 out of 36 pupils predict that the next day will be raining, which is the same as, 9/36 = 1/4 of the pupils.

18 out of 36 pupils guess that the next day will be windy, which is the same as, $18/_{36} = \frac{1}{2}$ of the pupils.

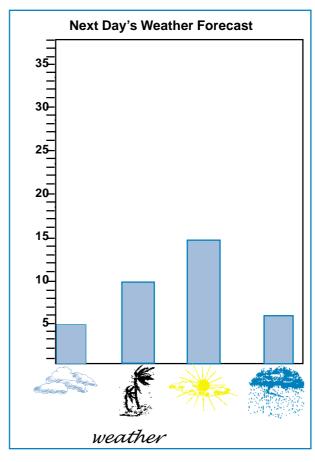
After discussing the weather forecast bar graph with the pupils, make one for the next day's weather forecast for your class.

What fraction (probability) predict cloudy weather?

Find out the pupils' prediction for each type of weather and record.

Talk about the results of the weather forecast the next day.

This activity helps pupils to use their probability skills to predict what the weather for the next day should be like, by looking at the weather situation of the day and also to realise the fraction notation of probability by looking at their results.



Continuous Assessment Record Sheet

This Record Sheet shown on page 227 has been designed to provide the teacher with a method of recording Grades and Averaging them Unit by Unit for each of the Topic Objectives.

The Record Sheet should make use of daily or weekly continuous assessments whenever they take place based on the Objective that has been taught.

Teachers should base their assessments on the results of:-

- a) Observations of the pupil's work in the classroom during lessons and activities,
- b) Marking the work done in the pupil's exercise book.

The following Grades are suggested which should help the teacher and the pupil know and understand about individual progress and whether a pupil can move on to the next Objective or not:-

VG = very well understood

G = some practice needed but can move on to the next Objective

S = more practice needed but can move on with caution

NS = not ready to progress, much more practice needed

Teachers should enter a Grade for each Objective once evidence has been obtained either from observation in class or marking exercise books. Grades should be averaged at the end of each Unit by counting those Grades which are in the majority. e.g. G + G + S = G.

Sometimes the teacher may have to make a decision based on her knowledge of the pupil and how he or she is progressing in class if for example the number of Grades in each category is equal.

e.g. VG + G + VG + G = G (because the teacher believes that more practice is still needed).

If the Grades obtained are as follows: VG + S + VG + S = G (because the 2 Ss balance out the 2 VGs).

Termly Assessment Record Sheet

This Record Sheet shown on page 228 is for the teacher to use at the end of each Term when the four Units are graded and averaged. This information is found in the Continuous Assessment Record Sheet.

The Record Sheet has also been designed for the end-of-term written test result to be graded and entered. (You can refer to the information given in the Sample Test).

The Average Grade for each Unit, obtained from the Continuous Assessment Record Sheet, is entered into the Termly Assessment Record Sheet (shown below), Topic by Topic. Most Units have only one Topic but in some cases such as Topics 1 and 2, an entry is made for both assessments. There is also a place for the assessment of an end-of-term written test.

Finally at the end of each Term, a Term Grade (TG) can be obtained from an average calculated in the same way as shown in the Continuous Assessment Record Sheet.

MATHS CONTINUOUS ASSESSMENT RECORD SHEET

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PERFORMANCE RANGE GRADES:

- VG- Very Good (very well understood)
- G- Good (some practice needed but can move on)
- S- Satisfactory (more practice needed but can move on with caution)
- NS- Not Satisfactory (not ready to progress, much more practice needed)

MATHS Termly Assessment Record Sheet

CLASS:	SCHOOL:	TERM:	YEAR:	
CLASS TEAC	CHER:			

Names	Unit		Unit		Unit		Unit		Test	TC
	Averag	e Grade	Average Grade Average Grade				Average	Grades		
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Take note that TG (Term Grade) is the combined assessment for both Continuous and Topic test results.

Guidance Notes For Test Design

The key features for the teacher to follow when making his or her own tests are as follows:-

- 1) Tests should be based on the outcomes of the Objectives what have the pupils learned and understood and what can they do?
- 2) Tests can target three levels of understanding: basic, intermediate and complex.
 - a) Basic level tests memory and factual information e.g. NUMBER FACTS
 - b) Intermediate level tests understanding a concept or idea e.g. PLACE VALUE
 - c) Complex level tests the ability to follow a sequence of logical steps with understanding e.g. CONSTRUCTING A NET or USING AN ALGORITHM
- 3) A good test can be designed as a mix of levels and a mix of types of tests e.g.
 - Multiple choice questions with 4 plausible answers and one correct answer (M)
 - Completion type questions to show working and the answer (C)
 - Practical tasks to demonstrate a skill and understanding (P)
- 4) A Blue-Print Specification Grid is useful when designing a test to make sure there is balance.

TEST BLUE-PRINT

A Blue-Print is a way of showing how a test is specified and constructed in relation to the:

- a) Objectives that are being tested;
- b) Level of conceptual understanding that is being tested.

There are **3 levels** of mathematical understanding that teachers should be aware of:

LEVEL 1 (basic): testing a number or measurement fact that could be memorised.

LEVEL 2 (intermediate): testing the understanding of a concept such as place value,

LEVEL 3 (*complex*): testing the ability to follow a sequence of logical steps such as solving a problem or following through a practical activity.

Teachers should learn how to specify and construct a test and include all levels of understanding that relate to the objectives that have been taught.

A balance of questions for the three levels is very important. It is advisable to have most questions aimed at level 2 and therefore most marks will be for level 2 questions.

The reason for this is that if too many marks are given for difficult questions (level 3) then the test will be too difficult and all the marks will probably be low. Similarly it is advisable not to have too many easy questions because the overall marks will be too high.

A good balanced test will therefore not be too difficult and not too easy. This will enable the teacher to differentiate between those pupils who are performing very well and those who are in difficulties and who need help.

HERE IS A BLUE - PRINT FOR THE SAMPLE TESTS SHOWING GOOD BALANCE.

SAMPLE TEST 1 BLUE-PRINT FOR TOPICS 1, 2 AND 13

	MARKS ASSIGNED TO NUMBER AND MEASUREMENT													
Quest	1	2	3	4	5	6	7	8	9	10	11	12	Tota	
Level 3										2 ^C	2 ^C	4 <i>P</i>	8	40%
Level 2		1 M	1 M		1 <i>M</i>	1 M	2 ^C	2 C	2 C				10	50%
Level 1	1 M		Ì	1 M									2	10%
Topic	N	N	N	N	М	М	N	N	М	М	N	М	20	
Number Concepts: 10 Marks, Measurement Concepts: 10 Marks														

SAMPLE TEST 2 BLUE-PRINT FOR TOPICS 8, 9 AND 3

	MARKS ASSIGNED TO SHAPE AND NUMBER													
Quest	1	2	3	4	5	6	7	8	9	10	11	12	Tota	I
Level 3										2 <i>C</i>	2 <i>C</i>	4 <i>P</i>	8	40%
Level 2		1 <i>M</i>	1 <i>M</i>		1 <i>M</i>	1 <i>M</i>	2 <i>C</i>	2 _C	2 <i>C</i>				10	50%
Level 1	1 <i>M</i>			1 <i>M</i>									2	10%
Topic	S	S	S	S	S	N	N	N	S	S	S	S	20	
	Number Concepts: 5 Marks, Shape Concepts: 15 Marks													

Tests

Two samples of tests are given in the next few pages. The sample tests give teachers examples of question types which they can develop when preparing a test for a particular topic.

The most common types of test questions that teachers can develop are: multiple choice, completion, problem solving, practical activities and short answers.

Teachers should be advised to begin with a **BLANK BLUE-PRINT** and enter into each level the total marks planned for each question. This way teachers can plan and design the TEST to ensure that more than half of the marks are assigned to Level 2.

A good balance is as follows:

- Level 3 30% 40% of the marks
- Level 2 50% of the marks
- Level 1 10% 20% of the marks

The teacher can make the final choice for the purpose of balance.

It is also wise to mix the types of questions at the design stage for example,

- multiple choice questions 6 marks (Level 1 and 2)
- completion questions 10 marks (Level 1 and 2)
- problem solving or practical activity 4 marks (Usually Level 3)

True/False questions are not very reliable because pupils may be encouraged simply to guess the answer and therefore the final grade will not reflect the true performance level of the pupil.

Another important aspect is the weight the teacher applies to each Topic being tested. For example more marks should be given for a Topic that has many Objectives compared to a Topic that may have only one or two Objectives.

Finally the teacher should decide how much time to spend on testing. If the mathematics period lasts for 50 minutes then it may be sensible to spend that amount of time on the test. The teacher should decide.

End of Year School Report

Using the information and Grades from the Termly Assessment Record Sheet for each pupil, an End of Year School Report can be prepared.

Teachers will be able to provide a clear statement on the pupil's ability in mathematics based on the evidence obtained from classroom work and written tests.

Standard 4 Mathematics

Sample Test one.

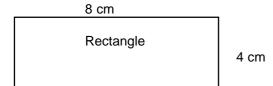
Themes: Number and Measurement. **Topics:** 1,2 and 13.

Part 1 (Multiple choice questions)

- 1) The value of 7 in 87,406 is:
 - a) 7 b) 70 c) 700 d) 7,000 e) 70,000
- 2) What is 459 rounded off to the nearest one hundred? a) 100 b) 400 c) 450 d) 460 e) 500
- 3) The biggest number that can be made from 4, 0, 8, 9, 2 is: a) 98,420 b) 89,402 c) 84,920 d) 49,802 e) 29,804
- 4) How many odd numbers are in the following group of numbers: 81, 22, 68, 121, 47? a) none b) 1 c) 2 d) 3 e) 5
- 5) A good estimate for the length of a banana fruit is: a) 1 cm b) 13 cm c) 30 cm d) 50 cm e) 100 cm
- 6) How many metres are in 2 kilometres? a) 2 m b) 200 m c) 2,000 m d) 2,200 m e) 2,220 m

Part 2 (Completion questions)

- 7) Write in words 2,041.
- 8) What should be added to 12,129 to make it 12,429?
- 9) Change 3m 42 cm to centimetres.
- 10) What is the perimeter of this shape?



Part 3 (Practical activity question)

12) Make a paper strip exactly 15 cm long. Mark each centimetre from 1 to 14 on the strip. (Your teacher will give you a ruler and strips of paper.)

Standard 4 Mathematics

Sample Test two.

Themes: Shape and Number **Topics:** 8,9 and 3

Part 1 (Multiple choice questions)

- What is the name of the 2-dimensional shape that has 7 sides?a) triangleb) rectanglec) hexagond) heptagone) octagon
- 2) How many lines of symmetry does a regular hexagon have? a) 1 b) 2 c) 3 d) 4 e) 6
- 3) Which shape can tessellate without leaving any gaps?
 a) rectangle b) pentagon c) heptagon d) nonagon e) decagon
- 4) How many vertices does a cuboid have? a) none b) 4 c) 8 d) 12 e) 16
- 5) How many faces does a triangular pyramid have when it is unfolded? a) 3 b) 4 c) 5 d) 6 e) 8
- 6) What is the total of \$4.80 + \$1.20? a) \$4.20 b)\$4.80 c)\$5.00 d)\$6.00 e) \$8.00

Part 2 (Completion questions)

- 7) Add 229 + 342.
- 8) What should be added to 123 to make it 132?
- 9) Draw a sketch of a cube after it is unfolded.
- a) How many edges does a prism have which has a base like the shape shown here? b) How many faces does this 3-dimensional shape have?

Rectangle

a) _____

b) _____

- 11) a) Name a shape that tessellates with an octagon?
 - b) Draw a sketch of this.

Part 3 (Practical activity question)

12) Make a triangular prism. Draw the net first with tabs and then fold it. (Your teacher will give you scissors, a ruler and glue.)

Marking Scheme (sample test 1)

Part 1:

Multiple choice questions

a) Each correct answer is worth 1mark

Total 6 marks

Answers for 1-6: d, e, a, d, b, c.

Teachers should take note that it is good to spread the answers evenly across the range a, b, c, d, and e.

Part 2:

Completion questions

b) Each correct answer is worth 2 marks

Total 10 marks

Answers 7: two thousand and forty one

8: 300 cm

9: 342 cm

10: 24 cm

11: 6 different numbers (1 mark) 385, 358, 853, 835, 583, 538 (1 mark)

Part 3:

Practical Activity Question

c) Worth 4 marks

Take note that: Full marks if cut and marked correctly

3 marks if marked correctly but not properly cut to length

2 marks if numbers are missing but correct length

1 mark if paper is close to 15 cm in length **Total 4 marks**

TEST TOTAL 20 MARKS

How to Grade:

Very Good	18-20 <u>VG</u>	(very well understood) -	A -	90% - 100%
Good	13-17 <u>G</u>	(some more practice needed but can move on) -	В-	65% - 89%
Satisfactory	9-12 <u>S</u>	(more practice needed but can move on with caution) -	C -	45% - 64%
Not Satisfactory	0-8 <u>NS</u>	(not ready to progress, much more practice) -	D -	0% - 44%

Marking Scheme (sample test 2)

Part 1:

Multiple choice questions

a) Each correct answer is worth 1mark

Total 6 marks

Answers for 1-6: d), e), a), c), b), d)

Teachers should take note that it is good to spread the answers evenly across the range a, b, c, d, and e

Part 2:

Completion questions

b) Each correct answer is worth 2 marks

Total 10 marks

Answers 7: 571

8: 9

9: give two marks for correct net and one mark if sketch shows 5 squares

10: 12 edges, one mark, 6 faces, one mark

11: The shape is a square (one mark). One mark for the sketch

Part 3:

Practical Activity Question

c) Worth 4 marks

Take note that: Full marks if cut and marked correctly.

3 marks if cut correctly but not properly glued

2 marks if the sketch is correct

1 mark if sketch shows triangles and rectangles

Total 4 marks

TEST TOTAL 20 MARKS

How to Grade:

Very Good	18-20 <u>VG</u>	(very well understood)-	A- 90%-100%
Good	13-17 <u>G</u>	(some more practice needed but can move on) -	B - 65%-89%
Satisfactory	9-12 <u>S</u>	(more practice needed but can move on with caution) -	C - 45%-64%
Not Satisfactory	0-8 <u>NS</u>	(not ready to progress, much more practice) -	D - 0%-44%



Nguzu Nguzu Mathematics

Standard Four