

New Syllabus

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PRIMARY MATHEMATICS

Teacher's
Resource Book



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CHAPTER 1

Numbers to 10

Estimated number of periods: 12

Lesson	Number of Periods	Learning Objectives	Learning Experiences	Textbook Learning	Workbook Practice	Pupil-centred Activities	Concrete Materials
1	5	<p>Counting to 10</p> <ul style="list-style-type: none"> Count to tell the number of objects in a given set. Read and write numbers in numerals and in words. 	<ul style="list-style-type: none"> Use 'counting all' to find the number of objects (pictorial and concrete) Recite the number sequence (0 to 10) forward and backward Spell number words in groups and independently Play games using dot cards, picture cards, numeral and number word cards for number recognition and matching 	<p>Textbook 1 P1 – 3</p> <p>Textbook 1 P4 – 6</p>	<p>Worksheet 1A Workbook 1A P1 – 4</p> <p>Worksheet 1B Workbook 1A P5 – 8</p>	<p>Teacher's Resource Book P3 – 4</p> <p>Textbook 1 P6</p>	<p>2-colour counters, picture cards, numeral cards</p> <p>Number word cards, dot cards, numeral cards, picture cards</p>
2	4	<p>Comparing and Ordering Numbers</p> <ul style="list-style-type: none"> Compare numbers. Arrange numbers in order. 	<ul style="list-style-type: none"> Use one-to-one correspondence to compare two sets of objects (using terms like 'more than', 'fewer than', 'the same as' or 'as many as') Order numbers using the terms 'greater than', 'smaller than', 'greatest' and 'smallest' 	<p>Textbook 1 P7 – 9</p> <p>Textbook 1 P10 – 12</p>	<p>Worksheet 2A Workbook 1A P9 – 12</p> <p>Worksheet 2B Workbook 1A P13 – 16</p>	<p>Textbook 1 P8</p> <p>Textbook 1 P11</p>	<p>–</p> <p>2-colour counters, numeral cards, dot cards, number word cards (1 – 10 for all cards)</p>
–	3	<p>Problem Solving, Maths Journal and Pupil Review</p>	<p>–</p>	<p>–</p>	<p>Review 1 Workbook 1A P17 – 18</p>	<p>Textbook 1 P13 Workbook 1A P16</p>	<p>–</p>

CHAPTER 2

Numbers Bonds

Estimated number of periods: 9

Lesson	Number of Periods	Learning Objectives	Learning Experiences	Textbook Learning	Workbook Practice	Pupil-centred Activities	Concrete Materials
1	7	<p>Making Number Bonds</p> <ul style="list-style-type: none"> • Make different number bonds for numbers up to 10. • Make number stories. 	<ul style="list-style-type: none"> • Use concrete objects to form different number bonds of a number up to 10 • Use pictures for pupils to articulate number bonds and form their own stories 	<p>Textbook 1 P14 – 17</p> <p>Textbook 1 P17 – 19</p>	<p>Worksheet 1A Workbook 1A P19 – 22</p> <p>Worksheet 1B Workbook 1A P17 – 19</p>	<p>Teacher's Resource Book P19</p> <p>Textbook 1 P18</p>	<p>2-colour counters, picture cards, numeral cards</p> <p>Number word cards, dot cards, numeral cards, picture cards</p>
–	2	<p>Problem Solving, Maths Journal and Pupil Review</p>	–	–	<p>Review 2 Workbook 1A P27 – 28</p>	<p>Textbook 1 P20 Workbook 1A P26</p>	–

CHAPTER 3

Addition Within 10

Estimated number of periods: 13

Lesson	Number of Periods	Learning Objectives	Learning Experiences	Textbook Learning	Workbook Practice	Pupil-centred Activities	Concrete Materials
1	4	<p>Ways to Add</p> <ul style="list-style-type: none"> Add using part-part-whole concept of number bonds. Add by using the count-on strategy. 	<ul style="list-style-type: none"> Use pictorial representations and concrete objects for the number bond concept to introduce and write the addition equation Use of 'counting all' strategy to add Use concrete objects and pictorial representations to reinforce addition using the 'counting on' strategy 	<p>Textbook 1 P21 – 23</p> <p>Textbook 1 P24 – 25</p>	<p>Worksheet 1A Workbook 1A P29</p> <p>Worksheet 1B Workbook 1A P31 – 34</p>	<p>Teacher's Resource Book P29</p> <p>Textbook 1 P25</p>	<p>Multilink cubes (2 colours)</p> <p>Multilink cubes, addition-fact cards</p>
2	2	<p>Making Addition Stories</p> <ul style="list-style-type: none"> Apply and reinforce learning of addition through making addition stories in the real world context. Two types of stories – 'putting together' and 'adding on'. 	<ul style="list-style-type: none"> Work in groups to make addition stories using concrete objects/pictures and write an addition equation for each story 	<p>Textbook 1 P26 – 28</p>	<p>Worksheet 2 Workbook 1A 35 – 38</p>	<p>Textbook 1 P27</p>	<p>Multilink cubes</p>
3	3	<p>Solving Picture Problems</p> <ul style="list-style-type: none"> Apply and reinforce learning of addition through solving addition problems presented in pictures. Two types of addition problems – 'putting together' and 'adding on'. 	<ul style="list-style-type: none"> Write addition equations and solve problems individually 	<p>Textbook 1 P29 – 31</p>	<p>Worksheet 3 Workbook 1A P39 – 41</p>	<p>–</p>	<p>–</p>
–	4	<p>Problem Solving, Maths Journal and Pupil Review</p>	<p>–</p>	<p>–</p>	<p>Review 3 Workbook 1A P43 – 46</p>	<p>Textbook 1 P31 – 32 Workbook 1A P42</p>	<p>–</p>

CHAPTER 4

Subtraction Within 10

Estimated number of periods: 14

Lesson	Number of Periods	Learning Objectives	Learning Experiences	Textbook Learning	Workbook Practice	Pupil-centred Activities	Concrete Materials
1	5	Ways to Subtract <ul style="list-style-type: none"> Subtract by crossing out (based on the take away concept). Subtract using number bonds (based on the part-whole concept). Subtract by counting back. 	<ul style="list-style-type: none"> Use pictorial representations and concrete objects to introduce the concept and write the subtraction equation Use concrete objects and pictorial representations to reinforce subtraction using the 'crossing out', 'counting back' and 'number bond' strategies 	Textbook 1 P33 – 35	Worksheet 1A Workbook 1A P47 – 48	Teacher's Resource Book P46	Mat, multilink cubes, 2-colour counters
				Textbook 1 P35 – 37	Worksheet 1B Workbook 1A P49 – 50	Teacher's Resource Book P50	Picture cards, number bond template
				Textbook 1 P37 – 39	Worksheet 1C Workbook 1A P51 – 52	Textbook 1 P39	Subtraction-fact cards
2	2	Making Subtraction Stories <ul style="list-style-type: none"> Apply and reinforce learning of subtraction through making subtraction stories in the real-world context. 	<ul style="list-style-type: none"> Work in groups to make subtraction stories using concrete objects/pictures and write a subtraction equation for each story 	Textbook 1 P40 – 41	Worksheet 2 Workbook 1A P53 – 56	Textbook 1 P41	Subtraction-fact cards
3	1	Solving Picture Problems <ul style="list-style-type: none"> Apply and reinforce the learning of subtraction through solving problems presented in pictures. 	<ul style="list-style-type: none"> Write subtraction equations and solve problems individually 	Textbook 1 P42 – 43	Worksheet 3 Workbook 1A P57 – 58	–	Picture cut-outs or magnetic buttons

4	2	<p>Addition and Subtraction</p> <ul style="list-style-type: none"> Relate addition and subtraction with the part-whole concept of number bonds. Write a family of related addition and subtraction facts. 	<ul style="list-style-type: none"> Use concrete objects to associate addition and subtraction through reversing the process of adding two sets of objects 	Textbook 1 P44 – 45	Worksheet 4 Workbook 1A P59 – 61	Teacher's Resource Book P59	Different types of counting objects, picture cut-outs, mini whiteboard
–	4	<p>Problem Solving, Maths Journal and Pupil Review</p>	–	–	Review 4 Workbook 1A P63 – 66	Textbook 1 P45 – 46 Workbook 1A P62	–

CHAPTER 5

Positions

Estimated number of periods: 10

Lesson	Number of Periods	Learning Objectives	Learning Experiences	Textbook Learning	Workbook Practice	Pupil-centred Activities	Concrete Materials
1	4	Naming Positions <ul style="list-style-type: none"> Use of ordinal numbers to name positions. Use position words to name relative positions. Note the importance of a reference point when naming positions. 	<ul style="list-style-type: none"> Create opportunities (such as queuing) for pupils to use ordinal numbers to tell positions 	Textbook 1 P47 – 50	Worksheet 1 Workbook 1A P67 – 70	–	Cards with positional names (in words and ordinal numbers)
2	4	Naming Left and Right Positions <ul style="list-style-type: none"> Use position words to name relative positions. Name relative positions in more than one way. 	<ul style="list-style-type: none"> Use real-life examples for pupils to tell the positions of objects either from the left or the right 	Textbook 1 P51 – 53	Worksheet 2 Workbook 1A P71 – 73	–	Family or class photograph
–	2	Problem Solving, Maths Journal and Pupil Review	–	–	Review 5 Workbook 1A P75 – 76	Textbook 1 P53 – 54 Workbook 1A P74	–

CHAPTER 6

Numbers to 20

Estimated number of periods: 13

Lesson	Number of Periods	Learning Objectives	Learning Experiences	Textbook Learning	Workbook Practice	Pupil-centred Activities	Concrete Materials
1	4	Counting to 20 <ul style="list-style-type: none"> Count on from 10, the numbers 11 to 20. Read and write 11 to 20 in words. 	<ul style="list-style-type: none"> Work in groups using concrete objects to make a group of ten and count on from 10 to tell the number (less than 20) Play games using dot cards, picture cards, numeral cards and number word cards etc. for number recognition and comparison 	Textbook 1 P55 – 58 Textbook 1 P59 – 60	Worksheet 1A Workbook 1A P86 – 89 Worksheet 1B Workbook 1A P90 – 93	Textbook 1 P58 Textbook 1 P60	2-colour counters Numeral cards, number word cards
2	4	Comparing and Ordering Numbers <ul style="list-style-type: none"> Compare numbers within 20. Arrange numbers in order. 	<ul style="list-style-type: none"> Use concrete objects and the base-ten set to represent and compare numbers in terms of tens and ones, and use language such as 'more than', 'fewer than', 'the same as' and 'as many as' to describe the comparison 	Textbook 1 P61 – 63 Textbook 1 P64 – 66	Worksheet 2A Workbook 1A 94 – 97 Worksheet 2B Workbook 1A 98 – 101	Textbook 1 P62 Textbook 1 P66	2-colour counters Numeral cards
3	2	Number Patterns <ul style="list-style-type: none"> Recognise and complete number patterns. 	<ul style="list-style-type: none"> Describe a given number pattern using language such as '1 more/less' or '10 more/less' before continuing the pattern or finding the missing number(s) 	Textbook 1 P67 – 69	Worksheet 3 Workbook 1A P102 – 105	Textbook 1 P68	Magnetic square tiles
–	3	Problem Solving, Maths Journal and Pupil Review	–	–	Review 6 Workbook 1A P106 – 109	Textbook 1 P69 – 70 Workbook 1A P105	–

CHAPTER 7

Addition and Subtraction

Within 20

Estimated number of periods: 16

Lesson	Number of Periods	Learning Objectives	Learning Experiences	Textbook Learning	Workbook Practice	Pupil-centred Activities	Concrete Materials
1	6	<p>Ways to Add</p> <ul style="list-style-type: none"> Add by counting on. Add by making 10. Add the ones. 	<ul style="list-style-type: none"> Use concrete objects and pictorial representations for pupils to explore the 'make 10' strategy in addition Use games to reinforce the 'make 10', 'counting on' and 'adding the ones' strategies for addition of numbers within 20 	Textbook 1 P71 – 73	Worksheet 1A Workbook 1A P110 – 111	Textbook 1 P73 Teacher's Resource Book P103	'0' to '9' dice, '1' to '6' dice, 2-colour counters, numeral cards, counting objects, ten frame
				Textbook 1 P74 – 77	Worksheet 1B Workbook 1A P112 – 115	Textbook 1 P76	Magnetic square tiles, numeral cards
				Textbook 1 P78 – 79	Worksheet 1C Workbook 1A P116 – 119	Textbook 1 P79	Numeral cards (10 – 15 and 1 – 4)
				Textbook 1 P80 – 81	Worksheet 2A Workbook 1A P120 – 121	Textbook 1 P81	'1' to '6' dice, 2-colour counters
				Textbook 1 P82	Worksheet 2B Workbook 1A P122 – 125	–	–
2	5	<p>Ways to Subtract</p> <ul style="list-style-type: none"> Subtract by counting back Subtract the ones Subtract from 10 	<ul style="list-style-type: none"> Use concrete objects and pictorial representations for pupils to explore the 'subtract from 10' strategy in subtraction Use games to reinforce the 'subtract from 10', 'counting back' and 'subtract the ones' strategies for subtraction of numbers within 20 	Textbook 1 P83 – 84	Worksheet 2C Workbook 1A P126 – 129	Textbook 1 P84	–

3	2	<p>Solving Word Problems</p> <ul style="list-style-type: none"> Apply and reinforce concepts of addition and subtraction through solving problems presented in pictures. 	<ul style="list-style-type: none"> Work in groups to make addition and subtraction stories using concrete objects/pictures and write an addition or subtraction equation for each story 	Textbook 1 P85 – 87	Worksheet 3 Workbook 1A P130 – 132	Textbook 1 P86	Numerical cards
–	3	<p>Problem Solving, Maths Journal and Pupil Review</p>	–	–	Review 7 Workbook 1A P134 – 135	Textbook 1 P87 –88 Workbook 1A P133	–

CHAPTER 8

Shapes and Patterns

Estimated number of periods: 16

Lesson	Number of Periods	Learning Objectives	Learning Experiences	Textbook Learning	Workbook Practice	Pupil-centred Activities	Concrete Materials
1	10	<p>Recognising and Grouping Shapes</p> <ul style="list-style-type: none"> Identify and name two-dimensional shapes. Describe and classify two-dimensional shapes. 	<ul style="list-style-type: none"> Recognise, name and describe the 4 basic 2D shapes (rectangle, square, circle and triangle) from real objects and pictures (drawings and photographs) Trace the outline of 2D shapes from 3D objects Identify and describe 2D shapes in different sizes and orientations Guess a 2D shape from a description of the shape Recognise and describe the differences/similarities between two 2D shapes according to attributes such as sides, corners, sizes and colours 	<p>Textbook 1 P89 – 92</p> <p>Textbook 1 P92 – 94</p>	<p>Worksheet 1A Workbook 1A P136 – 141</p> <p>Worksheet 1B Workbook 1A P142 – 143</p>	<p>Textbook 1 P91</p> <p>Textbook 1 P94 Activity Handbook 1 P27</p>	<p>Three-dimensional objects</p> <p>Assorted shapes pack</p>

2	4	<p>Recognising Patterns</p> <ul style="list-style-type: none"> Use shapes to make patterns. Complete patterns involving shapes. 	<ul style="list-style-type: none"> Work in groups to sort 2D shapes in different ways and explain how the shapes are sorted Use 2D shapes or applets to create patterns according to one or two attributes (size, shape, colour and orientation) and describe the patterns Work in groups to create a pattern and invite other groups to guess the missing shape(s) in the pattern and explain the pattern 	Textbook 1 P95 – 97	Worksheet 2 Workbook 1A P144 – 145	Textbook 1 P96	-
-	2	<p>Problem Solving and Pupil Review</p>	<ul style="list-style-type: none"> Form a 2D shape from cut-out pieces of the shape 	-	Review 8 Workbook 1A P148 – 49	Textbook 1 P97 – 98 Workbook 1A P146 – 147	-

CHAPTER 9

Length

Estimated number of periods: 7

Lesson	Number of Periods	Learning Objectives	Learning Experiences	Textbook Learning	Workbook Practice	Pupil-centred Activities	Concrete Materials
1	3	Comparing Objects <ul style="list-style-type: none"> Compare lengths of things using correct terms. 	<ul style="list-style-type: none"> Compare and sort real-world objects to develop the idea that length is a measure of how long an object is Use language of 'longer than', 'shorter than', etc. to describe lengths 	Textbook 1 P99 – 101	Worksheet 1 Workbook 1A P150 – 153	Textbook 1 P101	Coloured paper, scissors
2	2	Finding the Lengths of Objects <ul style="list-style-type: none"> Measure the lengths of objects using non-standard units. Compare lengths of objects using non-standard units. 	<ul style="list-style-type: none"> Estimate the length of an object before measuring it and use the word 'about' to describe the measurement Work in groups to measure length using a variety of non-standard units such as body parts, paper clips and common objects in their environment and explain their choices of units and how the measurement is done 	Textbook 1 P102 – 103 Textbook 1 P104 – 106	Worksheet 2A Workbook 1A P154 – 157 Worksheet 2B Workbook 1A P158	Textbook 1 P103 Textbook 1 P105	Paper clips Giant footprint pack
–	2	Problem Solving, Maths Journal and Pupil Review	–	–	Review 9 Workbook 1A P160 – 163	Textbook 1 P107 – 108 Workbook 1A P159	–

CHAPTER 10

Numbers to 40

Estimated number of periods: 14

Lesson	Number of Periods	Learning Objectives	Learning Experiences	Textbook Learning	Workbook Practice	Pupil-centred Activities	Concrete Materials
1	3	<p>Counting to 40</p> <ul style="list-style-type: none"> Count on to 40, numbers 21 to 40. Read and write the numbers 21 to 40 in numerals and in words. 	<ul style="list-style-type: none"> Work in groups using concrete objects to make groups of ten and count tens and ones to tell the number (more than 20) 	<p>Textbook 1 P109 – 112</p> <p>Textbook 1 P112 – 114</p>	<p>Worksheet 1A Workbook 1A P164 – 167</p> <p>Worksheet 1B Workbook 1A P168 – 169</p>	<p>Textbook 1 P111</p> <p>–</p>	<p>Multilink cubes</p> <p>–</p>
2	2	<p>Place Value</p> <ul style="list-style-type: none"> Interpret a 2-digit number in terms of tens and ones. 	<ul style="list-style-type: none"> Use base-ten sets and place-value chart to represent numbers in tens and ones Express a 2-digit number in terms of tens and ones 	<p>Textbook 1 P115 – 116</p>	<p>Worksheet 2 Workbook 1B P170 – 173</p>	<p>Textbook 1 P116</p>	<p>Base-ten blocks, place value chart</p>
3	4	<p>Comparing and Ordering Numbers</p> <ul style="list-style-type: none"> Compare and arrange 2-digit numbers within 40. Compare numbers by subtraction. 	<ul style="list-style-type: none"> Use concrete objects and the base-ten set to represent and compare numbers in terms of tens and ones, and use language such as ‘more than’, ‘fewer than’, ‘the same as’ and ‘as many as’ to describe the comparison 	<p>Textbook 1 P117 – 120</p> <p>Textbook 1 P121 – 122</p>	<p>Worksheet 3A Workbook 1A P174 – 177</p> <p>Worksheet 3B Workbook 1A P178 – 179</p>	<p>Textbook 1 P120</p> <p>Teacher’s Resource Book P164</p>	<p>Base-ten blocks, place value chart</p> <p>–</p>
4	2	<p>Number Patterns</p> <ul style="list-style-type: none"> Recognise and complete number patterns. 	<ul style="list-style-type: none"> Describe a given number pattern using language such as ‘1 more/less’ or ‘10 more/less’ before continuing the pattern or finding the missing number(s) 	<p>Textbook 1 P123 – 126</p>	<p>Worksheet 4 Workbook 1A P180</p>	<p>Textbook 1 P125</p>	<p>2-colour counters</p>

-	3	Problem Solving and Pupil Review	-	-	-	Review 10 Workbook 1A P182 – 185	Textbook 1 P126 – 127 Workbook 1A P181	-
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CHAPTER 11

Addition and Subtraction

Within 40

Estimated number of periods: 15

Lesson	Number of Periods	Learning Objectives	Learning Experiences	Textbook Learning	Workbook Practice	Pupil-centred Activities	Concrete Materials
1	2	Addition <ul style="list-style-type: none"> Add a 2-digit number and a 1-digit number. Add a 2-digit number and tens. Add two 2-digit numbers. Add using standard algorithm. 	<ul style="list-style-type: none"> Use of base-ten blocks to model the process of standard algorithm in addition within 40, with and without regrouping Use of activities to reinforce mental strategies of 'counting on' and 'make 10' in addition 	Textbook 1 P128 – 131	Worksheet 1 Workbook 1A P186 – 189	Teacher's Resource Book P176	Base-ten blocks
2	2	Addition With Regrouping <ul style="list-style-type: none"> Add a 2-digit number and a 1-digit number with regrouping, using the standard algorithm. Add two 2-digit numbers with regrouping, using the standard algorithm. 	<ul style="list-style-type: none"> Use of base-ten blocks to model the process of standard algorithm for subtraction within 40 with and without regrouping Use of activities to reinforce mental strategies of 'counting back' and 'subtract from 10' in subtraction 	Textbook 1 P132 – 133	Worksheet 2 Workbook 1A P190 – 191	–	–
3	2	Subtraction <ul style="list-style-type: none"> Subtract a 1-digit number from a 2-digit number. Subtract tens from a 2-digit number. Subtract a 2-digit number from a 2-digit numbers. Subtract using the standard algorithm. 	<ul style="list-style-type: none"> Explore different ways to add three 1-digit numbers 	Textbook 1 P134 – 136	Worksheet 3 Workbook 1A P192 – 195	–	–

4	2	<p>Subtraction with Regrouping</p> <ul style="list-style-type: none"> Subtract a 1-digit number from a 2-digit number with regrouping, using the standard algorithm. Subtract a 2-digit number from a 2-digit number with regrouping, using the standard algorithm. 	–	Textbook 1 P137 – 138	Worksheet 4 Workbook 1A P196 – 197	–	–
5	3	<p>Adding Three Numbers</p> <ul style="list-style-type: none"> Add three 1-digit numbers. 	–	Textbook 1 P139 – 141	Worksheet 5 Workbook 1A P198 – 200	Teacher's Resource Book P192	'0' to '9' dice
–	4	<p>Problem Solving, Maths Journal and Pupil Review</p>	–	–	Review 11 Workbook 1A P202 – 203	Textbook 1 P140 – 141 Workbook 1A P201	–

CHAPTER 12

More Word Problems

Estimated number of periods: 5

Lesson	Number of Periods	Learning Objectives	Learning Experiences	Textbook Learning	Workbook Practice	Pupil-centred Activities	Concrete Materials
1	3	Solving Word Problems <ul style="list-style-type: none"> Solve addition and subtraction 1-step word problems involving the part-part-whole concept. Solve addition and subtraction 1-step word problems involving the comparison concept. 	<ul style="list-style-type: none"> Use concrete models to translate the story problem into part-part-whole or comparison structure to help pupils in applying the appropriate operation to solve the problem 	Textbook 1 P142 – 145	Worksheet 1 Workbook 1B P1 – 4	–	Multilink cubes
–	2	Problem Solving, Maths Journal and Pupil Review	–	–	Review 12 Workbook 1B P5 – 6	Textbook 1 P146 Workbook 1B P4	–

CHAPTER 13

Multiplication

Estimated number of periods: 8

Lesson	Number of Periods	Learning Objectives	Learning Experiences	Textbook Learning	Workbook Practice	Pupil-centred Activities	Concrete Materials
1	2	Adding Equal Groups <ul style="list-style-type: none"> Illustrate multiplication as repeated addition. Add equal groups to find the total number of objects. 	<ul style="list-style-type: none"> Make equal groups using concrete objects and count the total number of objects in the groups by repeated addition using language such as '2 groups of 5' and '2 fives' 	Textbook 1 P147 – 150	Worksheet 1 Workbook 1B P7 – 10	Textbook 1 P149	2-colour counters, paper plates
2	2	Making Multiplication Stories <ul style="list-style-type: none"> Make multiplication stories and use the multiplication sign (\times) to write the mathematical equation for a given situation. 	<ul style="list-style-type: none"> Work in groups to make multiplication stories using objects or pictures 	Textbook 1 P151 – 152	Worksheet 2 Workbook 1B P11 – 14	Teacher's Resource Book P214	–
3	2	Solving Word Problems <ul style="list-style-type: none"> Solve 1-step word problems with pictorial representation. 	<ul style="list-style-type: none"> Translate a story word problem into a multiplication equation and solve it 	Textbook 1 P153 – 155	Worksheet 3 Workbook 1B P15 – 17	–	–
–	2	Problem Solving, Maths Journal and Pupil Review	–	–	Review 13 Workbook 1B P19 – 22	Textbook 1 P155 – 156 Workbook 1B P18	2-colour counters

CHAPTER 14

Division

Estimated number of periods: 7

Lesson	Number of Periods	Learning Objectives	Learning Experiences	Textbook Learning	Workbook Practice	Pupil-centred Activities	Concrete Materials
1	2	Grouping <ul style="list-style-type: none"> Illustrate the grouping concept of division. Find the number of equal groups. 	<ul style="list-style-type: none"> Divide a set of concrete objects into equal groups, and discuss the grouping and sharing concepts of division 	Textbook 1 P157 – 160	Worksheet 1 Workbook 1B P23 – 26	Textbook 1 P159	2-colour counters, paper plates
2	2	Sharing Equally <ul style="list-style-type: none"> Share things equally. Find the number of things in each group. 	<ul style="list-style-type: none"> Share a given number of concrete objects/picture cut-outs and explain how the sharing is done and whether the objects can be shared equally 	Textbook 1 P161 – 163	Worksheet 2 Workbook 1B P27 – 32	Textbook 1 P162	Multilink cubes, paper plates
–	3	Problem Solving, Maths Journal and Pupil Review	–	–	Review 14 Workbook 1B P33 – 38	Textbook 1 P163 – 164 Workbook 1B P32	2-colour counters, paper plates, A4 paper, stickers

CHAPTER 15

Numbers to 100

Estimated number of periods: 10

Lesson	Number of Periods	Learning Objectives	Learning Experiences	Textbook Learning	Workbook Practice	Pupil-centred Activities	Concrete Materials
1	2	Counting to 100 <ul style="list-style-type: none"> Count to 100 in steps of 10. Read and write numbers to 100 in numerals and in words. 	<ul style="list-style-type: none"> Work in groups using concrete objects to estimate the number of objects in a set before counting and make sense of the size of 100 	Textbook 1 P165 – 168	Worksheet 1 Workbook 1B P39 – 42	Textbook 1 P168	Base-ten blocks
2	2	Place Value <ul style="list-style-type: none"> Use a place-value chart to show 2-digit numbers within 100. Interpret numbers within 100 in tens and ones. 	<ul style="list-style-type: none"> Work in groups using concrete objects to make groups of ten and count tens and ones to tell the number (more than 40) 	Textbook 1 P169 – 170	Worksheet 2 Workbook 1B P43 – 46	Textbook 1 P170	Base-ten blocks, place value chart
3	2	Comparing and Ordering Numbers <ul style="list-style-type: none"> Compare and order numbers within 100. 	<ul style="list-style-type: none"> Use base-ten set and place-value chart to represent numbers in tens and ones and express a 2-digit number in terms of tens and ones within 100 	Textbook 1 P171 – 173	Worksheet 3 Workbook 1B P47 – 52	Textbook 1 P173	Numeral cards
4	2	Number Patterns <ul style="list-style-type: none"> Recognise and make number patterns. 	<ul style="list-style-type: none"> Describe a given number pattern using language such as '1 more/less' or '10 more/less' before continuing the pattern or finding the missing number(s) 	Textbook 1 P174 – 178	Worksheet 4 P53 – 54	Teacher's Resource Book P248	2-colour counters, spinner
–	2	Problem Solving, Maths Journal and Pupil Review	–	–	Review 15 Workbook 1B P55 – 56	Textbook 1 P178 – 179 Workbook 1B P54	2-colour counters, paper plates, A4 paper, stickers

CHAPTER 16

Addition and Subtraction

Within 100

Estimated number of periods: 13

Lesson	Number of Periods	Learning Objectives	Learning Experiences	Textbook Learning	Workbook Practice	Pupil-centred Activities	Concrete Materials
1		Addition <ul style="list-style-type: none"> Add two numbers without regrouping. 	<ul style="list-style-type: none"> Use strategies such as 'count on' and 'make ten' for addition within 100 	Textbook 1 P180 – 184	Worksheet 1 Workbook 1B P57 – 62	Textbook 1 P184	Numeral cards (0 – 3 and 10 – 90), '1' to '6' dice
2	5	Addition with Regrouping <ul style="list-style-type: none"> Add two numbers with regrouping. 	<ul style="list-style-type: none"> Use base-ten set to illustrate the standard algorithms for addition of 2-digit numbers Use of activities to reinforce mental strategies of 'counting on' and 'make 10' in addition 	Textbook 1 P185 – 187	Worksheet 2 Workbook 1B P63 – 64	Textbook 1 P186	Numeral cards (1 – 9 and 10 – 80), '1' to '6' dice
3		Subtraction <ul style="list-style-type: none"> Subtract a number from a 2-digit number without regrouping. 	<ul style="list-style-type: none"> Use strategies such as 'count back' and 'subtract from 10' for subtraction within 100 	Textbook 1 P188 – 192	Worksheet 3 Workbook 1B P65 – 70	Textbook 1 P191	Numeral cards (6 – 9 and 10 – 90), '1' to '6' dice
4	5	Subtraction with Regrouping <ul style="list-style-type: none"> Subtract a number from a 2-digit number with regrouping. 	<ul style="list-style-type: none"> Use the base-ten set to illustrate the standard algorithms for subtraction of 2-digit numbers Use of activities to reinforce mental strategies of 'counting back' and 'subtract from 10' in subtraction 	Textbook 1 P193 – 195	Worksheet 4 Workbook 1B P71 – 72	Textbook 1 P195	'1' to '6' dice
–	3	Problem Solving, Maths Journal and Pupil Review	–	–	Review 16 Workbook 1B P73 – 74	Textbook 1 P196 Workbook 1B P72	–

CHAPTER 17

Halves and Quarters

Estimated number of periods: 4

Lesson	Number of Periods	Learning Objectives	Learning Experiences	Textbook Learning	Workbook Practice	Pupil-centred Activities	Concrete Materials
1	2	Halves and Quarters <ul style="list-style-type: none"> Understand half and quarter as part of a whole. 	<ul style="list-style-type: none"> Recognise and name halves and quarters. Give examples of halves and wholes using real-life objects. 	Textbook 1 P197 – 200	Worksheet 1 Workbook 1B P84	Textbook 1 P199	A4 paper, fraction discs, pencils
–	2	Problem Solving, Maths Journal and Pupil Review	–	–	Review 17 Workbook 2B P86	Textbook 1 P200 – 201 Workbook 1B P85	–

CHAPTER 18

Time

Estimated number of periods: 12

Lesson	Number of Periods	Learning Objectives	Learning Experiences	Textbook Learning	Workbook Practice	Pupil-centred Activities	Concrete Materials
1	5	Telling Time to the Hour <ul style="list-style-type: none"> Read and tell time to the hour. 	<ul style="list-style-type: none"> Sequence events according to time and explain the appropriateness of events at different times of the day, e.g. lunch at 3 o'clock in the afternoon 	Textbook 1 P202 – 205	Worksheet 1 Workbook 1B P87 – 90	Textbook 1 P204	12-h demonstration geared clock
2	5	Telling Time to the Half Hour <ul style="list-style-type: none"> Read and tell time to the half hour. Show time to the hour on a clock. Show time to the half hour on a clock. Relate activities to the correct time of the day. 	<ul style="list-style-type: none"> Tell time from a clock face and relate time to the events of a day using 'o'clock' and 'half past' 	Textbook 1 P206 – 208	Worksheet 2 Workbook 1B P91 – 94	–	–
–	2	Problem Solving, Maths Journal and Pupil Review	–	–	Review 18 Workbook 1B P97 – 100	Textbook 1 P209 – 210 Workbook 1B P95 - 96	12-h demonstration geared clock

CHAPTER 19

Money

Estimated number of periods: 20

Lesson	Number of Periods	Learning Objectives	Learning Experiences	Textbook Learning	Workbook Practice	Pupil-centred Activities	Concrete Materials
1	4	<p>Recognising Our Coins and Notes</p> <ul style="list-style-type: none"> Recognise and use correct notations to name both coins and notes used in Pakistan. 	<ul style="list-style-type: none"> Communicate and share their shopping experiences Recognise coins and notes of different denominations, count money from the highest to the lowest denomination and represent money using \$ and ϕ symbols 	Textbook 1 P211 – 214	Worksheet 1 Workbook 1B P101 – 102	Textbook 1 P213	Specimens of Pakistani notes and coins
2	6	<p>Counting Money</p> <ul style="list-style-type: none"> Count and tell a given amount of money. 	<ul style="list-style-type: none"> Compare amounts of money using play money, and realise that when comparing two sets of notes (or coins), it is their values that are being compared and not the number of notes (or coins) 	Textbook 1 P215 – 217	Worksheet 2 Workbook 1B P103 – 104	Textbook 1 P217	Play money, envelopes
3	4	<p>Exchanging Money</p> <ul style="list-style-type: none"> Exchange coins or notes of one denomination for a set of coins or notes with an equal value. 	<ul style="list-style-type: none"> Match a coin/note of one denomination to an equivalent set of coins/notes of another denomination using play money, and realise that a greater number of coins/notes is not necessarily a greater amount of money 	Textbook 1 P218 – 220	Worksheet 3 Workbook 1B P105 – 106	Textbook 1 P220, Teacher's Activity Handbook 1 P60 – 61	Play money

4	4	<p>Solving Word Problems</p> <ul style="list-style-type: none"> Add or subtract money in dollars through real-life context of purchase and saving. Solve 1-step word problems involving addition or subtraction of money. 	<ul style="list-style-type: none"> Work in groups using play money to add, subtract and make change during shopping activities 	Textbook 1 P221 – 224	Worksheet 4 Workbook 1B P107 – 108	Textbook 1 P224	Play money, shopping cards
–	2	<p>Problem Solving, Maths Journal and Pupil Review</p>	–	–	Review 19 Workbook 1B P111 – 112	Textbook 1 P224 – 225 Workbook 1B P109 - 110	Play money

CHAPTER 20

Volume

Estimated number of periods: 4

Lesson	Number of Periods	Learning Objectives	Learning Experiences	Textbook Learning	Workbook Practice	Pupil-centred Activities	Concrete Materials
1	4	Comparing Volumes <ul style="list-style-type: none"> Measure and compare volumes of liquid using a non standard unit. 	<ul style="list-style-type: none"> Use everyday examples to develop a sense of how much 1 litre of liquid is, e.g. using a bottle of mineral water/cooking oil, and 1-litre containers in different shapes. 	Textbook 1 P226 – 227	–	Textbook 1 P227	Containers of various shapes and sizes
				Textbook 1 P228 – 232	Worksheet 1 Workbook 1 P113 – 117	Textbook 1 P231	1-litre bottle, 1-litre beaker/ container
–	2	Problem Solving, Maths Journal and Pupil Review	–	–	Review 20 Workbook 1B P118 - 120	Textbook 1 233	

CHAPTER 21

Picture Graphs

Estimated number of periods: 9

Lesson	Number of Periods	Learning Objectives	Learning Experiences	Textbook Learning	Workbook Practice	Pupil-centred Activities	Concrete Materials
1	6	<p>Reading Picture Graphs</p> <ul style="list-style-type: none"> Collect and show information on a picture graph. Interpret the information shown on a picture graph. 	<ul style="list-style-type: none"> Work in groups to collect data from the class to answer questions such as ‘What kind of fruits do we like?’ and use the data to make a picture graph for display Discuss and describe the data presented in a picture graph using language such as ‘most’, ‘least’, ‘greatest’, ‘smallest’, ‘as much as’ and ‘as many as’ 	Textbook 1 P234 – 237	Worksheet 1 Workbook 1B P121 – 127	Textbook 1 P236	Drawing block, markers
–	3	<p>Problem Solving, Maths Journal and Pupil Review</p>	<ul style="list-style-type: none"> Represent picture graphs in both vertical and horizontal forms, and make a story using information from a graph 	–	Review 21 Workbook 1B P129 – 130	Textbook 1 P238 – 239 Workbook 1B P128	2-colour counters

CHAPTER 22

Clockwise and Anticlockwise Movement

Estimated number of periods: 4

Anticlockwise Movement

Lesson	Number of Periods	Learning Objectives	Learning Experiences	Textbook Learning	Workbook Practice	Pupil-centred Activities	Concrete Materials
1	2	Clockwise and Anticlockwise Movement <ul style="list-style-type: none"> Use 'clockwise' and 'anticlockwise' to describe movements. Describe less than a whole turn in terms of half and quarters. 	<ul style="list-style-type: none"> Describe the movement of objects Use real-life objects to relate movement to 	Textbook 1 P240 – 243	Worksheet 1 Workbook 1B P131 – 132	Textbook 1 P242	Direction cards, 12-h demonstration geared clock, steering wheel of a toy car, flag, music player
–	2	Problem Solving, Maths Journal and Pupil Review	–	–	Review 22 Workbook 1B P133	Textbook 1 P244 – 245 Workbook 1B P132	

SYLLABUS MATCHING GRID

CAMBRIDGE PRIMARY MATHEMATICS STAGE 1

Learning Objective	Reference
1. Number	
Numbers and the number system	
Recite numbers in order (forwards from 1 to 100, backwards from 20 to 0).	Chapters 1, 6 and 16
Read and write numerals from 0 to 20.	Chapters 1 and 6
Count objects up to 20, recognising conservation of number.	Chapters 1 and 6
Count on in tens from zero or a single-digit number to 100 or just over.	Chapter 15
Count on in twos, beginning to recognise odd/even numbers to 20 as 'every other number'.	Book 2
Begin partitioning two-digit numbers into tens and ones and reverse.	Chapters 10 and 15
Within the range 0 to 30, say the number that is 1 or 10 more or less than any given number.	Chapters 6, 10 and 15
Use more or less to compare two numbers, and give a number which lies between them.	Chapters 6, 10 and 15
Order numbers to at least 20 positioning on a number track; use ordinal numbers.	Chapters 5 and 10
Use the = sign to represent equality.	Chapter 3
Give a sensible estimate of some objects that can be checked by counting, e.g. to 30.	Book 2
Find halves of small numbers and shapes by folding, and recognise which shapes are halved.	Chapter 17
2. Calculation	
Mental strategies	
Know all number pairs to 10 and record the related addition/subtraction facts.	Chapters 2, 3 and 4
Begin to know number pairs to 6, 7, 8, 9 and 10.	Chapter 2
Add more than two small numbers, spotting pairs to 10, e.g. $4 + 3 + 6 = 10 + 3$.	Chapter 11
Begin using pairs to 10 to bridge 10 when adding/subtracting, e.g. $8 + 3$, add 2, then 1.	Chapter 7
Know doubles to at least double 5.	Chapter 7
Find near doubles using doubles already known, e.g. $5 + 6$.	Chapter 7
Begin to recognise multiples of 2 and 10.	Book 2
Addition and Subtraction	
Understand addition as counting on and combining two sets; record related addition sentences.	Chapters 3, 7, 11 and 16
Understand subtraction as counting back and 'take away'; record related subtraction sentences.	Chapters 4, 7, 11 and 16
Understand difference as 'how many more to make?'	Chapter 4
Add/subtract a single-digit number by counting on/back.	Chapters 3 and 4
Find two more or less than a number to 20, recording the jumps on a number line.	Chapter 15
Relate counting on and back in tens to finding 10 more/less than a number (< 100).	Chapter 15
Begin to use the +, – and = signs to record calculations in number sentences.	Chapters 3 and 4
Understand that changing the order of addition does not change the total.	Chapter 7
Add a pair of numbers by putting the larger number first and counting on.	Chapters 3, 7, 11 and 16
Recognise the use of a sign such as \square to represent an unknown, e.g. $6 + \square = 10$.	Chapters 3 and 4
Begin to add single- and two-digit numbers.	Chapter 7
Multiplication and division	
Double any single-digit number.	Chapter 13
Find halves of even numbers of objects up to 10.	Chapter 14
Try to share numbers to 10 to find which are even and which are odd.	Book 2
Share objects into two equal groups in a context.	Chapter 14

3. Geometry

Shapes and geometric reasoning

Name and sort common 2D shapes (e.g. circles, squares, rectangles and triangles) using features such as number of sides, curved or straight. Use them to make patterns and models. Chapter 8

Name and sort common 3D shapes (e.g. cube, cuboid, cylinder, cone and sphere) using features such as number of faces, flat or curved faces. Use them to make patterns and models. Book 2

Recognise basic line symmetry. Book 2

Position and movement

Use everyday language of direction and distance to describe movement of objects. Chapters 5 and 22

4. Measure

Money

Recognise all coins and work out how to pay an exact sum using smaller coins. Chapter 19

Length, mass and capacity

Compare lengths and weights by direct comparison, then by using uniform non-standard units. Chapter 9

Estimate and compare capacities by direct comparison, then by using uniform non-standard units. Chapter 20

Use comparative language, e.g. longer, shorter, heavier, lighter. Chapter 9

Time

Begin to understand and use some units of time, e.g. minutes, hours, days, weeks, months and years. Book 2

Read the time to the hour (o'clock) and know key times of day to the nearest hour. Chapter 18

Order the days of the week and other familiar events. Pre-Primary Mathematics Book C3

5. Handling data

Organising, categorising and representing data

Answer a question by sorting and organising data or objects in a variety of ways, e.g.
– using block graphs and pictograms with practical resources; discussing the results
– in lists and tables with practical resources; discussing the results
– in Venn or Carroll diagrams giving different criteria for grouping the same objects Chapter 22

6. Problem solving

Using techniques and skills in solving mathematical problems

Choose appropriate strategies to carry out calculations, explaining working out. Chapter 12

Explore number problems and puzzles. Chapters 7, 12 and 15

Find many combinations, e.g. combinations of three pieces of different coloured clothing. Book 3

Decide to add or subtract to solve a simple word problem (oral), and represent it with objects. Chapters 7, 12 and 15

Check the answer to an addition by adding the numbers in a different order Chapter 7

Check the answer to a subtraction by adding the answer to the smaller number in the question. Chapter 12

Describe and continue patterns such as count on and back in tens, e.g. 90, 80, 70. Chapter 15

Identify simple relationships between numbers and shapes, e.g. this number is ten bigger than that number. Chapters 1, 6, 10 and 15

Make a sensible estimate of a calculation, and consider whether an answer is reasonable. Chapter 9

INTRODUCTION

The Teacher's Resource Book has been designed to promote good teaching practices for teachers to effectively implement the Primary Mathematics Curriculum.

This series provides teachers with the flexibility to choose the elements that are right for their learners. The key focus in Lower Primary Mathematics comprise of the following:

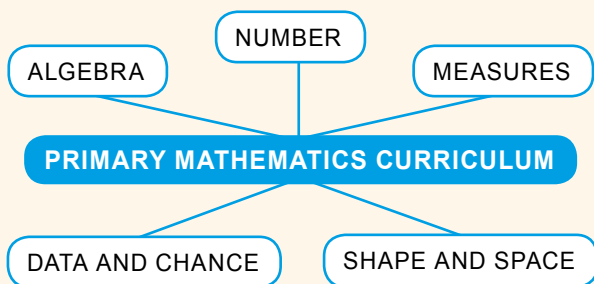
1. pupil-centred learning
2. active participation
3. problem solving
4. critical thinking
5. real-life contextual exercises
6. mathematical communication and reasoning

Teachers must provide a conducive environment for learning Mathematics in the classroom that encourages creativity and enjoyment. When introducing a concept to pupils, teachers need to ensure that pupils are able to relate mathematical activities and problems to relevant and real-life situations. Teaching mathematical concepts in real-life contexts and providing hands-on experience assist pupils to understand the concepts. Therefore, teachers need to provide mathematical contexts that are relevant to the pupils. Pupils need to apply the concepts and skills in various areas of Mathematics to find solutions to problems involving real-life situations. This series engages the pupils to learn by the Concrete-Pictorial-Abstract (C-P-A) approach:

Exploring concepts using **concrete** materials, leading to the use of **pictorial** representations and then, the **abstract**. Using this approach, pupils are first introduced to a concept through real-life examples or hands-on activities. The exercises then progress with the help of pictorial representations. Once they have a good understanding of the concept, mathematical notation; symbols and computations are introduced to achieve mastery in the abstract.

The Teacher's Resource Book provides instructions on the use of resources to help them carry out the abovementioned objectives. If a concept is taught in a comprehensive manner with clear instructions supplemented with hands-on activities and practice, most pupils would be able to achieve the set assessment target. Each pupil has a set pattern and pace of grasping concepts, but the expectation is the plateau of mathematical competency for all. In this regard, the Teacher's Resource Book serves as a support to teachers using this series.

The five main strands of the Primary Mathematics Curriculum are:



The Teacher's Resource Book supports a meaningful and holistic approach to teaching the strands of Mathematics. The buildup of concepts throughout this series is progressive and comprehensive.

With the implementation of hands-on activities, the learning of a mathematical concept is complemented with experiences that make learning Mathematics enjoyable and give pupils the ownership of independent and group practices. Multiple strategies are implemented through activities in the form of games, model work, standard and non-standard materials and resources. The Teacher's Resource Book facilitates teachers to implement this aspect of the series proficiently. The Teacher's Resource Book provides a structure whereby teachers and coordinators can select, combine and improvise various pedagogical practices for the pupil-centric textbook and workbooks.

In this regard, the Teacher's Resource Book provides the following elements:

- **Scheme of Work** - A tabulated guide showing a breakdown of each lesson's learning objectives, learning experiences, page references of relevant resources, concrete materials required and suggested number of periods required to conduct the lesson, keeping in mind the level of difficulty of the content.
- **Syllabus Matching Grid** - A tabulated guide referring the chapters in this series to the learning objectives of the Cambridge Primary Mathematics curriculum.
- **Exposition of Lessons** - A guide for teachers to prepare and conduct lessons.
- **Answers** - Solutions to questions in the textbook and workbook are provided, along with detailed steps where required.
- **Activities** - Additional activities to assist teachers to support struggling learners and challenge advanced learners.
- **Lesson Plans** - Detailed lesson plans for the lessons to formalise the teaching approach for the teachers. It encompasses prior learning, pre-emptive pitfalls, introduction, problem solving and mathematical communication support.
- **Navigating through the Assessment Activities and Exercises** - An essay explaining to teachers how to use the resources provided effectively when conducting the lessons. The resources include formative and progressive exercises, activities and assessments provided in the textbook and workbook.
- **Activity Handbook** - Activity templates and worksheets for pupils to use when carrying out activities and to supplement the lessons.

NUMBERS TO 10

CHAPTER

1



Related Resources

NSPM Textbook 1 (P1 – 13)
NSPM Workbook 1A (P1 – 18)

Materials

2-colour counters, multilink cubes, magnetic square tiles, picture cards, dot cards, number word cards and numeral cards

Lesson

Lesson 1 Counting to 10
Lesson 2 Comparing and Ordering Numbers

Problem Solving, Maths Journal and Pupil Review

INTRODUCTION

Most pupils coming to Primary 1 would be able to count by rote and learn the numbers up to ten and beyond at the kindergarten level. The goals of this chapter are to enable pupils to count the number of objects in a set with one-to-one correspondence; to read and write the number names and symbols in sequence; to compare the number of objects in two or more sets using terms: **as many as**, **more than** and **fewer than**; as well as order numbers using the terms: **smaller than**, **greater than**, **smallest** and **greatest**.

LESSON

1

COUNTING TO 10

LEARNING OBJECTIVES

1. Count to tell the number of objects in a given set.
2. Read and write numbers in numerals and in words.

Numbers to 10


CHAPTER 1




How many balls are there?

COUNTING TO 10

LESSON 1



IN FOCUS



Count.
How many balls are there?

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NUMBERS TO 10 1

IN FOCUS

Use the chapter opener (P1) to discuss with pupils the things they see in the cupboard.

Ask the pupils the following questions:

- What do you see in the cupboard?
- Name one thing that you see in the cupboard.
- Do you have any of these things at home?
- How many balls are there?

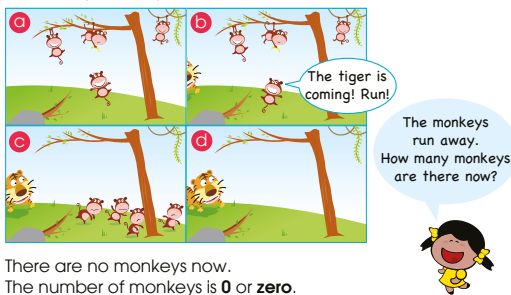
Count with the pupils, starting with the biggest ball. Stress that there are seven balls on the shelf, and then write the numeral on the board.

Textbook 1 P1

1. Count the things in the cupboard.

	1		6
	2		7
	3		8
	4		9
	5		10

2. How many monkeys are there?



There are no monkeys now.
The number of monkeys is **0** or **zero**.

2

CHAPTER 1

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Textbook 1 P2

Continue the activity by getting the pupils to count other things in the cupboard. Point at the items as you count to show a one-to-one correspondence. Stress the last number to emphasise that it is the total number of things in that set.

Get some volunteers to count the remaining things. Write the numeral on the board each time the pupils are done with counting.

Referring back to Let's Learn 1, point to each numeral in the picture and get the pupils to say the numbers out loud. Demonstrate the writing of each numeral in the air and ask the pupils to follow. After the revision exercise, get the pupils to write the numerals on their mini whiteboards.

Let's Learn 2 introduces the concept of 'zero'. Encourage pupils to discuss what they see in the pictures.

Lead the discussion with the following questions:

- How many monkeys were there at the start?
- How many monkeys were left after the tiger came?

Introduce the term **zero** and the numeral **0**. Get the pupils to write the numeral in the air, then write it again on their mini whiteboard. Check the pupils' boards to ensure that they wrote correctly.

Activity

Counting the number of objects in sets of 1 to 10

Materials

Counters, sets of numeral cards and picture cards (1 to 10)

Procedure

Demonstrate these steps before getting the pupils to work in pairs.

1. Show a picture card and say the number of things (e.g. seven apples).
2. Ask the pupils to count out loud using counters.
3. Take out a set of counters. Ask the pupils to show the number of counters present using a numeral card.
4. Ask the pupils to count a set of counters, then select the matching numeral cards and picture cards.

For each pair of pupils, get one to pick a number from one to ten and the other to show the number to his/her partner using the counters, numeral card and picture card.

3. Count back from 10 to 0.



PRACTICE

1. Count the eggs.



2. Look at our national flag. Count.



Our national flag has 2 colour(s).

Our national flag has 1 star(s).

Our national flag has 1 crescent(s).

3. Which set matches the number?



Complete Workbook 1A, Worksheet 1A • Pages 1 – 4

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NUMBERS TO 10

3

Textbook 1 P3

For Let's Learn 3, lead the pupils to count from 0 to 10 while writing the number sequence on the whiteboard. After that, lead the pupils to recite the sequence backwards. Erase the sequence from the whiteboard and practice counting forward and backward with the pupils.

Pick a number and ask a pupil to either count forward from this number to 10 or count backward from this number to zero. Get the pupils to try this out in pairs.

PRACTICE

Help the pupils to read and understand each question. Avoid chorus answers from pupils and encourage participation by inviting individual responses. Ask the pupils how they get their answers and if possible, get another pupil to verify the answer.

For better understanding, select items from **Worksheet 1A** and work these out with the pupils.

Independent seatwork

Assign pupils to complete Worksheet 1A (Workbook 1A P1 – 4).

Answers Worksheet 1A (Workbook 1A P1 – 4)

1. (a) 2

(b) 3

(c) 4

(d) 5

(e) 6

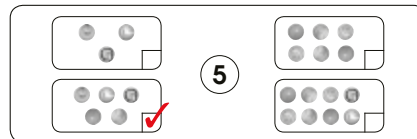
(f) 7

(g) 9

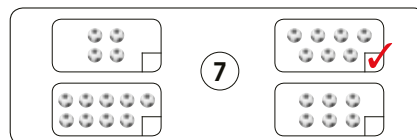
(h) 10

2. (a) 4 , 2 , 6 , 3

3. (a)



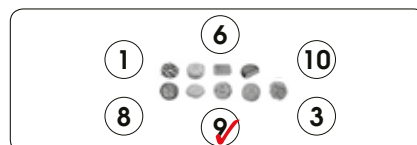
(b)



4. (a)



(b)





There are 5 apples.
How do we write '5' in words?

LET'S LEARN

		0 zero
		1 one
		2 two
		3 three
		4 four
		5 five
		6 six

Ask the pupils to count the number of apples in the picture on P4.

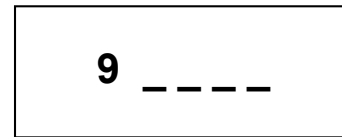
Write the number of apples as a numeral on the whiteboard and get the pupils to read it out loud. Then write the number in words and get the pupils to spell it out together.

LET'S LEARN

For each number, ask pupils to look at the number in words and spell it. Get the pupils to copy the words onto their mini whiteboard, in sequence from zero to ten. Give the pupils some time to look at the words they have written.

		7 seven
		8 eight
		9 nine
		10 ten

Next, write a numeral on the whiteboard and blanks for spelling the letters as shown.



Invite pupils to say the number and spell it out. Continue doing this with other numbers.

ACTIVITY TIME



Assign pupils to work in groups of 4.

Work in groups of 4.

Part A:

Pupil A gets 	Pupil B gets
Pupil C gets 	Pupil D gets

What you need:



- 1 Pupil A shows a card.
- 2 Pupils B, C and D find matching cards from their sets.
- 3 Switch roles and repeat 1 and 2.

Part B:

- 1 Pupil B shows a card.
- 2 Pupils A, C and D take turns to say why the chosen number is special to him/her.



I have two brothers.

ACTIVITY TIME

What you need:



PRACTICE

Count.
Show in numerals and in words.



- 7 seven
- 4 four
- 6 six

Complete Workbook 1A, Worksheet 1B • Pages 5 – 8

An alternative activity can be done as follows:

1. Use only the numeral cards and word cards to play a memory matching game.
2. Shuffle and lay all the cards facing down on the table.
3. Take turns to pick two cards. If they match (e.g. '3' and 'three'), the pupil gets to keep the cards. If not, put back the cards facing down.
4. Game finishes when all the cards are paired and collected.
5. The pupil with the most cards is the winner.

PRACTICE

Help the pupils to read and understand each question. Avoid chorus answers from pupils and encourage participation by inviting individual responses. Ask the pupils how they get their answers and if possible, get another pupil to verify the answer.

For better understanding, select items from **Worksheet 1B** and work these out with the pupils.

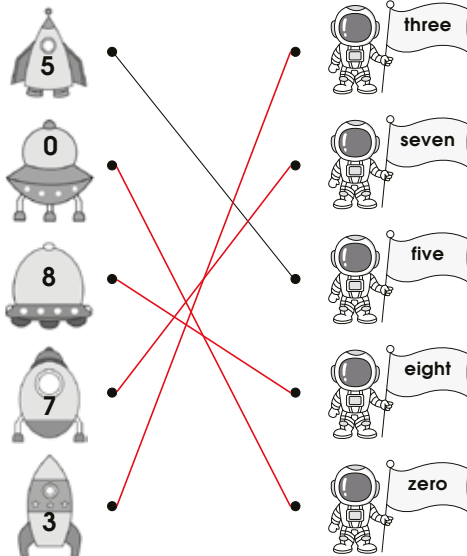
Independent seatwork

Assign pupils to complete Worksheet 1B (Workbook 1A P5 – 8).

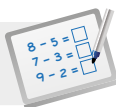
Answers

Worksheet 1A (Workbook 1A P5 – 8)

1.



2. one – 1,
seven – 7,
four – 4,
ten – 10,
three – 3,
zero – 0
3. 6 – six,
5 – five,
0 – zero,
8 – eight,
2 – two,
9 – nine
4. (a) four
(b) seven
(c) one
(d) three



Specific Learning Focus

- Count to tell the number of objects in a given set.
- Read and write numbers in numerals and in words.

Suggested Duration

3 periods

Prior Learning

Pupils would have prior knowledge of numerals 1 to 10. Some of them would also be able to write most of the numbers in words. This lesson could serve as a reinforcement and a warm-up lesson.

Pre-emptive Pitfalls

- Pupils may have difficulty in learning the spelling of eight and four. Repetitive enunciation in class would solve this problem. Highlight the 'gh' and 'ou' with different coloured board markers.
- Some pupils may relate the numbers in sequential order only and might display gaps in knowledge when completing a number pattern when presented with numbers in backwards and sporadic order. Carry out simple activities with number, picture and cards.
- Pupils do not relate numbers tangibly with their real-life objects. The correlation between the number and object is extremely important. Get pupils to work in groups of 2 to 4 and use picture cards and real-life objects to count.

Introduction

The chapter opener example may be used as an introductory conceptual exercise. The class cupboard can be used with a variety of objects differentiated into numbers 1 to 10. Number songs can be played in class. Fruits can be brought to class to carry out 'Let's Learn' exercise (Textbook 1 P4 - 5). Numeral and word matching can be done on the board by getting pupils to complete the matching.

Problem Solving

Get the pupils to count backwards and in parts.

E.g. write on the board 7, ____, 9 or 3, ____, 5.

Make the numbers tangible and then get pupils to identify the object that is related to the number.

E.g. There may be 'ten' desks in the classroom or 'two' dustbins.

Activities

Refer to Activity Handbook 1 P4.

Resources

- classroom materials and objects
- number word cards
- numeral cards
- dot cards
- picture cards
- 2-colour counters

Mathematical Communication Support

Enunciate in class the spellings of each numeral. Avoid chanting and encourage individual responses in class. Ask pupils questions about objects at home that are in numerals from 1 to 10. Encourage a mathematical conversation in class and at the school playground.

(a) How many lines can you count?

(b) How many sandwiches do you need to buy from the school canteen to treat your friends?

COMPARING AND ORDERING NUMBERS

LEARNING OBJECTIVES

1. Compare numbers.
2. Arrange numbers in order.

COMPARING AND ORDERING NUMBERS

LESSON
2

IN  FOCUS



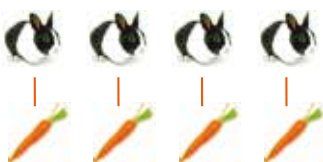
Are there more rabbits or carrots?
Are there fewer squirrels or nuts?

How can we tell?



LET'S LEARN 

1.



There are 4 rabbits.
There are 4 carrots.
There are **as many** carrots **as** rabbits.
The number of carrots is the **same as** the number of rabbits.

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NUMBERS TO 10 7

IN  FOCUS

Engage the pupils by discussing the animals and the food they like.

Get the pupils to compare the numbers of animals/food with the following questions:

- Are there more rabbits or more carrots?
- What about the squirrels and the nuts?
- How can you tell?

LET'S LEARN 

Show the pupils that the numbers can be compared using one-to-one correspondence.

Count the number of rabbits and carrots together with the pupils and ask if the number of rabbits and the number of carrots match.

Show that the numbers are the same and introduce the term **as many as** when comparing the numbers.

2.



There are 5 squirrels.
There are 6 nuts.
6 is **more than** 5.
There are **more nuts than** squirrels.
5 is **less than** 6.
There are **fewer squirrels than** nuts.

ACTIVITY TIME

Work in pairs.

What you need:

Set A



Set B



Place in Sets A and B to show that:

- 1 Set A has more than Set B.
- 2 Set A has fewer than Set B.
- 3 Set A has as many as Set B.
- 4 Set B has the same number of as Set A.



8

CHAPTER 1

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Textbook 1 P8

Repeat the activity with the squirrels and the nuts. Lead pupils to see that there is one nut unmatched, and that means that there are more nuts than squirrels.

Take out two sets of objects (e.g. 5 squares and 7 circles) and place them on the visualiser.



Ask pupils to compare the numbers of squares and circles. Invite a pupil to do a one-to-one correspondence to check. Ask the class to verbalise the statements using the terms **more than** and **fewer than** with the squares and circles. Repeat this activity using other objects for comparison.

ACTIVITY TIME



Assign pupils to work in pairs.

The pupils will take turns to place the square tiles on Set A and Set B as instructed in the activity. They are allowed to place any number of square tiles, after which the partner will check if the correct numbers of square tiles are placed for 1 to 4.

1. Which set has more things?



2. Which set has fewer things?



3. Are there as many sharpeners as rulers? **Yes**



4. Compare the number of hangers and the number of shirts.



The number of hangers is the **the same as** the number of shirts.

Complete Workbook 1A, Worksheet 2A • Pages 9 – 12

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NUMBERS TO 10

9

Textbook 1 P9

PRACTICE



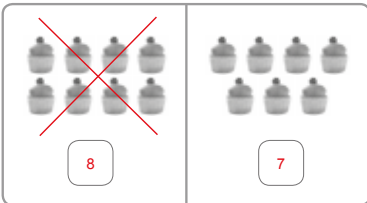
Help the pupils to read and understand each question.

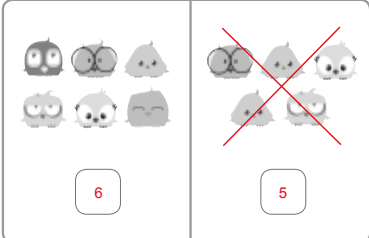
Avoid chorus answers from pupils and encourage participation by inviting individual responses. Ask the pupils how they get their answers and if possible, get another pupil to verify the answer.

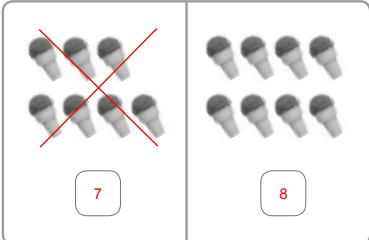
For better understanding, select items from **Worksheet 2A** and work these out with the pupils.

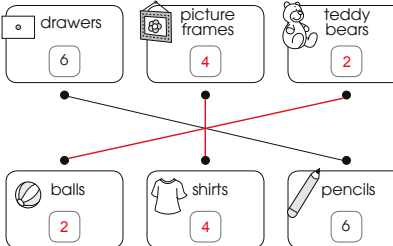
Independent seatwork

Assign pupils to complete Worksheet 2A (Workbook 1A P9 – 12).

1. 

2. (a) 

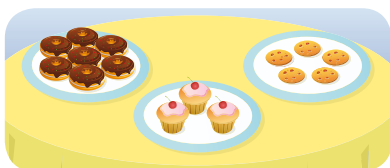
(b) 

3. 

4. (a) fewer
(b) more
(c) as many

IN FOCUS

Compare the number of snacks.



Which plate has the greatest number of snacks?

LET'S LEARN

- There are 3 cupcakes. 
There are 5 cookies. 
5 is greater than 3.
3 is smaller than 5.
- There are 3 cupcakes. 
There are 5 cookies. 
There are 7 doughnuts. 

Which number is the greatest?
Which number is the smallest?

7 is greater than 5. 7 is greater than 3.
7 is the **greatest**.
3 is smaller than 7. 3 is smaller than 5.
3 is the **smallest**.



IN FOCUS

Get the pupils to talk about what they see on the plates. Ask them to compare the number of snacks on each plate and decide which plate contains the **greatest** number of snacks.

LET'S LEARN

Start off by comparing the plates of cupcakes and cookies. Count the number of snacks on each plate. Lead the pupils to see that there are more cookies than cupcakes by showing a one-to-one correspondence.

Use the terms **greater than** and **smaller than** to compare the numbers of each snack. Write these terms on the whiteboard and get pupils to read them.

In Let's Learn 2, continue the discussion by comparing all three plates of snacks.

Count the number of doughnuts and align them with the cupcakes and cookies for comparison. Write the number of snacks on each plate, then ask the pupils to identify the plate with the **greatest** or **smallest** number of snacks and explain how they get their answers.

Arrange the numbers in order. Start with the greatest.

7, 5, 3
greatest → smallest

We can also start with the smallest.

3, 5, 7
smallest → greatest

3. Compare 6, 9 and 2 using a number line.



Since 9 is on the right of 2 and 6, 9 is the greatest. Since 6 is on the right of 2, 6 is greater than 2.

ACTIVITY TIME

Work in pairs.



What you need:

1 2 3 ■

2 9

6

0 1 2 3 4 5 6 7 8 9 10

- 1 The frog lands on stone 0.
- 2 Take turns to pick a number card to find out the frog's next stone.
- 3 Place ■ on the stone showing that number.
- 4 Repeat 2 and 3 until no cards are left on the table.

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NUMBERS TO 10

11

Textbook 1 P11

Get the pupils to arrange the three numbers in order, starting with the greatest number, and show their answers on their mini whiteboards. After checking their answers, repeat the activity by starting with the smallest number.

Explain to pupils how a number line is used to arrange and compare numbers. Get them to see that the number on the number line increases from left to right.

ACTIVITY TIME



Assign pupils to work in pairs.

The pupils will take turns to pick a number card and place the square tile on the stone showing that number. This helps pupils to recognise and identify numbers from 0 to 10.

PRACTICE



1. Which number is greater?

(a) 2 9 (b) 6 5

2. Which number is the smallest?

4 1 3

3. Arrange the numbers in order.

(a) Start with the greatest.

2, 7, 5
7, 5, 2
greatest → smallest

(b) Start with the smallest.

9, 10, 4
4, 9, 10
smallest → greatest

4. Compare 5, 10 and 2 using a number line.



2, 5, 10
smallest → greatest

Complete Workbook 1A, Worksheet 2B • Pages 13 – 16

12

CHAPTER 1

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Textbook 1 P12

PRACTICE



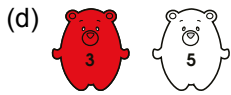
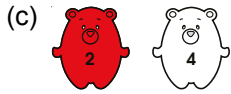
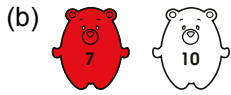
Help the pupils to read and understand each question.

Avoid chorus answers from pupils and encourage participation by inviting individual responses. Ask the pupils how they get their answers and if possible, get another pupil to verify the answer.

For better understanding, select items from **Worksheet 2B** and work these out with the pupils.

Independent seatwork

Assign pupils to complete **Worksheet 2B** (Workbook 1A P13 – 16).



4. (a) 8
(b) 9

(c) 7
(d) 10

5. (a) 1
(b) 3

(c) 6
(d) 0

6. (a) 3, 7, 10
(b) 0, 1, 4

7. (a) 9, 8, 5
(b) 7, 6, 3

8. 10, 8, 4, 1



Specific Learning Focus

- Compare numbers.
- Arrange numbers in order.

Suggested Duration

4 periods

Prior Learning

Pupils would have prior knowledge of counting the number of objects, and reading and writing numbers. In this lesson, we progress to comparing and arranging numbers and number of objects.

Pre-emptive Pitfalls

- Key terminologies will have to be reinforced to students. Numbers and objects can go hand in hand to avoid confusion. In Let's Learn 1 and 2, the correlation between numbers and objects is shown. The use of real-life objects correlating with numbers helps pupils to understand how to compare.

Introduction

The 'In Focus' exercise (Textbook 1 P10) can be done in class. Have the pupils distribute food items found in their lunch boxes onto different plates and compare the number of food items on each plate. They can then arrange the numbers in order. Numeral cards can be placed next to each plate and the order can be shown numerically as well.

Problem Solving

Other real-life objects can be used in the classroom as well. Once pupils have learnt to arrange the numbers and number of objects in order of size, number lines can then be introduced (Textbook 1 P11). It can be pointed out that numbers on the number line increase from left to right, so the first number on the left of the number line is the smallest, while the last number on the right of the number line is the greatest.

Activities

Refer to Textbook 1 P11 and Activity Handbook 1 P2 to carry out the activities in class. In addition, pupils can pick up numeral cards randomly and when the teacher claps 3 times they can all scramble and stand in order of the numbers they have. The teacher can call out the cue saying "big to small" or "smallest to largest".

Resources

- classroom materials and objects
- number word cards
- numeral cards
- stones painted with numbers

Mathematical Communication Support

Encourage mathematical conversation.

- Does Sam have more pencils than Ali?
- Who has more books on their table? Arrange from the greatest to the smallest.

Terms like **more than**, **fewer than**, **same as**, **as many as**, **greater**, **smaller**, **greatest** and **smallest** can be written on the board and pupils can be encouraged to come up with a sentence using each term. This will reinforce the pupils' understanding of the concepts and enable them to translate the numbers to mathematical language.

PROBLEM SOLVING, MATHS JOURNAL AND PUPIL REVIEW

8. Compare the following numbers using the number line below.



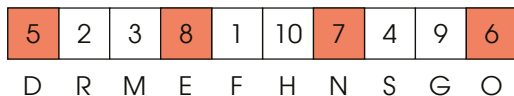
Mind Workout

Date: _____

Colour the boxes with numbers greater than four and smaller than 9.



Which numbers are greater than four?
Which numbers are smaller than 9?



What word is formed?

WELL D O N E!

16 Chapter 1

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Mind Workout

Get the pupils to understand the problem by asking the following questions:

- Does the question ask for the **number** or **numbers** that are greater than 4?
- How many numbers are greater than 4?
- Which numbers are smaller than 9?
- Do you need **all** these numbers?
- Which numbers are greater than 4 **and** smaller than 9?

Workbook 1A P16

MIND WORKOUT

The balls have numbers from 0 to 10.



What are the missing numbers?

MATHS JOURNAL

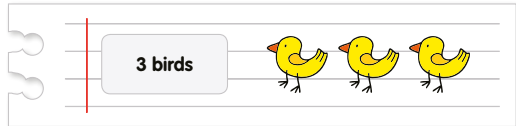
Draw pictures to match each card.

five apples

8 balls

two cakes

Example



I know how to...

- count to 10.
- read and write numbers from 0 to 10.
- compare and order numbers from 0 to 10.

SELF-CHECK



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NUMBERS TO 10

13

Textbook 1 P13



MIND WORKOUT

Get the pupils to understand the problem by asking the following questions:

- How many balls are there?
- How many numbers are there from 0 to 10?
- How many missing numbers do we have to find?

Help the pupils by asking them to recite from 0 to 10. Get them to match each number they have recited to the number found on each ball.

MATHS JOURNAL

Illustrate the activity with an example:

3 birds



Get pupils to draw and colour their pictures in their exercise book and write the caption beside it. Encourage creativity in their drawings.

SELF-CHECK



Before the pupils do the self check, ask them to show what they have learnt for each objective. For instance, ask the pupils to show that they can count to 10.

This self check can be done after pupils have completed **Review 1** (Workbook 1A P17 – 18) as consolidation of understanding for the chapter.

Answers Review 1 (Workbook 1A P17 – 18)

1. eight ● ~~0~~
zero ● ~~3~~
three ● ~~8~~

2. 4 , 6 , 1 

(a) more

(b) fewer

3. (a) 0 and 2

(b) 7 and 10

4. (a) 9, 6, 4

(b) 2, 5, 8

NUMBER BONDS


CHAPTER

2

Number Bonds CHAPTER 2


2

How can Nora put the 5 cupcakes on the two plates?



MAKING NUMBER BONDS LESSON 1

IN FOCUS



How many cupcakes are there on each plate?
Is there another way to put the cupcakes on the two plates?

14 CHAPTER 2 OXFORD UNIVERSITY PRESS

Textbook 1 P14

Related Resources

NSPM Textbook 1 (P14 – 20)
NSPM Workbook 1A (P19 – 28)

Materials

Magnetic buttons, picture cut-outs, 2-colour counters, multilink cubes, '1' to '6' dice

Lesson

Lesson 1 Making Number Bonds
Problem Solving, Maths Journal and
Pupil Review

INTRODUCTION

Any given number can be made up of different sums of two numbers. These different sums that make up the given number are called **number bonds**. The underlying concept of a number bond is the part-part-whole relationship between three numbers. Number bond diagrams are used to help pupils in visualising the part-part-whole relationship. A number bond statement is related to a family of four basic addition and subtraction facts e.g. $2 + 3 = 5$, $3 + 2 = 5$, $5 - 2 = 3$ and $5 - 3 = 2$. Pupils will be given a variety of activities to help them commit to memory the various number bonds. The understanding and memorisation of number bonds up to 10 will facilitate pupils' mastery of the basic addition and subtraction facts in later chapters.

LESSON

1

MAKING NUMBER BONDS


LEARNING OBJECTIVES

1. Make different number bonds for numbers up to 10.
2. Make number stories.

Number Bonds

CHAPTER 2


How can Nora put the 5 cupcakes on the two plates?



MAKING NUMBER BONDS

LESSON 1

IN FOCUS



How many cupcakes are there on each plate?
Is there another way to put the cupcakes on the two plates?

14 CHAPTER 2 OXFORD UNIVERSITY PRESS

Textbook 1 P14

IN FOCUS

Use the chapter opener to discuss the picture with the pupils.

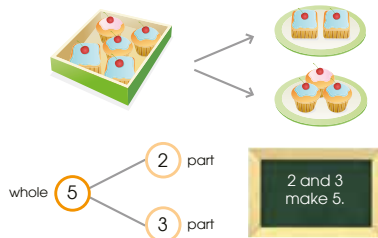
Ask the pupils the following questions:

- Look at the cupcakes in the box. How many cupcakes are there in the box?
- How many plates are there?
- Suppose we want to arrange 5 cupcakes into two groups, how many ways can we do it?

Encourage the pupils to find a partner to discuss ways to arrange the cupcakes.

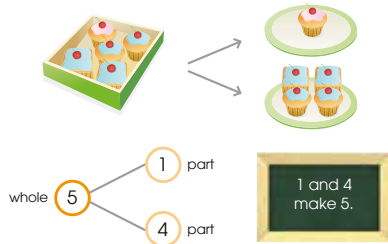
LET'S LEARN

1. Put 5 cupcakes on two plates.



This is a **number bond**.

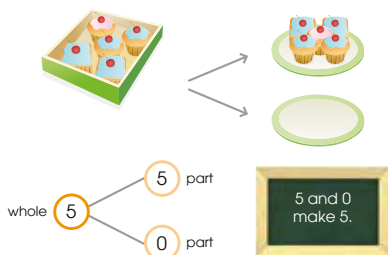
2. There are other ways to make 5.



Use picture cut-outs of the individual cupcakes (or different coloured counters to represent the cupcakes) to show different ways of grouping the 5 cupcakes. Alternatively, get some volunteers to show the grouping to the class.

For each grouping (P15 – 16), draw the number bond diagram, introduce the term **number bond** and state that **2 and 3 make 5**.

3.



Is $\begin{matrix} 5 \\ 5 \\ 0 \end{matrix}$ the same as $\begin{matrix} 5 \\ 0 \\ 5 \end{matrix}$?



ACTIVITY TIME

Work in groups of 4.

- 1 Make number bonds of 6.
- 2 Put on the to show different ways to make 6.

What you need:



How many number bonds can you form?



- 3 Take turns to make number bonds for different numbers.

Continue making number bonds of 5 in Let's Learn 2 and 3. Get pupils to say the two number bonds of 5 as they write them on their mini whiteboards with the number bond diagrams.

When drawing the number bond diagrams, the orientation should be varied. Stress to pupils that the two lines linking the parts must come from the whole.

ACTIVITY TIME



Assign pupils to work in groups of 4. Give the pupils multilink cubes of two colours to make number bonds of 6. They are to observe the pattern after all the bonds are made.

At the end of the activity, check that the pupils can systematically and efficiently list all the number bonds of 6.

The activity can be extended for pupils to make bonds of other numbers within 10.



Complete the number bonds.

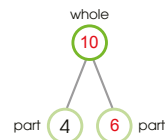
- (a)
 6 and 1 make 7.



- (b)
 2 and 8 make 10.



- (c)
 4 and 6 make 10.



Complete Workbook 1A, Worksheet 1A • Pages 19 – 22



How are the slices of cake different?

Highlight the different orientations and the missing numbers in the number bond diagrams. Focus pupils' attention on the two lines linking the parts and whole.

For better understanding, select items from **Worksheet 1A** and work these out with the pupils.

Independent seatwork

Assign pupils to complete Worksheet 1A (Workbook 1A P19 – 22).

Activity Making bonds of 7 with a dice.

Materials '1' to '6' dice, worksheet (Activity Handbook 1 P6)

Procedure

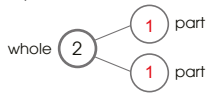
1. Give each pupil a dice. Get the pupils to throw their individual dice as a class.
2. Ask the pupils to count the number of dots on the top face and the bottom face of their dice.
3. Get the pupils to count the total number of dots on both faces and check that everyone in the class gets the same result of 7.
4. Individually, the pupils are to throw their dice to find the different number bonds of 7 by counting the dots on the top and bottom faces.
5. Assign the pupils to complete the worksheet provided. They are to draw the dots for each throw and represent these as a number bond.

Answers Worksheet 1A (Workbook 1A P19 – 22)

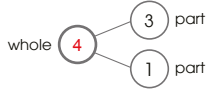
1. (a) 2, 3

(b) 3, 7

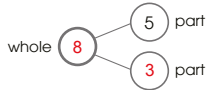
2. (a) 1, 1



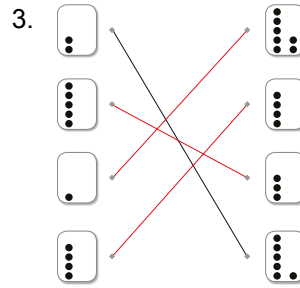
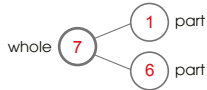
(b) 4



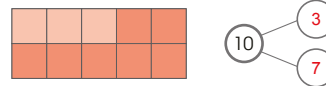
(c) 3, 8



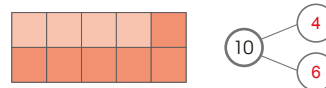
(d) 1, 6



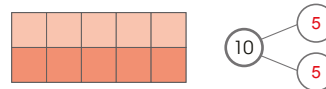
4. (a) 3, 7



(b) 4, 6



(c) 5, 5



IN FOCUS

Encourage pupils to talk about the 4 slices of cake. Ask them what they notice about the decorations on the slices of cake and their colours.

PRACTICE

Complete the number bonds.



Complete Workbook 1A, Worksheet 1A • Pages 19 – 22

IN FOCUS



How are the slices of cake different?

LET'S LEARN

Number Stories

We can make number stories.



There are 4 slices of cake.
3 slices have cherries.
1 slice has no cherry.



There are 4 slices of cake.
2 slices are yellow.
2 slices are red.



ACTIVITY TIME

Work in pairs.

- Tell a number story.
- Get your partner to use and to show the number story.

What you need:



There are 9 fruits.
7 of them are oranges.
2 of them are apples.



7 and 2 make 9.

- Take turns to tell number stories with different numbers.

Get pupils to tell different number stories about the 4 slices of cake in the picture. Guide pupils along with the stories and write them out on the whiteboard.

ACTIVITY TIME



Assign pupils to work in pairs. Provide each pair of pupils with 2 sets of 10 multilink cubes, each set of a different colour.

For each pair, one pupil will tell a number story while the other pupil shows it by using multilink cubes of two different colours. Check that the sum of the numbers in the story does not exceed 10.

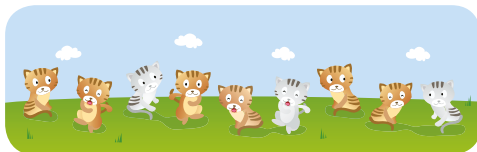
After the activity, each pair is allowed to share their stories with their peers. Select some pairs to share their stories with the class.

PRACTICE



Make number stories.

1.



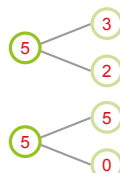
There are 9 kittens.
3 kittens are grey.
6 kittens are brown.



2.



There are 5 children.
There are 3 boys.
There are 2 girls.
5 children wear glasses.
0 children do not wear glasses.



Complete Workbook 1A, Worksheet 18 • Pages 23 – 25

PRACTICE



For questions 1 and 2, get pupils to talk about what they see in the pictures. Ask them to spot the differences and make number stories about them.

Independent seatwork

For better understanding, select items from **Worksheet 1B** and work these out with the pupils.

Assign pupils to complete **Worksheet 1B** (Workbook 1A P23 – 25).

Activity Match number bonds

Materials Numeral cards and number bond cards

Procedure

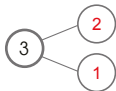
1. Get the pupils to play in groups of 2 or more.
2. Shuffle both sets of cards and place the 20 cards facing down in a 4 by 5 arrangement.
3. Players take turns to open any two cards. The player has to match the number bond card with a numeral card. For example, a number bond card '2 and 2' matches the numeral card '4'.



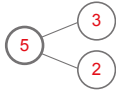
4. The player who matches the cards correctly gets to keep them. Otherwise, the cards are to be returned to their original position.
5. The game continues until all cards are matched and collected.
6. The player who collects the greatest number of cards is the winner.

Answers Worksheet 1B (Workbook 1A P23 – 25)

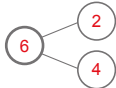
1. (a) 2, 1



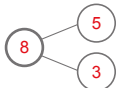
(b) 5, 3, 2



(c) 6, 2, 4

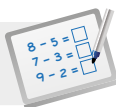


(d) 8, 5, 3



(e) 10, 3, 7





Specific Learning Focus

- Make different number bonds for numbers up to 10.
- Make number stories.

Suggested Duration

7 periods

Prior Learning

Pupils have been taught before that 2 and 2 make 4, and 3 and 3 make 6. Most of them use their fingers on their right and left hands to count to a whole number. This exercise can be used to build up on number bonds. Each hand can be the 'part' and both can then become a 'whole'.

Pre-emptive Pitfalls

When pupils are asked to make multiple bonds of the same number, they face a problem. They might be quick to say that 4 and 2 make 6, but might have difficulty coming up with the other combinations like 3 and 3, 5 and 1, or 6 and 0. Multiple number bonds of the same number are important for the development of problem-solving skills.

Introduction

'Let's Learn' and 'Practice' (Textbook 1 P15 - 17) can be done in class with real-life objects. To develop number stories in class, first get sets of stationeries, fruits, vegetables, books, etc. Help pupils to develop the skill of identifying the same 'whole' number given different combinations of 'parts' (e.g. Show 4 red markers and 2 black markers, or 5 english books and 1 mathematics book.).The pupils should be able to recognise that different combinations of 'parts' can make the same 'whole'. This concept can be repeatedly taught with different numbers and have different number stories created.

Problem Solving

Make the pupils pick sets of objects and create their own stories. They can be asked to go to the playground and collect different types of leaves or flowers and come up with a number. Make sure they select two 'parts' to make a 'whole' (e.g. 3 yellow flowers and 2 red flowers make 5.). Then, get them to write a number bond.

Activities

The activity (P22) can be done in class once the lesson is at the summative stage and pupils have grasped the concept.

Resources

- Worksheet (Activity Handbook 1 P6)
- magnetic buttons
- picture cut-outs
- 2-colour counters
- multilink cubes
- numeral cards
- '1' to '6' dice
- number bond cards (Activity Handbook 1 P5)

Mathematical Communication Support

Use concrete objects to formulate mathematical concepts. Number bonds have to be pictorial and visual. Also, the correlation between numbers and objects are to be made tangible. Encourage pupils to come up with number stories by showing them two picture cards representing two 'parts' (e.g. I have 5 toys. My mama got me 3 toy cars and my nana got me 2 balls.). Numeral cards can also be used to guide pupils.

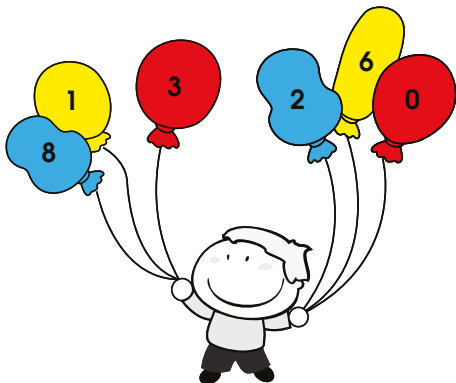
PROBLEM SOLVING, MATHS JOURNAL AND PUPIL REVIEW



Mind Workout

Date: _____

Colour two balloons that make 3 red.
Colour two balloons that make 7 yellow.
Colour two balloons that make 10 blue.



26 Chapter 2

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Mind Workout

This problem requires pupils to use the guess and check heuristic strategy before they colour the balloons.

Help the pupils to understand the problem and plan their strategy by leading them to trial with the smallest number.

Give them hints by asking the following questions:

- How many ways are there to make number bonds of 3?
- Which set of number bonds has a number which is not used by the other number bonds?

Provide hints for the pupils to complete two sets of number bonds and leave the last one for them to do on their own.

Workbook 1A P26



MIND WORKOUT

There are 8 on the table.
How many is Kate covering
with her hand? 6

Use to help you.



MATHS JOURNAL

Look at the picture.



Make number stories about the number of children.
Make number stories about the number of pails.

I know how to...

- make different number bonds for numbers up to 10.
- make number stories.

SELF-CHECK



20

CHAPTER 2

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Textbook 1 P20



MIND WORKOUT

Pupils can use the strategy of counting on or counting backwards to arrive at the answer.

Provide counters to help pupils in deriving their answers.

MATHS JOURNAL

Encourage pupils to talk about the children at the beach by asking the following questions:

- What are some activities that are done at the beach?
- Where are the children playing?

Get some pupils to tell various number stories from the picture. Allow pupils to make different number bonds in their journals independently. They can show these by writing number bond statements or drawing the number bond diagrams.

SELF-CHECK

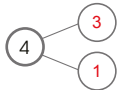


Before the pupils do the self check, review the important concepts once more by illustrating with some examples.

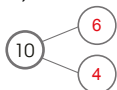
This self check can be done after pupils have completed **Review 2** (Workbook 1A P27 – 28) as consolidation of understanding for the chapter.

Answers Review 2 (Workbook 1A P27 – 28)

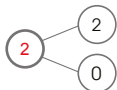
1. (a) 3, 1



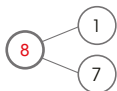
(b) 6, 4



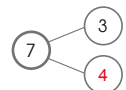
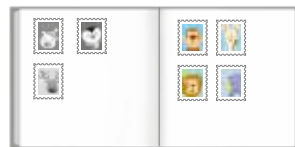
(c) 2



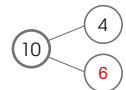
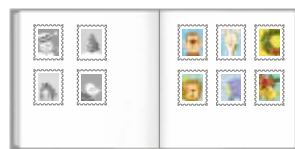
(d) 8



2. (a)



(b)



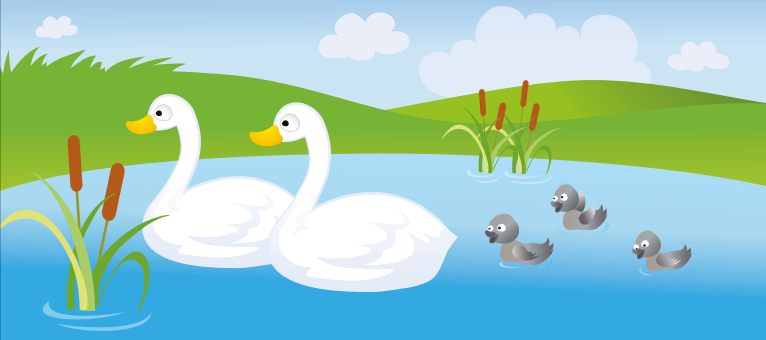
ADDITION WITHIN 10

CHAPTER


3


Addition Within 10 CHAPTER **3**

How many swans are there altogether?



WAYS TO ADD LESSON **1**

IN  FOCUS



How can we find the total number of swans?

OXFORD UNIVERSITY PRESS ADDITION WITHIN 10 **21**

Textbook 1 P21

Related Resources

NSPM Textbook 1 (P21 – 32)
NSPM Workbook 1A (P29 – 46)

Materials

2-colour counters, multilink cubes, addition-fact cards

Lesson

Lesson 1 Ways to Add
Lesson 2 Making Addition Stories
Lesson 3 Solving Picture Problems

Problem Solving, Maths Journal and Pupil Review

INTRODUCTION

In the previous chapter on number bonds, pupils have acquired an informal analysis of the part-part-whole concept where a set of things can be partitioned into two subsets. As they put the two subsets together to make the whole, they learn to describe the number bond in a statement e.g. '2 and 3 make 5'. In this chapter, the part-part-whole setting is used in introducing the concept of addition followed by setting where more things are being added or joined to a set. The use of **number bond facts** within 10 and **counting-on** strategy are ways for pupils to add two numbers. The instructional activities enable pupils to recognise the concept of addition in real world context and be able to interpret the equation for the operation of addition in mathematical language and written symbols; as well as to apply them in addition stories and solve simple picture problems.

LESSON

1

WAYS TO ADD

LEARNING OBJECTIVES

1. Add using part-part-whole concept of number bonds.
2. Add by using the count-on strategy.

Addition Within 10

How many swans are there altogether?



CHAPTER

3

WAYS TO ADD

IN  FOCUS



How can we find the total number of swans?

LESSON

1

OXFORD UNIVERSITY PRESS

ADDITION WITHIN 10

21

Textbook 1 P21

IN FOCUS

Use the chapter opener to discuss the problem with the pupils.

Ask the pupils the following questions to encourage discussion:

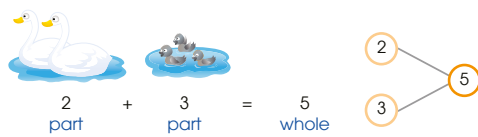
- How many small swans are there swimming in the pond?
- How many big swans are there swimming in the pond?
- How many swans are there altogether?

Some pupils may respond by counting all the swans to give the answer. Encourage them to think of other ways to find the total number of swans in the picture.

LET'S LEARN

Add Using Number Bonds

1.

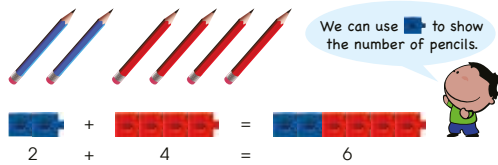


There are 5 swans altogether.



$2 + 3 = 5$ is an **addition fact**.
We read it as two **plus** three **equals** five.

2.



2 plus 4 equals 6.

Get the pupils to recall what they learned about number bonds. Ask the pupils to form a number bond based on the picture.

Referring to Let's Learn 1, say '2 and 3 make 5' while pointing to the bond diagram on the whiteboard. Relate the two sets of swans as 'part-part', which makes up the total number of swans or the 'whole'.

Introduce the addition equation ' $2 + 3 = 5$ '. Get pupils to read the equation in words 'two plus three is equal to five'. Explain that the symbol '+' means **add** and that it means to **put the sets together** to find the total, emphasising the terms **altogether** and **in all**.

Introduce two more examples to reinforce understanding, with emphasis on the part-part-whole concept and number bonds.

Use pencils on the visualiser to illustrate Let's Learn 2 if possible.

Ask the following questions:

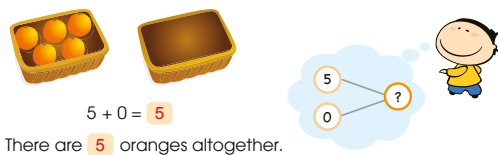
- How many blue pencils are there?
- How many red pencils are there?
- How many pencils are there altogether?

Count the number of pencils with the class by counting all the pencils. Draw the number bond and say '2 and 4 make 6'. Write the addition equation and invite pupils to say '2 plus 4 equals to 6'.

Provide pupils with multilink cubes to work in pairs to model the two sets of pencils and add them together. After which, get them to write the addition equation on their mini whiteboard.

Repeat the above mentioned steps for Let's Learn 3.

3.



PRACTICE

1. Find the missing numbers.



2. Add.



Activity Addition operation and equation

Materials Multilink cubes or any other objects that can be used for counting, worksheet (Activity Handbook 1 P8)

Procedure

1. Assign pupils to work in pairs.
2. Provide each pair with the following activity worksheet and two sets of multilink cubes of two different colours.
3. Pupils are to work together to show the cubes as instructed in the worksheet. They are to show this using the different coloured cubes. For instance, pupils are to show '3 plus 3' using 3 cubes of one colour and 3 cubes of another colour.
4. To form the addition equation, they are to add the two sets of cubes by counting all to find the total.
5. After repeating steps 1 – 4 for four rounds, encourage pupils to make up their own addition equations and illustrate them with cubes.

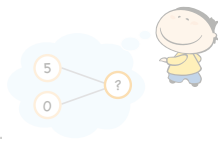


3.



$$5 + 0 = 5$$

There are 5 oranges altogether.



PRACTICE



1. Find the missing numbers.



2 brown horses

2 white horses



$$2 + 2 = 4$$

There are 4 horses altogether.

2. Add.



$$4 + 3 = 7$$



$$5 + 3 = 8$$



$$4 + 6 = 10$$



Complete Workbook 1A, Worksheet 1A • Pages 29 – 30

Textbook 1 P23

Help the pupils to read and understand each question. Make the connection between the number bonds and the addition equations.

Avoid chorus answers from pupils and encourage participation by inviting individual responses. Ask the pupils how they get their answers and if possible, get another pupil to verify the answer.

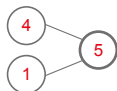
For better understanding, select items from **Worksheet 1A** and work these out with the pupils.

Independent seatwork

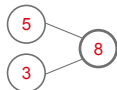
Assign pupils to complete Worksheet 1A (Workbook 1A P29 – 30).

Answers Worksheet 1A (Workbook 1A P29 – 30)

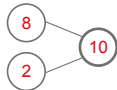
1. (a) $4 + 1 = 5$



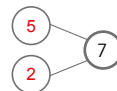
(b) $5 + 3 = 8$



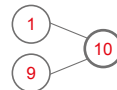
(c) $8 + 2 = 10$



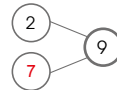
2. (a) $5 + 2 = 7$



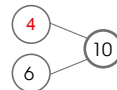
(b) $1 + 9 = 10$



(c) $2 + 7 = 9$



(d) $4 + 6 = 10$





There are 6 buttons in the box.



How many buttons are there altogether?

LET'S LEARN

Add By Counting On

1. $6 + 3 = ?$



Count on 3 steps from 6.



$6 + 3 = 9$

There are 9 buttons altogether.

Why do we count on from the greater number?



2. How many eggs are there in all?



$5 + 2 = 7$

There are 7 eggs in all.

Put 6 buttons inside a box and 3 buttons beside it. Ask pupils how they would count the total number of buttons if 6 buttons are inside the box and 3 buttons are outside the box. Encourage pupils to give their suggestions.

If there are pupils who suggest taking out all buttons from the box to count along with the buttons outside the box, invite a pupil to demonstrate this.

After which, ask pupils if there is another way of counting the total number of buttons without taking the buttons out of the box.

LET'S LEARN

Show pupils that an alternative way to finding the total number of buttons is through counting on. Introduce this strategy by saying that the buttons need not be taken out of the box, and that the total number can be found by counting on from 6.

Point to the box and count aloud starting from 6, and continue counting on with the 3 buttons outside the box. At the end of this, say that **6 plus 3 equals 9**.

Repeat the same steps for Let's Learn 2 to reinforce the concept of counting on.

Extend the practice by asking if the total number of eggs can be found if they counted on from the smaller number instead. Invite pupils to start counting from 2 and continue counting on with the 5 eggs in the nest. Ask if there is any difference in counting on from the greater number or the smaller number.

ACTIVITY TIME



Assign pupils to work in pairs. Provide each pair with a set of 10 addition fact cards.

This activity serves to reinforce the counting-on strategy.

Each pair has to take turns in checking their partner's counting-on strategy and answer.

PRACTICE



Give time to all pupils to practice the 'counting on' strategy on their own for each example. Then select individual pupils to demonstrate aloud to the class the strategy to get the answer.

For better understanding, select items from **Worksheet 1B** and work these out with the pupils.

Independent seatwork

Assign pupils to complete Worksheet 1B (Workbook 1A P31 – 34).

Work in pairs.

- Pick a $5+2$ card.
- Add by counting on. Use to help you.
- Repeat 1 and 2 until no cards are left on the table.

ACTIVITY TIME

What you need:

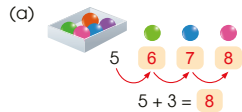


5, 6, 7
 $5 + 2 = 7$

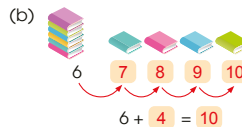
PRACTICE



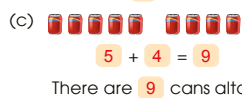
Add by counting on.



There are 8 marbles altogether.



There are 10 books in all.



There are 9 cans altogether.

**Specific Learning Focus**

- Add using part-part-whole concept of number bonds.
- Add by using the count-on strategy.

Suggested Duration

4 periods

Prior Learning

To introduce addition equations, prior knowledge of number bonds is crucial. The concept of part-part-whole leads to addition facts and equations. The counting-on strategy using fingers and objects must be taught earlier and most pupils should be able to add up to ten quickly. This lesson can essentially be used to teach pupils to make addition equations.

Pre-emptive Pitfalls

Overcounting or undercounting results in wrong addition facts. Pupils should be encouraged to start counting on from the greater number (Textbook 1 P24) as this minimises the chances of overcounting or undercounting. The teacher should have a clear understanding that pupils need to learn the number bonds up to 10.

Introduction

Addition facts in this lesson are taught by (a) adding using number bonds (b) adding by counting on. These two strategies are made concrete by putting together an “addition equation”. Pupils are introduced to the signs ‘+’ and ‘=’, where the two ‘parts’ add up (+) and make or equal to (=) a ‘whole’. Translating the English language into a mathematical statement and correlating visually with real-life objects are the key concepts of this lesson. Provide pupils with numeral cards, dot cards, picture cards and multilink cubes to make addition equations. We use number bonds to come up with addition equations. Number lines can also be used to apply the counting-on strategy for addition.

Problem Solving

Making addition stories and solving picture problems in Lessons 2 and 3 develop critical thinking skills which leads to the abstract aspect of this topic. Discourage chanting of the addition equations. Ask pupils to build a story around the equation and work out the ‘whole’ either by adding up the ‘parts’ or counting on.

Activities

Activities in Textbook 1 (P25, 27) and Teacher’s Resource Book 1 (P29) can be used in the formative and accumulative stages of concept-building. The activity on P30 can also be used as an evaluative assessment activity by the teacher to gauge the level of mastery amongst the pupils in the class.

Resources

- number bond and addition equation cards (Activity Handbook 1 P7)
- Worksheet (Activity Handbook 1 P8)
- 2-colour counters
- multilink cubes
- addition-fact cards
- magnetic buttons
- picture cut-outs
- dice

Mathematical Communication Support

Equations are mathematical statements and facts. Emphasise to pupils that ‘+’ means add and ‘=’ means ‘the same as’. Introducing symbols to the language and getting the pupils understand the translation from one form to another is critical to their basic mathematical understanding. Encourage creating number stories building up to addition. Introduce real-life examples and role-play with the pupils and create a story (e.g. Sara had 3 sweets, Anne gave her two more.). Make the pupils in class role-play the number story. The pupils can then solve the story and form an addition fact.

LESSON 2

MAKING ADDITION STORIES


LEARNING OBJECTIVES

1. Apply and reinforce learning of addition through making addition stories in the real world context.
2. Two types of stories – ‘putting together’ and ‘adding on’.

MAKING ADDITION STORIES

LESSON 2


IN FOCUS



What addition stories can you make from the picture?

LET'S LEARN

1.



3 children are playing with a skipping rope.
2 children are playing with kites.

$3 + 2 = 5$
There are 5 children playing altogether.

26 CHAPTER 3

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Textbook 1 P26

IN FOCUS

Encourage pupils to talk about what they see in the picture. Some points of focus include:

- What are the children doing in the park?
- How many children are there in total?
- How many boys and girls are there?
- What are the different activities the children are doing?

Finally, ask pupils to come up with an addition story from the picture.

At this stage, some pupils may or may not be able to respond with some stories intuitively. This helps to gauge each pupil's level of understanding on what was taught previously.

LET'S LEARN

Refer to the picture in Let's Learn 1 and ask the pupils to come up with an addition story about the two groups of children.

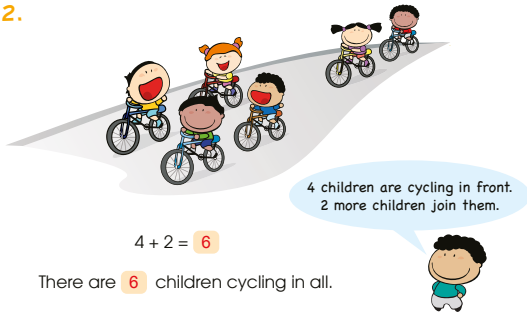
Model response:

3 children are playing with skipping rope. 2 children are playing with kites.

There are 5 children playing altogether.

This is a 'putting together' story.

2.



$$4 + 2 = 6$$

There are 6 children cycling in all.

ACTIVITY TIME

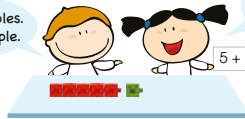
Work in pairs.

- 1 Make an addition story using .
- 2 Get your partner to write the addition fact.

What you need:



There are 5 red apples.
There is 1 green apple.



There are 6 apples altogether.

$$5 + 1 = 6$$

- 3 Take turns to make addition stories.

How many addition stories can you make?

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ADDITION WITHIN 10

27

Textbook 1 P27

Likewise, get the pupils to come up with an addition story with the picture in Let's Learn 2. At this point, pupils may respond with a 'putting together' story.

Introduce the 'adding on' story.

'Adding on' story:

4 children are cycling in front. 2 more children join them.

There are 6 children cycling in all.

Highlight to pupils the difference between the two types of stories. Give further examples to reinforce these concepts.

ACTIVITY TIME



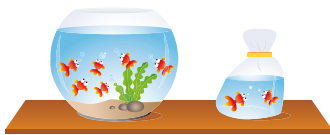
Assign pupils to work in pairs. Encourage pupils to use the cubes to represent the objects in their stories.

Ensure that each pair takes turns to make 'putting together' and 'adding on' stories.

Find the missing numbers.

PRACTICE

1.



There are 6 goldfish in the bowl.

There are 2 goldfish in the bag.

$$6 + 2 = 8$$

There are 8 goldfish altogether.

2.



There are 2 birds on the branch.

3 more birds join them on the branch.

$$2 + 3 = 5$$

There are 5 birds on the branch now.

Complete Workbook 1A, Worksheet 2 • Pages 35 – 38

28

CHAPTER 3

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Textbook 1 P28

PRACTICE



Help the pupils to read and understand each question. Using the same context, invite pupils to make up another type of story.

Avoid chorus answers from pupils and encourage participation by inviting individual responses. Ask the pupils how they get their answers and if possible, get another pupil to verify the answer.

For better understanding, select items from **Worksheet 2** and work these out with the pupils.

Independent seatwork

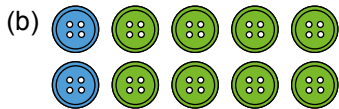
Assign pupils to complete Worksheet 2 (Workbook 1A P35 – 38).

1. (a)



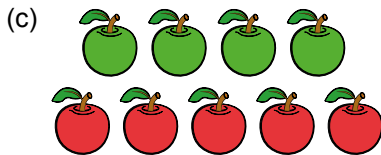
$$4 + 3 = 7$$

There are 7 crayons altogether.



$$2 + 8 = 10$$

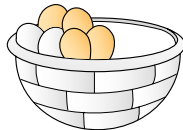
There are 10 buttons in all.



$$5 + 4 = 9$$

There are 9 apples altogether.

2. (a)



$$2 + 4 = 6$$

There are 6 eggs now.

(b)



$$1 + 5 = 6$$

There are 6 buttons now.

3. (a) There are 4 boys at the bus stop.
There are 4 girls at the bus stop.
 $4 + 4 = 8$
There are 8 children at the bus stop in all.

(b) There are 5 monkeys in the tree.
There is 1 monkey on the ground.
 $5 + 1 = 6$
There are 6 monkeys altogether.

(c) There are 8 children in the queue.
2 more children join the queue.
 $8 + 2 = 10$
There are 10 children altogether.

(d) There are 3 babies sleeping.
There are 3 babies playing.
 $3 + 3 = 6$
There are 6 babies altogether.


SOLVING PICTURE PROBLEMS

LEARNING OBJECTIVES

1. Apply and reinforce learning of addition through solving addition problems presented in pictures.
2. Two types of addition problems – ‘putting together’ and ‘adding on’.

SOLVING PICTURE PROBLEMS

IN FOCUS




How many flowers does Meiling have altogether?

LESSON
3


LET'S LEARN


1.



5


How many flowers do you see?





3

Add 5 and 3. What is the answer?



$5 + 3 = 8$

Meiling has 8 flowers altogether.

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ADDITION WITHIN 10

29

Textbook 1 P29

IN FOCUS

Help pupils to understand the question by asking the following questions:

- How many types of flowers are there?
- How do we find the number of flowers that Meiling has altogether?

The pupils are expected to identify that there are two types of flowers (daisies and roses) from the picture.

LET'S LEARN

After identifying the two types of flowers, pupils are expected to count the number of roses and daisies present.

Bring the attention back to the question and ask the pupils if they can identify the number story ('putting together') in this case.

Get pupils to construct an addition equation to answer the question. Check that their equations are written correctly.

2.



How many children are there in all?

$$3 + 4 = 7$$

There are 7 children in all.

3 children are playing.
4 more children
join them.



PRACTICE



Solve.

1.



How many cupcakes are there altogether?

$$7 + 3 = 10$$

There are 10 cupcakes altogether.

30

CHAPTER 3

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Textbook 1 P30

Reinforce the problem-solving concept with Let's Learn 2. Note that in this case, the number story is an 'adding on' problem.

PRACTICE



Help the pupils to read and understand each question through interpretation of the pictures. Check their understanding by asking if they know what is required to answer the question.

Avoid chorus answers from pupils and encourage participation by inviting individual responses. Ask the pupils how they get their answers and if possible, get another pupil to verify the answer.

For better understanding, select items from **Worksheet 3** and work these out with the pupils.

2.



How many apples does Bina have now?

$$2 + 5 = 7$$

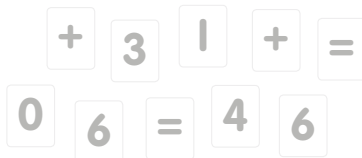
Bina has 7 apples now.

Complete Workbook 1A, Worksheet 3 • Pages 39 - 41



MIND WORKOUT

Make two addition facts.
Use all the cards shown.



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ADDITION WITHIN 10

31

Textbook 1 P31

Independent seatwork

Assign pupils to complete Worksheet 3 (Workbook 1A P39 – 41).

Answers Worksheet 3 (Workbook 1A P39 – 41)

1. (a) $2 + 2 = 4$
There are 4 cupcakes altogether.

(b) $5 + 4 = 9$
There are 9 flowers in all.

(c) $8 + 2 = 10$
Tom has 10 stamps now.

(d) $6 + 4 = 10$
Kate has 10 fruits now.

2. (a) $4 + 5 = 9$
Meiling has 9 dolls altogether.

(b) $2 + 4 = 6$
Meiling has 6 toy cars in all.

(c) $3 + 1 = 4$
Meiling has 4 balls now.

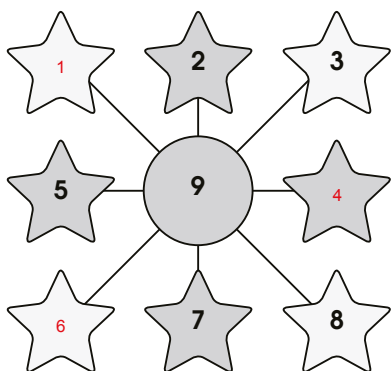
PROBLEM SOLVING, MATHS JOURNAL AND PUPIL REVIEW



Mind Workout

Date: _____

Fill in each star with a number from 1 to 8.
You can use each number only once.



How do you get the answer?



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Mind Workout

Help pupils understand the problem by asking the following questions:

- How many stars are there altogether?
- How many stars do not have a number?
- Between the numbers 1 to 8, which numbers are not in the picture?

Draw the pupils' attention to the stars with the numbers 2 and 7 and the number 9 in the centre of the picture. Lead pupils to see that the numbers are related to number bonds of 9.

Workbook 1A P42

2.



How many apples does Bina have now?

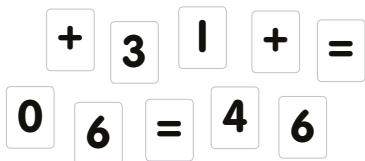
$$2 + 5 = 7$$

Bina has 7 apples now.

Complete Workbook 1A, Worksheet 3 • Pages 39 - 41

MIND WORKOUT

Make two addition facts.
Use all the cards shown.



Textbook 1 P31



MIND WORKOUT

Provide the cards for pupils to have a hands-on approach.

Get pupils to understand the problem by asking the following questions:

- How do you write an addition equation?
- How many numeral cards do you need for one equation?
- How many '+' and '=' cards do you need for one equation?
- Where do you place '+' and '=' in an equation?

Lead pupils to form the following first:

$$\underline{\quad} + \underline{\quad} = \underline{\quad}$$

From here on, pupils can try making addition equations from the numeral cards. Pupils can do so by forming number bonds with any 3 numeral cards, or through the 'guess and check' method.

MATHS JOURNAL



How many ways can you put the cherries onto the plates?
Draw the different ways.
Write the addition facts.

I know how to...

SELF-CHECK

- add using number bonds.
- add by counting on.
- make addition stories.
- write addition facts.

Textbook 1 P32

MATHS JOURNAL

Assign pupils to work in pairs. Provide each pair with 2 paper plates and 6 counters for a hands-on approach.

For each way the pupils place the counters, get them to draw and write the addition equation in a systematic format.

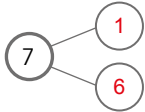
With this format, they are able to see the different number bonds and addition facts of 6.

SELF-CHECK

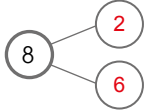
Before doing the self check, ask the pupils to give examples for each objective.

This self check can be done after pupils have completed **Review 3** (Workbook 1A P43 – 46) as consolidation of understanding for the chapter.

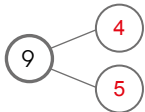
1. (a) $1 + 6 = 7$



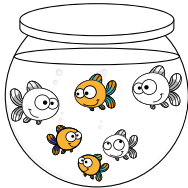
(b) $2 + 6 = 8$



(c) $4 + 5 = 9$

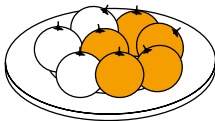


2. (a)



$3 + 3 = 6$
There are 6 fish altogether.

(b)



$3 + 5 = 8$
There are 8 oranges altogether.

(c)



$5 + 4 = 9$
There are 9 flowers altogether.

3. (a)



(b)



(c)



4. (a) $4 + 6 = 10$

(b) $7 + 2 = 9$

5. (a) $4 + 2 = 6$

There are 6 cans altogether.

(b) $3 + 5 = 8$

There are 8 marbles in all.

(c) $7 + 3 = 10$

There are 10 ice creams altogether.


SUBTRACTION WITHIN 10

CHAPTER

4



Subtraction Within 10 CHAPTER **4**

2 ladybirds fly away.
How many ladybirds are left?



WAYS TO SUBTRACT LESSON **1**

IN FOCUS



There are 7 ladybirds.
2 ladybirds fly away.

How many ladybirds are left?

OXFORD UNIVERSITY PRESS SUBTRACTION WITHIN 10 **33**

Textbook 1 P33

Related Resources

NSPM Textbook 1 (P33 – 46)

NSPM Workbook 1A (P47 – 66)

Materials

2-colour counters, multilink cubes, subtraction-fact cards, number bond template, marker, numeral cards, magnetic buttons, mat, picture cut-outs, drawing block

Lesson

Lesson 1 Ways to Subtract

Lesson 2 Making Subtraction Stories

Lesson 3 Solving Picture Problems

Lesson 4 Addition and Subtraction

Problem Solving, Maths Journal and Pupil Review

INTRODUCTION

Two early concepts of subtraction are introduced in this chapter – the ‘take away’ and ‘part-part-whole’ concepts. The instructional activities enable pupils to recognise these two meanings of subtraction and experience subtraction as the reverse of addition. Ways to subtract include methods of **crossing out**, **use of number bonds** and **counting-back**. Through the use of real world context and concrete materials, pupils will be able to express subtraction equations in mathematical language and written symbols; as well as to apply them in making subtraction stories and solving simple picture problems.

LESSON

1

WAYS TO SUBTRACT

LEARNING OBJECTIVES

1. Subtract by crossing out (based on the 'take away' concept).
2. Subtract using number bonds (based on the 'part-part-whole' concept).
3. Subtract by counting back.

Subtraction Within 10

CHAPTER 4

2 ladybirds fly away.
How many ladybirds are left?

WAYS TO SUBTRACT

LESSON 1

IN FOCUS

There are 7 ladybirds.
2 ladybirds fly away.

How many ladybirds are left?

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SUBTRACTION WITHIN 10 33

IN FOCUS

Use the chapter opener to discuss the problem with pupils.

Ask pupils the following questions to encourage discussion:

- How many ladybirds do you see altogether?
- There were 7 ladybirds resting on the leaf at first, then 2 ladybirds start to fly away. How many ladybirds are left on the leaf?

Textbook 1 P33

LET'S LEARN

Subtract By Crossing Out

1.



$7 - 2 = 5$
5 ladybirds are left.

- is read as **minus**.
It means to **subtract**.

$7 - 2$ is the same as 5.

$7 - 2 = 5$ is a **subtraction fact**.

We read it as seven **minus** two **equals** five.

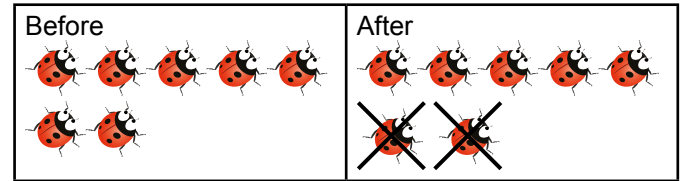
2. How many sandwiches are left?



$5 - 1 = 4$
4 sandwiches are left.

There are 5 sandwiches.
1 sandwich is eaten.

Using magnetic buttons or picture cut-outs, show the 'before' and 'after' situation on the whiteboard.



Illustrate the 'crossing out' action to represent 'fly away'. Then introduce the term 'take away' to show that there are 5 ladybirds left in the 'after' picture.

Introduce the subtraction equation ' $7 - 2 = 5$ '. Get pupils to read the equation in words 'seven minus two is equal to five'. Explain that the symbol '-' means minus and that it means to **subtract**. Emphasise that crossing out is to minus and to find what is left after taking away from the whole set.

Provide pupils with these counting objects (multilink cubes or counters) and ask them to model the problem in the example. Ask them to show the number of sandwiches left if one is eaten.

Illustrate the 'crossing out' on the picture as 'taking away' and link the concrete objects to the subtraction equation ' $5 - 1 = 4$ '.

Get pupils to read the equation as '5 minus 1 equals to 4'.

PRACTICE

Subtract by crossing out.



$8 - 5 = 3$



$10 - 3 = 7$

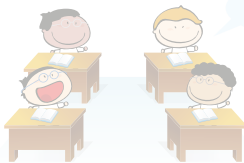


$6 - 3 = 3$

Complete Workbook 1A, Worksheet 1A • Pages 47 - 48

IN

FOCUS



There are 4 boys.
3 boys wear glasses.

How many boys do not wear glasses?

PRACTICE

Help the pupils to read and understand each question. Make the connection between the crossed out pictures and the subtraction equation. Avoid chorus answers from pupils and encourage participation by inviting individual responses. Ask the pupils how they get their answers and if possible, get another pupil to verify the answer.

For better understanding, select items from **Worksheet 1A** and work these out with the pupils.

Independent seatwork

Assign pupils to complete Worksheet 1B (Workbook 1A P47 - 48).

Activity Subtraction operation and equation

Materials Mat, multilink cubes or any other objects that can be used for counting, worksheet (Activity Handbook 1 P13)

Procedure

1. Assign pupils to work in pairs.
2. Provide each pair with the following activity worksheet and 10 multilink cubes in a box.
3. Pupils are to work together to show the cubes as instructed in the worksheet.
4. Start the activity by placing the appropriate number of cubes as instructed on the worksheet on the mat. Then take away by removing the cubes from the mat.
5. To form the subtraction equation, they are to count and record the number of cubes left on the mat after taking away.
6. After repeating steps 1 – 5 for six rounds, encourage pupils to make up their own subtraction equations and illustrate them with cubes.

Answers Worksheet 1A (Workbook 1A P47 – 48)

1. (a) $7 - 4 = 3$

(b) $8 - 3 = 5$

(c) $10 - 7 = 3$

2. (a) 5



(b) 4



(c) 6



(d) 1



(e) 0



(f) 7



Subtract by crossing out.

(a)  $8 - 5 = 3$

(b)  $10 - 3 = 7$

(c)  $6 - 3 = 3$

Complete Workbook 1A, Worksheet 1A • Pages 47 – 48



How many boys do not wear glasses?


Textbook 1 P35

LET'S LEARN

Subtract Using Number Bonds

1. $4 - 3 = 1$
 whole part part
 1 boy does not wear glasses.



2.  $7 - 2 = 5$
 5 boats are left.

How many boats are there?
 How many boats sail away?

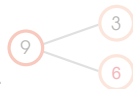


PRACTICE

Subtract.

1.  $9 - 3 = 6$
 6 of the toys are aeroplanes.

There are 9 toys.
 3 of the toys are toy robots.

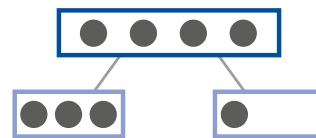


Textbook 1 P36

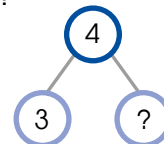
LET'S LEARN

Use magnetic buttons or picture cut-outs to represent the boys in the picture. Show how to separate the boys into 2 groups using the 'part-part-whole' concept. Ask pupils how the buttons should be placed to show the two parts.

Example



Draw the number bond diagram and lead pupils to fill in the numbers while reading it aloud:
 There are 4 boys. 3 boys wear glasses. How many boys do not wear glasses?



Say that the unknown part can be found by subtracting the other part from the whole. Show this with the subtraction equation: $4 - 3 = 1$, and invite the pupils to read this equation aloud, '4 minus 3 equals to 1'.
 Using Let's Learn 2, reinforce the 'part-part-whole' concept by linking the subtraction equation to the number bond diagram.

LET'S LEARN

Subtract Using Number Bonds

1. $4 - 3 = 1$
 whole part part
 1 boy does not wear glasses.

2. How many boats are there? How many boats sail away?

$7 - 2 = 5$
 5 boats are left.

PRACTICE

Subtract.

1. There are 9 toys. 3 of the toys are toy robots.

$9 - 3 = 6$
 6 of the toys are aeroplanes.

Textbook 1 P36

PRACTICE

Help the pupils to read and understand each question. Avoid chorus answers from pupils and encourage participation by inviting individual responses. Ask the pupils how they get their answers and if possible, get another pupil to verify the answer.

For better understanding, select items from **Worksheet 1B** and work these out with the pupils.

2. There are 6 pelicans. How many pelicans fly away?

$6 - 0 = 6$
 6 pelicans are left.

Complete Workbook 1A, Worksheet 1B • Pages 49 – 50

IN FOCUS

There are 8 books in all. 3 books are on the table.

How many books are there in the bag?

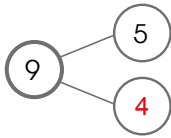
Textbook 1 P37

Independent seatwork

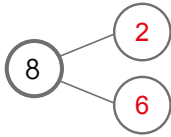
Assign pupils to complete Worksheet 1B (Workbook 1A P49 – 50).

Answers Worksheet 1B (Workbook 1A P49 – 50)

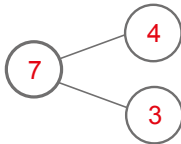
1. (a) $9 - 5 = 4$
4 pencils are short.



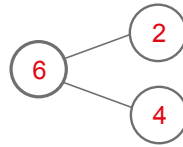
- (b) $8 - 2 = 6$
6 buttons are square.



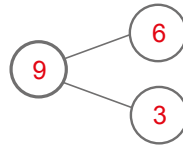
- (c) $7 - 4 = 3$
3 birds are left.



- (d) $6 - 2 = 4$
4 cats do not have stripes.



- (e) $9 - 6 = 3$
3 fish are big.



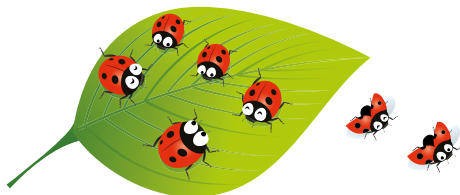
Activity Associate subtraction with number bonds

Materials Picture cards, number bond template, marker pens, subtraction picture cards

Procedure

1. Provide each pupil with a number bond template and a marker pen.
2. Prepare some subtraction picture cards with the number sentences (examples in the textbook or workbook can be used) to show on the visualiser.

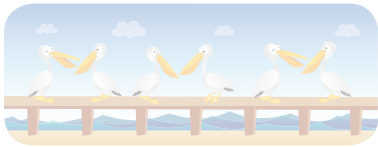
Example



$$7 - 2 = \square$$

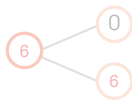
3. Show the picture cards to pupils and get them to tell the story and read the number sentence.
4. Ask pupils to draw a number bond diagram that matches the subtraction sentence on their mini whiteboards.
5. Check the pupils' work once they are done and repeat the activity with another story.
6. If time permits, select some pupils to present their work to the class.

2.



There are 6 pelicans.
How many pelicans fly away?

$6 - 0 = 6$
6 pelicans are left.



Complete Workbook 1A, Worksheet 1B • Pages 49 – 50



There are 8 books in all.
3 books are on the table.

How many books are there in the bag?

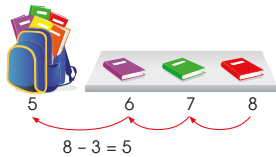


Textbook 1 P37

LET'S LEARN

Subtract By Counting Back

1. $8 - 3 = ?$

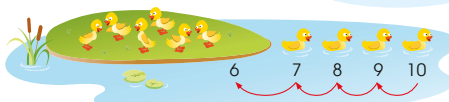


Count back 3 steps
from 8.



There are 5 books in the bag.

2. How many ducklings are left?



There are 10 ducklings.
4 ducklings swim away.



$10 - 4 = 6$

There are 6 ducklings left.

Textbook 1 P38

Use concrete objects to illustrate the example in the picture. Without showing the pupils, place 5 books inside a bag and lay 3 books next to the bag.

Tell pupils that there are 8 books in total and encourage them to guess the number of books in the bag.

Review with pupils the concept of subtracting by 'crossing out' or using number bonds. Ask for other ways to find the number of books in the bag, other than those learned previously.

Introduce 'counting back' as another method to find the number of books in the bag. Starting from 8, count back 3 steps. Emphasise that the last count (5) is the answer to $8 - 3$. This can be demonstrated by using fingers or writing on the whiteboard.

Further reinforce this strategy with Let's Learn 2. Start off by reciting the number sequence backward from 10 with the pupils.

More examples should be given to allow pupils to practice counting back mentally from a given number. Get some pupils to demonstrate the counting-back strategy to the class.

Play in groups of 3 to 4.

- 1 Show a $5-2$.
- 2 The other players count back and answer.

Example

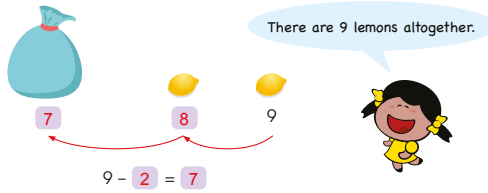


The first player to get the correct answer gets 1 point.

- 3 After 10 rounds, the player with the most points wins!

PRACTICE

Subtract by counting back.



There are **7** lemons in the bag.

Complete Workbook 1A, Worksheet 1C • Pages 51 – 52

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SUBTRACTION WITHIN 10

Textbook 1 P39

Assign pupils to work in groups of 3 to 4. Provide each group with a set of 10 to 20 subtraction-fact cards.

Pupils are required to count back mentally or silently.

The player with the correct answer has to demonstrate how he or she counts back to get the answer.

PRACTICE

Give time for all pupils to practice the 'counting back' strategy on their own for this example. Then select individual pupils to demonstrate aloud to the class the strategy to get the answer.

Give more practice with selected items from **Worksheet 1C**.

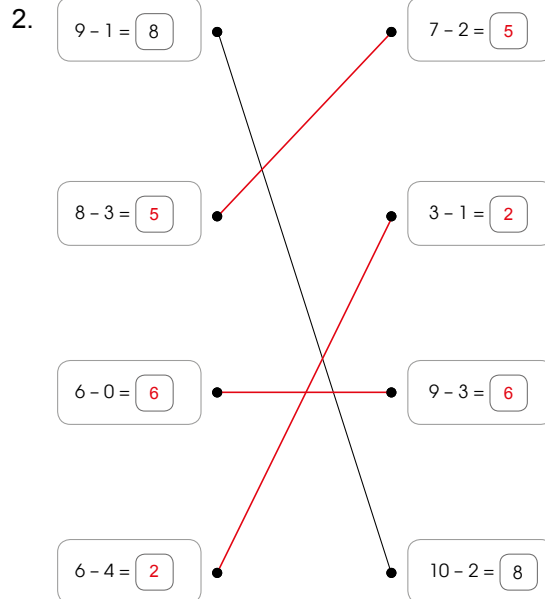
Independent seatwork

Assign pupils to complete Worksheet 1C (Workbook 1A P51 – 52).

Answers

Worksheet 1C (Workbook 1A P51 – 52)

1. (a) 2
- (b) 4
- (c) 1
- (d) 0
- (e) 10





Specific Learning Focus

- Subtract by crossing out (based on the 'take away' concept).
- Subtract using number bonds (based on the concept of 'part-part-whole').
- Subtract by counting back.

Suggested Duration

5 periods

Prior Learning

To introduce subtraction equations, prior knowledge of the 'take away' concept has to be revisited. Pupils should be well versed with using their fingers to apply the 'take away' concept and they can see this as a backward process or the opposite of addition. Counting back is another method of subtraction. It can be carried out by backward counting using real-life objects and the 'taking away' or 'removing' them as a hands-on activity can also be experienced by pupils as they have done it before in their earlier experiences. This lesson essentially serves as a foundation that leads to the formulating of subtraction equations.

Pre-emptive Pitfalls

Avoid chorus counting in class. Pupils should be asked individually to count backwards to solve the subtraction equation. Pupils tend to get confused while 'taking away' and as a result, under or over count. If the 'number bonds' method has not been made clear earlier, pupils will struggle to correlate number bonds with subtraction.

Introduction

Subtraction facts in this lesson are taught by three strategies (a) crossing out (b) using number bonds (c) counting back. The use of the 'before' and 'after' concept will be the key to explaining subtraction. Pupils will relate 'before' to real-life situations such as the number of items they started off with and relate 'after' to 'cross out', 'fly away', 'take away', 'eaten', 'given', 'broken', etc. The 'part-part-whole' concept of number bonds will be done in reverse as subtraction is the opposite operation of addition. Hence the 'whole' will be placed in the number bond first, followed by the 'part-part'. Introduce the symbol '-' as 'minus'. Have the pupils recall the addition equation with the '+' and '=' signs and then start making them individually say the subtraction equations aloud, such as '5 minus 2 equals 3'.

Problem Solving

Making subtraction stories and solving picture problems (Lessons 2 & 3) are crucial to linking C-P-A progression and development (Textbook 1 P40 – 43). Encourage pupils to understand the difference between 'before' and 'after' in number stories. Break the story into two parts – before (past) and after (present) and get pupils to understand that the difference between the two stages will always be less than the original ('before') number. Developing their critical thinking by relating to a real-life scenario is essential. Always reinforce that subtraction is the reverse of addition and that subtraction will always give a smaller number than the original number.

Activities

The activity in Textbook 1 (P39) can be used as a formative assessment tool, leading to the application of the equations concept required in the activity in the Activity Handbook 1 (P13).

Resources

- 2-colour counters
- multilink cubes
- subtraction-fact cards (Activity Handbook 1 P12)
- number bond templates (Activity Handbook 1 P9 - 10)
- marker
- numeral cards
- magnetic buttons
- mat
- picture cut-outs
- drawing block

Mathematical Communication Support

Reintroducing the symbols '=' as 'equals to' or the result of an operation, the '-' minus sign as 'take away' and opposite of '+' (plus or altogether) will strengthen the mathematical language skills of pupils. Once again translating language key words to symbols will be crucial to their mathematical communication transition. Encouraging pupils to interpret the real-life stories (Lesson 2) of each question (Textbook 1 P40 – 43) will be important as some will struggle to articulate. The motivation and spontaneous involvement of learning during interactive class participation will be critical (e.g. Sara, what do you see in the picture on page 40? What are the rabbits doing? What do you think they are up to? Are they all going to eat the carrots? How many carrots will there be left? What if only two rabbits eat their carrots? How many carrots will be left then?). Create interesting scenarios through drama and role-play.

MAKING SUBTRACTION STORIES


LEARNING OBJECTIVES

1. Apply and reinforce learning of subtraction through making subtraction stories in the real-world context.

MAKING SUBTRACTION STORIES

LESSON
2


IN
FOCUS



What subtraction stories can you make from the picture?

LET'S LEARN

1.




There are 7 rabbits.
1 rabbit is black.
The rest of the rabbits are white.

$7 - 1 = 6$

6 of the rabbits are white.

2.



There are 10 carrots.
The rabbits pull out 7 carrots.

$10 - 7 = 3$

There are 3 carrots left.

40 CHAPTER 4
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Textbook 1 P40

IN FOCUS

Encourage pupils to discuss what they see in the picture. Some points of focus are as follows:

- The rabbits
- The carrots being held by the rabbits and the carrots in the garden
- Any difference between the numbers of carrots and rabbits

Finally, ask pupils to come up with a subtraction story from the picture.

At this stage, some pupils may or may not be able to respond with some stories intuitively. This helps to gauge each pupil's level of understanding on what was taught previously.

LET'S LEARN

First discuss the difference in the two different coloured rabbits in the picture. Invite pupils to come up with subtraction stories about the rabbits.

Next, discuss the difference in the carrots that are held by the rabbits and the carrots left in the garden. Similarly, invite pupils to come up with subtraction stories relating to the carrots.

Help to present the pupils' stories on the whiteboard.

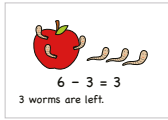


Work in groups of 3 to 4.

- 1 Open a card and make a story.
- 2 Draw a picture to show your story.

ACTIVITY TIME

What you need:



There are 6 worms.
3 worms crawl away.

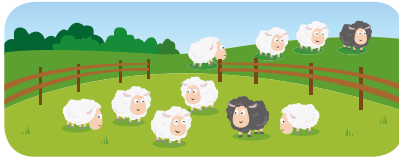


- 3 Show your group's picture to the class.
Tell your subtraction story.

PRACTICE



Find the missing numbers.



- (a) There are 10 sheep.
2 sheep are black.
 $10 - 2 = 8$
8 sheep are white.
- (b) There are 10 sheep.
4 sheep walk away.
 $10 - 4 = 6$
6 sheep are left.

Complete Workbook 1A, Worksheet 2 • Pages 53 - 56

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SUBTRACTION WITHIN 10

41

Textbook 1 P41

Assign pupils to work in groups of 3 to 4. Encourage pupils to be creative in their subtraction stories and drawings.

Select 10 best drawings to be displayed on the class board.

PRACTICE



Help the pupils to read and understand each question by interpreting the picture. Encourage them to come up with their own subtraction stories before attempting the questions.

Avoid chorus answers from pupils and encourage participation by inviting individual responses.

For better understanding, select items from **Worksheet 2** and work these out with the pupils.

Independent seatwork

Assign pupils to complete Worksheet 2 (Workbook 1A P53 - 56).

Answers Worksheet 2 (Workbook 1A P53 - 56)

1. (a)
 $7 - 2 = 5$
 5 are blue.

- (b)
 $9 - 6 = 3$
 3 balls are green.

2. (a) 1 fish swims away.
 $6 - 1 = 5$
 5 fish are left in the pond.

- (b) 2 bees fly away.
 $5 - 2 = 3$
 3 bees are left.

- (c) There are 7 frogs.
 3 frogs jump off the lily pads.
 $7 - 3 = 4$
 There are 4 frogs left on the lily pads.

- (d) There are 8 ducks.
 3 ducks are on the ground.
 $8 - 3 = 5$
 5 ducks are in the lake.

- (e) There are 8 apples altogether.
 2 apples are outside the box.
 $8 - 2 = 6$
 There are 6 apples in the box.

- (f) There are 9 cupcakes in all.
 6 cupcakes have a cherry each.
 $9 - 6 = 3$
 3 cupcakes do not have cherries.

SOLVING PICTURE PROBLEMS

LEARNING OBJECTIVES


1. Apply and reinforce the learning of subtraction through solving problems presented in pictures.

SOLVING PICTURE PROBLEMS

LESSON

3


IN FOCUS



How many of the children are girls?

LET'S LEARN


1. Group the children into boys and girls. There are 5 boys.



$9 - 5 = 4$

4 of the children are girls.

Subtract 5 from 9. What is the answer?



42

CHAPTER 4

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Textbook 1 P42

IN FOCUS

Invite pupils to talk about the picture. Ask for any differences they can spot in the picture and if the children in the picture can be placed into two groups.

Help the pupils to do this through the use of cut-outs or magnetic buttons to represent the children.

Once the pupils are able to group the children in the picture, ask them to come up with subtraction stories.

LET'S LEARN

Draw pupils' attention to the number of girls in the picture. After which, count the number of boys. Ask the pupils if they can identify the type of number story here.

Get pupils to write a subtraction equation for the problem and check if they are correct. They should be able to come up with: $9 - 5 = 4$

Get them to read the equation aloud (9 minus 5 equals 4) and ask how they solve the problem. They are expected to respond with: 4 of the children are girls.

2.



How many children are left on the bus?

$$9 - 3 = 6$$

6 children are left on the bus.

PRACTICE



Solve.

1.



How many balloons does Nora have left?

$$7 - 3 = 4$$

Nora has 4 balloons left.

2.



How many eggs are left?

$$9 - 4 = 5$$

5 eggs are left.

Complete Workbook 1A, Worksheet 3 • Pages 57 – 58

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SUBTRACTION WITHIN 10

43

Textbook 1 P43

Reinforce the concept with Let's Learn 2. Follow the similar line of questioning as for Let's Learn 1 to help the pupils to fully understand the question.

PRACTICE



Help pupils with the problems by asking questions about the pictures to aid in the interpretation of each question.

For better understanding, select items from Worksheet 3 and work these out with the pupils.

Independent seatwork

Assign pupils to complete Worksheet 3 (Workbook 1A P57 – 58).

Answers Worksheet 3 (Workbook 1A P57 – 58)

1. (a) $8 - 4 = 4$
4 rabbits are left.
- (b) $10 - 3 = 7$
7 chicks are eating.
- (c) $4 - 2 = 2$
2 of the children are girls.
- (d) $7 - 2 = 5$
5 firemen are left on the fire engine.

ADDITION AND SUBTRACTION

LEARNING OBJECTIVES

1. Relate addition and subtraction with the 'part-part-whole' concept of number bonds.
2. Write a family of related addition and subtraction facts.

ADDITION AND SUBTRACTION

LESSON
4

IN  FOCUS

What addition and subtraction stories can you tell?



LET'S LEARN 



There are 7 apples.
5 apples are red and
2 apples are green.

How many apples are there altogether?

$5 + 2 = 7$ or $2 + 5 = 7$

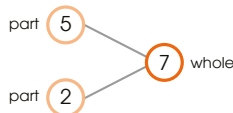
How many apples are red?

$7 - 2 = 5$

How many apples are green?

$7 - 5 = 2$

They make up a family of **addition and subtraction facts**.



IN  FOCUS

Discuss the picture with the pupils, drawing their attention to the colours of the apples and the number of each type of apples.

Get pupils to discuss in pairs and come up with addition and subtraction stories. Invite responses from the class and write their stories on the whiteboard.

LET'S LEARN 

Using magnetic buttons or other counting objects, put the apples into two groups – one containing only red apples and the other containing only green apples.

Get volunteers from the class to show addition stories using numeral cards and cards with the signs '+' and '-'.

Ask for different addition equations that can be formed. Write the equations on the whiteboard and their corresponding number bonds.

Repeat the above activity to show subtraction equations. Lead the pupils to see how the addition and subtraction equations are related to the same number bond for the total number of apples (whole) and their subgroups (parts).

Consolidate by putting the family of number equations together and get the pupils to recognise that this makes up a **family of addition and subtraction facts**.

Activity

Subtraction is the reverse of addition

Materials

Different types of counting objects, picture cut-outs, mini whiteboard

Procedure

1. Take out 4 red buttons and 3 blue buttons on the visualiser.
2. Ask the class to think of an addition story and invite some pupils to respond.

Example


There are 4 red buttons and 3 blue buttons. How many buttons are there altogether?

3. Get the class to write two addition equations for the story on their mini whiteboards. Check the pupils' work.
4. Next, reverse the process by separating the buttons into two groups, covering one of the groups.
5. Ask the class to think of a subtraction story and invite some pupils to respond.


Example

There are 7 buttons. 4 buttons are red. How many buttons are blue?


6. Get the class to write the subtraction equation for the story on their mini whiteboards. Check the pupils' work.
7. Repeat steps 4 to 6 by covering the other group of buttons.
8. Repeat this activity using other counting objects or picture cut-outs, using numbers for addition and subtraction within 10.


PRACTICE 

Make a family of addition and subtraction facts.

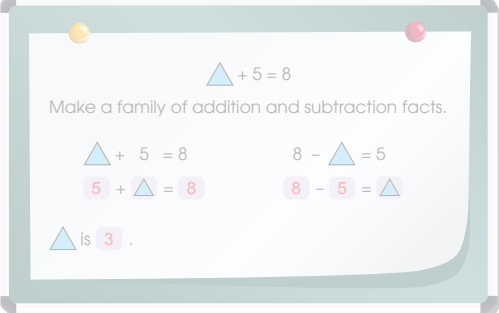


$$\begin{array}{l} 4 + 5 = 9 \\ 5 + 4 = 9 \end{array} \quad \begin{array}{l} 9 - 4 = 5 \\ 9 - 5 = 4 \end{array}$$

 Complete Workbook 1A, Worksheet 4 • Pages 59 – 61

 **MIND WORKOUT**

Solve.



$\triangle + 5 = 8$

Make a family of addition and subtraction facts.

$$\begin{array}{l} \triangle + 5 = 8 \\ 5 + \triangle = 8 \end{array} \quad \begin{array}{l} 8 - \triangle = 5 \\ 8 - 5 = \triangle \end{array}$$

\triangle is 3 .

OXFORD UNIVERSITY PRESS SUBTRACTION WITHIN 10 45

PRACTICE 

Help pupils with the problems by asking questions about the pictures to aid in the interpretation of each question.

Avoid chorus answers from pupils and encourage participation by inviting individual responses. Ask the pupils how they get their answers and if possible, get another pupil to verify the answer.

For better understanding, select items from **Worksheet 4** and work these out with the pupils.

Independent seatwork

Assign pupils to complete Worksheet 4 (Workbook 1A P59 – 61).

1. (a) $4 + 1 = 5$
 $1 + 4 = 5$
 $5 - 4 = 1$
 $5 - 1 = 4$

(b) $5 + 2 = 7$
 $2 + 5 = 7$
 $7 - 5 = 2$
 $7 - 2 = 5$

(c) $3 + 7 = 10$
 $7 + 3 = 10$
 $10 - 3 = 7$
 $10 - 7 = 3$

(d) $2 + 8 = 10$
 $8 + 2 = 10$
 $10 - 2 = 8$
 $10 - 8 = 2$

2. (a) $3 + 5 = 8$
 $5 + 3 = 8$
 $8 - 3 = 5$
 $8 - 5 = 3$

(b) $1 + 9 = 10$
 $9 + 1 = 10$
 $10 - 1 = 9$
 $10 - 9 = 1$

**Specific Learning Focus**

- Relate addition and subtraction with the 'part-part-whole' concept of number bonds.
- Write a family of related addition and subtraction facts.

Suggested Duration

2 periods

Prior Learning

Pupils have learnt addition and subtraction facts and equations through multiple strategies. This lesson is an accumulation of chapters 3 and 4. Chapter 2 is the foundation of both chapters 3 and 4 and critical to their mathematical understanding.

Pre-emptive Pitfalls

Pupils tend to get confused between the symbols '+' (addition) and '-' (subtraction). Since there are multiple strategies for both operations, it will be important to point out to the pupils the strategy they have to use after deciding the operation '+' or '-'. In the later stage when both operations are introduced in one mathematical story, further confusion might arise. The purpose of this lesson is to ensure that pupils understand that addition and subtraction equations are the parts that make the 'whole' of the same family.

Introduction

Addition and subtraction facts should be made fun using addition and subtraction stories. To carry out the activity in Textbook 1 (P44 - 45), bring to the classroom a basket of apples and teddy bears. Get pupils to role-play the situation and make number bonds. Distribute the items (apple and teddy bear) to each pupil. Ask them to show addition and subtraction using the items (e.g. the teacher may get the pupils to work in groups of 3 or 4 and get them to put all the items in the basket to show addition.). After the activity, have them return to their desks and fill in their addition and subtraction fact cards (Activity Handbook 1 P14).

Problem Solving

The use of both operations involving the same items develops their critical thinking. It enhances their knowledge of the concept and they are able to see the link between number bonds, parts, wholes, addition and subtraction.

Activities

The activities in 'Mind Workout' (Textbook 1 P45) and 'Maths Journal' (Textbook 1 P46) can be carried out in the classroom. Cut-outs and plastic frogs can be used. The teacher can be creative by bringing in a container filled with water and placing the frog toys in the container of water to represent frogs in the pond.

Resources

- apples
- teddy bears
- toy frogs
- container filled with water

Mathematical Communication Support

The content in this lesson is a consolidation of operations taught earlier, cognizant of the fact that subtraction is the reverse of addition. Encouraging pupils to understand the total number of items as putting them together and the difference as a result of taking away a few items is important. Making both equations involving the same 'whole' and encouraging pupils to come up with their own subtraction and addition facts should be made fun. Give them blank fact cards and items to create addition and subtraction facts.

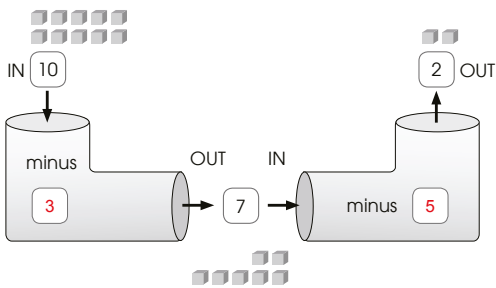
PROBLEM SOLVING, MATHS JOURNAL AND PUPIL REVIEW



Mind Workout

Date: _____

This is a subtraction machine.
Fill in the blanks with the correct numbers.



Maths Journal

Draw a picture to show the subtraction fact.

$$5 - 3 = 2$$

62 Chapter 4

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Mind Workout

Help pupils understand the problem by asking the following questions.

For the first machine:

- What does the subtraction machine do when you put in 10 cubes?
- Do all the cubes come out of the machine?
- How many missing cubes are there?
- Think of the number bond of 10, what is the missing number?

For the second machine:

- What happens to the 7 cubes when it goes into the next machine?
- Think of the number bond of 7, what is the missing number?



Maths Journal

Encourage creativity in pupils' drawings for the subtraction story. The story should demonstrate either the 'take away' concept or the 'part-part-whole' concept.

Workbook 1A P62

PRACTICE

Make a family of addition and subtraction facts.



$$4 + 5 = 9$$

$$5 + 4 = 9$$

$$9 - 4 = 5$$

$$9 - 5 = 4$$

Complete Workbook 1A, Worksheet 4 • Pages 59 – 61

MIND WORKOUT

Solve.

$\triangle + 5 = 8$

Make a family of addition and subtraction facts.

$$\triangle + 5 = 8$$

$$8 - \triangle = 5$$

$$5 + \triangle = 8$$

$$8 - 5 = \triangle$$

\triangle is 3 .

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SUBTRACTION WITHIN 10

Textbook 1 P45



MIND WORKOUT

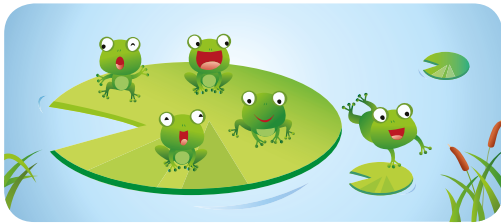
Help pupils understand the problem by asking the following questions:

- What does the triangle represent? (A missing number in the addition equation)
- Think of the number bond of 8, what is the missing number?

After which, allow pupils to complete the family of addition and subtraction facts. From this, they are to make deductions from the facts to find the value of the triangle.

MATHS JOURNAL

Look at the picture.



Make a subtraction story.
Make a family of addition and subtraction facts for the story.

I know how to...

- subtract by crossing out.
- subtract using number bonds.
- subtract by counting back.
- make subtraction stories. write subtraction facts.
- make a family of addition and subtraction facts.

SELF-CHECK



Textbook 1 P46

MATHS JOURNAL

Provide some hints to allow pupils to look for different features in the picture, such as the expressions on the frogs and their positions.

Give some helping words that are suitable for writing their stories in their journals.

Based on their chosen story, pupils are to write out the family of addition and subtraction facts.

SELF-CHECK

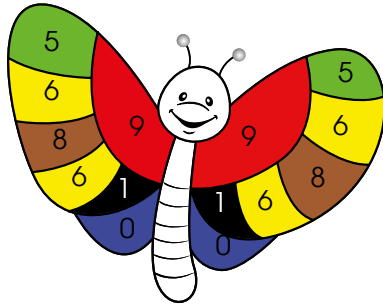


Before the pupils do the self check, review the important concepts once more by asking for examples learnt for each objective.

This self check can be done after pupils have completed **Review 4** (Workbook 1A P63 – 66) as consolidation of understanding for the chapter.

Answers Review 4 (Workbook 1A P63 – 66)

1. (a) 5
- (b) 1
- (c) 0
- (d) 8
- (e) 6
- (f) 9













2. (a) 7
- (b) 4
- (c) 5
- (d) 8
- (e) 3
- (f) 8
- (g) 6
- (h) 7

3. (a) $10 - 2 = 8$
8 cars are left.

(b) $10 - 1 = 9$
There are 9 strawberries in the bag.

4.

 $1 + 1 = 2$	 $7 - 4 = 3$
 $1 + 4 = 5$	 $8 - 2 = 6$
 $6 + 2 = 8$	 $2 - 1 = 1$
 $3 + 4 = 7$	 $10 - 7 = 3$
 $3 + 7 = 10$	 $5 - 1 = 4$

POSITIONS

CHAPTER 5



Related Resources

NSPM Textbook 1 (P47 – 54)
NSPM Workbook 1A (P67 – 76)

Materials

Cards with positional names in words and ordinal numbers, photographs (of the class or family), picture cut-outs

Lesson

Lesson 1 Naming Positions
Lesson 2 Naming Left and Right Positions

Problem Solving, Maths Journal and Pupil Review

INTRODUCTION

In previous chapters, pupils are taught to count with numbers (as cardinal numbers). This chapter shows another use of numbers in the naming of positions (as ordinal numbers). Pupils will learn how to identify cardinal numbers and ordinal numbers based on their roles and the forms they take (i.e. 1 and 1st, 2 and 2nd, etc.). The importance of reference points is also emphasised as naming of positions is meaningless without them. Different ways of describing positions are introduced and opportunities should be provided for pupils to communicate the naming of positions with real-life examples.

NAMING POSITIONS

LEARNING OBJECTIVES

1. Use ordinal numbers to name positions.
2. Use position words to name relative positions.
3. Note the importance of a reference point when naming positions.

Positions
CHAPTER 5

Who will receive the first prize?



NAMING POSITIONS
LESSON 1

IN
FOCUS



Can you tell the position of each runner?

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POSITIONS 47

IN FOCUS

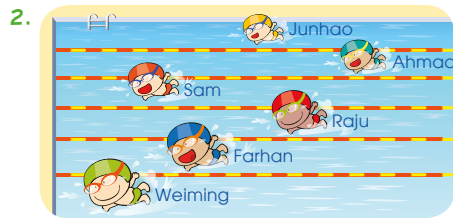
Use the chapter opener to discuss the problem with the pupils. Orientate pupils to relate the concept of position to a race, or any other real-world contexts (such as swimming competitions).

Point to each of the runners and ask the pupils to identify the winner. Lead the pupils to relate the winner to his position relative to the finish line.

The key idea of a reference point, which is the finish line in this case, must be highlighted. Positions become meaningless without a reference point.

Textbook 1 P47

LET'S LEARN



Weiming is **1st**.
 Sam is **2nd**.
 Farhan is **3rd**.
 Raju is **before** Ahmad.
 Raju is **after** Junhao.
 Raju is **between** Junhao and Ahmad.
 Ahmad is the **last**.

What is the position of each swimmer?



Introduce the ordinal numbers (i.e. **1st to 10th, first to tenth**) used to describe positions. Emphasise the importance of having a reference point when naming the positions.

Allow pupils to practice through communication to master the use of ordinal numbers.

For Let's Learn 2, introduce words that can be used to describe the positions. These words are **before, after, between** and **last**.

Allow some time for the pupils to interpret the picture. Ask for reasons to the positions of each child. Pupils are encouraged to form statements to explain the positions. For example, pupils can be asked to explain why Weiming is 1st. The expected response is that Weiming is in front of the rest.

Display cards with positional names (in words and ordinal numbers) to facilitate the learning of the correct mathematical terms.

Make a distinction between ordinal numbers and cardinal numbers. Cardinal numbers are used to describe quantity while ordinal numbers are used to describe positions.



Sam is standing **in front of** Xinyi.
 Xinyi is standing **behind** Sam.

What can you say about where Bala is standing?



PRACTICE

1. There are 5 children in the queue. What is the position of each child in the queue?



fifth	fourth	third	second	first
5th	4th	3rd	2nd	1st

- (a) **Nora** is first in the queue.
- (b) Kate is **fourth** in the queue.
- (c) Raju is **second** in the queue.
- (d) **Junhao** is after Kate.

PRACTICE



Help the pupils to read and understand each question.

For question 1, lead them to note the point of reference by looking at the direction that the children are facing. Demonstrate how the table can be filled up to organise the information.

For question 2, highlight to pupils that the arrangement need not be horizontal.

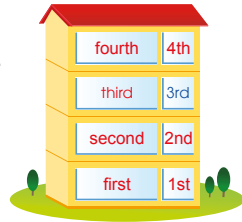
For better understanding, select items from **Worksheet 1** and work these out with the pupils.

Independent seatwork

Assign pupils to complete Worksheet 1 (Workbook 1A P67 – 70).

2. A block of flats has 4 floors. The third floor is named. Use the helping words to name the positions of the other floors.

second 4th first
1st fourth 2nd



3. There are 4 children in the queue.



- (a) Farhan is standing in front of Bina.
 (b) Ann is standing behind Weiming.
 (c) Ann is standing behind Weiming.
 (d) Bina is standing behind Farhan.

Complete Workbook 1A, Worksheet 1 • Pages 67 – 70

Textbook 1 P50

Answers Worksheet 1 (Workbook 1A P67 – 70)

1. (a) the 3rd zebra

 1st
- (b) the 7th bird

 1st
- (c) the 2nd octopus

 1st
- (d) the 6th fish

 1st

2. (a) 4 rabbits

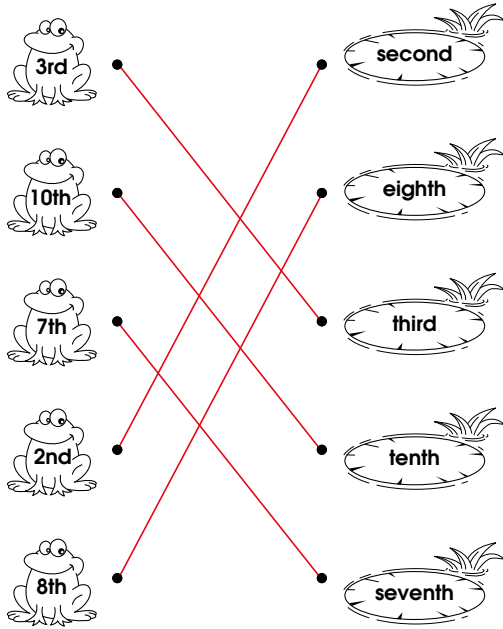
 the 4th rabbit

 1st
- (b) 6 penguins

 the 6th penguin

 1st

3.



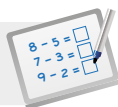
4.

Tom	Xinyi	Nora	Priya	Ahmad	Weiming
1st	2nd	3rd	4th	5th	6th
first	second	third	fourth	fifth	sixth

(a) Tom

(b) Priya

(c) Priya, Weiming

**Specific Learning Focus**

- Use ordinal numbers to name positions.
- Use position words to name relative positions.
- Note the importance of a reference point when naming positions.

Suggested Duration

4 periods

Prior Learning

Pupils are aware of cardinal numbers. They understand the quantitative significance of numbers. During assembly in school and in other instances of lining up, they are able to order and compare amongst themselves (e.g. who is the tallest, shortest, etc.) and can communicate these distinctions. In this lesson, ordinal numbers are used to describe the orientation and position of objects. To distinguish the order, the reference point is crucial.

Pre-emptive Pitfalls

Some pupils may have difficulty differentiating between right and left. This confusion need not be highlighted but can be gently pointed out to the class.

Introduction

This chapter shows another aspect of numbers which is not quantitative. The naming of positions using ordinal numbers is not quantitative. Pupils will learn how cardinal numbers (1, 2, 3) can also take the form of ordinal numbers (first 1st, second 2nd, third 3rd) as positions according to a reference point. It is important that they do not relate ordinal numbers to just competitions (e.g. Sam came first in the race.). Point out the significance of a reference point (e.g. Sara came first as she reached the finishing line the earliest, where the 'finishing line' is the reference point (Textbook 1 P47 - 48)). The block of flats in Question 2 (Textbook 1 P50) is an important real-life example. Use this example to get pupils to explain to their classmate how to go to their friend's house by describing the location of the house.

Problem Solving

'Mind Workout' (Textbook 1 P53) is a good example of relating ordinal numbers to positions and reference points. The stages of decorating and icing the cake can be identified by using ordinal numbers and the reference point being the picture of the completely decorated cake. The activity in the 'Maths Journal' (Textbook 1 P54) can be extended by getting pupils to identify the month of the year when school events will be held (e.g. school concert or sports day). Conceptual appreciation of this chapter can be enhanced with many real-life examples (e.g. the fifth bag on Belt 12 of the airport).

Activities

Take the pupils to the canteen during break time and get them to queue at a stall and point out the position of each child. Highlight the fact that these ordinal numbers are based on a 'reference point' which is the person mending the stall in this example. Another important fact to point out is that ordinal numbers need not be used to describe the position of things in a horizontal arrangement but it can also be a vertical arrangement, so point out to the pupils the different floors of the school building while at the first floor and get them to use ordinal numbers to describe the position of the classroom, science lab, principal's office, etc.

Resources

- ordinal number cards (Activity Handbook 1 P15)
- position word cards (Activity Handbook 1 P16)
- picture cut-outs

Mathematical Communication Support

The way to write ordinal numbers (1st, 2nd, 3rd) and in words (first, second, third) needs to be highlighted. Position words 'before', 'after', 'between' and 'last' with reference to a point can be reinforced with objects and pupils in the classroom. The teacher can carry out an interactive classroom activity where the teacher points out the object and the reference point and gets the pupils to describe the position using ordinal number or words.

NAMING LEFT AND RIGHT POSITIONS

LEARNING OBJECTIVES

1. Use position words to name relative positions.
2. Name relative positions in more than one way.

NAMING LEFT AND RIGHT POSITIONS

LESSON
2

IN  FOCUS



Can you tell the position of each animal from the left?
Can you do the same from the right?

LET'S LEARN

1. The giraffe is first from the **left**.
The monkey is second from the left.
The giraffe is fifth from the **right**.
It is also **last** from the right.
The zebra is third from the left.
It is also third from the right.
The elephant is **next to** the zebra.
It is also next to the tiger.
The elephant is **between** the zebra and the tiger.

We can name the position of each animal starting from the left or the right.



What is the position of the elephant from the right?



POSITIONS 51

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Textbook 1 P51

IN  FOCUS

Use the picture to show other ways of naming positions apart from the use of ordinal numbers, such as using the words **left** or **right**.

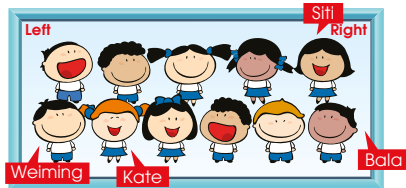
Ask for different ways of describing each animal's position. One way of doing this is to lead the class to play a game.

Assign pupils to work in pairs. Each pupil has to pick an animal and not tell each other. They have to rely on verbal communication and are only allowed to describe the position of the animal using words related to direction. Ensure that the pupils do not describe the animal itself.

LET'S LEARN

Introduce words related to positional naming – **left**, **right**, **next to** and **last**. The key idea is to get pupils to understand that there are many ways to name the positions. This method of positional naming is relational (e.g. different ways of naming the giraffe's position based on different reference points).

2.



Kate is in the first row.
She is second from the left.
She is also fifth from the right.
Siti is in the second row.
She is fifth from the left.
She is also first from the right.
Weiming is **to the left of** Kate.
Kate is **to the right of** Weiming.

Can you tell Bala's position?



ACTIVITY TIME

Work in pairs.

- 1 Look at the .
- 2 Tell your position in the .
 - (a) I am in the _____ row.
 - (b) I am _____ from the left.
 - (c) I am _____ from the right.
 - (d) I am next to _____.
- 3 Read aloud the sentences to tell your position.
- 4 Ask your partner to check your answers.

What you need:
Your family photograph

Use Let's Learn 2 to get pupils to describe the position of a particular child in the picture. For each child (Weiming, Kate, Siti, Bala), get the pupils to describe their position in four different statements using the positional words learnt earlier in this lesson.

ACTIVITY TIME



Assign pupils to work in pairs. Get pupils to prepare a class or family photograph beforehand.

The activity serves to make positional naming meaningful through real-life application.

PRACTICE



What is the position of each child?



- (a) **Weiming** is fourth from the left.
- (b) **Sam** is next to Farhan.
- (c) **Bala** is between Ann and Nora.
- (d) Xinyi is **third** from the right.

Complete Workbook 1A, Worksheet 2 • Pages 71 - 73

MIND WORKOUT

Priya wants to decorate a cake.
Name the pictures from first to sixth to show the correct order.



PRACTICE



Help the pupils with the problems by asking questions about the pictures to aid in the interpretation of each question.

Avoid chorus answers from pupils and encourage participation by inviting individual responses. Ask the pupils how they get their answers and if possible, get another pupil to verify the answer.

For better understanding, select items from Worksheet 2 and work these out with the pupils.

Independent seatwork

Assign pupils to complete Worksheet 2 (Workbook 1A P71 - 73).

1. (a) the seventh drink from the left



the seventh drink from the right



(b) the tenth ball from the right



the tenth ball from the left



(c) the third umbrella from the left



the third umbrella from the right



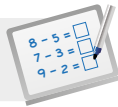
2. (a) pear

(b) pineapple

(c) first

(d) orange

(e) pear, lemon

**Specific Learning Focus**

- Use position words to name relative positions.
- Name relative positions in more than one way.

Suggested Duration

4 periods

Prior Learning

Pupils are already aware of position and reference point taught in Lesson 1. Ordinal numbers and position words have been used to locate an object or name the position of an object.

Pre-emptive Pitfalls

This is a fun chapter with role play and a quick class activity of naming objects. Pupils might have difficulty writing the ordinal numbers and spelling position in words, but these can be reinforced using cards and repetitive classroom activities.

Introduction

Introduce the words 'right' and 'left' using hands and legs. This lesson highlights the fact that there is more than one way of naming positions. Ordinal numbers can be complemented with position words (e.g. 'the book that is 'third' from the 'left' on the 'second' row of the shelf). Similarly, words 'next to', 'between', 'first' and 'last' can be used in class with objects and pupils. The method of positional naming with reference to different reference points should be reinforced. This can be done by describing the same object using different reference points (e.g. Farhan is third from the left and fifth from the right.).

Problem Solving

The activity in 'Mind Workout' (Textbook 1 P53) can be extended by drawing picture stories on the board and discussing the sequential order with the pupils. The use of ordinal numbers and position words together is the main focus of this lesson.

Activities

All the questions in this lesson can be converted to fun games and the class can be divided into two groups or pairs to name positions. In class, the teacher can show pupils ordinal number and position word cards (Activity Handbook 1 P15 - 16) and call out the reference point, and then prompt the pupils to name the positions of the objects. If the class is divided into two groups, the group with the greatest number of correct answers will win.

Resources

- photographs (of the class or family)
- picture cut-outs
- ordinal number cards (Activity Handbook 1 P15)
- position word cards (Activity Handbook 1 P16)

Mathematical Communication Support

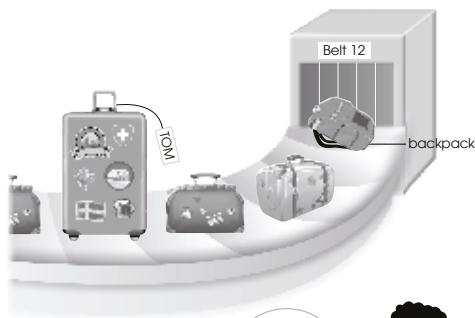
'Let's Learn' (Textbook 1 P51) can be done by assigning pupils to work in pairs. Each pupil has to pick an animal in the picture and ask his/her partner to describe the position of the animal using position words. It should be highlighted that the reference point must be mentioned when describing. If necessary, the pupil can help his/her partner guess the animal by using the vocabulary words put up on the board and stating the reference point.

PROBLEM SOLVING, MATHS JOURNAL AND PUPIL REVIEW



Mind Workout

Date: _____



The
backpack
is the last
bag.



The picture shows part of Belt 12 of the airport.

Tom's bag is fifth from the left.

The backpack is the last bag.

There are bags on the belt in all.

74 Chapter 5

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Mind Workout

To help pupils to visualise, encourage them to draw the bags that are not shown in the picture.

Workbook 1A P74

PRACTICE

What is the position of each child?

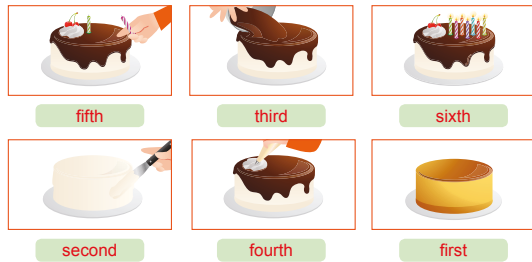


- (a) Weiming is fourth from the left.
- (b) Sam is next to Farhan.
- (c) Bala is between Ann and Nora.
- (d) Xinyi is third from the right.

Complete Workbook 1A, Worksheet 2 • Pages 71 – 73

MIND WORKOUT

Priya wants to decorate a cake.
Name the pictures from first to sixth to show the correct order.



fifth

third

sixth

second

fourth

first

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POSITIONS 53

Textbook 1 P53



MIND WORKOUT

This activity shows another form of positional naming in the form of instructions. This should be familiar to pupils and serves more as an exposure than a challenging task.

MATHS JOURNAL

Weiming wants to record his friends' birthdays in his calendar. Write their names in the spaces provided below.

- Ann's birthday - 1st month of the year
- Bala's birthday - 2nd month of the year
- Nora's birthday - 4th month of the year
- Bina's birthday - 5th month of the year
- Xinyi's birthday - 8th month of the year
- Sam's birthday - 10th month of the year

January	February	March	April
May	June	July	August
September	October	November	December

I know how to...

- name positions.
- use words such as before, after, next to, last and between to name positions.
- name positions from the left and from the right.
- name positions using ordinal numbers.

SELF-CHECK



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Textbook 1 P54

MATHS JOURNAL

In this task, pupils will relate ordinal numbers to the months of the year.

Get pupils to say which month of the year their birthdays fall on using ordinal numbers.

SELF-CHECK



Before the pupils do the self check, review the important concepts once more by asking for examples learnt for each objective.

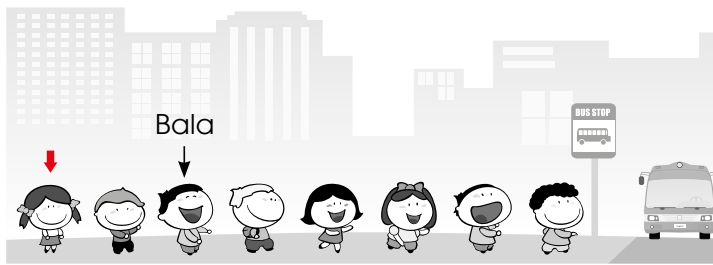
This self check can be done after pupils have completed **Review 5** (Workbook 1A P75 – 76) as consolidation of understanding for the chapter.

Answers Review 5 (Workbook 1A P75 – 76)

1. (a) 2

(b) sixth

(c)

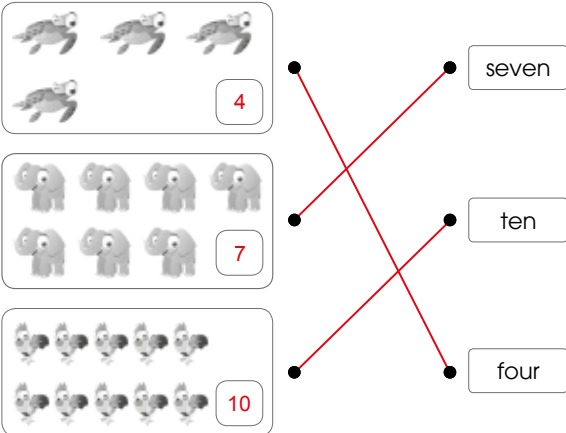


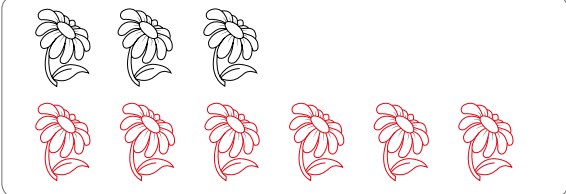
2. (a) third

(b) second

3.



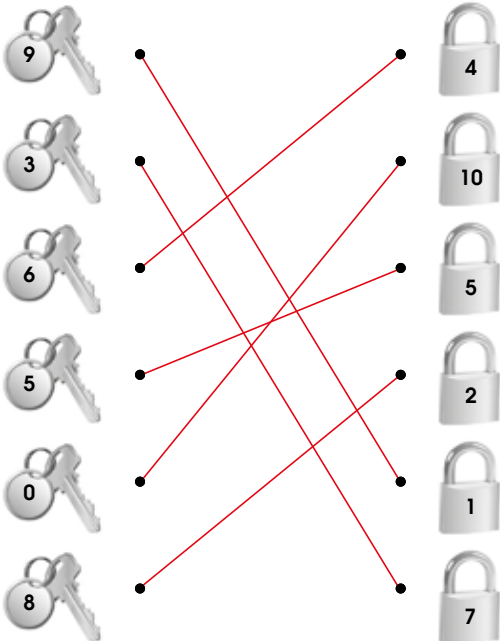
1. 

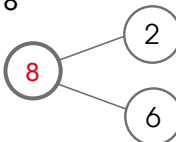
2. 

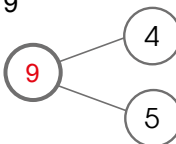
3. (a) more

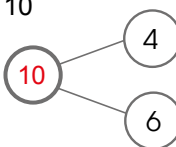
(b) fewer

4. 8, 5, 3

5. 

6. (a) 8 

(b) 9 

(c) 10 

7. (a) There are 3 big boxes.
There are 4 small boxes.
 $3 + 4 = 7$
There are 7 boxes altogether.

(b) There are 2 boys.
There are 6 girls.
 $2 + 6 = 8$
There are 8 children altogether.

8. (a) $7 - 3 = 4$

(b) $7 - 4 = 3$

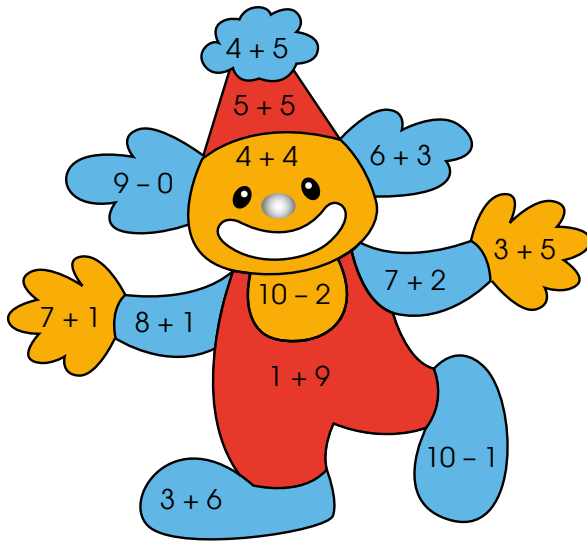
(c) $10 - 6 = 4$

9. (a) $7 - 2 = 5$
5 balls are left in the basket.

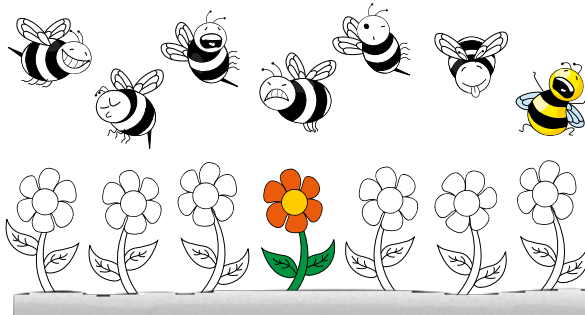
(b) $10 - 4 = 6$
Sam has 6 balloons left.

10. $1 + 6 = 7$ $7 - 1 = 6$
 $6 + 1 = 7$ $7 - 6 = 1$

11.



12.



13. 7

Numbers to 20 CHAPTER **6**

Is it easier to count the number of eggs or strawberries?

COUNTING TO 20 LESSON **1**

IN FOCUS
Count on from 10.

Why is it easier to count on from 10?

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Textbook 1 P55

Related Resources

NSPM Textbook 1 (P55 – 70)
NSPM Workbook 1A (P86 – 109)

Materials

2-colour counters, multilink cubes, magnetic buttons, magnetic square tiles, picture cards, number word cards and numeral cards

Lesson

Lesson 1 Counting to 20
Lesson 2 Comparing and Ordering Numbers
Lesson 3 Number Patterns
Problem Solving, Maths Journal and Pupil Review

INTRODUCTION

The informal concept of place value will first be introduced in this chapter through the system of grouping objects up to 20 into 1 ten and ones. This also facilitates counting on from 10. The ability to distinguish between a group of ten objects and loose ones helps pupils in the comparing and ordering of numbers. This is done so by making a 10 and then comparing the ones. Pupils continue to learn the numerals and number names of 2-digit numbers up to 20 through the C-P-A approach. The goals for this chapter are to enable pupils to count the number of objects between 11 to 20 by making a group of ten first; to read and write the names and symbols of 2-digit numbers in sequence; to compare and match sets; order numbers; and to recognise number patterns and relationships.

LESSON

1

COUNTING TO 20

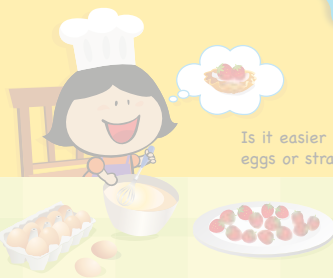
LEARNING OBJECTIVES

1. Count on from 10, the numbers 11 to 20.
2. Read and write 11 to 20 in words.

Numbers to 20

CHAPTER

6



Is it easier to count the number of eggs or strawberries?

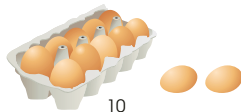
COUNTING TO 20

LESSON

1



Count on from 10.



Why is it easier to count on from 10?

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NUMBERS TO 20 55

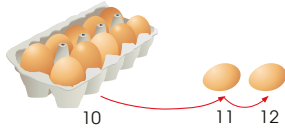
IN  FOCUS

Use the chapter opener to discuss with the pupils. After engaging the class, ask which is easier to count – the eggs or the strawberries.

Show that the eggs are easier to count since there is a carton of 10 eggs and a few loose ones. Count on from 10 with the class to show that there are 12 eggs in total.

Textbook 1 P55

1.

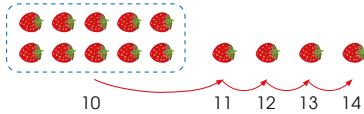


There are 12 eggs.

2. How many strawberries are there?



Make 10 and count on.



10 and 4 make 14.

$$10 + 4 = 14$$

There are 14 strawberries.

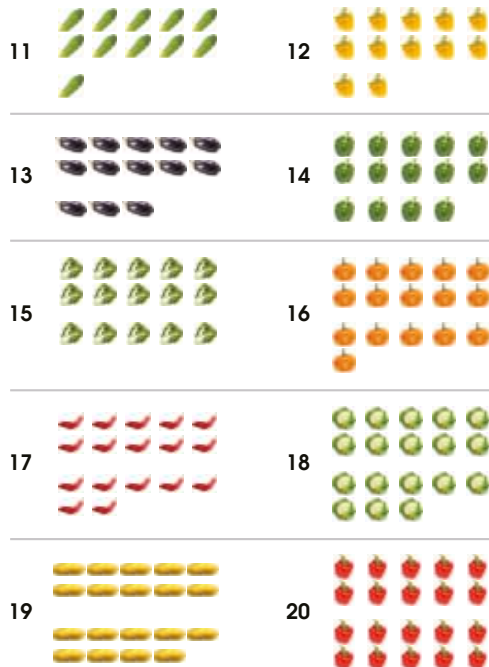
Move on to counting the number of strawberries. A volunteer can be called forward to point and count the strawberries as arranged on the plate in the picture.

It is expected to be difficult as the strawberries are arranged in random order, making it easy to lose track while counting. At this juncture, ask the pupils to suggest other easier ways to count the strawberries.

Allow the pupils to recall how the eggs were counted – through counting out 10 first and counting on from there. Using magnetic buttons to represent the strawberries, regroup the objects into 1 group of 10 and 4 loose ones. Lead pupils to count on from 10.

After counting, write and say aloud '10 and 4 make 14', followed by the addition equation '10 + 4 = 14'. Encourage the class to say this aloud.

3. Count on from 10.



Highlight that each group of vegetables is divided into 1 group of 10 and ones. Go through the numbers in sequence and count on from 10.


Allow pupils to recognise the numerals from 11 to 20. Get pupils to read the numbers aloud.

Alternatively, model the grouping of the vegetables (into 1 group of 10 and ones). Count on from 10 to show the number of vegetables. This activity can be done in pairs.



ACTIVITY TIME

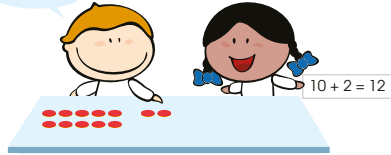
Work in pairs.

- 1 Collect three sets of .
- 2 For each set, make 10 and count on.
Get your partner to write the addition fact.

What you need:



10, 11, 12



- 3 Take turns to count and to write the addition fact.

PRACTICE



Count out 10.
Then count on from 10.



10 and 9 make 19.

$$10 + 9 = 19$$

Complete Workbook 1A, Worksheet 1A • Pages 86 – 89

Assign pupils to work in pairs.

Provide each pair of pupils with three sets of different coloured counters or any other counting objects. Each set should contain 11 to 20 objects.

Encourage pupils to check their partners' work.

PRACTICE



Help the pupils to read and understand each question. Avoid chorus answers from pupils and encourage participation by inviting individual responses. Ask the pupils how they get their answers and if possible, get another pupil to verify the answer.

For better understanding, select items from **Worksheet 1A** and work these out with the pupils.

Independent seatwork

Assign pupils to complete Worksheet 1A (Workbook 1A P86 – 89).

Answers Worksheet 1 (Workbook 1A P86 – 89)

1. (a)



10 and 3 make 13.

$$10 + 3 = 13$$

(b)



10 and 5 make 15.

$$10 + 5 = 15$$

(c)



10 and 8 make 18.

$$10 + 8 = 18$$

(d)



10 and 9 make 19.

$$10 + 9 = 19$$

2. (a) 14



(b) 16



(c) 17



(d) 13



(e) 18



IN FOCUS

Count the flowers.



How do we write the number in words?

LET'S LEARN

11 **eleven**

12 **twelve**

13 **thirteen**

14 **fourteen**

15 **fifteen**

16 **sixteen**

17 **seventeen**

18 **eighteen**

19 **nineteen**

20 **twenty**

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NUMBERS TO 20 59

Textbook 1 P59

IN FOCUS

Ask pupils to count the flowers by counting on from 10. After counting, write the numeral '13' on the whiteboard, followed by the number in words. Get the class to spell aloud.

LET'S LEARN

For each number word, get pupils to spell and copy the words onto their mini whiteboard, in sequence from 'eleven' to 'twenty'.

Give some time for the pupils to study the words they have copied. Lead them to see the pattern of the number words, those ending with '-teen' being easier to remember than those without.

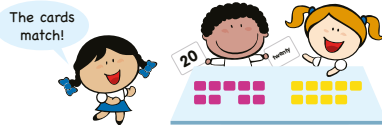
Next, write a numeral and blanks for its corresponding number word. Invite pupils to say the number word and spell it aloud. Fill in the blanks as pupils spell out the word.

Repeat this with other numbers.

ACTIVITY 1 2 3 TIME

Play in groups of 3.

- Put the cards face down on the table. What you need:
- Take turns to pick a 20 and a twenty. If they match, keep them. If they do not match, turn them back.



- The player with the most cards wins!

PRACTICE

Make 10 and count. Write in numerals and in words.

(a) 14 **fourteen**

(b) 17 **seventeen**

Complete Workbook 1A, Worksheet 1B • Pages 90 – 93

60 CHAPTER 6

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Textbook 1 P60

PRACTICE

Assign pupils to work in groups of 3.

Note that only the numeral and number word cards for 11 to 20 should be used for this game.

Help the pupils to read and understand each question. Avoid chorus answers from pupils and encourage participation by inviting individual responses. Ask the pupils how they get their answers and if possible, get another pupil to verify the answer.

For better understanding, select items from **Worksheet 1B** and work these out with the pupils.

Independent seatwork

Assign pupils to complete Worksheet 1B (Workbook 1A P90 – 93).

1. (a) 15
(b) 20

2.

fifteen
eleven
thirteen
nineteen

3. (a) ten

(b) twelve

(c) fourteen

(d) eighteen

(e) seventeen

(f) twenty

**Specific Learning Focus**

- Count on from 10, the numbers 11 to 20.
- Read and write 11 to 20 in words.

Suggested Duration

4 periods

Prior Learning

Pupils have learnt counting to 10 in Chapter 1. This chapter covers an extension of the same concept of counting from 11 to 20. They have earlier done counting to 10 by the C-P-A approach. In this chapter, the same methodology will be employed.

Pre-emptive Pitfalls

Since this is a continuation of the earlier concepts, no significant confusion should arise. Pupils should not have difficulty counting on beyond 10 and learning the spellings of the two-digit numbers.

Introduction

Place value will be introduced in this chapter. The concept of tens and ones is best explained in Let's Learn 1 and 2 (Textbook 1 P56). Make the pupils realise that it is easier to count the eggs than the strawberries as the eggs are grouped in a 'ten' and 'ones'. On the other hand, all the strawberries are placed in a random arrangement on the plate, which could lead to over- or under-counting. Use a number bond to show 10 (part) and 2 (part) make 12 (whole). Then translate this to an addition equation $10 + 2 = 12$. The linking of the concepts of counting all, number bond, addition facts/equations and place value is important. Linking all the concepts will create a better understanding of 'tens' and 'ones' and thereby go beyond the introduction of 2-digit numbers and their spellings.

Problem Solving

The C-P-A approach used in this chapter makes the numbers tangible. Encourage pupils to use real-life objects to count on from 10 up to 20. Reinforce the regrouping of a 2-digit number (11 to 20) into 1 ten and ones.

Activities

Encourage pupils to work in pairs (Textbook 1 P58) and let them check their partner's work once done (peer learning). The matching activity (Textbook 1 P60) can also be carried out in the form of a 'SNAP' game. The one with the most cards wins. The teacher will have to make multiple card sets for this activity (Activity Handbook 1 P19 - 20).

Resources

- 2-colour counters
- place-value cards
- number word cards
- numeral cards

Mathematical Communication Support

During an interactive classroom activity, on mini whiteboards, ask pupils to write a 2-digit number in numerals given the number in words and vice versa. Get them to spell the numbers aloud in class. Continue with similar questions (Textbook 1 P60) on the board and worksheets and encourage them to group the objects in tens and ones, then write the numbers in numerals and in words.

COMPARING AND ORDERING NUMBERS

LEARNING OBJECTIVES

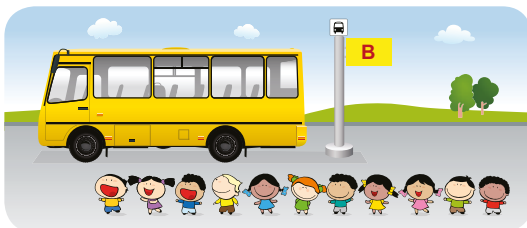
1. Compare numbers within 20.
2. Arrange numbers in order.

COMPARING AND ORDERING NUMBERS

LESSON

2

IN  FOCUS



Which bus stop has more children?

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NUMBERS TO 20

61

IN  FOCUS

Invite pupils to talk about the children waiting at each bus stop. Get them to guess which bus stop (Set A or Set B) has more children waiting.

It will be expected for the comparison to be difficult due to the random arrangement of the children in Set A.

Ask for suggestions to make it easier to count the children in Set A.

LET'S LEARN


Set A
13 children 

Set B
11 children 

Set A has more children than Set B.
Set B has fewer children than Set A.

ACTIVITY  TIME

Work in pairs.

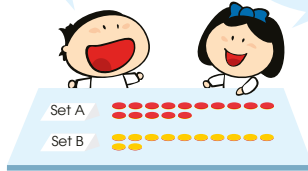
- Compare two sets of .
 - Which set has more?
 - Which set has fewer?


What you need:



There are 15 counters in Set A.
There are 12 counters in Set B.

Set A has more counters than Set B.
Set B has fewer counters than Set A.



- Make another two sets with different numbers of . Compare the two sets.

62

CHAPTER 6

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Textbook 1 P62

LET'S LEARN 

Introduce the terms of comparison **more** and **fewer** here.

Continue comparing sets of objects to reinforce the usage of these terms. Place two sets of objects (e.g. 15 magnetic squares and 12 counters) on the visualiser.

Ask pupils to compare the two sets of objects and invite some volunteers to do the counting by making 1 group of 10 and counting on from there.

Get the class to describe the comparison using the terms **more than** and **fewer than**.

ACTIVITY  TIME

Assign pupils to work in pairs.

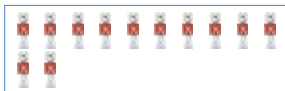
Provide each pair with two sets of 20 counters. The two sets should be of different colours.

Pupils are to talk to each other using the language of comparison 'more than' and 'fewer than'.

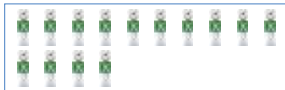
PRACTICE 

- Compare using **more** or **fewer**.

Set A
12 toy soldiers



Set B
14 toy soldiers



- Set A has **fewer** toy soldiers than Set B.
- Set B has **more** toy soldiers than Set A.

- Count and compare.

Set C
16 ribbons



Set D
13 ribbons



- Set C has **more** ribbons than Set D.
- Set D has **fewer** ribbons than Set C.

Complete Workbook 1A, Worksheet 2A • Pages 94 – 97

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NUMBERS TO 20

63

Textbook 1 P63

PRACTICE 

Help the pupils to read and understand each question. Avoid chorus answers from pupils and encourage participation by inviting individual responses. Ask the pupils how they get their answers and if possible, get another pupil to verify the answer.

For better understanding, select items from **Worksheet 2A** and work these out with the pupils.

Independent seatwork

Assign pupils to complete Worksheet 2A (Workbook 1A P94 – 97).

Answers Worksheet 2A (Workbook 1A P94 – 97)

1. (a) more
(b) fewer
2. (a) Set A – 7 horses
Set B – 10 horses
Set A has fewer horses than Set B.
(b) Set C – 12 hens
Set D – 11 hens
Set C has more hens than Set D.
(c) Set E – 13 sheep
Set F – 16 sheep
Set E has fewer sheep than Set F.
(d) Set G – 14 cows
Set H – 9 cows
Set G has more cows than Set H.

IN FOCUS

The numbers become greater from 1 to 20.

Do the number towers get longer from 1 to 20?

LET'S LEARN

1. Compare 11 and 15.
11
15
15 is greater than 11.
11 is smaller than 15.

64 CHAPTER 6 OXFORD UNIVERSITY PRESS

IN FOCUS

Get pupils to look at the number towers from 1 to 20. Draw attention to the different coloured cubes.

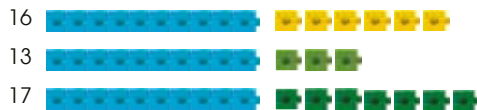
Note the groups of blue cubes that are present in towers 10 to 20. Compare towers 1 and 11, 2 and 12, 3 and 13 and so on. Ask if they notice a pattern in the colour of the cubes.

This can be demonstrated using multilink cubes.

LET'S LEARN

Introduce the terms **greater** and **smaller** as terms that can be used to compare numbers. Using the picture, lead pupils to conclude that 15 is greater than 11, or 11 is smaller than 15.

2. Compare 16, 13 and 17.



17 is greater than 13.
17 is greater than 16.
17 is the greatest.

13 is smaller than 16.
13 is smaller than 17.
13 is the smallest.

Arrange the numbers in order.
Start with the greatest.

17, 16, 13
greatest \rightarrow smallest

We can also start with the smallest.

13, 16, 17
smallest \rightarrow greatest

Textbook 1 P65

Use multilink cubes to compare the numbers 16, 13 and 17. Based on the concrete model, get pupils to tell which number is the **greatest** and which number is the **smallest**.

After which, get pupils to arrange these numbers in order, starting with the greatest. The pupils are to write their answers on their mini whiteboards. Help them to recall the ordering of numbers (previously taught in Chapter 1, Lesson 2).

Repeat this activity by arranging the numbers from smallest to greatest.

ACTIVITY 1 TIME

Play in groups of 3 to 4.

1 Take a card each.
Compare the numbers.

What you need:



8 is smaller than 14.
8 is smaller than 11.
8 is the smallest.

14 is the greatest.



2 The player with the greatest number keeps the cards.

3 Arrange the numbers in order.
Start with the smallest.

4 After 5 rounds, the player with the most cards wins!

PRACTICE

1. Which is smaller, 18 or 10? 10

2. Compare 11, 19 and 13.

(a) The greatest number is 19.

(b) Arrange the numbers in order.
Start with the smallest.

11, 13, 19

3. Arrange 9, 19 and 14 in order.

Start with the greatest.

19, 14, 9

Complete Workbook 1A, Worksheet 2B • Pages 98 – 101

Textbook 1 P66

Assign pupils to work in groups of 3 to 4. Provide each group with numeral cards (0 to 20).

Players are to decide before the game whether they wish to have the 'greatest' or the 'smallest' as the winning card.

The winning card can be changed for every new round (e.g. the greatest card wins in round 1, the smallest card wins in round 2, and so on). The game ends after 5 rounds.

PRACTICE

Help the pupils to read and understand each question. Avoid chorus answers from pupils and encourage participation by inviting individual responses. Ask the pupils how they get their answers and if possible, get another pupil to verify the answer.

For better understanding, select items from **Worksheet 2B** and work these out with the pupils.

Independent seatwork

Assign pupils to complete Worksheet 2B (Workbook 1A P98 – 101).

1. (a)



(b)



2. (a)



(b)



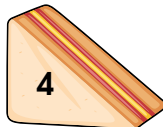
3. (a)



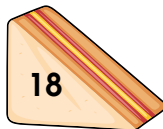
(b)



4. (a)



(b)



5. (a) 13

(b) 18

(c) 18, 17, 13

6. (a) 16

(b) 3

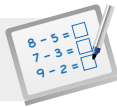
(c) 3, 8, 16

7.



8.



**Specific Learning Focus**

- Compare numbers within 20.
- Arrange numbers in order.

Suggested Duration

4 periods

Prior Learning

Pupils can count numbers in tens and ones up to 20. They can arrange objects in groups and in ascending sequence.

Pre-emptive Pitfalls

If the C-P-A approach towards counting up to 20 is clear to pupils, then comparing ('more than' or 'fewer than') and ordering the numbers should not cause any confusion.

Introduction

This lesson is a direct continuation of counting on. The arranging of numbers in sequence has already been done before and in this lesson, identifying which number is bigger or smaller than the other is the key concept reinforced. Arranging them in ascending or descending order is another concept taught best with cards on the table. Have the pupils lay the cards out and arrange them starting with the smallest to the greatest and vice versa.

Problem Solving

'Let's Learn' (Textbook 1 P62) and 'Practice' (Textbook 1 P63) can be done in class with real-life objects so that the ordering and comparing is made tangible. Once the pupils organise and group the numbers, comparing them will be made easy.

Activities

Both activities (Textbook 1 P62, 66) can be used for formative and summative assessments by the teacher. When carrying out the activities, observe if the pupils are able to arrange numbers in order and compare easily.

Resources

- 2-colour counters
- numeral cards
- multilink cubes

Mathematical Communication Support

Use multilink cubes to guide pupils to arrange the numbers in order. Seeing a taller tower or longer set of multilink cubes will make the comparison easier. Ask pupils which number written on the board is greater or smaller than the other number (avoid chorus answers from them). Scramble numbers or magnetic counters on the board and get pupils to arrange them in ascending or descending order.

LESSON

3

NUMBER PATTERNS

LEARNING OBJECTIVES

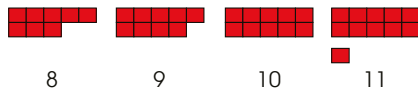
1. Recognise and complete number patterns.

NUMBER PATTERNS

LESSON
3

IN FOCUS

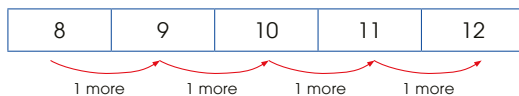
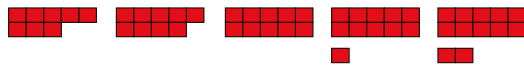
Use square tiles to show numbers from 8 to 11.



What comes next?

LET'S LEARN

1.



9 is 1 more than 8.
10 is 1 more than 9.
11 is 1 more than 10.

What is 1 more than 11?
12 is 1 more than 11.

8, 9, 10, 11, 12 is a **number pattern**.

Each number is 1 more than the number before.



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NUMBERS TO 20 67

IN FOCUS

Take some magnetic square tiles to show the shapes on the whiteboard and write the numbers under each shape.

Get pupils to work in pairs to discuss about how the shapes are put together and what the number under each shape represents.

Provide some square tiles for each pair and ask them to form the next shape in the pattern. Invite some pupils to show the shapes that they have formed.

LET'S LEARN

Get pupils who managed to get the correct shape to explain how they got their answer.

Allow pupils to observe the shapes and ask them to spot the difference between the first shape and the second shape. Continue to observe the difference between the second and third shapes, the third and fourth shapes, and so on.

Lead pupils to see the pattern in the sequence of shapes. Each subsequent shape has 1 more tile that is added in a certain manner.

Textbook 1 P67

2. What comes next in the pattern?



17 is 1 less than 18.
16 is 1 less than 17.
15 is 1 less than 16.

Each number is 1 less than the number before.



What is 1 less than 15?
The number pattern is 18, 17, 16, 15, 14.

Work in pairs.

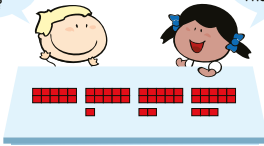
- 1 Use to make a pattern.
- 2 Get your partner to tell what number comes next in the pattern.

ACTIVITY TIME

What you need:



What comes next?



13 is 1 more than 12.
14 is 1 more than 13.
The next number is 14.

- 3 Take turns and repeat 1 and 2.

68

CHAPTER 6

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Textbook 1 P68

Put up the pattern of number towers using multilink cubes and ask the pupils to observe the length of the towers (from the longest to the shortest).

The pupils may observe that there is 1 fewer cube between the first tower (from the top) and the second tower, and so on. Link this observation with the number pattern – the next number is 1 less than the number before it.

Ask the pupils what comes after 15 in the number pattern.

ACTIVITY TIME



Assign pupils to work in pairs.

Encourage pupils to be creative in the design of their shapes. Remind them that they must also be able to explain a 'rule' on how the next shape can be formed.

Note that while pupils can give the correct number pattern, they may form shapes in random arrangements.

1. Find the missing numbers.
Use to help you.

- (a) 7 is 1 more than 6.
- (b) 9 is 1 less than 10.
- (c) 20 is 1 more than 19.
- (d) 10 is 1 less than 11.

2. Complete the number patterns.

- (a) 6, 7, 8, 9, 10
- (b) 12, 13, 14, 15, 16, 17
- (c) 12, 11, 10, 9, 8, 7
- (d) 20, 19, 18, 17, 16, 15, 14

Complete Workbook 1A, Worksheet 3 • Pages 102 – 105



MIND WORKOUT

Use the numbers below to make two number patterns.
You can use each number only once.



Pattern 1: 9, 10, 11, 12

Pattern 2: 16, 15, 14, 13

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NUMBERS TO 20

69

Textbook 1 P69

PRACTICE



Help the pupils to read and understand each question. Avoid chorus answers from pupils and encourage participation by inviting individual responses. Ask the pupils how they get their answers and if possible, get another pupil to verify the answer.

For better understanding, select items from **Worksheet 3** and work these out with the pupils.

Independent seatwork

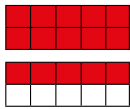
Assign pupils to complete Worksheet 3 (Workbook 1A P102 – 105).

1.

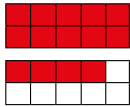
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20

- (a) 3
- (b) 10
- (c) 4
- (d) 6
- (e) 17
- (f) 13
- (g) 14
- (h) 18

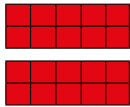
2. (a) 15



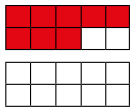
(b) 14



(c) 20



(d) 8



3. (a)



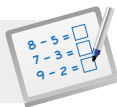
(b)



(c)



4. (a) 13, 14, 15
 (b) 13, 12, 11
 (c) 17, 18, 19
 (d) 16, 15, 14

**Specific Learning Focus**

- Recognise and complete number patterns.

Suggested Duration

2 periods

Prior Learning

Pupils can organise numbers sequentially. The transition to number patterns is done in Lesson 3. Counting on and counting back lead to number patterns. This lesson helps pupils recognise the arrangement of numbers and the relationship between them.

Pre-emptive Pitfalls

Number patterns at this stage are very simple. If the pupils are good at comparing and ordering numbers in the earlier lessons, linking the concept to number patterns in this lesson should not be difficult.

Introduction

The goal of this lesson is to enable pupils to recognise a pattern in a given set of numbers. They will have to recognise if the numbers are arranged in ascending or descending order (without using these terminologies). The use of multilink cubes in Let's Learn 2 (Textbook 1 P68) will clearly show the pupils that each number is 1 less than the other. Magnetic tiles and real-life classroom objects can also be used to help pupils recognise the pattern. Once the recognition is done, the next step will be to complete the pattern and predict the next number.

Problem Solving

In this lesson, the problem-solving skills of pupils are put to test. It enhances their observation skills to be able to recognise a pattern and then complete it.

Activities

The use of magnetic tiles, numeral cards and real-life objects will come in handy when predicting or recognising the number patterns. When the concrete objects are laid out on the table, pupils will recognise the pattern easily.

Resources

- magnetic square tiles
- multilink cubes
- numeral cards

Mathematical Communication Support

Write number patterns on the board and get pupils to recognise the pattern. Ask them questions (e.g. Are the numbers getting bigger or smaller? How much bigger or smaller is the number compared to the number before it?). Interactive class participation and individual pupil responses will make this lesson fun.

PROBLEM SOLVING, MATHS JOURNAL AND PUPIL REVIEW

4. Complete the number patterns.

(a) 9, 10, 11, 12, , ,

(b) 17, 16, 15, 14, , ,

(c) 13, 14, 15, 16, , ,

(d) 20, 19, 18, 17, , ,



Mind Workout

Date: _____

Use the number cards below to make two number patterns.
You can use each card only once.

Pattern 1: , , , 13

Pattern 2: 9, , ,

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Numbers to 20 105



Mind Workout

Allow pupils to work in pairs or groups.

Help pupils understand the problem by asking the following questions:


- How many missing numbers are there in each pattern?
- How many numbers are given for the two patterns altogether?
- Do you use all the numbers for the two patterns?
- Which of the given numbers is the smallest?
- Which of the given numbers is the greatest?

Get the pupils to try this with pattern 1 first, starting with either the greatest or smallest number. Get them to consider if the next number in the pattern should be '1 more' or '1 less'.

Pupils are expected to apply the 'guess and check' method to derive their answers.

Workbook 1A P105

PRACTICE

- Find the missing numbers.
Use  to help you.
 - 7 is 1 more than 6.
 - 9 is 1 less than 10.
 - 20 is 1 more than 19.
 - 10 is 1 less than 11.
- Complete the number patterns.
 - 6, 7, 8, 9, 10
 - 12, 13, 14, 15, 16, 17
 - 12, 11, 10, 9, 8, 7
 - 20, 19, 18, 17, 16, 15, 14

Complete Workbook 1A, Worksheet 3 • Pages 102 – 105

MIND WORKOUT

Use the numbers below to make two number patterns. You can use each number only once.



Pattern 1: 9, 10, 11, 12

Pattern 2: 16, 15, 14, 13

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NUMBERS TO 20

69

Textbook 1 P69



MIND WORKOUT

Allow pupils to work in pairs or groups.

Help pupils understand the problem by asking the following questions:

- How many missing numbers are there in each pattern?
- How many numbers are given for the two patterns altogether?
- Do you use all the numbers for the two patterns?
- Which of the given numbers is the smallest?
- Which of the given numbers is the greatest?

Get the pupils to try this with pattern 1 first, starting with either the greatest or smallest number. Get them to consider if the next number in the pattern should be '1 more' or '1 less'.

Pupils are expected to apply the 'guess and check' method to derive their answers.

MATHS JOURNAL

Look at the picture.



Write two sentences to compare the number of ribbons that the girls have.

Example

Priya has more ribbons than Ann.

I know how to...

- count to 20.
- read and write numbers from 11 to 20.
- compare and order numbers within 20.
- complete number patterns.

SELF-CHECK



70

CHAPTER 6

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Textbook 1 P70

MATHS JOURNAL

Pupils are allowed to make more than two comparisons. The two sentences should not be between the same two persons.

Example

Priya has more ribbons than Ann.
Ann has fewer ribbons than Meiling.

SELF-CHECK

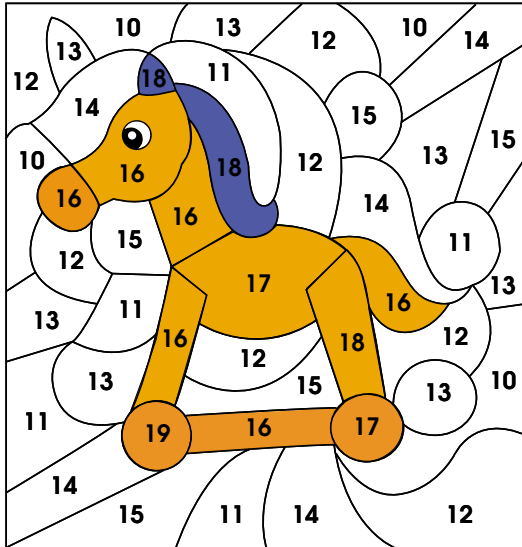


Before the pupils do the self check, review the important concepts once more by asking for examples learnt for each objective. For instance, get pupils to give an example of a number pattern.

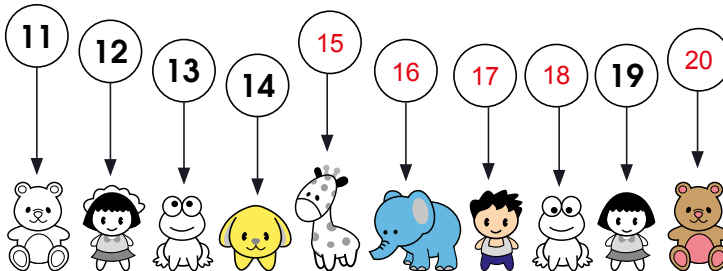
This self check can be done after pupils have completed **Review 6** (Workbook 1A P106 – 109) as consolidation of understanding for the chapter.

Answers Review 6 (Workbook 1A P106 – 109)

- (a) 15, 12, 10
(b) more, fewer
- Rocking horse



- (a) 10, 15, 19
(b) 2, 11, 20
- (a) 18, 12, 6
(b) 17, 14, 5
- (a), (b)



ADDITION AND SUBTRACTION WITHIN 20

CHAPTER 7

Addition and Subtraction Within 20 CHAPTER 7

How many buns are there altogether?



WAYS TO ADD LESSON 1

IN FOCUS



8 $8 + 3 = ?$ 3

What are the different ways to add?

OXFORD UNIVERSITY PRESS ADDITION AND SUBTRACTION WITHIN 20 71

Textbook 1 P71

Related Resources

NSPM Textbook 1 (P71 – 88)
NSPM Workbook 1A (P110 – 135)

Materials

2-colour counters, numeral cards, '1' to '6' dice, '0' to '9' dice, magnetic square tiles, magnetic buttons, picture cut-outs, ten-frame, marker, drawing block

Lesson

Lesson 1 Ways to Add
Lesson 2 Ways to Subtract
Lesson 3 Solving Word Problems
Problem Solving, Maths Journal and Pupil Review

INTRODUCTION

In previous chapters, pupils would have mastered addition and subtraction facts within 10. This chapter continues with pupils learning more ways of addition and subtraction within 20. New strategies such as **making 10** and **adding the ones** are introduced for adding a 2-digit number and a 1-digit number. Similarly for subtraction of a 1-digit number from a 2-digit number, strategies such as **subtracting from the ones** and **subtracting from 10** are taught. Ample activities and practices are given to help pupils recall the basic addition and subtraction facts within 20. Pupils' understanding of the addition and subtraction operations is further developed by number stories that are rephrased into questions.

LESSON

1

WAYS TO ADD

LEARNING OBJECTIVES

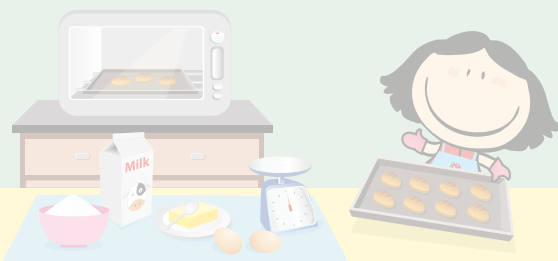
1. Add by counting on.
2. Add by making 10.
3. Add the ones.

Addition and Subtraction Within 20

CHAPTER

7

How many buns are there altogether?



WAYS TO ADD

LESSON

1

IN  FOCUS



8

$$8 + 3 = ?$$

3

What are the different ways to add?

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ADDITION AND SUBTRACTION WITHIN 20

71

IN  FOCUS

Use the chapter opener to discuss the problem with the pupils.

Get the pupils to focus on the buns and that there are two groups of them, one of them being the buns that are already baked (on the tray) and the other being the buns that are still being baked in the oven.

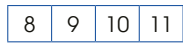
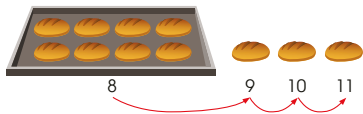
Count the number of buns in each group and add them together. Ask the pupils to recall the different ways of adding two numbers.

Textbook 1 P71

LET'S LEARN

Add By Counting On

1.



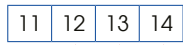
$8 + 3 = 11$

There are 11 buns altogether.

Count on 3 steps from 8.



2. $11 + 3 = ?$



$11 + 3 = 14$

Why do we count on from 11?



LET'S LEARN

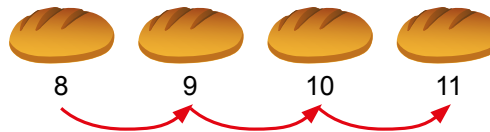
Use magnetic buttons or picture cut-outs to represent the buns and place them on the whiteboard.

Write the addition equation ' $8 + 3 = ?$ ' and ask what '+' means. Recall that the sign means to add or to put the sets together to find the total.

Discuss different ways of finding the total number of buns in the two sets. First, recall the 'count all' strategy to add. This means counting the objects individually to find the total.

Next, recall the 'count on' concept. Invite a pupil to demonstrate this. Starting from 8, count on 3 steps.

Example



$8 + 3 = 11$

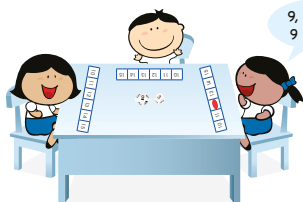
There are 11 buns altogether.

For Let's Learn 2, show the pupils how to count on using a number ladder, pointing to each number while counting on.

Play in groups of 2 to 3.

- 1 Roll a 9 and a 3.
- 2 Add the two numbers by counting on.
- 3 Find the number on your 10 11 12 13 14 15. Put a yellow dot on the number.

What you need:

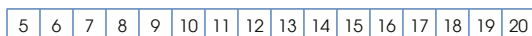


9, 10, 11, 12
 $9 + 3 = 12$

- 4 Take turns and repeat 1 to 3.
- 5 The first player to cover all the numbers wins!

PRACTICE

Add by counting on.



- (a) $7 + 4 = 11$ (b) $2 + 9 = 11$
 (c) $12 + 2 = 14$ (d) $4 + 15 = 19$

Complete Workbook 1A, Worksheet 1A • Pages 110–111

ACTIVITY 1 2 3 TIME

Assign pupils to work in groups of 2 to 3. Since the pupils have already used the 'count on' strategy for addition within 10, the game gives extra practice for this strategy for mental addition within 10 to 20.

PRACTICE

Help the pupils to read and understand each question. Avoid chorus answers from pupils and encourage participation by inviting individual responses. Ask the pupils how they get their answers and if possible, get another pupil to verify the answer.

For better understanding, select items from **Worksheet 1A** and work these out with the pupils.

Independent seatwork

Assign pupils to complete Worksheet 1A (Workbook 1A P110 – 111).

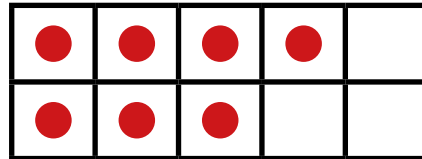
Activity Recall the number bonds of 10
Materials Numeral cards, counting objects, ten-frame

Procedure

1. Hold up a number card and ask for the number that can be added to get 10. The pictorial representation can be shown to the class as well.

Example

Hold up the card with 7 on it and ask for the number that makes 10 with 7.



2. Get pupils to write their answers on their mini whiteboards.
3. Continue this activity until all number bonds of 10 are done. Summarise this exercise by writing all bonds of 10 on the whiteboard.
4. Introduce the strategy of adding two numbers by 'making a 10' through the number bonds of 10.

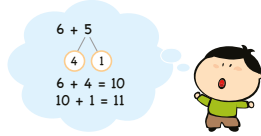
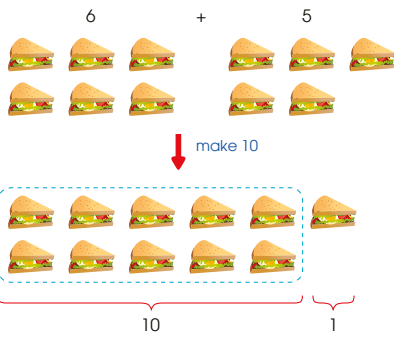
Answers Worksheet 1A (Workbook 1A P110 – 111)

1. (a) $9 + 2 = 11$
(b) $8 + 3 = 11$
(c) $13 + 2 = 15$
2. (a) 11
(b) 11
(c) 12
(d) 12
(e) 15
(f) 13
(g) 15
(h) 20
(i) 13
(j) 20

LET'S LEARN

Add By Making 10

1. $6 + 5 = ?$



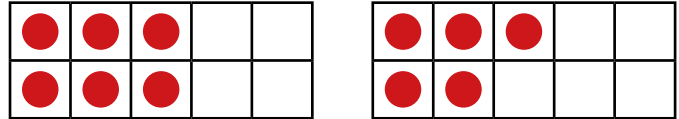
$6 + 5 = 11$

There are 11 sandwiches.

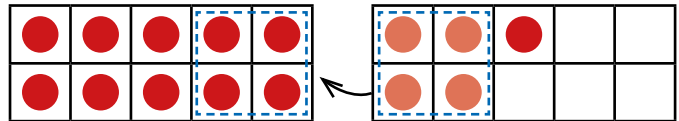
LET'S LEARN

Demonstrate the addition of the two groups of sandwiches using ten-frames and any counting objects.

Use two ten-frames, one with 6 magnetic buttons and another with 5 magnetic buttons.



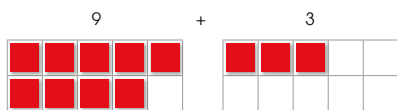
Show the 'make 10' method by moving 4 counters from the second frame to the first frame.



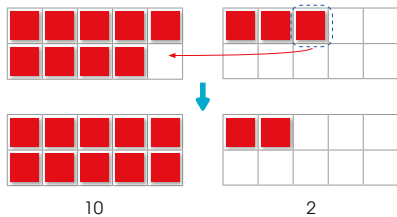
Say '6 and 4 make 10, so $6 + 5$ is the same as $10 + 1$ '. There are 11 sandwiches altogether.

2. $9 + 3 = ?$

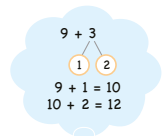
Use square tiles to show the two numbers.



Move 1 tile to make 10.



$9 + 3 = 12$



Is $9 + 3$ the same as $3 + 9$? Why?

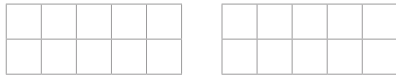


ACTIVITY TIME

Work in pairs.

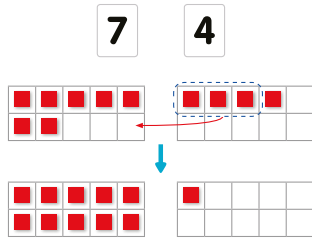
- 1 Take turns to open two numeral cards.
- 2 Put \blacksquare on each grid to show each number.

What you need:



- 3 Add the two numbers. Make 10 to add if needed.

Example



- 4 Check each other's answers.

Textbook 1 P76

Assign pupils to work in pairs. Provide each pair with two sets of numeral cards and some magnetic square tiles.

This activity gives further hands-on practice of the 'make 10' strategy.

PRACTICE



PRACTICE

Add by making 10.

(a)



$$6 + 4 = 10$$



$$4 + 6 = 10$$



(b)



$$9 + 4 = 13$$

$$4 + 9 = 13$$

Complete Workbook 1A, Worksheet 1B • Pages 112 – 115

Textbook 1 P77

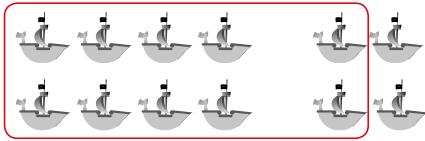
Help the pupils to read and understand each question. Avoid chorus answers from pupils and encourage participation by inviting individual responses. Ask the pupils how they get their answers and if possible, get another pupil to verify the answer.

For better understanding, select items from **Worksheet 1B** and work these out with the pupils.

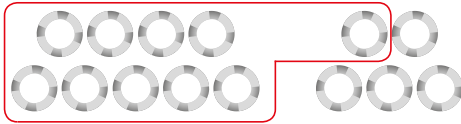
Independent seatwork

Assign pupils to complete Worksheet 1B (Workbook 1A P112 – 115).

1. (a) 12



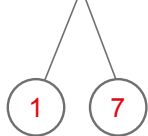
(b) 14



2. (a)



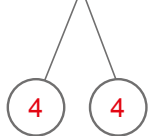
$$9 + 8 = 17$$



(b)



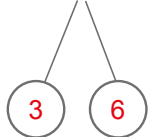
$$6 + 8 = 14$$



(c)

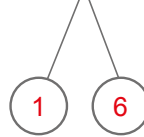


$$7 + 9 = 16$$

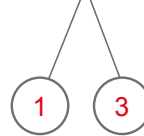


3. (a) $8 + 5 = 13$

(b) $9 + 7 = 16$



(c) $4 + 7 = 11$



4. (a) 13

(b) 13

(c) 15

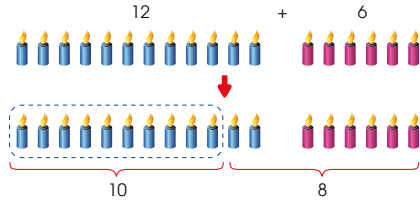
(d) 11



How many candles are there altogether?

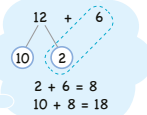
LET'S LEARN

Add Ones



$$12 + 6 = 18$$

There are 18 candles altogether.



Get pupils to count the number of candles on each cake. After which, write '12 + 6 = ?' on the whiteboard to find the total number of candles on both cakes. Emphasise that this involves the addition of a 2-digit number and a 1-digit number.

LET'S LEARN

Revise the method of regrouping the objects into 1 group of 10 and loose ones.

Link the number bond diagram to the 6 pink candles. Show that after regrouping, the remaining 2 blue candles can be added with the 6 red candles. Introduce this as the 'add the ones' strategy.

Ask pupils why this strategy is 'add the ones' and whether this strategy is applicable to adding two 1-digit numbers. Get pupils to suggest suitable strategies to add two 1-digit numbers.

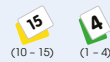
Give further examples involving addition of a 2-digit number and a 1-digit number and allow pupils to work in pairs. Counting objects can be provided to help pupils apply the 'add the ones' strategy.

ACTIVITY 1 TIME

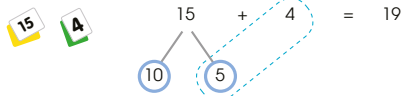
Play in groups of 3 to 4.

- Place the 15 and A face down on the table.
- Open two cards. Add the two numbers shown.

What you need:



Example

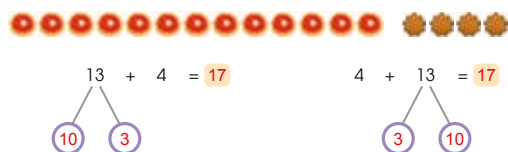


The first player to get the correct answer keeps the cards.

- The player with the most cards wins!

PRACTICE

Add.



Complete Workbook 1A, Worksheet 1C • Pages 116–119

ACTIVITY 1 TIME

Get pupils to play in groups of 3 to 4. Provide two sets of numeral cards, one set containing 1-digit numbers (1 to 4) and another set containing 2-digit numbers (10 to 15).

The game allows pupils to practice mental calculation and the use of 'add the ones' strategy.

PRACTICE

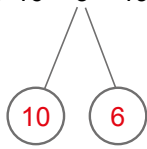
Help the pupils to read and understand each question. Show the commutative structure of addition.

For better understanding, select items from **Worksheet 1C** and work these out with the pupils.

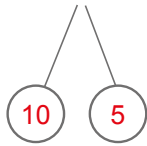
Independent seatwork

Assign pupils to complete Worksheet 1C (Workbook 1A P116 – 119).

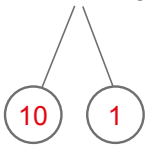
1. (a) $16 + 3 = 19$



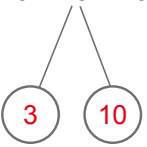
(b) $15 + 4 = 19$



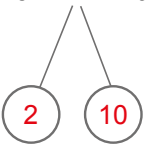
(c) $11 + 7 = 18$



(d) $6 + 13 = 19$

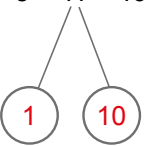


(e) $8 + 12 = 20$

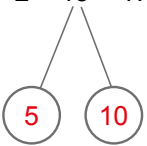


2. (a) $13 + 5 = 18$

(b) $8 + 11 = 19$



(c) $2 + 15 = 17$



3. (a) 17

(b) 16

(c) 20

(d) 19

**Specific Learning Focus**

- Add by counting on.
- Add by making 10.
- Add the ones.

Suggested Duration

6 periods

Prior Learning

In the earlier chapters, pupils have grasped the concept of adding up to 10 using number bonds, counting on and counting all. In this chapter, the numbers extend beyond 20. The concept of number bonds and place value (previous chapters) will be used as a strategy to add 2-digit numbers.

Pre-emptive Pitfalls

Pupils with weak understanding of number bonds (splitting of a whole into parts) and the place value of tens and ones will have difficulty adding 2-digit numbers. It is crucial that these two concepts are grasped when learning this chapter.

Introduction

Strategies of adding by counting on (Textbook 1 P72) and making 10 (Textbook 1 P74 - 75) are introduced. It is important for pupils to be comfortable with using both methods when adding. Real-life objects will come in handy to make these strategies tangible. The use of concrete materials will make the concept of splitting a 2-digit number into tens and ones easier. Since the addition is up to 20, the concept of tens and ones will come in handy. At a later stage, 2 or more sets of ten-frames and ones will be required. If the concept is grasped at this stage, later transition of adding beyond 20 will be smoother.

Problem Solving

Critical thinking will be enhanced when pupils are required to decide if the counting all or adding by making 10 strategy has to be employed. Differentiating the equations and deciding which strategy to employ will also develop their problem-solving skills.

Activities

The use of ten-frames (Textbook 1 P76) and numeral cards (Textbook 1 P79) (Activity Handbook 1 P21) will come in handy to grasp the concept. Have the pupils use different strategies (ten-frame or number bond) to add the numbers.

Resources

- 2-colour counters
- numeral cards
- real-life objects
- ten-frame

Mathematical Communication Support

Guide pupils to solve word problems (Lesson 3) by creating a real-life scenario and having an interactive class discussion. Help them visualise the story or enact the word problem by role-playing. The teacher can make use of a class party to come up with addition stories using names of the pupils in real-life situations. The teacher should ask pupils to use multiple strategies to add and get ideas from pupils. Encourage pupils to write their own addition stories and then replace them with numerals and symbols to translate the English language to mathematical equations. Enunciate each symbol with its English word '+' (add or plus) '=' (equals or equal to).

LESSON

2

WAYS TO SUBTRACT

LEARNING OBJECTIVES

1. Subtract by counting back.
2. Subtract the ones.
3. Subtract from 10.

LESSON
2

WAYS TO SUBTRACT

IN FOCUS

$15 - 3 = ?$

What are the different ways to subtract?

LET'S LEARN

Subtract By Counting Back
Subtract 3 from 15.

Count back
3 steps from 15.

12	13	14	15
----	----	----	----

$15 - 3 = 12$

There are 12 flowers left.

80 CHAPTER 7
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IN FOCUS

Review the 'count back' strategy that was previously taught in Chapter 4 (Lesson 1). Demonstrate this using a number ladder or by counting with fingers.

Introduce this as a strategy to subtract a 1-digit number from a 2-digit number.

In this picture, there are 15 flowers in the vase. Xinyi then takes away 3 flowers. This strategy will be applied to find the number of flowers left in the vase.

LET'S LEARN

Ask pupils if the problem requires addition or subtraction. Write the subtraction equation on the whiteboard.

Invite some pupils to try counting back from 15. Model this using a number ladder, or demonstrate through crossing out, showing that this is a subtraction process.

Get the pupils to work in pairs to further practice the counting back strategy. Provide two more examples for the pupils to work on.

Example

$$17 - 2 = ?$$

$$19 - 4 = ?$$

Play in groups of 2 to 4.

20	19	18	17
16	15	14	13 <small>(miss a turn)</small>
12	11	10	9
8	7	6 <small>(miss a turn)</small>	5
4	3	2	1

What you need:



- Choose a counter and put it on 20.
- Take turns to roll the die to get a number.
- Subtract by counting back from where your counter is.
- The first player to reach HOME wins!

PRACTICE

Subtract by counting back.

11	12	13	14	15	16	17	18	19	20
----	----	----	----	----	----	----	----	----	----

- (a) $15 - 2 = 13$ (b) $17 - 3 = 14$

Complete Workbook 1A, Worksheet 2A • Pages 120 – 121

Assign pupils to play in groups of 2 to 4. Provide counters and a '1' to '6' dice for each game.

Note that the starting point is at number 20. Pupils are required to move backwards from the number their counters are at. The number of steps to count back is given by rolling the dice.

PRACTICE

Help the pupils to read and understand each question. Encourage pupils to count back mentally and check their answers using the number ladder.

For better understanding, select items from **Worksheet 2A** and work these out with the pupils.

Independent seatwork









Assign pupils to complete Worksheet 2A (Workbook 1A P120 – 121).

Answers

Worksheet 2A (Workbook 1A P120 – 121)

- (a) 14
(b) 15
(c) 16
(d) 13
(e) 15
(f) 9
(g) 8
(h) 10
(i) 14
(j) 18

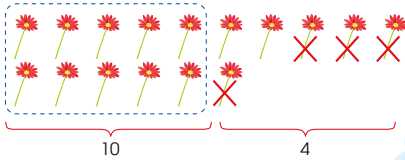
2.

 $18 - 3 = 15$	 $11 - 2 = 9$
 $20 - 4 = 16$	 $15 - 2 = 13$
 $13 - 4 = 9$	 $16 - 1 = 15$
 $16 - 3 = 13$	 $19 - 3 = 16$

LET'S LEARN

Subtract Ones

$16 - 4 = ?$



$16 - 4 = 12$
There are 12 flowers left.



$$\begin{array}{r} 16 \\ - 4 \\ \hline 10 \quad 6 \\ 6 - 4 = 2 \\ 10 + 2 = 12 \end{array}$$

PRACTICE

Subtract.



$$\begin{array}{r} 17 - 5 = 12 \\ \swarrow \quad \searrow \\ (10) \quad (7) \end{array}$$

Complete Workbook 1A, Worksheet 2B • Pages 122 – 125

LET'S LEARN

Recall the 'counting back' strategy by allowing pupils to work on a subtraction equation involving a 2-digit number and a small 1-digit number. Ensure that the equation given can be solved without the need for regrouping (e.g. $13 - 2$, $18 - 3$, $17 - 6$, etc.).

Introduce the 'subtracting from ones' strategy by referring to the picture on P82. Show that the 16 flowers can be regrouped into 1 group of 10 and ones. This can be illustrated using counting objects.

After regrouping, ask the pupils where the 4 flowers can be subtracted from. Show the subtraction by crossing out 4 flowers from the ones. There would be $10 + 2$ flowers left.

Repeat the subtraction by crossing out 4 flowers from the group of 10 instead. Ask pupils if it is easier to see the final answer through this method.

Draw the number bond diagram to link the process of subtracting the ones and getting the answer.

This strategy can be demonstrated further with equations given at the start of the lesson.

PRACTICE

Use the question for pupils to see that 17 is more than 10 and should be regrouped into 1 group of 10 and ones. Show that it is easier to subtract from the ones. The final answer can be seen by looking at the 1 group of 10 and ones.

For better understanding, select items from **Worksheet 2B** and work these out with the pupils.

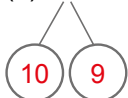
Independent seatwork

Assign pupils to complete Worksheet 2B (Workbook 1A P122 – 125).

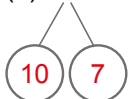
Answers Worksheet 2B (Workbook 1A P122 – 125)

1. (a) 11 (b) 12
(c) 12

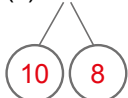
2. (a) $19 - 9 = 10$



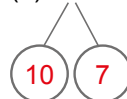
- (b) $17 - 2 = 15$



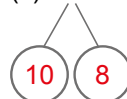
- (c) $18 - 5 = 13$



3. (a) $16 - 3 = 13$
(b) $17 - 6 = 11$



- (c) $18 - 4 = 14$



4. (a) 11 (b) 14
(c) 12 (d) 10

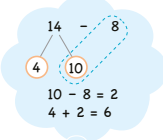
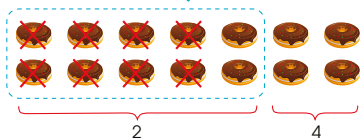


How many doughnuts does Junhao have left?

LET'S LEARN

Subtract From 10

$14 - 8 = ?$



$14 - 8 = 6$

Junhao has 6 doughnuts left.



Textbook 1 P83

Recall the 'subtract from ones' strategy with the pupils. Highlight to pupils that this is useful when the ones in the 2-digit number is bigger than the 1-digit number.

Ask the pupils how subtraction can be done if the ones in the 2-digit number is smaller than the 1-digit number, such as the case in the picture.

LET'S LEARN

Introduce the 'subtract from 10' strategy for finding $14 - 8$. Like the 'subtracting for ones' strategy, the 2-digit number should be regrouped into 1 group of 10 and loose ones. Allow pupils to think about where the 8 doughnuts should be crossed out from – the group of 10 or the loose ones.

Lead the pupils to see that the 8 doughnuts should be crossed out from the group of 10. Ask pupils to count the total number of doughnuts from the two groups.

Draw a number bond diagram and link the above process with the related number statements for the subtraction (i.e. the subtraction of 8 from 10, then adding the remaining result to 4).

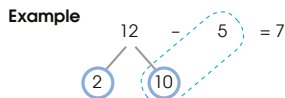
Emphasise to pupils that this strategy is useful when the ones in the 2-digit number is smaller than the 1-digit number to be subtracted.

Counting objects (e.g. magnetic buttons, counters) can also be used to illustrate the process. Apply this strategy with another example.

ACTIVITY 1 2 3 TIME

Play in groups of 3 to 4.

1. Open a 9 and a 20. Subtract the smaller number from the greater number.



2. The first player to get the correct answer keeps the cards.
3. The player with the most cards wins!

What you need:



Subtract 5 from 12.



PRACTICE

1. Subtract from 10.

(a)

$15 - 7 = 8$

(b)

$19 - 9 = 10$

2. Subtract.

(a) $13 - 5 = 8$ (b) $17 - 9 = 8$

Complete Workbook 1A, Worksheet 2C + Pages 126 - 129

Textbook 1 P84

Assign pupils to work in groups of 3 to 4. Provide each group with 1 set of 1-digit numeral (0 to 9) cards and 1 set of 2-digit numeral (10 to 20) cards.

It is intended for the pupils to select any of the three strategies - counting back, subtracting from the ones and subtracting from 10. They have to select the most suitable strategy for the quickest way to get the answer.

PRACTICE

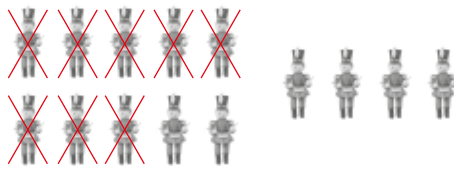
Use these questions for pupils to see that they should make a group of 10 and loose ones for the set, then subtract from the 10 to obtain the answer.

For better understanding, select items from **Worksheet 2C** and work these out with the pupils.

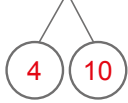
Independent seatwork

Assign pupils to complete Worksheet 2C (Workbook 1A P126 - 129).

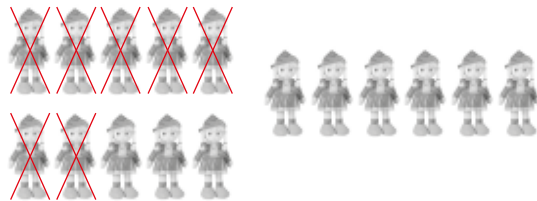
1. (a)



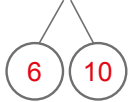
$$14 - 8 = 6$$



(b)



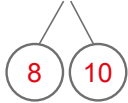
$$16 - 7 = 9$$



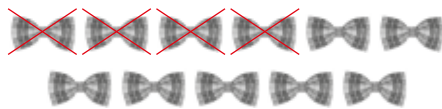
(c)



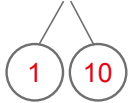
$$18 - 9 = 9$$



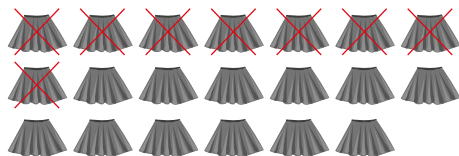
(d)



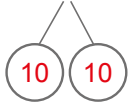
$$11 - 4 = 7$$



(e)



$$20 - 8 = 12$$



2. (a) $12 - 3 = 9$

(b) $13 - 8 = 5$



(c) $14 - 5 = 9$



3. (a) 4

(b) 8

(c) 8

(d) 5

**Specific Learning Focus**

- Subtract by counting back.
- Subtract the ones.
- Subtract from 10.

Suggested Duration

5 periods

Prior Learning

Pupils have earlier knowledge of subtracting by counting backwards, using fingers and crossing out. A quick review would be helpful for them when subtracting ones from 2-digit numbers.

Pre-emptive Pitfalls

Pupils might stumble in counting backwards by overcounting or undercounting. Encourage pupils to count backwards from the largest number. Number ladders come in handy to grasp the concept of subtraction.

Introduction

While introducing subtracting ones from double digits, avoid using big 'ones' (e.g. $13 - 2$, $15 - 1$, $16 - 3$ etc.) Bigger 'ones' can be used at the next stage, where regrouping into tens and ones (number bonds) can be employed. Multiple strategies taught in the previous chapters should be recalled and applied (counting backwards, crossing out, using number bonds and place value). Enunciate to the pupils which strategy works better for a given subtraction equation. Avoid chorus answers or chants from pupils when employing the counting backwards strategy of subtraction. Encourage individual responses.

Problem Solving

Discuss with pupils the multiple strategies that they would select to add and subtract. This enhances their critical thinking. In Lesson 3, to decide whether to add or subtract, pupils should look for key words like 'all' or 'taken away'. 'Maths Journal' (Textbook 1 P88) encourages pupils to make doubles to help them add two numbers (e.g. $8 + 9 =$ double 8 plus 1 or double 9 minus 1). This could be a fun activity to carry out in class. They should recall finding doubles in their earlier classes.

Activities

The activities (Textbook 1 P81, 84) clearly define the two strategies. Pupils will understand the differentiation and when the teacher points out that the faster method is the preferred method, subtraction can be done more easily. Encourage pupils to work in groups and help each other in choosing the preferred strategy. Peer learning should be encouraged during these activities.

Resources

- '1' to '6' dice
- 2-colour counters
- ten-frames
- magnetic square tiles
- numeral cards

Mathematical Communication Support

Lesson 3 'Solving Word Problems' helps in mathematical communication and critical thinking. Encourage pupils to draw story sums in real-life context and even create and write their own stories. Ask pupils to read their story sums out loud in class.

SOLVING WORD PROBLEMS

LEARNING OBJECTIVES

1. Apply and reinforce concepts of addition and subtraction through solving problems presented in pictures.

SOLVING WORD PROBLEMS

LESSON
3

IN
FOCUS

There are 11 apples on the tree.
There are 4 apples in the basket.

How many apples are there altogether?

LET'S LEARN

1. $11 + 4 = 15$
There are 15 apples altogether.
- There are 15 apples on the tree.
4 apples drop.

How many apples are left on the tree?

$15 - 4 = 11$

11 apples are left on the tree.

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ADDITION AND SUBTRACTION WITHIN 20

85

Textbook 1 P85

IN FOCUS

Invite pupils to talk about the picture. It might be useful to prepare a picture cut-out without the speech bubble and the question for the pupils to discuss.

Get them to work in pairs to think of number stories from the picture. After which, allow some pairs to share their stories with the class.

LET'S LEARN

Referring back to P85, read the number story (from the speech bubble) aloud. Write the addition equation and the word statement on the whiteboard.

Introduce the example as an addition story and ask for suggestions as to how a question should be asked to make it an addition story problem.

Using the picture in Let's Learn 2, ask pupils to think of a subtraction story and an appropriate question to make it a subtraction story problem.

Get pupils to work in groups to make up addition or subtraction stories.

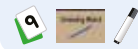


Work in groups of 3 to 4.

ACTIVITY TIME

- 1 Open two cards. Use the numbers to write an addition or subtraction fact.

What you need:

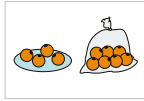


- 2 Make a story and draw a picture to show the fact.

Example

$$\begin{array}{|c|} \hline 4 \\ \hline \end{array} \begin{array}{|c|} \hline 7 \\ \hline \end{array}$$

$$4 + 7 = 11$$



There are 4 oranges. Tom buys 7 more oranges. There are 11 oranges altogether.



- 3 Show your group's picture to the class. Tell the story.

PRACTICE



Solve.

1.



There are 9 fish. 5 fish swim in to join them. How many fish are there altogether?

$$9 + 5 = 14$$

There are 14 fish altogether.

Textbook 1 P86

Assign pupils to work in groups of 3 to 4. Provide each group with a set of 1-digit numeral cards, coloured marker pens and a sheet of drawing paper.

Give the pupils some time to draw their stories. After which, get each group to present their story based on their drawing and an appropriate equation.

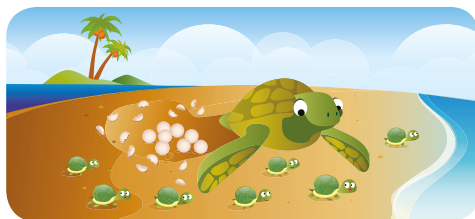
PRACTICE



Help the pupils to read and understand each question. Guide them to interpret the picture by asking them the following questions:

- What is the question asking us to solve?
- Is this an addition or subtraction story?
- What should be written for the equation?

2.



There are 15 eggs. 7 eggs hatch into baby turtles. How many eggs are left?

$$15 - 7 = 8$$

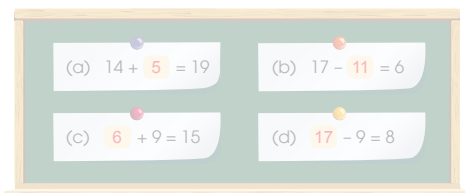
8 eggs are left.

Complete Workbook 1A, Worksheet 3 • Pages 130 – 132



MIND WORKOUT

Complete the addition and subtraction facts.



Textbook 1 P87

Avoid chorus answers from pupils and encourage participation by inviting individual responses. Ask the pupils how they get their answers and if possible, get another pupil to verify the answer.

For better understanding, select items from **Worksheet 3** and work these out with the pupils.

Independent seatwork

Assign pupils to complete Worksheet 3 (Workbook 1A P130 – 132).

Answers Worksheet 3 (Workbook 1A P130 – 132)

1. $8 + 5 = 13$
There are 13 buttons altogether.
2. $7 + 12 = 19$
The monkey has 19 bananas now.
3. $12 - 4 = 8$
She has 8 sandwiches left.
4. $18 - 9 = 9$
She has 9 bows left.
5. $12 + 8 = 20$
He has 20 cups now.
6. $13 - 6 = 7$
He has 7 cupcakes left.

PROBLEM SOLVING, MATHS JOURNAL AND PUPIL REVIEW



Mind Workout

Date: _____

Fill in the blanks with the numbers 5, 8, 9 and 12.

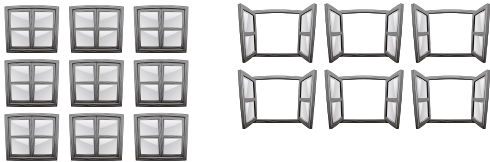
$$7 + 5 = 12$$

$$17 - 8 = 9$$



Maths Journal

Use the picture to make a number story.



9 windows are closed.

6 windows are open.

$$9 + 6 = 15$$

There are 15 windows altogether.

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Addition and Subtraction Within 20 133



Mind Workout

Pupils can use the guess and check method to match the numbers into the appropriate addition or subtraction equations.

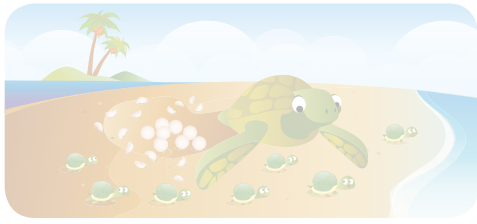


Maths Journal

This activity serves to review the concept of addition stories and the application of a suitable strategy to add two numbers.

Workbook 1A P133

2.



There are 15 eggs.
7 eggs hatch into baby turtles.
How many eggs are left?

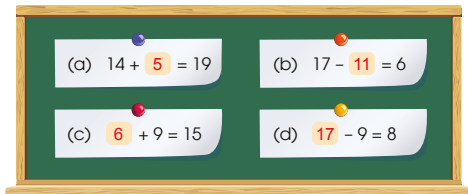
$$15 - 7 = 8$$

8 eggs are left.

Complete Workbook 1A, Worksheet 3 • Pages 130 – 132

MIND WORKOUT

Complete the addition and subtraction facts.



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ADDITION AND SUBTRACTION WITHIN 20

87

Textbook 1 P87



MIND WORKOUT

Allow pupils to work in pairs. These sums can be considered to be unfamiliar to pupils as they are different from the usual exercises where the unknown is placed after the equal sign in the equation.

Recall the concepts of addition and subtraction as related through number bonds (the part-part-whole concept).

Interpret the addition and subtraction equations by identifying the parts and the whole in their respective number bond diagrams.

Another way of interpreting the equations is to ask pupils to tell number stories that are appropriate to the equation to identify the parts and the whole.

MATHS JOURNAL

Add.

- (a) $1 + 1 = 2$
- (b) $2 + 2 = 4$
- (c) $3 + 3 = 6$
- (d) $4 + 4 = 8$
- (e) $5 + 5 = 10$
- (f) $6 + 6 = 12$
- (g) $7 + 7 = 14$
- (h) $8 + 8 = 16$
- (i) $9 + 9 = 18$
- (j) $10 + 10 = 20$

Do you know how to use the same numbers to help you add?



How can you use $7 + 7$ to find $7 + 8$ and $7 + 6$?

I know how to...

- add by counting on.
- add by making 10.
- add ones.
- subtract by counting back.
- subtract ones.
- subtract from 10.
- solve word problems involving addition or subtraction.

SELF-CHECK



88

CHAPTER 7

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Textbook 1 P88

MATHS JOURNAL

Allow pupils to work in pairs. This task serves to familiarise pupils with the doubles of the numerals up to 10 and to commit them to memory.

When given non-doubles where one number is 1 more or 1 less than the other number, the pupils would automatically use the appropriate double and add or subtract 1 to get the answer, rather than adding the two numbers.

Example

To solve $7 + 6$, 14 (double of 7, $7 + 7$) minus 1 or 12 (double of 6, $6 + 6$) plus 1 can be used.

The main objective is to explore the use of double facts and to help pupils in mental calculations.

SELF-CHECK



Before the pupils do the self check, review the important concepts once more by asking for examples learnt for each objective.

This self check can be done after pupils have completed **Review 7** (Workbook 1A P134 – 135) as consolidation of understanding for the chapter.

Answers Review 7 (Workbook 1A P134 – 135)

1. (a) +
- (b) –
- (c) –
- (d) +
- (e) +
- (f) –
- (g) +
- (h) –

2. (a)



- (b)



3. (a) $3 + 8 = 11$
Tom has 11 pets in all.
- (b) $16 - 9 = 7$
There are 7 tennis balls.

SHAPES AND PATTERNS

CHAPTER

8

Shapes and Patterns

CHAPTER 8

What shapes can you see in the picture?



RECOGNISING AND GROUPING SHAPES

LESSON 1



How many shapes are there?
Can you name the shapes?

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SHAPES AND PATTERNS

89

Textbook 1 P89

Related Resources

NSPM Textbook 1 (P89 – 98)

NSPM Workbook 1A (P136 – 149)

Materials

Two-dimensional shape pattern blocks,
attribute blocks, three-dimensional objects,
coloured paper, bag

Lesson

Lesson 1 Recognising and
Grouping Shapes

Lesson 2 Recognising Patterns

Problem Solving, Maths Journal and
Pupil Review

INTRODUCTION

Shapes are all around us. To be able to make sense of the various shapes around us, pupils have to learn to identify similar and different attributes of two-dimensional shapes around them. Thus the visual skills to observe the various two-dimensional shapes around them and allowing the pupils to articulate what they observe will help them in their thinking skills. They are also expected to observe similarities and differences, look for patterns and classify shapes according to some attributes. To engage the pupils, opportunities are provided for pupils to label, trace, draw, shade and verbalise their thinking aloud to ensure that they have a common vocabulary to describe the attributes that they notice in the shapes. The analysis of a pattern with the clear understanding of the attributes will help the pupils to classify the shapes which may look different due to the orientation, colour or size. This is crucial in forming the foundation to the learning of the properties of the shapes in subsequent years.

RECOGNISING AND GROUPING SHAPES

LEARNING OBJECTIVES

1. Identify and name two-dimensional shapes.
2. Describe and classify two-dimensional shapes.

Shapes and Patterns

CHAPTER
8

What shapes can you see in the picture?



RECOGNISING AND GROUPING SHAPES

LESSON
1

IN  FOCUS



How many shapes are there?
Can you name the shapes?

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SHAPES AND PATTERNS

89

Textbook 1 P89

IN FOCUS

Discuss the picture to orientate pupils to relate different shapes in objects around them. The key idea is to recognise two-dimensional shapes in three-dimensional objects.

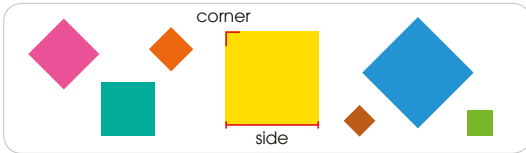
Point out to the pupils that there can be more than one two-dimensional shape in a single three-dimensional object. For instance, many rectangles of different lengths and sizes can be found on a table.

Outline the two-dimensional shapes to direct the pupils' focus.

Which are the sides?
Which are the corners?

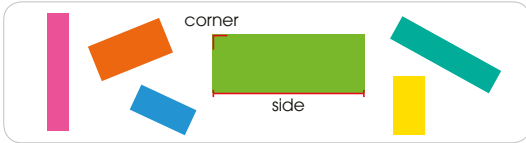


These are **squares**.



A square has 4 **sides** and 4 **corners**.

These are **rectangles**.

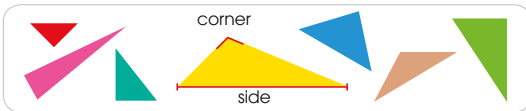


A rectangle has 4 sides and 4 corners.

A square and a rectangle
have 4 sides and 4 corners each.
How are they different?



These are **triangles**.



A triangle has 3 sides and 3 corners.

Textbook 1 P90

Trace the outlines of each shape along with the pupils, using fingers only. At the same time, highlight the properties of each shape (such as the corners and sides).

Encourage pupils to communicate using correct mathematical terms (e.g. names of the shapes) and make links with the tracing action and visual cues (e.g. sides: finger moves horizontally or vertically, corners: pause and put a dot). Get pupils to draw each shape mentally.

These are **circles**.



A circle is round.

ACTIVITY TIME

Work in pairs.

- Take turns to pick up one object. Name and trace one shape you see.



A square has 4 sides.

The Rubik's cube has squares.



Which object has more than one shape?



- Describe the shape.

PRACTICE

- Which shapes are triangles?



Textbook 1 P91

Display the properties of each shape clearly and provide opportunities for comparisons and discussion. One way of doing this is presenting it in a table as follows.

	square	rectangle	triangle	circle
corner	4	4	3	0
sides	4	4	3	0

Other possible questions can be posed to encourage discussion.

- Do you see a pattern between corners and sides?
- Why does a circle have no corners and sides?
- How are squares and rectangles similar and different?

ACTIVITY TIME

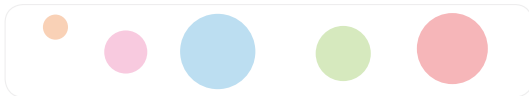


Assign pupils to work in pairs or small groups of 3. Get pupils to bring their own three-dimensional objects or use any other objects that are available in the school.

Demonstrate the activity to give the pupils a better idea of what to do. Take an object and look at one of its faces. Trace the shape and talk about its properties aloud. Do the same with another face of the object.



These are circles.



A circle is round.

ACTIVITY TIME

Work in pairs.

- 1 Take turns to pick up one object. Name and trace one shape you see.

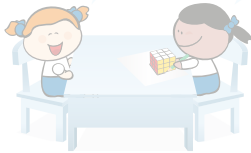
What you need:



A square has 4 sides.

The Rubik's cube has squares.

Which object has more than one shape?



- 2 Describe the shape.

PRACTICE



1. Which shapes are triangles?



Textbook 1 P91

Independent seatwork

Assign pupils to complete Worksheet 1A (Workbook 1A P136 – 141).

2. Which shapes are rectangles?



3. Which shapes have 3 sides?

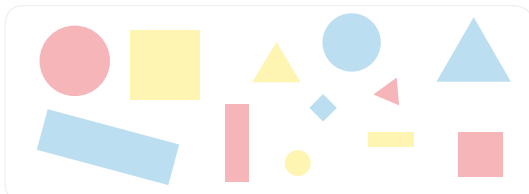


4. Which shapes have 4 equal sides?



Complete Workbook 1A, Worksheet 1A • Pages 136 – 141

IN FOCUS



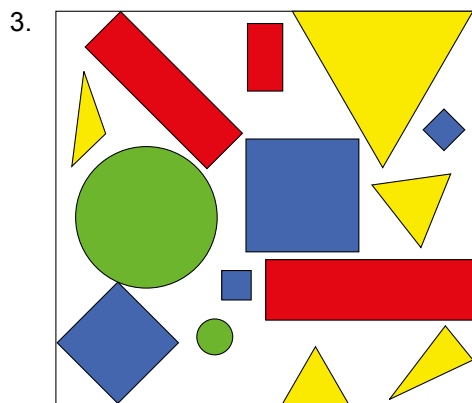
How can we group the shapes?

Textbook 1 P92

1. (a) square, 4, 4
- (b) circle, round
- (c) triangle, 3, 3
- (d) rectangle, 4, 4
- (e) square, 4, 4
- (f) triangle, 3, 3

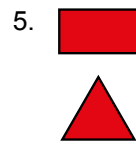
2.

triangle	It has 4 equal sides.	
circle	It has 3 corners.	
rectangle	It is round.	
square	It has 4 corners, 2 long sides and 2 short sides.	



- (a) 3
- (b) 4
- (c) 2
- (d) 5

4.



6. (a) circle
- (b) rectangle
- (c) triangle
- (d) square



2. Which shapes are rectangles?



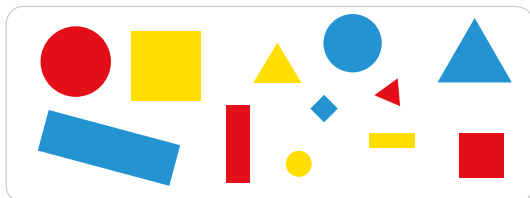
3. Which shapes have 3 sides?



4. Which shapes have 4 equal sides?



Complete Workbook 1A, Worksheet 1A • Pages 136 – 141



How can we group the shapes?

Textbook 1 P92

LET'S LEARN



LET'S LEARN

1. We can group them by **shape**.



2. We can group them by **size**.



3. We can group them by **colour**.



Textbook 1 P93

Get pupils to work in pairs or small groups. Select some shapes from the assorted shapes pack for the pupils to group.

The pupils are to group the given shapes and present their work to the class. They have to explain how the shapes are grouped.

Based on the pupils' responses, bring their focus to the four possible ways of grouping the shapes.

Introduce the four ways of classification: shape, size, colour and orientation. Highlight the key principle of grouping based on a shared feature.



Work in pairs.

- 1 Put the  into groups by shape, size or colour.
- 2 Ask your partner to tell how you grouped the shapes.
- 3 Take turns to sort the  into different groups.

ACTIVITY TIME

What you need:



The shapes are grouped by **colour**.



PRACTICE



How are the shapes grouped?



The shapes are grouped by **colour**.



The shapes are grouped by **shape**.



The shapes are grouped by **size**.

Complete Workbook 1A, Worksheet 1B • Pages 142 – 143

Assign pupils to work in pairs. Provide pupils with assorted shapes and a worksheet (refer to Activity Handbook 1 P27) for them to write down the different groupings made.

PRACTICE



Work with the pupils to solve the questions.

For better understanding, select items from **Worksheet 1B** and work these out with the pupils.

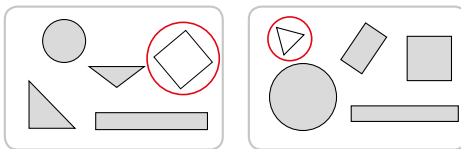
Independent seatwork

Assign pupils to complete Worksheet 1B (Workbook 1A P142 – 143).

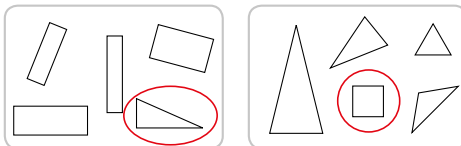
Answers Worksheet 1B (Workbook 1A P110 – 111)

1. (a) size
- (b) shape
- (c) colour

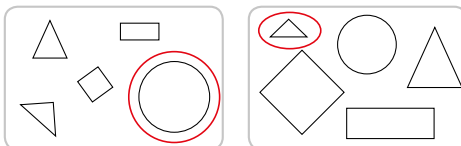
2. (a) colour



- (b) shape



- (c) size



**Specific Learning Focus**

- Identify and name two-dimensional shapes.
- Describe and classify two-dimensional shapes.

Suggested Duration

10 periods

Prior Learning

Pupils are aware of shapes around them from the earlier grade. A quick recap by playing 'I Spy' in class by calling out the properties of the shapes and asking pupils for the objects in the classroom that are in that shape could be a fun 'Recap' session. Pupils should be able to recognise squares, rectangles, triangles, circles and ovals.

Pre-emptive Pitfalls

Pupils sometimes get confused with the difference between square and rectangle. When dealing with real-life objects which are mostly 3D, identifying the 2D shapes on these 3D objects tends to get confusing. The teacher should explain that many of the same 2D shapes combine to make a 3D object.

Introduction

There are 3 attributes of 2D shapes that the pupils should be familiar with in order to differentiate and classify them: (i) orientation, (ii) colour, (iii) size of each shape. These attributes are to be further discussed and the similarities and differences will be recorded in a table. This lays the foundation of spatial Mathematics. Rectangles and squares have four sides and 4 corners. This is the similar attribute between rectangles and squares. However, all sides of a square are equal while not all sides of a rectangle are equal. This is the differentiating attribute between rectangles and squares. When comparing a rectangle or a square to a triangle, it can be easily seen that the similarity is that they are only formed by straight lines, unlike a circle or oval which is round. Tracing, drawing, shading or colouring, and verbalising their attributes are multiple pedagogical strategies to grasp in this chapter.

Problem Solving

Pupils should be encouraged to apply their visual and observational skills to identify shapes. Helping them to highlight the attributes of shapes verbally will enhance their thinking skills and critical reasoning skills. Observing similarities and differences between shapes will also help to improve their problem-solving skills.

Activities

The activities (Textbook 1 P91, 94) require pupils to identify the shapes by recognising the attributes (properties) of the shapes and classifying (grouping) by orientation, colour and size. Use of real-life objects in the classroom or play ground is critical. Ask them to draw their bedroom and point out the shapes found in their bedroom.

Resources

- three-dimensional objects
- assorted shapes pack

Mathematical Communication Support

Verbal enunciation of attributes and usage of vocabulary words are essential in this lesson. Interactive class discussions help pupils to sharpen their observation and problem-solving skills. The ability to articulate verbally (mathematical reasoning) is important. Vocabulary words such as corners, edges, faces, horizontal lines, vertical lines and curves are some of the words to be used as visual and verbal cues to guess shapes and conduct pop quizzes in class.

RECOGNISING PATTERNS

LEARNING OBJECTIVES

1. Use shapes to make patterns.
2. Complete patterns involving shapes.

RECOGNISING PATTERNS

IN FOCUS

LESSON
2

How are the shapes arranged on the birthday card?

LET'S LEARN

- There is a change in colour.
red, yellow, red, yellow, ...
- There is a change in size.
big, small, big, small, ...

These are patterns.

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SHAPES AND PATTERNS
95

Textbook 1 P95

IN FOCUS

Direct the pupils' attention to the design of the birthday card. Get pupils to describe the patterns using the correct mathematical terms (e.g. triangle, circle, size).

Ask pupils what is meant by a 'pattern' and what is being repeated for each pattern on the card.

LET'S LEARN

Get the pupils to look at the first pattern. Get them to observe the shapes and tell the similarities and differences.

To help them notice the pattern better, get the pupils to read the pattern aloud (red, yellow, red, yellow, ...). After reading, pupils should be able to deduce that the shapes are repeated in a particular sequence.

Do the same for the rest of the examples.

3.



There is a change in size and shape.

{big circle, small square}, {big circle, small square}, ...

4.



What is the pattern?
What comes next in each pattern?



ACTIVITY TIME

Work in groups of 3 to 4.

Do this activity on a computer.



- 1 Use the shapes tool to draw the shapes above.
- 2 Choose 2 shapes and make a pattern.
- 3 Print out your pattern.
- 4 Ask another group to describe your pattern and guess what comes next.

After going through the worked examples, get the pupils to reflect on making patterns.

Discuss the patterns by talking about what is similar, what is different and what is the repeated set in a pattern.

ACTIVITY TIME

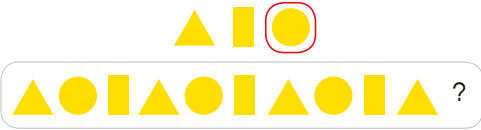
Assign pupils to work in groups of 3 to 4. Provide a word document template for pupils to work on. A sample template is shown in Activity Handbook 1 P29.

Each group has to create their own patterns using Microsoft drawing tools. Show the pupils how they can access the drawing tools before they begin with the activity.

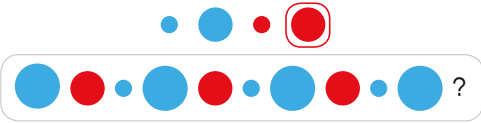


Pick a shape to complete each pattern.

(a)



(b)

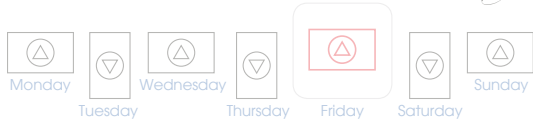


Complete Workbook 1A, Worksheet 2 • Pages 144 – 145

MIND WORKOUT

Weiming draws seven pictures from Monday to Sunday.

Look at the pattern of the pictures.
Draw the picture that Weiming draws on Friday.



Textbook 1 P97



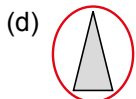
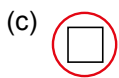
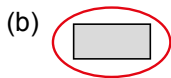
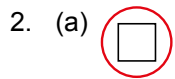
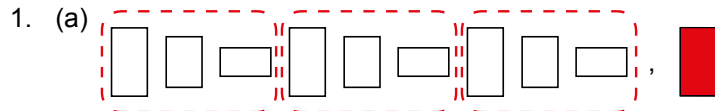
Work with the pupils to solve the questions.

For better understanding, select items from **Worksheet 2** and work these out with the pupils.

Independent seatwork

Assign pupils to complete Worksheet 2 (Workbook 1A P144 – 145).

Answers Worksheet 2 (Workbook 1A P144 - 145)



**Specific Learning Focus**

- Use shapes to make patterns.
- Complete patterns involving shapes.

Suggested Duration

4 periods

Prior Learning

In Chapter 6, pupils dealt with number patterns, where they were required to recognise and complete the patterns. A quick recap of number patterns involving more than/less than 1 and then an introduction of shape patterns should be done. It should be explained to pupils that both are linked and the goal is to classify and recognise by visual cue and then complete the pattern.

Pre-emptive Pitfalls

Pupils might need verbal cues to help them identify the pattern according to shape, size, colour or orientation. The teacher should initially be giving the cues to pupils.

Introduction

Teach pupils to recognise patterns in this lesson by introducing the four types of classification (shape, size, colour and orientation). The shared or similar attributes will help pupils to recognise the pattern and then complete it. Grouping of objects is similar to regrouping a number in tens and ones and splitting the number (whole) into parts in number bonds. Number patterns and shape patterns go hand in hand. The questions (Workbook 1A P142 - 143) provide pupils with ample practice in differentiating and classifying the shapes according to attributes and then move on to recognising the pattern (Workbook 1A P144 - 145). Once the pattern is recognised according to the correct classification, completing the pattern is made easier.

Problem Solving

Deducing the pattern by observing the key attributes of the shapes is critical in developing problem-solving skills. 'Mind Workout' (Textbook 1 P97) can be used as a critical-thinking activity and pupils are encouraged to see different patterns, deduce and complete the pattern.

Activities

The activity (Textbook 1 P96) requires access to a computer so that pupils can generate their own patterns. Word document template (Activity Handbook 1 P29) and word pattern templates (Activity Handbook 1 P28) can be shown to the class and a class quiz can be conducted.

Resources

- word document template (Activity Handbook 1 P29)
- word pattern templates (Activity Handbook P28)

Mathematical Communication Support

Encourage pupils to classify shapes in a pattern by saying aloud the description of each shape in the pattern. Verbalising enables them to see the pattern clearly and therefore they will find it easier to complete it. Similarities and differences of the shapes will enable them to form the pattern. Interactive class discussions, where pupils observe and then articulate the pattern verbally, should be encouraged. After which they can be asked to complete their pattern on their mini whiteboards. Correct mathematical terms such as sides, edges, corners, lines and curves, used to describe shapes should be highlighted in class by putting them on paper and then having the paper pinned on the board for pupils to see at all times during the course of the chapter.

PROBLEM SOLVING, MATHS JOURNAL AND PUPIL REVIEW



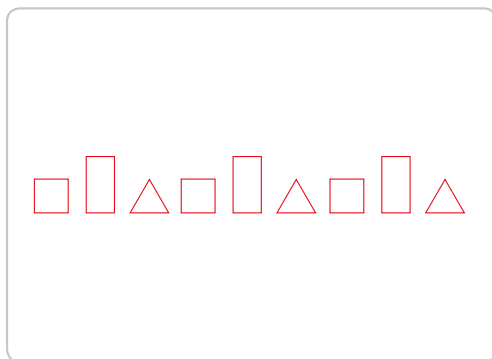
Mind Workout

Date: _____

Tom makes a pattern with three shapes, □, ▭ and △.
He makes a mistake in the pattern below.



Colour the shape that Tom should remove to make a pattern.
Draw the correct pattern in the space below.



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Mind Workout

Allow pupils to work in pairs. Get them to name and describe the shapes they see in the diagram. After which, get the pupils to observe the pattern before predicting the answer.

There may be more than one response to this.
Encourage pupils to share their thoughts on the pattern.

Workbook 1A P146

MATHS JOURNAL

Cut a square, a rectangle, a triangle and a circle into 2 pieces.

Mix the pieces.



Put the pieces to make a square, a rectangle, a triangle and a circle.

I know how to...

- name shapes.
- talk about shapes.
- group shapes.
- make and complete patterns with shapes.

SELF-CHECK



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CHAPTER 8

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Textbook 1 P98

MATHS JOURNAL

Give each pupil a square, a rectangle and a circle. They are to cut each shape into two pieces. After which, these pieces will be placed in a bag.

Without looking into the bag, pupils are required to place their hands into the bag and pick their first piece. After looking at the shape they picked, they are to place their hand into the bag again to obtain the matching piece.

The purpose of the activity is to allow pupils to feel for attributes of the shape (in terms of sides, corners and lengths).

When picking the second matching piece, pupils are to articulate on the attributes of the piece they are touching and why that particular piece will or will not match.

Before the pupils do the self check, review the important concepts once more by asking for examples learnt for each objective.

This self check can be done after pupils have completed **Review 8** (Workbook 1A P148 – 149) as consolidation of understanding for the chapter.

SELF-CHECK



Answers Review 8 (Workbook 1A P148 – 149)

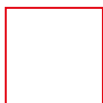
1. (a) triangle



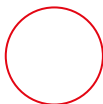
(b) rectangle



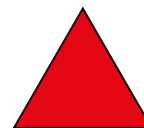
(c) square



(d) circle



2.



3. (a)



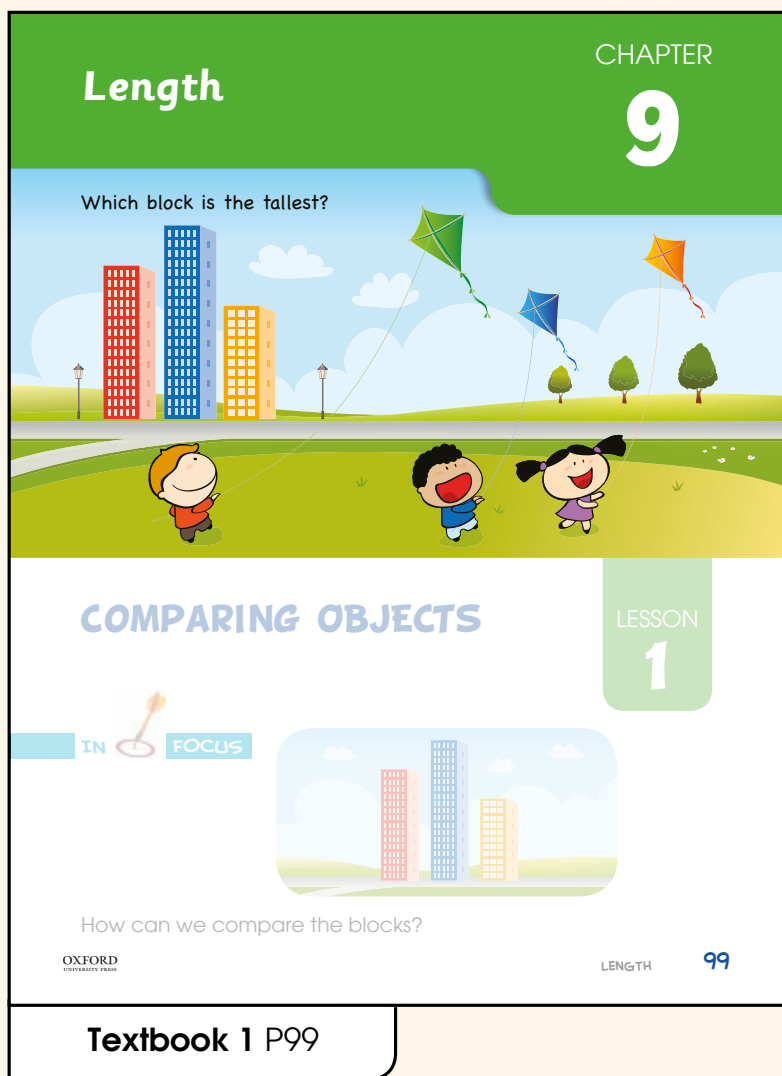
(b)



LENGTH

CHAPTER

9



Related Resources

NSPM Textbook 1 (P99 – 108)
NSPM Workbook 1A (P150 – 163)

Materials

Paper clips, giant footprint pack, paper, scissors

Lesson

Lesson 1 Comparing Objects
Lesson 2 Finding the Lengths of Objects
Problem Solving, Maths Journal and Pupil Review

INTRODUCTION

The concept of length is the simplest attribute among the series on measurement. Like all other measurement, the introduction of length starts from simple comparison to non-standard units before proceeding on to the use of standard units in Primary 2. It is crucial for simple comparison and measuring with non-standard units to be covered first as they are the basis for developing the concept of measurement. The focus of teaching instruction is for pupils to understand the linear attribute that can be portrayed horizontally and vertically using different terms to describe comparison depending on the context. Once pupils are aware of this attribute, they proceed to measure using non-standard units. Use of non-standard units helps pupils to focus only on the attribute being measured rather than the operations of the tools, allowing pupils to develop a deep understanding of the length. While using non-standard units, the rules of iterations come in play which forms the basis for appreciation and understanding of standard units in future.

LEARNING OBJECTIVES

1. Compare lengths of things using correct terms.

Length
CHAPTER 9

Which block is the tallest?

IN FOCUS
LESSON 1

COMPARING OBJECTS

How can we compare the blocks?

OXFORD UNIVERSITY PRESS LENGTH 99

IN FOCUS

Use the picture to orientate pupils to compare the heights of the three blocks of flats.

Some questions can be asked to get the pupils to discuss the picture:

- What is the difference between the three blocks of flats?
- Are they the same as the blocks of flats that you are living in?

Extend the discussion to get the pupils to relate their real life experiences in the heights of different types of buildings in their environment.

Textbook 1 P99

LET'S LEARN

- The blue block is **tall**.
It is **taller than** the red block.
The orange block is **short**.
It is **shorter than** the red block.
The blue block is the **tallest**.
The orange block is the **shortest**.

We only use tallest or shortest when comparing 3 or more objects.



We can arrange the blocks from tallest to shortest.

blue block, red block, orange block
tallest → shortest

- Starting line

lorry
bus
car
bicycle

Compare from the same starting line.

Compare from the same starting line.



The bus is **long**. It is **longer** than the car.
The bus is **as long as** the lorry.
The bicycle is **short**.
It is **shorter** than the car.

How do you arrange the bus, car and bicycle from longest to shortest?



Textbook 1 P100

LET'S LEARN

Discuss the heights of the buildings and bring the pupils' attention to the key words: **tall, taller, tallest, short, shorter, shortest**.

While teaching, bring the pupils' attention to the measurable attribute (e.g. by using a pointer to show the linear movement, which is vertical in the case of the buildings).

Discuss the length of the vehicles using the following keywords: **long, longer, longest, short, shorter, shortest**.

Like the previous example, use a pointer to show the horizontal movement while moving along the measurable attribute.

A clear distinction has to be made for the usage of the terms of comparison (tall, short, long) and their respective comparatives and superlatives.

ACTIVITY TIME

Work in pairs.

- Cut out a piece of
- Cut out a piece of that is longer than the .
- Cut out a piece of that is shorter than the .
- Talk to your partner about the lengths of the 3 pieces of paper.

What you need:



How do you compare the lengths of the pieces of paper?



PRACTICE

Look for objects around the classroom. Compare using **taller, longer** or **shorter**.

- The teacher's table is **taller/longer** than my table.
- My chair is **shorter** than my table.
- My ruler is **longer** than my eraser.
- I am **shorter/taller** than my teacher.
- My pen is **shorter/longer** than my pencil.

When do you use taller or longer to describe an object?



Textbook 1 P101

ACTIVITY TIME



Assign pupils to work in pairs. Provide a piece of paper and a pair of scissors for each pair.

Get pupils to label each piece of paper so that it is easier to talk about the lengths with their partners. They are expected to describe the lengths by using the keywords that were previously taught.

Check how the pupils compare the lengths of paper. The comparison must be done from the same starting line. A non-example can be demonstrated to the pupils to show what would happen if comparison is done at different starting lines.

PRACTICE



It may be useful to label or identify objects mentioned in the questions (e.g. teacher's table, pupil's table, pen, pencil, etc.). This is to avoid confusion and facilitate the completion of the practice questions.

Independent seatwork

Assign pupils to complete Worksheet 1 (Workbook 1A P150 – 153).

1. (a)



(b)



(c)



2. (a) shorter, taller

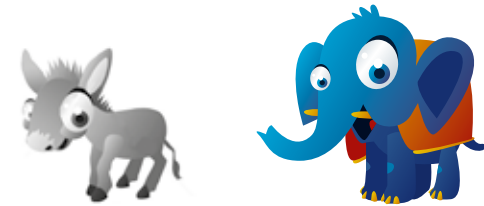
(b) shorter

(c) longer

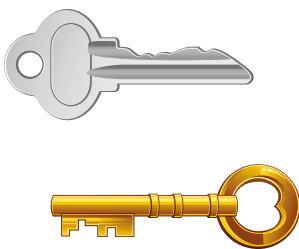
3. (a)



(b)



(c)



4. (a) spade, hammer, screwdriver

(b) duck, horse, giraffe

**Specific Learning Focus**

- Compare lengths of things using correct terms.

Suggested Duration

3 periods

Prior Learning

Pupils are aware of what 'long' or 'short' means when describing the length and height of an object, and consider it as a measure of comparison. In this chapter, non-standard units will be used to introduce the concept of length as an attribute of measurement.

Pre-emptive Pitfalls

Pupils find this topic quite simple. They also learn through fun activities as they measure length in non-standard units. They generally get confused when body parts are used to measure length (e.g. half or quarter of an arm span), as they might not be familiar with the words used.

Introduction

Two key concepts come into play when teaching pupils about length. First, pupils need to identify the orientation of the object (horizontal or vertical) and then choose the appropriate non-standard unit to measure the length of the object. Examples of non-standard units are paper clips, arm/foot span and real-life objects. This builds the foundation of the concept of length measured in standard units, which will be taught in the subsequent years. The concept of estimation also comes into play as pupils will be encouraged to guess the length of the object while assessing the choice of non-standard units.

Problem Solving

The main aim of this chapter is to enhance their skills of identifying the orientation of the object and estimating length. The teacher should highlight the correct term used to describe the length (horizontal orientation) and height (vertical orientation) of an object (e.g. ask pupils if 'longer' or 'taller' should be used in a question like this 'would the table be taller or longer than...?') Estimating the length of an object and deciding the non-standard units will help pupils to identify which standard units (e.g. kilometres, metres and centimetres) should be used to measure the length. It should be pointed out that when comparing the length of objects, the comparison must be done from the same starting line. This concept has a direct link to perimeter which will be taught in Grade 3. Deciding on the starting line to measure length is similar to choosing the starting number to count backward and forward from.

Activities

The activity (Textbook 1 P101) is a hands-on activity where pupils cut out different coloured pieces of paper are given to cut out into different lengths and then compare their lengths. Since this chapter requires measurement, 'Let's Learn' and 'Practice' (Textbook 1 P100 - 101) can be converted to hands-on activities.

Resources

- coloured paper
- scissors
- paper clips

Mathematical Communication Support

Recognising the relationship between vocabulary words like tall, short, long, vertical and horizontal ensures that pupils know in which context should the words be used (e.g. the height of buildings, trees and poles are measured vertically, while the length of buses, tables and stationeries are measured horizontally). Similarly, comparatives and superlatives like shorter than, longer than, shortest, longest, tallest, etc. should be pinned on the soft board in class during the course of this chapter. An interactive class activity where pupils stand in ascending and descending order of height can be carried out. In this activity, the concept of arranging in order can be incorporated with the measurement of height as a spiral approach to the curriculum. It is important to revisit concepts learnt earlier and link them to the current topic.

LESSON

2

FINDING THE LENGTHS OF OBJECTS

LEARNING OBJECTIVES

1. Measure the lengths of objects using non-standard units.
2. Compare lengths of objects using non-standard units.

FINDING THE LENGTHS OF OBJECTS

LESSON
2

IN
FOCUS

Which is longer, the pencil or the crayon?

LET'S LEARN

The pencil is about 6 long.
The crayon is about 5 long.

The length of the pencil is about 6 units.
The length of the crayon is about 5 units.

The pencil is longer than the crayon.

We can use 1 to show 1 unit.

What other objects can we use to measure lengths?

102
CHAPTER 9

IN FOCUS

From this picture, show that comparison by simply looking at the objects may be problematic at times. Highlight the limitation on comparing length through sight alone.

Ask pupils how this problem can be resolved. It may be helpful to use concrete objects to draw the attention of the pupils.


LET'S LEARN

Introduce the use of other items such as paper clips (non-standard units) as a better form of comparison. When eliciting other possible non-standard units, help pupils focus attention on the linear aspect of two-dimensional objects. For example, when using ice cream sticks, colour the length of the ice cream stick so that pupils will not be confused with its breadth.

It may be good to explain the use of the word 'about', but avoid going in depth with the concept of estimation.

Highlight to pupils that no gaps should be present when placing the non-standard units side by side, and that the same item should be used (instead of using a variety of items).

Work in pairs.

- 1 Look at objects around you.
- 2 Guess the length of each object.
- 3 Use  to measure the length.


ACTIVITY  TIME


What you need:



Your pencil case




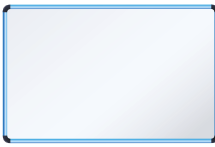
I guess my pencil case is about  long.


My pencil case is about  long.

PRACTICE 


Count.

(a) 1  shows 1 unit.




The whiteboard is about 12  long.

The length of the whiteboard is about 12 units.

(b) 1  shows 1 unit.



The burger is about 8  long.

The length of the burger is about 8 units.

Complete Workbook 1A, Worksheet 2A • Pages 154 – 157

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LENGTH 103

Textbook 1 P103

Get pupils to work in pairs. Provide each pair of pupils with a box of paper clips. They are to find five objects and decide on the side of each object to measure.

Before starting the activity, guide the pupils through the guessing part. This can be done by either demonstrating with one object, or guessing the lengths of all objects before distributing materials for pupils to measure.

Do not overlook the importance of guesswork as this is an avenue for pupils to develop their abilities in measurement and approximation.

PRACTICE 

Go through (a) with the class by demonstrating good habits in measuring, such as marking out the start and end of each object to direct pupils' attention to the length of the item rather than merely counting where the item ends.

Emphasis should be placed on the iterated non-standard unit to prevent misconceptions when items for measuring the length do not start from the beginning in the case of non-standard units, or zero in the case of the ruler (standard unit).

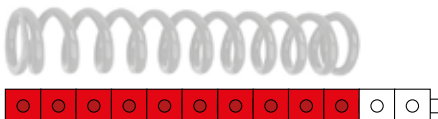
For better understanding, select items from **Worksheet 2A** and work these out with the pupils.

Independent seatwork

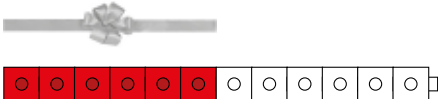
Assign pupils to complete Worksheet 2A (Workbook 1A P154 – 157).

Answers Worksheet 2A (Workbook 1A P154 – 157)

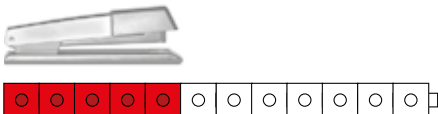
1. (a) 10



(b) 6



(c) 5



(d) 8



2. (a) 7, 7

(b) 9, 9

(c) 3, 3

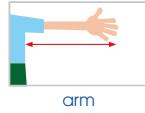
3. (a) 3

(b) 6

(c) 7

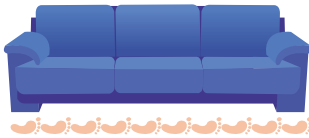


How long is the sofa?
Which parts of our body can we use to find out?



LET'S LEARN

We can use parts of our body to measure lengths.



The sofa is about 10 long.
We can also say that the length of the sofa is about 10 units.

Textbook 1 P104

LET'S LEARN

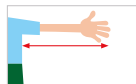
Demonstrate how different body parts can be used for measuring length.

While demonstrating, get pupils to try measuring with their body parts, e.g. hand span, arm span and stride.

ACTIVITY TIME



Work in pairs.



What you need:



- 1 Look at the parts of the body.
- 2 Use these to measure the length of each object.
- 3 How many , or do you use?

Object			
Your desk			
A pencil case			
The whiteboard			

Which part of the body will you choose to measure the length of each object?
Why do you choose that part of the body to measure?

Assign pupils to work in pairs.

The objective of this activity is to give pupils hands-on experience on measuring using different body parts.

The activity also gets pupils to understand the need to choose the most appropriate body parts to measure a given object. The choice of body part depends on several criteria, such as feasibility, practicality or efficiency.

Pupils are to pick objects (e.g. pupil's desk, pencil case, mini whiteboard) and decide on the side of the objects to measure. After deciding, they are to indicate the side of the object that is being measured on the textbook.

At the end of the activity, discuss with the pupils their choice of body parts for measuring each object.

Textbook 1 P105



1. Count.



- (a) The carpet is about 7 hands long.
- (b) The length of the carpet is about 7 units.

2. Use hands to measure the length of your desk.



- (a) My desk is about 4 hands long.
- (b) The length of my desk is about 4 units.

Complete Workbook 1A, Worksheet 2B • Page 158



Help the pupils to read and understand each question.


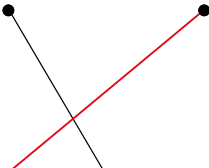

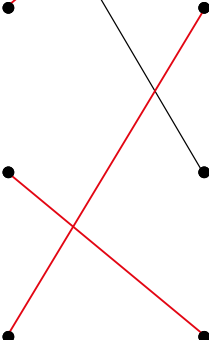
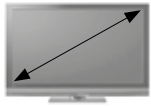


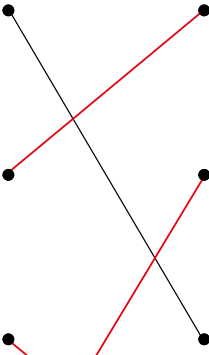
For better understanding, select items from **Worksheet 2B** and work these out with the pupils.

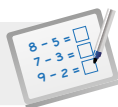
Independent seatwork

Assign pupils to complete Worksheet 2B (Workbook 1A P158).

Answers Worksheet 2B (Workbook 1A P158)

1.

<p>door mat</p> 		<p>It is about 11 hands long.</p>
<p>can</p> 		<p>It is about 2 hands long.</p>
<p>television</p> 		<p>It is about 1 hand long.</p>
<p>bed</p> 		<p>It is about 1 hand long.</p>

**Specific Learning Focus**

- Measure the lengths of objects using non-standard units.
- Compare lengths of objects using non-standard units.

Suggested Duration

2 periods

Prior Learning

This lesson is a continuation of Lesson 1. Concepts are formalised and covered in this lesson on Length.

Pre-emptive Pitfalls

The appropriate usage of non-standard units might be a little confusing to pupils. Repetitive exercise and hands-on activities should clear this confusion. Showing a list of comparatives and superlatives together with different objects and having the pupils use the words to describe the length or height of the objects based on their observation will strengthen pupils' understanding of the concept of measurement. The starting line of objects and starting the measurement from the zero mark on the ruler can be highlighted to clear any misconceptions of measuring length.

Introduction

Avoid going into the details of estimation but use the word 'about' frequently to assist pupils in choosing the appropriate non-standard units.

Problem Solving

The activity (Textbook 1 P103) and 'Maths Journal' (Textbook 1 P108) are good exercises to reinforce the correct usage of non-standard units. The C-P-A approach is adopted in these activities, leading to the application of length and height in real life. Elicit pupils' thinking by asking them for real-life examples of measurement of length or height (e.g. distance between home and school, length of a book, distance between the Earth and Mars, distance between the classroom door and the teacher's desk, height of the school building).

Activities

Questions 1 and 2 in 'Practice' (Textbook 1 P106) and the activity (Textbook 1 P105) can be carried out in a fun way. Pupils can be encouraged to measure the length and height of different objects found in the school, playground and at home.

Resources

- paper clips
- hand and foot span template (Activity Handbook 1 P31)
- real-life objects

Mathematical Communication Support

As pupils know from Lesson 1 the correct usage of non-standard units, this lesson is about determining the correct numerical answer. Encourage class participation and motivate each pupil to measure the length or height of objects and come up with the answer.

PROBLEM SOLVING, MATHS JOURNAL AND PUPIL REVIEW



Mind Workout

Date: _____

Read the clues.

My bracelet is longer than Siti's bracelet.



Bina



Siti



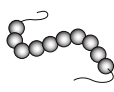
Meiling

My bracelet is the shortest.

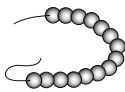
Write the names in the boxes below.



Siti



Meiling



Bina

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Length 159

Workbook 1A P159



Mind Workout

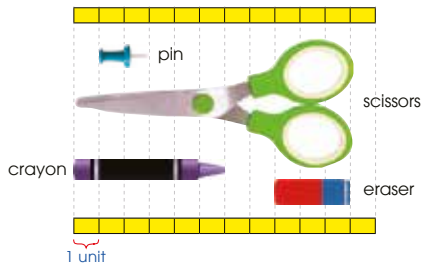
Help pupils to understand that the non-standard units used in this case are beads on the bracelets.

Pupils can start the activity by counting the lengths of each bracelet, using the beads for iteration. After which, they are to read the clues to find the order of lengths of the bracelets, starting from the shortest.

After finding the order of lengths, pupils are to link this back to the lengths of the bracelets they have found.

MIND WORKOUT

Compare the lengths of the objects.



- (a) The **pin** is shorter than the eraser.
- (b) The **pin** is the shortest.
- (c)



The length of the pen is about **12** units.

Textbook 1 P107

MIND WORKOUT

Instead of the regular non-standard items for iteration, the iterated unit is now a rectangle. This is more demanding as pupils may not perceive the rectangle as a non-standard unit.

Use concrete materials to help bridge the gap. Take an object (such as an A4 file) and then iterate rectangular shapes at one side to measure its length. The rectangular shapes used will help pupils to understand the rectangular unit used in the question.

Emphasis must be placed on counting the iteration by paying attention to the start and end of each item in order to find the respective lengths.

For (c), pupils have to understand that the length of the pen is derived from the length of the eraser. In turn, the length of the eraser can be obtained in terms of the non-standard units (the rectangles) based on the diagram earlier.

MATHS JOURNAL

Kate has a red ribbon and a blue ribbon. She measures the length of each ribbon.



The red ribbon is about 7 paper clips long.



The blue ribbon is about 4 ice cream sticks long.

I use more paper clips than ice cream sticks. So, the red ribbon is longer than the blue ribbon.



Is Kate correct? Why?

I know how to...

- compare lengths of objects.
- measure lengths of objects.



Textbook 1 P108

MATHS JOURNAL

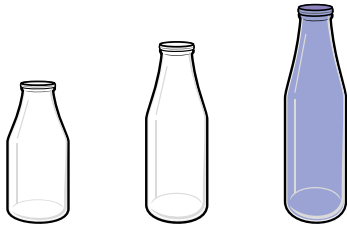
The scenario given is for pupils to communicate a rule of iteration, which is the use of uniform units for comparison.

Before the pupils do the self check, review the important concepts once more by asking for examples learnt for each objective.



This self check can be done after pupils have completed **Review 9** (Workbook 1A P160 – 163) as consolidation of understanding for the chapter.

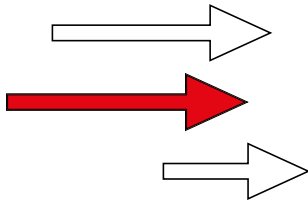
1. (a)



(b)



(c)



2. (a) shortest

(b) tallest

(c) taller

(d) shorter

3. (a) B

(b) C

(c) C

(d) B

4. (a) 7

(b) 6

(c) shorter

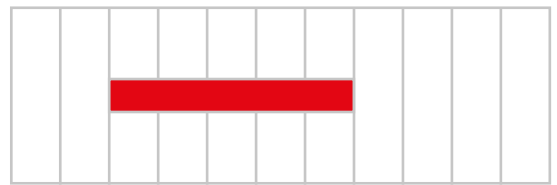
5. (a) 8

(b) 3

(c) 5

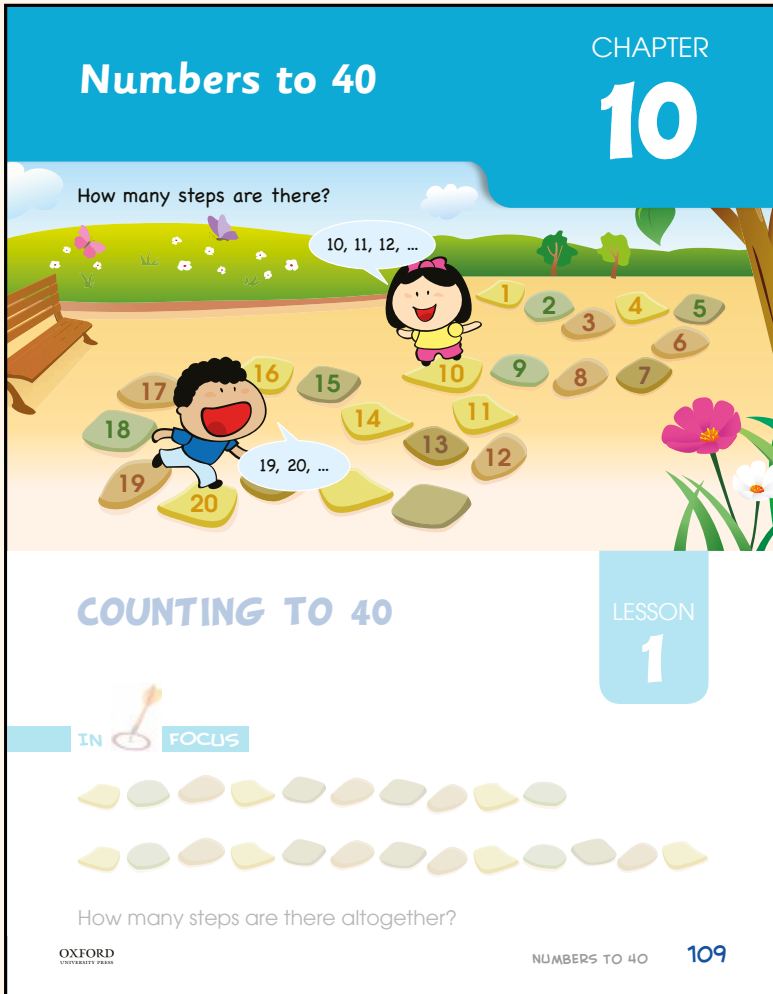
(d) Y

(e)



NUMBERS TO 40

CHAPTER 10



Textbook 1 P109

Related Resources

NSPM Textbook 1 (P109 – 127)
NSPM Workbook 1B (P164 – 185)

Materials

2-colour counters, multilink cubes, base-ten set, place-value chart, magnetic square tiles

Lesson

- Lesson 1 Counting to 40
- Lesson 2 Place Value
- Lesson 3 Comparing and Ordering Numbers
- Lesson 4 Number Patterns

Problem Solving, Maths Journal and Pupil Review

INTRODUCTION

In the spiral approach, pupils continue the learning of numbers and numerations from Textbook 1 towards numbers beyond 20. Pupils have previously experienced the informal concept of place value with grouping objects up to 20 into a ten and ones. In this chapter, the formal concept of tens and ones for a 2-digit number is introduced. Writing a 2-digit number in a place-value chart enables pupils to recognise the value of the digit in the tens and ones positions. Basic understanding of place values is essential for pupils in learning the standard algorithms for the four operations in later chapters. Proportional models in the form of base-ten blocks are effective in representing the place-value numeral system. The chapter continues with counting patterns and order up to 40; reading and writing the names and symbols of 2-digit numbers as well as recognising the number relationship in completing number patterns.

LESSON

1

COUNTING TO 40

LEARNING OBJECTIVES

1. Count on from 20, the numbers 21 to 40.
2. Read and write the numbers 21 to 40 in numerals and in words.

Numbers to 40

CHAPTER 10

How many steps are there?

10, 11, 12, ...

19, 20, ...

COUNTING TO 40

LESSON 1

IN FOCUS

How many steps are there altogether?

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NUMBERS TO 40 109



Use the chapter opener to discuss the picture with the pupils.

Textbook 1 P109

LET'S LEARN

1. We can use cubes to make tens and count.

10 and 10 make 20.
Count on from 20.

20 and 3 make 23.
 $20 + 3 = 23$

2. How many beads are there?

There are 40 beads.

LET'S LEARN

Introduce counting of objects beyond 20 by making tens.

Show 23 multilink cubes on the visualiser and count with the pupils by making two rows of ten cubes and loose ones.

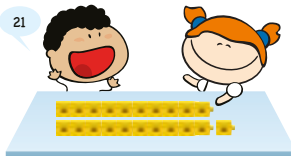
Use other objects (such as 3 strings of 10 beads and 10 loose ones), for pupils to count up to 40.

ACTIVITY TIME

Work in pairs.

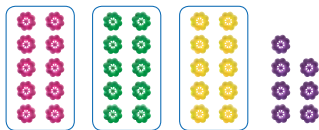
- Take a number of cubes from 21 to 40.
- Ask your partner to count the number of cubes by making tens.
- Take turns and repeat 1 and 2.

What you need:



PRACTICE

1. Count in tens and ones.



30 and 7 make 37.
 $30 + 7 = 37$

Assign pupils to work in pairs. Prepare 40 multilink cubes in a bag for each pair.

Pupils are to take out a random amount of cubes that is more than 20. They have to estimate the number of cubes. After which, their partner has to count the number of cubes.

Encourage pupils to check on each other's work.

PRACTICE

Help the pupils to read and understand each question.

Avoid chorus answers from pupils and encourage participation by inviting individual responses. Ask the pupils how they get their answers and if possible, get another pupil to verify the answer.

For better understanding, select items from **Worksheet 1A** and work these out with the pupils.

Independent seatwork

Assign pupils to complete Worksheet 1A (Workbook 1A P164 – 167).

2. Count in tens and ones. Match.

30 + 1 = 31

20 + 7 = 27

40 + 0 = 40

40

31

27

Complete Workbook 1A, Worksheet 1A • Pages 164 – 167

IN FOCUS



How many dots are there?
Can you write the number in words?

Textbook 1 P112

Answers Worksheet 1A (Workbook 1A P150 – 153)

1. (a) 7, 27; 7, 27

(b) 30, 32; 30, 32

(c) 20, 3, 23; 20, 3, 23

(d) 30, 5, 35; 30, 5, 35

(e) 30, 8, 38; 30, 8, 38

2. (a) 30 and 0 make 30.

(b) 30 and 7 make 37.

3. (a) 20, 2, 22; 20, 2, 22

(b) 20, 8, 28; 20, 8, 28

(c) 40, 0, 40; 40, 0, 40

2. Count in tens and ones. Match.

Complete Workbook 1A, Worksheet 1A • Pages 164 - 167



How many dots are there?
Can you write the number in words?

Ask pupils to count the number of dots on each card and get them to calculate the total number of dots in all three cards.

Write the numeral '22' on the whiteboard, and get pupils to read aloud ('twenty-two'). Invite a pupil to write the number in words on the whiteboard.

Check that the pupil's answer is correct and highlight the use of the hyphen or dash(-) when writing the number in words.

LET'S LEARN 

1.

21		twenty-one	22		twenty-two
23		twenty-three	24		twenty-four
25		twenty-five	26		twenty-six
27		twenty-seven	28		twenty-eight
29		twenty-nine	30		thirty

2. We can write numbers in words.

There are thirty-two cubes.

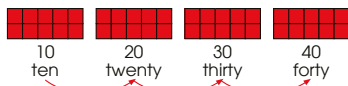
LET'S LEARN 

Introduce the numerals and number words for 21 to 30. Ask pupils what they notice about the number words for 21 to 29. Lead them to see that these number words are not difficult since they were covered in Chapter 6.

Highlight the new number word **thirty** and allow pupils to practise spelling it.

For Let's Learn 2, use multilink cubes to lead pupils to count on beyond 30. Get pupils to work in pairs to write the number words for 31 to 39.

3. How many  are there?



Count in tens.

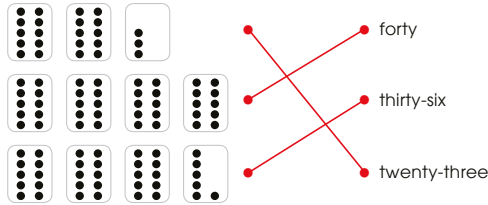


There are forty .

PRACTICE



1. Count in tens and ones. Match the picture with the number in words.



2. Write in numerals or in words.

Words	Numerals
twenty-seven	27
forty	40
twenty-four	24
thirty-eight	38

Complete Workbook 1A, Worksheet 1B • Pages 168 – 169

114

CHAPTER 10

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Textbook 1 P114

For Let's Learn 3, arrange multilink cubes or magnetic square tiles into 4 tens. Lead the pupils to count in tens ('10, 20, 30, 40') to find the total number of cubes or tiles.

PRACTICE



Help the pupils to read and understand each question. Avoid chorus answers from them and encourage participation by inviting individual responses. Ask the pupils how they get their answers and if possible, get another pupil to verify the answer.

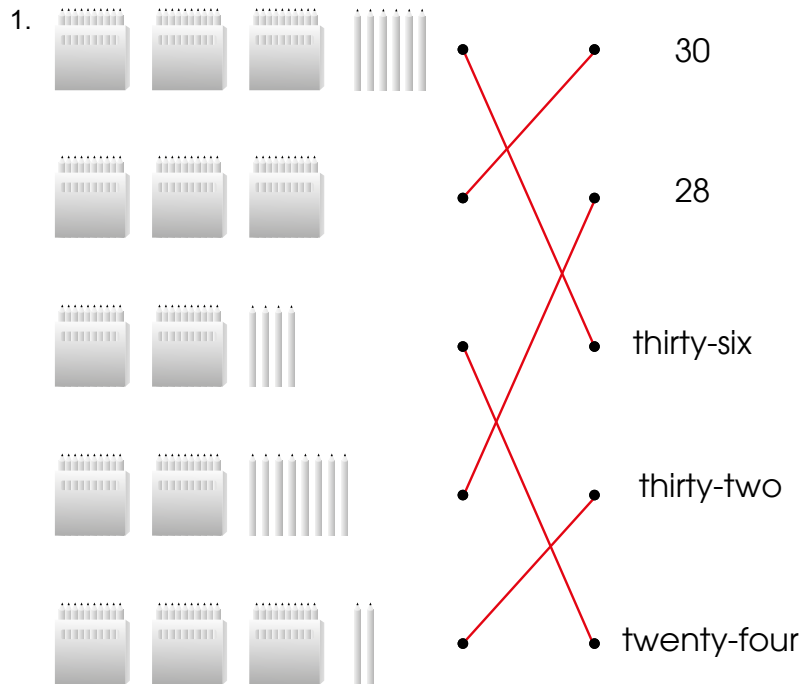
For better understanding, select items from **Worksheet 1B** and work these out with the pupils.

Independent seatwork

Assign pupils to complete Worksheet 1B (Workbook 1A P168 – 169).

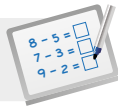
Answers

Worksheet 1B (Workbook 1A P168 – 169)



2. 22, 23, 29, 35, 37

3. twenty, twenty-four, thirty-one, thirty-eight, forty

**Specific Learning Focus**

- Count on from 20, the numbers 21 to 40.
- Read and write the numbers 21 to 40 in numerals and in words.

Suggested Duration

3 periods

Prior Learning

Pupils have learnt to count up to 20 and read and write numbers up to 20 in numerals and in words. This chapter is a continuation of chapters 1 and 6. The spiral approach to the concept of place value was informally implemented in Chapter 6.

Pre-emptive Pitfalls

Since this topic is a continuation of reading and writing numbers in numerals and words, pupils should not face any difficulty in learning the numbers 21 to 40. The C-P-A approach will be implemented in this chapter for better understanding and learning.

Introduction

In Let's Learn 1 (Textbook 1 P110), multilink cubes are used to group numbers in tens and ones and then count on and count all. Pupils should recognise the key terms 'twenty', 'thirty' and 'forty' first so that the intermediate numbers will be easy to read and write. Teaching pupils to make tens will teach them that it is easier to group the number in tens and ones when counting numbers more than 10. This also reinforces the concept of number bonds. Number bonds can be revisited as a quick recap. This exercise in 'Let's Learn' adopts a spiral approach which strengthens pupils' numeracy.

Problem Solving

The key to making numbers more tangible is to use real-life objects to introduce numbers. The pupils will have a sense of the quantitative aspect of numbers. Questions like 'What will the number be if I take away two ones?' will enhance their critical-thinking skills.

Activities

Getting pupils to work in pairs and encouraging partner-checking and correcting each other's answers will be quick and fun. The activity (Textbook 1 P111) using multilink cubes is one such activity to work in pairs. In addition, Let's Learn 1 (Textbook 1 P113) using dot cards can also be converted to a class activity where the teacher can shuffle and raise the dot cards in the air and get pupils to say the number represented by the dot cards.

Resources

- numeral cards (Activity Handbook 1 P32 - 33)
- number word cards (Activity Handbook 1 P34 to 35)
- multilink cubes

Mathematical Communication Support

Numeral cards and number word cards with pictures of objects stacked in rows of tens and ones can be pinned on the soft boards in class during the course of this chapter. The teacher can conduct quick verbal pop quizzes asking for the numerals and spellings of numbers. Questions like 'How many sets of tens are there in the number 42?' or 'How many ones are there in 42?' can be asked. Teaching by asking can help pupils take ownership of the concept taught and acknowledging them for giving the correct answers will build their confidence and sense of achievement.

LESSON

2

PLACE VALUE

LEARNING OBJECTIVES

1. Interpret a 2-digit number in terms of tens and ones.

PLACE VALUE

IN FOCUS

Count the chocolates.
How many tens and how many ones are there?

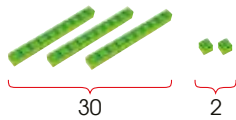


There are 32 chocolates.
The numbers 3 and 2 in 32 are called **digits**.

What does the digit 3 in 32 stand for?
What does the digit 2 in 32 stand for?

LET'S LEARN

We can use to show 32 in tens and ones.



$$32 = 3 \text{ tens } 2 \text{ ones}$$

$$32 = 30 + 2$$

Tens	Ones
3	2

This is a **place-value chart**.

30 is the same as 3 tens.
2 is the same as 2 ones.



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NUMBERS TO 40 115

Textbook 1 P115

IN FOCUS

Get pupils to count the number of chocolates in each box, followed by the chocolates that are outside the box.

Encourage pupils to count in tens and ones ('ten, twenty, thirty, thirty-one, thirty-two'). Write the number '32' on the whiteboard and ask the pupils how many digits there are in the number.

Ask the pupils about the digits '3' and '2' and their link to the number of chocolates in the picture.

LET'S LEARN

Display a blank place-value chart on the whiteboard or visualiser and introduce it to the pupils. Explain that the chart is used to show the values of the digits in a number.

Get a pupil to place 3 base-ten blocks and 2 cubes in the place-value chart according to tens and ones. Show that the digit '3' in the chart represents 3 tens (or 30) and the digit '2' represents 2 ones.


In another empty place-value chart, display the following and ask if it is possible.

Tens	Ones
	32

State that the latter representation is incorrect as only one digit should be written in each column of the place-value chart. Further emphasise this by taking out 32 individual cubes and show that the cubes should be grouped into tens and ones to show the tens and ones in the number.

Reinforce the concept of place value by repeating the activity with another 2-digit number.

Work in pairs.

1 Use  to show each number in tens and ones.

21 24 30 35 36

2 Write the numbers on a place-value chart.

ACTIVITY  TIME

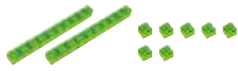
What you need:



PRACTICE 

Count in tens and ones.

1.

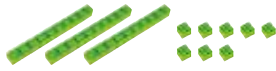


$27 = 2$ tens 7 ones

$27 = 20 + 7$

Tens	Ones
2	7

2.



$38 = 3$ tens 8 ones

$38 = 30 + 8$

Tens	Ones
3	8

Complete Workbook 1A, Worksheet 2 • Pages 170 – 173

Assign pupils to work in pairs. Provide each pair with a place-value chart to record their work.

Pupils are to explore the concept of place value hands-on with base-ten blocks and cubes.

PRACTICE 

Help the pupils to read and understand each question.

Avoid chorus answers from pupils and encourage participation by inviting individual responses. Ask the pupils how they get their answers and if possible, get another pupil to verify the answer.

For better understanding, select items from **Worksheet 2** and work these out with the pupils.

Independent seatwork

Assign pupils to complete Worksheet 2 (Workbook 1A P170 – 173).

Answers Worksheet 2 (Workbook 1A P170 – 173)

1. (a)

Tens	Ones
2	0

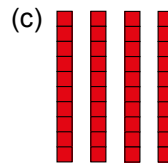
$20 = 20 + 0$

(b)

Tens	Ones
2	4

$24 = 2$ tens 4 ones

$24 = 20 + 4$



$40 = 4$ tens 0 ones

(d)

Tens	Ones
2	8

$28 = 2$ tens 8 ones

$28 = 20 + 8$

(e)

Tens	Ones
3	3

$33 = 3$ tens 3 ones

$33 = 30 + 3$

(f)

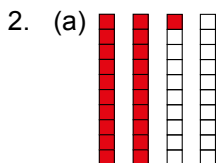
Tens	Ones
3	9

$39 = 3$ tens 9 ones

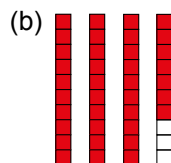
$39 = 30 + 9$

3.

	Tens	Ones
(a) thirteen	1	3
(b) twenty-three	2	3
(c) thirty-three	3	3
(d) eleven	1	1
(e) twenty-one	2	1
(f) thirty-eight	3	8

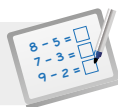


$21 = 2$ tens 1 one



$37 = 3$ tens 7 ones

4. (a) 40 (b) 16
(c) 29 (d) 31
(e) 37

**Specific Learning Focus**

- Interpret a 2-digit number in terms of tens and ones.

Suggested Duration

2 periods

Prior Learning

Pupils are aware of groups of tens and ones. In Lesson 1, numbers from 21 to 40 were introduced as groups of tens and ones.

Pre-emptive Pitfalls

Since this lesson is a continuation of Lesson 1 and the formal introduction of place value takes place in this lesson, not much confusion should arise. The use of concrete materials which will then lead to real-life objects or vice versa, will give pupils a clear understanding of place value. This is the foundation of the algorithm for the four operations and the teacher should be aware of this fact.

Introduction

Teach by first asking pupils ‘How many tens are there in 32?’ and then bring boxes of chocolates (Textbook 1 P115) or other real-life objects to the classroom. Use base-ten blocks to show 32 before using the place-value chart. The teacher should formally introduce the place-value chart by teaching pupils to write each digit of a 2-digit number in the correct column.

Problem Solving

Formal introduction to the place-value chart and understanding the place value concept of numbers is critical. Moving on to the four operations, place value plays a pivotal role in numeracy.

Activities

‘Let’s Learn’ and ‘Practice’ (Textbook 1 P115 – 116) can be converted to class activities. Laminate the place-value chart (Activity Handbook 1 P36) and provide pupils with board markers so that they can write and erase the numbers on the chart when carrying out the activity (Textbook 1 P116).

Resources

- numeral cards
- base-ten blocks
- place-value chart (Activity Handbook 1 P36)
- box of chocolates

Mathematical Communication Support

This entire lesson can be conducted in an interactive manner in class and then ask pupils to write their answers in their workbooks and worksheets. Elicit individual answers from pupils and ask them to fill in their place-value charts and raise them in the air. Ask the pupils how they decided the placement of digits in the place-value chart and encourage peer learning by asking another pupil to check the answer and the mathematical reason given. Encourage mathematical dialogue between pupils and then ask them to write mathematical statements in their exercise book to clear any misconception and strengthen their understanding of the concepts. Encourage mathematical reasoning expressed in English statements and then translate them to mathematical equations (e.g. There are 3 tens and 2 ones in thirty-two (statement), $30 + 2 = 32$ (mathematical equation)).

LESSON

3

COMPARING AND ORDERING NUMBERS

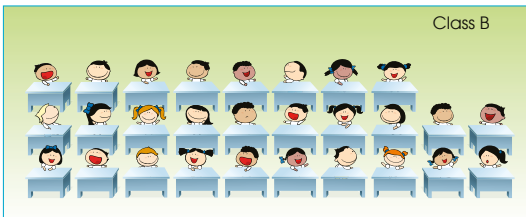
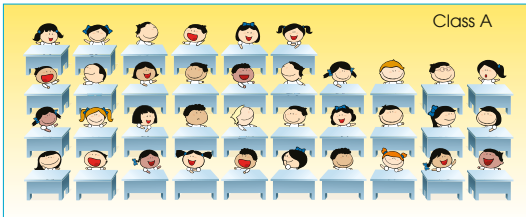
LEARNING OBJECTIVES

1. Compare and arrange 2-digit numbers within 40.
2. Compare numbers by subtraction.

COMPARING AND ORDERING NUMBERS

LESSON
3

IN FOCUS



Which class has more pupils?
What can we do to find out?

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NUMBERS TO 40 117

IN FOCUS

Get the pupils to study and compare the number of children in Class A and Class B.


Get pupils to suggest ways (other than counting one by one) to count the number of children in each class.

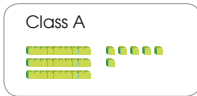
Guide the pupils in counting the children in each class by counting the number of children in each row.

Lead the pupils to see that the comparison can be made by counting the number of filled rows (rows of 10) in each class. The class with fewer rows of 10 children has fewer pupils.

Textbook 1 P117

1. Which class has more pupils, Class A or Class B?

Count the number of pupils in each class.
Use  to show each number.



Tens	Ones
3	6

36 = 3 tens 6 ones



Tens	Ones
2	8

28 = 2 tens 8 ones

Compare the number of tens.
Are they different?



3 tens is greater than 2 tens.
36 is greater than 28.

2 tens is smaller than 3 tens.
28 is smaller than 36.

Class A has more pupils.
Class B has fewer pupils.

Use base-ten blocks to represent the numbers of children in Class A and Class B. Write the numbers '36' and '28' as tens and ones in the place-value charts.

From the base-ten blocks, lead the pupils to see that the tens of the two numbers can be compared first. If the digits in the tens place are the same, the comparison should be made between the ones instead.

If the digits in the tens place are different, the two digits can be compared to see which of the two is greater or smaller. Revise the use of the terms **more than** and **fewer than** when comparing the sets of objects (such as the number of children in this case).

2. Compare the numbers in Sets A, B and C.



Tens	Ones
3	7

37 = 3 tens 7 ones



Tens	Ones
2	2

22 = 2 tens 2 ones



Tens	Ones
2	9

29 = 2 tens 9 ones

3 tens is greater than 2 tens.
37 is greater than 22.
37 is greater than 29.
37 is the greatest.

How can we compare
37 and 22? How about
37 and 29?



2 ones is smaller than 9 ones.
22 is smaller than 29.
22 is the smallest.

Both 22 and 29 have
2 tens. What should
we compare next?



We can put the numbers in order.

37, 29, 22
greatest → smallest

22, 29, 37
smallest → greatest

For Let's Learn 2, conduct a class activity to compare and order the three 2-digit numbers.

Getting pupils to work in pairs, provide base-ten blocks to represent the numbers '37', '22' and '29' in place-value charts.

Guide the pupils to compare the tens of the three numbers first, and if the digits in the tens place are the same, compare the ones instead.

Order the comparison to find the greatest and the smallest number, after which the pupils will be able to arrange the three 2-digit numbers in order.

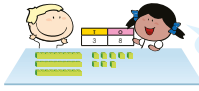


Work in pairs.

ACTIVITY TIME

- Use \square to show a number from 21 to 40.
- Ask your partner to write the number in tens and ones.

What you need:



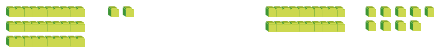
38 is the same as 3 tens 8 ones.

- Use \square to show two more numbers. Compare and arrange the three numbers in order.
- Take turns and repeat 1 to 3.

PRACTICE



- Count and compare.



$32 = 3$ tens 2 ones $29 = 2$ tens 9 ones
 32 is greater than 29 .

- Compare 34, 39 and 30.

- The greatest number is 39 .
- Arrange the numbers in order. Start with the smallest.

30 , 34 , 39

Complete Workbook 1A, Worksheet 3A • Pages 174 – 177

Assign the pupils to work in pairs. Provide each pair with a blank place value chart to record their work.

This activity provides further hands-on practice with base-ten blocks of tens and ones on representing 2-digit numbers in place value charts.

PRACTICE



Help the pupils to read and understand each question.

Avoid chorus answers from pupils and encourage participation by inviting individual responses. Ask the pupils how they get their answers and if possible, get another pupil to verify the answer.

For better understanding, select items from **Worksheet 3A** and work these out with the pupils.

Independent seatwork

Assign pupils to complete Worksheet 3A (Workbook 1A P174 – 177).

Answers Worksheet 3A (Workbook 1A P174 – 177)

- $14 = 1$ ten 4 ones
 $26 = 2$ tens 6 ones
 26 is greater than 14 .
 14 is smaller than 26 .
 - $31 = 3$ tens 1 one
 $33 = 3$ tens 3 ones
 33 is greater than 31 .
 31 is smaller than 33 .
 - $32 = 3$ tens 2 ones
 $33 = 3$ tens 3 ones
 33 is greater than 32 .
 32 is smaller than 33 .

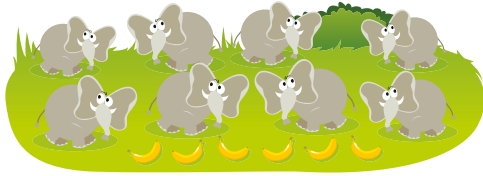
- 25 ; 37 ; 25 , 35 , 37
 - 21 ; 40 ; 40 , 34 , 21

3.

32	23	35	39	20	40	31	29	25	34
O	M	A	P	T	R	E	H	S	U
M		A		T		H		S	

30	27	22	33	38	28	21	26	35	28
P	I	S	O	B	F	U	I	A	N
I		S		F		U		N	

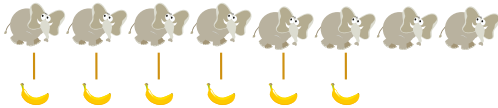
MATHS IS FUN!



Are there more elephants than bananas?
How many more?

LET'S LEARN

- How many **more** elephants than bananas are there?
How many **fewer** bananas than elephants are there?



$$8 - 6 = 2$$

There are 2 **more** elephants than bananas.
There are 2 **fewer** bananas than elephants.

We can write a subtraction sentence to compare.

Why do we subtract to compare?



Textbook 1 P121

Get pupils to compare and find out whether there are more elephants or more bananas, and how many more. To help the pupils, counting objects (used to represent the elephants and bananas) can be aligned for easier comparison.

LET'S LEARN

Aligning the two sets of objects on a one-to-one correspondence, ask the pupils if all elephants are matched with the bananas.

Based on the matching of the two sets of objects, ask if there are more bananas or more elephants. Lead pupils to see that there are more elephants since some of them are not matched to the bananas.

Since there are two elephants that are not matched to the bananas, show that this means that there are 2 more elephants than bananas, or 2 fewer bananas than elephants.

A subtraction equation can be written to compare which set has more or fewer objects.

Repeat the process for Let's Learn 2.

Get pupils to make tens and ones before comparing the two 2-digit numbers. The pupils are to write a suitable subtraction equation to show the comparison.

- Compare the number of crayons and pencils.



12 crayons



14 pencils

$$14 - 12 = 2$$

There are 2 fewer crayons than pencils.
There are 2 more pencils than crayons.

We can say that 12 is 2 less than 14. 14 is 2 more than 12.



PRACTICE

Compare.



$$9 - 6 = 3$$

There are 3 more butterflies than caterpillars.
There are 3 fewer caterpillars than butterflies.

Textbook 1 P122

PRACTICE



Help the pupils to read and understand each question.

Avoid chorus answers from pupils and encourage participation by inviting individual responses. Ask the pupils how they get their answers and if possible, get another pupil to verify the answer.

For better understanding, select items from **Worksheet 3B** and work these out with the pupils.

Independent seatwork

Assign pupils to complete Worksheet 3B (Workbook 1A P178 - 179).

Activity Make a comparison story using subtraction.

Procedure

1. Assign pupils to work in groups of 3 to 4.
2. Pupils are to tell a comparison story based on the subtraction equation.

$$7 - 4 = 3$$

3. They are to draw a picture of the story and fill in the blanks of the story provided below.

There are .
(name of object 1)

There are .
(name of object 2)

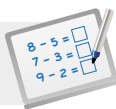
There are more than .
(name of object 1) (name of object 2)

There are fewer than .
(name of object 2) (name of object 1)

4. Provide pupils with helping words to write the subtraction story if necessary.

Answers Worksheet 3B (Workbook 1A P178 – 179)

1. (a) $9 - 7 = 2$; 2
(b) $8 - 6 = 2$; 2
(c) $7 - 4 = 3$; 3
(d) $10 - 8 = 2$; 2
(e) $7 - 4 = 3$; 3
(f) $10 - 6 = 4$; 4

**Specific Learning Focus**

- Compare and arrange 2-digit numbers within 40.
- Compare numbers by subtraction.

Suggested Duration

4 periods

Prior Learning

Pupils are aware of the concept of comparison and ordering in Chapters 1, 6 and 9. This lesson is an extension of the same concept taught in the previous chapter. In this chapter, the same problem-solving skills and strategies will be used with the only difference being the larger place value of the tens. In this lesson, ordering and comparing will be done using the place-value chart.

Pre-emptive Pitfalls

It is important that pupils put each number in the place-value chart first and then compare the numbers based on what they see in the place-value charts. It should be highlighted that when comparing 2-digit numbers, start comparing the digits in the tens place first. If this concept and approach is made clear, pupils will not compare in the incorrect order (i.e. comparing the digits in the ones place first).

Introduction

Comparing 3 or more numbers with the help of place-value charts is important. Start comparing the digits in the tens place first and if the digits in the tens place are the same then compare the digits in the ones place to decide. Once comparison is done, prompt the pupils' thinking by asking 'how much is the difference' (subtraction). Get pupils to arrange the numbers in ascending or descending order based on the comparison. Note that these terminologies (ascending and descending) should not be used and instead use 'greatest to smallest' and vice versa.

Problem Solving

With the help of base-ten blocks, pupils should be able to compare the two numbers by comparing the number of blocks of ten and cubes by lining them up. Ordering of numbers will not be possible if the pupils do not classify and compare.

Activities

Get pupils to help to arrange the tables in the classroom into rows of tens and ones (Textbook 1 P117). The activity (Textbook 1 P120) can be done in pairs and can be used as an evaluative assessment.

Resources

- base-ten blocks
- place-value chart
- classroom tables

Mathematical Communication Support

Go through 'Let's Learn' (Textbook 1 P118 – 119) and prompt individual responses from pupils. Enunciate the terms 'greater than', 'smaller than', 'by how much', 'arrange', 'compare', 'start from' etc. Put these vocabulary words on the whiteboard or soft board for visual learning.

LESSON

4

NUMBER PATTERNS

LEARNING OBJECTIVES

1. Recognise and complete number patterns.

NUMBER PATTERNS

LESSON 4

IN FOCUS

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

What are the missing numbers in the number chart?

Read aloud the numbers from 1 to 40 and from 40 to 1.

LET'S LEARN

1. What number comes after 24?



Each number is 1 more than the number before it. What is 1 more than 24?



1 more than 24 is 25.
The number pattern is 21, 22, 23, 24, 25.

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NUMBERS TO 40 123

IN FOCUS

Get pupils to recite aloud the numbers and fill in the blanks as they go along.

Show the pupils some number patterns by getting them to look at the horizontal rows and vertical columns of numbers. Ask them what they notice about the sequence of numbers (numbers increase by 1 in the horizontal row, numbers increase by 10 in the vertical column).

Lead pupils to see that these are patterns, since there is something common which can be used to guess the next number in the sequence.

Ask the pupils if they see any other number patterns in the picture.

LET'S LEARN

Using the number ladder, explore with pupils skip counting of **1 more**, **2 more**, **1 less** and **2 less** by moving forward and backward to derive the next number in a pattern.

Textbook 1 P123

2. What comes next in the pattern?



Each number is 2 more than the number before it. What is 2 more than 26?



2 more than 26 is **28**.

The number pattern is 20, 22, 24, 26, **28**.

3. What comes next in the pattern?



Each number is 1 less than the number before it. What is 1 less than 27?

1 less than 27 is **26**.

The number pattern is 30, 29, 28, 27, **26**.



4. What comes next in the pattern?



Each number is 2 less than the number before it. What is 2 less than 32?

2 less than 32 is **30**.

The number pattern is 38, 36, 34, 32, **30**.



Ask pupils to guess the next number in the pattern, then show by drawing arrows or by pointing. Help them to find the next number using base-ten blocks.

Do the same for the rest of the number patterns. Help pupils in the thinking process by pointing to the numbers.

Refer the pupils back to the number chart under 'In Focus' on P123. Get them to work in pairs to pick out a number pattern of five numbers from the chart. Allow some pupils to show their number pattern to the class and explain their pattern in their own words.

ACTIVITY TIME

Work in pairs.

What you need:



21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40

- Put a yellow counter on the number 21. Move the yellow counter forward 1 number at a time to find the next number. Then complete the pattern.

21, 22, 23, 24, **25**, **26**, **27**

1 more than 21 is 22.

- Use a yellow counter and the number chart to complete each pattern.

- 34, 35, 36, 37, **38**, **39**, **40**
- 28, 27, 26, 25, **24**, **23**, **22**
- 24, 26, 28, 30, **32**, **34**, **36**
- 37, 35, 33, 31, **29**, **27**, **25**



What do you notice about each pattern?



Assign pupils to work in pairs. Provide each pair with counters.

The pupils are to move the counters as an aid to finding the missing numbers in the patterns given. This helps them to understand that they move forward for the next increasing number with a constant difference and backward for a decreasing number.



1. Find the missing numbers.

27	28	29	30	31	32	33	34	35	36	37
----	----	----	----	----	----	----	----	----	----	----

- (a) 30 is 1 more than 29.
 (b) 36 is 1 less than 37.
 (c) 33 is 2 more than 31.
 (d) 33 is 2 less than 35.

2. Complete the number patterns.

- (a) 33, 32, 31, 30, 29, 28, 27, 26
 (b) 26, 28, 30, 32, 34, 36, 38, 40

Complete Workbook 1A, Worksheet 4 • Page 180

MATHS JOURNAL

Use the numbers below to make any three 2-digit numbers greater than 20.



Write the numbers and arrange them in order.
Start with the smallest.



Help the pupils to read and understand each question.

Avoid chorus answers from pupils and encourage participation by inviting individual responses. Ask the pupils how they get their answers and if possible, get another pupil to verify the answer.

For better understanding, select items from **Worksheet 4** and work these out with the pupils.

Independent seatwork

Assign pupils to complete Worksheet 4 (Workbook 1A P180).

Answers Worksheet 4 (Workbook 1A P180)

1. (a) 27
 (b) 31
 (c) 24
 (d) 25
2. (a) 33, 34
 (b) 31, 26
 (c) 28, 26
 (d) 22, 32

**Specific Learning Focus**

- Recognise and complete number patterns.

Suggested Duration

2 periods

Prior Learning

Pupils have previously worked with number patterns (up to 20) and shape patterns. They are able to recognise the 'more than' and 'less than' patterns, as well as the sequence of shapes in terms of orientation, shape, size and colour. In this lesson, the same concept is required and extended to number patterns involving 10 more/less (instead of just 1 or 2 more/less).

Pre-emptive Pitfalls

Some pupils might not be quick to recognise the pattern. If proper cues are given by the teacher where pupils are asked to first recognise if it is an increasing or decreasing sequence and then asked to recognise the difference between the numbers, they should not face any problems. Again, implementing the spiral approach, revisit Lesson 3 on comparison to help pupils recognise the pattern.

Introduction

To recognise the pattern, encourage pupils to first determine the order (decreasing or increasing) and then pick out the first two numbers and compare. They will have to use the strategy implemented in Lesson 3 to compare. They should then compare the second and third numbers to check the pattern. The teacher should be mindful by using ordinal numbers to prompt the pupils to recall what was taught in Chapter 5. This involves the spiral approach of revisiting and combining concepts. Pupils and teachers should be cognizant of the fact that in mathematics all concepts are a build-up and combination of one another. In a number pattern lesson, the concepts of ordering, comparing, subtraction, place value and ordinal numbers are integrated.

Problem Solving

In 'Mind Workout' (Workbook 1B P181 and Textbook 1 P127), pupils are required to deduce the meaning of the clues given in the statements. Similarly, 'conditions' given out should navigate their thought process and help them in their critical thinking. The teacher should be aware that the activities are to be done as a consolidated exercise of the concepts taught – this is a back-track approach. Pupils will think backwards and approach the activity by applying the strategies in a systematic manner. The teacher should prompt the pupils' thinking by asking them questions leading to the correct strategy.

Activities

Number chart (Activity Handbook 1 P37) is to be used in 'In Focus' (Textbook 1 P123). The number patterns in 'Let's Learn' can be cut out and individually handed to pupils to fill up. The activity (Textbook 1 P125) can be used as a formative assessment tool to see if pupils understand the concept well and are able to complete the pattern.

Resources

- number chart
- 2-colour counters
- base-ten blocks

Mathematical Communication Support

Help pupils to use keywords like 'two-digit numbers', 'pattern', 'sequence', 'greater than', 'less than', 'starting point', 'greater to smaller', 'smallest to greatest'. Ask them to write the keywords in their exercise books or use a highlighter to highlight the words in the questions of the workbook and worksheets. Prompt pupils' thinking as they deduce the pattern by using these keywords. Once they recognise the pattern, it will be easy to complete the pattern. Pupils should be aware of the order of the pattern and then decide to 'add on' or 'take away' to find the missing number in the pattern.

PROBLEM SOLVING, MATHS JOURNAL AND PUPIL REVIEW



Mind Workout

Date: _____

There are three numbers.
One number is between 29 and 31.
The next number is 1 more than 38.
The last number is 2 less than 35.

What are the three numbers?

30 . 39 . 33

Arrange the numbers in order.
Start with the smallest.

30 . 33 . 39

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Numbers to 40 181



Mind Workout

Help pupils to interpret the meaning of each clue to find the numbers.

Pupils are to make a deduction based on the statements given.

Workbook 1A P181

MATHS JOURNAL

Help pupils to understand the key words **2-digit numbers** and **greater than 20**.

If pupils have difficulty in solving the problem, start off by saying that the first digit of each number cannot be 1. Give pupils some time to think about this and ask for their responses if possible.

Ask pupils to be systematic in their listing of the numbers, starting with the smallest.

1. Find the missing numbers.

27	28	29	30	31	32	33	34	35	36	37
----	----	----	----	----	----	----	----	----	----	----

- (a) 30 is 1 more than 29.
 (b) 36 is 1 less than 37.
 (c) 33 is 2 more than 31.
 (d) 33 is 2 less than 35.

2. Complete the number patterns.

- (a) 33, 32, 31, 30, 29, 28, 27, 26
 (b) 26, 28, 30, 32, 34, 36, 38, 40

Complete Workbook 1A, Worksheet 4 • Page 180

MATHS JOURNAL

Use the numbers below to make any three 2-digit numbers greater than 20.



Write the numbers and arrange them in order. Start with the smallest.

126 CHAPTER 10

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Textbook 1 P126

MIND WORKOUT



Make two different number patterns with the numbers given. Each pattern should have four numbers. Use each number only once.

I know how to...

- make tens and count within 40.
- read and write numbers from 21 to 40.
- use a place-value chart to show numbers in tens and ones.
- compare and order numbers within 40.
- complete number patterns.

SELF-CHECK



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NUMBERS TO 40 127

Textbook 1 P127



MIND WORKOUT

Help pupils to understand the conditions stated in the problem.

- Only four numbers allowed for each pattern.
- Each number can only be used once.

If pupils have difficulty with this, get them to try numbers in the twenties or thirties and look for the pattern rule.

Before the pupils do the self check, review the important concepts once more by asking for examples learnt for each objective.

This self check can be done after pupils have completed **Review 10** (Workbook 1A P182 – 185) as consolidation of understanding for the chapter.

SELF-CHECK



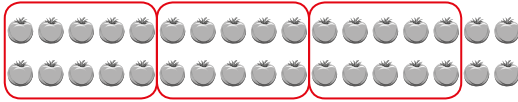
1. (a)



20 and 9 make 29.

$$20 + 9 = 29$$

(b)



30 and 4 make 34.

$$30 + 4 = 34$$

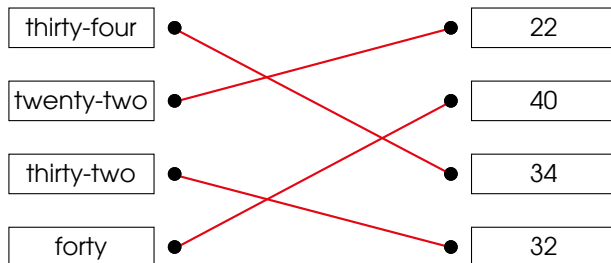
2. (a)

Tens	Ones
2	3

(b)

Tens	Ones
3	6

3.



4. 38 = 3 tens 8 ones

$$38 = 30 + 8$$

5. (a) 35

(b) 33

6. (a) 38, 37, 28

(b) 30, 32, 39

7. $15 - 13 = 2$; 2

8. (a) 30

(b) 39

(c) 28

9. (a) 38, 40

(b) 22

(c) 37, 27, 25


ADDITION AND SUBTRACTION WITHIN 40

CHAPTER

11

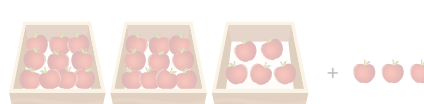
Addition and Subtraction Within 40 CHAPTER **11**

How many apples are there altogether?



ADDITION LESSON **1**

IN FOCUS



$25 + 3 = ?$

What are the ways to add?

How many apples are there altogether?

128 CHAPTER 11 OXFORD UNIVERSITY PRESS

Textbook 1 P128

Related Resources

NSPM Textbook 1 (P128 – 141)
NSPM Workbook 1A (P186 – 203)

Materials

Base-ten set, place-value chart, three '0' to '9' dice

Lesson

- Lesson 1 Addition
- Lesson 2 Addition With Regrouping
- Lesson 3 Subtraction
- Lesson 4 Subtraction With Regrouping
- Lesson 5 Adding Three Numbers

Problem Solving, Maths Journal and Pupil Review

INTRODUCTION

Pupils continue to learn addition and subtraction of numbers within 40 and revisit strategies such as **count-on**, **count-back**, **make 10**, and **regroup 10 and ones**. The main focus of this chapter is the introduction of the standard algorithms of addition and subtraction in the vertical format with and without regrouping in which the concept of place-value is essential. Base-ten blocks are used to represent the process of regrouping the ones into tens and ones in addition and the process of regrouping a ten into 10 ones for subtraction. In addition mental computations, using counting on and counting back are reinforced through pupil activities. Making number bonds of 10 will be taught as a strategy for helping pupils in the addition of three 1-digit numbers.

LEARNING OBJECTIVES

1. Add a 2-digit number and a 1-digit number.
2. Add a 2-digit number and tens.
3. Add two 2-digit numbers.
4. Add using the standard algorithm.

Addition and Subtraction Within 40CHAPTER 11

How many apples are there altogether?



ADDITION



LESSON 1



$25 + 3 = ?$

What are the ways to add?



128 CHAPTER 11

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IN  FOCUS

Use the chapter opener as a stimulus to discuss with pupils what they see in the picture. Draw attention to the apples in the crates and the basket.

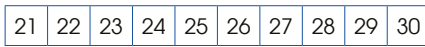
Get pupils to count the apples in the boxes and the basket separately, and then ask for the total number of apples. Lead them to form the following addition equation to find the sum of apples and write it on the board:

$$25 + 3 = ?$$

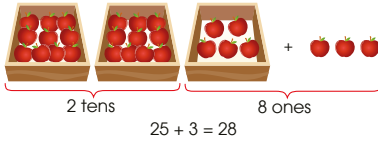
Give pupils about five minutes to get into pairs and discuss different ways to add the two numbers.

1. Add 25 and 3.

Method 1 Count on from 25.



Method 2 Add ones.

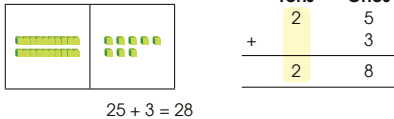


Method 3 Use  to add.

Step 1 Add the ones.
5 ones + 3 ones = 8 ones



Step 2 Add the tens.



Textbook 1 P129

Review with pupils the two methods of addition that were previously covered.

Method 1: Counting on

Invite a pupil to demonstrate counting on from 25 to find the answer to $25 + 3$. Show this to the class once again with the aid of a number ladder, starting from 25 and counting on 3 steps.

Method 2: Add the ones

Based on the picture, ask pupils to give the number of apples in the boxes in tens and ones, followed by the number of apples outside the box in ones.

Add the ones first, followed by the tens to find the total number of apples.

Method 3: Standard Algorithm

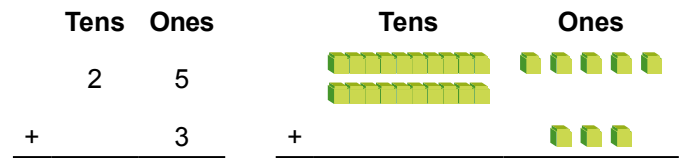
Introduce a new method to add, through the use of place-value charts.

Demonstrate this through a visualiser, using a place-value chart and base-ten blocks. Write the addition equation:

$25 + 3 = ?$

Then show pupils its transition to the vertical form.

The meaning of this addition will be illustrated by putting the corresponding base-ten blocks representing the two numbers onto the place-value chart.



Addition using the base-ten blocks must be clearly demonstrated to ensure that they are in tandem with the calculation in the written format.

Use the two examples $19 + 20 = ?$ and $23 + 14 = ?$ in Let's Learn 2 and 3 to reinforce the standard algorithm method.

For the addition of a 2-digit number and tens in these examples, it is recommended to explore with pupils the **count on in tens** method.

2. Add 19 and 20.

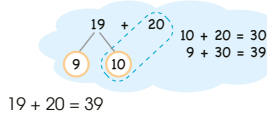
Method 1 Count on in tens from 19.

$19 + 20 = 39$

19, 29, 39

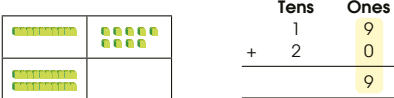


Method 2 Add tens.

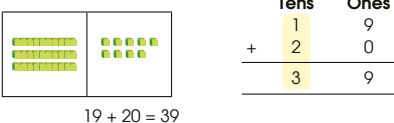


Method 3 Use  to add.

Step 1 Add the ones.



Step 2 Add the tens.
1 ten + 2 tens = 3 tens



Textbook 1 P130

Activity Show addition using base-ten blocks

Procedure

1. Get pupils to work in pairs.
2. Pupils are to use base-ten blocks to work on several addition problems.

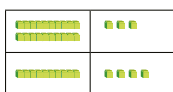
$23 + 16 = ?$	$22 + 15 = ?$
$6 + 12 = ?$	$25 + 10 = ?$
3. For each addition, they are required to show the individual numbers using base-ten blocks.
4. Pupils are to first add by adding the ones, followed by the tens.
5. They can repeat the addition by adding the tens first, followed by the ones.

3. Add 23 and 14.

Use to help you add.

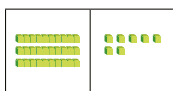


Step 1 Add the ones.
3 ones + 4 ones = 7 ones



Tens	Ones
2	3
+	1
2	4
2	7

Step 2 Add the tens.
2 tens + 1 ten = 3 tens



Tens	Ones
2	3
+	1
3	4
3	7

$23 + 14 = 37$

PRACTICE



1. Add.
(a) $24 + 4 = 28$

(b) $12 + 20 = 32$

2. Add.
(a)

Tens	Ones
3	1
+	5
3	6

(b)

Tens	Ones
2	2
+	7
3	9

Complete Workbook 1A, Worksheet 1 • Pages 186 – 189

PRACTICE



Help the pupils to read and understand each question.

Avoid chorus answers from pupils and encourage participation by inviting individual responses. Ask the pupils how they get their answers and if possible, get another pupil to verify the answer.

For better understanding, select items from **Worksheet 1** and work these out with the pupils.

Independent seatwork

Assign pupils to complete Worksheet 1 (Workbook 1A P186 – 189).

1. (a) 24

(b) 27

(c) 33

(d) 39

(e) 37

(f) 35

(g) 29

(h) 37

(i) 40

(j) 28

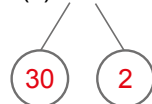
2. (a) $31 + 4 = 35$



(b) $24 + 1 = 25$



(c) $32 + 7 = 39$



3. (a) 26

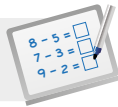
(b) 38

(c) 36

(d) 37

(e) 26

(f) 34

**Specific Learning Focus**

- Add a 2-digit number and a 1-digit number.
- Add a 2-digit number and tens.
- Add two 2-digit numbers.
- Add using the standard algorithm.

Suggested Duration

2 periods

Prior Learning

This is in continuation of Chapter 10, which uses the strategies of counting on and making tens and adding. Place value taught in the previous chapters plays a significant role. There is no need to revisit the concept as number strategies will be familiar to pupils since they just learnt them in Chapter 10.

Pre-emptive Pitfalls

'In Focus' (Textbook 1 P128) should be used to clear any confusion that pupils have while adding. Ask the pupils for multiple strategies that can be used to add up the apples in the crates. Since this chapter introduces the standard algorithm method (vertical addition), introducing another method of addition might confuse pupils who have established their methods of counting on.

Introduction

The teaching of addition of a 2-digit number with ones and two 2-digit numbers by vertical addition can be quite challenging as it is a new method that is different from the methods learnt earlier (which they are already used to). The teacher should explain that counting on and adding ones can be used in mental calculations and since we are proceeding to larger numbers (up to 40), vertical addition needs to be learnt. The significance of vertical addition should be highlighted in class by saying that pupils will need this method for larger numbers in the next grade. 'Let's Learn' (Textbook 1 P129 – 131) shows pupils the transition of base-ten blocks and number bonds to vertical addition (C-P-A approach). Linking the methods is extremely important. The methods taught in this chapter should be used for mental calculations.

Problem Solving

It should be made clear to pupils that the blocks of tens and cubes placed in the place-value chart corresponds to the numbers placed in the vertical addition. At a later stage, this will come in handy when regrouping is involved in vertical addition and subtraction.

Activities

The activity (P176) can be done in class. Get pupils to work in pairs and hand them addition-problem cards (Activity Handbook 1 P38) and use it as an evaluative assessment tool. Encourage pupils to do vertical addition sums on their mini white boards and time them.

Resources

- base-ten blocks
- addition-problem cards
- mini whiteboards

Mathematical Communication Support

Write the addition equation on the board first. Then write the vertical addition. Ask pupils how to align the numbers in the vertical addition and then proceed to add. Revisit the concept of breaking the numbers into tens and ones and emphasise that the ones should be added first before adding the tens.

ADDITION WITH REGROUPING

LEARNING OBJECTIVES

1. Add a 2-digit number and a 1-digit number with regrouping, using the standard algorithm.
2. Add two 2-digit numbers with regrouping, using the standard algorithm.

ADDITION WITH REGROUPING


LESSON

2

IN FOCUS

Ann has 24 crayons.
Farhan has 7 crayons.

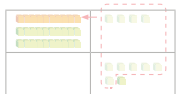
How many crayons do they have altogether?



LET'S LEARN

1. Add 24 and 7.

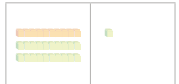
Step 1 Add the ones.
4 ones + 7 ones = 11 ones
Regroup the ones.
11 ones = 1 ten 1 one



Tens	Ones
2	4
+	7
	1

Use to help you add.

Step 2 Add the tens.
1 ten + 2 tens = 3 tens



Tens	Ones
2	4
+	7
3	1

$24 + 7 = 31$

132 CHAPTER 11

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Textbook 1 P132

IN FOCUS

Discuss the picture on P132 with the pupils. Get pupils to count the number of crayons that Ann has, starting from the boxes of 10 crayons, followed by the loose ones. Then count the number of crayons that Farhan has. Lead pupils to form the following addition equation to find the total number of crayons Ann and Farhan have and write it on the board:

$$24 + 7 = ?$$

$$2 \text{ tens } 4 \text{ ones plus } 7 \text{ ones}$$

Use base-ten blocks to represent the crayons each child has. Add the two numbers by adding the ones first. Adding the ones gives 1 ten and 1 one.

To obtain the final answer, ask the pupils to count the number of tens and ones.

ADDITION WITH REGROUPING

LESSON
2

IN FOCUS

Ann has 24 crayons.
Farhan has 7 crayons.

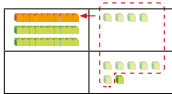
How many crayons do they have altogether?



LET'S LEARN

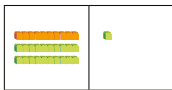
1. Add 24 and 7.

Step 1 Add the ones.
4 ones + 7 ones = 11 ones
Regroup the ones.
11 ones = 1 ten 1 one



Tens	Ones
2	4
+	7
2	1

Step 2 Add the tens.
1 ten + 2 tens = 3 tens



Tens	Ones
2	4
+	7
3	1

$$24 + 7 = 31$$

132 CHAPTER 11

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Textbook 1 P132

LET'S LEARN

Repeat the calculation using a place-value chart. Introduce the concept of **regrouping** the ones into a ten and ones.

Using a visualiser, show the regrouping of the base-ten blocks on a place-value chart for the addition of 24 and 7.

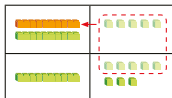
Write the addition equation $24 + 7 = ?$, then show the pupils its transition to the vertical form. Illustrate the addition by placing the corresponding base-ten blocks onto the place-value chart.

The process of adding the ones ($4 + 7 = 11$) and regrouping to exchange for 1 ten has to be emphasised on the place-value chart.

Stress that the 11 ones cannot be put under the ones place, and should be regrouped into 1 ten and 1 one. The regrouping process should be in tandem with the calculations in written format.

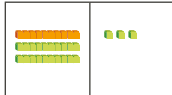
2. Add 15 and 18.

Step 1 Add the ones.
5 ones + 8 ones = 13 ones
Regroup the ones.
13 ones = 1 ten 3 ones



Tens	Ones
1	5
+	8
1	3

Step 2 Add the tens.
1 ten + 1 ten + 1 ten = 3 tens



Tens	Ones
1	5
+	8
3	3

$$15 + 18 = 33$$

PRACTICE

Add.

(a) $5 + 28 = 33$

(b) $11 + 19 = 30$

Tens	Ones
0	5
+	8
2	3
3	3

Tens	Ones
1	1
+	9
1	0
3	0

Complete Workbook 1A, Worksheet 2 • Pages 190 – 191

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ADDITION AND SUBTRACTION WITHIN 40

133

Textbook 1 P133

Repeat the process using an example of adding two 2-digit numbers with regrouping to reinforce the standard algorithm method.

Likewise, show the regrouping process using base-ten blocks.

PRACTICE

Help the pupils to read and understand each question.

Avoid chorus answers from pupils and encourage participation by inviting individual responses. Ask the pupils how they get their answers and if possible, get another pupil to verify the answer.

For better understanding, select items from **Worksheet 2** and work these out with the pupils.

Independent seatwork

Assign pupils to complete Worksheet 2 (Workbook 1A P190 – 191).

1. (a)

	Tens	Ones
	2	7
+	1	4
	3	1

(b)

	Tens	Ones
	1	9
+	1	8
	3	7

(c)

	Tens	Ones
	2	5
+	1	5
	4	0

(d)

	Tens	Ones
	1	4
+	1	7
	3	1

(e)

	Tens	Ones
	1	6
+	1	6
	2	2

(f)

	Tens	Ones
	1	3
+	1	8
	3	1

2. (a) 32

	Tens	Ones
	2	9
+	□	3
	3	2

(b) 33

	Tens	Ones
	1	7
+	1	6
	3	3

(c) 32

	Tens	Ones
	2	5
+	□	7
	3	2

(d) 32

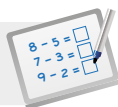
	Tens	Ones
	1	3
+	1	9
	3	2

(e) 32

	Tens	Ones
	1	6
+	1	6
	3	2

(f) 33

	Tens	Ones
	1	5
+	1	8
	3	3



Specific Learning Focus

- Add a 2-digit number and a 1-digit number with regrouping, using the standard algorithm.
- Add two 2-digit numbers with regrouping, using the standard algorithm.

Suggested Duration

2 periods

Prior Learning

Having learnt the standard algorithm method in Lesson 1, pupils are now ready to add with regrouping.

Pre-emptive Pitfalls

For some pupils who have not completely understood how the standard algorithm method is done, they will face difficulty understanding regrouping. It is crucial that all the pupils understand the concept of vertical addition before proceeding to add with regrouping.

Introduction

The use of base-ten blocks, place-value chart and vertical addition should be continued in this lesson. Emphasise to pupils that when adding 28 and 5, when the ones are added we get a 2-digit number ($8 + 5 = 13$). Regroup 10 ones to 1 ten and carry over 1 ten to the tens place. Challenge pupils with different additions (1-digit and 2-digit numbers; 2-digit and 2-digit numbers) until the pupils are well versed with it. Then ask the pupils to record the addition equations in their exercise books. Have them work on the sums in Workbook 1B (P190 – 191).

Problem Solving

Ensure that when pupils work on the sums, they start by adding ones first and if this gives a 2-digit number, emphasise the regrouping into tens and ones and carrying over the tens to the tens column. Repeated practice until every pupil has grasped the concept of regrouping will lay the foundation for the addition of larger numbers later on.

Activities

Get pupils to work on the sums in 'Practice' (Textbook 1 P133) as a class activity. Divide the class into two groups. Each group takes turns to send their group member to do the vertical addition on the board. Prompting may or may not be allowed. This can lead to a fun game.

Resources

- base-ten blocks
- mini whiteboard

Mathematical Communication Support

Enunciate the steps of aligning the numbers in the tens and ones column in the standard algorithm method, then adding the ones first, and if this gives a 2-digit number then regroup into tens and ones, carry the tens over to the tens column and proceed to add the tens:

(if it is
a 2-digit
number)

place-value chart → add the ones → regroup into tens and ones → carry over → add the tens

SUBTRACTION

LEARNING OBJECTIVES

1. Subtract a 1-digit number from a 2-digit number.
2. Subtract tens from a 2-digit number.
3. Subtract a 2-digit number from a 2-digit number.
4. Subtract using the standard algorithm.

SUBTRACTION

IN FOCUS

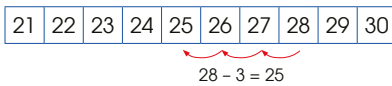


How many balloons are there left?

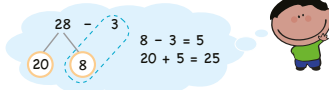
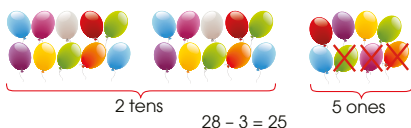
LET'S LEARN

1. Subtract 3 from 28.

Method 1 Count back from 28.



Method 2 Subtract ones.



IN FOCUS

Get pupils to count the total number of balloons in the picture. Help them to recall the **take away** concept and ask them to give the subtraction equation for the picture. ($28 - 3 = ?$).

Ask for the different ways that a 1-digit number can be subtracted from a 2-digit number. Give pupils five minutes to come up with their own answers.

LET'S LEARN

Review the two methods that were taught previously.

Method 1: Counting back

Using the number ladder, count back 3 steps starting from 28.

Method 2: Subtract the ones

Based on the picture, ask pupils to give the total number of balloons in the picture in tens and ones.

There are 2 tens and 8 ones. Subtracting 3 ones from 8 ones, we have 2 tens and 5 ones.

Method 3 Use  to subtract.

Step 1 Subtract the ones.
8 ones - 3 ones = 5 ones



Tens	Ones
2	8
-	3
<hr/>	
	5

Step 2 Subtract the tens.



Tens	Ones
2	8
-	3
<hr/>	
2	5

$28 - 3 = 25$

2. Subtract 20 from 36.

Method 1 Count back in tens from 36.
 $36 - 20 = 16$

36, 26, 16



Method 2 Subtract tens.

$36 - 20 = 16$

$36 - 20 = 16$

$30 - 20 = 10$
 $6 + 10 = 16$



Method 3 Use  to subtract.

Step 1 Subtract the ones.



Tens	Ones
3	6
-	2
<hr/>	
	4

Step 2 Subtract the tens.
3 tens - 2 tens = 1 ten



Tens	Ones
3	6
-	2
<hr/>	
1	6

$36 - 20 = 16$


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ADDITION AND SUBTRACTION WITHIN 40

135

Textbook 1 P135

3. Subtract 24 from 37.

Use  to help you subtract.



Step 1 Subtract the ones.
7 ones - 4 ones = 3 ones



Tens	Ones
3	7
-	4
<hr/>	
	3

Step 2 Subtract the tens.
3 tens - 2 tens = 1 ten



Tens	Ones
3	7
-	4
<hr/>	
1	3

$37 - 24 = 13$

PRACTICE



Subtract.

(a)

Tens	Ones
3	8
-	6
<hr/>	
3	2

(b)

Tens	Ones
2	9
-	4
<hr/>	
1	5

Complete Workbook 1A, Worksheet 3 • Pages 192 - 195

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CHAPTER 11

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Textbook 1 P136

Method 3: Standard algorithm

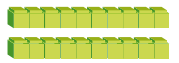



Introduce a new method of using place-value charts to subtract, as done previously in lessons 1 and 2.

Demonstrate this a visualiser, using a place-value chart and base-ten blocks. Write the subtraction equation:

$$28 - 3 = ?$$

Then show pupils its transition to the vertical form.

The meaning of this subtraction will be illustrated by putting the corresponding base-ten blocks representing the two numbers onto the place-value chart.

Tens	Ones	Tens	Ones
2	8		
-	3		
<hr/>		<hr/>	

Subtraction using the base-ten blocks must be clearly demonstrated to ensure that they are in tandem with the calculation in the written format.

Repeat the process for the two examples in Let's Learn 2 and 3 to reinforce the standard algorithm method.

The subtraction $36 - 20 = ?$ is good for mental calculation. Explore with pupils the **count back in tens** method, followed by the **subtract tens** method.

PRACTICE



Help the pupils to read and understand each question.

Avoid chorus answers from pupils and encourage participation by inviting individual responses. Ask the pupils how they get their answers and if possible, get another pupil to verify the answer.

For better understanding, select items from **Worksheet 3** and work these out with the pupils.

Independent seatwork

Assign pupils to complete Worksheet 3 (Workbook 1A P192 - 195).

Answers Worksheet 3 (Workbook 1A P192 - 195)

1. (a) 21 (b) 23
(c) 25 (d) 36
(e) 23 (f) 32
(g) 16 (h) 27
(i) 15 (j) 9

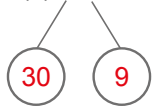
2. (a) $37 - 5 = 32$



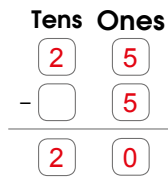
(b) $28 - 6 = 22$



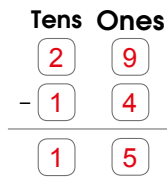
(c) $39 - 8 = 31$



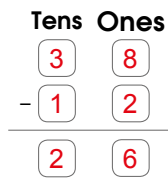
3. (a) 20



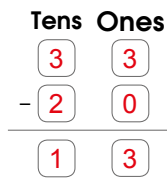
(b) 15

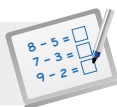


(c) 26



(d) 13



**Specific Learning Focus**

- Subtract a 1-digit number from a 2-digit number.
- Subtract tens from a 2-digit number.
- Subtract a 2-digit number from a 2-digit number.
- Subtract using the standard algorithm.

Suggested Duration

2 periods

Prior Learning

Since vertical addition has been introduced in lessons 1 and 2, standard algorithm method involving subtraction will be a continuation of lessons 1 and 2. No recap is required as it will be a smooth transition.

Pre-emptive Pitfalls

Before introducing the standard algorithm method for subtraction, revisit the earlier strategies in 'Let's Learn' (Textbook 1 P134). It should be emphasised to pupils that all methods are correct and not to be confused with. Methods 1 and 2 (Textbook 1 P134) should be emphasised for mental calculations and Method 3 for advanced mathematical calculations.

Introduction

The standard algorithm method should not be challenging as they have been introduced in the earlier lessons. The same stages of the method (e.g. starting by subtracting the ones) have to be revisited. Once again, the transition of base-ten blocks to standard algorithm method uses the C-P-A approach.

Problem Solving

Highlight that in this lesson, subtraction of a 1-digit number from a 2-digit number and subtraction of a 2-digit number from a 2-digit number are done. For both types of subtraction, the process for vertical subtraction remains the same as for vertical addition, except that the operation is different (addition VS subtraction).

Activities

The subtractions in Worksheet 3 (Workbook 1A P192 – 195) can be done as an activity in class. For each question, the subtraction can be done by using the three methods learnt so that pupils are familiar with all three methods.

Resources

- base-ten blocks
- number chart
- real-life objects

Mathematical Communication Support

Have the pupils write statements next to the vertical subtraction (e.g. $25 - 3 = ?$)

1. We write 25 in the tens and ones column in the vertical form.
2. We place '3' under '5' in the ones column.
3. Next we take away or count back 3 from 5.
4. Write the difference below the ones.
5. Lastly, we subtract the tens (take away '0' from 2 tens to give 2 tens).

The answer is twenty-two ($25 - 3 = 22$). Enunciate these steps while doing the subtractions on the whiteboard and encourage individual responses for each step.

SUBTRACTION WITH REGROUPING

LEARNING OBJECTIVES

1. Subtract a 1-digit number from a 2-digit number with regrouping, using the standard algorithm.
2. Subtract a 2-digit number from a 2-digit number with regrouping, using the standard algorithm.

LESSON
4

SUBTRACTION WITH REGROUPING

IN
FOCUS

Subtract 5 from 23.

Tens	Ones
2	3
-	5
2	2

Do I subtract 3 ones from 5 ones?

Should I regroup first?

Is the answer correct? Why?

IN
FOCUS

LET'S LEARN

1. Subtract 5 from 23.

Use to help you subtract.

Step 1 Regroup 1 ten into 10 ones. Subtract the ones.
13 ones - 5 ones = 8 ones

Tens	Ones
2	13
-	5
2	8

Step 2 Subtract the tens.

Tens	Ones
2	13
-	5
1	8

23 - 5 = 18

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ADDITION AND SUBTRACTION WITHIN 40
137

IN FOCUS

The picture is used to review the common error made by pupils if they have no concept of place-values of a multi-digit number, especially when they are in vertical form.

Pupils often see the digits as separate entities. A common error arising from this in subtraction is to take the smaller number from the bigger regardless.

Ask pupils what the algorithm shows.

Write the subtraction equation:

$$23 - 5 = ?$$

Make up a number story to give it a context.

Show the operation with concrete materials such as counters. Take out 23 counters and then take away 5 counters to show that the answer cannot be 22.

Textbook 1 P137

SUBTRACTION WITH REGROUPING

LESSON
4

IN FOCUS

Subtract 5 from 23.

Tens	Ones
2	3
-	5
2	2

Do I subtract 3 ones from 5 ones?

Should I regroup first?



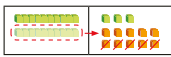
Is the answer correct? Why?

LET'S LEARN

1. Subtract 5 from 23.

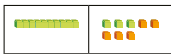
Use to help you subtract.

Step 1 Regroup 1 ten into 10 ones.
Subtract the ones.
13 ones - 5 ones = 8 ones



Tens	Ones
2	3
-	5
	8

Step 2 Subtract the tens.



Tens	Ones
2	3
-	5
1	8

$$23 - 5 = 18$$

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ADDITION AND SUBTRACTION WITHIN 40

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Textbook 1 P137

LET'S LEARN

Invite a pupil to demonstrate the subtraction of 5 from 23. Get the pupil to show the number using base-ten blocks (2 tens and 3 ones), then subtract 5 ones.

Get the class to suggest other ways of subtracting. Show that another way of doing so is to regroup 1 ten into 10 ones. Exchange 1 base-ten block into 10 loose ones.

Show that there are 13 ones after regrouping, from which 5 ones can be taken away, leaving behind a total of 1 ten and 8 ones. Write the subtraction equation: $23 - 5 = ?$, then show pupils its transition to the vertical form.

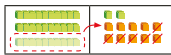
Demonstrate the subtraction using base-ten blocks. When doing so, stress that 5 ones cannot be put out for subtraction as this number has to be taken away.

Show the process of regrouping, using the place-value chart for the standard algorithm. Emphasise the renaming of 2 tens to 1 ten after regrouping, and the renaming of 3 ones to 13 ones. Stress once again that the need to regroup 10 ones from 1 ten is because there are not enough ones to subtract 5 from.

2. Subtract 16 from 32.

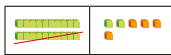
Use to help you subtract.

Step 1 Regroup 1 ten into 10 ones.
Subtract the ones.
12 ones - 6 ones = 6 ones



Tens	Ones
3	2
-	6
	6

Step 2 Subtract the tens.
2 tens - 1 ten = 1 ten



Tens	Ones
3	2
-	6
2	6

$$32 - 16 = 16$$

PRACTICE

Subtract.

(a) $26 - 7 = 19$

(b) $33 - 15 = 18$

Tens	Ones
2	6
-	7
1	9

Tens	Ones
3	3
-	5
2	8

Complete Workbook 1A, Worksheet 4 • Pages 196 – 197

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CHAPTER 11

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Textbook 1 P138

PRACTICE

Repeat the process using a 2-digit number to subtract from another 2-digit number, reinforcing the regrouping method.

Help the pupils to read and understand each question.

Avoid chorus answers from pupils and encourage participation by inviting individual responses. Ask the pupils how they get their answers and if possible, get another pupil to verify the answer.

For better understanding, select items from **Worksheet 4** and work these out with the pupils.

Independent seatwork

Assign pupils to complete Worksheet 4 (Workbook 1A P196 – 197).

Answers Worksheet 4 (196 - 197)

1. (a)

Tens	Ones
3 4	1 0
- 2	1
1	9

(b)

Tens	Ones
1 2	1 4
-	9
1	5

(c)

Tens	Ones
2 3	1 2
-	8
2	4

(d)

Tens	Ones
2 2	1 7
-	8
□	9

(e)

Tens	Ones
2 3	1 6
-	7
1	9

(f)

Tens	Ones
2 3	1 0
-	6
1	4

2. (a) 28

Tens	Ones
2 3	1 1
-	□
2	8

(b) 19

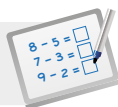
Tens	Ones
1 2	1 8
-	□
1	9

(c) 9

Tens	Ones
1 2	1 2
-	□
1	3
□	9

(d) 17

Tens	Ones
2 3	1 5
-	□
1	8
□	9



Specific Learning Focus

- Subtract a 1-digit number from a 2-digit number with regrouping, using the standard algorithm.
- Subtract a 2-digit number from a 2-digit number with regrouping, using the standard algorithm.

Suggested Duration

2 periods

Prior Learning

Pupils have already been introduced to regrouping in Lesson 2. The same strategy is used in this lesson except that the operation involved is subtraction.

Pre-emptive Pitfalls

'In Focus' (Textbook 1 P137) highlights a common error made by pupils. This misconception can be cleared using real-life objects. Emphasise to pupils that in a subtraction statement, the number after the word 'from' refers to the number to be taken away from (e.g. subtract 5 from 23).

Introduction

In Let's Learn 1 (Textbook 1 P137), when subtracting 5 from 23, show that 5 cannot be taken away from 3 since 3 is smaller than 5. As such, we need to borrow 1 ten from 2 tens in 23 and regroup 1 ten into 10 ones to give us 13 ones. 13 is greater than 5, hence subtraction can take place. This is the key concept of this lesson. Repetitive practice will ensure that pupils understand this strategy well.

Problem Solving

Renaming the tens after regrouping and borrowing the ones is important. For example, in $53 - 7$, we regroup 1 ten into 10 ones and bring them over to the ones column to give 13. Therefore, 5 tens become 4 tens.

This gives us

$$\begin{array}{r} \overset{4}{\cancel{5}} \quad \overset{13}{3} \\ - \quad \quad 7 \\ \hline 4 \quad 6 \end{array}$$

Activities

Getting pupils to do the subtractions (Textbook 1 P137 – 138) as a group activity would be fun. Divide the class into two groups and write the subtractions on the whiteboard. Get the pupils to send a representative from each group to work on the subtractions on the board. Allow prompting at the start but let the pupils work on them on their own thereafter.

Resources

- base-ten blocks
- mini whiteboards

Mathematical Communication Support

Make pupils write in words the mathematical reasoning for regrouping. Pupils can answer the following questions in their exercise books for $53 - 7 = ?$.

- Why can't we take away '7' from '3'?
- What should we do then?
- After borrowing 1 ten from 5 tens, how do we rename the new tens?
- Which place value do we begin the subtraction with?
- Which column do we place '7' under and why?


ADDING THREE NUMBERS

LEARNING OBJECTIVES

1. Add three 1-digit numbers.

ADDING THREE NUMBERS

IN FOCUS



Can you add to find how many flowers there are in all?

LESSON
5

LET'S LEARN

1. Add 7, 3 and 2.

Method 1 Make 10. 7 and 3 make 10.

$$7 + 3 + 2 = 10 + 2 = 12$$

Method 2 Add by counting on.

7	8	9	10	11	12
---	---	---	----	----	----

$7 + 3 + 2 = 12$

2. Add 9, 9 and 8.

$9 + 9 + 8 = 26$

$9 + 9 = 18$
 $18 + 8 = 26$

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ADDITION AND SUBTRACTION WITHIN 40

139

Textbook 1 P139

IN FOCUS

Invite pupils to talk about the different flowers in the vases.

Show that there are three types of flowers (tulips, daisies, roses) in the picture. Get the pupils to count the number of each type of flower.

Ask if the picture shows an addition or subtraction story, and get them to write the equation for the number story.

LET'S LEARN

Write the equation:

$$7 + 3 + 2 = ?$$

Get pupils to discuss in pairs, to think of different ways to add the three numbers. Get pupils to share their answers with the class.

Some ways of adding the numbers are as follows:

- Add 7 and 3 first
 $7 + 3 + 2 = 10 + 2 = 12$
- Add 7 and 2 first
 $7 + 2 + 3 = 9 + 3 = 12$
- Add 3 and 2 first
 $3 + 2 + 7 = 5 + 7 = 12$

Ask pupils which way of adding is easier. Lead them to see that it will be easier if they can **make 10** with two of the numbers. Give more examples for pupils to practice the make 10 strategy.

Activity Mental addition of three numbers.

Materials Three '0' to '9' dice

Procedure

1. Assign pupils to work in pairs.
2. Take 5 turns to throw the three dice to obtain three numbers.
3. The pupil who threw the dice records and adds these numbers together.
4. The other pupil does the same, after which the pair compares their answers.
The pupil with the greater number scores a point.
5. Repeat this for six rounds.
6. The pupil with the higher points wins.

PRACTICE

1. Make 10 and add.

$$(a) 2 + 8 + 4 = 10 + 4 = 14$$

$$(b) 3 + 9 + 1 = 3 + 10 = 13$$

2. Add.

$$(a) 6 + 7 + 4 = 17$$

$$(b) 9 + 0 + 4 = 13$$

$$(c) 8 + 5 + 9 = 22$$

$$(d) 7 + 9 + 6 = 22$$

Complete Workbook 1A, Worksheet 5 • Pages 198 – 200



MIND WORKOUT

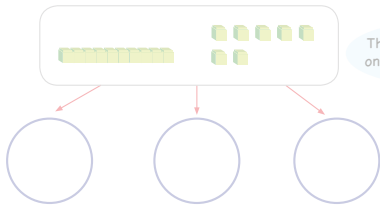
Use 1-digit numbers to complete the addition equation.

Use  to help you.

$$\square + \square + \square = 17$$

How can we put 17 cubes in 3 groups?

There is more than one correct answer.



PRACTICE

Help the pupils to read and understand each question.

Invite pupils to suggest different ways of adding and ask them to compare to see which way is the easiest and the fastest.

For better understanding, select items from **Worksheet 5** and work these out with the pupils.

Independent seatwork

Assign pupils to complete Worksheet 5 (Workbook 1A P198 – 200).

Answers

Worksheet 5 (Workbook 1A P198 – 200)

1. (a) 14

(b) 11

(c) 21

2. (a) $7 + 3 + 4 = 10 + 4$
 $= 14$ (b) $2 + 5 + 8 = 10 + 5$
 $= 15$ 

(c) 13

(d) 19

(e) 17

3. (a) 15

(b) 18

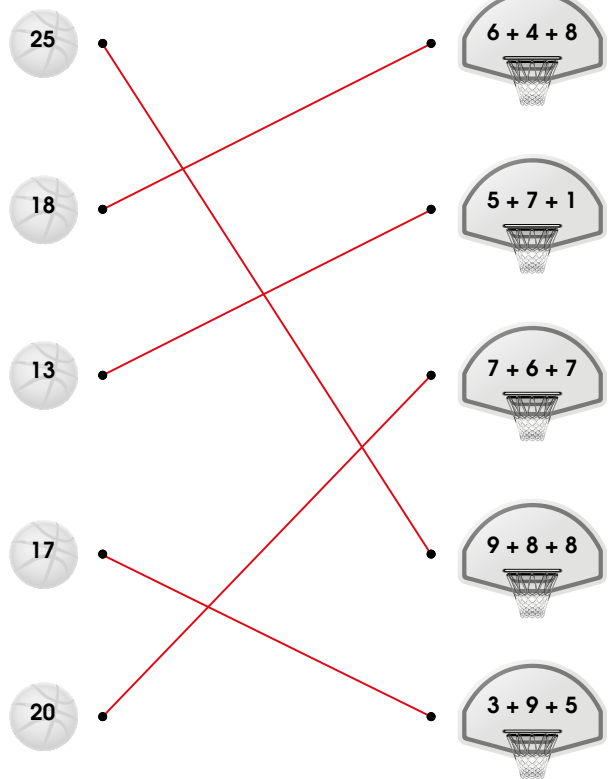
(c) 16

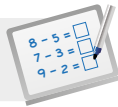
(d) 20

(e) 21

(f) 27

4.



**Specific Learning Focus**

- Add three 1-digit numbers.

Suggested Duration

3 periods

Prior Learning

Pupils are aware of adding and subtracting two numbers. This lesson is a continuation of the earlier lessons with the extension of carrying out addition in two steps instead of one step as now the addition involves 3 numbers.

Pre-emptive Pitfalls

Since they are used to adding and subtracting 2 numbers, the addition of 3 numbers might be challenging to pupils. Encourage visual understanding using real-life objects (Textbook 1 P139) for an easier transition to multiple steps.

Introduction

Help pupils to permutate different combinations to approach these sums. Encourage them to recognise number bonds of ten as it is an easier strategy (e.g. In the addition $7 + 2 + 3$, pupils should be able to recognise that 7 and 3 make 10 as they should be familiar with numbers that make 10, and then add 2.). Give repetitive examples on the whiteboard and discuss various strategies of adding 3 numbers.

Problem Solving

To develop critical thinking skills, encourage pupils to come up with easier and faster strategies to do the given sums on the whiteboard. Encourage them to make 10 as much as possible.

Activities

Activity (P192) can be done in pairs. Each pair will need three '0' to '9' dice.

Resources

- base-ten blocks
- 9-sided dice

Mathematical Communication Support

Mind Workout (Textbook 1 P140) can be used as a mathematical dialogue in class. To get 17, ask pupils to break 1 ten into two numbers or 7 ones into two numbers. Continue asking pupils questions, leading up to a number of possibilities of breaking 17 into three numbers. Elicit individual responses from pupils and ask them to describe their number bonds.

PROBLEM SOLVING, MATHS JOURNAL AND PUPIL REVIEW



Mind Workout

Date: _____

1. Fill in the missing numbers.

(a)

	Tens	Ones
	¹ 2	7
+	1	3
<hr/>		
	4	0

(b)

	Tens	Ones
	² 3	¹ 2
-	1	3
<hr/>		
	1	9

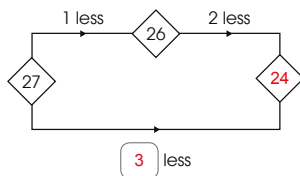
(c)

	Tens	Ones
	¹ 1	8
+	1	4
<hr/>		
	3	2

(d)

	Tens	Ones
	² 3	¹ 4
-	1	7
<hr/>		
	1	7

2. Study the puzzle.
Fill in the missing numbers.



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Addition and Subtraction Within 40 201



Mind Workout

1. Help pupils to recognise that these standard algorithms involve addition and subtraction with regrouping.

For (a) and (c), adding of the ones involves regrouping the ones into tens and ones. Guide the pupils along by asking these questions:

- Do you need to regroup the ones?
- What do you do with the tens?

For (b) and (d), subtracting the ones involves regrouping the tens into ones. Likewise, guide the pupils along by asking these questions:

- Do you need to regroup 10 ones from the tens to subtract the ones?
- What do you do with the 10 ones?
- What happens to the tens now?

2. Facilitate the pupils' understanding of the diagram with respect to the number comparison and arrow direction for the missing numbers.

Help pupils to translate from the diagrams with questions such as: What number is 2 less than 26?

Workbook 1A P201

PRACTICE

1. Make 10 and add.

(a) $2 + 8 + 4 = 10 + 4 = 14$

(b) $3 + 9 + 1 = 3 + 10 = 13$

2. Add.

(a) $6 + 7 + 4 = 17$

(b) $9 + 0 + 4 = 13$

(c) $8 + 5 + 9 = 22$




(d) $7 + 9 + 6 = 22$

Complete Workbook 1A, Worksheet 5 • Pages 198 – 200

MIND WORKOUT

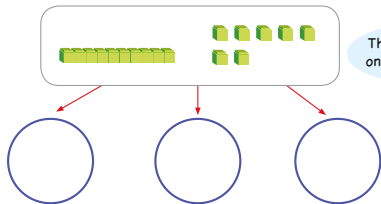
Use 1-digit numbers to complete the addition equation.

Use  to help you.

 +  +  = 17

How can we put 17 cubes in 3 groups?

There is more than one correct answer.



Textbook 1 P140

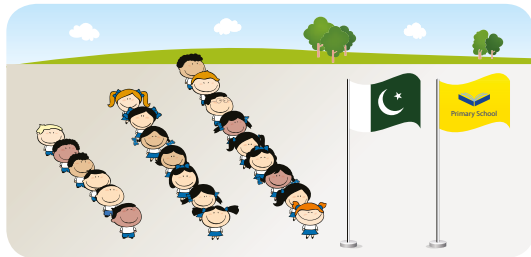


MIND WORKOUT

Pupils may start with the bond of $10 + 7$, then they can select any two numbers that make a number bond of 10. This means that there are many possible answers.

Hint: Use base-ten blocks and exchange 1 ten for 10 ones. Group all 17 ones into three smaller groups for various answers.

MATHS JOURNAL



How many pupils are there altogether?
Write down different ways to add.

Which way do you like best?
Why?

I know how to...

- add numbers without regrouping.
- add numbers with regrouping.
- subtract numbers without regrouping.
- subtract numbers with regrouping.
- add three numbers.

SELF-CHECK

Textbook 1 P141

MATHS JOURNAL

Allow pupils to work in pairs. The objective of this task is to enable pupils to show the different possible ways in adding three numbers.

Ask them to reflect on which way is the quickest and why they think it is so.

Before the pupils do the self check, review the important concepts once more by asking for examples learnt for each objective.

This self check can be done after pupils have completed **Review 11** (Workbook 1A P202 – 203) as consolidation of understanding for the chapter.

SELF-CHECK



Answers Review 11 (Workbook 1A P202 – 203)

1. (a) 3 tens 7 ones

(b) 3 tens 3 ones

2. (a)
$$\begin{array}{r} 27 \\ + 12 \\ \hline \end{array}$$

(b)
$$\begin{array}{r} 115 \\ + 25 \\ \hline \end{array}$$

(c)
$$\begin{array}{r} 36 \\ - 11 \\ \hline \end{array}$$

(d)
$$\begin{array}{r} 124 \\ - 18 \\ \hline \end{array}$$

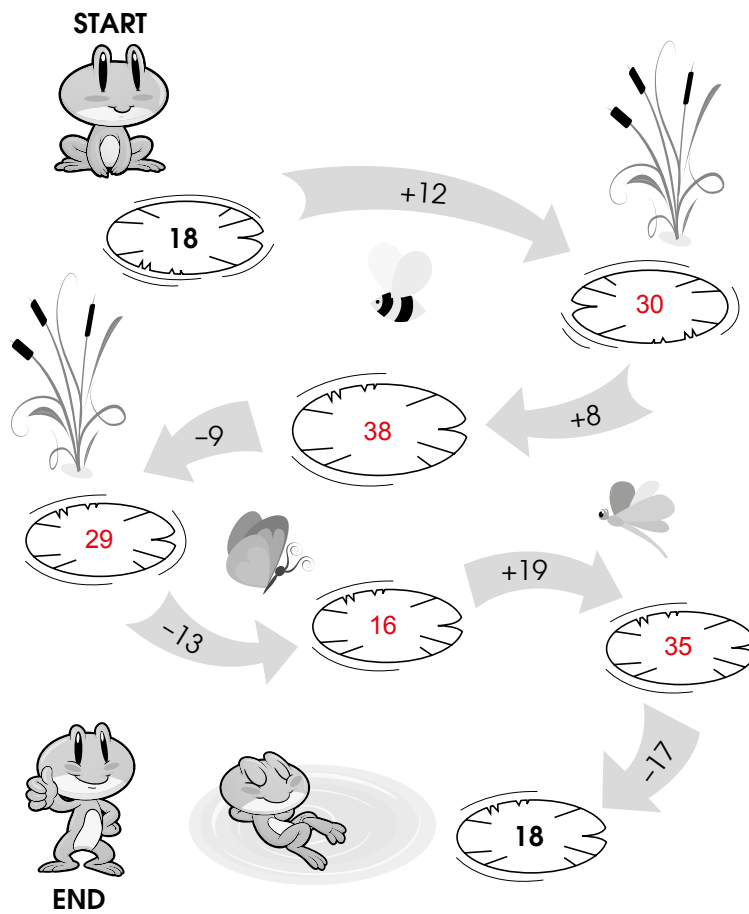
3. (a) 15

(b) 17

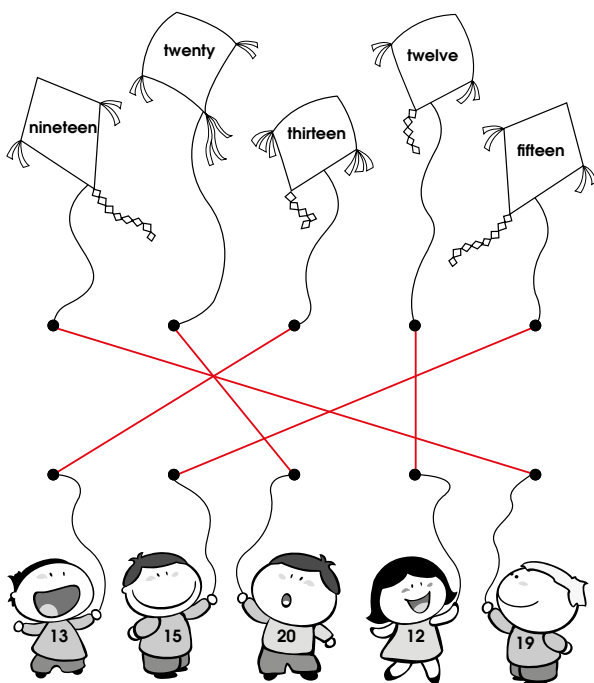
(c) 15

(d) 24

4.



1.



2. Set A: 17 buttons
Set B: 14 buttons

(a) more

(b) fewer

3. (a) 7, 8

(b) 13, 16

(c) 19, 16

(d) 11, 10, 9

4. $16 - 5 = 11$

11 squirrels are left.

5. triangle, rectangle



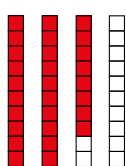
7. C, A, B

8. (a) 3

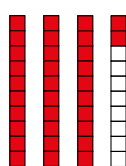
(b) 3

(c) 9

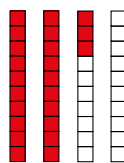
9. (a) 2 tens 8 ones



(b) 3 tens 2 ones



(c) 2 tens 3 ones



10. (a) 28, twenty-eight

(b) 33, thirty-three

11. (a) 35, 37

(b) 12, 10

12. (a)

$$\begin{array}{r} \boxed{1} \quad \boxed{1} \\ + \boxed{2} \quad \boxed{4} \\ \hline \boxed{3} \quad \boxed{5} \end{array}$$

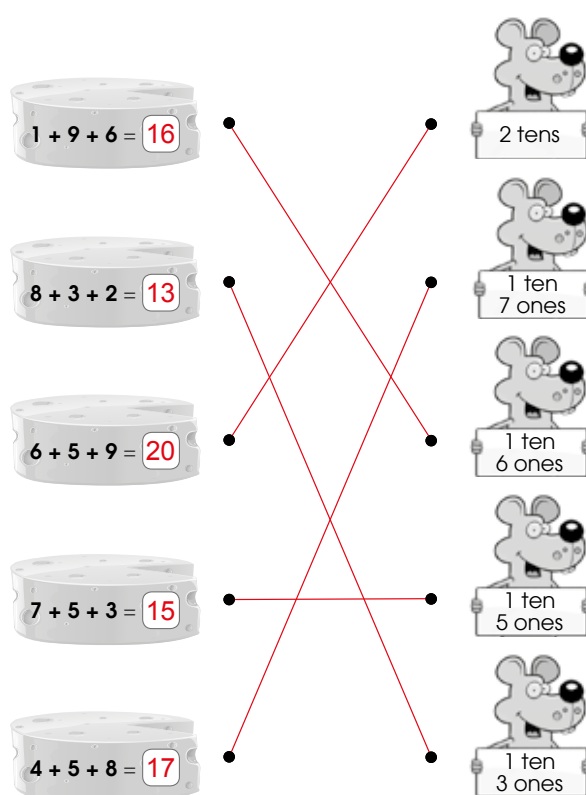
(b)

$$\begin{array}{r} \boxed{2} \quad \boxed{6} \\ - \boxed{1} \quad \boxed{2} \\ \hline \boxed{1} \quad \boxed{4} \end{array}$$

13. (a) 23

(b) 14

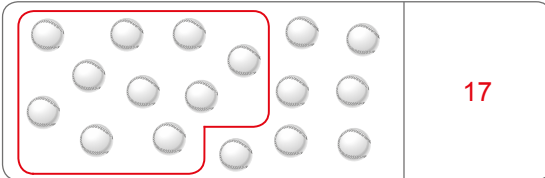
14.



Section A

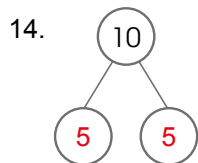
1. (1)
2. (3)
3. (1)
4. (3)
5. (4)
6. (4)
7. (3)
8. (4)
9. (4)
10. (3)

Section B

11. 

12. $7 + 5 = 12$

13. fewer



15. $9 + 7 = 16$
 $16 - 7 = 9$

16. Car Q

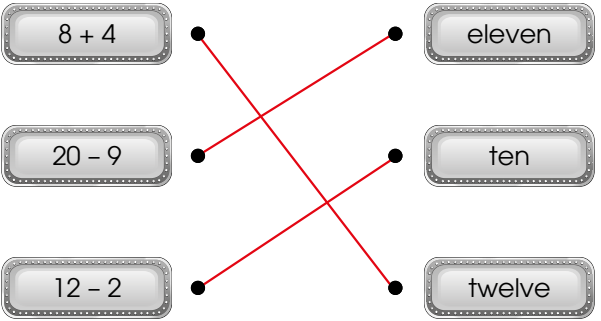
17. 5

18. shorter

19. (a) twelve (b) eighteen

20. (a) 11 (b) 15

21. $11 - 4 = 7$

22. 

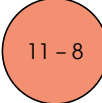
23. seventh

24. 4, 8

25. 2

26. 4

27. fewer

28. 

29. (a) 20 (b) 20
(c) 11

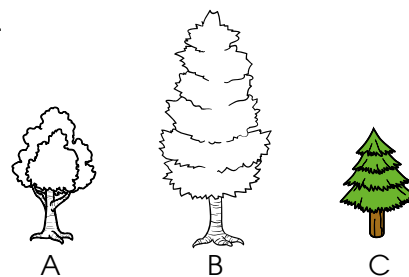
30. (a) 10, 11 (b) 28, 26

31. 19, 17, 13



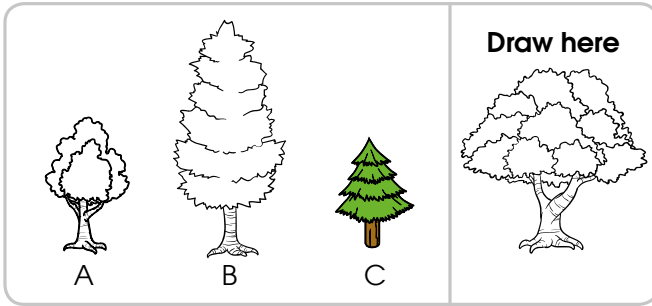
34. 6

35.



36. third

37.



38. $8 + 2 = 10$

39. $10 - 6 = 4$

40. (a)

Tens	Ones
¹ 1	7
+ 1	8
3	5

(b)

Tens	Ones
³ 4	¹ 0
- 1	3
2	7

Section C

41. $4 + 6 = 10$

There are 10 stickers altogether.

42. $8 - 2 = 6$

6 cupcakes are left on the table.

43. $11 + 6 = 17$

There are 17 fruits altogether.

44. $8 + 4 = 12$

There are 12 people on the bus in all.

45. $20 - 7 = 13$

Bala has 13 sweets left.

MORE WORD PROBLEMS

CHAPTER 12

More Word Problems CHAPTER
12

How many flowers does Xinyi have now?



**SOLVING
WORD PROBLEMS**

IN  FOCUS

LESSON
1



There are 8 flowers
in the vase.
I am holding 2 flowers.

Should we add or subtract to find the number of flowers
Xinyi has?

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Textbook 1 P142

Related Resources

NSPM Textbook 1 (P142 – 146)
NSPM Workbook 1B (P1 – 6)

Materials

Multilink cubes

Lesson

Lesson 1 Solving Word Problems
Problem Solving, Maths Journal and
Pupil Review

INTRODUCTION

The main goal of this chapter is to enable pupils to apply concepts of addition and subtraction in solving number story problems that involve either the **part-part-whole** or **comparison** structure. Using pictures or models to translate the number story into part-part-whole or comparison structure enables pupils to identify and write the appropriate addition or subtraction equation to solve the problem. From the previous chapters, pupils have acquired the prerequisites of part-part-whole concepts linking with number bonds for addition and subtraction, as well as concepts of 'more than' and 'fewer than' in the comparison of two sets of objects. In helping pupils to solve story problems, it is important that the teacher models the process of problem solving through questioning and uses pictures or concrete models to represent the problem structure.

LESSON

1

SOLVING WORD PROBLEMS


LEARNING OBJECTIVES

1. Solve addition and subtraction 1-step word problems involving the part-part-whole concept.
2. Solve addition and subtraction 1-step word problems involving the comparison concept.

More Word Problems


CHAPTER 12


How many flowers does Xinyi have now?



SOLVING WORD PROBLEMS

LESSON 1

IN  FOCUS



There are 8 flowers in the vase.
I am holding 2 flowers.

Should we add or subtract to find the number of flowers Xinyi has?

142 CHAPTER 12

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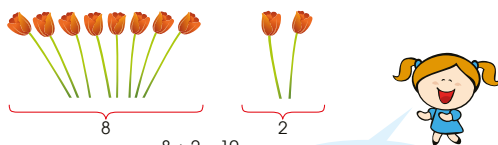
Textbook 1 P142

IN  FOCUS

Discuss the chapter opener with pupils. Ask them how they would find the total number of flowers that Xinyi has (e.g. through addition or subtraction).

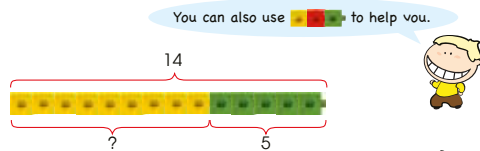
LET'S LEARN

1. Xinyi has 8 flowers. She buys 2 more flowers. How many flowers does Xinyi have now?



Xinyi has 10 flowers now.

2. Tom has 14 storybooks and comic books. 5 of them are comic books. How many storybooks does Tom have?



Tom has 9 storybooks.

Textbook 1 P143

In the first part of this lesson, the problems presented to the pupils are familiar problems where they can recognise the number story and write the correct equation as the solution. It serves as a revision. However, the emphasis is on representing the problem situation with picture or concrete models. In showing or drawing out the flowers, review with pupils the **part-part-whole concept** (Chapter 2).

The 8 flowers in the vase is one part, and the 2 flowers that Xinyi is holding is another part. To find the whole, the two parts are added together.

$$8 + 2 = 10$$

There are 10 flowers in all.

Let's Learn 2 and 3 are **take-away** problems. Using concrete models, show the part-part-whole structure of the problem to complete the number equation.

Start off by using multilink cubes to represent the numbers in the problem.

Put out 14 yellow cubes and ask pupils if they represent the same type of books. The pupils are expected to point out that there are two types of books.

Swap out 5 green cubes with 5 yellow cubes to represent the comic books. Show the pupils that the two different coloured cubes represent the two types of books.

While showing the concrete models, it is recommended to draw the pictorial diagram to show the representation.

Based on the diagram (or the concrete objects used earlier), ask pupils what they have to do to obtain the answer.

Repeat the process with Let's Learn 3.

Let's Learn 4 and 5 involve the **comparison** structure.

Start off by discussing the story with the pupils. Lead them to see that the problem involves comparing the number of stamps that Ann and Bala each has.

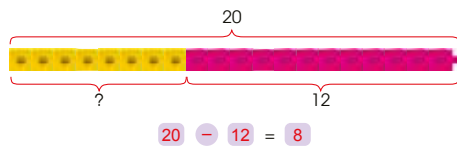
Use multilink cubes to represent the number of stamps each child has. Take out 13 multilink cubes to represent Ann's 13 stamps.

Ask the following questions to get pupils to guess the number of cubes that should be used to represent the number of stamps that Bala has:

- Who has more stamps?
- Should the length of cubes be longer for Bala's stamps?
- How many cubes longer should it be?

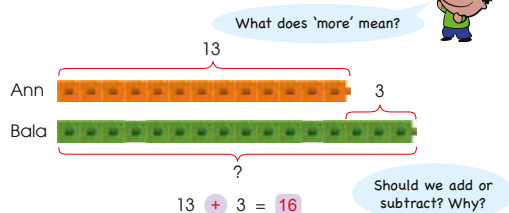
The length of cubes representing Bala's stamps is 3 cubes longer than that of Ann's. By using the multilink cubes or the diagram on P144, get pupils to compare the two sets of cubes. Ask if they should subtract or add to find the number of stamps that Bala has.

3. Nora bakes 20 cookies. She gives away 12 cookies. How many cookies does Nora have left?



Nora has 8 cookies left.

4. Ann has 13 stamps. Bala has 3 more stamps than Ann. How many stamps does Bala have?

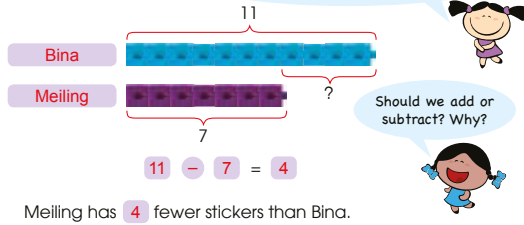


Bala has 16 stamps.

Textbook 1 P144

5. Bina has 11 stickers. Meiling has 7 stickers.
How many fewer stickers does Meiling have than Bina?

What does 'fewer' mean?
Who has fewer stickers, Bina or Meiling?



PRACTICE

Solve.

1. Weiming buys 15 sweets.
Farhan buys 2 more sweets than Weiming.
How many sweets does Farhan buy?

$$15 + 2 = 17$$



2. Kate has 13 goldfish.
She has 6 fewer clownfish than goldfish.
How many clownfish does Kate have?

$$13 - 6 = 7$$



Complete Workbook 1B, Worksheet 1 + Pages 1 – 4

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MORE WORD PROBLEMS

145

Textbook 1 P145

Use a similar line of questioning for Let's Learn 5 to help pupils reinforce the comparison structure. This helps pupils to translate the situation into the correct operation for the number equation.

PRACTICE



Help the pupils to read and understand the context in each question. Aid them in writing the appropriate equations to solve the questions.

For better understanding, select items from Worksheet 1 and work these out with the pupils.

Use questions 1, 2 and 5 for reinforcement and practice of take-away problems involving the part-part-whole concept.

Use questions 3, 4, 6 and 7 for reinforcement and practice of comparison problems.

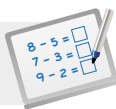
For questions 5, 6 and 7, give time for pupils to work in pairs to draw the pictures or provide cubes for concrete representation of the problem structure.

Independent seatwork

Assign pupils to complete Worksheet 1 (Workbook 1B P1 – 4).

Answers Worksheet 1 (Workbook 1B P1 – 4)

- $16 - 4 = 12$
Priya has 12 chocolates left.
- $8 + 3 = 11$
Ahmad has 11 toy robots now.
- $12 + 7 = 19$
Siti makes 19 paper flowers.
- $13 - 5 = 8$
Bala collects 8 leaves.
- $12 - 9 = 3$
Sam has 3 sandwiches left.
- $15 - 4 = 11$
Weiming has 11 fewer sweets than Bina.
- $18 - 11 = 7$
Junhao has 7 more marbles than Farhan.

**Specific Learning Focus**

- Solve addition and subtraction 1-step word problems involving the part-part-whole concept.
- Solve addition and subtraction 1-step word problems involving the comparison concept.

Suggested Duration

3 periods

Prior Learning

From the earlier lessons, pupils are aware of the difference between addition and subtraction. They differentiate between the two operations by looking for the key terms (counting all or counting back, more or less than). The strategies used in this lesson are a revisit of the part-part whole (number bond) and comparison concept using a spiral approach.

Pre-emptive Pitfalls

The teacher should be cognizant of the fact that the word problems have to be depicted as stories with real-life scenarios using objects or pictures. The use of concrete models can also be effective after deducing the operation to use and proceeding with the mathematical calculation (solving the equation).

Introduction

Let's Learn 1 (Textbook 1 P143) involves the part-part-whole concept. Let's Learn 2 and 3 (Textbook 1 P143 – 144) involve the 'take away' concept. Let's Learn 4 and 5 (Textbook 1 P144 – 145) involve the comparison concept. The teacher may have the pupils work on the problems in 'Let's Learn' using other real-life objects (instead of flowers, cookies and stamps which may be difficult to bring into the classroom) and using the names of pupils in the class. Similarly, while using multilink cubes, teach the pupils to use different-coloured cubes to differentiate the objects or people in the word problems.

Problem Solving

There are multiple strategies in this lesson and pupils have to learn to comprehend the statements in a word problem by focusing on the key terms and then deduce the operation to use. Upon deciding, mathematical calculation is then carried out.

Activities

Each sum can be converted into an activity by bringing real-life objects into the classroom.

Resources

- multilink cubes
- real-life objects

Mathematical Communication Support

Maths Journal (Textbook 1 P146) can be used as a group activity. The groups can discuss amongst themselves and come up with as many stories as they can with the same set of numbers. Encourage them to first verbally discuss and then put pen to paper and present it to the class. Have pupils write down their mathematical thought process while coming up with a story as follows:

1. Read the story.
2. Visualise the story and draw.
3. Deduce the operation by looking for key terms.
4. Write the mathematical equation.
5. Work out the equation by applying a strategy.
6. Check your answer using an alternative strategy.

PROBLEM SOLVING, MATHS JOURNAL AND PUPIL REVIEW

7. Farhan has 11 marbles.
Junhao has 18 marbles.
How many more marbles does Junhao have than Farhan?

$$18 - 11 = 7$$

Junhao has 7 more marbles than Farhan.



Mind Workout

Date: _____

Ann has 16 stickers.
Xinyi and Ann have 25 stickers altogether.
Who has more stickers, Ann or Xinyi? How many more?

$$25 - 16 = 9$$

Xinyi has 9 stickers.

$$16 - 9 = 7$$

Ann has 7 more stickers than Xinyi.

4 Chapter 12

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Mind Workout

Write out the process of problem solving on the board for pupils to do self-questioning as they work:

- Read the question. (What do I know? What do I have to find?)
- Draw the picture to represent the story. Do I add or subtract?
- Write the equation and find the answer.
- Have I answered the question?

Workbook 1B P4

MIND WORKOUT

Raju has 8 blue blocks. He has 4 fewer blue blocks than red blocks. How many red blocks does Raju have?

$$8 + 4 = 12$$

Raju has 12 red blocks.

Should you add or subtract to find the number of red blocks? Draw pictures to help you.



MATHS JOURNAL

Look at the numbers.

11

7

Use the numbers to make your own word problem. Show how you solve the word problem. Draw to help you add or subtract.

Example

There are 11 snails in the garden. 7 snails crawl away. How many snails are there left?



There are 4 snails left.

$$11 - 7 = 4$$

I know how to...

- solve 1-step word problems involving addition or subtraction.



146

CHAPTER 12

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Textbook 1 P146



MIND WORKOUT

Write out process of problem solving on the board for pupils to do self-questioning as they work:

- Read the question. (What do I know? What I have to find?)
- Draw the picture to represent the story. Do I add or subtract?
- Write the equation. Find the answer.
- Have I answered the question?

MATHS JOURNAL

Allow pupils to work in groups of 3 for discussion. Provide each group with drawing papers or vanguard sheets for them to present their work to the class.

Encourage pupils to be creative in their word problems. A variety of addition and subtraction problem structures can be expected from the pupils.

Before the pupils do the self check, review the important concepts once more by asking for examples learnt for each objective.



This self check can be done after pupils have completed **Review 12** (Workbook 1B P5 – 6) as consolidation of understanding for the chapter.

Answers Review 12 (Workbook 1B P5 – 6)

1. $17 - 4 = 13$
There are 13 deer in the zoo.
2. $12 + 6 = 18$
Raju has 18 oranges.
3. $10 + 8 = 18$
Nora has 18 beads.
4. $19 - 13 = 6$
The baker bakes 6 fewer doughnuts than cupcakes.

MULTIPLICATION

CHAPTER 13

Multiplication CHAPTER **13**

Which objects are in groups of equal numbers?

ADDING EQUAL GROUPS LESSON **1**

IN FOCUS

These objects are in equal groups.
How many of each object are there?

OXFORD UNIVERSITY PRESS MULTIPLICATION **147**

Textbook 1 P147

Related Resources

NSPM Textbook 1 (P147 – 156)
NSPM Workbook 1B (P7 – 22)

Materials

2-colour counters, paper plates, papers, markers

Lesson

Lesson 1 Adding Equal Groups
Lesson 2 Making Multiplication Stories
Lesson 3 Solving Word Problems

Problem Solving, Maths Journal and Pupil Review

INTRODUCTION

The concept of multiplication is introduced informally as repeated addition (i.e. adding groups of equal number of objects). It is necessary that pupils develop the ability to recognise equal groups, count the number of objects in each group and the number of groups. Through the C-P-A approach and use of the appropriate language, multiplication is modelled through real-world situations as putting equal groups together e.g. 3 bowls of 4 apples each. Language like '3 groups of 4' or '3 fours' will help pupils translate the repeated addition situations to the multiplication language of '3 multiplied by 4 is 12' or '3 times 4 is equal to 12', and the eventual use of the multiplication symbol in an equation ' $3 \times 4 = 12$ '. Pupils' understanding of the multiplication operation is further developed by making multiplication stories and solving word problems with pictures. At this level, pupils are not expected to memorise multiplication facts.

ADDING EQUAL GROUPS

LEARNING OBJECTIVES

1. Illustrate multiplication as repeated addition.
2. Add equal groups to find the total number of objects.

Multiplication

CHAPTER
13

Which objects are in groups of equal numbers?



IN FOCUS

LESSON
1

ADDING EQUAL GROUPS



These objects are in equal groups.
How many of each object are there?

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MULTIPLICATION 147

Textbook 1 P147

IN FOCUS

Use the chapter opener as a stimulus picture to discuss with pupils the objects they see on the shelves.

Draw their attention to the number of groups of each object and the number of objects in each group.

Lead pupils to see that some objects are not packed in groups of equal numbers (such as the canned food and eggs) and why they are not equal groups.

Finally, draw pupils' attention to the objects that are packed in groups of the same number and introduce these as **equal groups**.

LET'S LEARN

1. There are 3 groups.
Each group has 2 bottles.

$$2 + 2 + 2 = 6$$

$$3 \text{ twos} = 6$$

$$3 \text{ groups of } 2 = 6$$

There are 6 bottles altogether.



There are 3 groups of 2 or 3 twos.



2. There are 5 groups.
Each group has 3 bananas.

$$3 + 3 + 3 + 3 + 3 = 15$$

$$5 \text{ threes} = 15$$

$$5 \text{ groups of } 3 = 15$$

There are 15 bananas altogether.



There are 5 groups of 3.



3. There are 4 groups.
Each group has 5 bottles.

$$5 + 5 + 5 + 5 = 20$$

$$4 \text{ fives} = 20$$

$$4 \text{ groups of } 5 = 20$$

There are 20 bottles altogether.



Textbook 1 P148

LET'S LEARN

Introduce the concept of equal groups and repeated addition.

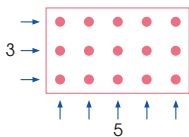
Talk about the bottles of ketchup in the first example. Say that there are two bottles of ketchup in each group and that these are equal groups because they have the same number of bottles in each group.

Find the total number of bottles through repeated addition. Show that the repeated addition can also be described as **3 twos** or **3 groups of 2**.

Repeat the steps for Let's Learn 2 to 3.

Use a non-example with unequal groups to demonstrate incompatibility with repeated addition to find the total.

4. This is a 3 by 5 array.
This is also a 5 by 3 array.



This is an array of dots.



ACTIVITY TIME

Work in pairs.

- 1 Take 5 plates.
Put 4 on each plate.

$$2 + 2 + 2 + 2 + 2 = 10$$

What you need:



There are 5 groups of 4.

- 2 Take 3 plates.
Put 6 on each plate.

$$6 + 6 + 6 = 18$$



PRACTICE

1. There are 3 groups.
Each group has 4 hats.

$$4 + 4 + 4 = 12$$

There are 12 hats.



Textbook 1 P149

ACTIVITY TIME

Use arrays to help pupils understand the concept of multiplication. Lead them to count the number of rows of dots and then to count the number of dots arranged in each row. Hence, show that the array can be described as a **3 by 5 array** or a **5 by 3 array**.

Assign pupils to work in pairs. Provide pupils with paper plates and counters (up to 40 per pair).

Pupils are required to make equal groups and use repeated addition to find the total.

PRACTICE

Help the pupils to read and understand each question.

For Question 1, extend the question by asking pupils for another way of making equal groups. Get them to write the repeated addition equation for the new grouping.

Avoid chorus answers from pupils and encourage participation by inviting individual responses. Ask the pupils how they get their answers and if possible, get another pupil to verify the answer.

For better understanding, select items from **Worksheet 1** and work these out with the pupils.

Independent seatwork

Assign pupils to complete Worksheet 1 (Workbook 1B P7 – 10).

2. Circle to show groups of 2.



3 groups of 2 = 6

3 twos = 6

3. Write two arrays.

(a) 2 by 6
or
6 by 2

(b) 8 by 3
or
3 by 8

(c) 5 by 4
or
4 by 5

Complete Workbook 1B, Worksheet 1 • Pages 7 – 10

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CHAPTER 13

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Textbook 1 P150

Answers Worksheet 1 (Workbook 1B P7 – 10)

1. (a) 3; 6; $6 + 6 + 6 = 18$; 18

(b) 2; 8; $8 + 8 = 16$; 16

2. (a)

4 groups of 2 = 8

4 twos = 8

(b)

10 groups of 5 = 50

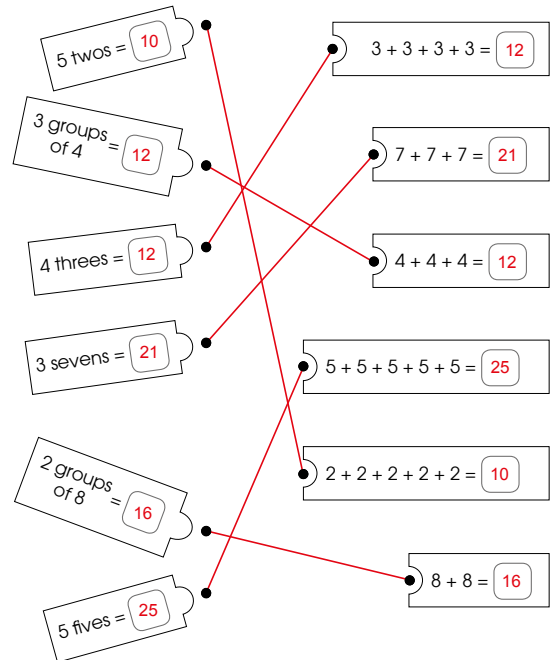
10 fives = 50

(c)

3 groups of 6 = 18

3 sixes = 18

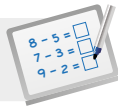
3.



4. (a) 7 by 2 or 2 by 7

(b) 5 by 8 or 8 by 5

(c) 3 by 9 or 9 by 3

**Specific Learning Focus**

- Illustrate multiplication as repeated addition.
- Add equal groups to find the total number of objects.

Suggested Duration

2 periods

Prior Learning

Addition of 3 numbers has been done in Chapter 11. Understanding the concept of adding 3 numbers helps pupils understand multiplication, which is the repeated addition of numbers.

Pre-emptive Pitfalls

Since multiplication is a new concept to pupils, the C-P-A approach has to be implemented to make the concept crystal clear. At this level, pupils are not expected to learn multiplication tables.

Introduction

Let's Learn (Textbook 1 P148) emphasises the key concept of multiplication as the repeated addition of groups of equal number of objects. Let's Learn 1 introduces the '2' times table informally by emphasising $3 \times 2 = 6$ as '3 twos' or 3 groups of 2, where 2 is the same number added 3 times.

Problem Solving

Introducing groups of unequal number of objects will show pupils the distinction between repeated addition of groups of equal number of objects (multiplication) and other types of addition (addition involving different numbers).

Activities

Use a large number of real-life objects and show how they can be grouped into groups of equal number of objects. Stickers of the same shape and design can come in handy when showing the sets visually.

Resources

- 2-colour counters
- paper plates
- array cards
- real-life objects
- stickers sheets

Mathematical Communication Support

The questions in 'Practice' (Textbook 1 P149 – 150) encourage description of sets verbally in class. Explain and introduce arrays using the array card (Activity Handbook 1 P40) emphasising that a number can be described in different ways, leading to the concept of $2 \times 3 = 6$ or $3 \times 2 = 6$. The questions (Workbook 1B P7 – 10) should be described in class before the pupils attempt them in the workbook.

MAKING MULTIPLICATION STORIES

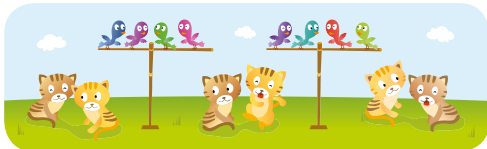
LEARNING OBJECTIVES

1. Make multiplication stories and use the multiplication sign (\times) to write the mathematical equation for a given situation.

MAKING MULTIPLICATION STORIES

LESSON
2

IN  FOCUS



What number stories can you make from the picture?

LET'S LEARN 

1.



There are 3 groups.
Each group has 2 cats.

$$2 + 2 + 2 = 6$$

3 groups of 2 = 6

We write $3 \times 2 = 6$

There are 6 cats altogether.

$3 \times 2 = 6$ is a **multiplication fact**.

$3 \times 2 = 6$ is read as three **times** two **equals** six.

\times is to multiply.

3×2 is the same as 6.



IN  FOCUS

Encourage pupils to talk about the animals and how they are grouped. Ask pupils to recall what they have learnt in Lesson 1 (on equal groups and finding the total).

Introduce the new operation 'multiplication' along with the symbol ' \times ' and write these on the whiteboard.

LET'S LEARN 

Describe how the kittens are grouped as done in Lesson 1. Emphasise the language of equal groups.

Lead pupils to translate the repeated addition to multiplication, introducing the language and symbols of a multiplication story.

$$2 + 2 + 2 = 6$$

$$3 \times 2 = 6$$

Read the multiplication equation aloud (3 times 2 equals 6).

2.



There are 2 stands.
 Each stand has 4 birds.
 $4 + 4 = 8$
 2 groups of 4 = 8
 $2 \times 4 = 8$
 There are 8 birds altogether.

PRACTICE



Look at the picture.
 Complete the multiplication story.

(a)



Each plate has 3 chocolates.

$$3 + 3 + 3 + 3 + 3 = 15$$

$$3 \times 5 = 15$$

There are 15 chocolates in all.

(b)



Each bee has 6 legs.

$$6 + 6 + 6 = 18$$

$$6 \times 3 = 18$$

There are 18 legs in all.

Complete Workbook 18, Worksheet 2 • Pages 11 – 14

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CHAPTER 13

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Textbook 1 P152

Reinforce the multiplication concept with Let's Learn 2. First, get pupils to see that the birds are in equal groups. Since this is the case, a multiplication story can be told.

Invite class participation and guide the pupils to refine their answers.

PRACTICE



Help the pupils to read and understand each question.

Avoid chorus answers from pupils and encourage participation by inviting individual responses. Ask the pupils how they get their answers and if possible, get another pupil to verify the answer.

For better understanding, select items from **Worksheet 2** and work these out with the pupils.

Independent seatwork

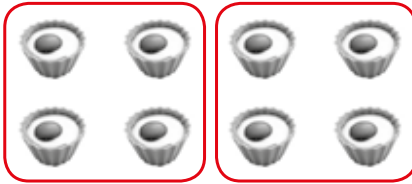
Assign pupils to complete Worksheet 2 (Workbook 1B P11 – 14).

Activity Draw a multiplication story

Procedure

1. Show an example for the class before allowing them to start the activity.
2. Assign pupils to work in groups of 3 to 4.
3. Provide pupils with paper and markers.
4. Each group is required to think of objects and draw equal groups of these objects.
After which, they are to write the multiplication equation for their picture.
5. Remind the pupils that the number of groups and the number of objects in each group must be smaller than 10.

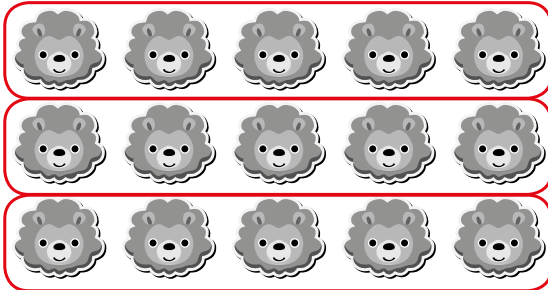
1. (a)



$$4 + 4 = 8$$

$$2 \times 4 = 8$$

(b)



$$5 + 5 + 5 = 15$$

$$3 \times 5 = 15$$

2. (a) 3; 7; $3 \times 7 = 21$; 7

(b) 5; 6; $5 \times 6 = 30$; 30

3. (a) 5; 4; $5 \times 4 = 20$; 20

(b) 6; 6; $6 \times 6 = 36$; 36

(c) 4; 9; $4 \times 9 = 36$; 36

(d) 5; 8; $5 \times 8 = 40$; 40

LESSON

3

SOLVING WORD PROBLEMS

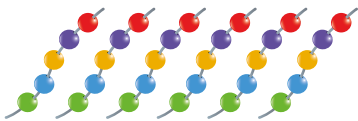
LEARNING OBJECTIVES

1. Solve 1-step word problems with pictorial representation.

SOLVING WORD PROBLEMS

LESSON
3

IN  FOCUS



How many beads are there altogether?

LET'S LEARN 

1.

How many strings do you see?

How many beads are there on each string?



There are 6 strings.
Each string has 5 beads.

$$6 \text{ groups of } 5 = 30$$

$$6 \times 5 = 30$$

There are 30 beads altogether.

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MULTIPLICATION 153

IN  FOCUS

Assign pupils to work in pairs to discuss the picture. Get them to think of a multiplication story.

Invite pupils to share their stories with the class.

LET'S LEARN 

Using the pupils' stories, refer to the picture of the beads once again.

Talk about how the beads are grouped, how the total number of beads can be found and how they can check if their answer is correct.

Textbook 1 P153

2. There are 3 trees.
Each tree has 7 oranges.
How many oranges are there altogether?



3 groups of 7 = 21

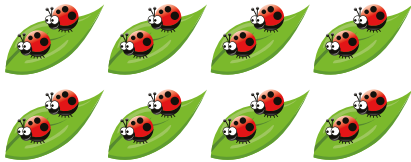
$3 \times 7 = 21$

There are 21 oranges altogether.

What do you need to know to find out the total number of oranges?



3. There are 8 leaves.
Each leaf has 2 ladybirds.
How many ladybirds are there altogether?



$8 \times 2 = 16$

There are 16 ladybirds altogether.

As multiplication involves adding of equal groups, show pupils that they can check if the answer they got from their multiplication equation is correct through repeated addition.

At this stage, pupils are not expected to memorise their multiplication facts. To find the answer, recall strategies such as addition of three numbers to find the total. For smaller numbers, pupils can be taught to do skip counting.

Repeat the process with two other examples to reinforce the concept of multiplication.

PRACTICE

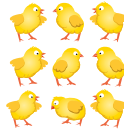


Solve.

1. There are 9 chicks.
Each chick has 2 legs.
How many legs do they have in all?

$9 \times 2 = 18$

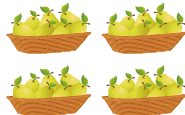
They have 18 legs in all.



2. There are 4 baskets.
Each basket has 7 pears.
How many pears are there in all?

$4 \times 7 = 28$

There are 28 pears in all.



Complete Workbook 1B, Worksheet 3 • Pages 15 – 17

MIND WORKOUT

Xinyi wants to buy 8 cupcakes for a party.



Use to help you.



She wants to have an equal number of cupcakes in each box.
How many ways can Xinyi buy the cupcakes?

PRACTICE



Help the pupils to read and understand each question.

Avoid chorus answers from pupils and encourage participation by inviting individual responses. Ask the pupils how they get their answers and if possible, get another pupil to verify the answer.

For better understanding, select items from **Worksheet 3** and work these out with the pupils.

Independent seatwork

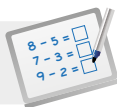
Assign pupils to complete Worksheet 3 (Workbook 1B P15 – 17).

Answers Worksheet 3 (Workbook 1B P15 – 17)

- $5 \times 3 = 15$; 15
- $3 \times 6 = 18$; 18
- $3 \times 8 = 24$; 24

- $6 \times 5 = 30$; 30
- $4 \times 9 = 36$; 36
- $7 \times 5 = 35$; 35

LESSON PLAN



Chapter 13 Lessons 2 & 3

Specific Learning Focus

- Make multiplication stories and use the multiplication sign (\times) to write the mathematical equation for a given situation.
- Solve 1-step word problems with pictorial representation.

Suggested Duration

Lesson 2: 2 periods
Lesson 3: 2 periods

Prior Learning

Pupils have been introduced to the concept of multiplication as repeated addition in Lesson 1. This lesson formalises the concept of multiplication with the introduction of the multiplication sign (\times) and multiplication equation.

Pre-emptive Pitfalls

The transition of repeated addition to multiplication equation could be challenging for most pupils to comprehend. After pupils understand the concept of repeated addition in groups and arrays taught in Lesson 1, the introduction of multiplication symbol will be easier for the teacher to explain.

Introduction

After a brief recap of Lesson 1, replace the phrase 'repeated addition' with 'multiplication' and introduce the word 'multiplication'. Also introduce the multiplication symbol (\times). This transition can be made smooth with real-life stories. Use 'In Focus' (Textbook 1 P151) to relate multiplication to real-life stories. Using the picture in 'In Focus', give an example of finding the total number of cats altogether. Explain that this can be found by repeated addition ($2 + 2 + 2 = 6$) or the easier and faster method which is multiplication ($3 \times 2 = 6$). Guide pupils to see that the same number '2' is being repeated 3 times.

Problem Solving

Emphasise that multiplication is only applicable if the same number is repeated or if the number of objects in each group is equal. In Lesson 3, pupils learn to solve word problems with real-life examples, which further reinforces the concept of multiplication. 'In Focus' (Textbook 1 P153) can be used to come up with a multiplication statement using the 'arrays' concept and expressed in two ways. Counting and repeated addition can be used as alternate methods to check the multiplication equation and its answer (Textbook 1 P154). In 'Mind Workout' (Textbook 1 P155), distributing the cupcakes equally into the boxes shows groups of equal number of objects and therefore a multiplication equation can be formed. Maths Journal (Textbook 1 P156) can be used as an activity for class discussion, prompt the pupils' thinking by asking them for the number of cars, total number of wheels, etc.

Activities

Bring food items into the classroom and distribute equally to the pupils. Demonstrate the concept of array by getting the pupils to stand in rows and columns and then have them come up with two multiplication equations based on that array.

Resources

- real-life objects
- array cards
- big cut-outs of pictures (for pupils to make multiplication stories)

Mathematical Communication Support

$2 \times 5 = 10$ is a multiplication equation or multiplication fact. Have the pupils read aloud that 2 times 5 equals 10 or 2 groups of 5 make 10. Enunciate this on the board with multiple examples. Show pupils big cut-outs of picture such as a group of animals in a park or a group of food items in a store, and encourage them to make equal groups and come up with multiplication facts.

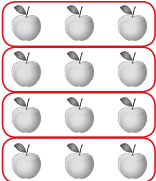
PROBLEM SOLVING, MATHS JOURNAL AND PUPIL REVIEW



Mind Workout

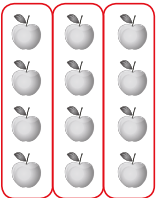
Date: _____

Circle the apples to make groups.



4 groups of 3

$$4 \times 3 = 12$$



3 groups of 4

$$3 \times 4 = 12$$

Are 4 groups of 3 the same as 3 groups of 4?

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Mind Workout

By looking at the picture, pupils are able to answer the question.

Lead pupils to the conclusion that in multiplication:

- 4 groups of 3
 $3 + 3 + 3 + 3 = 12$
 $4 \times 3 = 12$
- 3 groups of 4
 $4 + 4 + 4 = 12$
 $3 \times 4 = 12$
- Therefore, $3 \times 4 = 4 \times 3$

Get pupils to create another example to show
 $2 \times 3 = 3 \times 2$.

Ask them to draw and show the equal groupings for both situations.

Workbook 1B P18

Solve.

PRACTICE

- There are 9 chicks.
Each chick has 2 legs.
How many legs do they have in all?

$9 \times 2 = 18$

They have 18 legs in all.



- There are 4 baskets.
Each basket has 7 pears.
How many pears are there in all?

$4 \times 7 = 28$

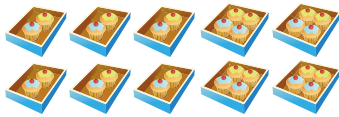
There are 28 pears in all.



Complete Workbook 1B, Worksheet 3 • Pages 16 - 17

MIND WORKOUT

Xinyi wants to buy 8 cupcakes for a party.



Use to help you.



She wants to have an equal number of cupcakes in each box.
How many ways can Xinyi buy the cupcakes?

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MULTIPLICATION 155

Textbook 1 P155



MIND WORKOUT

Help pupils to read and understand the situation in the picture by asking questions. Some questions that can be asked are as follows:

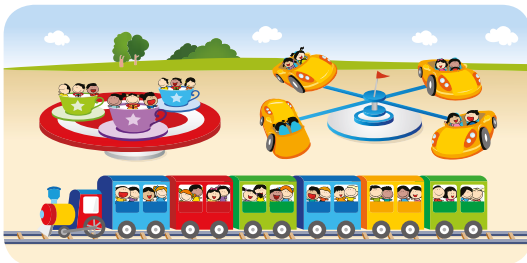
- How does Xinyi want to buy her boxes of cupcakes?
- How are the cupcakes packed? Are they in equal groups?

Help pupils to see that Xinyi wants boxes that have the same number of cupcakes.

Pupils are to use deductive thinking to select four boxes of two cupcakes or two boxes of four cupcakes. Get them to check their answers through repeated addition.

MATHS JOURNAL

Look at the picture.



Make a story for the multiplication fact $3 \times 3 = 9$.
Make two other multiplication stories.
Use the words below to help you.

car train carriage teacup

I know how to...

- add equal groups to find the total number of objects.
- make multiplication stories.
- write multiplication facts.
- solve multiplication word problems.

SELF-CHECK



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Textbook 1 P156

MATHS JOURNAL

Allow pupils to work in pairs to talk about the picture.

Show a format of how a multiplication story can be written.

Example

There are cars.

Each car has wheels.

\times =

There are wheels altogether.

Before the pupils do the self check, review the important concepts once more by asking for examples learnt for each objective.

This self check can be done after pupils have completed **Review 13** (Workbook 1B P19 – 22) as consolidation of understanding for the chapter.

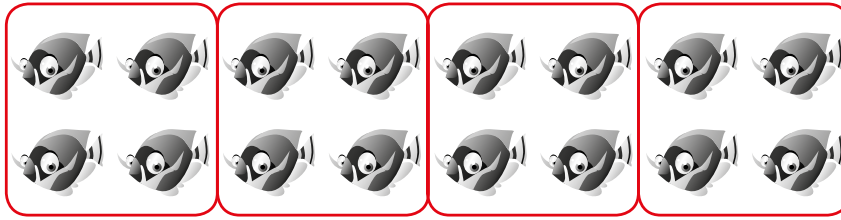
SELF-CHECK



Answers Review 13 (Workbook 1B P19 – 22)

1. 3; 3; $3 + 3 + 3 = 9$; 9

2.



4; 16; 4; 16

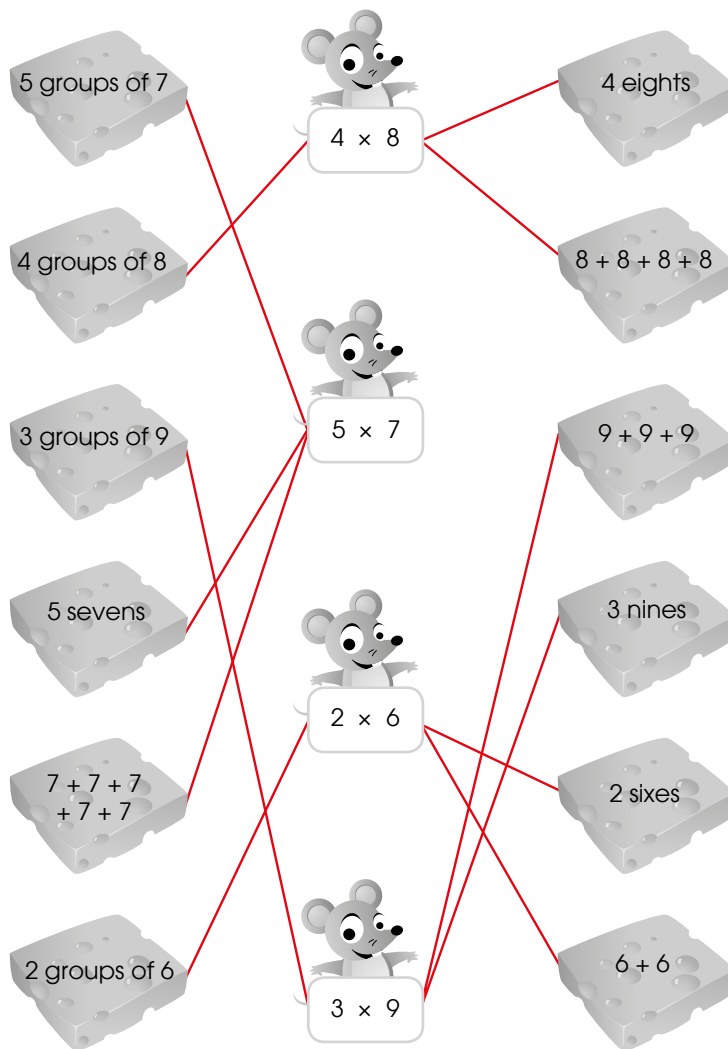
3. (a) 2; 4; $4 + 4 = 8$; $2 \times 4 = 8$; 8

(b) 4; 3; $3 + 3 + 3 + 3 = 12$; $4 \times 3 = 12$; 12

4. $6 \times 3 = 18$; 18

5. 8 by 7 or 7 by 8

6.



DIVISION

CHAPTER 14

Division

CHAPTER 14

How can the girls pack the objects into equal groups?



GROUPING

LESSON 1

IN FOCUS



Kate puts 2 cans of mushroom soup into each group.
How many groups are there?

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DIVISION 157

Textbook 1 P157

Related Resources

NSPM Textbook 1 (P157 – 164)
NSPM Workbook 1B (P23 – 38)

Materials

2-colour counters, multilink cubes, paper plates, stickers

Lesson

Lesson 1 Grouping
Lesson 2 Sharing Equally

Problem Solving, Maths Journal and Pupil Review

INTRODUCTION

At Primary 1, the division symbol and the number sentence are not introduced. However pupils will encounter the two concepts of division through real-world situations with concrete materials or pictures, and the associate language of grouping and sharing equally. The grouping concept starts with a known collection of objects to be put into equal groups and then to find the number of groups formed. Sharing equally also starts with a known collection of objects and a known number of groups. The experience of sharing equally is through distributing the collection of things fairly into equal groups and then to find the number of objects in each group. Division stories are used to describe the concrete situations. The grouping concept of division is introduced first as it links directly with multiplication that pupils have just learned in Chapter 13.

LESSON

1

GROUPING

LEARNING OBJECTIVES

1. Illustrate the grouping concept of division
2. Find the number of equal groups.

Division CHAPTER **14**

How can the girls pack the objects into equal groups?



GROUPING LESSON **1**

IN FOCUS



Kate puts 2 cans of mushroom soup into each group.
How many groups are there?

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Textbook 1 P157

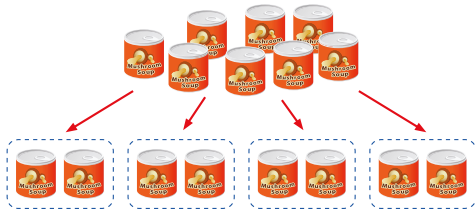


Use the chapter opener as a stimulus picture to discuss with pupils the objects they see in the picture.

Ask pupils how each group of objects can be packed into equal groups and how many equal groups there will be (e.g. If Kate packs the cans into groups of 2, how many groups are there?).

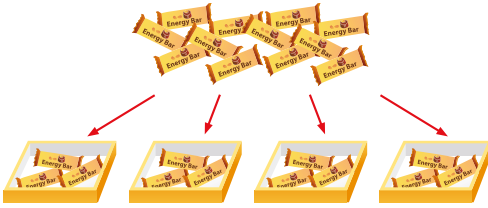
Alternatively, the objects can be represented with concrete models for manipulation.

1. There are 8 cans.



There are 4 groups.

2. There are 12 bars. Meiling puts 3 bars in each box. How many boxes does she need?



Meiling needs 4 boxes.

Introduce the concept of grouping objects into equal groups and find the number of these groups.

Taking 8 counters (or any other concrete objects) to represent the 8 cans of mushroom soup, shift them into groups of 2 until all counters are distributed.

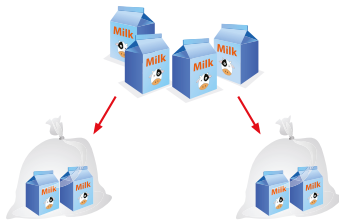
Emphasise the language patterns of grouping into equal groups:

- How many objects are there at first?
- How many objects are put into each group?
- How many equal groups are made?

Reinforce the concept of forming equal groups with Let's Learn 2 and 3. In these examples, the terms 'boxes' and 'bags' are used to substitute 'groups'.

Use of concrete objects allows for the demonstration of repeated subtraction for grouping in division.

3. There are 4 milk cartons. Kate puts 2 cartons in each bag. How many bags are there?



There are 2 bags.

ACTIVITY TIME

Work in pairs.

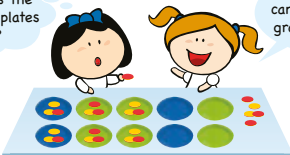
- 1 Count out 24 .
- 2 Put 3 on each .
- 3 Make equal groups of different numbers with the and the .

What you need:



What does the number of plates show?

How many ways can you make equal groups with 24 .



ACTIVITY TIME



Assign pupils to work in pairs. Provide each pair with 12 paper plates and 24 counters.

In this activity, pupils use repeated subtraction to find the number of equal groups that can be formed from a quantity. This requires pupils to guess and check to obtain all the possible groupings.

For each trial, get pupils to record their findings, including the incorrect groupings (e.g. equal groups of 5 cannot be made in this case).



PRACTICE

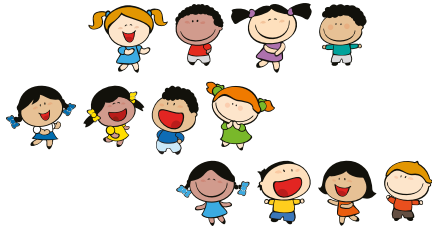


1. Bala has 18 pencils.
He puts 6 pencils equally in each box.
How many boxes does Bala need?



Bala needs 3 boxes.

2. There are 12 children at a party. 4 children are seated at each table. How many tables are there?



There are 3 tables.

Complete Workbook 1B, Worksheet 1 • Pages 23 – 26

Allow pupils to work in pairs and provide counters for each pair. Extend the activity by asking how many boxes Bala would need if he decides to make equal groups of 3.

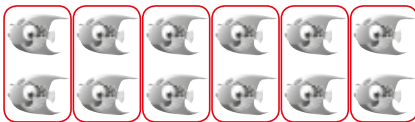
For better understanding, select items from **Worksheet 1** and work these out with the pupils.

Independent seatwork

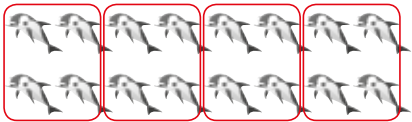
Assign pupils to complete Worksheet 1 (Workbook 1B P23 – 26).

Answers Worksheet 1 (Workbook 1B P23 – 26)

1. (a) 6



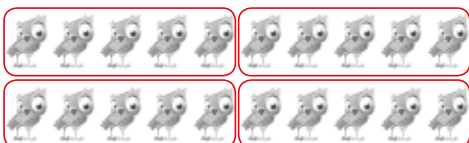
- (b) 4



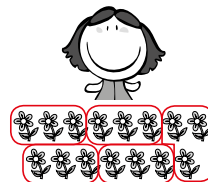
- (c) 2



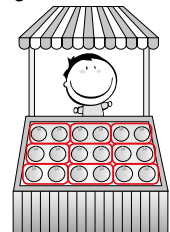
- (d) 4



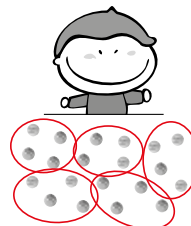
2. (a) 5



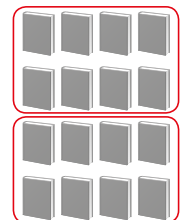
- (b) 9

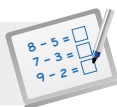


- (c) 5



- (d) 2



**Specific Learning Focus**

- Illustrate the grouping concept of division.
- Find the number of equal groups.

Suggested Duration

2 periods

Prior Learning

This lesson is a continuation of multiplication. In this chapter, division is introduced informally as grouping and sharing equally, which is the reverse of multiplication (repeated addition of the same number).

Pre-emptive Pitfalls

If pupils still do not understand multiplication that was taught in Chapter 13, it would be more challenging to explain to pupils the grouping concept of division.

Introduction

Since pupils have been exposed to the concept of an array of dots or objects in Chapter 13, grouping objects equally would be easier for them. 'Let's Learn' (Textbook 1 P158 – 159) can be carried out in class using real-life objects through the C-P-A approach. It will be much easier for pupils to do the grouping if they are allowed to carry out 'Let's Learn' as hands-on activities. At this stage, division is not formally introduced (i.e. the division symbol and division equation or fact are not introduced).

Problem Solving

Division can be explained as repeated subtraction of the same number until 0, and this is exactly the reverse of what was taught in Chapter 13 (multiplication is repeated addition). Reinforce the fact that in division problems, groups can be in the form of boxes, cartons, friends, etc., each getting an equal share.

Activities

The activity (Textbook 1 P159) requires 24 coloured counters and plates. Determining the number of ways we can make equal groups with 24 leads to the array concept of 3×8 or 8×3 . Alternatively, we can have 12×2 or 2×12 .

Resources

- 2-colour counters
- paper plates

Mathematical Communication Support

Emphasise the language of mathematical reasoning by applying the 'teach by asking' method.

Examples:

1. How many objects are there altogether that need to be distributed?
2. How can you group objects into groups of equal number of objects?
3. How have you shared the objects equally?
4. How many equal groups have you made, bearing in mind that there must not be any remaining objects left ungrouped.

SHARING EQUALLY

LEARNING OBJECTIVES

1. Share things equally.
2. Find the number of things in each group.

SHARING EQUALLY

IN  FOCUS



There are 6 cookies.
Each child takes the same number of cookies.
How many cookies does each child have?

LET'S LEARN

1. Each child takes one cookie first.



Each child takes one more cookie.



3 children each take the same number of cookies.
Each child has 2 cookies.

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DIVISION

161

Textbook 1 P161



Get three pupils to act out the scenario as shown in the picture.

Use counters to represent the cookies and give 6 counters to one pupil. Get the pupil to distribute the counters unequally, giving 1 and 2 counters respectively to the other two pupils. Ask if this distribution is fair and invite responses from the class.

Repeat the activity and get the pupil to distribute the counters equally among the three of them. Guide the pupils until all the counters are evenly distributed.

Recall with pupils that Lesson 1 covers how numbers of equal groups can be found. This lesson will show how the number of objects in each equal group can be found.

LET'S LEARN

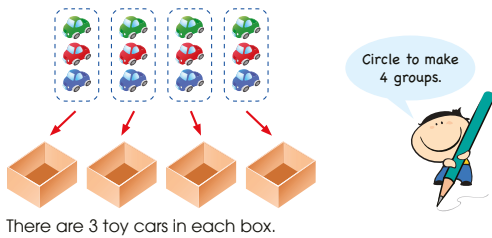
In Let's Learn 1, both the total number of objects (6 cookies) to be shared and the number of groups (3 plates or 3 children) are known. What is left to be found is the number of objects in each group.

Model the action of sharing equally by giving one counter to each of the 3 pupils in sequence until there are no counters left to be distributed.

Emphasise the language patterns of sharing equally:

- How many cookies are there altogether?
- How many children are there to share equally with?
- How many cookies will each child get?

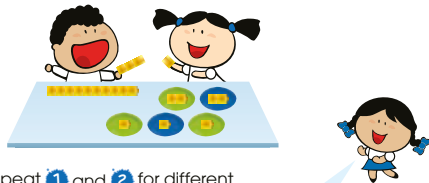
2. There are 12 toy cars.
Put the toy cars into 4 boxes equally.
How many toy cars are there in each box?




Work in pairs.

- Count out 20 .
- Put the  onto 5 plates equally.

What you need:



- Repeat 1 and 2 for different numbers of cubes and paper plates.

Can you put 18  in 5 equal groups? Why?

162

CHAPTER 14

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Textbook 1 P162

Reinforce the concept of finding the number of objects in each equal group with Let's Learn 2.

Emphasise the language patterns by asking the following questions:

- How many toy cars are there altogether?
- How many boxes do we put the toys cars equally into?
- How can we distribute the toy cars equally into the 4 boxes?
- How many toy cars are there in each box?

ACTIVITY TIME



Assign pupils to work in pairs. Observe that pupils form the groups of equal numbers by distributing the counters one at a time, across all plates until all counters are distributed.

Get pupils to record the number of counters that can or cannot be put equally into a given number of paper plates. For example, 20 counters can be put equally into 5 plates and 4 plates, but not in 3 plates.

PRACTICE



- 5 children share 10 sweets equally.
How many sweets does each child get?



Each child gets 2 sweets.

- Put 12 cherries on 3 slices of cake equally.
How many cherries are there on each slice of cake?



There are 4 cherries on each slice of cake.



Complete Workbook 1B, Worksheet 2 • Pages 27 - 32

MIND WORKOUT



Move some balls so that there is the same number of balls in each box.

There will be 5 balls in each box.

You can try this using  and .



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Textbook 1 P163

PRACTICE



Help the pupils to read and understand each question. Guide the pupils along by repeating the language patterns as demonstrated in Let's Learn.

For better understanding, select items from **Worksheet 2** and work these out with the pupils.

Independent seatwork

Assign pupils to complete Worksheet 2 (Workbook 1B P27 - 32).

Answers Worksheet 2 (Workbook 1B P27 – 32)

1. (a) 15; 3; 5
(b) 14; 2; 7
(c) 12; 4; 3
(d) 18; 6; 3

2. (a) 3



- (b) 2



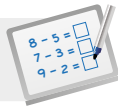
- (c) 3



- (d) 2



3. (a) 5
(b) 3
(c) 4

**Specific Learning Focus**

- Share things equally.
- Find the number of things in each group.

Suggested Duration

2 periods

Prior Learning

In Lesson 1, pupils have been taught how to find the number of equal groups. In this lesson, in continuation from Lesson 1, pupils are required to find the number of objects in each equal group.

Pre-emptive Pitfalls

If a hands-on activity using real-life objects is carried out (e.g. 'In Focus' (Textbook 1 P161)), pupils should not have difficulty dealing with this lesson.

Introduction

This lesson is about sharing things equally. Emphasise to pupils that they have to figure out the same number that is repeated in each group after a whole is divided into equal parts.

Problem Solving

'Mind Workout' (Textbook 1 P163) develops pupils' logical thinking of equal distribution. Moving the balls from one box to another leads to equal grouping. The 'array' concept (3×5) works well here. Guide the pupils by emphasising the key terms in questions.

Activities

The scenario in each question can be demonstrated in class using pictorial representations and hands-on activities. Pupils will be able to distribute equally if they are handed concrete materials or real-life objects. Encourage group or pair work like in the activity (Textbook 1 P162).

Resources

- real-life objects
- multilink cubes
- paper plates

Mathematical Communication Support

Emphasise the importance of using mathematical language and teach by asking questions leading to the mathematical statement and answer as mentioned in the earlier lessons.

PROBLEM SOLVING, MATHS JOURNAL AND PUPIL REVIEW

- (c) Kate has 12 sunflower seeds.
She gives each of her 3 hamsters an equal number of sunflower seeds.
How many sunflower seeds does Kate give each hamster?



Kate gives each hamster sunflower seeds.



Mind Workout

Date: _____



Put the stars in 3 equal groups.

There are stars in each group.



Mind Workout

This task requires pupils to apply their spatial thinking skills with the guess and check strategy.

Pupils can count the stars along the lengths of the rectangular arrangement to find that both have 6 stars each.



On counting the remaining stars, they will find that there are 6 stars as well. This gives 3 groups of 6 stars.

Alternatively, pupils can count the total number of stars and apply the equal sharing method to find the answer.

PRACTICE

- 5 children share 10 sweets equally.
How many sweets does each child get?



Each child gets **2** sweets.

- Put 12 cherries on 3 slices of cake equally.
How many cherries are there on each slice of cake?



There are **4** cherries on each slice of cake.

Complete Workbook 1B, Worksheet 2 • Pages 27 – 32

MIND WORKOUT



Move some balls so that there is the same number of balls in each box.

There will be **5** balls in each box.

You can try this using



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Textbook 1 P163



MIND WORKOUT

Pupils can start this activity by first counting the number of balls in each box (8, 3 and 4 respectively).

There are two different approaches that the pupils can take in solving the problem.

Using logical thinking, pupils should move two balls from the box containing the greatest number into the other two boxes, such that the three boxes will then contain 6, 4 and 5 balls respectively. By comparing, pupils will see that they need to move one ball from the box of 6 to the box of 4, so that there will be 5 balls in each box.

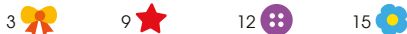
Alternatively, pupils can take the whole collection of 15 balls and do the equal sharing into the 3 boxes to get the answer.

MATHS JOURNAL



Kate is making birthday cards for 3 friends.
She wants to put the same number of objects on each card.

She has the following objects:



On a piece of paper, draw 3 birthday cards.
Put the objects on each card equally.
Draw to show how you put the same number of each object on each card.

I know how to...

- find the number of equal groups.
- share objects equally.

SELF-CHECK



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Textbook 1 P164

MATHS JOURNAL

Allow pupils to work in groups of 3 so that each pupil can work on one card.

For more hands-on experience, give each pupil an A4 paper, which can be folded to make a blank card. Provide stickers for each group as each of these stickers represents the objects as shown in the picture.

Encourage pupils to be creative in decorating their cards. Remind each group that the four types of stickers have to be shared equally among the three of them.

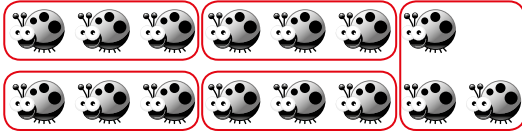
SELF-CHECK



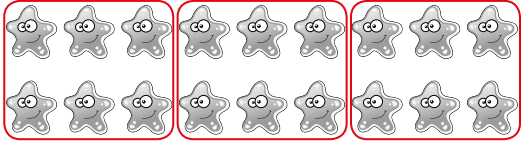
Before the pupils do the self check, review the important concepts once more by asking for examples learnt for each objective.

This self check can be done after pupils have completed **Review 14** (Workbook 1B P33 – 38) as consolidation of understanding for the chapter.

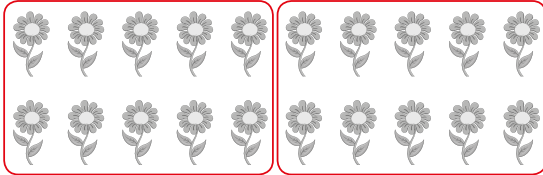
1. (a) 5



(b) 3



2. (a) 10



(b) 2



3. (a) 12

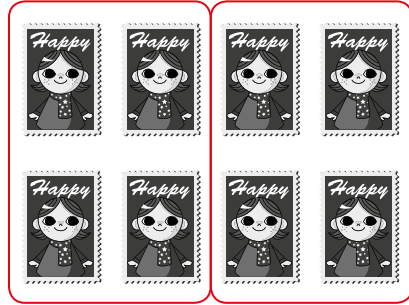
(b) 4

(c) 3

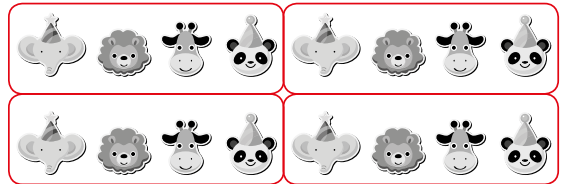
(d) 6

(e) 2

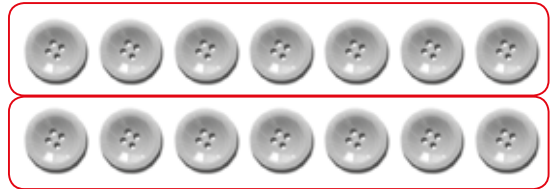
4. (a) 2



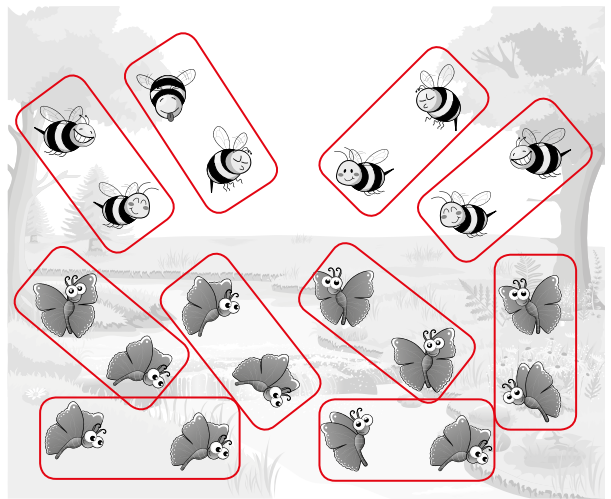
(b) 4



(c) 7



5.



(a) 4

(b) 6

NUMBERS TO 100

CHAPTER

15

Numbers to 100

CHAPTER 15

How many crayons are there altogether?

COUNTING TO 100

LESSON 1

IN FOCUS

How many crayons are there?
Group in tens.

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NUMBERS TO 100 165

Textbook 1 P165

Related Resources

NSPM Textbook 1 (P165 – 179)
NSPM Workbook 1B (P39 – 56)

Materials

Straws, rubber bands, base-ten blocks, place-value charts, numeral cards, spinners, counters, number grids

Lesson

Lesson 1 Counting to 100
Lesson 2 Place Value
Lesson 3 Comparing and Ordering Numbers
Lesson 4 Number Patterns

Problem Solving, Maths Journal and Pupil Review

INTRODUCTION

This chapter revisits the concepts that are taught in Chapter 10 (Numbers to 40). Pupils will learn to count in tens, as well as read and write numbers from 40 to 100. The place-value concept of tens and ones will be reinforced with the use of concrete materials such as base-ten blocks, whereby pupils are given activities in counting and making tens and ones for 2-digit numbers. Strategies to help pupils compare and order 2-digit numbers are suggested. Pupils are exposed to counting patterns and relationships using the number ladder and a hundred-chart.

LESSON

1

COUNTING TO 100

LEARNING OBJECTIVES

1. Count to 100 in steps of 10.
2. Read and write numbers to 100 in numerals and in words.

Numbers to 100

CHAPTER 15

How many crayons are there altogether?



COUNTING TO 100

LESSON 1

IN  FOCUS

How many crayons are there?
Group in tens.



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NUMBERS TO 100 165

IN  FOCUS

Get pupils to discuss the chapter opener. Highlight to pupils that some of the crayons are in boxes of 10 while others are on the floor.

Ask pupils to count the total number of crayons and encourage them to find quicker ways to count. Lead them to make 10 with the crayons lying on the floor, then count in tens.

There are a total of 10 tens. Tell pupils that this is also equal to 100.

Textbook 1 P165

LET'S LEARN

1. 1 ten



Count in tens.
10 ones = 1 ten



10
ten

2 tens



20
twenty

3 tens



30
thirty

4 tens



40
forty

5 tens



50
fifty

6 tens



60
sixty

7 tens



70
seventy

166

CHAPTER 15

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Textbook 1 P166

LET'S LEARN

Before referring to P166 – 167, assign pupils to work in groups of 4 to 6. Provide 100 straws and 10 rubber bands for each group. The activity will require pupils to make 10.

Get each group to make bundles of 10 straws, securing each bundle using a rubber band. Allow the pupils to work on this for 5 to 10 minutes. After all groups are done, get each group to line up their bundles. Each group will count the number of bundles they have in front of the class.

Get some pupils to count the number of straws altogether, based on the number of bundles they have.

Refer back to P166 – 167 and use the bundles of straws made to discuss the total number of crayons.

List the numerals 10 to 100 on the whiteboard, providing blanks next to each numeral for spelling the number in words.

10 _ _ _
20 _ _ _ _ _

For each numeral, get some pupils to show the number using the bundles of straws, say the number and spell it out.

Alternatively, guide the pupils in writing and spelling the numbers as a class. While going through each number, get pupils to write in numerals and in words on their mini whiteboards.

After the pupils have learnt the numbers 10 to 100 in numerals and in words, it is necessary for them to recognise the pattern or reading and writing numbers in tens and ones within 100.

In Let's Learn 2, help pupils to read 2-digit numbers by separating them into tens and ones. Pupils should know that 50 is spelled as fifty and since there is 50 and 2 in 52, the number 52 will be read as fifty-two. Highlight that the hyphen separates the tens and the ones.

Repeat this for other numbers, getting pupils to read and write the numbers in numerals and in words on their mini whiteboards.

In Let's Learn 3, 100 is separated into 9 tens and 10 ones. Starting from 90, count the loose ones to 100. This serves to emphasise that 10 tens make up 100.

8 tens



80
eighty

9 tens



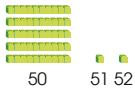
90
ninety

10 tens



100
one hundred

2.



We can count in tens and ones.



We read 52
as fifty-two.

$$50 + 2 = 52$$

3.



How many tens make 100?



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NUMBERS TO 100 167

Textbook 1 P167



Work in pairs.

- 1 Think of a 2-digit number between 40 and 100.
- 2 Use to show the number. Ask your partner to guess the number of cubes. Then, get him to count the cubes.
- 3 Take turns and repeat 1 and 2.

What you need:



Can you use to show 100?



PRACTICE

Count. Write in numerals and in words.

1. 90 ninety
2. 60 sixty
3. 78 seventy-eight
4. 85 eighty-five

Textbook 1 P168

Assign pupils to work in pairs. Provide pupils with some base-ten blocks.

One pupil thinks of a 2-digit number between 40 and 100 and uses base-ten blocks to show the number. The other pupil has to first guess the number of cubes shown, then confirm his or her guess by counting them.

Pupils are to switch roles and repeat the activity.

PRACTICE

Help the pupils to read and understand each question.

Avoid chorus answers from pupils and encourage participation by inviting individual responses. Ask the pupils how they get their answers and if possible, get another pupil to verify the answer.

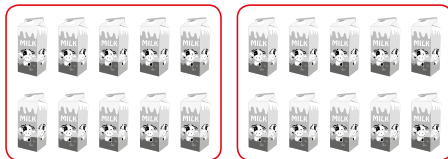
For better understanding, select items from **Worksheet 1** and work these out with the pupils.

Independent seatwork

Assign pupils to complete Worksheet 1 (Workbook 1B P39 – 42).

Answers Worksheet 1 (Workbook 1B P39 – 42)

1. (a) 2 tens = 20



- (b) 7 tens = 70



2. 80, eighty; 90, ninety; 70, seventy; 100, one hundred; 60, sixty

3. (a)

31	thirteen
	thirty-one

- (b)

45	forty-five
	fifty-four

- (c)

91	ninety-one
	nineteen

- (d)

18	eighteen
	eighty

- (e)

60	sixteen
	sixty

- (f)

78	eighty-seven
	seventy-eight

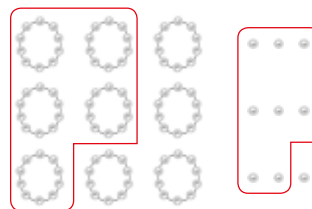
- (g)

51	fifty-one
	fifteen

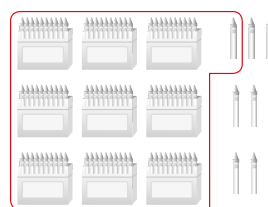
- (h)

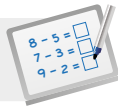
69	sixty-nine
	ninety-six

4. (a) fifty-eight



- (b) ninety-one



**Specific Learning Focus**

- Count to 100 in steps of 10.
- Read and write numbers to 100 in numerals and in words.

Suggested Duration

2 periods

Prior Learning

This is in continuation to Chapters 1, 6 and 10. Pupils are taught the 'ty' numbers and learn to count in tens up to 100. Most pupils should be able to count in tens up to 100 as they should understand the numeracy pattern of adding one ten from one 'ty' number to the next.

Pre-emptive Pitfalls

The only possible pitfall could be that pupils do not have a good sense of the numbers and learn by chant and rote. Making the numbers tangible is the key idea of this lesson.

Introduction

It is important to guide pupils to count in a quicker and easier way. Therefore, skip counting in tens is emphasised in this lesson and at the same time, the 'ty' numbers are being introduced. The intermediate numbers (numbers in between two 'ty' numbers) can be shown on a number line. Making the numbers tangible is important. Using concrete materials like base-ten blocks, straws, ice cream sticks, etc. works well. Make sure each bundle or packet is a group of ten and tied using rubber bands, and the loose ones represent 'ones'. After the pupils are familiar with the 'ty' numbers and their spellings by being engaged in a pop quiz conducted by the teacher in class, ask them to write the intermediate numbers in numerals and in words.

Problem Solving

Maths Journal (Textbook 1 P179) involves the application of numbers in real life and this takes the C-P-A approach. It is a fun activity where the learning will go beyond the classroom and involve the family and the community.

Activities

The activity (Textbook 1 P168), using base-ten blocks, and 'Let's Learn' and 'Practice' (Textbook P166 – 167) can be done as activity in pairs in class. Pupils can take turns and test their partners and correct them where necessary.

Resources

- base-ten blocks
- real-life objects (e.g. bundles of straws and ice cream sticks)
- mini whiteboards

Mathematical Communication Support

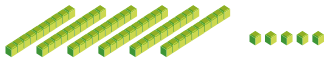
Think of numbers found around the environment and encourage answers from pupils, e.g. home address, building number, etc. Using the number line to discuss the 'ty' numbers with ones (e.g. fifty-two) will help pupils better understand numbers to 100.

LEARNING OBJECTIVES

1. Use a place-value chart to show 2-digit numbers within 100.
2. Interpret numbers within 100 in tens and ones.

PLACE VALUE

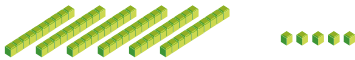
IN  FOCUS



There are 65 cubes.

What does the digit 6 in 65 stand for?
What does the digit 5 in 65 stand for?

LET'S LEARN 



Tens	Ones
6	5

$65 = 6 \text{ tens } 5 \text{ ones}$

$65 = 60 + 5$

There are 65 cubes.

The digit 6 in 65 stands for 60.

The digit 5 in 65 stands for 5.

How many tens and how many ones are there?



IN  FOCUS

Assign pupils to work in groups of 3 to 4 and provide each group with sets of base-ten blocks.

Review with pupils the structure of the blocks, where 1 long block is called 1 ten as it is made up of 10 ones. Get pupils to count the number of cubes to verify.

Ask a pupil to represent 65 using the base-ten blocks over the visualiser. Ask the class the following questions:

- What does the digit 6 show? (6 tens or 60)
- What does the digit 5 show? (5 ones or 5)

The key terms **tens** and **ones** will be emphasised here.

For further practice, get pupils to come up with other numbers, after which a few volunteers can present to the class.

LET'S LEARN 


Display a blank place-value chart on the visualiser and state that it is used to show the values of digits in a number.

Using base-ten blocks to represent the number 65, separate the blocks into tens and ones, then fill in the blank place-value chart as illustrated on P169.

Use other examples and get pupils to fill in the place-value chart and write its expanded form in tens and ones.

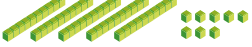
Work in pairs.

1 Think of a 2-digit number between 40 and 100.

2 Use  to show the number in tens and ones.

3 Ask your partner to write the number on a .

Example

58 

Tens	Ones
5	8

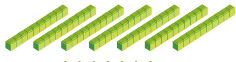
4 Take turns and repeat 1 to 3.

What you need:



PRACTICE 

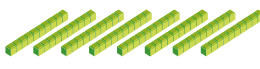
Count in tens and ones.

1. 

Tens	Ones
7	7

$77 = 7$ tens 7 ones

$77 = 70 + 7$

2. 

Tens	Ones
8	0

$80 = 8$ tens 0 ones

$80 = 80 + 0$

Complete Workbook 1B, Worksheet 2 • Pages 43–46

Assign pupils to work in pairs. Provide base-ten blocks and a blank place-value chart for each pair.

One pupil thinks of a 2-digit number between 40 and 100 and uses base-ten blocks to show the number. The other pupil counts the blocks and writes the number on the place-value chart.

Pupils are to switch roles and repeat the activity.

PRACTICE 

Help the pupils to read and understand each question.

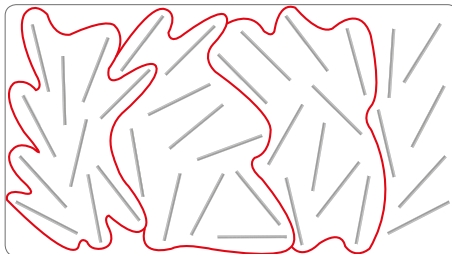
For better understanding, select items from **Worksheet 2** and work these out with the pupils.

Independent seatwork

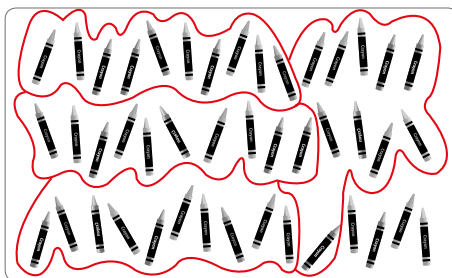
Assign pupils to complete Worksheet 2 (Workbook 1B P43–46).

Answers Worksheet 2 (Workbook 1B P43–46)

1. (a) 36



(b) 44



2. (a)

Tens	Ones
4	5

$45 = 4$ tens 5 ones

$45 = 40 + 5$

(b)

Tens	Ones
6	2

$62 = 6$ tens 2 ones

$62 = 60 + 2$

(c)

Tens	Ones
8	0

$80 = 8$ tens 0 ones

$80 = 80 + 0$

3. (a)

Tens	Ones
4	3

$43 = 4$ tens 3 ones

$43 = 40 + 3$

(b)

Tens	Ones
5	9

$59 = 5$ tens 9 ones

$59 = 50 + 9$

(c)

Tens	Ones
8	5

$85 = 8$ tens 5 ones

$85 = 80 + 5$

(d)

Tens	Ones
5	1

$51 = 5$ tens 1 one

$51 = 50 + 1$

(e)

Tens	Ones
7	4

$74 = 7$ tens 4 ones

$74 = 70 + 4$

(f)

Tens	Ones
9	8

$98 = 9$ tens 8 ones

$98 = 90 + 8$

**Specific Learning Focus**

- Use a place-value chart to show 2-digit numbers within 100.
- Interpret numbers within 100 in tens and ones.

Suggested Duration

2 periods

Prior Learning

Place value was formally introduced in Chapter 10 and addition, subtraction, comparing and ordering of numbers were taught using the place-value chart. This lesson ties in the same concept but with numbers beyond 40.

Pre-emptive Pitfalls

The use of place-value chart and concrete materials like base-ten blocks is necessary to make the pupils comfortable with numbers up to 100.

Introduction

'In Focus', 'Let's Learn' and 'Practice' (Textbook 1 P169 – 170) involve the breaking of numbers in tens and ones. Hands-on experiences will enhance pupils' numeracy. This provides a good foundation for future mathematical calculations. Bundles or stacks of ten using real-life objects or concrete materials will help pupils to show the numbers in tens and ones (e.g. 77 = 7 tens and 7 ones).

Problem Solving

Using the place-value chart and worksheets (Workbook 1B P43 – 46) will provide pupils with a lot of practice. Reinforce the placing of the digits of numbers in the place-value chart.

Activities

Laminate the place-value chart (Activity Handbook P36) and make groups of objects to represent numbers for pupils to work in pairs and use numeral cards (Activity Handbook P44 - 47) so that pupils are familiar with numbers to 100.

Resources

- numeral cards (Activity Handbook P44 - 47)
- base-ten blocks
- place-value chart

Mathematical Communication Support

Teach by asking pupils to break the numbers into tens and ones. Conduct verbal quizzes in class asking pupils for the spellings of the numbers. Ask them how they fill up the place-value chart and describe in words the breaking of numbers into tens and ones.

COMPARING AND ORDERING NUMBERS

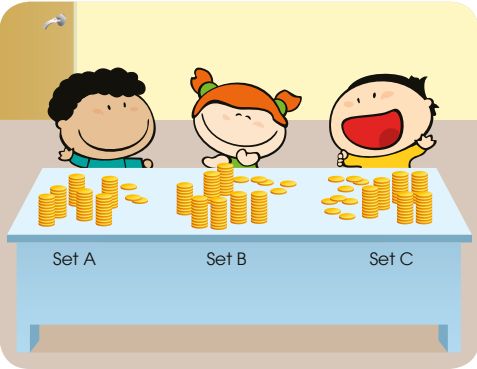
LEARNING OBJECTIVES

1. Compare and order numbers within 100.

COMPARING AND ORDERING NUMBERS

LESSON
3

IN
FOCUS



Which set has the greatest number of coins?
Which set has the smallest number of coins?

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NUMBERS TO 100
171

Textbook 1 P171

IN FOCUS

Using the numbers 54 and 45, ask pupils how these two numbers can be compared.

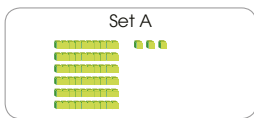
Draw attention to the fact that both numbers have the digits 4 and 5. Then get pupils to talk about the difference between the two numbers.

Provide base-ten blocks for pupils to allow them to compare the two numbers.

Next, demonstrate to pupils how the two numbers can be compared by using a place-value chart. Lead the pupils to see that 45 and 54 can be compared by looking at the digit in the tens place.

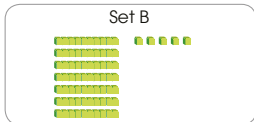
LET'S LEARN

Compare the numbers in Sets A, B and C.



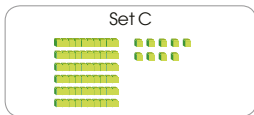
Tens	Ones
6	3

63 = 6 tens 3 ones



Tens	Ones
7	5

75 = 7 tens 5 ones



Tens	Ones
6	9

69 = 6 tens 9 ones

7 tens is greater than 6 tens.
75 is greater than 63.
75 is greater than 69.
75 is the greatest.

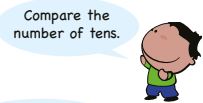
3 ones is smaller than 9 ones.
63 is smaller than 69.
63 is the smallest.

We can arrange the numbers in order.

75, 69, 63
greatest → smallest

Both 63 and 69 have 6 tens. What should we compare next?

63, 69, 75
smallest → greatest



Textbook 1 P172

LET'S LEARN

Before referring to Let's Learn on P172, compare three numbers that have the same digit in the tens place, or the same digit in the ones place. This is to consolidate the process of comparison by examining the digits at the higher place-value first.

Get pupils to find out which is the greatest and which is the lowest of the three numbers. They can do so by using base-ten blocks. Lead them to see that two numbers can be compared at a time to identify the greatest and smallest numbers. After which, they can arrange the numbers in increasing or decreasing order using the appropriate language.

Write the number sentences and language of comparison on the whiteboard and get pupils to read them aloud.

ACTIVITY 1 2 3 TIME

Play in groups of 3 to 4.

1. Take turns to take two number cards to make a 2-digit number.

2. Compare the numbers. The player with the greatest 2-digit number wins!

Example

9 1 6 2 1 8
greatest

What you need:
9

Is 18 or 81 greater?

PRACTICE

1. Compare the numbers.



Tens	Ones
5	5

55 = 5 tens 5 ones



Tens	Ones
6	4

64 = 6 tens 4 ones

64 is greater than 55.

2. Arrange the numbers in order. Start with the greatest.

92, 98, 89
98, 92, 89

Textbook 1 P173

ACTIVITY 1 2 3 TIME

Assign pupils to work in groups of 3 to 4. Provide a set of numeral cards for each group.

Pupils are to take turns to take two number cards to make a 2-digit number. When all pupils have done so, they are to compare their numbers to find who has the greatest 2-digit number.

PRACTICE

Help the pupils to read and understand each question.

For better understanding, select items from **Worksheet 3** and work these out with the pupils.

Independent seatwork

Assign pupils to complete Worksheet 3 (Workbook 1B P47 – 52).

1. (a)

$71 = 7 \text{ tens } 1 \text{ ones}$	$48 = 4 \text{ tens } 8 \text{ ones}$

71 is greater than 48.
48 is smaller than 71.

(b)

$62 = 6 \text{ tens } 2 \text{ ones}$	$69 = 6 \text{ tens } 9 \text{ ones}$

69 is greater than 62.
62 is smaller than 69.

(c)

$89 = 8 \text{ tens } 9 \text{ ones}$	$98 = 9 \text{ tens } 8 \text{ ones}$

98 is greater than 89.
89 is smaller than 98.

2. (a)

(b)

3. (a)

(b)

4. Set A – 6 tens 4 ones
Set B – 7 tens 2 ones
Set C – 7 tens 3 ones

(a) C

(b) A

5. (a)

(b)

(c)

6. (a)

(b)

(c)

7. (a) 45, 49, 50, 51

(b) 71, 72, 73, 74

8. 97, 96, 69, 67

**Specific Learning Focus**

- Compare and order numbers within 100.

Suggested Duration

2 periods

Prior Learning

Pupils have learnt to compare and order numbers in chapters 1, 6 and 10. In this lesson, the similar strategy of comparison is used, except that now the numbers go beyond 40 and up to 100.

Pre-emptive Pitfalls

Pupils have been using the place-value chart to compare, but they should be able to compare mentally by now too. Emphasise to pupils that when comparing numbers, we always start comparing the digits at the higher place-value first and if the digits at that higher place-value are the same, then proceed to compare the digit at the next place-value.

Introduction

In 'Let's Learn' (Textbook 1 P172), since the digit '7' in the tens place of 75 is bigger than the digit '6' in the tens place of 63 and 69, 75 is the greatest out of the three numbers. Then, compare 63 and 69. Since 63 and 69 have the same 'tens' value, we compare the digits in the ones place. Encourage the use of base-ten blocks while doing the questions in 'Practice' (Textbook P173).

Problem Solving

Write down a few numbers on the board and ask pupils to compare and then arrange the numbers in order. Prompt their thinking by asking questions along the way to guide them to the correct answer. The teacher can get pupils to work in groups and conduct quick pop quizzes with numeral cards. Get them to listen for the instructions given by the teacher ('greatest to smallest' or 'smallest to greatest') and quickly arrange the numeral cards in the correct order on their desks. Ask how they decided the order of the numbers. Encourage individual responses and get pupils to explain using the concept of breaking the numbers into tens and ones (e.g. 47 is bigger than 39 because there are 4 tens in 47, which is greater than the 3 tens in 39).

Activities

The activity (Textbook P173) has to be done in groups. Encourage mathematical communication, coordination and group work. You will need to laminate sets of numeral cards (Activity Handbook P41 - 42).

Resources

- numeral cards
- base-ten blocks

Mathematical Communication Support

Write down the number sentences and key vocabulary words on comparison and order (e.g. how much more than, less than, greatest to smallest, smallest to greatest) on the board for the pupils to record in their exercise books. Enunciate each phrase and lead pupils to compare and then arrange numbers in order according to instructions given by the teacher. The phrases (Textbook P172) should be enunciated in class.

LEARNING OBJECTIVES

1. Recognise and make number patterns.

NUMBER PATTERNS

LESSON
4

IN  FOCUS

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

A hundred chart is shown.

Look at numbers across the blue boxes.
What number patterns do you see?

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Textbook 1 P174

IN  FOCUS

Get pupils to talk about what they see in the chart and ask the following questions to encourage discussion:

- Are there numbers that are not 2-digit numbers? Which are the numbers?
- Which number is 2 more than 85?
- Which number is 1 less than 66?
- Which number is 10 more than 57? Which number is 10 less than 100?
- Can you count on from 55 to 66?
- Can you count back from 100 to 89?
- If I move on 2 steps from 72 what number will I be on?
- Which number will I be on if I move back 3 steps from 72?

Next, direct the pupils' attention to the numbers along a row. Then examine the numbers along a column. Ask them what they notice when moving forward or backward along a row, or upward and downward along a column.

Lead pupils to see that the numbers have something in common which they can use to guess the next number, and such sequences are called patterns.

1. What is 2 more than 42?

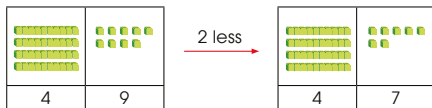


2 more than 42 is 44.

We can form a number pattern.
Each number is 2 more than the number before it.



2. What is 2 less than 49?



2 less than 49 is 47.

We can form a number pattern.
Each number is 2 less than the number before it.



Take the row of numbers 41 to 50 and get pupils to count on in ones using base-ten blocks from 41. After that, count backwards from 50 back to 41.

Lead pupils to identify the pattern of **1 more** for counting on and **1 less** for counting back. At the same time, reinforce the language of **45 is 1 more than 44** or **44 is 1 less than 45**.

For Let's Learn 1 and 2, extend to the pattern of **2 more** and **2 less** using the same number sequence of 41 to 50.

3. What is 10 more than 40?



10 more than 40 is 50.

We can form a number pattern from 10 to 100.
Each number is 10 more than the number before it.



4. What comes next in the pattern?



Each number is 10 less than the number before it.

10 less than 50 is 40.

The number pattern is 100, 90, 80, 70, 60, 50, 40.

In the same way, extract the column of tens from the hundred chart (i.e. 10, 20, 30, ..., 100) and teach patterns of counting on by tens and counting back by tens; as well as patterns of **10 more** and **10 less**.

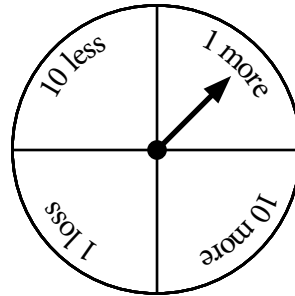
Get pupils to work in pairs to find more of such patterns from the hundred chart and share it with the class.

Activity More number patterns

Materials Counters, spinner, number grid

Procedure

1. Assign pupils to play in groups of 2 to 4.
2. Provide the number grid, some counters and spinner for each group.
3. Players have to spin the spinner and move their counters on the number grid given.
For example, if the spinner shows '1 more', move the counter one step forward.



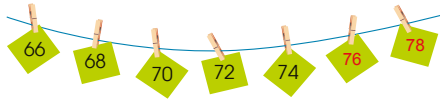
4. The players are to take turns spinning the spinner.
5. The first player to reach the finish mark wins.
6. Alternatively, pupils can draw their own chart of numbers and get their classmates to complete them.

START							
1	2	3	4	5	6	7	8
11	12	13	14	15	16	17	18
21	22	23	24	25	26	27	28
31	32	33	34	35	36	37	38
41	42	43	44	45	46	47	48
							FINISH



1. Complete the number patterns.

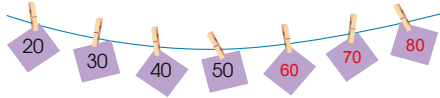
(a)



(b)

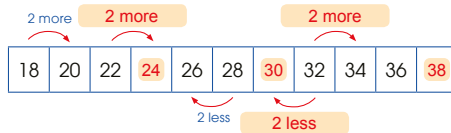


(c)



2. Study each number pattern carefully.

(a)



Textbook 1 P177

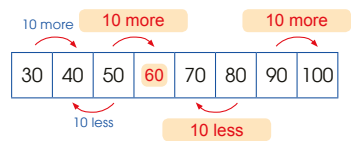


Help the pupils to read and understand each question.

Avoid chorus answers from pupils and encourage participation by inviting individual responses. Ask the pupils how they get their answers and if possible, get another pupil to verify the answer.

For better understanding, select items from **Worksheet 4** and work these out with the pupils.

(b)



(c) 90, 80, 70, 60, 50, 40, 30

Each number is 10 less than the number before it.

(d) 10, 20, 30, 40, 50, 60, 70

Each number is 10 more than the number before it.

Complete Workbook 18, Worksheet 4 • Pages 53 – 54



MIND WORKOUT

Look at the numbers.



The greatest 2-digit number I can make is 65.

The smallest 2-digit number I can make is 45.

Make two more 2-digit numbers.
Arrange the numbers in order.

45, 46, 54, 65
smallest

Textbook 1 P178

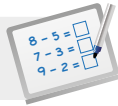
Independent seatwork

Assign pupils to complete Worksheet 4 (Workbook 1B P53 – 54).

Answers Worksheet 4 (Workbook 1B P53 – 54)

- | | | | | | |
|-----------|--------|---------|---------------|------------|------------|
| 1. (a) 42 | (b) 98 | (c) 100 | 2. (a) 83, 81 | (b) 51, 53 | (c) 60, 50 |
| (d) 49 | (e) 70 | (f) 90 | (d) 90, 40 | (e) 50, 60 | |
| | | | 3. (a) 54 | (b) 42 | (c) 30 |
| | | | (d) 40 | | |

LESSON PLAN



Chapter 15 Lesson 4

Specific Learning Focus

- Recognise and make number patterns.

Suggested Duration

2 periods

Prior Learning

Pupils have done number and shape patterns in chapters 6, 8 and 10. This lesson is a continuation of the same strategy of recognising patterns by comparison and then completing the pattern.

Pre-emptive Pitfalls

Some pupils might find it difficult to recognise the pattern, especially because the numbers in this lesson are greater than before and finding the difference between numbers mentally might be challenging. Recognising the order of the numbers (increasing or decreasing) should not be difficult for them to figure out.

Introduction

Laminate the hundred chart (Activity Handbook P43) and shade the number sequences on the laminated hundred chart using whiteboard markers. Explain the orientation of the rows or columns of the highlighted number sequence. Some pupils may get confused with the horizontal rows and vertical columns. Use hand gestures to explain the difference between the two. Guide pupils to see the pattern in the directions 'upward', 'downward', 'forward', 'backward' and let them skip count to recognise the pattern. This can be a fun activity to carry out in class. Encourage individual responses and not chorus answers.

Problem Solving

'Let's Learn' (Textbook P175) using base-ten blocks, place-value chart and number line should help pupils to form number patterns easily. Lead pupils to recognise the increasing or decreasing order of the pattern. Highlight that subtracting the first two numbers in a pattern gives us the difference between two successive numbers and then proceed to skip count in the pattern.

Activities

Highlight different number patterns on the hundred chart and have the pupils recognise the patterns until they are well versed with the process of recognising patterns by finding the difference between two successive numbers, identifying the order (ascending or descending), skip counting and completing the pattern. Activity (P248) should be done in groups of 4.

Resources

- hundred chart (Activity Handbook P43)
- spinner
- base-ten blocks
- 2-colour counters
- number grid
- number pattern cut-outs (in rectangular strips)

Mathematical Communication Support

Questions in 'Practice' (Textbook 1 P177) can be done as an activity carried out in class. Hang a string across the classroom and peg numeral cards to form various number patterns. Get pupils to grab the numeral cards on the teacher's desk and peg the cards to the string to complete the pattern. Teach by asking questions to prompt pupils' thinking:

- Are these 1-digit or 2-digit numbers?
- Do we look at the left-hand side or right-hand side of the number pattern to compare?
- For 2-digit numbers, are the digits in the tens place the same or different?
- If the digits in the tens place are the same, compare the digits in the ones place and find the difference between the two successive numbers.
- Can you now figure out how much more or less the number is compared to the previous number?
- Can you now predict the next number in the number pattern?

PROBLEM SOLVING, MATHS JOURNAL AND PUPIL REVIEW

3. Cross out the number that does not belong in each pattern.

Example

59, 60, 61, 62, ~~63~~, 63, 64, 65

(a) 74, 72, 70, 68, 66, ~~54~~, 64

(b) 48, ~~42~~, 50, 52, 54, 56, 58

(c) 40, 50, ~~30~~, 60, 70, 80, 90, 100

(d) 90, 80, 70, ~~40~~, 60, 50



Mind Workout

Date: _____

I am a number smaller than 100.
I have zero ones.
My tens digit is 1 less than 8.
What number am I?



I am .

54 Chapter 15

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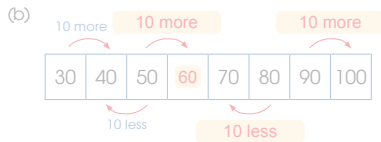


Mind Workout

Help the pupils to read the question and allow some time for silent reading.

Use Polya 4-stage questioning process to clarify their understanding. Guide the pupils to use the place-value chart to translate each given statement into the appropriate digit.

Workbook 1B P54



- (c) 90, 80, 70, 60, 50, 40, 30
Each number is 10 less than the number before it.
- (d) 10, 20, 30, 40, 50, 60, 70
Each number is 10 less than the number before it.

Complete Workbook 1B, Worksheet 4 • Pages 53–54

MIND WORKOUT

Look at the numbers.



The greatest 2-digit number I can make is 65.

The smallest 2-digit number I can make is 45.

Make two more 2-digit numbers.
Arrange the numbers in order.

45, 46, 54, 65
smallest

Textbook 1 P178



MIND WORKOUT

Allow pupils to work in pairs. Help pupils to understand the problem. This question requires pupils' analysis and comparison of numbers.

To obtain the greatest number, they have to first consider the digit in the tens place and select the appropriate digit. The same is done to obtain the smallest number.

The other 2-digit numbers that can be formed are 46, 54, 56 and 64. Pupils can select any two of these numbers for the arrangement of numbers, from the smallest to the greatest.

MATHS JOURNAL

Do you know that numbers are everywhere?
Look around you for three 2-digit numbers.

You may find 2-digit numbers in storybooks, around the school, at home or around your neighbourhood.



Write the numbers that you find.
Write where you find the numbers and what they show.

Talk about it with your classmates.

I know how to...

- count to 100.
- read and write numbers to 100.
- compare and order numbers within 100.
- complete number patterns.

SELF-CHECK



SELF-CHECK



Before the pupils do the self check, review the important concepts once more by asking for examples learnt for each objective.

This self check can be done after pupils have completed **Review 15** (Workbook 1B P55 – 56) as consolidation of understanding for the chapter.

Textbook 1 P179

Answers Review 15 (Workbook 1B P55 – 56)

1. (a) 68
(b) 80
(c) seventy-three
(d) one hundred

2. (a) 4 tens 7 ones
(b) 9 tens 0 ones

3. (a) 43
(b) 95
(c) 43
(d) 95

4. 88, 89, 98, 99

5. (a) 100
(b) 60
(c) 66
(d) 85
(e) 60
(f) 80

6. (a) 85, 87
(b) 92, 86
(c) 80, 100
(d) 90, 40

ADDITION AND SUBTRACTION WITHIN 100

CHAPTER 16

Addition and Subtraction Within 100 CHAPTER **16**

How many dresses are there in all?



ADDITION LESSON **1**

IN FOCUS



How many dresses are there in all?

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Textbook 1 P180

Related Resources

NSPM Textbook 1 (P180 – 196)
NSPM Workbook 1B (P57 – 74)

Materials

Base-ten blocks, place-value charts,
numeral cards, '1' to '6' dice, '0' to '9' dice

Lesson

Lesson 1 Addition
Lesson 2 Addition with Regrouping
Lesson 3 Subtraction
Lesson 4 Subtraction with Regrouping
Problem Solving, Maths Journal and
Pupil Review

INTRODUCTION

In line with the spiral approach, pupils revisit addition and subtraction of numbers up to 100 with more practices on computational strategies such as **count on**, **count back**, **make 10**, **subtract from 10**, and the process of **regrouping tens and ones** in the standard algorithms. Mental computations of counting on and counting back are effective when the number to be added or subtracted is within 3. Beyond that, the method of making 10 and subtracting from 10 should be encouraged and pupils should be given more mental practice on them. Base-ten blocks and place-value charts are used to represent the process of regrouping the ones into tens and ones in addition and the process of regrouping a ten into 10 ones for subtraction.

LESSON

1

ADDITION

LEARNING OBJECTIVES

1. Add two numbers without regrouping.

Addition and Subtraction Within 100

CHAPTER

16

How many dresses are there in all?



ADDITION

LESSON

1

IN  FOCUS



How many dresses are there in all?

180 CHAPTER 16

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IN  FOCUS

Use the chapter opener as a stimulus to discuss with pupils the things that they see in the picture.

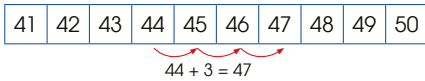
Get the pupils to count the clothes on the rack and the clothes that Ann is holding. Then ask them to find the number of clothes in total.

Give pupils time to discuss in pairs the different ways they can add the two numbers together to find the total number of clothes.

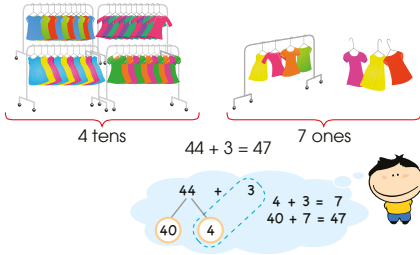
Textbook 1 P180


1. Add 44 and 3.

Method 1 Count on from 44.

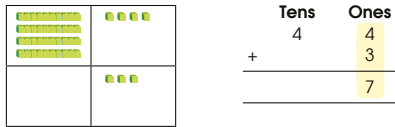


Method 2 Add ones.



Method 3 Use  to add.

Step 1 Add the ones. 4 ones + 3 ones = 7 ones



Revise with pupils the three methods previously learnt in Chapter 11.

Method 1: Count on

Remind pupils that counting on starts from the greater number, followed by counting on with the smaller number.

Method 2: Add ones

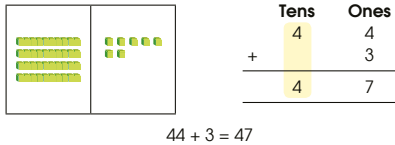
To use this method, pupils first need to make a number bond in order to add the ones.

Method 3: Use standard algorithm with place-value charts

Use base-ten blocks to represent the addition of 2-digit numbers in the standard algorithm. Allow for class participation in using the concrete materials to illustrate the process of adding the ones and the tens.

Ensure that the three steps using the concrete materials are in tandem with the calculation in written format.

Step 2 Add the tens.



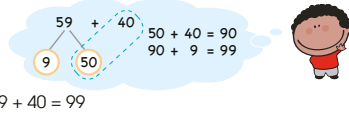
$44 + 3 = 47$

2. Add 59 and 40.

Method 1 Count on in tens from 59.

$59 + 40 = 99$ 59, 69, 79, 89, 99

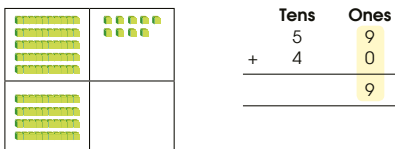
Method 2 Add tens.



$59 + 40 = 99$

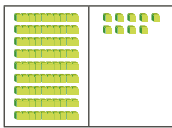
Method 3 Use  to add.

Step 1 Add the ones.



To reinforce the three methods covered, apply them in the addition of two 2-digit numbers without regrouping.

Step 2 Add the tens. 5 tens + 4 tens = 9 tens



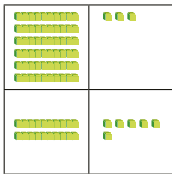
Tens	Ones
5	9
+ 4	0
9	9

$$59 + 40 = 99$$

3. Add 63 and 26.

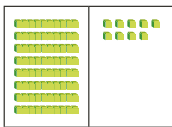
Use to help you add.

Step 1 Add the ones. 3 ones + 6 ones = 9 ones



Tens	Ones
6	3
+ 2	6
	9

Step 2 Add the tens. 6 tens + 2 tens = 8 tens



Tens	Ones
6	3
+ 2	6
8	9

$$63 + 26 = 89$$

Reinforce the use of standard algorithm in the addition of two 2-digit numbers without regrouping with Let's Learn 3.

Use base-ten blocks to illustrate the addition of the ones and tens.

In addition to this method, the number bond method can be used as well.

$$\begin{array}{r}
 63 + 26 = 6 \text{ tens } 3 \text{ ones} + 2 \text{ tens } 6 \text{ ones} \\
 \begin{array}{cc}
 \diagdown \quad \diagup & \diagdown \quad \diagup \\
 \textcircled{60} \quad \textcircled{3} & \textcircled{20} \quad \textcircled{6}
 \end{array} \\
 = 8 \text{ tens} + 9 \text{ ones} \\
 = 80 + 9 \\
 = 89
 \end{array}$$

Work in pairs.

1. Take turns to open a and a . Form a 2-digit number.

2. Roll the . Add the number on the to the 2-digit number.

Example

$$\begin{array}{r}
 50 \quad 3 \\
 53 + 3 = 56
 \end{array}$$

3. Check each other's answer.

ACTIVITY TIME

Assign pupils to work in pairs.

Provide each pair with one set of 1-digit number cards (include 0 to 3 only), one set of 2-digit number cards (include 10 to 90 only), and a 6-sided dice.

The activity requires pupils to do mental calculation through the count on method.

1. Add.

(a) $71 + 7 = 78$

(b) $42 + 40 = 82$

2. Add.

(a)

Tens	Ones
8	2
+ 6	
8	8

(b)

Tens	Ones
4	1
+ 1	5
5	6

ACTIVITY TIME

PRACTICE

Help the pupils to read and understand each question.

For better understanding, select items from **Worksheet 1** and work these out with the pupils.

Independent seatwork

Assign pupils to complete Worksheet 1 (Workbook 1B P57–62).

LESSON 2

ADDITION WITH REGROUPING


LEARNING OBJECTIVES

1. Add two numbers with regrouping.

LESSON
2

ADDITION WITH REGROUPING


IN FOCUS



Xinyi gives Bina 8 stickers.
How many stickers does Bina have now?

LET'S LEARN

Use to help you add.



1. Add 45 and 8.

Step 1 Add the ones. 5 ones + 8 ones = 13 ones
Regroup the ones. 13 ones = 1 ten 3 ones

		Tens	Ones
4	5		
+	8		
5	3		

Step 2 Add the tens. 1 ten + 4 tens = 5 tens

		Tens	Ones
4	5		
+	8		
5	3		

$45 + 8 = 53$

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ADDITION AND SUBTRACTION WITHIN 100
185

Textbook 1 P185

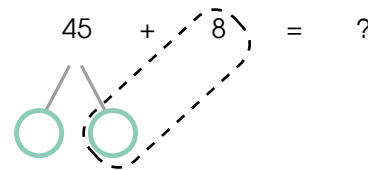
IN FOCUS

Pupils have to use the 'make 10' strategy for addition with regrouping. A quiz can be given to pupils to enable them to recall bonds of 10, which will allow them to use the 'make 10' strategy.

After revision on the number bonds of 10, find the total number of stickers that Devi has by adding 45 and 8 through the 'make 10' strategy.

LET'S LEARN


Use base-ten blocks to show the make tens process. This action should be coordinated with the written form and the number bond diagram.



Next, use standard algorithm with place-value chart (Chapter 11) to add the two numbers. Inform pupils that the addition in Let's Learn 1 involves regrouping of the ones into a ten and ones.

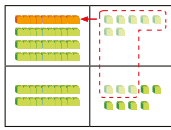
First write the addition equation in the horizontal format, then show pupils its transition to the vertical form. The addition in the vertical format will be illustrated by placing the corresponding base-ten blocks onto the place-value chart.

2. Add 37 and 29.

Use  to help you add.

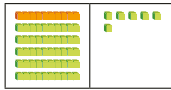


Step 1 Add the ones. 7 ones + 9 ones = 16 ones
Regroup the ones. 16 ones = 1 ten 6 ones



	Tens	Ones
	3	7
+	2	9
	6	6

Step 2 Add the tens. 1 ten + 3 tens + 2 tens = 6 tens



	Tens	Ones
	3	7
+	2	9
	6	6


$$37 + 29 = 66$$

ACTIVITY  **TIME**

Play in groups of 4.

1 Open a  and a .

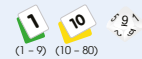
Form a 2-digit number.

2 Roll the .

Add the number on the  to the 2-digit number.

3 Compare your answer with the other players.
The player with the smallest answer wins!

What you need:



Ensure that the steps using the concrete materials are in tandem with the calculation in written format.

Reinforce the method of using standard algorithms with place-value charts by repeating the steps in the addition of 37 and 29.

ACTIVITY  **TIME**

Assign pupils to work in groups of 4.

Provide each group with one set of 1-digit numeral cards (1 to 9), one set of 2-digit numeral cards (include 10 to 80 only) and a '0' to '9' dice.

PRACTICE 

Add.

	Tens	Ones
	8	4
+		8
	9	2

	Tens	Ones
	5	6
+	2	9
	8	5

	Tens	Ones
	4	5
+	1	6
	6	1

	Tens	Ones
	7	7
+		9
	8	6

Complete Workbook 1B, Worksheet 2 • Pages 63 – 64

PRACTICE 

Help the pupils to read and understand each question.

For better understanding, select items from **Worksheet 2** and work these out with the pupils.

Independent seatwork

Assign pupils to complete Worksheet 2 (Workbook 1B P63 – 64).

1. (a)

	Tens	Ones
	4	5
+		5
	5	0

(b)

	Tens	Ones
	8	7
+		4
	9	1

(c)

	Tens	Ones
	3	8
+	3	6
	7	2

(d)

	Tens	Ones
	5	3
+	2	9
	8	2

(e)

	Tens	Ones
	1	3
+	7	7
	9	0

(f)

	Tens	Ones
		8
+	5	9
	6	7

2. (a) 62

	Tens	Ones
	5	6
+		6
	6	2

(b) 93

	Tens	Ones
	8	4
+		9
	9	3

(c) 71

	Tens	Ones
	4	3
+	2	8
	7	1

(d) 95

	Tens	Ones
	3	6
+	5	9
	9	5

(e) 90

	Tens	Ones
	2	9
+	6	1
	9	0

(f) 93

	Tens	Ones
	7	6
+	1	7
	9	3

**Specific Learning Focus**

- Add two numbers without regrouping.
- Add two numbers with regrouping.

Suggested Duration

5 periods

Prior Learning

Since addition with and without regrouping involving numbers up to 40 has been covered in Chapter 11, it will be easier for pupils to move on to addition with and without regrouping involving numbers up to 100.

Pre-emptive Pitfalls

Adding using the place-value chart helps pupils immensely. However, the challenging part of this lesson is for pupils to calculate mentally and to choose the strategy to add.

Introduction

In Lesson 1, have the pupils attempt the sums using all 3 strategies – counting on, adding ones and using standard algorithm method with place-value charts. Breaking the numbers into tens and ones, then placing them under the tens and ones columns in the place-value chart gives the pupils a clearer understanding of the different strategies for addition. Having more practice will sharpen their mental calculation skills. Similarly in Lesson 2, pupils will break the numbers into tens and ones and use the standard algorithm method to add with regrouping. The ones will have to be regrouped if the addition of the ones gives a number greater than 9. Emphasise that when 10 ones are regrouped into 1 ten, the 1 ten needs to be carried over to the tens column in the vertical addition.

Problem Solving

The spiral approach of revisiting concepts and strategies is useful. Another important aspect is the integration of concepts. In Lesson 1 (adding without regrouping) and Lesson 2 (adding with regrouping), encourage pupils to break the numbers into tens and ones and then add. Reinforce that when comparing numbers, we start comparing the digit with the highest place value (i.e. the digit on the left) but when adding, we start adding the digit in the ones first (i.e. add from right to left).

Activities

The activities in Lesson 1 (Textbook 1 P184) and in Lesson 2 (Textbook 1 P186) require the use of numeral cards and pupils to work in pairs or groups of 4.

Resources

- numeral cards
- '1' to '6' dice
- base-ten blocks

Mathematical Communication Support

Explain the transition from using base-ten block (horizontal) to standard algorithm method (vertical) when adding with or without regrouping. At the end of lessons 1 and 2, provide pupils with a worksheet consisting of sums that involve a consolidation of both concepts. Before the pupils work on the sums, prompt the pupils' thinking by verbalising the steps with the class:

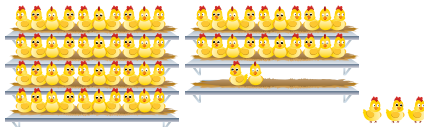
- Start from ones.
- Add the ones.
- If the addition of ones gives a 2-digit number:
 - Break the number into tens and ones
 - Regroup 10 ones into 1 ten and carry over 1 ten to the tens column
- Add vertically and write the answers under the ones and tens columns in the vertical addition.

LEARNING OBJECTIVES

1. Subtract a number from a 2-digit number without regrouping.

SUBTRACTION

IN FOCUS

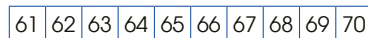


How many chickens are there left?

LET'S LEARN

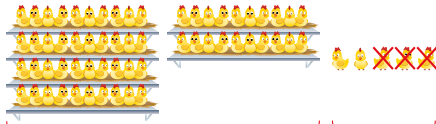
1. Subtract 3 from 65.

Method 1 Count back from 65.



$$65 - 3 = 62$$

Method 2 Subtract ones.



$$65 - 3 = 62$$

$$\begin{array}{r} 65 \\ - 3 \\ \hline 60 \quad 5 \end{array} \quad \begin{array}{l} 5 - 3 = 2 \\ 60 + 2 = 62 \end{array}$$



IN FOCUS

Revise the three methods for subtraction, count back, use of number bonds and use of place-value charts, as covered in Chapter 11.

Ask pupils to give an example of a subtraction that does not require regrouping.

LET'S LEARN

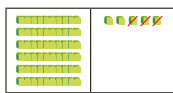
Write the equation $65 - 3 = ?$ on the whiteboard. Invite class participation, then review the three methods of subtracting.

Method 1 involves counting back from 65 in 3 steps to get the answer.

Method 2 involves subtracting ones. This can be done by first making the number bond of 65, then subtracting 3 ones from 5 ones.

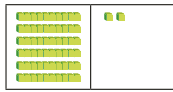
Method 3 Use  to subtract.

Step 1 Subtract the ones. 5 ones - 3 ones = 2 ones



Tens	Ones
6	5
-	3
	2

Step 2 Subtract the tens.



Tens	Ones
6	5
-	3
6	2

$$65 - 3 = 62$$

2. Subtract 30 from 97.

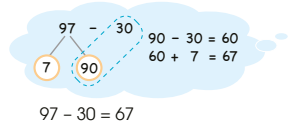
Method 1 Count back in tens from 97.

$$97 - 30 = 67$$

97, 87, 77, 67



Method 2 Subtract tens.



$$97 - 30 = 67$$



Method 3 is the use of standard algorithm with place-value charts to subtract. Base-ten blocks can be put in the place-value charts to show the subtraction clearly.

Provide more examples to reinforce the three methods.

The three methods are revised in Let's Learn 2.

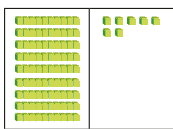
Instead of subtracting from ones, Let's Learn 2 focuses on subtracting the tens.

In the first method, help pupils to count back in tens with the aid of a hundred chart.

The second method requires pupils to subtract tens instead of ones. After making the number bond of 97, pupils should be able to see that subtraction is only possible with the tens.

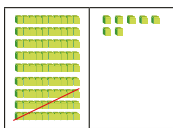
Method 3 Use  to subtract.

Step 1 Subtract the ones.



Tens	Ones
9	7
-	3
	4

Step 2 Subtract the tens. 9 tens - 3 tens = 6 tens



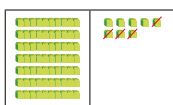
Tens	Ones
9	7
-	3
6	7

$$97 - 30 = 67$$

3. Subtract 14 from 78. Use  to help you subtract.



Step 1 Subtract the ones. 8 ones - 4 ones = 4 ones



Tens	Ones
7	8
-	4
	4

In the final method, focus the pupils' attention on the base-ten blocks in the tens place.

Unlike Let's Learn 1 and 2, Let's Learn 3 requires pupils to subtract from both the tens and ones. Only the standard algorithm method is applied here.

Emphasise to pupils that subtraction should be done with the ones before moving on to the tens.

Show the subtraction using base-ten blocks on a place-value chart. Ensure that the use of concrete materials is in tandem with the calculation in written format.



Step 2 Subtract the tens. 7 tens - 1 ten = 6 tens



$$78 - 14 = 64$$

ACTIVITY TIME

Work in pairs.

1 Take turns to open a 90 and a 9. Form a 2-digit number.

2 Roll the dice.

Subtract the number on the dice from the 2-digit number.

Example

$$\begin{array}{r} 80 \\ - 6 \\ \hline 86 \end{array} - 4 = 82$$

3 Check each other's answer.



Assign pupils to work in pairs. Provide each pair with one set of 1-digit numeral cards (6 to 9 only), one set of 2-digit numeral cards (10 to 90 only) and a '1' to '6' dice.

This activity involves subtracting a 1-digit number from a 2-digit number without regrouping.

Pupils are required to form a 2-digit number by picking a card from each of the two decks. After which they will subtract a 1-digit number obtained from rolling the dice.

Textbook 1 P191

PRACTICE



Subtract.

PRACTICE



(a)
$$\begin{array}{r} \text{Tens} \quad \text{Ones} \\ 7 \quad 5 \\ - \quad 3 \\ \hline 7 \quad 2 \end{array}$$

(b)
$$\begin{array}{r} \text{Tens} \quad \text{Ones} \\ 9 \quad 9 \\ - \quad 5 \quad 0 \\ \hline 4 \quad 9 \end{array}$$

(c)
$$\begin{array}{r} \text{Tens} \quad \text{Ones} \\ 6 \quad 5 \\ - \quad 1 \quad 4 \\ \hline 5 \quad 1 \end{array}$$

(d)
$$\begin{array}{r} \text{Tens} \quad \text{Ones} \\ 5 \quad 8 \\ - \quad 2 \quad 6 \\ \hline 3 \quad 2 \end{array}$$

(e)
$$\begin{array}{r} \text{Tens} \quad \text{Ones} \\ 6 \quad 8 \\ - \quad 2 \quad 3 \\ \hline 4 \quad 5 \end{array}$$

(f)
$$\begin{array}{r} \text{Tens} \quad \text{Ones} \\ 8 \quad 7 \\ - \quad 4 \quad 2 \\ \hline 4 \quad 5 \end{array}$$

Complete Workbook 18, Worksheet 3 • Pages 65 – 70

Help the pupils to read and understand each question.

For better understanding, select items from **Worksheet 3** and work these out with the pupils.

Independent seatwork

Assign pupils to complete Worksheet 3 (Workbook 1B P65 – 70).

Textbook 1 P192

1. (a)

63	64	65	66	67	68
----	----	----	----	----	----

$68 - 3 = 65$

(b)

81	82	83	84	85	86
----	----	----	----	----	----

$86 - 4 = 82$

(c)

35	45	55	65	75	85
----	----	----	----	----	----

$65 - 30 = 35$

(d)

49	59	69	79	89	99
----	----	----	----	----	----

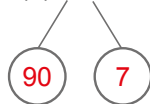
$99 - 40 = 59$

2. (a) 41 (b) 55
 (c) 57 (d) 91
 (e) 58 (f) 69
 (g) 47 (h) 58

3. (a) $69 - 8 = 61$



(b) $97 - 4 = 93$



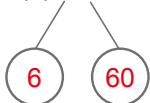
(c) $73 - 3 = 70$



(d) $53 - 20 = 33$

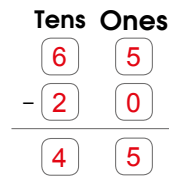


(e) $66 - 40 = 26$

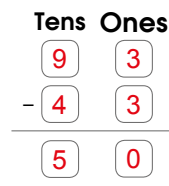


4. (a) 53 (b) 60
 (c) 32 (d) 53

5. (a) 45



(b) 50



SUBTRACTION WITH REGROUPING

LEARNING OBJECTIVES

1. Subtract a number from a 2-digit number with regrouping.

SUBTRACTION WITH REGROUPING

LESSON

4

IN FOCUS

How many red apples are there?

How many apples are there altogether? Count in tens and ones.

LET'S LEARN

1. Subtract 9 from 63. Use to help you subtract.

Step 1 Regroup 1 ten into 10 ones. Subtract the ones. 13 ones - 9 ones = 4 ones

Tens	Ones
5	13
-	9
—	4

Step 2 Subtract the tens.

Tens	Ones
5	13
-	9
—	4

$63 - 9 = 54$

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ADDITION AND SUBTRACTION WITHIN 100

193

Textbook 1 P193

IN FOCUS

Similar to the lesson on the addition of two numbers with regrouping, revise with pupils the 'subtract from 10' strategy where they have to recall the number bonds of 10, as well as forming the bond of a 2-digit number into a 10 and the remaining value.

The language of 'when there are not enough ones to subtract from, then we subtract from the 10' should be reinforced with the manipulation of the base-ten blocks to show the process meaningfully.


At the same time, help pupils to see the difference between subtractions that require regrouping and those that do not need regrouping.

LET'S LEARN

Inform pupils that the subtraction can be done by using place-value charts, but this time will involve the regrouping of a ten into 10 ones. Demonstrate the regrouping with base-ten blocks on a place-value chart.

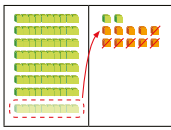
First write the subtraction equation $63 - 9 = ?$ in horizontal format, then show pupils its transition to the vertical form. Stress to pupils that there are not enough ones to subtract from, so there is a need to subtract from a 10.

2. Subtract 36 from 82.

Use  to help you subtract.

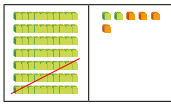


Step 1 Regroup 1 ten into 10 ones.
Subtract the ones. 12 ones - 6 ones = 6 ones



Tens	Ones
7	12
-	3
	6

Step 2 Subtract the tens. 7 tens - 3 tens = 4 tens

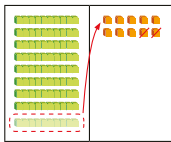


Tens	Ones
7	12
-	3
4	6

$$82 - 36 = 46$$

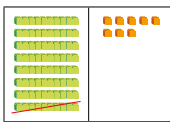
3. Subtract 12 from 90.

Step 1 Regroup 1 ten into 10 ones.
Subtract the ones. 10 ones - 2 ones = 8 ones



Tens	Ones
8	10
-	1
	2
	8


Step 2 Subtract the tens. 8 tens - 1 ten = 7 tens



Tens	Ones
8	10
-	1
7	8

$$90 - 12 = 78$$

Play in groups of 3 to 4.

- Take turns to roll the  two times.
- After each roll, write the number in one of the blanks.
- Subtract to find the answer.
- Compare your answers. The player with the greatest answer wins!

ACTIVITY TIME

What you need:

Tens	Ones
	0
-	

PRACTICE

Subtract.

(a)

Tens	Ones
5	0
-	4
5	6

(b)

Tens	Ones
8	6
-	5
3	9

(c)

Tens	Ones
6	0
-	1
5	7

(d)

Tens	Ones
4	4
-	4
0	5

Reinforce the method by going through Let's Learn 2 and 3.

Ensure that the steps using the concrete materials are in tandem with the calculation in written format. The renaming after regrouping (i.e. the cancelling of tens from 9 to 8, the regrouping of the ones from 0 to 10) must be explicated.

ACTIVITY TIME



Assign pupils to work in groups of 3 to 4. Provide a '1' to '6' dice for each group.

Pupils are expected to work on their own subtraction independently.

PRACTICE



Help the pupils to read and understand each question.

For better understanding, select items from **Worksheet 4** and work these out with the pupils.

Independent seatwork

Assign pupils to complete Worksheet 4 (Workbook 1B P71 - 72).

1. (a)

Tens	Ones
⁴ 5	¹ 3
-	8
4	5

(b)

Tens	Ones
⁷ 8	¹ 1
-	3
7	8

(c)

Tens	Ones
⁵ 6	¹ 4
-	1 6
4	8

(d)

Tens	Ones
⁶ 7	¹ 5
-	1 9
5	6

(e)

Tens	Ones
⁶ 7	¹ 2
-	4 5
2	7

(f)

Tens	Ones
⁸ 9	¹ 3
-	5 4
3	9

2. (a) 49

Tens	Ones
⁴ 5	¹ 7
-	□ 8
4	9

(b) 71

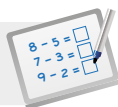
Tens	Ones
⁷ 8	¹ 0
-	□ 9
7	1

(c) 28

Tens	Ones
³ 4	¹ 5
-	1 7
2	8

(d) 37

Tens	Ones
⁵ 6	¹ 6
-	2 9
3	7

**Specific Learning Focus**

- Subtract a number from a 2-digit number without regrouping.
- Subtract a number from a 2-digit number with regrouping.

Suggested Duration

5 periods

Prior Learning

In Chapter 11, grouping and regrouping during addition and subtraction have been done using the standard algorithm method. This lesson is a continuation of that concept, but with numbers beyond 40 and up to 100.

Pre-emptive Pitfalls

To subtract without regrouping, the counting back strategy is used, and to subtract with regrouping, 1 ten needs to be borrowed and regrouped into 10 ones. Pupils will have to distinguish between when regrouping is required and when it is not. If the ones in the greater number is greater than or equal to the ones in the smaller number, then no regrouping is required. The teacher needs to emphasise the key steps to choosing the correct strategy.

Introduction

In Lesson 4, Let's Learn 1 to 3 (Textbook 1 P193 – 195) show addition using the same strategies as in Lessons 1 and 2 (breaking numbers into tens and ones, place-value charts, standard algorithm method). The difference is that in lessons 3 and 4, the ones are taken away in subtraction, instead of counting all in addition. In lesson 4, the ones in the greater number are smaller than the ones in the smaller number, so regrouping of 10 ones into 1 ten is required in order to subtract.

Problem Solving

Reinforce all three methods when subtracting without regrouping. The use of concrete materials like base-ten blocks and place-value charts is essential. Emphasise to pupils that it is important to know how to identify when regrouping is required and when it is not. Once they are able to identify that, mathematical calculation becomes easy.

Activities

The activities (Textbook P191, 195) require pupils to work in pairs and groups of 4. The use of base-ten blocks and place-value charts are essential as it strengthens pupils' understanding of the concepts.

Resources

- numeral cards
- '1' to '6' dice
- base-ten blocks
- place-value chart

Mathematical Communication Support

The language of 'there are not enough ones to take away the other ones' or 'not big enough' is essential. Similarly, 'borrowing a ten and regrouping a ten into ones to make the ones bigger' are key phrases to use in class.

PROBLEM SOLVING, MATHS JOURNAL AND PUPIL REVIEW

2. Subtract.

(a) $57 - 8 = 49$

Tens	Ones
4 5	1 7
-	8
4	9

(b) $80 - 9 = 71$

Tens	Ones
7 8	1 0
-	9
7	1

(c) $45 - 17 = 28$

Tens	Ones
3 4	1 5
-	1 7
2	8

(d) $66 - 29 = 37$

Tens	Ones
5 6	1 6
-	2 9
3	7



Mind Workout

Fill in the blanks with 1, 3, 4, 5, 6 and 7.
You can use each number only once.

	6	7
	5	3
-	1	4

72 Chapter 16

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Mind Workout

This is an investigative activity for pupils.

Help pupils to understand the question, then remind them that the larger number has to subtract the smaller number.

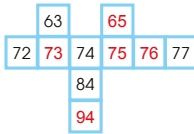
An example can be shown before pupils proceed to do this on their own.

Workbook 1B P72



MIND WORKOUT

Part of a hundred chart is shown. Study the chart and find the missing numbers.



MATHS JOURNAL

Use the numbers 3, 4 and 5 to make two addition facts and two subtraction facts. You can use each number only once for each fact.

Tens	Ones	Tens	Ones	Tens	Ones	Tens	Ones
3	4	5	3	3	4	5	3
+	5	+	4	-	5	-	4
3	9	5	7	2	9	4	9

Use to show each fact. Then write the answers.

I know how to...

- add numbers without regrouping.
- add numbers with regrouping.
- subtract numbers without regrouping.
- subtract numbers with regrouping.

SELF-CHECK



MIND WORKOUT

This problem requires pupils to use deductive reasoning and knowledge of number patterns along the rows and columns of a hundred chart.

To guide pupils along, ask pupils to visualise a hundred chart and the numbers 0 to 100. Alternatively, show a number chart with the numbers 1 to 50 and help pupils deduce the necessary patterns.

Get pupils to see the patterns along a row (1 more when moving forward and 1 less when moving backward) and along a column (10 more when moving downward and 10 less when moving upward).

MATHS JOURNAL

Allow pupils to work in pairs.

The objective of this task is to enable pupils to formulate subtraction and addition questions with the given 3 digits.

Encourage pupils to systematically list out all the possibilities before deciding on three addition sums and one subtraction question.

SELF-CHECK



Before the pupils do the self check, review the important concepts once more by asking for examples learnt for each objective.

This self check can be done after pupils have completed **Review 16** (Workbook 1B P73 – 74) as consolidation of understanding for the chapter.

Answers Review 16 (Workbook 1B P73 – 74)

1. (a) 74 (b) 87
(c) 55 (d) 92

2. (a) 66 (b) 84
(c) 36 (d) 75





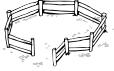

3. (a)
$$\begin{array}{r} 6 & 4 \\ -1 & 3 \\ \hline 5 & 1 \end{array}$$

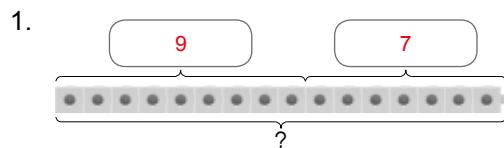
(b)
$$\begin{array}{r} 7 & 8 \\ -2 & 4 \\ \hline 5 & 4 \end{array}$$

(c)
$$\begin{array}{r} 3 & 4 \\ -3 & 7 \\ \hline & 7 \end{array}$$

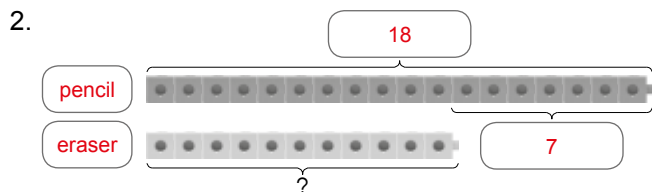
(d)
$$\begin{array}{r} 7 & 8 & 13 \\ -3 & 8 & 8 \\ \hline 4 & 5 & \end{array}$$

4. **START**

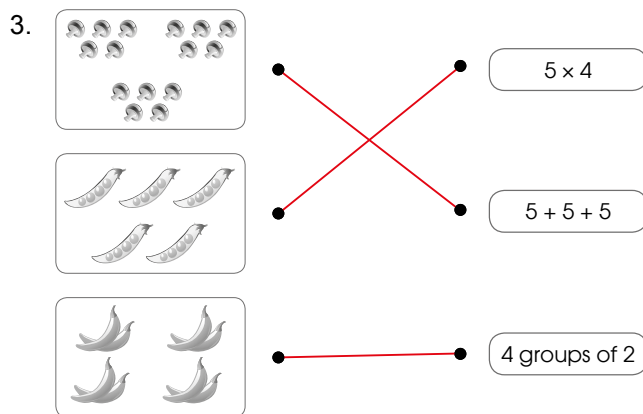
 $40 + 6 = 46$	$55 - 31 = 24$	$34 + 13 = 47$ 
$50 - 4 = 46$	$37 + 9 = 46$	$87 - 8 = 79$
$42 - 16 = 26$	$49 - 3 = 46$	$28 + 18 = 46$ 
$36 + 48 = 84$ 	$52 - 11 = 41$ 	$47 - 1 = 46$ 
		$90 - 44 = 46$



$9 + 7 = 16$
Sam has 16 marbles.



Kate has 11 erasers.



4. $4 \times 4 = 16$
There are 16 legs altogether.

5. (a) 8 by 1 or 1 by 8
(b) 4 by 7 or 7 by 4
(c) 6 by 5 or 5 by 6



There are 5 groups of 3 stars.



Each child gets 2 sweets.

7. 3

8. (a) 47
(b) 97
(c) 49 and 74 (Alternative answers: 94 and 79)

(d) 97, 74, 49, 47

9. (a) 61, 55, 53

(b) 32, 42, 62

(c) 56, 26, 6

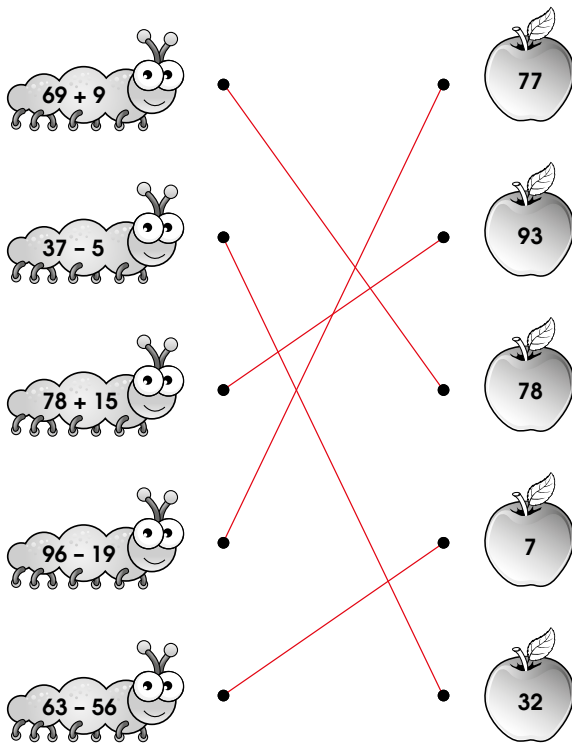
10. (a)

51	52	53	54
61	62	63	64
71	72	73	74

(b)

25	26	27	28
35			38
45			48
55			58

11.



12. (a)

$$\begin{array}{r} 8 \quad 0 \\ + 1 \quad 7 \\ \hline 9 \quad 7 \end{array}$$

(b)

$$\begin{array}{r} 6 \quad 8 \\ - 2 \quad 5 \\ \hline 4 \quad 3 \end{array}$$

(c)

$$\begin{array}{r} 15 \quad 5 \\ + \quad 9 \\ \hline 6 \quad 4 \end{array}$$

(d)

$$\begin{array}{r} 6 \cancel{7} \quad 11 \\ - \quad 3 \\ \hline 6 \quad 8 \end{array}$$

(e)

$$\begin{array}{r} 14 \quad 6 \\ + 3 \quad 7 \\ \hline 8 \quad 3 \end{array}$$

(f)

$$\begin{array}{r} 8 \cancel{9} \quad 14 \\ - 3 \quad 8 \\ \hline 5 \quad 6 \end{array}$$

HALVES AND QUARTERS

CHAPTER 17

Halves and Quarters CHAPTER 17


How can Raju and Meiling share the pizza equally?



HALVES AND QUARTERS LESSON 1

IN FOCUS

What is 1 half of a whole?
What is 1 quarter of a whole?



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Textbook 1 P197

Related Resources

NSPM Textbook 1 (P197 – 201)
NSPM Workbook 1B (P83 – 86)

Materials

pupil's lunch box, shape cut-outs

Lesson

Lesson 1 Halves and Quarters
Problem Solving, Maths Journal and
Pupil Review

INTRODUCTION

Pupils are introduced to halves and quarters to build a foundation for fractions in the next level. Pupils will learn to recognise and name a half as one of two equal parts of an object, shape or quantity. They will also learn to recognise and name a quarter as one of four equal parts of an object, shape or quantity. The writing and reading of fractions are not required at this level.

LESSON

1

HALVES AND QUARTERS

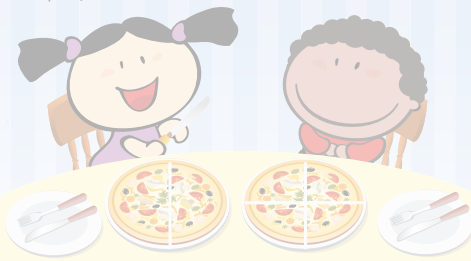
LEARNING OBJECTIVES

1. Understand half and quarter as part of a whole.

Halves and Quarters


CHAPTER 17

How can Raju and Meiling share the pizza equally?




HALVES AND QUARTERS

LESSON 1

IN  FOCUS

What is 1 half of a whole?
What is 1 quarter of a whole?



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HALVES AND QUARTERS 197

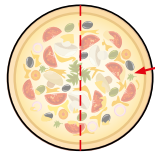
IN  FOCUS

Ask the class how they share pizzas with their family and friends. Use the chapter opener to discuss with pupils how Raju and Meiling can share the pizza equally.

Textbook 1 P197

LET'S LEARN

1.



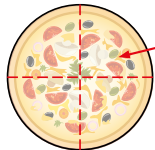
1 half

This whole pizza is cut into 2 halves.



Each part of the pizza is **1 half** of the whole pizza.

2.



1 quarter

This pizza is cut into 4 quarters.

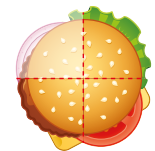


2 quarters give us 1 half.

Each part of the pizza is **1 quarter** of the whole pizza.

3.

Nora eats 1 quarter of a burger.
How many quarters of the burger are left?



4 quarters - 1 quarter = 3 quarters

4 quarters make up one whole burger.



There are 3 quarters of the burger left.

Textbook 1 P198

Cut the pizza into 2 equal parts and point to the dotted line on the pizza to indicate the cut. Guide pupils to understand each part is 1 half of the whole pizza by asking the following questions:

- How many equal parts are there?
- Can you point to the 2 equal parts?

Indicate to pupils that each part is 1 out of 2 equal parts.

In Let's Learn 2, cut the pizza into 4 equal parts and repeat the abovementioned steps to guide pupils to understand 1 quarter. Get them to see that 2 quarters make 1 half.

In Let's Learn 3, lead pupils to see that the burger is cut into 4 equal parts and after taking away 1 part, 3 equal parts are left. Get pupils to see that each equal part in this case refers to 1 quarter.

PRACTICE



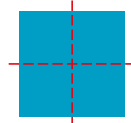
1.

Cut the following into:

(a) 2 halves



(b) 4 quarters



Complete Workbook 1B, Worksheet 1A + Page 83

ACTIVITY TIME



Work in pairs.

- 1 Think of some examples of halves and quarters in your everyday life.
- 2 Tell your partner about these examples.

What you need:
Your lunch box

Example

A plain waffle can be cut into halves or quarters.



- 3 Open your lunch box. Do you have a sandwich?
Your teacher will cut your sandwich into 2 halves or 4 quarters.
Which part is a half? Which part is a quarter?

Textbook 1 P199

PRACTICE



Work with pupils on the questions and selected examples from **Worksheet 1A**.

Independent seatwork

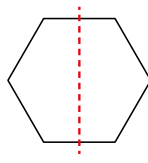
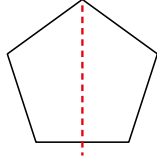
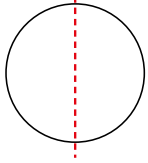
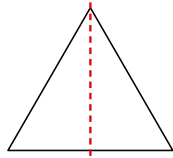
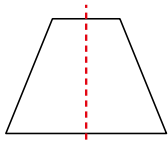
Assign pupils to complete Worksheet 1A (Workbook 1B P83)

ACTIVITY TIME

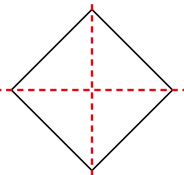
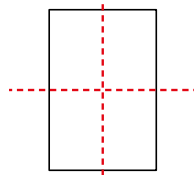
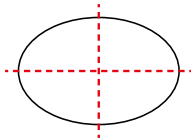


Provide examples for pupils if they are unable to suggest any example of halves and quarters (e.g. biscuits, bread, plasticine, chocolate, whiteboard, wheel of a bicycle, etc.).

1.

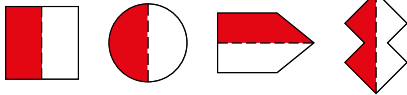


2.





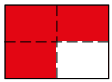
1. Colour half of each shape.



2. For each of the following shapes, colour
(a) one quarter (b) two quarters



(c) three quarters



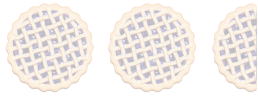
(d) four quarters



Complete Workbook 1B, Worksheet 1B • Page 84

MIND WORKOUT

Sam has some blueberry pies.



How many halves can he cut them into? **5**
How many quarters can he cut them into? **10**

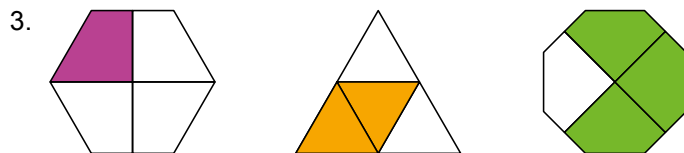
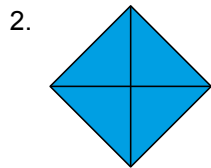
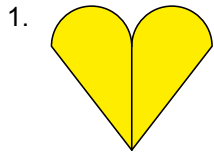
Help pupils to remember that 1 half is 1 out of 2 equal parts and 1 quarter is 1 out of 4 equal parts. Lead them to see how many equal parts there are in two quarters, three quarters and four quarters.

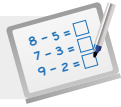
Independent seatwork

Assign pupils to complete Worksheet 1B (Workbook 1B P84)

Textbook 1 P200

Answers Worksheet 1B (Workbook 1B P84)



**Specific Learning Focus**

- Understand half and quarter as part of a whole.

Suggested Duration

2 periods

Prior Learning

Pupils are aware of sharing equally. Through a spiral approach, the part-part-whole concept can be used to introduce fractions informally.

Pre-emptive Pitfalls

Fractions are generally taught using circular objects to represent a whole. As such, pupils tend to relate wholes to pizzas and cakes only. It should be emphasised to pupils that any shape can represent a whole (e.g. square, rectangle, triangle) and some shapes can be divided into equal parts.

Introduction

Fractions are introduced informally in this grade. Pupils are first taught the concept of a whole and how it is cut into two equal parts called 'halves' or four equal parts called 'quarters'. It must be reinforced that not all shapes can be cut into halves and quarters. This also means that these shapes cannot be cut into equal parts. 'Maths Journal' (Textbook 1 P201) enunciates this fact.

Problem Solving

Pupils should be aware that a whole can be made up of 2 halves or 4 quarters and also that not all shapes can be cut into halves and quarters. These are the key concepts of this lesson and it would be good to show before using real-life objects.

Activities

The activity (Textbook 1 P199) involves the cutting of a circular waffle and a square sandwich into halves and quarters. Enunciate the fact that each half and each quarter are equal and that 2 halves make up a whole and 4 quarters make up a whole.

Resources

- pizzas
- waffles
- sandwiches
- shape cut-outs

Mathematical Communication Support

Key vocabulary words 'half', 'quarter' and 'whole' should be written on the whiteboard and get pupils to familiarise themselves with these words when doing the questions in 'Practice' (Textbook 1 P200), Workbook 1B (P84) and 'Mind Workout' (Textbook 1 P200). Prompt pupils' thinking by asking questions in class and encourage individual responses.

PROBLEM SOLVING, MATHS JOURNAL AND PUPIL REVIEW



Mind Workout

Date: _____



- (a) Part A is 1 half of a figure.
Draw a possible figure.



- (b) Part A is 1 quarter of a figure.
Draw a possible figure.



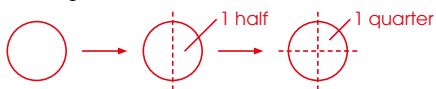
Maths Journal

Date: _____



A shape that can be cut into equal quarters can also be cut into equal halves.

Draw figures to show that Sam is correct.



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Halves and Quarters 85

Workbook 1B P85



Mind Workout

In part (a), pupils will have to focus on the concept of equal parts in fraction.

In part (b), spatial visualisation skills will be required to identify the position of the additional line to make all the parts equal.

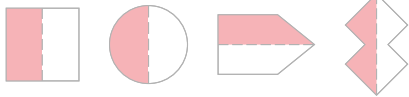


Maths Journal

This journal presents a common error made by pupils in the addition of like fractions. It will highlight why the answer $\frac{3}{10}$ does not make sense as it is less than $\frac{3}{5}$, the correct answer. Pupils can be guided to see that the equation should be changed to $\frac{2}{10} + \frac{1}{10}$ to get $\frac{3}{10}$.

PRACTICE

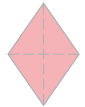
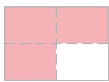
1. Colour half of each shape.



2. For each of the following shapes, colour
(a) one quarter (b) two quarters



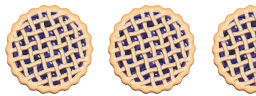
(c) three quarters (d) four quarters



Complete Workbook 1B, Worksheet 1B • Page 84

MIND WORKOUT

Sam has some blueberry pies.



How many halves can he cut them into? 5
How many quarters can he cut them into? 10

Textbook 1 P200



MIND WORKOUT

Ask pupils to point to the picture representing 1 whole. Ask them how many equal parts will there be when 1 whole blueberry pie is cut into halves and how many equal parts will there be when 1 whole blueberry pie is cut into quarters?

MATHS JOURNAL

Look at the following shapes and fill up the table below.



Square



Circle



Arrow



Letter Q



Triangle



Letter J



Heart



Rectangle

Shapes that can be cut into halves and quarters	Shapes that can be cut into halves but not quarters	Shapes that cannot be cut into halves and quarters
Square, Circle, Rectangle	Triangle, Arrow, Heart	Letter Q, Letter J

I know how to...

recognise 1 half and 1 quarter of a whole.

SELF-CHECK

Textbook 1 P201

MATHS JOURNAL

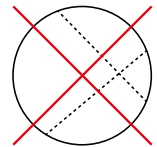
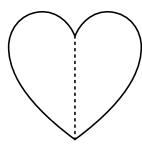
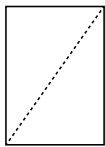
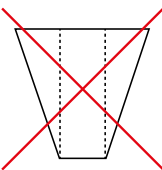
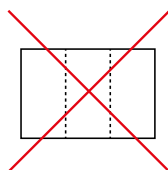
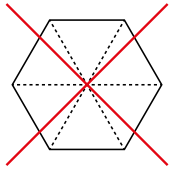
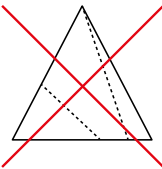
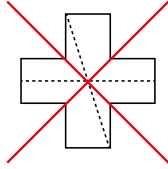
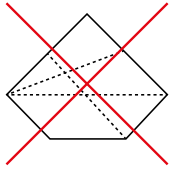
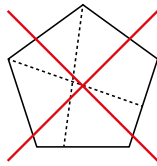
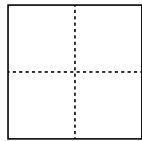
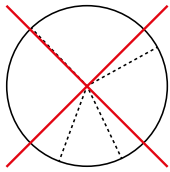
Provide shape cut-outs for the pupils to fold into equal parts to classify the shapes in the table. Lead them to see that if the shape cannot be folded into equal parts, the shape cannot be cut into halves and quarters.

SELF-CHECK

Before pupils proceed to do the self check, review the important concepts by asking for examples learnt for each objective.

Pupils to complete **Review 17** (Workbook 1B P86) as consolidation of understanding for the chapter.

1.



Time
CHAPTER
18

What time does Xinyi leave for school every morning?



TELLING TIME TO THE HOUR

IN FOCUS

Look at the clock.
What is the time?

LESSON

1

202 CHAPTER 18
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Related Resources

NSPM Textbook 1 (P202 – 210)
NSPM Workbook 1B (P87 – 100)

Materials

12-h demonstration geared clock

Lesson

Lesson 1 Telling Time to the Hour
Lesson 2 Telling Time to the Half Hour
Problem Solving, Maths Journal and
Pupil Review

Textbook 1 P202

INTRODUCTION

The teaching of time includes the measurement units of time (i.e. hours, minutes and seconds), duration of time (i.e. hour and half hour) and the reading of the clock. In Primary 1, pupils are only required to master the skill of clock reading and acquire a sense of time through the association of events of a day. However, the 12-hour analogue clock is one of the most puzzling devices for telling time. Skills and procedures are best introduced in a systematic and sequential manner. Start off by familiarising pupils to the parts of the clock. The basic sense of time (i.e. a.m. and p.m.) is best developed by relating them to significant events of pupils' lives such as going to school, mealtimes, sleep, play and so on.

LESSON

1

TELLING TIME TO THE HOUR

LEARNING OBJECTIVES

1. Read and tell time to the hour.

Time

CHAPTER 18

What time does Xinyi leave for school every morning?



TELLING TIME TO THE HOUR

LESSON 1

IN  FOCUS

Look at the clock. What is the time?



202 CHAPTER 18

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Textbook 1 P202

IN  FOCUS

Use the chapter opener as a stimulus picture to discuss with pupils what they do when getting ready for school.

Draw attention to the face of the clock as shown in the picture. Write the time shown on the whiteboard, along with the clock face and the activities as suggested by pupils.

LET'S LEARN

1.



→ This is the **minute** hand.
→ This is the **hour** hand.

The minute hand is pointing to 12.
The hour hand is pointing to 7.
The time is **7 o'clock**.

Can you tell if it is morning, afternoon or night from the clock?



2. Look at the times.

12 o'clock	1 o'clock	2 o'clock	3 o'clock
4 o'clock	5 o'clock	6 o'clock	7 o'clock
8 o'clock	9 o'clock	10 o'clock	11 o'clock

Textbook 1 P203

Introduce the blue and red arrows as the minute hand and the hour hand respectively.

Show pupils that when the minute hand points to 12 and the hour hand points to a certain number, this combination tells the time to the hour.

Referring to the clock faces on P203, encourage pupils to see that when the minute hand points to 12, the number that the hour hand points to is related to the time.

Introduce ways to write time, namely in **o'clock** and **:00**. While presenting the time notations, do cover the concept of **morning**, **afternoon**, **evening** and **night**. Misconceptions tend to arise as the analogue clock does not explicitly show the 24 hour timeline.

For weaker pupils, it might be good to give them more exposure to read time. This can be done so by providing geared clocks for pupils to manipulate during the lesson.

Work in pairs.

1. Move the hands of . Ask your partner to read the .
2. Talk about the activities you do at that time.
3. Switch roles and repeat 1 and 2.

ACTIVITY TIME

What you need:



I watch television at 8 o'clock at night.

I have music lessons at 8 o'clock in the morning.



Textbook 1 P204

ACTIVITY TIME



Assign pupils to work in pairs. Provide each pair with a geared clock.

Time cards (Activity Handbook 1 P53 - 54) can be used in this activity. Using the cards, pupils are to show the time on the geared clock.

After which, they are to describe to their partners the activities they do at that time of the day.

To assist weaker pupils, it may be good to supplement cards with the words 'in the morning', 'in the afternoon', 'at night' and 'in the evening'. Cover the recognition, familiarisation and meaning of each word for pupils in order for them to make connections between 12-hour time telling and events of the day.



What is the time?



It is 8 o'clock in the morning.



It is 11 o'clock in the morning.



It is 2 o'clock in the afternoon.



It is 5 o'clock in the afternoon.

Complete Workbook 1B, Worksheet 1 • Pages 87 – 90



Help the pupils to read and understand each question.

Highlight to pupils the contextual clues that help them interpret the possible time of the day. Start off by talking about the first picture (e.g. Why do you think it is 8:00 in the morning?).

For better understanding, select items from **Worksheet 1** and work these out with the pupils.

Independent seatwork

Assign pupils to complete Worksheet 1 (Workbook 1B P87 – 90).

1. Match



5 o'clock

11 o'clock

2 o'clock

12 o'clock

2. (a) 6 o'clock
 (b) 3 o'clock
 (c) 9 o'clock
 (d) 8 o'clock
 (e) 10 o'clock
 (f) 4 o'clock
 (g) 2 o'clock

3. (a) 7 o'clock
 (b) 9 o'clock
 (c) 2 o'clock
 (d) 6 o'clock

TELLING TIME TO THE HALF HOUR

LEARNING OBJECTIVES

1. Read and tell time to the half hour.
2. Show time to the hour on a clock.
3. Show time to the half hour on a clock.
4. Relate activities to the correct time of the day.

TELLING TIME TO THE HALF HOUR

LESSON
2

IN  FOCUS



What time do Priya and Tom go to bed at night?

LET'S LEARN 

1.



The minute hand is pointing to 12. Priya goes to bed at 9 o'clock.

Where is the hour hand pointing to?



2.



The minute hand is pointing to 6. Tom goes to bed at **half past** 9.

The hour hand is between 9 and 10. It has gone past 9.



IN  FOCUS

Pose the following question to pupils, 'Who sleeps earlier, and why?'













Draw the pupils' attention to the face of the clock depicted in each scene. For each scene, write down on the board or show the time on the geared clock.

LET'S LEARN 

Ask pupils if they can spot the difference between the two clock faces. Direct their attention to the minute hands which point to different numbers.

Show pupils that the minute hand in the first clock face is pointing to 12 and it is pointing to 6 in the second clock face. Introduce the term **half past**, when stating the time for the second clock face.

3. Look at the times.

			
half past 12	half past 1	half past 2	half past 3
			
half past 4	half past 5	half past 6	half past 7
			
half past 8	half past 9	half past 10	half past 11

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TIME 207

Textbook 1 P207

Refer to the clock faces on P207 and introduce ways to write time, namely **half past** and : 30.

Which clock shows the correct time?

PRACTICE 

- (a)   
It is half past 8 in the morning.
- (b)   
It is half past 10 in the morning.
- (c)   
It is half past 3 in the afternoon.
- (d)   
It is half past 7 at night.

Complete Workbook 18, Worksheet 2 • Pages 91 – 94

208 CHAPTER 18

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Textbook 1 P208

PRACTICE 

Help the pupils to read and understand each question.

The questions relate time to events of the day (as in Lesson 1). Highlight to pupils the contextual clues to help them interpret the possible time of the day.

For better understanding, select items from **Worksheet 2** and work these out with the pupils.

Independent seatwork

Assign pupils to complete Worksheet 2 (Workbook 1B P91 – 94).

1.



half past 3



half past 7



half past 6



half past 12

2. (a) half past 1
 (b) half past 10
 (c) half past 2
 (d) half past 4
 (e) half past 9
 (f) half past 5
 (g) half past 8
3. (a) half past 1
 (b) half past 3
 (c) half past 5
 (d) half past 8

**Specific Learning Focus**

- Read and tell time to the hour.

Suggested Duration

5 periods

Prior Learning

Pupils have understood hour as a measure of time and are able to use time to describe the order of a day's events. They are able to recognise the hour hand (red, short) and minute hand (blue, long) according to the colours and length. Pupils have not been introduced to telling time to the hour and half hour yet and these will be covered in this chapter, where pupils will be taught to relate time to the hour to the minute hand pointing to 12, and relate half hour to the minute hand pointing to 6.

Pre-emptive Pitfalls

The pupils may still struggle with reading time on the analogue clock and the notations 'a.m.' and 'p.m.' It is important to relate time to the hour to the minute hand pointing to 12 and half hour to the minute hand pointing to 6. They might have difficulty reading the time when the hour hand is not pointing exactly to the number. Hence point out that when telling time to the half hour (e.g. 4:30), the minute hand points to 6 while the hour hand points to halfway between 4 and 5.

Introduction

Relating time to events in pupils' lives in this chapter will be fun. Ask them the time that they wake up and draw a huge clock on the board for pupils to draw the hands of the clock. Point out that for times to the half hour, the hour hand points to halfway in between the number of the hour and the next number, while the minute hand points to 6. For times to the hour, the minute hand points to 12. Get pupils to look at their school time table and play a game on the whiteboard. The teacher can draw the clock showing the time and then get pupils to say what lesson they have at that time by referring to their class time table. It can be a quick "Bingo" game. Acquiring a sense of time through the association of events, table reading and indicating the time on the clock can be fun.

Problem Solving

Understanding and interpreting the sequence of events by reading tables and schedules reinforce the learning of time. Mind Workout (Textbook 1 P209 and Workbook 1B P95) helps pupils develop their ability to organise information in a systematic way and think logically. For example, the teacher can point out that midnight cannot be the time to be in school. To be able to interpret tables, encourage pupils to first fill up an empty table with their daily schedule and then work on worksheets that require table reading.

Activities

Play the "Bingo" game in class with the pupils using the templates (Activity Handbook 1 P51 - 52). Get them to read the clocks and fill in the time in the worksheet. Then pupils are to find the bingo card that shows the time written in the worksheet and put a tick beside the time on the bingo card when the time is matched. For every time that is matched, the pupil says "Bingo!".

Resources

- 12-h demonstration geared clock
- A clock can also be drawn on the floor using temporary markers or masking tapes and the pupils can move the cardboard cut-outs of the minute and hour hand and play games with each other.

Mathematical Communication Support

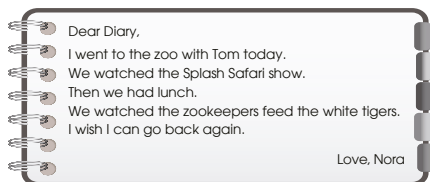
Show pupils pictures of events (e.g. cut-outs from magazines and calendars) by drawing on the whiteboard. Ask them to talk about the event and the estimated time of the day that the event takes place. To encourage the understanding of telling time to the half hour, get pupils to talk about the time when they have dinner and other events and let them correlate it with their daily routine.

PROBLEM SOLVING, MATHS JOURNAL AND PUPIL REVIEW



Mind Workout

Date: _____



Look at the times shown.

Show / Feeding	Time
Splash Safari	10 o'clock
White tigers	half past 2

Fill in the blanks to show what Nora and Tom did at the zoo.

Activity	Time
Reached zoo	half past 8
Watched Splash Safari	10 o'clock
Lunch	12 o'clock
White tiger feeding session	half past 2
Home sweet home	5 o'clock

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Time 95

Workbook 1B P95



Mind Workout

The skills required for this activity are relating time to events as well as understanding and interpreting information displayed in a table format.

To facilitate the learning of weaker pupils, go through the diary entry and get pupils to retell the story. This allows teachers to check if pupils understand the passage.

Explain to pupils the information shown in the table and how it is related to the diary entry. As pupils are required to present a schedule, teachers may need to spend some time going through what a schedule is like (e.g. use TV guides in magazines or newspapers) and how to present their answers in such a format.

For weaker pupils, allow them to fill in as many activities as possible and let them be the ones to ask about the extra space. For pupils who are not able to sieve out the 'lunch activity', assist them by encouraging them to list down each activity mentioned line by line in the diary entry. Depending on the ability of the pupils, additional pointers may be discussed such as what time should lunch be.



Draw some activities you do on Sunday.

--	--	--

Fill in the blanks to show the activities and the times.

Activity	Time

Workbook 1B P96



Maths Journal

Complete this as a class, and get pupils to list down events that happen on a Sunday. Provide helping words to facilitate writing.

The information has to be presented as a schedule, which is similar to Mind Workout on P95. Likewise, help pupils to familiarise themselves with schedules by showing them examples from TV guides on newspapers or magazines.



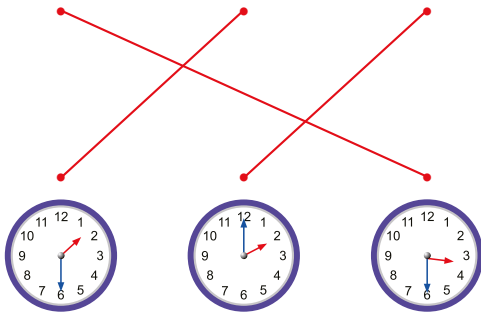
MIND WORKOUT



Farhan

Weiming

Bina



Farhan left school after Bina.

Weiming left school before Farhan.

Bina left school after Weiming.

Match each clock to the correct picture.

Textbook 1 P209

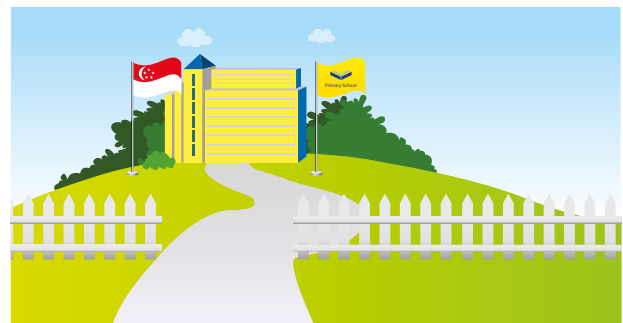


MIND WORKOUT

The skills to be developed from this activity are logical reasoning and systematic way of organising information.

Demonstrate or encourage pupils to translate the passage into a picture. Get them to draw based on their understanding of the passage.

Assist weaker pupils by providing them a picture with the school gate as shown.




Pupils can also use counters to represent each child in the question and get them to act out the scenario.

Once the pupils are able to sequence the order of departure, relate the time factor with the sequence.

MATHS JOURNAL

Talk about what you do on Saturday.
Show the time.

Use a  to show the time.



My Saturday

I wake up at 8 o'clock.



I eat breakfast at .



I watch television at .



I go outdoors at .



I know how to...

- tell time to the hour. tell time to the half hour.

SELF-CHECK



MATHS JOURNAL

This activity is similar to Maths Journal (Workbook 1B P96). Instead of tabulating the information like a schedule, pupils are to draw the correct times on the given clock faces.

Before the pupils do the self check, review the important concepts once more by asking for examples learnt for each objective.

This self check can be done after pupils have completed **Review 18** (Workbook 1B P97 – 100) as consolidation of understanding for the chapter.

SELF-CHECK



Answers Review 18 (Workbook 1B P97 – 100)

1.

(a) half past 2

(b) 4 o'clock

(c) 6 o'clock

2.



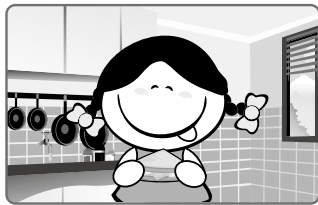
Seven o'clock

3. (a) 8 o'clock

(b) 2 o'clock

(c) half past 4

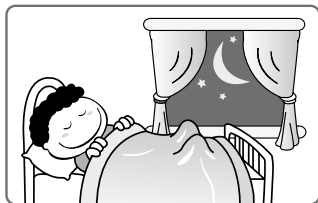
4.



Bina is eating lunch.



10 o'clock at night



Ahmad is sleeping.



8 o'clock in the morning



Meiling is walking to school.



half past 1 in the afternoon

Dollars, Cents and Rupees

CHAPTER 19

How much money is Bina giving to the cashier?



RECOGNISING OUR COINS AND NOTES

LESSON
1

IN FOCUS

Bina is holding one hundred rupees. We write it as Rs 100.



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DOLLARS, CENTS AND RUPEES
211

Textbook 1 P211

Related Resources

NSPM Textbook 1 (P211 – 225)
NSPM Workbook 1B (P101 – 112)

Materials

Play money, specimens of Pakistani coins and notes, envelope, shopping cards

Lesson

- Lesson 1 Recognising Our Coins and Notes
 - Lesson 2 Counting Money
 - Lesson 3 Exchanging Money
 - Lesson 4 Solving Word Problems
- Problem Solving, Maths Journal and Pupil Review

INTRODUCTION

Money is an important topic that relates to real life. The most important concept at Grade 1 is recognising and counting the Pakistani Rupee. Pupils should also be given opportunities to handle money as financial literacy is becoming more important, and hence, a shopping experience is incorporated into one of the lessons. However, to count money proficiently, pupils must be skilled in whole numbers and place value concepts up to hundreds as these are important pre-requisites to the concept of exchanging money. Pupils also have to understand some important key ideas, such as a greater number of coins does not necessarily mean a bigger value. There are essentially two different variables, the number of coins and the total value. Hands-on experiences with handling and dealing with play money are important avenues to sensitise children to such subtle ideas.

LESSON

1

RECOGNISING OUR COINS AND NOTES

LEARNING OBJECTIVES

1. Recognise and use correct notations to name both coins and notes used in Pakistan.

Dollars, Cents and Rupees CHAPTER **19**

How much money is Bina giving to the cashier?



RECOGNISING OUR COINS AND NOTES LESSON **1**

IN FOCUS

Bina is holding one hundred rupees. We write it as Rs 100.



OXFORD UNIVERSITY PRESS DOLLARS, CENTS AND RUPEES 211

Textbook 1 P211

IN FOCUS

Use the chapter opener as a stimulus to discuss the concept of money.

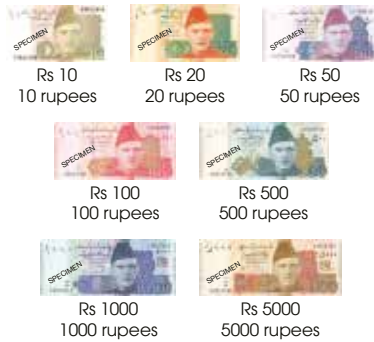
At each scene, focus on the exchange of money for objects and relate this to using money to buy items in real life.

LET'S LEARN

1. Here are some Pakistani coins and notes.
Coins



Notes



Re stands for rupee.
Rs stands for rupees.



Look at both sides of the notes. Whose picture is on the notes?

Using specimens of Pakistani coins and notes, help pupils recognise the different denominations. Talk about the distinctive features, such as the numerals written, pictures featured on each note and coin, colour, etc.

2. Here are some of the coins and notes that are used in the United States of America.



¢ stands for cents. \$ stands for dollars.
Dollars and cents are also used in countries such as Canada and Singapore.

ACTIVITY TIME

Work in pairs.

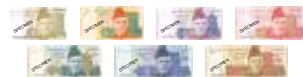
1 Name the coin. Tell your partner what you can buy with each coin from a bookshop.



What you need:



2 Name the note. Tell your partner what you can buy with each note from a supermarket.



Let pupils be aware of some coins and notes that are used in the United States of America. Introduce the symbol for cents and dollars to them.

ACTIVITY TIME



Assign pupils to work in pairs. Provide each pair with specimens of Pakistani coins and notes.

Allow pupils to discuss and talk about what they see on the notes and coins. A worksheet listing specific observables can be given to each pair to aid in discussion. The worksheet can list properties such as colour, numerals present, picture featured, etc.

To incorporate National Education, the activity can be extended to discuss the significance of the pictures on the notes and coins.



1. Count.



- | | | |
|---------------|---------------|---------------|
| 3 Re 1 coins | 4 Rs 2 coins | 1 Rs 5 coin |
| 3 Rs 10 notes | 1 Rs 20 notes | 4 Rs 50 notes |

2. Count.



- | | | |
|--------------|--------------|---------------|
| 4 1¢ coins | 1 5¢ coin | 3 \$1 notes |
| 4 \$10 notes | 2 \$20 notes | 5 \$100 notes |

Complete Workbook 18, Worksheet 1 • Pages 101 – 102



Ensure that pupils are able to recognise the notes and coins. After which, introduce the money notation and how to say it.

Get pupils to practice writing the standard notation, involving only dollars (e.g. \$2, \$5) or only cents (e.g. 10¢, 50¢).

Other ways of writing can be brought up for class discussion or for high-ability pupils (e.g. \$5.00).

For better understanding, select items from **Worksheet 1** and work these out with the pupils.







Independent seatwork

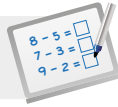
Assign pupils to complete Worksheet 1 (Workbook 1B P101 – 102).

1.



2.

Picture	Amount	Number of coins or notes
	Re 1	2
	Rs 2	1
	Rs 5	3
	Rs 10	4
	Rs 20	2
	Rs 50	1

**Specific Learning Focus**

- Recognise and use correct notations to name both coins and notes used in Pakistan.

Suggested Duration

4 periods

Prior Learning

At this stage, pupils have not dealt with money yet but should be aware that notes and coins are exchanged and used at the banks and shops. In this chapter, pupils are introduced to the mathematical link between currency and denominations.

Pre-emptive Pitfalls

Currency and denominations can be quite confusing to pupils. Point out the fact that every country has its own currency. Dollars, cents and rupees are introduced in this chapter. The US Dollar is introduced as it is a predominant currency used by the Government and generally when travelling. Most pupils should be aware of the US Dollar and Rupee. The aim of this lesson is to formalise this concept with the recognition of notes and coins.

Introduction

Bring rupees dollars and cents to the classroom. Show pupils that the Pakistani notes are different from the other notes in other currencies. Also, the design of each Pakistani note representing each denomination is different. Pupils are encouraged to handle money in a role-play of activities like buying items at a shop, interaction between a mother and a father, or withdrawing cash from the bank. The teacher may talk about the ATM machines to pupils and may encourage parents to bring their child to the ATM machine to show different types of notes that can be withdrawn from the machine. Explain that cents are represented by coins as cents are less than a dollar. The teacher may want to mention to pupils that 'paisa' is a currency used in India in the past but is no longer in use today.

Problem Solving

Pupils are encouraged to recognise the Pakistani coins and notes and identify/read the value. The concept of less than or greater than can be revisited using different denominations. The teacher can carry out an activity where pupils are required to arrange Rs 100, Rs 500 and Rs 5000 notes in ascending and descending order according to their values.

Activities

This lesson is best learnt through hands-on activities. Learning can be made fun through role-play involving shopping at a shop in pairs or groups.

Resources

- Pakistani coins and notes
- play money

Mathematical Communication Support

Ask pupils if they can bring in different currencies used in other parts of the world and then get them to draw a table in their exercise book to indicate the different countries and the names of their currencies.

LESSON

2

COUNTING MONEY

LEARNING OBJECTIVES

1. Count and tell a given amount of money.

COUNTING MONEY

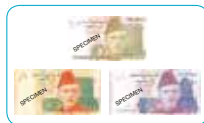
LESSON 2

IN FOCUS

Junhao has these coins in his pocket.



Siti has these notes in her purse.



How much does each child have?

LET'S LEARN

1. Count on to find the amount.



Junhao has 9 rupees.

Rs 5, Rs 7,
Rs 8, Rs 9



- 2.



Siti has 80 rupees.

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DOLLARS, CENTS AND RUPEES

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IN FOCUS

To model the example shown in the picture, show the class specimens of the coins and notes through the visualiser.

LET'S LEARN

Taking specimens of one Rs 5 coin, one Rs 2 coin and two Re 1 coins, use the count-on method to find the total amount that Junhao has.

Take specimens of one Rs 50 note, one Rs 20 note and one Rs 10 note to show the amount that Siti has. Likewise, count on to find the total amount of money.

Textbook 1 P215

3. Raju saves 2 ten-dollar notes, 1 five-dollar note and 1 two-dollar note.



\$10, \$20,
\$25, \$27



Raju saves \$27.

Ann saves 1 ten-dollar note, 2 five-dollar notes, 1 two-dollar note and 1 one-dollar coin.



\$10, \$15, \$20, \$22, \$23

Ann saves \$23.

Raju saves more money than Ann.

Raju saves four dollar notes.
Ann saves four dollar notes and a coin.
Who saves more money?



Do the same for Let's Learn 3 by using play money and counting on to find the total amount of money each child has.

For weaker pupils, try breaking down the counting to help them to progress on more systematically.

Example

Instead of using the notes as suggested in Let's Learn 3, start off by using a set of notes of similar value.

Get pupils to count on in tens by giving them four Rs 10 notes. Then proceed to give them three Rs 5 notes to count on in fives.

Next, combine both sets of notes for them to count. At this point, it is necessary to bridge the counting on from 15 to 25.

Breaking down the counting concept helps pupils to progress on more systematically.

ACTIVITY TIME



Work in groups of 3.

- Each pupil takes a envelope.
- Count the amount of in the envelope. Write the amount of money on each envelope.
- Put the envelopes in order. Start with the envelope with the most money.

What you need:



Rs 200 is the greatest.

Does the envelope with the most coins and notes have the most money?

Rs 55 is the smallest.



PRACTICE

Count the amount of money in each set.



Rs 56



\$ 50 and 70 ¢

Assign pupils to work in groups of 3. For each group, provide some play money and three envelopes.

At the end of the activity, check that the money in each envelope is correctly counted and written.

Alternatively, prepare some envelopes with play money in them beforehand. State an amount and get pupils to find the envelope containing the stated amount. Pupils will pick an envelope randomly to count the amount of money in them in order to locate the correct envelope.

PRACTICE

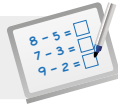


Help the pupils to read and understand each question. For better understanding, select items from Worksheet 2 and work these out with the pupils.

Independent seatwork

Assign pupils to complete Worksheet 2 (Workbook 1B P103 – 104).

1. (a) Rs 20
(b) Rs 100
(c) Rs 70
(d) Rs 60
2. Kate saves more money than Ahmad.
3. Nora spends more money than Tom.



Specific Learning Focus

- Count and tell a given amount of money.

Suggested Duration

6 periods

Prior Learning

Pupils have been introduced to Pakistani notes and coins so they are able to recognise the notes and coins in various denominations and understand that every country has its own currency.

Pre-emptive Pitfalls

This lesson covers the addition of amount using notes and coins. Recognising the correct denomination and adding up to a certain amount of money could be challenging for the pupils.

Introduction

Bring coins and notes into the classroom and guide the pupils to carry out all the activities in 'Let's Learn' in class. Encourage pupils to work in pairs and recognise the notes and coins and add to find the amount. They can record their answers on worksheets or their exercise books.

Problem Solving

When pupils count money, it should be emphasised that they need to be able to recognise the denomination. The addition of money can be done mentally. Strategies like number bonds, skip counting, adding with grouping and regrouping can all be revisited in this chapter.

Activities

The teacher can set up make-believe shops in class where various objects with price tags can be displayed. Get pupils to take turns to role-play as a shopkeeper and a customer.

Resources

- Pakistani coins and notes
- play money
- envelopes

Mathematical Communication Support

Ask pupils if Rs 100 is enough to buy a book that costs Rs 80. Similar questions related to real-life situations can be asked. The teacher can also ask pupils to bring their coin banks to class if they have, and find the total amount they have in their coin banks. If most of them do not have a coin bank, the teacher can bring a make-believe coin bank into the classroom. The pupils can be made to gather around the teacher's desk to count her "savings".

LESSON 3

EXCHANGING MONEY

LEARNING OBJECTIVES


1. Exchange coins or notes of one denomination for a set of coins or notes with an equal value.

EXCHANGING MONEY

LESSON
3


IN FOCUS

Bina wants to exchange Rs 5.




What coins can she get in exchange?

LET'S LEARN

1. 1 five-rupee coin =  5 one-rupee coins

Bina can exchange Rs 5 for 5 one-rupee coins.

2. Xinyi wants to exchange Rs 20.

1 twenty-rupee note =  2 ten-rupee notes

She can exchange Rs 20 for 2 ten-rupee notes.

218 CHAPTER 19

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Textbook 1 P218

IN FOCUS

In this lesson, pupils are taught that there can be more than one combination of coins or notes for a given value.

Pupils will also learn that the number of coins or notes in a set does not always equate to a greater or smaller value.

LET'S LEARN

Start off by comparing five-rupee coin with 5 one-rupee coins. Show that the two sets of coins have the same value by counting on.

Highlight that the two sets of coins have the same value even though there are more one-rupee coins than five-rupee coins.

Provide pupils with play money or specimens of Pakistani coins and notes to allow for exploration.

Likewise for Let's Learn 2, show that 1 twenty-rupee note has the same value as 2 ten-rupee notes by counting on.

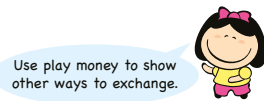
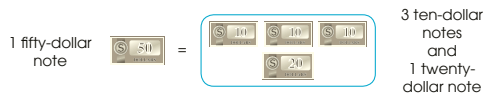
3. We can exchange coins and notes.



4. Junhao wants to exchange \$1.



5. Raju wants to exchange \$50.



Textbook 1 P219

Repeat the steps taken for Let's Learn 3, 4 and 5.

For weaker pupils, guide them along by giving them hands-on practice in the exchange of coins using play money.

Example

- Can you pick up 10 coins that give the same value as 1 ten-rupee note?
- Can you pick up 5 coins that give the same value as 1 ten-rupee notes?
- Do you think there is another way?

Pose the last question only after a few practices of using coins of the same denomination.

Once pupils are familiar with using coins or notes of the same denomination, challenge them to exchange money using different denomination.

Work in pairs.

1 Show how you can pay for the eraser using $\$1$.



2 Show how you can pay for the bicycle using $\$10$.





ACTIVITY TIME

What you need:



PRACTICE

Find the missing numbers.

(a)  1 two-rupee coin = one-rupee coins 

(b)  1 hundred-rupee note = twenty-rupee notes 

Complete Workbook 18, Worksheet 3 • Pages 105 – 106

Textbook 1 P220

ACTIVITY TIME



Assign pupils to work in pairs. Provide each pair with play money, shopping cards and a worksheet (refer to the Activity Handbook 1 P60 - 61) for recording of the activity.

PRACTICE



Help the pupils to read and understand each question.

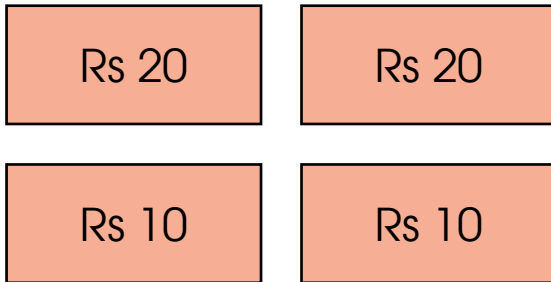
For better understanding, select items from **Worksheet 3** and work these out with the pupils.

Independent seatwork

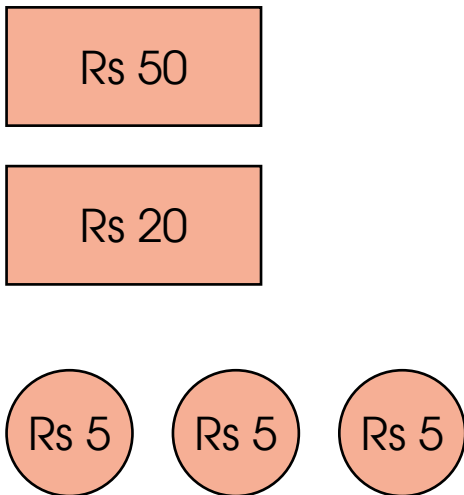
Assign pupils to complete Worksheet 3 (Workbook 1B P105 – 106).

1. (a) 2
- (b) 10
- (c) 20
- (d) 4
- (e) 5
- (f) 5

2. (a)



- (b)




SOLVING WORD PROBLEMS

LEARNING OBJECTIVES

1. Add or subtract money in dollars through real-life context of purchase and saving.
2. Solve 1-step word problems involving addition or subtraction of money.

SOLVING WORD PROBLEMS

IN FOCUS



Sam buys two ice creams.
How much does Sam spend altogether?

LESSON
4

LET'S LEARN

1. Look at the price of each ice cream.


Rs 45

Rs 55

Add the cost of the ice creams to find how much Sam spends altogether.

$\text{Rs } 45 + \text{Rs } 55 = \text{Rs } 100$

Sam spends Rs 100 altogether.



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DOLLARS, CENTS AND RUPEES

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Textbook 1 P221

IN FOCUS

Recap the 2 different structures in word problems involving whole numbers. Let pupils know that word problems in this chapter are similar to that in whole numbers, except that the context now involves money.

Recap possible money transactions in real life, such as savings, purchases, donations, etc.

LET'S LEARN

Let's Learn 1 covers the purchase of two items. The word problem involves the **part-part-whole concept**. This requires combining the two groups to find the answer.

2. Raju has Rs 40.
His father gives him Rs 50.
How much does Raju have now?

$$\text{Rs } 40 + \text{Rs } 50 = \text{Rs } 90$$

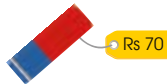
Raju has Rs 90 now.



3. Nora has Rs 100.
She buys an eraser for Rs 70.
How much does Nora have left?

$$\text{Rs } 100 - \text{Rs } 70 = \text{Rs } 30$$

Nora has Rs 30 left.



4. Bala buys a globe and a toy set.
The globe costs \$25 and the toy set costs \$10.
How much does Bala have to pay altogether?



$$\$ 25 + \$ 10 = \$ 35$$

Bala has to pay \$ 35 altogether.

In Let's Learn 2, pupils are required to understand the meaning of giving. Lead pupils to see that after Raju's father gives him Rs 50, Raju has more money. Therefore, to find the amount that Raju has after receiving Rs 50, addition of two groups is required.

Let's Learn 3 is a part-part-whole concept that requires taking away a part from the whole to find the answer. Lead pupils to see that this involves subtraction.

Let's Learn 4 deals with sum in dollars. Check that pupils are able to work with such word problem involving dollars.

For high-ability pupils, pose questions to elicit their thinking in other context involving money that leads to:

- a combined structure (e.g. purchase of more than two items).
- a change (i.e. increase or decrease) of the original amount of money (e.g. loss of money, receiving money from parent).

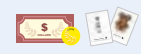
Work in groups of 3 to 4.

Part A: Shopping using coins

- 1 Take three 50 each.
- 2 Look at .
Take turns to choose two objects to buy.
- 3 Add and say how much the objects cost.
- 4 Use to pay for the objects.
- 5 Tell your group members how much you will get back.

ACTIVITY TIME

What you need:



Part B: Shopping using notes

- 1 Take a 50 each.
- 2 Look at .
Take turns to choose two objects to buy.
- 3 Add and say how much the objects cost.
- 4 Use to pay for the objects.
- 5 Tell your group members how much you will get back.



ACTIVITY TIME



Assign pupils to work in groups of 3 to 4. Provide play money and shopping cards for each group. Alternatively, the task can be conducted as a class activity.

For a more realistic shopping enactment, real things (such as chips, sweets, etc.) can be used in place of shopping cards.



Solve.

1. Farhan has Rs 80.
He spends Rs 35 and saves the rest of his money.
How much does Farhan save?

$$\text{Rs } 80 - \text{Rs } 35 = \text{Rs } 45$$

Farhan saves Rs 45.

2. Kate buys a box of chocolates that costs \$13.
She gives the cashier \$50.
How much does Kate get back from the cashier?

$$\text{\$ } 50 - \text{\$ } 13 = \text{\$ } 37$$

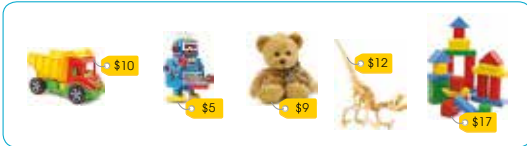
Kate gets \$ 37 back from the cashier.



Complete Workbook 1B, Worksheet 4 • Pages 107 – 108



MIND WORKOUT



Tom has \$20.
He buys one toy and has \$11 left.
Which toy does Tom buy? **Toy bear**



Help the pupils to read and understand each question.

For better understanding, select items from **Worksheet 4** and work these out with the pupils.

Independent seatwork

Assign pupils to complete Worksheet 4 (Workbook 1B P107 – 108).

1. $\text{Rs } 40 + \text{Rs } 55 = \text{Rs } 95$
Raju spends Rs 99 in all.
2. $\text{Rs } 95 - \text{Rs } 88 = \text{Rs } 7$
Ann has Rs 7 left.
3. $\$15 + \$13 = \$28$
Weiming saves \$28 in all.
4. $50\text{¢} + 45\text{¢} = 95\text{¢}$
Siti needs 95¢ altogether.
5. $\$20 - \$17 = \$3$
Mrs Kumar gets \$3 back.

**Specific Learning Focus**

1. Add or subtract money in dollars through real-life context of purchase and savings.
2. Solve 1-step word problems involving addition or subtraction of money.

Suggested Duration

Lesson 3: 4 periods

Lesson 4: 4 periods

Prior Learning

Pupils should now be comfortable with handling money in various denominations and adding to find the total amount of money.

Pre-emptive Pitfalls

Pupils may face difficulty when adding coins or notes of the same value (e.g. five Rs 10 notes, three Rs 2 coins). It should be emphasised to pupils that when adding or subtracting money, it would be helpful to sort the coins and notes in a systematic way according to the denominations. Exchanging money can be confusing for pupils at this stage.

Introduction

'Let's Learn' (Textbook 1 P218 onwards) should be carefully introduced to the pupils. In Lesson 3, when pupils learn to exchange money, they need to be able to determine how many coins or notes add up to give the same value as the value of one coin or note. For example, 1 twenty-rupee note is equivalent in value to 2 ten-rupee notes, and this can be shown using number bonds, where two tens make a twenty. In Lesson 4, pupils learn to solve word problems involving money such as finding the change by subtraction.

Problem Solving

Exchanging money highlights an important fact that it is common and alright to have more than one answer or to come up with various combinations to solve mathematical problems. The concept of change and linking it to number bonds should be reinforced during the course of this chapter. Questions in 'Practice' (Textbook 1 P224) need to be explained to the pupils step-by-step on the whiteboard. In Question 2, prompt the pupils' thinking by asking them 'How much money did Kate give to the cashier? What is the cost of the box of chocolates she buys? How much change does she receive from the cashier? Could she have given the cashier a different amount to make the purchase?' These are some questions the teacher should ask to help pupils develop their conceptual learning.

Activities

Get pupils to role-play in an activity involving buying items and paying for the items at the cashier. This can be done by having different objects with price tags, Pakistani coins and notes, or play money (Textbook 1 P223).

Resources

- Pakistani coins and notes
- play money
- shopping cards
- real-life objects

Mathematical Communication Support

Change, currency, exchanging of money, value, cost, adding and subtracting amount of money, purchasing of items, and savings are concepts that are taught in this chapter. It is easier to explain these technical terms when pupils apply the use of money in real-life situations. Determining which item is more expensive, recognising different combinations of notes and coins that add up to the same value, and calculating the change are important and need to be discussed in class. Role-play and teach by asking can be effective in this lesson.

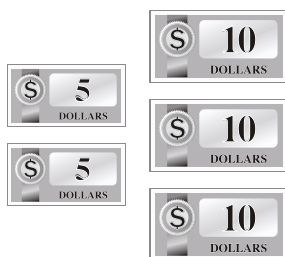
PROBLEM SOLVING, MATHS JOURNAL AND PUPIL REVIEW



Mind Workout

Date: _____

Kate has five \$5 and \$10 notes that add up to \$40.
Use play money to find the numbers of each note Kate has.



Kate has \$5 notes and \$10 notes.

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Dollars, Cents and Rupees 109



Mind Workout

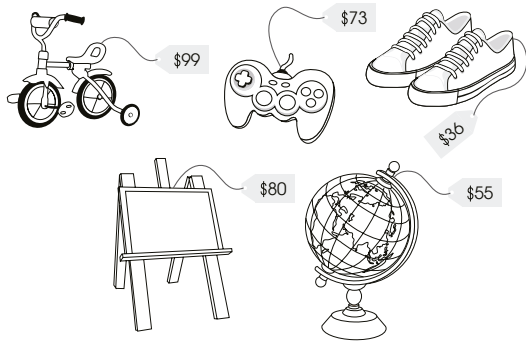
This question adopts the strategy of combinations and systematic listing.

Help pupils to understand that the phrase 'five \$5 notes and \$10 notes' means that Kate has a total of five notes, which is made up of unknown numbers of \$5 notes and \$10 notes. Pupils will be required to find the combination of \$5 notes and \$10 notes that gives a total value of \$40.

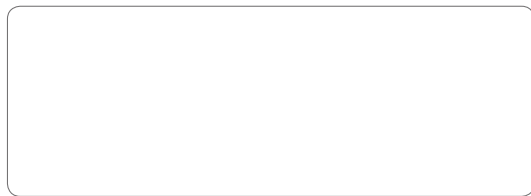
Most will misinterpret it as having five \$5 notes and some \$10 notes, or five \$5 notes and five \$10 notes.

Workbook 1B P109

Look at the objects.



Colour one object that you want to buy.
Then draw to show the amount of money.



This purpose of this activity is for pupils to show different combinations of notes or coins for a given value. Pupils will also learn that it is common to have more than one answer in mathematics problems.

Solve.

PRACTICE

- Farhan has Rs 80.
He spends Rs 35 and saves the rest of his money.
How much does Farhan save?

$$\text{Rs } 80 - \text{Rs } 35 = \text{Rs } 45$$

Farhan saves Rs 45.

- Kate buys a box of chocolates that costs \$13.
She gives the cashier \$50.
How much does Kate get back from the cashier?

$$\$ 50 - \$ 13 = \$ 37$$

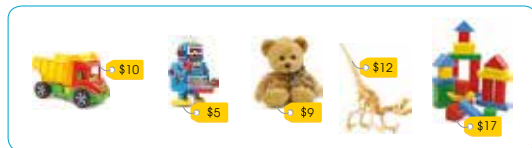
Kate gets \$ 37 back from the cashier.



Complete Workbook 1B, Worksheet 4 • Pages 107 – 108



MIND WORKOUT



Tom has \$20.
He buys one toy and has \$11 left.
Which toy does Tom buy? **Toy bear**



MIND WORKOUT

The problem requires pupils to find the cost of the toy that Tom buys, followed by identifying the correct toy.

Help them to understand the question by asking the following questions:

- How much did Tom have?
- How much does he have left?
- How do we find the amount of money Tom spent?

Lead them to see that the amount of money spent is equal to the price of the toy.

Pupils can also use play money to find the answer. They can try acting out the situation in the problem and find the amount of money left over from buying each toy.

For middle or high-ability pupils, help them to relate their guesses to making number bonds of 20.

MATHS JOURNAL

Meiling has four coins in her wallet.
Bala has three coins in his wallet.



Draw to show three ways where Bala has more money than Meiling.

I know how to...

- name coins and notes.
- count to tell the amount of money.
- exchange coins or notes.
- solve word problems involving money.

SELF-CHECK



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DOLLARS, CENTS AND RUPEES 225

Textbook 1 P225

MATHS JOURNAL

There are many possible answers to this problem. Allow pupils to work with play money to obtain their answers.

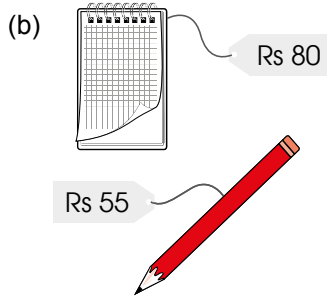
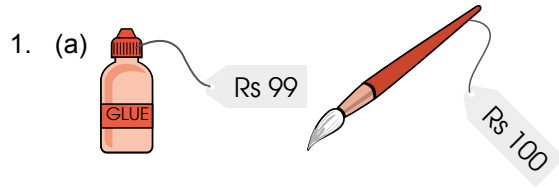
The purpose of this activity is to reinforce the idea of exchanging money (in Lesson 3) and that there can be multiple approaches to a single problem.

SELF-CHECK



Before the pupils do the self check, review the important concepts once more by asking for examples learnt for each objective.

This self check can be done after pupils have completed **Review 19** (Workbook 1B P111 – 112) as consolidation of understanding for the chapter.



2. (a) $\text{Rs } 70 + \text{Rs } 25 = \text{Rs } 95$
Priya spends Rs 95 altogether.

(b) $\$19 - \$15 = \$4$
Mrs Ali has \$4 left.

(c) $\$50 - \$11 = \$39$
Meiling gets \$39 back.

VOLUME

CHAPTER 20

Volume CHAPTER
20

What can we fill the different containers with?

COMPARING VOLUMES LESSON
1

IN FOCUS

We can fill each container with water.
What else can we use to fill the containers?

226 CHAPTER 20 OXFORD
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Textbook 1 P226

Related Resources

NSPM Textbook 1 (P226 – 233)
NSPM Workbook 1B (P113 – 120)

Materials

containers of various shapes and sizes to hold liquids, paper cup

Lesson

Lesson 1 Comparing Volumes
Problem Solving, Maths Journal
and Pupil Review

INTRODUCTION

The topic on volume is first introduced at Grade 1. At this level, the concept of volume refers to the amount of liquid in a container. Pupils will learn to compare different amounts of liquid in identical containers as well as the concept of conservation of volume (i.e., same amount of liquid poured into different containers) through the engaging hands-on activities.

LESSON

1

COMPARING VOLUMES


LEARNING OBJECTIVES

1. Measure and compare volumes of liquid using a non-standard unit.

Volume

CHAPTER 20


What can we fill the different containers with?



COMPARING VOLUMES

LESSON 1

IN FOCUS



We can fill each container with water.
What else can we use to fill the containers?

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Textbook 1 P226

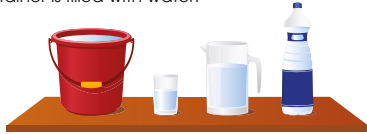


Using the chapter opener, discuss the following questions:

- Do you recognise these containers in your home?
- Can you name some of them? (e.g. pail, cup, water bottle, jug, kettle)
- What are they used for?
- What do we fill these containers with?
- What else can we fill these containers with?
- Can we fill them with rice like the rice container at home?

LET'S LEARN

Each container is filled with water.



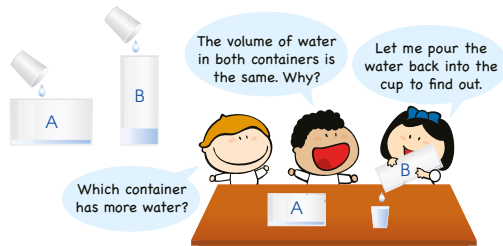
The amount of water in a container is called the **volume** of water.

ACTIVITY TIME

Work in groups of 3 to 4.

1. Fill the with the same volume of water.
2. Pour the water from one cup into Container A.
3. Pour the water from the other cup into Container B.

What you need:



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VOLUME 227

Textbook 1 P227

LET'S LEARN

Bring a pail of water and 3 empty containers for demonstration in class. Fill the empty containers with water from the pail. Tell pupils that the amount of water in a container is called the **volume** of water and the containers have different volumes of water in them. Write the word 'Volume' on the board.

ACTIVITY TIME

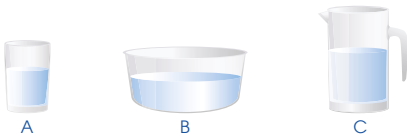
This activity aims to develop the pupils' understanding on conservation of volume. Ask pupils to observe the levels of water in the two containers and discuss the following questions:

- Which container will have more water? Why?
- How can you check to find out?

After the discussion, the teacher can repeat the activity using coloured water to reinforce the concept of conservation of volume.

Note: Some pupils may relate the volume of water with the water level in a container. Guide them to understand that the volume of water has not changed when it is poured from one container to another.

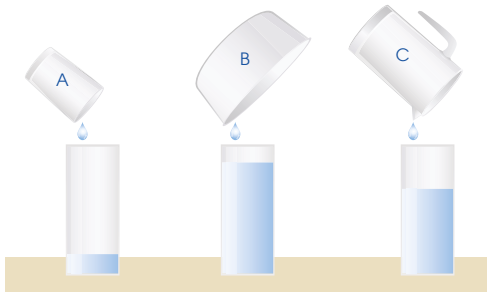
IN FOCUS



Compare the volume of water in the three containers. Which container has the greatest amount of water?

LET'S LEARN

1. Pour the water into containers of the same size.



228 CHAPTER 20

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Textbook 1 P228

IN FOCUS

Ask pupils to guess which container has the greatest amount of water and get them to suggest ways to find out the answer.

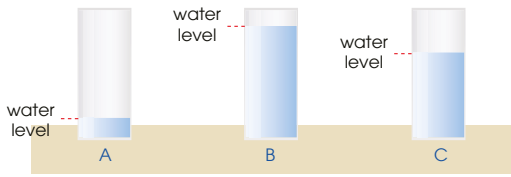
LET'S LEARN

There are two ways to find out which container has the greatest amount of water.

Method 1: Use of a standard unit

Pour the water into containers of the same size and compare the water levels.

Look at the water levels and compare.



The volume of water in Container A is **less than** the volume of water in Container B.

The volume of water in Container B is **greater than** the volume of water in Container C.

Container A has the **least** amount of water.

Container A has less water than Container B.

Container B has the **greatest** amount of water.

Container B has more water than Container C.

Arrange in order.
Start with the container with the greatest amount of water.

Container B, Container C, Container A
greatest \longrightarrow least

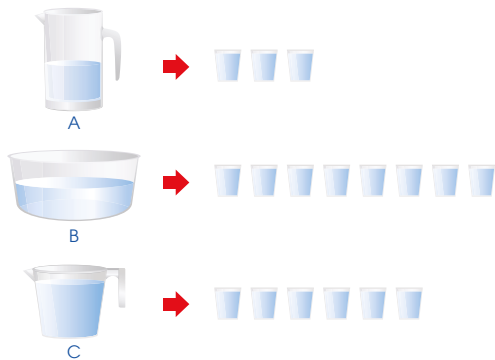
Container B has the most water.

Emphasise on the use of terms **less than** or **greater than** to make the comparison between 2 containers.

Use the terms **greatest** or **least** for comparison among 3 containers and arrange them in order, starting with the container with the greatest amount of water.

2. The water in Containers A, B and C is poured into cups of the same size.

Compare the volume of water in each container.



(a) The volume of water in Container **B** is the greatest.

(b) The amount of water in Container **B** is more than the amount of water in Container C.

(c) Arrange in order.
Start with the container with the least amount of water.



Container **A**, Container **C**, Container **B**
least \longrightarrow greatest

Method 2:

Pour the water in the containers into cups of the same size.

Get pupils to count the number of cups used as teacher pours the water into the cups. Compare the number of cups used by each container and order them, starting with the container with the least amount of water.

Work in groups of 3 to 4.

- Fill the  with water.
- Pour the water into the .

Which container do you think can hold more water? Why?

ACTIVITY  TIME

What you need:



PRACTICE 

- Cup A and Cup B have the same amount of water. The water is poured into Container C and Container D.



The volume of water in Container C is less than the volume of water in Container D.

True / **False**

Textbook 1 P231

A suggested follow-up task is to compare the volumes using a non-standard unit e.g. paper cup. Find out how many paper cups each container can fill.

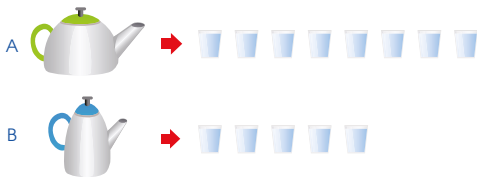
PRACTICE 

Work with pupils on the questions. Allow them to explain how they arrive at their answers.

- Compare the volumes of water in the containers using **less**, **more**, **greatest** or **least**.



- Container A has **less** water than Container B.
 - Container B has **more** water than Container C.
 - Container C has the **least** amount of water.
 - Container B has the **most** amount of water.
- All the water in the kettles is used to fill up the cups.



- Kettle **B** has less water than Kettle **A**.
- Which kettle has a greater amount of water? **A**

 Complete Workbook 1B, Worksheet 1 • Pages 113–117

Textbook 1 P232

Highlight to pupils that Let's Learn 3 shows the approach of comparing volumes using a non-standard unit.

For better understanding, select questions from **Worksheet 1** and work on them with pupils.

Independent seatwork

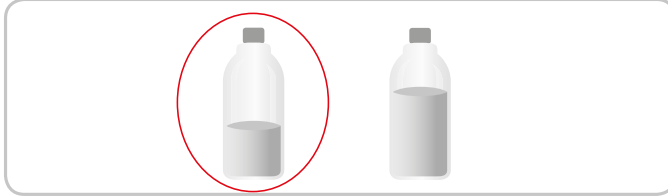
Assign pupils to complete Worksheet 1 (Workbook 1B P113 – 117).

Answers Worksheet 1 (Workbook 1B P113 – 117)

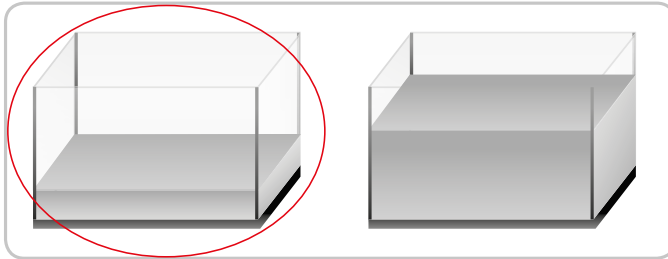
1. (a)



(b)



(c)



- 2. (a) True
- (b) True
- (c) False

3.



- 4. (a) A
- (b) A
- (c) A, C, B

5. Y, X

- 6. (a) S
- (b) S, R, Q

- 7. (a) False
- (b) True
- (c) False

**Specific Learning Focus**

- Measure and compare volumes of liquid using a non-standard unit.

Suggested Duration

4 periods

Prior Learning

Pupils have been engaged in pouring of liquid and filling up of containers in their kindergarten years, which shapes their motor skills. However, they have no prior knowledge of volume and capacity. In this chapter, the concepts of volume and the comparison of volume and capacity are introduced.

Pre-emptive Pitfalls

This chapter talks about the quantity of liquid contained in an object. It is a relatively easy concept with a lot of hands-on activities which the pupils would enjoy. Care should be taken when pouring liquid (e.g. water) to prevent accidents.

Introduction

Explain to pupils that volume is the amount of space contained in an object and can be measured. There will be opportunities for pupils to explore and compare pairs or groups of containers that look different but have similar capacities. The containers could be tall, short, wide or narrow. Provide plenty of practice involving volume and capacity and encourage pupils to select the container that would best fit the volume of liquid to be contained.

Problem Solving

Bring three containers into the classroom (Textbook 1 P229) and carry out 'Let's Learn' (Textbook 1 P228 – 230) as hands-on activities. Pupils can then relate to the concept of arranging the container from the container containing the least amount of water to the container containing the greatest amount of water and vice versa. The teacher may show a few containers in the shape of cuboids or cubes and ask pupils for the container that would hold the greatest number of equally-sized smaller boxes. This could be a problem-solving activity for pupils. Through this activity, pupils will understand that the amount of space contained in containers can be measured. It should be noted that the measuring of volume using a standard unit of measure is not taught at this stage. In this lesson, pupils also learn how to estimate volume, which helps them develop problem-solving skills.

Activities

Bring various containers into the classroom and compare the volume of water poured into the containers. To determine which container has a larger capacity, the teacher can show that it can be compared by finding the number of equally-sized small boxes that can fit in a larger box. It should be highlighted that volume is not just a measure of the amount of liquid.

Resources

- 1-litre beaker/bottle
- containers of various shapes and sizes to hold liquids
- newspaper clippings
- sand or beans

Mathematical Communication Support

'Takes up more or less space', least, most and level are some of the mathematical phrases that can be used to explain and introduce the concept of volume and capacity at this stage.

PROBLEM SOLVING, MATHS JOURNAL AND PUPIL REVIEW



MIND WORKOUT

There are many kinds of containers we can use to contain water. The pictures below show a few common examples of these containers.



water bottle



cup



kettle

One kettle can be filled by 10 cups of water or 4 bottles of water. Can 15 cups of water and 10 bottles of water fill up 5 kettles? Show your workings. **No, only 4 kettles will be filled up.**



MATHS JOURNAL

A person should drink about 8 cups of water daily. How many cups are you drinking daily?

Are you drinking more than/less than/about 8 cups daily? What about your classmate?

Fill in the blanks below.

I drink cups of water daily.

I am drinking 8 cups daily.

My friend drinks cups of water daily.

My friend drinks 8 cups daily.

I know how to...

compare volumes.

SELF-CHECK



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VOLUME 233

Textbook 1 P233



MIND WORKOUT

Help pupils to understand the situation by breaking down the information given:

10 cups → 1 kettle

4 bottles → 1 kettle

Emphasise the word 'or' in '10 cups of water or 4 bottles of water' to avoid misinterpretation of the question.

Lead them to split 15 cups of water into 10 and 5 cups since it is known that 10 cups of water fill up 1 kettle. Then, since 5 cups is half of 10 cups, 5 cups of water fill up half of a kettle. Repeat the same steps for the 10 bottles of water:

15 cups = 10 cups + 5 cups → 1 and a half kettle

10 bottles = 4 bottles + 4 bottles + 2 bottles → 2 and a half kettles

So, 15 cups of water and 10 bottles of water fill up 4 kettles.



MATHS JOURNAL


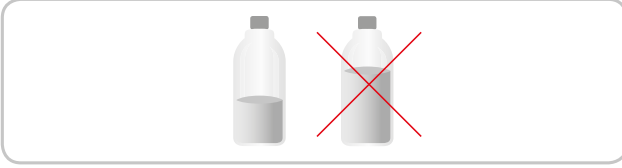

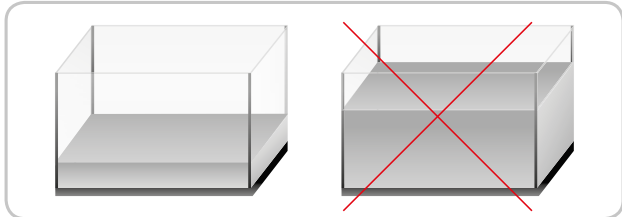
This activity enables pupils to relate Mathematics with their everyday life. Use this opportunity to educate pupils on the importance of drinking enough water daily. Get pupils to share with their classmates the number of cups of water they drink everyday. You may show pupils a cup as a reference to help them estimate the volume of water in 1 cup.

Before the pupils do the self check, review the important concepts once more by asking for examples learnt for each objective.

This self check can be done after pupils have completed Review 19 (Workbook 1B P118 - 120) as consolidation of understanding for the chapter.

SELF-CHECK



1. (a) 
- (b) 
- (c) 
- (d) 

2. (a) False
(b) True
(c) C, A, B

3. L

4. (a) Y
(b) Z, X, Y

PICTURE GRAPHS

CHAPTER 21

Picture Graphs CHAPTER **21**

How many stars does each group have?



READING PICTURE GRAPHS LESSON **1**

IN **FOCUS**



Group D

Group D	☆☆☆☆☆☆☆☆☆☆
---------	------------

Which is easier to count? Why?

234 CHAPTER 21 OXFORD UNIVERSITY PRESS

Textbook 1 P234

Related Resources

NSPM Textbook 1 (P234 – 239)
NSPM Workbook 1B (P121 – 130)

Materials

2-colour counters, stickers or magnetic buttons, drawing blocks, markers, A4 paper

Lesson

Lesson 1 Reading Picture Graphs
Problem Solving, Maths Journal and Pupil Review

INTRODUCTION

This is the first time pupils encounter graphical representation in statistics. Nonetheless, graphical representations are everywhere in real life. To start off this series of lessons on picture graphs, pupils should be exposed to real-life picture graphs that relate to the pupils' world so that they can appreciate the application of mathematics outside the four walls of the classrooms. The teaching of picture graphs at this level includes making sense of graphical representations, reading off and simple interpretation of graphical data. Apart from such skills, teaching of picture graph should also involve rich essences of statistics such as the process of doing statistics and the story that graphical representation tells. Opportunities should be provided for pupils to immerse in the gathering of information and making their own graphs to tell their own story. Although materials are available for the benefit of teachers, they can creatively incorporate this topic with other disciplines such as health education, and with other modes of pedagogy such as Maths Trail or even ICT with the use of Microsoft Excel.

LESSON

1

READING PICTURE GRAPHS

LEARNING OBJECTIVES

1. Collect and show information on a picture graph.
2. Interpret the information shown on a picture graph.

Picture Graphs

CHAPTER 21

How many stars does each group have?

READING PICTURE GRAPHS

LESSON 1

IN FOCUS

Group D

Group D

Which is easier to count? Why?

234 CHAPTER 21

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IN FOCUS

Discuss the chapter opener to help pupils understand the scenario depicted. Direct pupils to see that the random arrangement of the stars on the rewards chart makes counting and comparing difficult as the number of stars increases. Encourage pupils to think of better ways of representation for ease of retrieving the information.

Textbook 1 P234

LET'S LEARN

1. This is a **picture graph**.
It shows the number of stars each group has.

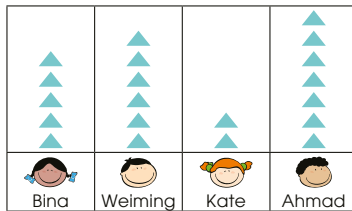
Primary 1H's Reward Chart

Group A		8 stars
Group B		3 stars
Group C		8 stars
Group D		9 stars

Group D has the **most** number of stars.
Group B has the **least** number of stars.
Group A has **as many** stars **as** Group C.
The **title** tells us what the picture graph shows.

2. The picture graph shows the number of sweets four children have.

Sweets the Children Have



Each  stands for 1 sweet.

Bina has 5 sweets. Weiming has 6 sweets.
Kate has 2 sweets. Ahmad has 7 sweets.

Textbook 1 P235

For Let's Learn 1, use stickers or magnetic buttons to represent the stars, and organise them into a picture graph. At this stage, pupils are not required to learn how to make picture graphs.

Transfer each type of coloured stars to a row. Pose questions about the need to organise the stars in each row.

After reorganising the stars systematically, try to elicit from pupils the need for labels to know the groups to which the stars belong to. Next, highlight the importance of a title in graphs.

After completing the picture graph, demonstrate how information is retrieved from the graph by reading off directly (e.g. Group A has 8 stars) before moving on to interpreting the information (e.g. most, least, as many as).

Highlight another possible orientation of picture graphs, leading pupils to Let's Learn 2.

Show the picture graph over the visualiser and allow pupils to have some time to understand the graph.

Allow pupils to practice reading information directly from the picture graph by asking some of the following questions:

- What is the picture graph about?
- How many sweets does each child have?
- Explain how you get your answers.

After which, teach pupils to interpret from the picture graph rather than the numbers derived from each column.

Bina has 3 **more** sweets than Kate.
 Weiming has 1 **fewer** sweet than Ahmad.
 Ahmad has the **greatest** number of sweets.
 Kate has the **smallest** number of sweets.
 They have 20 sweets in all.



What other way can we draw this picture graph?

ACTIVITY  **TIME**

Work in groups of 4.

- 1 Make a picture graph to show how your classmates go to school.

What you need:



Example

How We Come to School

Car	School bus	MRT train	Walking

Each ★ stands for 1 pupil.

- 2 Write five sentences about the picture graph. Use words such as **more than**, **fewer than**, **most**, **least** and **as many as**.
- 3 Ask your partner to check your sentences.

Although it is a good habit to get pupils to write down the numerical representation of each column, it may not help in the reinforcement of graphical understanding. It is important to elevate the pupils' ability from mere counting to the spatial understanding of graphical representation (e.g. column's height).

Thus, provide opportunities for pupils to explain the reason for the interpretation of the following:

- 'most': Focus is on the highest/tallest column.
- 'least': Focus is on the shortest/lowest column.
- 'more than': Identify the two columns mentioned and make one-to-one comparison.
- 'less than' or 'fewer than': Identify the two columns mentioned and make one-to-one comparison.
- 'as many as' or 'as much as': Identify the two columns and make one-to-one comparison.

For weaker pupils, provide them sufficient practice with simple direct reading of the graph first. Proceed on to interpretative questions after they are proficient in reading off graphs directly.

ACTIVITY  **TIME**

Assign pupils to work in groups of 4. Provide each group with a drawing block paper and markers.

Alternatively, the activity can be done as a class. In this case, provide each pupil with stickers representing the different ways of coming to school. Project the graph template on the whiteboard and get pupils to place stickers in the correct column.

While making the picture graph, some of the following questions can be asked:





- Should we build a horizontal or a vertical picture graph?
- What symbol should be used to represent the information? (Note: Although at Grade 1, all symbols represent one, it is a good practice to highlight the significance of the symbol.)
- What should be placed on the bottom of the columns as labels?
- What is the graph about?
- What is a good title for the graph?

Guide pupils how to tally so as to reduce mistakes when transferring information to the picture graph.



The picture graph shows the number of fruits in a basket. Count and compare.

Fruits in the Basket

Strawberry	
Orange	
Pear	
Apple	

- (a) How many strawberries are there? **6**
- (b) There are **2** oranges.
- (c) There are **4** pears.
- (d) How many apples are there? **7**
- (e) The number of **apples** is the greatest.
- (f) There is **1** more apple than strawberries.
- (g) How many fruits are there in the basket altogether? **19**

Complete Workbook 1B, Worksheet 1 • Pages 121 – 127



Help the pupils to read and understand each question.

Allow pupils to work on these questions individually. (g) may need a little more guidance for pupils who are not able to relate fruits as consisting all the strawberries, oranges, pears and apples.

For better understanding, select items from **Worksheet 1** and work these out with the pupils.

Independent seatwork

Assign pupils to complete Worksheet 1 (Workbook 1B P121 – 127).

1. (a) 5, 4, 2, 4
(b) birds
(c) pandas

2. (a) 7, 6, 3
(b) dolls
(c) toy cars
(d) 4
(e) 3
(f) 16

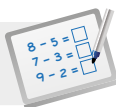
3. (a) 11
(b) 8
(c) 8
(d) 3
(e) 3

4. (a) pencils
(b) sharpeners
(c) erasers, staplers
(d) 4
(e) 20

5. (a) shahi tukra
(b) fish and chips
(c) fish and chips
(d) shami kebab, chicken tikka

6. (a) 6
(b) 5
(c) yellow, green
(d) more
(e) fewer
(f) 17

7. (a) 5
(b) 4
(c) 3
(d) 3
(e) Farhan
(f) Junhao

**Specific Learning Focus**

- Collect and show information on a picture graph.
- Interpret the information shown on a picture graph.

Suggested Duration

6 periods

Prior Learning

Pupils have been introduced to interpreting a time table in Chapter 18. However, the organisation of statistical data or information is a completely new concept for pupils. Prior knowledge of sequence and making sets come in handy when learning to create picture graphs. Each counter or sticker or picture will stand for a numerical value and translating into a graphical data will be the first baby steps in the mathematical strand of statistics.

Pre-emptive Pitfalls

In this chapter, pupils learn to organise data related to real-life situations. Pupils learn to interpret statistical data by reading picture graphs. This chapter can be made fun with lots of hands-on activities, making it one of the pupils' favourite chapters in Grade 1.

Introduction

Start this chapter by showing the 'In Focus' (Textbook 1 P234). Lead pupils to understand that organising information helps in a faster interpretation of the picture graph. Have them carry out hands-on activities based on the questions in Workbook 1B (P121 – 127) using materials like stickers, cut-outs and magnetic buttons. Have them create a picture graph showing the type of pets their classmates have at home. Guide the pupils to first gather the information by asking the class how many of them have pets and what type of pets they have. Once the information is collected, put the information on the whiteboard as a picture graph. The teacher may conduct similar activities with other similar day-to-day examples.

Problem Solving

Explaining to pupils the significance of depicting, gathering and interpreting information is the main objective of this lesson. The technical knowledge of creating a picture graph should be explained by highlighting the following points: (i) horizontal or vertical alignment; (ii) symbol or picture representing the numeric information; (iii) labelling of the graphs and title. The 'Mind Workout' (Textbook 1 P238 and Workbook 1B P128) helps pupils to organise and interpret data.

Activities

For the activity (Textbook 1 P236), provide pupils with fruit cut-outs, magnetic buttons or stickers to complete the picture graph. They can first collect the information and then label the categories of the picture graph and fill it up with the materials handed to them.

Resources

- drawing block
- markers
- fruit cut-outs (Activity Handbook 1 P62), stickers or magnetic buttons

Mathematical Communication Support

Guide pupils to see that the column of the picture graph with the greatest number of pictures corresponds to the category that has the highest frequency, while the column with the least number of pictures corresponds to the category that has the lowest frequency. Columns with the same number of pictures indicate that the categories have the same frequency. For a better understanding of this chapter, explain to pupils that the number of pictures represent the numeric information of the subject of concern.

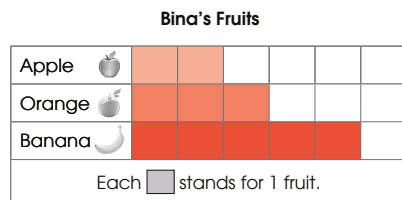
PROBLEM SOLVING, MATHS JOURNAL AND PUPIL REVIEW



Mind Workout

Date: _____

Bina has 10 fruits.
She has 3 oranges and a few apples.
She has 2 more bananas than oranges.
Colour to show the number of each fruit.
Complete the picture graph and fill in the blanks.



- (a) How many bananas does Bina have?
- (b) Bina has fewer apples than bananas.



Mind Workout

Help pupils to understand the problem by getting them to act it out. Provide each child with counters as representations of the fruits if needed.

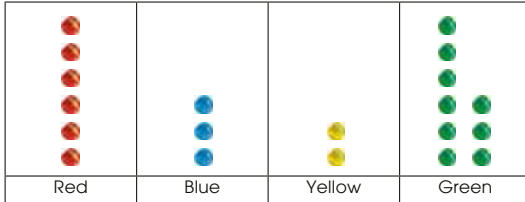


MIND WORKOUT

Junhao has 20 red, blue, yellow and green marbles.
 He has 3 more red marbles than blue marbles.
 He has 1 fewer yellow marble than blue marbles.
 He has 9 green marbles.

Complete the picture graph.


Junhao's Marbles



- (a) Junhao has 3 blue marbles.
- (b) Junhao has 2 yellow marbles.
- (c) Junhao has the most number of green marbles.
- (d) Junhao has the least number of yellow marbles.

Is there another way to draw the graph?



Use  to help you find the number of each type of marble.



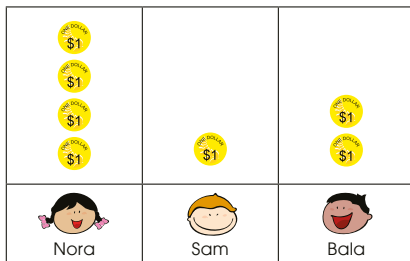
MIND WORKOUT

Provide each pupil with 20 counters and allow pupils to act out the scenario to understand the problem better.

First get pupils to set aside 6 counters to represent the red marbles. From there, guide the pupils by bringing them through a series of logical deduction through questioning.

MATHS JOURNAL

Amount Spent



Look at the picture graph.

Draw the picture graph in a different way .

Write three sentences to tell what your picture graph shows.

Do the two picture graphs show the same information?



I know how to...

- read a picture graph.
- make a picture graph.

SELF-CHECK



MATHS JOURNAL

Get pupils to think of another way to draw the picture graph and draw it in that way. Get them to compare their picture graph with the one shown in the Textbook and say if the two picture graphs show the same information. Have them share with their classmates three things that their picture graph shows.

Before the pupils do the self check, review the important concepts once more by asking for examples learnt for each objective.

SELF-CHECK



This self check can be done after pupils have completed **Review 21** (Workbook 1B P129 – 130) as consolidation of understanding for the chapter.


1. (a) badminton
(b) tennis
(c) 3
(d) 3
(e) 32

2. (a) cupcake
(b) bun
(c) jellies
(d) 2
(e) 3

CLOCKWISE AND ANTICLOCKWISE MOVEMENT


CHAPTER 22

Clockwise and Anticlockwise Movement CHAPTER 22



CLOCKWISE AND ANTICLOCKWISE MOVEMENT LESSON 1

IN FOCUS



Look at the clock.
How does the minute hand turn?
How does the hour hand turn?

240 CHAPTER 22 OXFORD UNIVERSITY PRESS

Textbook 1 P240

Related Resources

NSPM Textbook 1 (P240 – 245)
NSPM Workbook 1B (P131 – 133)

Materials

direction cards, 12-h demonstration geared clock, steering wheel of a toy car, flag, music player

Lesson

Lesson 1 Clockwise and Anticlockwise Movement

Problem Solving, Maths Journal and Pupil Review

INTRODUCTION

In this chapter, pupils are introduced to the movement of objects in two different directions – clockwise and anticlockwise. Pupils will learn to relate with real-life objects that make clockwise and anticlockwise turns. They will also learn how to describe the movement of objects as whole, quarter, half and three quarters of a turn. Halves and quarters were first introduced to pupils in Chapter 17.

LESSON


1

CLOCKWISE AND ANTICLOCKWISE MOVEMENT

LEARNING OBJECTIVES

1. Use 'clockwise' and 'anticlockwise' to describe movements.
2. Describe less than a whole turn in terms of half and quarters.


Clockwise and Anticlockwise Movement CHAPTER 22



How do the hands turn?

CLOCKWISE AND ANTICLOCKWISE MOVEMENT LESSON 1

IN FOCUS



Look at the clock.
How does the minute hand turn?
How does the hour hand turn?

240 CHAPTER 22 OXFORD UNIVERSITY PRESS

Textbook 1 P240

IN FOCUS

Use the chapter opener to discuss the problem with the pupils. Orientate pupils to relate the concept of movement to the hands of a clock, or any other real-world contexts (such as a windmill).

Ask pupils to observe the clock in the classroom or their watch. Pupils should be able to identify the minute and hour hands of the clock, which was taught in Chapter 18. Get them to describe how the minute and hour hands turn.

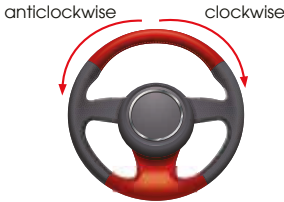
LET'S LEARN

1.



The hands of a clock turn in a **clockwise** direction.

2.



You can turn the steering wheel of a car **clockwise** or **anticlockwise**.

3.

Whole clockwise turn

Three quarters of a clockwise turn

quarter of a clockwise turn

Four quarters give us one whole turn.

Three quarters of a clockwise turn is the same as one quarter of an anticlockwise turn.

half of a clockwise turn

three quarters of a clockwise turn

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CLOCKWISE AND ANTICLOCKWISE MOVEMENT

241

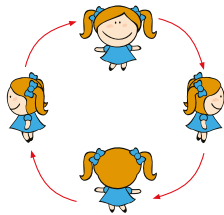
Textbook 1 P241

Introduce the term 'clockwise' to the pupils. Use a 12-h demonstration geared clock and move the respective hands of the clock to show pupils that the hands of a clock turn in a clockwise direction. Explain to them that clockwise direction is the same as the direction of the hands of the clock.

Prompt the pupils' thinking by asking if there is another direction of movement. Introduce the term 'anticlockwise' to the pupils. Using the picture in Let's Learn 3, explain to pupils that the steering wheel of a car can be turned clockwise or anticlockwise. Explain to them that anticlockwise direction is opposite to the direction of the hands of the clock.

Ask pupils how an object changes as it is turned. Referring to the picture in Let's Learn 3, lead pupils to see that the orientation of the object changes as it is turned until one whole turn is made. Use a real-life object to show how it turns a quarter, half, three quarters and a whole in the clockwise and anticlockwise directions respectively.

4.



ACTIVITY 1 2 3 TIME

Let us dance and learn.

- 1 4 children stand in a row facing the class. Let the music play.
- 2 The first time the music stops, make a quarter turn.
- 3 The second time the music stops, make another quarter turn.
- 4 Count how many quarter turns you make until you face your class.

What you need:



Repeat with clockwise and anticlockwise turns.



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Textbook 1 P242

In Let's Learn 4, invite pupils to stand up and turn a quarter, half, three quarters and a whole in the anticlockwise direction.

ACTIVITY TIME



Assign pupils to work in groups of 4. Prepare an audio device and music to be played during the activity. Get them to stand in a row facing the class. Let the music play and each time the music is stopped, pupils are to make a quarter turn. Ask them to count the number of quarter turns they make until they face the class. Have them carry out the activity in both clockwise and anticlockwise directions.



Look at the picture.



Complete the story.
Use the words below to help you.

half quarter clockwise anticlockwise

Sam jogs to the park.

He then makes **quarter of a clockwise** turn.

Next, he walks to the shop.

He then makes **half of a clockwise** turn to return to the park.

Finally, he makes **quarter of a clockwise** turn to walk to the bus.

Is there more than one way to fill each blank? **Yes**

Complete Workbook 1B, Worksheet 1 • Pages 131 – 132



Help the pupils to read and understand each question. Guide them to interpret the picture by asking them the following questions:

- Where is Sam's starting point?
- Which direction is Sam facing at the start?
- After jogging to the park, in which direction and by how many quarters should Sam turn to walk to the shop, then back to the park, and then to the bus?

Prompt pupils' thinking by asking them if there is more than one way to make the turn to reach the respective destinations. Get them to write down the other way(s).






Avoid chorus answers from pupils and encourage participation by inviting individual responses. Ask the pupils how they get their answers and if possible, get another pupil to verify the answer.

For better understanding, select items from **Worksheet 1** and work these out with the pupils.






Independent seatwork

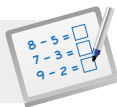
Assign pupils to complete Worksheet 1 (Workbook 1B P131 – 132).

(a)

		
	Quarter of a clockwise turn	Half of a clockwise turn
		
	Three quarters of a clockwise turn	Whole clockwise turn

(b)

		
	Quarter of an anticlockwise turn	Half of an anticlockwise turn
		
	Three quarters of an anticlockwise turn	Whole anticlockwise turn

**Specific Learning Focus**

- Use 'clockwise' and 'anticlockwise' to describe movements.
- Describe less than a whole turn in terms of half and quarters.

Suggested Time

2 periods

Prior Learning

Pupils are familiar with ordinal numbers and ordering of numbers. These are directly linked to this chapter. They are also aware of the meaning of the words 'quarters', 'halves' and 'wholes' taught in Chapter 17. Pupils can play 'Simon says' where the teacher calls out the cue to them to turn left, right, forward or one step backwards as an introductory activity.

Pre-emptive Pitfalls

Since direction is important in this chapter, care should be taken to ensure that while the teacher is calling out the cue, he/she should face in the same direction as the pupils and carry out the activities. Pupils may have difficulty reading the keywords and relating them to the correct movement and direction.

Introduction

Explain to the pupils that the hands of a clock always turn in the direction called 'clockwise'. The direction that is opposite of 'clockwise' is called 'anticlockwise'. Explain that 'anti' means 'against' or 'opposite'. This chapter helps pupils in navigation and map reading. The teacher can bring the pupils out on a class outing to a funfair or a park, and a map of the venue can be handed out to the pupils and the teacher can get the pupils to move in a particular direction with the help of the map. This provides pupils the opportunity to apply the concept of movement in real-life context.

Problem Solving

The diagram in the questions in 'Practice' (Textbook 1 P243) and Mind Workout (Textbook 1 P244) can be drawn on the floor and pupils can role-play and answer the questions. Similarly, the clock, steering wheel of a toy car and flag (Textbook 1 P241) can be brought into the classrooms to show clockwise and anticlockwise movements. Besides half and quarter, three quarter should be taught to pupils and they should link these words to movement.

Activities

This can be a fun chapter and pupils can dance ('Activity Time' in Textbook 1 P249) and turn in the clockwise and anticlockwise direction to the music and according to cues from the teacher. Cut-outs of clocks can be used and pupils can work in pairs where one partner picks the direction cards (Activity Handbook 1 P64) and the other partner turns the hands of the clock accordingly.

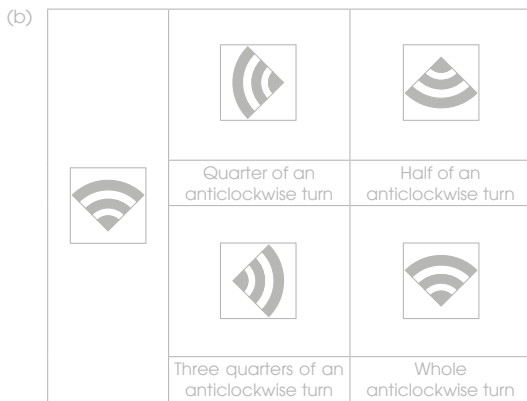
Resources

- direction cards
- 12-h demonstration geared clock
- steering wheel of a toy car
- flag
- music player

Mathematical Communication Support

Put up key vocabulary words (e.g. clockwise, anticlockwise, quarters, halves, three quarters and whole) with picture cut-outs on the soft board to support the pupils.

PROBLEM SOLVING, MATHS JOURNAL AND PUPIL REVIEW



Mind Workout

Date: _____

Look at the letters shown below.

A E I O U

Which letters, after making one whole clockwise turn, show the original letter more than once? **I and O**

132 Chapter 22

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Mind Workout

Allow pupils to work in pairs or groups.

Help pupils understand the problem by asking the following questions:

- How does the letter look like after every quarter of a clockwise turn?
- Does the original letter show at any point while making one whole clockwise turn?

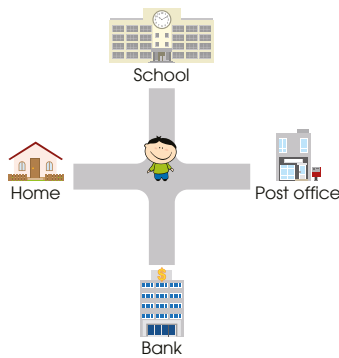
For weaker pupils, get them to draw the letter on a piece of paper and turn the piece of paper in the clockwise direction to see how the letter looks like after every quarter of a clockwise turn. Get them to draw the letter for each quarter of the turn.

Workbook 1B P132



MIND WORKOUT

Weiming is standing at a road junction in his neighbourhood. He is facing the bank now.



Weiming needs to make **three-quarter** of a clockwise turn to face the post office.

Will Weiming also face the post office if he instead makes half an anticlockwise turn? **No**

If not, where will he be facing after making the turn? **School**

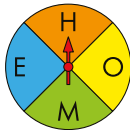


MIND WORKOUT

Get pupils to visualise themselves as Weiming. Get the pupil to stand and turn to see which direction he faces after turning.

Challenge the pupils by asking them if there are other ways to make the turn so that Weiming faces the post office.

MATHS JOURNAL



Look at the diagram above. Fill in the blanks below.

The red arrow is now pointing at the letter H.

Firstly, the arrow makes half of a clockwise turn to point at the letter **M**.

Next, it makes three quarters of an anticlockwise turn to point at the letter **O**.

Lastly, the arrow makes one whole anticlockwise turn to point at the letter **H**.

I know how to...

SELF-CHECK

- describe the movement and direction of objects as anticlockwise and clockwise and whole, quarter, half and three quarters of a turn.

MATHS JOURNAL

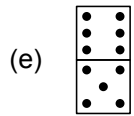
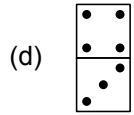
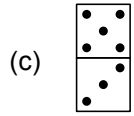
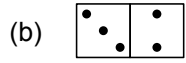
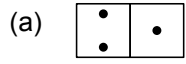
Allow pupils to work in pairs or groups to discuss. Reinforce to pupils the importance of identifying the direction and number of quarters of turn the arrow makes.

Before the pupils do the self check, review the important concepts once more by asking for examples learnt for each objective. For instance, get pupils to describe how they should turn and walk to a particular destination.

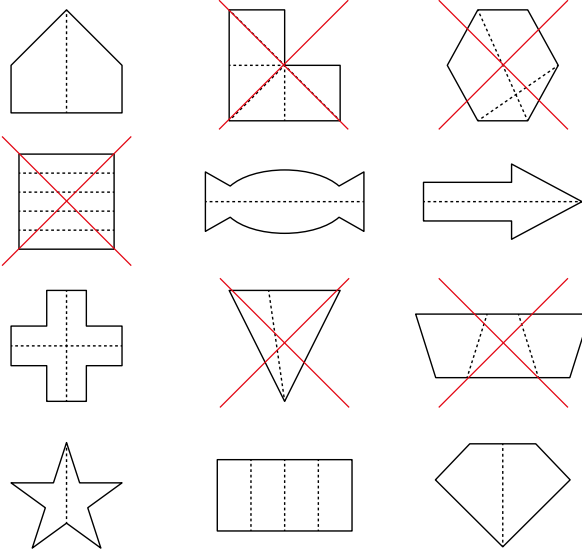
This self check can be done after pupils have completed **Review 22** (Workbook 1B P133) as consolidation of understanding for the chapter.

SELF-CHECK





1.



2. (a) half past 3

(b) 9 o'clock

3. (a) C

(b) B

(c) half past 11

4. (a) C

(b) B

(c) half past 11

(a)



(b)



(c)



(d)



5. (a) A, C

(b) B

6. (a) B

(b) C

(c) B

(d) C

7. (a) 3

(b) 2

(c) 13

8. (a) 1 cupcake

(b) 6

(c) 3

(d) walnut, chocolate

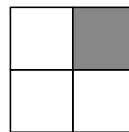
(e) 3

9. (a) 6

(b) 1

(c) A, C, D

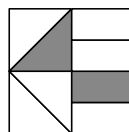
10. (a)



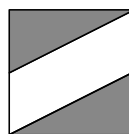
(b)



(c)

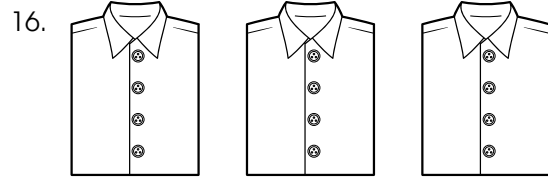


(d)



Section A

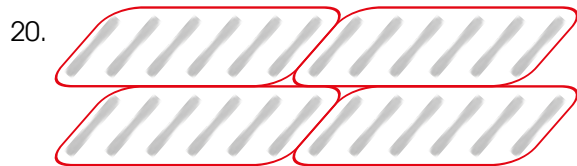
1. (2)
2. (2)
3. (4)
4. (2)
5. (2)
6. (2)
7. (3)
8. (4)
9. (3)
10. (4)



17.
$$\begin{array}{r} \overset{5}{\cancel{8}} \overset{1}{0} \\ - 24 \\ \hline 36 \end{array}$$

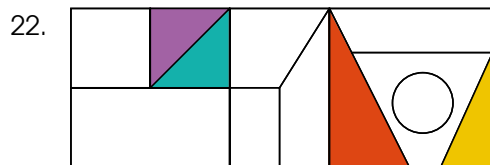


19. (a) forty-eight
(b) fifty-three



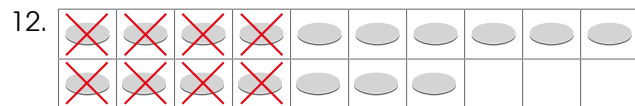
There are 4 groups of 6 ice cream sticks.

21. B, C, A



Section B

11. $5 + 3 = 8$ $8 - 3 = 5$
 $3 + 5 = 8$ $8 - 5 = 3$



$17 - 8 = 9$

13. $3 \times 2 = 6$
There are 6 wheels in all.



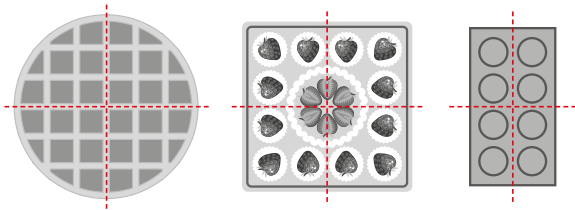
15. Set A – 23
Set B – 18
Set A has 5 more buttons than Set B.

23. (a) 18, 20, 22
(b) 90, 88, 86

24. (a) 4 tens 4 ones
(b) 7 tens 4 ones

25. (a) 7 tens 6 ones
(b) 9 tens 1 one

26.



27. 95

28. 90

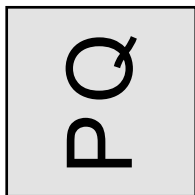
29. 65, 83, 90

30. Priya

31. 13

32. 4

33.



34. (a) 6 o'clock
(b) half past 12

35. (a) 75
(b) 23
(c) 23
(d) 75

36. 9

37. less

38. (a) more
(b) 8

39. (a) football, basketball
(b) 3

40. $8 - 6 = 2$
Ans: 2

Section C

41. $8 + 3 = 11$
They have 11 stickers altogether.

42. $12 - 5 = 7$
Bina has 7 sweets left.

43. 5

44. $6 \times 2 = 12$
Junhao has 12 pencils altogether.

45. $\$9 + \$9 + \$6 = \24
They have to pay \$24.

NAVIGATING THROUGH THE ASSESSMENT EXERCISES AND ACTIVITIES

For teachers to assess pupils' achievement of the learning objectives, the Teacher's Resource Book provides direction for teachers on how to use the following assessment and exercises. Summarising the evaluative aspect of this series, the following exercises can be utilised optimally.

TEXTBOOK

CHAPTER OPENER

Chapter Opener consists of familiar events or occurrences that serve as an introduction of the topic to pupils.

IN FOCUS

Questions related to the lesson objectives are asked as an introductory activity for pupils. The activity allows pupils to explore different ways to solve the problem.

LET'S LEARN

Main concepts are introduced in Let's Learn. The consolidation and formalising of concepts are achieved. The exercises can be used by teachers to test their pupils' prior knowledge. Teachers can provide valuable assessment-based feedback to pupils. Having pupils attempt these exercises will help teachers identify the focus of each lesson and the adjustments they need to make to their teaching in order to help pupils meet the intended learning outcomes.

ACTIVITY TIME

Most of the activities in the book are to be carried out in pairs or groups. Pupils explore mathematical concepts in a fun way through games. Observing pupils' approach and dexterity while doing the activity will give a clear indication to teachers on how the lesson should be conducted.

PRACTICE

The questions in Practice enable teachers to gauge if pupils have grasped the concepts. Practice can be done as an independent exercise in class or as homework.

Through the questions, teachers get to understand what their pupils have learned. They will be able to find the answers to the following questions:

- (i) Are there any common gaps in my pupils' knowledge of the topic which I need to revisit?
- (ii) In which aspects of my pupils' learning of the topic did they achieve mastery?
- (iii) What are the strengths and weaknesses in my planning for teaching?



MIND WORKOUT

Pupils' critical and problem-solving skills are enhanced when working on the Mind Workout. Teachers can use the exercises to challenge advanced learners. It is advisable to use the exercise as an independent assignment for pupils.

MATHS JOURNAL

Maths Journal enhances pupils' skills such as mathematical communication, reasoning, organisation and tabulation of data. The exercises can be done in a group or individually in class or at home.

SELF-CHECK

Key concepts required in the syllabus that must be learnt are highlighted in Self-Check. It would be beneficial for pupils when teachers revise the key concepts in class as this allows pupils to assess their own learning at the end of each chapter and facilitates their revision in preparation for the examination.

WORKBOOK

Worksheets

Well-structured questions covering all the concepts taught in each lesson, are found in each worksheet. A suggested approach would be to have pupils do alternate questions from each worksheet or do the questions that will build their foundation of the concepts. The skipped questions can be revisited during revision before the examination. The worksheets in the workbooks can be done as a complimentary practice exercise to augment the concepts learnt.



Maths Journal

Maths Journal tests pupils' understanding of the mathematical concepts learnt in the chapter and further enhances their learning of the concepts.



Mind Workout

Mind Workout consists of higher-order thinking tasks which enable pupils to apply relevant heuristics and extend the concepts and skills learnt.

Revision

Revision exercises at the end of a set of chapters consist of questions that enable pupils to apply all the concepts and skills taught. The exercises can be done before an examination or a test. They serve as good revision exercises for pupils to do in class or as homework with guidance from their parents when necessary. They also enable teachers to evaluate the pupils' understanding of the concepts across strands and topics and can be used as an effective preparatory exercise for examinations.

Review

The Review Exercise consists of questions that requires the application of a consolidation of concepts learnt in the chapter. The exercises can be done as a group assignment for teachers to gauge the pupils' ability to grasp the consolidated concepts learnt in the chapter. Group assignments help pupils to learn together as they gather feedback from one another. Teachers can also get pupils to submit their completed exercises and mark them as a form of informal assessment.

Mid-Year and End-of-Year Revisions

These are assessment exercises with multiple choice questions, short-answer questions and word problems. Teachers can use the revision exercises as mock examinations to help pupils prepare for the examinations. Feedback provided to pupils will be extremely beneficial as they will be aware of the areas that they are weak in and work on them. The revision exercises test pupils' ability to recall the concepts taught and apply them. They also allow teachers to analyse the effectiveness of their spiral approach of teaching concepts. Teaching concepts by revisiting, re-linking to other concepts and creating a mind map help pupils do their examinations in a more effective way. A good evaluative assessment should not consist of questions that encourage rote learning, but should consist of questions that encourage learning by the spiral approach.

Examination papers should not be considered by teachers as the only means of evaluation. Informal evaluation involves classroom discussions, participation, exchange of ideas, multiple strategies, activities, group assignments, presentations and above all, mind-mapping, before they embark on independent work. It is essential for the pupils to receive feedback on their work which provides an important opportunity for reflection on what they have learnt. Similarly, teachers should be able to diagnose the progress and achievement of the pupils and decide on the future course of action, which is where the assessment activities and exercises come in.