New Syllabus Primary Mathematics

TEACHING GUIDE

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# Contents

Preface: iv

Unit 1: Numbers to 100 000 ................................................................. 1

Unit 2: Multiplication and Division ..................................................... 18

Unit 3: Fractions (I) ......................................................................... 28

Revision 1 and 2 (Workbook 4A) ...................................................... 41

Unit 4: Fractions (II) ........................................................................ 44

Unit 5: Tables and Line Graphs .......................................................... 51

Unit 6: Perpendicular and Parallel Lines ............................................ 57

Unit 7: Symmetry .............................................................................. 62

Revision 3 and 4 (Workbook 4A) ....................................................... 66

Unit 8: Decimals (I) ........................................................................ 68

Unit 9: Decimals (II) ......................................................................... 86

Unit 10: Angles ................................................................................ 109

Revision 1 and 2 (Workbook 4B) ...................................................... 115

Unit 11: Squares and Rectangles ...................................................... 117

Unit 12: Area and Perimeter .............................................................. 120

Unit 13: Time .................................................................................. 128

Unit 14: Tessellations ...................................................................... 136

Revision 3 and 4 (Workbook 4B) ...................................................... 139
Preface

The New Syllabus Primary Mathematics (NSPM) series is designed and written, based on the latest primary mathematics syllabus. In this series, the concrete to abstract approach has been used to introduce new concepts. The knowledge base is built incrementally as the pupils progress up the levels so as to consolidate the linkages between mathematical concepts.

The Teaching Guides have been developed effectively to provide valuable support to the teachers throughout the series. The key features of the Teaching Guides are mentioned below.

1. **Learning Outcomes**
   A set of learning outcomes is listed at the beginning of each topic for all the chapters. At the end of a particular topic, the teacher should be able to evaluate whether or not the objectives have been communicated to the students in an effective manner. The revision sections present in the workbooks will prove very helpful in assessing students' understanding of key concepts.

2. **Instructions**
   Mathematics is usually associated with difficulty and challenge, mainly as a result of the teaching approach used in the class. Teachers should make sure that they are dynamic in their approach to teaching mathematics. Only if the teachers are enthusiastic and dynamic will they be able to inspire the pupils to put in their best efforts, work hard, and learn something. Keeping these aspects in mind, step-by-step guidance is provided to the teachers to deliver mathematical concepts in a student-friendly manner. Varied activities have been included in the guides to help generate enthusiasm and enjoyment in the classroom, thereby making mathematics interesting. Where necessary, group work or pair work has been encouraged to enhance learning and understanding of concepts.

   An average teaching duration has been suggested to cover each topic in the class, thereby helping the teachers to plan and vary their lessons accordingly. The teachers can adjust this duration as per their requirements. With careful planning, sufficient time can be allocated to the more important concepts of mathematics, while introducing new and interesting ideas will make the class more lively.

   Teachers should try to create an atmosphere in the class that is conducive to learning. This can be achieved physically by ensuring that the classroom is colourful, exciting, attractive, and full of interesting things that help pupils to link mathematics with daily life. For example, a display table should be set up in the classroom consisting of different items such as shapes, number cards, 3-D figures, etc. that aid teaching. Similarly, on a psychological level, teachers should ensure that the pupils do not feel fearful or intimidated in class. The atmosphere should be peaceful and relaxed to accomplish effective learning.

3. **Answers**
   The guides contain answers to all the questions and activities in the textbook and workbooks.

4. **Additional activities**
   Extra activities have been included in the guides to reinforce and assess the children's understanding of the concepts learnt. These can be done individually or in groups, depending upon the strength of the class and the resources available.
Unit 1: Numbers to 100 000

NUMBERS BEYOND 10 000

Suggested Duration
4 periods (160 min)

Learning Outcomes
Pupils should be able to:
- count in ones, tens, hundreds, thousands and ten thousands up to 100 000
- recognize the place values of ones, tens, hundreds, thousands and ten thousands.
- write numbers up to 100 000
- read and write numbers up to 100 000 in numerals and in words

Instructions
Let's Learn...

Activity 1 (20 min): Count in ones, tens, hundreds, thousands and ten thousands up to
100 000

Things you need: Place Value Chart. Number discs – 1, 10, 100, 1000 and 10 000
1. Revise with the pupils ones, tens, hundreds, thousands and ten thousands:
   - 10 ones make 1 ten or 10
   - 10 tens make 1 hundred or 100
   - 10 hundreds make 1 thousand or 1000
   - 10 thousands make 1 ten thousand or 10 000
2. Pin up the Place Value Chart. Ask 2 pupils to pin up five ‘1’ discs, three ‘10’ discs, seven
   ‘100’ discs, four ‘1000’ discs and six ‘10 000’ discs on the Place Value Chart to form the
   number: 64 735. Ask another pupil to count the number of discs in each place value.
3. Write on the board 60 000 + 4000 + 700 + 30 + 5 = 64 735. Write the number in words:
   ‘Sixty-four thousand, seven hundred and thirty-five’.
4. Repeat No. 2 to 3 for 4 other 5-digit numbers, but ask the pupils to write the number in
   numerals and words on the board instead.
5. Remind the pupils that in writing numbers in words, there is no need to add ‘s’ to the
   ‘hundred’ and ‘thousand’. The letter ‘s’ is used only when the value of the digit is to be
   reflected e.g. the digit ‘4’ in 64 735 stands for 4000 or 4 thousands. Another occasion when
   the letter ‘s’ is used is when describing the place value of a digit, e.g. the digit ‘6’ in 645
   is in the hundreds place.
Activity 2 (20 min): Recognize the place values of ones, tens, hundreds, thousands and ten thousands

1. Write any 5-digit number on the board and explain the place value for each digit and what it stands for. For example, write 82 574 on the board. Explain that the digit 5 is in the hundreds place and it stands for 500.

2. Explain to the class that given any 5-digit number, the first digit on the extreme right is the ‘ones’ place, followed by ‘tens’ place, followed by ‘hundreds’ place followed by ‘thousands’ and followed by ‘ten thousands’ place to the extreme left.

Activity 3 (20 min): Recognize numbers up to 100 000

Things you need: 4 sets of number cards 0 to 9

1. Select 5 pupils to stand in a straight line facing the class. From the pupils’ view, assign each of the pupils starting from the extreme left, the ‘ten thousands’ place, the ‘thousands’ place, the ‘hundreds’ place, the ‘tens’ place and the ‘ones’ place. Give each of them a set of number cards from 0 to 9. When you read out a 5-digit number using words, they are to lift up the correct number card and the rest of the class is to say if it is correct or wrong. Do this for 5 other numbers with the same 5 pupils. Repeat the entire activity twice with different pupils.

2. Select another 5 pupils to stand in a straight line facing the class. This time, they are to randomly hold up any number card and the class is to read out aloud the number. Do this for 5 other numbers.

Activity 4 (20 min): Read and write numbers in words up to 100 000

1. Write the words twenty, thirty, forty, fifty, sixty, seventy, eighty, ninety on the board and read them together with the class. Cover up the words and ask the pupils to write the words on a piece of paper. Reveal the words and check that the pupils spelt them correctly.

2. Write ‘twenty three thousand, four hundred and forty-five’ on the board and ask the pupils to read it together. Repeat this with 5 more numbers written in words.

3. Write 65 872 on the board and ask one pupil to write the number in words on the board. Do this for 5 other pupils with different numbers.

4. Write ‘99 997, 99 998, 99 999, _______’ on the board. Ask the class, ‘What is the next number after 99 999?’ Introduce the number ‘100 000’ or ‘One hundred thousand’.

Activity 5 (20 min): Class practice

1. Go through with the pupils the examples on pages 3–5 of the Student’s Book.

Let’s Explore

Activity 6 (20 min): Work in pairs

Things you need: Number discs – 1, 10, 100, 1000, 10 000. Use different colours to differentiate them.

1. Refer pupils to the Let’s Explore exercise on page 5 of the Student’s Book. Ask the pupils to work in pairs to show the 5-digit numbers using number discs.
Let's Try...

Activity 7 (40 min): Individual practice

1. Ask pupils to do the exercises on page 6 of the Student’s Book.

Homework

Ask pupils to do Workbook 4A—Worksheet 1.

Answers

page 6

1. (a) One thousand, three hundred and twenty-five
    (b) Sixty-three thousand, nine hundred and seventy
    (c) Fifty-two thousand, nine hundred and five
    (d) Twenty-six thousand and eight

2. (a) 89 505  (b) 92 040  (c) 61 803  (d) 37 642

3. (a) 800  (b) 8000  (c) 80

4. (a) 8000  (b) 50  (c) 7  (d) 90 000

Worksheet 1

1. (a) 33 145, Thirty-three thousand, one hundred and forty-five
    (b) 31 628, Thirty-one thousand, six hundred and twenty-eight

2. (a) Twelve thousand, nine hundred and forty-two
    (b) Thirty-seven thousand, eight hundred and fifty-one
    (c) Sixty thousand and fourteen
    (d) Two thousand and five
    (e) Fifty thousand and seventy-eight
    (f) Eighty-three thousand, five hundred and three

3. (a) 19 872  (b) 26 518  (c) 79 421  (d) 5720  (e) 21 205  (f) 85 515

4. (a) 2, 80, 600, 4000, 50 000
    (b) 9, 20, 0, 6 000, 70 000
    (c) 7, 80, 600, 9000, 30 000

5. (a) 80 000  (b) 3000  (c) 600  (d) 50
    (e) 3  (f) 67 527  (g) 4000  (h) 40 360
COMPARING AND ORDERING NUMBERS

Suggested Duration
4 periods (160 min)

Learning Outcomes
Pupils should be able to:
- compare numbers up to 100,000 using ‘more than’, ‘greater than’, ‘bigger than’, ‘smaller than’, ‘fewer than’, ‘less than’ and ‘as many as’
- find numbers up to 100,000 using more than and less than
- arrange numbers up to 100,000 in ascending and descending order
- complete number patterns involving 5-digit numbers

Instructions

Let’s Learn...

Activity 1 (20 min): Revise comparing phrases
1. Write on the board all the comparing phrases: more than, greater than, bigger than, smaller than, fewer than, less than and as many as. Revise with the pupils by asking them to give an example for each of the phrases.
2. Play a simple game of guessing the number using the phrases as clues as follows:
   - Think of a 5-digit number
   - Ask the class to guess the number
   - Give clues such as ‘it is less than that’ or ‘it is more than that’
   - Continue with guesses and clues until someone gives the right answer.

Activity 2 (20 min): Compare numbers up to 100,000
1. Explain to the class 5 simple steps to identify which number is greater or smaller given two 5-digit numbers:
   
   Step 1: Compare the digits in the ten thousands place
   - Move to the next step if the digits are the same.
   - If not, the number with the bigger digit is the greater number.
   
   Step 2: Compare the digits in the thousands place
   - Move to the next step if the digits are the same.
   - If not, the number with the bigger digit is the greater number.
   
   Step 3: Compare the digits in the hundreds place
   - Move to the next step if the digits are the same,
   - If not, the number with the bigger digit is the greater number.
   
   Step 4: Compare the digits in the tens place
   - Move to the next step if the digits are the same.
• If not, the number with the bigger digit is the greater number.

Step 5: Compare the digits in the ones place
• If the digits are the same, both numbers are identical.
• If not, the number with the bigger digit is the greater number.

2. Go through with the pupils the examples on pages 7–8 of the Student’s Book. Provide more examples of comparing numbers for the class to practise.

Activity 3 (25 min): Find numbers up to 100 000 using more than and less than
1. Write the following questions on the board:
   • What number is 1 more than 356?
   • What number is 10 more than 673?
   • What number is 100 more than 217?
   • What number is 1000 more than 4634?
   • What number is 10,000 more than 37 108?

2. Give the answers to the above questions and ask the pupils if they notice anything common about the way the 3 answers were obtained? Explain to them that when the phrase ‘more than’ is used, they need to do an addition.

3. Repeat No. 1 and 2 using ‘less than’ and explain to the class that when the phrase ‘less than’ is used, they need to do a subtraction.

Activity 4 (15 min): Arrange numbers in ascending and descending order
1. Revise with the class the meaning of ‘ascending’ and ‘descending’.

2. Play a game as follows:
   • Divide the class into 4 groups.
   • Give each pupil a slip of paper with a 5-digit number written on it.
   • At the start signal, pupils in each group are to arrange themselves in a straight line according to the ascending order of their numbers.
   • The team that correctly completes the arrangement first, wins!

Activity 5 (25 min): Complete number patterns involving 5-digit numbers
1. Explain to the class that a number pattern is a set of numbers that follows a certain pattern. If the numbers gets bigger, it is an ascending number pattern and if the numbers get smaller, it is a descending number pattern. Gives some examples of ascending and descending number patterns involving 5-digit numbers:

   Number patterns that are ascending
   • 35 201, 35 202, 35 203, 35 204, 35 205 is a number pattern whose numbers get bigger by 1 each time.
   • 74 623, 74 633, 74 643, 74 653, 74 663 is a number pattern whose numbers get bigger by 10 each time.
   • 86 156, 86 256, 86 356, 86 456, 86 556 is a number pattern whose numbers get bigger by 100 each time.
Number patterns that are increasing
• 62 945, 63 945, 64 945, 65 945, 66 945 is a number pattern whose numbers get bigger by 1000 each time.
• 22 876, 32 876, 42 876, 52 876, 62 876 is a number pattern whose numbers get bigger by 10 000 each time.

Number patterns that are descending
• 21 999, 21 998, 21 997, 21 996, 21 995 is a number pattern whose numbers get smaller by 1 each time.
• 59 094, 59 084, 59 074, 59 064, 59 054 is a number pattern whose numbers get smaller by 10 each time.
• 42 798, 42 698, 42 598, 42 498, 42 398 is a number pattern whose numbers get smaller by 100 each time.
• 18 302, 17 302, 16 302, 15 302, 14 302 is a number pattern whose numbers get smaller by 1000 each time.
• 87 432, 77 432, 67 432, 57 432, 47 432 is a number pattern whose numbers get smaller by 10 000 each time.

2. Write on the board the following sets of number patterns:
• 13 201, 13 202, 13 203, ______, ______
• 27 239, 27 249, 27 259, ______, ______
• 65 014, 65 114, 65 214, ______, ______
• 84 256, 85 256, 86 256, ______, ______
• 20 987, 30 987, 40 987, ______, ______

3. Ask the class which digit in each of the number patterns changes and what is the pattern of change (whether it is more by 1, 10, 100 or 1000 or less by 1, 10, 100, 1000 or 10 000). Lead the class to see that to obtain the next number in the number pattern, you have to either add or subtract 1 or 10 or 100 or 1000 or 10 000 to the previous number.

4. Show the class slightly more complex number patterns and ask pupils to try completing the patterns as follows:
17 997, 17 998, 17 999, ______, ______
23 970, 23 980, 23 990, ______, ______
52 701, 52 801, 52 901, ______, ______
95 002, 95 001, 95 000, ______, ______
73 825, 73 815, 73 805, ______, ______
46 263, 46 163, 46 063, ______, ______

Activity 6 (15 min): Class practice
1. Go through with the pupils the examples on pages 7–11 of the Student’s Book.

Let’s Try...

Activity 7 (40 min): Individual practice
1. Ask pupils to do the exercises on page 12 of the Student’s Book.
Homework
Ask pupils to do Workbook 4A—Worksheet 2.

Answers

page 12
1. (a) 12 369, <  (b) 39 372, <  (c) 48 076, <  (d) 90 842, >
2. 24 906, 24 932, 25 078
3. 97 320, 97 082, 97 054
4. (a) 57 326, 55 326     (b) 74 421, 44 421

Worksheet 2

1. (a) >  (b) <  (c) <  (d) >  (e) >
   (f) >  (g) <  (h) <  (i) <  (j) >
2. (a) 48 304     (b) 21 543     (c) 29 310     (d) 12 975     (e) 70 103
3. (a) 24 300     (b) 67 115     (c) 47 899     (d) 2789      (e) 5906
4. (a) 69 840, 69 480, 68 940, 64 980
   (b) 28 001, 27 936, 27 396, 26 937
   (c) 45 321, 44 576, 43 657, 43 567
5. (a) 14 369, 14 396, 14 936, 14 963
   (b) 58 479, 58 497, 59 798, 59 807
   (c) 84 407, 84 409, 86 705, 87 307
6. (a) 97 500     (b) 13 785     (c) 51 277     (d) 250
   (e) 66 335     (f) 23 579     (g) 44 944

ROUND OFF TO THE NEAREST TEN

Suggested Duration
2 periods (80 min)

Learning Outcomes
Pupils should be able to:

• round off numbers to the nearest ten

Instructions
Let’s Learn . . .
Activity 1 (40 min): Round off numbers to the nearest ten

1. Draw a number line. Write the tens (30 and 40) on the number line and ask a pupil to fill in the ones in between the tens as follows:

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 30  31  32  33  34  35  36  37  38  39  40
```

2. Tell the pupils a story:

The numbers 30 to 40 represent lampposts at equal distance. There were bus-stop shelters at lampposts 30 and 40.

(a) One day, John started walking from lamppost 30 and wanted to reach lamppost 40. When he reached lamppost 34, it started to rain. Ask the class ‘Which is the nearest shelter he can run to, the one at lamppost 30 or the one at lamppost 40?’ (It should be the one at lamppost 30 because it is nearer to lamppost 34). So, 34 rounded off to the nearest ten is 30.

(b) On the next day, John started walking again from lamppost 30 and wanted to reach lamppost 40. When John reached lamppost 37, it started to rain. Ask the class ‘Which is the nearest shelter he can run to, the one at lamppost 30 or the one at lamppost 40?’ (It should be lamppost 40 because it is nearer to lamppost 37). So, 37 rounded off to the nearest ten is 40.

(c) On another day, John took the same path and started again from lamppost 30 walking towards lamppost 40. When he was at lamppost 35, midway between lamppost 30 and lamppost 40, it started to rain. Ask the class ‘Which shelter should he run to, the one at lamppost 30 or lamppost 40?’ (It should be lamppost 40 even though the distance to lamppost 30 is the same as the distance to lamppost 40 because John’s intention is to reach lamppost 40, so it would save him time if he chose lamppost 40). So, if the number is midway between 2 tens, rounding off the number to the nearest ten will be the next higher ten and not the lower ten.

3. Go through with the pupils Examples 1 to 4 on pages 13–14 of the Student’s Book. For each of the examples, ask the class the additional question, ‘Which is a more accurate estimate of the length?’

4. Write on the board the notation ‘≈’ to denote rounding off.

5. Let the pupils try out rounding off the following numbers to the nearest ten:
   95, 197, 994, 998, 3996, 99 999, 104, 1003, 10 002

6. To round off to the nearest ten, pupils can also adopt the following rule:
   - If the digit in the ones place is 0, 1, 2, 3, and 4, round off the number to the lower ten.
   - If the digit in the ones place is 5, 6, 7, 8, and 9, round off the number to the higher ten.

Activity 2 (15 min): Class practice

1. Go through with the pupils the examples on pages 13–14 of the Student’s Book.
Let’s Explore
Activity 3 (10 min): Work in pairs
1. Let the pupils try out the Let’s Explore activity on page 14 of the Student’s Book.

Let’s Try…
Activity 4 (15 min): Individual practice
1. Ask the pupils to try out the exercises on page 16 of the Student’s Book.

Homework
Ask pupils to do Workbook 4A—Worksheet 3.

Answers

page 16
1. (a) 90  (b) 30  (c) 60  (d) 130  (e) 900
   (f) 350  (g) 4310  (h) 90 900  (i) 5620
2. (a) 80 + 100 = 180  (b) 670 + 120 = 790  (c) 390 + 240 = 630
   (d) 80 – 70 = 10  (e) 870 – 520 = 350  (f) 610 – 260 = 350
3. 2000
4. 280 + 220 = 500

Worksheet 3
1. (a) 20  (b) 140  (c) 4600  (d) 32 290
2. 850, 1010, 450, 1000, 320, 1980, 2020
3. (a) 20 + 20 = 40  (b) 50 + 100 = 150  (c) 690 + 260 = 950
   (d) 360 + 360 = 720  (e) 580 + 90 = 670  (f) 190 – 140 = 50
   (g) 370 – 190 = 180  (h) 980 – 460 = 520  (i) 790 – 680 = 110
   (j) 380 – 20 = 360
4. 350 + 200 = 550
5. Rs 500 – Rs 300 = Rs 200

ROUND OFF TO THE NEAREST HUNDRED

Suggested Duration
2 periods (80 min)

Learning Outcomes
Pupils should be able to:

• round off numbers to the nearest hundred
Instructions

Let’s Learn…

Activity 1 (40 min): Round off numbers to the nearest hundred
1. Refer pupils to page 17 of the Student’s Book. Go through with the pupils Example 1.
2. Remind the class that the notation ‘≈’ denotes rounding off.
3. Explain to the class that rounding off to the nearest hundred involves looking at the first 2 digits of the number.
4. To round off to the nearest hundred, pupils can adopt the following rule:
   • If the number formed by the digits in the ones place and tens place is from 0 to 49, round off to the lower hundred. If the number formed by the digits in the ones and tens place is 50 to 99, round off to the higher hundred.
5. Go through with the pupils Example 3 on page 18 of the Student’s Book to illustrate how rounding off can be used in estimation.

Let’s Think

Activity 2 (20 min): Work in pairs
1. Ask the pupils to discuss in pairs the Let’s Think question on page 19 of the Student’s Book. Find out how many pupils have the right answer. (Ali is wrong, Maira is correct.)
2. Explain to the class that when rounding off a number, it cannot be carried out in parts. For example, to round off to the nearest hundred, one cannot first round off to the nearest tens and then followed by rounding off to the nearest hundred.
3. Remind the class of the rules below:
   For rounding off to the nearest ten
   Look at the digit in the ones place. If the digit is less than 5, round off to the lower ten, if the digit is 5 or more, round off to the higher ten.
   For rounding off to the nearest hundred
   Look at the first 2 digits in the number. If the first 2 digits is less than 50, round off to the lower hundred, if the first 2 digits is 50 or more, round off to the higher hundred.

Let’s Try . . .

Activity 3 (20 min): Individual practice
1. Ask the pupils to do the exercises on page 19 of the Student’s Book.

Homework
Ask pupils to do Workbook 4A—Worksheet 4.

Answers

page 19
1. (a) 700 (b) 2300 (c) 400 (d) 1900 (e) 10 000
(f) 2000  (g) 800  (h) 10 700  (i) 1700
2. (a) 400 + 600 = 1000  (b) 1800 + 700 = 2500  
(c) 2800 – 600 = 2200  (d) 3700 – 2300 = 1400  

WORKSHEET 4
1. (a) 300  (b) 1000  (c) 1200  (d) 12 500
2. (a) 500  (b) 31 100  (c) 20 000  (d) 2000  
(e) 49 600  (f) 36 100  (g) 29 900
3. (a) 200 + 300 = 500  (b) 4300 + 6500 = 10 800  (c) 6700 + 7700 = 14 400  
(d) 1100 + 6800 = 7900  (e) 3000 + 1400 = 4400  (f) 5300 – 2100 = 3200  
(g) 9300 – 1500 = 7800  (h) 4000 – 2600 = 1400  (i) 9500 – 800 = 8700  
(j) 9000 – 2000 = 5000
4. 600 × 4 = 2400
5. 4000 + 5700 = 9700

FACTORS

Suggested Duration
3 periods (120 min)

Learning Outcomes
Pupils should be able to:

- know what factors are
- determine if a number is a factor of another number
- find and list all the factors of any 2-digit number
- identify the common factors of two 2-digit numbers

Instructions

Let’s Learn...

Activity 1 (15 min): Know what factors are
1. Explain to the class that factors are whole numbers. A whole number when divided by its factors, will not leave behind any remainder. For example: 6 can be divided exactly by 3 leaving behind no remainder, so, 3 is a factor of 6. Similarly, 6 can be divided exactly by 2, leaving behind no remainder, so 2 is also a factor of 6.

2. Ask the class ‘What number can 6 be divided exactly by, with no remainder?’ Lead the pupils to see that 1 and 6 are also factors of 6. So, the factors of 6 are 1, 2, 3 and 6. Point out to the class that the smallest factor of any given whole number is 1 and the largest factor of any given whole number is itself.
3. Ask the class to examine $8 \div 2 = 4$ and $6 \div 2 = 3$. Both division leave behind no remainder, so 2 is a factor of both 6 and 8. Hence 2 is known as the common factor of 6 and 8.

4. Highlight to the pupils that a factor of a whole number can never be greater than the whole number itself.

**Activity 2 (25 min): Determine if a number is a factor of another number**

1. Write on the board the number ‘12’. Ask the class ‘Is 3 a factor of 12?’ Tell the class that there are two methods to determine if a number is a factor of another number.

   **Method 1: Use multiplication sentences**
   - Ask the class, ‘Can a multiplication sentence be formed to connect the numbers 3 and 12?’ Write on the board $3 \times 4 = 12$
   - Hence 3 is a factor of 12. Similarly, 4 is also a factor of 12. Lead the class to see that the 2 numbers can be connected nicely through a multiplication sentence. Tell the pupils that this method is suitable for small numbers.

   **Method 2: Vertical Division (or Quotient and Remainder)**
   - Use vertical division to find out if 12 can be divided exactly by the other number as follows:
     
     \[
     \begin{array}{c|c}
     \text{4} & \Rightarrow \text{quotient} \\
     \hline
     3 & 12 \\
     -12 & \\
     0 & \Rightarrow \text{remainder}
     \end{array}
     \]
   - Since there is 0 remainder, 12 can be divided exactly by 3. Hence, 3 is a factor of 12. Lead the class to see that the quotient, 4 is also a factor of 12.

2. Provide more examples for pupils to practise using both methods. Advise the pupils to adopt the Quotient and Remainder method if big numbers are involved.

**Activity 3 (10 min): Find and list all the factors of any 2-digit number**

1. Write the number ‘16’ on the board. Ask the pupils to write on the board all the multiplication sentences that form 16. Lead the pupils to begin with the smallest number as follows:
   
   \[
   1 \times 16 = 16 \\
   2 \times 8 = 16 \\
   4 \times 4 = 16
   \]

2. From the multiplication sentences, the factors of 16 are: 1, 2, 4, 8 and 16. Pupils can also use vertical division to find the factors.

3. Provide more examples for the pupils to practise on the board.

**Activity 4 (10 min): Identify the common factors of two 2-digit numbers**

1. Write two 2-digit numbers on the board. Ask 2 pupils to find and list down all the factors for each number using the multiplication sentence method.

2. Ask another pupil to circle the factors that appear in both lists of factors. Point out to the class that these circled factors are known as the ‘common factors’ of the 2 numbers.
3. Provide more examples for the pupils to practise on the board.

**Activity 5 (20 min): Class practice**
1. Go through with the class the examples on pages 20–22 of the Student’s Book.

**Activity 6 (25 min): Play a guessing game to reinforce learning**
1. Pair up the pupils. One pupil will think of a 2-digit number and list down on a piece of paper all the factors except the largest factor which is the number itself. The other pupil will try to figure out the number by looking at the list of factors. If he is able to guess correctly the number in 2 tries, he wins 1 point.

**Let’s Try...**

**Activity 7 (15 min): Individual practice**
1. Ask the pupils to do the exercises on page 23 of the Student’s Book.

**Homework**
Ask pupils to do Workbook 4A—Worksheet 5.

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**Answers**

**page 23**

1. (a) 4  (b) 3  (c) 8  (d) 5  (e) 9  (f) 7  (g) 10  (h) 14  (i) 5  (j) 11
2. (a) 1, 3, 5, 15  (b) 1, 2, 5, 10, 50  (c) 1, 37
   (d) 1, 2, 4, 7, 14, 28  (e) 1, 2, 4, 8, 64  (f) 1, 31
   (g) 1, 2, 3, 6, 7, 14, 21, 42  (h) 1, 2, 3, 6, 13, 26, 39, 78  (i) 1, 2, 41, 82
3. (a) 4  (b) 4  (c) 6

**WORKsheet 5**

1. (a) 1, 2, 7, 14  (b) 1, 3, 9, 7  (c) 1, 2, 17, 34
   (d) 1, 3, 5, 9, 15, 45  (e) 1, 2, 5, 10, 25, 50  (f) 1, 2, 4, 7, 8, 14, 28, 56
2. (a) 1, 3, 9  (b) 1, 2, 4, 8, 16  (c) 1, 2

---

**MULTIPLES**

**Suggested Duration**
5 periods (200 min)

**Learning Outcomes**
Pupils should be able to:
- know what multiples are
- determine if a number is a multiple of another number
• find and list some multiples of any 2-digit number
• identify the common multiples of two 2-digit numbers
• know the relationship between factors and multiples

Instructions

Let’s Learn...

Activity 1 (20 min): Know what multiples are
1. Explain to the class that just like factors, multiples are also whole numbers. The word ‘multiple’ comes from the word ‘multiply’. Each time you multiply a number, the result is known as a multiple of the number.
2. Write the number 6 on the board. Multiplying 6 by 2 gives 12. So, 12 is a multiple of 6. Multiplying 6 by 3 gives 18, so 18 is another multiple of 6. Ask the class ‘What is the next multiple of 6?’
3. Ask the class, ‘Is 6 a multiple of 6?’ Lead the class to see that the first multiple of 6 is actually 6 itself by showing $6 \times 1 = 6$.
4. Ask the class to notice that the multiples of a number get larger and larger and there is no end to it. The smallest multiple of a number is actually the number itself.
5. Highlight to the class that the multiples of a number can never be smaller than the number itself.

Activity 2 (20 min): Determine if a number is a multiple of another number
1. Write on the board the number ‘36’. Ask the class ‘Is 36 a multiple of 4?’ Tell the class to divide 36 by 4. If there is no remainder then 36 is a multiple of 4.
2. In general, if a number $A$ is divisible by number $B$, then the number $A$ is a multiple of the number $B$.
3. Provide more examples for the pupils to practise.

Activity 3 (20 min): Find and list all the multiples of any 2-digit number
1. Write the number ‘7’ on the board. Ask the pupils to write on the board all the 10 multiplication sentences involving 7 as follows:
   
   $1 \times 7 = 7$
   $2 \times 7 = 14$
   $3 \times 7 = 21$
   $4 \times 7 = 28$
   $5 \times 7 = 35$
   $6 \times 7 = 42$
   $7 \times 7 = 49$
   $8 \times 7 = 56$
   $9 \times 7 = 63$
   $10 \times 7 = 70$
2. Ask the pupils to ‘List down the first 10 multiples of 7’. (The first 10 multiples of 7 are 7, 14, 21, 28, 35, 42, 49, 56, 63 and 70.)

**Activity 4 (15 min): Identify the common multiples of two 2-digit numbers**

1. Write the numbers 6 and 8 on the board. Ask 2 pupils to list down the first 8 multiples of each number.
   
   6 \( \rightarrow \) 6, 12, 18, 24, 30, 36, 42, 48  
   8 \( \rightarrow \) 8, 16, 24, 32, 40, 48, 56, 64  

2. Ask another pupil to circle the multiples that appear in both lists of multiples. Point out to the class that these circled multiples are known as the ‘common multiples’ of the 2 numbers. Provide more examples for the pupils to practise on the board.

**Activity 5 (20 min): Know the relationship between factors and multiples**

1. Draw on the board a table with 2 columns: Factors and Multiples. Write the number ‘8’ under each heading with its factors and multiples and explain the differences between factors and multiples as follows:

<table>
<thead>
<tr>
<th>Factors</th>
<th>Multiples</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 ( \rightarrow ) 1, 2, 4, 8</td>
<td>8 ( \rightarrow ) 8, 16, 24, 32, 40, . . . . . .</td>
</tr>
<tr>
<td>• There are only 4 factors.</td>
<td>• There are unlimited number of multiples.</td>
</tr>
<tr>
<td>• Factors are equal or less than the number.</td>
<td>• Multiples are equal or more than the number itself.</td>
</tr>
<tr>
<td>• To find factors, divide the number exactly.</td>
<td>• To find multiples, multiply the number.</td>
</tr>
<tr>
<td>• The smallest factor is 1 and the largest factor is the number itself.</td>
<td>• The smallest multiple is the number itself. There is no largest multiple.</td>
</tr>
</tbody>
</table>

2. Show the pupils how factors and multiples relate to each other in multiplication and division sentences as follows:

   **Multiplication sentence**
   
   \[ 9 \times 6 = 56 \]
   
   9 and 6 are factors of 56. 56 is a multiple of both 6 and 9

   **Division sentence**
   
   \[ 72 \div 9 = 8 \]
   
   72 is a multiple of both 9 and 8. 9 and 8 are factors of 72

3. Provide more examples of multiplication and division sentences and ask pupils to identify the factors and multiples.

4. Ask the class whether the sentence, ‘If A is a factor of B, then B is a multiple of A’ is true or false. Gives some examples to show that this statement is true.
Activity 6 (10 min): Class practice
1. Go through with the class the examples on pages 24–26 of the Student’s Book.

Let’s Try…

Activity 7 (10 min): Individual practice
1. Ask the pupils to do the exercises on page 27 of the Student’s Book.

Homework
Ask pupils to do Workbook 4A—Worksheet 6 and Practice 1.

Answers

Page 27

1. 4: 12, 16, 20, 24, 28, 32, 36, 40, 44, 48
   7: 21, 28, 35, 42, 49, 56, 63, 70, 77, 84
   8: 24, 32, 40, 48, 56, 64, 72, 80, 88, 96
   9: 27, 36, 45, 54, 63, 72, 81, 90, 99, 108
2. Yes. 28 ÷ 7 = 4
   No. 28 ÷ 6 = 4 R 4
   No. 28 ÷ 9 = 3 R 1
3. 10, 20
4. 18, 36, 54
5. (a) 24  (b) 28  (c) 30
6. Yes for 5, No for 6

20

Worksheet 6

1. (a) 3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, 36
   (b) 5, 10, 15, 20, 25, 30, 35, 40, 45, 50 55, 60
   (c) 8, 16, 24, 32, 40, 48, 56, 64, 72, 80, 88, 96
2. (a) 12, 24
   (b) Multiples of 5: 5, 10, 15, 20, 25, 30, 35, 40, 45, 50 55, 60
      Multiples of 6: 6, 12, 18, 24, 30, 36, 42, 48, 54, 60
      Common multiples: 30, 60
   (c) Multiples of 3: 3, 6, 9, 12, 15, 18, 21 24, 27, 30
      Multiples of 5: 5, 10, 15, 20, 25, 30
      Common multiples: 15, 30
3. (a) 6  (b) 9  (c) 20  (d) 30
Practice 1

1. 35 060
2. Sixty thousand and two
3. 2000
4. 67 904
5. 21 347, 23 073, 23 800, 24 009
6. 40 870, 40 807, 40 780, 40 708
7. 1, 2, 4, 5, 10, 20, 25, 50, 100
8. 24
9. Rs 60, Rs 90, Rs 770
10. (a) 450 (b) 7300
11. (a) $300 + 800 = 1100$
   (b) $2900 + 1000 = 3900$
12. (a) 60  (b) 250  (c) 30  (d) 60  (e) 370  (f) 190
13. (a) 500  (b) 700  (c) 300  (d) 700  (e) 100  (f) 600

Fun with Maths

Activity 8 (40 min): Work in pairs to reinforce learning

1. Ask the pupils to work in pairs to discuss and teach each other the exercise on page 28 of the Student’s Book. Ask a few pupils to share what they have learnt from each other. (The pupils should learn that common multiples of 2 and 5 are all the tens.)

2. Repeat the above exercise for the numbers 5 and 10. (The pupils should also learn that the common multiples of 5 and 10 are all the tens.)

Revision (40 min)

Revise and go through pupil’s homework.
Unit 2: Multiplication and Division

MULTIPLYING BY A 1-DIGIT NUMBER

Suggested Duration
3 periods (120 min)

Learning Outcomes
Pupils should be able to:
- multiply numbers up to 4-digits with a 1-digit number

Instructions

Let’s Learn...

Activity 1 (40 min): Revise the time-tables for 2 to 9
1. Emphasize to the pupils the importance of knowing by heart the time-tables for 2 to 9. Just like one need to first know the letters A to Z in order to learn to write words, one need to first know the time-tables for 2 to 9 in order to do multiplication of numbers.
2. Pair up the pupils to test each other the time-tables of numbers 2 to 9. Each pupil will take turns to ask the other pupil a multiplication question e.g. ‘What is 2 times 3?’ If he answers correctly, he gets a point.

Activity 2 (40 min): Revise the vertical multiplication method
1. Revise with the pupils multiplying 2-digit and 3-digit numbers with a 1-digit number using the vertical multiplication method (some call it the multiplication algorithm).
2. Provide some examples for pupils to practise working through the vertical multiplication on the board.

Activity 3 (25 min): Multiply 4-digit numbers with a 1-digit number
1. Go through with the pupils the steps in vertical multiplication for each of the examples found on pages 30–33 of the Student’s Book. Remember to stress that the steps used for 4-digit numbers are the same as the steps used for any 2-digit or 3-digit numbers that the pupils were taught in Primary 3.
2. Provide some examples for pupils to practise on the board. Ask the rest of the pupils to observe if the workings and answers are correct.

Let’s Try...

Activity 4 (15 min): Individual practice
1. Ask pupils to do the exercises on page 34 of the Student’s Book.

Homework
Ask pupils to do Workbook 4A—Worksheet 7.
**Answers**

**WORK Sheet 7**

1. (a) 2130  (b) 2732  (c) 13 728  (d) 25 788  (e) 44 380  (d) 23 229

2. (a) 8445  (b) 5992  (c) 10 710  (d) 20 881  (e) 29 400
   (f) 26 845  (g) 2604  (h) 2520  (i) 19 026  (j) 20 160
   (k) 14 370  (l) 6216  (m) 352  (n) 19 848

**MULTIPLYING BY TENS**

**Suggested Duration**

2 periods (80 min)

**Learning Objectives**

Pupils will be able to

- Multiply any number by 10
- Multiply any number by tens

**Instructions**

**Let’s Learn…**

1. Ask the class ‘What is 3 × 10?’ ‘What is 45 × 10?’ ‘What is 123 × 10?’ and ‘What is 456 × 10?’ Write on the board the answers as follows:
   - $3 \times 10 = 30$
   - $45 \times 10 = 450$
   - $123 \times 10 = 1230$
   - $4564 \times 10 = 45 600$

2. Show some more examples of multiplying by 10:
   - $40 \times 10 = 400$
   - $8900 \times 10 = 89 000$
   - $502 \times 10 = 5020$
   - $7030 \times 10 = 70 300$

3. Ask the class if they can see any pattern in the way the answers are obtained. Lead the class to see that the answers are actually obtained by adding a ‘0’ to the first number. Tell
the class, as a rule to remember, that to find the answer to any number multiplied by 10, simply add a ‘0’ to the number as follows:

\[ 234 \times 10 = 2340 \]

**Activity 2 (40 min): Multiply any number by tens**

1. Write \( 453 \times 50 \) on the board. Explain to the pupils the steps below:
   - Re-write \( 453 \times 50 \) as \( 453 \times 5 \times 10 \) (since 50 is the same as \( 5 \times 10 \))
   - Work out \( 453 \times 5 \) using vertical multiplication (also known as algorithm)
     
     \[
     \begin{array}{c}
     453 \\
     \times 5 \\
     \hline
     2265 \\
     \end{array}
     \]
   - Add a zero to 2265 \( \Rightarrow 2265 \times 10 = 22650 \)

4. Go through with the pupils the examples on pages 35–36 of the Student’s Book. Provide more examples and word problems for the pupils to practise.

5. Ask the class ‘What if we multiply a number by hundreds?’ Lead the class to see that for hundreds, they simply need to add two zeros to the answer.

**MULTIPLYING BY A 2-DIGIT NUMBER**

**Suggested Duration**

3 periods (120 min)

**Learning Outcomes**

Pupils should be able to:

- multiply by a 2-digit number

**Instructions**

*Let’s Learn...*

**Activity 1 (40 min): Revise multiplying by a 1-digit number**

1. Revise with the pupils multiplying by a 1-digit number. Pupils must be well-versed with the steps in vertical multiplication for multiplying by a 1-digit number before they move to multiplying by a 2-digit number.

**Activity 2 (40 min): Multiply by a 2-digit number**

1. Explain to the pupils that in multiplying by a 2-digit number, the steps taken are the same as those for multiplying by a 1-digit number. For multiplying by a 2-digit number, the steps are repeated twice, one for the digit in the ones place and the other for the digit in the tens place. Emphasize to the pupils to always begin the multiplication steps with the digit in the ones place first and then followed by the digit in the tens place.
2. Refer the pupils to the examples on pages 37–38 of the Student’s Book. Explain in detail on the board the steps taken in multiplying by a 2-digit number.

3. Provide more examples for pupils to try out on the board.

4. Tell the pupils to remember two very important points when multiplying by a 2-digit number:
   - Make sure that the numbers are aligned correctly as there is a tendency to align them in the incorrect row due to the many rows of numbers.
   - Remember to put in the zeros at the correct place.

5. Give more sums for the pupils to practise on the board. Ensure that pupils observe instruction 4, as mentioned above.

**Let’s Think**

**Activity 3 (25 min): Interesting exercise**
1. Let the pupils think through the exercise on page 38 of the Student’s Book. Encourage the pupils to discuss their findings with their friends and to work out the correct answer if they think that John’s answer is wrong. Ask a few pupils to work out the correct answer on the board for all to see.

**Let’s Try…**

**Activity 4 (15 min): Individual practice**
1. Ask the pupils to do the exercises on page 39 of the Student’s Book.

**Homework**
Ask pupils to do Workbook 4A—Worksheets 8 and 9.

**Answers**

![Image] page 39

1. (a) 120  (b) 480  (c) 1480  (d) 2300  
   (e) 4350  (f) 20 880  (g) 19 200  (h) 6820 
2. (a) 1836  (b) 13 144  (c) 7752  (d) 19 346  (e) 36 358  (f) 9468

**WORK SHEET 8: Multiplying by Tens**
1. (a) 240  (b) 3150  (c) 2720  (d) 9060  (e) 7000  (f) 820  
2. (a) 1380  (b) 49 500  (c) 28 080  (d) 23 030  (e) 21 850  
   (f) 29 640  (g) 14 400  (h) 4760  (i) 10 560  (j) 30 850

**WORK SHEET 9**
1. (a) 3240  (b) 9504  (c) 21 888  (d) 44 086  (e) 4606  (f) 10 868 
2. (a) 300, 40, 300 × 40 = 12 000, 13 545  (b) 400, 60, 400 × 60 = 24 000, 27 392 
3. 4320  4. 3280  5. 4200
DIVIDING BY A 1-DIGIT NUMBER

Suggested Duration
3 periods (120 min)

Learning Outcomes
Pupils should be able to:
• Divide numbers up to 4-digits by a 1-digit number

Instructions
Let’s Learn...

Activity 1 (40 min): Revise on division by numbers 2 to 9
1. Ask the pupils ‘What is 24 divided by 6?’ and write ‘24 ÷ 6 = ?’ on the board. Teach the pupils to refer to the time-table of 6 and ask themselves ‘What multiplies by 6 gives 24? or 6 × ? = 24?’
2. Emphasize the importance of knowing the time-tables for 2 to 9. Just like multiplication, the pupils need to know by heart the time-tables for 2 to 9 in order to do division of numbers that are more than 2 digits.
3. Provide examples of division involving number 2 to 9 for pupils to practise.

Activity 2 (40 min): Revise the vertical division method
1. Revise with the pupils dividing 2-digit and 3-digit numbers by a 1-digit number using the vertical division method (some call it the division algorithm).
2. Provide examples for pupils to practise vertical division on the board.

Activity 3 (25 min): Divide numbers up to 4-digit by a 1-digit number
1. Go through with the pupils the steps of vertical division for each of the examples on pages 40–42 of the Student’s Book. Remember to stress that the steps used to divide 4-digit numbers are the same as those used to divide 2-digit or 3-digit numbers. These steps were taught in Primary 3.
2. Provide examples for pupils to practise on the board. Ask the rest of the pupils to observe if the workings and answers are correct.

Let’s Try...

Activity 4 (15 min): Individual practice
1. Ask pupils to do the exercises on page 42 of the Student’s Book.

Homework
Ask pupils to do Workbook 4A—Worksheet 10.
# Answers

Page 42

1. (a) 42  
   (b) 124.5  
   (c) 109.25  
   (d) 993  
   (e) 327  
   (f) 958.5  

2. \[2100 \div 7 = 300, \ 299\]

**Worksheet 10**

1. (a) 159  
   (b) 779  
   (c) 903  
   (d) 810  
   (e) 6701  
   (f) 653  

2. (a) 1081 R2  
   (b) 1209 R6  

3.

## Divisibility by 2

<table>
<thead>
<tr>
<th>Number</th>
<th>Is the last digit even?</th>
<th>Divisible by 2?</th>
</tr>
</thead>
<tbody>
<tr>
<td>31 592</td>
<td>(2) yes</td>
<td>yes</td>
</tr>
<tr>
<td>45 536</td>
<td>(6) yes</td>
<td>yes</td>
</tr>
<tr>
<td>24 861</td>
<td>(1) no</td>
<td>no</td>
</tr>
<tr>
<td>54 690</td>
<td>(0) yes</td>
<td>yes</td>
</tr>
<tr>
<td>21 343</td>
<td>(3) no</td>
<td>no</td>
</tr>
<tr>
<td>35 975</td>
<td>(5) no</td>
<td>no</td>
</tr>
</tbody>
</table>

## Divisibility by 5

<table>
<thead>
<tr>
<th>Number</th>
<th>Is the last digit 0 or 5?</th>
<th>Divisible by 5?</th>
</tr>
</thead>
<tbody>
<tr>
<td>18 207</td>
<td>(7) no</td>
<td>no</td>
</tr>
<tr>
<td>63 000</td>
<td>(0) yes</td>
<td>yes</td>
</tr>
<tr>
<td>5688</td>
<td>(8) no</td>
<td>no</td>
</tr>
<tr>
<td>35 215</td>
<td>(5) yes</td>
<td>yes</td>
</tr>
<tr>
<td>97 552</td>
<td>(2) no</td>
<td>no</td>
</tr>
<tr>
<td>99 003</td>
<td>(3) no</td>
<td>no</td>
</tr>
</tbody>
</table>

## Divisibility by 10

<table>
<thead>
<tr>
<th>Number</th>
<th>Is the last digit 0?</th>
<th>Divisible by 10?</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 215</td>
<td>(5) no</td>
<td>no</td>
</tr>
<tr>
<td>64 380</td>
<td>(0) yes</td>
<td>yes</td>
</tr>
<tr>
<td>11 132</td>
<td>(2) no</td>
<td>no</td>
</tr>
<tr>
<td>46 800</td>
<td>(0) yes</td>
<td>yes</td>
</tr>
<tr>
<td>96 814</td>
<td>(4) no</td>
<td>no</td>
</tr>
<tr>
<td>33 390</td>
<td>(0) yes</td>
<td>yes</td>
</tr>
</tbody>
</table>
4. **Divisibility by 3**

<table>
<thead>
<tr>
<th>Number</th>
<th>Is the sum of the digits a multiple of 3?</th>
<th>Divisible by 3?</th>
</tr>
</thead>
<tbody>
<tr>
<td>18 273</td>
<td>$(1 + 8 + 2 + 7 + 3 = 21)$ yes</td>
<td>yes</td>
</tr>
<tr>
<td>66 320</td>
<td>$(6 + 6 + 3 + 2 + 0 = 17)$ no</td>
<td>no</td>
</tr>
<tr>
<td>1818</td>
<td>$(1 + 8 + 1 + 8 = 18)$ yes</td>
<td>yes</td>
</tr>
<tr>
<td>65 131</td>
<td>$(6 + 5 + 1 + 3 + 1 = 16)$ no</td>
<td>no</td>
</tr>
<tr>
<td>43 236</td>
<td>$(4 + 3 + 2 + 3 + 6 = 18)$ yes</td>
<td>yes</td>
</tr>
<tr>
<td>90 345</td>
<td>$(9 + 0 + 3 + 4 + 5 = 21)$ yes</td>
<td>yes</td>
</tr>
<tr>
<td>12 317</td>
<td>$(1 + 2 + 3 + 1 + 7 = 14)$ no</td>
<td>no</td>
</tr>
<tr>
<td>55 542</td>
<td>$(5 + 5 + 5 + 4 + 2 = 21)$ yes</td>
<td>yes</td>
</tr>
<tr>
<td>81 334</td>
<td>$(8 + 1 + 3 + 3 + 4 = 19)$ no</td>
<td>no</td>
</tr>
<tr>
<td>10 009</td>
<td>$(1 + 0 + 0 + 0 + 9 = 10)$ no</td>
<td>no</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Divisibility by 9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
</tr>
<tr>
<td>----------</td>
</tr>
<tr>
<td>65 457</td>
</tr>
<tr>
<td>36 612</td>
</tr>
<tr>
<td>58 213</td>
</tr>
<tr>
<td>31 109</td>
</tr>
<tr>
<td>58 221</td>
</tr>
<tr>
<td>69 444</td>
</tr>
<tr>
<td>12 345</td>
</tr>
<tr>
<td>1116</td>
</tr>
<tr>
<td>72 720</td>
</tr>
<tr>
<td>43 318</td>
</tr>
</tbody>
</table>

5. (a) $450, 450 \div 5 = 90, 89$
   (b) $5400, 5400 \div 6 = 900, 939$

6. 229

7. 1645
WORD PROBLEMS

Suggested Duration
6 periods (240 min)

Learning Outcomes
Pupils should be able to:
  • Solve word problems up to 3 steps involving a combination of multiplication and division

Instructions
Let’s Learn…

Activity 1 (40 min): Revise equal parts model to represent multiplication and division
1. Revise with the pupils drawing models of equal parts to represent multiplication and division. You may use the following examples or create your own:
   • Tom has 250 marbles and John has 4 times as many marbles as Tom. How many marbles does John have?
   (Ask pupil to draw the model. Ask pupils ‘Who has more?’ to assess their understanding of the phrase ‘4 times as many as’).
   ![Diagram]
   Tom: ■■■■■
   John: ■■■■■■■■■ (4 equal parts to represent 4 times)
   (This is a multiplication word problem.)
   • Mary bought 5 boxes of puffs. Each box contained 20 curry puffs. How many curry puffs did she buy?
   (Ask pupils to draw the model.)
   20 curry puffs
   ![Diagram]
   (This is a multiplication word problem.)
   • Ali has 400 stamps. He has 8 times more stamps than Wasif. How many stamps does Wasif has?
   (Ask pupil to draw the model. Ask pupils ‘Who has more?’ to assess their understanding of the phrase ‘8 times more than’).
Mr Khan gave Rs 500 to be shared equally among his 6 children. How much did each child get?

Rs 500

(This is a division word problem.)

Activity 2 (40 min): Class practice
1. Go through with the pupils the examples on pages 43–45 of the Student’s Book. For each example, show both the models and the vertical multiplication and vertical division steps.

Activity 3 (40 min): Work in pairs
1. Let the pupils try out the Let’s Explore activity on page 46 of the Student’s Book. Ask a few pupils to share their answers with the class.

Activity 4 (40 min): Individual practice
1. Ask the pupils to do the exercises on page 47 of the Student’s Book.

Homework
Ask the pupils to do Workbook 4A—Worksheets 11-12 and Practice 2.

Answers

Let’s Try
1. 5367 2. 900 3. Rs 1020 4. Rs 2233 5. Rs 252 6. Rs 16 320

Worksheet 11
1. 2868 2. 156 3. 7080 4. 4032

Worksheet 12
1. Rs 9850 2. 1134 3. Rs 115 4. (a) 2 (b) 94 5. Rs 500 6. Rs 80
Practice 2

1. (a) 24102 (b) 18548 (c) 13050 (d) 71440
   (e) 3915 (f) 14880 (g) 157 (f) 268
2. (a) 6420 (b) 7090
3. 5 kg
4. (a) 343 (b) 3
5. 634

Fun With Maths

Activity 5 (40 min): Game to reinforce learning

Things you need: Dice

1. Let the pupils play the game on page 48 of the Student’s Book. Acknowledge the pupil who has the highest score.

Revision (40 min)

Revise and go through pupil’s homework.
Unit 3: Fractions (I)

MIXED NUMBERS AND IMPROPER FRACTIONS

Suggested Duration
6 periods (240 min)

Learning Outcomes
Pupils should be able to:
• to express a mixed number as an addition of a proper fraction and a whole number
• to express a mixed number in its simplest form
• to express an improper fraction in its simplest form
• to express an improper fraction as a mixed number and vice versa

Instructions

Let’s Learn…

Activity 1 (20 min): Recall the concept of fractions
1. Recall the concept of fraction as equal parts of a whole as follows:
   One whole

   2 out of 3 equal parts

   Write the fraction and recall the terms, numerator and denominator as follows:
   \[
   \frac{2}{3}
   \]
   - numerator, it tells how many equal parts that are being talked about
   - denominator, it tells how many equal parts something has

2. Show a square divided into 9 equal parts and revise with pupils by asking the following questions:

   - How many equal parts are there?
   - What is the fraction representing one equal part?
   - What fraction of the square is shaded?
   - What fraction of the square is unshaded?

3. Repeat No. 2 with other pictures (e.g. circles and triangles) showing parts and whole and revise with the pupils.
Activity 2 (20 min): Recall finding equivalent fractions of a given fraction

1. Place on the table 3 rectangular strips of the same size, one showing one whole, the second showing one whole divided into 3 equal parts, and the third one showing one whole divided into 6 equal parts.

<table>
<thead>
<tr>
<th>One whole</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\frac{1}{3}$</td>
</tr>
<tr>
<td>$\frac{1}{6}$</td>
</tr>
</tbody>
</table>

2. Lead the pupils to see that both $\frac{1}{3}$ and the $\frac{2}{6}$ are represented by the same length in the rectangular strips. Therefore $\frac{1}{3}$ is equal to $\frac{2}{6}$. Write:

$$\frac{1}{3} = \frac{1}{6} + \frac{1}{6}$$

$$= \frac{2}{6}$$

3. Recall with the pupils how to find equivalent fractions by multiplying the numerator and denominator by the same number as follows:

$$\frac{2}{3} \times 5 = \frac{10}{15}$$

Therefore, $\frac{2}{3}$ is equivalent to $\frac{10}{15}$.

4. Remind the pupils that both numerator and denominator must be multiplied by the same number. Point out that although the numerator and denominator have both increased in value, the value of the fraction remains the same. Tell the class that the fraction has been ‘expanded’.

5. Recall with the pupils how to find equivalent fractions by dividing the numerator and denominator by the same number as follows:

$$\frac{20}{30} \div 2 = \frac{10}{15}$$

Therefore, $\frac{20}{30}$ is equivalent to $\frac{10}{15}$.

6. Remind the pupils that both numerator and denominator must be multiplied by the same number. Point out that although the numerator and denominator have both decreased in value, the value of the fraction remains the same. Tell the class that the fraction has been ‘reduced to a simpler form’.

Activity 3 (20 min): Recall adding and subtracting like fractions

Things you need: Rectangular strips of paper
1. Recall with the class that like fractions are fractions with the same denominators.

2. Recall the adding of like fractions as follows:
   - Display on the table 3 strips of paper showing 3 like fractions, \( \frac{2}{11} \) and \( \frac{5}{11} \) and \( \frac{1}{11} \) and show how to add them by joining the strips end-to-end as follows:
     
     \[
     \begin{array}{cccc}
     \frac{2}{11} & \frac{1}{11} & \frac{5}{11} & \frac{1}{11} \\
     \hline
     \frac{1}{11} & \frac{1}{11} & \frac{1}{11} & \frac{11}{11} \\
     \hline
     \frac{8}{11}
     \end{array}
     \]
   
   - Count the number of \( \frac{1}{11} \) (one eleventh) and write the addition sentence:
     \[
     \frac{2}{11} + \frac{2}{11} + \frac{1}{11} = \frac{8}{11} \quad \text{(Add 2, 5 and 1 to get 11)}
     \]
     
     2 elevenths + 5 elevenths + 1 eleventh = 8 elevenths
   
   - Emphasize to the pupils that in adding like fractions, the denominators are not to be added and only the numerators are added. For example:
     \[
     \frac{3}{8} + \frac{2}{8} \neq \frac{5}{16}
     \]

3. Recall the subtraction of like fractions as follows:
   - Display on the table 2 strips of paper showing 2 like fractions, \( \frac{8}{11} \) and \( \frac{4}{11} \) and show the subtraction by aligning the strips as follows:
     
     \[
     \begin{array}{cccc}
     \frac{8}{11} & \frac{1}{11} & \frac{1}{11} & \frac{11}{11} \\
     \hline
     \frac{1}{11} & \frac{1}{11} & \frac{1}{11} & \frac{11}{11} \\
     \hline
     \frac{4}{11}
     \end{array}
     \]
   
   - Count the number of \( \frac{1}{11} \) (one eleventh) and write the subtraction sentence:
     \[
     \frac{8}{11} - \frac{4}{11} = \frac{4}{11} \quad \text{(Subtract 4 from 8 to give 4)}
     \]
     
     8 elevenths – 4 elevenths = 4 elevenths
   
   - Emphasize to the pupils that in subtracting like fractions, the denominators are not to be subtracted and only the numerators are subtracted. For example:
     \[
     \frac{8}{11} - \frac{4}{11} \neq \frac{4}{0}
     \]
   
   - Remind the pupils that only a bigger fraction can subtract a smaller fraction and not the other way round.
4. Write some examples of adding and subtracting like fractions on the board and get some pupils to work on them.

**Activity 4 (20 min): Recall adding and subtracting related fractions**

1. Recall with the class that related fractions are fractions that relate to the same whole object. Give some word problem examples to illustrate the meaning of related fractions:
   - Mary ate \( \frac{2}{3} \) of the cake and John ate \( \frac{1}{6} \) of the cake.  
     \( (\frac{2}{3} \text{ and } \frac{1}{6} \text{ are related fractions}) \)
   
   - Tom gave \( \frac{2}{5} \) of his stamps to his brother, \( \frac{1}{10} \) to his sister and \( \frac{2}{7} \) to his friend.  
     \( (\frac{2}{5}, \frac{1}{10} \text{ and } \frac{2}{7} \text{ are related fractions}) \)

2. Recall how to add related fractions as follows:
   - Explain to the class that to add related fractions, the denominators of fractions must be the same. If the denominators are different, then they must be made the same by converting one or both fractions into their equivalent fractions such that the denominators are the same. You may also tell the class that to add related fractions, the method is to convert the fractions into like fractions.
   
   - Show the adding of related fractions as follows:
     
     Write on the board: \( \frac{1}{6} + \frac{1}{12} \)
     
     Convert \( \frac{1}{6} \) to a fraction that has a denominator of 12:
     
     \( \Rightarrow \) Denominator \( \times 2 \Rightarrow 6 \times 2 = 12 \)
     
     \( \Rightarrow \) Numerator \( \times 2 \Rightarrow 1 \times 2 = 2 \)
     
     Therefore the fraction has been converted to a like fraction: \( \frac{2}{12} \)
     
     Add the like fractions \( \frac{2}{12} + \frac{1}{12} = \frac{3}{12} \)

3. Recall how to subtract related fractions as follows:
   - Explain to the class that subtracting related fractions is similar to adding related fractions and that is, the fractions must be converted into like fractions or with same denominators.
   
   - Show the subtraction of related fractions as follows:
     
     Write on the board: \( \frac{1}{6} - \frac{1}{12} \)
     
     Convert \( \frac{1}{6} \) to a fraction that has a denominator of 12:
     
     \( \Rightarrow \) Denominator \( \times 2 \Rightarrow 6 \times 2 = 12 \)
     
     \( \Rightarrow \) Numerator \( \times 2 \Rightarrow 1 \times 2 = 2 \)
     
     Therefore the fraction has been converted to a like fraction: \( \frac{2}{12} \)
     
     Subtract the like fractions \( \frac{2}{12} - \frac{1}{12} = \frac{1}{12} \)
   
   - Remind the pupils to always subtract from the bigger fraction.
4. Provide some examples on adding and subtracting related fractions to further strengthen pupils' understanding.

5. Provide some word problems on adding and subtracting related fractions and get the pupils to work on them on the board.

**Activity 5 (40 min): Express a whole number and a fraction as a mixed number**

*Things you need: Pictures representing wholes and fractions*

1. Display the picture of 1 whole and 1 half apples as shown on page 49 of the Student’s Book. Show the class that 1 and \( \frac{1}{2} \) apples can be combined and written as \( 1 \frac{1}{2} \) apples. Explain that \( 1 \frac{1}{2} \) is called a mixed number.

2. Display other pictures showing the following sets of whole number and proper fractions and write the mixed numbers as follows:
   - 2 wholes and 3 eighths (2 and \( \frac{3}{8} \)) \( \Rightarrow \) Write \( 2 \frac{3}{8} \)
   - 4 wholes and 1 fifth (4 and \( \frac{1}{5} \)) \( \Rightarrow \) Write \( 4 \frac{1}{5} \)
   - 9 wholes and 5 ninths (9 and \( \frac{5}{9} \)) \( \Rightarrow \) Write \( 9 \frac{5}{9} \)

3. Explain to the pupils that besides pictures, mixed numbers can also be represented using a number line. Draw an example of a number line to show the mixed number, \( 1 \frac{3}{5} \) as follows:

```
0   1   2
```

```
|   |   |   |   |   |   | 1 | 1/5 | 2 | 3/5 | 4 | 5 |
```


3. Go through with the pupils the examples on page 50–51 of the Student’s Book.

**Activity 6 (40 min): Recognize proper and improper fractions**

1. Write on the board, 2 sets of fractions and ask the class, ‘What is one thing that is common in each set of fractions?’
   - Set 1: \( \frac{3}{6}, \frac{1}{2}, \frac{5}{12}, \frac{11}{12}, \frac{3}{5}, \frac{9}{12}, \frac{7}{10}, \frac{3}{9} \)
   - Set 2: \( \frac{2}{2}, \frac{8}{3}, \frac{5}{2}, \frac{9}{8}, \frac{15}{12}, \frac{7}{7}, \frac{14}{5}, \frac{11}{10} \)

2. Lead the class to see that the numerators in Set 1 is smaller than the denominators whereas the numerators in Set 2 are greater than or equal to the denominators.

3. Explain to the class that Set 1 consists of proper fractions where the numerator is smaller than the denominator while Set 2 consists of improper fractions where the numerator is greater than or equal to the denominator. Point out that proper fractions are less than 1 whole and improper fractions are either more than or equal to 1 whole.

4. Ask some pupils to write examples of proper and improper fractions on the board.

5. Go through with the pupils the examples on page 52 of the Student’s Book.
Activity 7 (40 min): Convert mixed numbers and improper fractions

1. Explain how to convert a mixed number into an improper fraction as follows:

To express a mixed number, \(2 \frac{4}{5}\) as an improper fraction:

Step 1
Break up the mixed number into the whole and fraction
\(2 \frac{4}{5} = 2 + \frac{4}{5}\)

Step 2
Convert the wholes to a fraction with denominator same as the other fraction.
\(2 \frac{4}{5} = 2 + \frac{4}{5} = \frac{10}{5} + \frac{4}{5}\)
Explain that since 1 whole is equal to 5 fifths, 2 wholes equals to 10 fifths.

Step 3
Add the two like fractions
\(2 \frac{4}{5} = 2 + \frac{4}{5} = \frac{10}{5} + \frac{4}{5} = \frac{14}{5}\)

2. Explain how to convert an improper number into a mixed number as follows:

To express an improper fraction, \(\frac{13}{5}\) as a mixed number:

Step 1
Break up the improper fraction into a proper fraction and an improper fraction
\(\frac{13}{5} = \frac{10}{5} + \frac{3}{5}\)
Explain that 13 fifths is split into 10 fifths and 3 fifths because 10 fifths is equal to 2 wholes.

Step 2
Convert the \(\frac{10}{5}\) into whole number
\(\frac{13}{5} = \frac{10}{5} + \frac{3}{5}\)
\(\frac{13}{5} = 2 + \frac{3}{5}\)

Step 3
Add the two whole and the proper fraction
\(\frac{13}{5} = \frac{10}{5} + \frac{3}{5}\)
\(\frac{13}{5} = 2 + \frac{3}{5}\)
\(= 2 \frac{3}{5}\)
3. Provide more examples on the board and ask pupils to come forward to work out the conversion using the 3 steps.

Activity 8 (15 min): Class practice
1. Go through with the pupils the examples on pages 53–54 of the Student’s Book.

Let’s Try...

Activity 9 (15 min): Individual practice
1. Ask pupils to do the exercises on page 55 of the Student’s Book. Go through with the pupils the answers.

Homework
Ask pupils to do Workbook 4A—Worksheet 13.

Let’s Explore

Activity 10 (10 min): Interesting activity to enhance learning
1. Ask the pupils to try out the interesting activity on page 56 of the Student’s Book. Ask the pupils to work out the exercise twice using two ways: The first way is to convert all to improper fractions and the second way is to convert all to mixed numbers. They should arrive at the same answers for both ways.

Answers

2. (a) \( \frac{3}{4} \) (b) \( \frac{2}{3} \) (c) \( \frac{5}{4} \)
3. (a) \( \frac{3}{2} \) (b) \( \frac{1}{3} \) (c) \( \frac{1}{2} \)
4. (a) \( \frac{9}{7} \) (b) \( \frac{12}{5} \) (c) \( \frac{15}{4} \)
5. (a) \( \frac{1}{2} \) (b) \( \frac{1}{2} \) (c) \( \frac{1}{4} \)

Workbook 13

1. (a) \( \frac{2}{7} \) (b) \( \frac{2}{5} \) (c) \( \frac{2}{5} \) (d) \( \frac{5}{6} \) (e) \( \frac{3}{7} \) (f) \( \frac{2}{9} \)
2. (a) \( \frac{1}{4} \) (b) \( \frac{4}{6} \) (c) \( \frac{3}{5} \) (d) \( \frac{4}{10} \) (e) \( \frac{1}{8} \)
3. (a) \( \frac{7}{6} \) (b) \( \frac{11}{8} \) (c) \( \frac{27}{10} \)
4. (a) \( \frac{6}{4} \) (b) \( \frac{14}{4} \) (c) \( \frac{28}{8} \) (d) \( \frac{47}{8} \) (e) \( \frac{16}{6} \)
5. (a) \( \frac{3}{5} \) (b) \( \frac{4}{8} \) (c) \( \frac{2}{4} \) (d) \( \frac{5}{3} \) (e) \( \frac{1}{2} \)
6. (a) \( \frac{9}{2} \) (b) \( \frac{43}{7} \) (c) \( \frac{50}{6} \) (d) \( \frac{37}{4} \) (e) \( \frac{66}{9} \)
ADDINg Fractions

Suggested Duration
3 periods (120 min)

Learning Outcomes
Pupils should be able to:
- to add like fractions and express answers in its simplest form
- to add related fractions and express answers in its simplest form

Instructions

Let's Learn...

Activity 1 (40 min): Add like fractions and express answer in its simplest form

Things you need: Strips of paper showing the fractions involved in the addition

1. Tell the class that like fractions are fractions that have the same denominators. Ask some pupils to write on the board examples of fractions.

2. Display on the table 2 strips of paper showing two like fractions, \( \frac{2}{8} \) and \( \frac{4}{8} \) and show how to add them by joining the strips end-to-end as follows:

   \[
   \begin{array}{cccccccc}
   & & & & & & & \\
   & \frac{2}{8} & & \frac{4}{8} & & & & \\
   & & \frac{1}{8} & & \frac{1}{8} & & \frac{1}{8} & \\
   & & & \frac{1}{8} & & \frac{1}{8} & & \\
   & & & & \frac{1}{8} & & \\
   & & & & & \frac{6}{8} & & \\
   \end{array}
   \]

3. Count the number of \( \frac{1}{8} \) (one eighth) and write the addition sentence:

   \[
   \frac{2}{8} + \frac{4}{8} = \frac{6}{8}
   \]

   2 eighths + 4 eighths = 6 eighths

4. Show that the answer can be expressed in simpler form as follows:

   \[
   \frac{6}{8} \div 2 = \frac{3}{4}
   \]

   (Explain that \( \frac{3}{4} \) is the simplest form as the numerator and the denominator cannot be divided anymore by a same number.)

5. Emphasize to the pupils that in adding like fractions, the denominators are not to be added and only the numerators are added. For example:

   \[
   \frac{3}{8} + \frac{2}{8} \neq \frac{5}{16} \text{ is not correct}; \quad \frac{3}{8} + \frac{2}{8} = \frac{5}{8} \text{ this is correct}
   \]
6. Provide more examples using different rectangular strips and ask the pupils to practise writing addition sentences for like fractions.

**Activity 2 (40 min): Add related fractions and express the answers in its simplest form**

1. Explain to the class that related fractions are fractions that relate to the same whole object. Give some word problem examples to illustrate the meaning of related fractions:
   - Ali ate $\frac{1}{2}$ of the cake and John ate $\frac{1}{4}$ of the cake. ($\frac{1}{2}$ and $\frac{1}{4}$ are related fractions)
   - Tom gave $\frac{1}{3}$ of his stamps to his brother, $\frac{1}{5}$ to his sister and $\frac{1}{6}$ to his friend. ($\frac{1}{3}$, $\frac{1}{5}$ and $\frac{1}{6}$ are related fractions)

2. Explain further that to add related fractions, the denominators of fractions must be the same. If the denominators are different, then they must be made the same by converting one or both fractions into their equivalent fractions such that the denominators are the same. You may tell the class that to add related fractions, the method is to convert the fractions into like fractions.

3. Show the adding of related fractions as follows:
   Write on the board: $\frac{1}{6} + \frac{5}{12}$
   Convert $\frac{1}{6}$ to a fraction that has a denominator of 12:
   - Denominator × 2 → 6 × 2 = 12)
   - Numerator × 2 → 1 × 2 = 2)
   Therefore the fraction has been converted to a like fraction: $\frac{2}{12}$
   Add the like fractions $\frac{2}{12} + \frac{1}{12} = \frac{3}{12}$

4. Go through with the pupils the examples on pages 57–59 of the Student’s Book. Display each example on the table and explain the steps taken in solving the problem sum. Lead the pupils to see how to convert the answer from improper fractions to mixed numbers and vice versa. Emphasize and show the workings to explain the following points for each example:
   - To add fractions: convert to like fractions (fractions with the same denominator).
   - To convert to like fractions: multiply both the numerator and denominator with the same number
   - To change improper fraction to mixed number: separate the improper fraction into one proper and one improper fraction
   - To convert mixed number to improper fraction: separate the wholes and the proper fraction, convert the wholes into improper fraction and then add the proper fraction and the improper fraction

5. For each example, emphasize the need to express the answer in its simplest form. Revise with the pupils the meaning of ‘simplest form’ by showing the following example:
(Explain that is the simplest form as the numerator and the denominator cannot be divided anymore by a same number)

6. Provide more examples on the board for pupils to practise reducing fractions to its simplest form.

7. Provide more examples of word problems and addition sentences on the board for the pupils to practise.

**Let’s Try...**

**Activity 2 (40 min): Individual practice**

1. Ask pupils to do the exercises on page 60 of the Student's Book.

**Homework**

Ask pupils to do Workbook 4A—Worksheet 14.

**Answers**

1. (a) 1  (b) 1\(\frac{1}{7}\)  (c) 1\(\frac{4}{9}\)  (d) 1\(\frac{1}{8}\)  (e) 1\(\frac{5}{6}\)  (f) 1\(\frac{7}{10}\)

2. 1\(\frac{3}{10}\) m

**WORKSHEET 14**

1. (a) \(\frac{3}{4}\)  (b) 1\(\frac{1}{2}\)  (c) 1\(\frac{1}{5}\)  (d) 1\(\frac{1}{6}\)  (e) 1\(\frac{1}{2}\)

2. (a) \(\frac{8}{10}\), 1\(\frac{1}{10}\)  (b) 1\(\frac{1}{6}\)  (c) 1\(\frac{1}{6}\)  (d) 1\(\frac{2}{9}\)  (e) 1\(\frac{1}{8}\)

3. Check that the children match the correct sums.

4. (a) 1\(\frac{1}{6}\)  (b) 1\(\frac{1}{12}\)  (c) 1\(\frac{3}{10}\)  (d) 1\(\frac{2}{3}\)

5. 1\(\frac{1}{10}\)

6. 1\(\frac{1}{12}\)

**SUBTRACTING FRACTIONS**

**Suggested Duration**

3 periods (120 min)
Learning Outcomes

Pupils should be able to:

- to subtract like fractions.
- To subtract related fractions

Instructions

Let’s Learn…

Activity 1 (40 min): Subtract like fractions

Things you need: Strips of paper showing the fractions involved in the subtraction

1. Display on the visualiser 2 strips of paper showing 2 like fractions, \( \frac{8}{11} \) and \( \frac{4}{11} \) and show the subtraction by aligning the strips as follows:

\[
\frac{8}{11} - \frac{4}{11} = \frac{4}{11}
\]

2. Count the number of \( \frac{1}{11} \) (one eleventh) and write the subtraction sentence:

\[
\frac{8}{11} - \frac{4}{11} = \frac{4}{11}
\]

8 elevenths – 4 elevenths = 4 elevenths

3. Emphasize to the pupils that in subtracting like fractions, the denominators are not to be subtracted and only the numerators are subtracted. For example:

\[
\frac{8}{11} - \frac{4}{11} \neq \frac{4}{0}
\]

4. Remind the pupils that only a bigger fraction can subtract a smaller fraction and not the other way round.

5. Provide more examples using different rectangular strips and ask the pupils to practise writing subtraction sentences for fractions.

Activity 3 (40 min): Subtract related fractions

1. Go through with the pupils the examples on pages 61–62 of the Student’s Book. Display each example on the table and explain the steps taken in solving the problem sum. Lead the pupils to see how to convert the answer from improper fractions to mixed numbers and vice versa. Emphasize and show the workings to explain the following points for each example:

- To subtract related fractions: convert to like fractions (fractions with the same denominator).
- To convert to like fractions: multiply both the numerator and denominator with the same number
• To change improper fraction to mixed number: separate the improper fraction into one proper and one improper fraction

• To convert mixed number to improper fraction: separate the wholes and the proper fraction, convert the wholes into improper fraction and then add the proper fraction and the improper fraction

2. Remind the pupils to always express the answer in its simplest form.

3. Provide more examples, both problem sums and addition sentences for pupils to practise reducing fractions to its simplest form.

4. Provide more examples of word problems and subtraction sentences for the pupils to practise.

Let’s Try…

Activity 4 (40 min): Individual practice

1. Ask pupils to do the exercises on page 63 of the Student’s Book.

Homework

Ask pupils to do Workbook 4A—Worksheet 15

Answers

page 63

1. (a) \( \frac{1}{6} \) (b) \( \frac{4}{9} \) (c) \( \frac{1}{5} \) (d) \( \frac{1}{12} \) (e) \( \frac{2}{9} \)
2. \( \frac{2}{9} \)

WORK Sheet 15

1. (a) \( \frac{1}{2} \) (b) \( \frac{1}{2} \) (c) \( \frac{2}{5} \)
2. (a) \( \frac{6}{10}, \frac{5}{10}, \frac{1}{2} \) (b) \( \frac{1}{2} \) (c) \( \frac{3}{8} \) (d) \( \frac{1}{6} \) (e) \( \frac{5}{8} \)
3. (a) \( \frac{1}{6} \) (b) \( \frac{2}{5} \) (c) \( \frac{2}{9} \) (d) \( \frac{1}{4} \) (e) \( \frac{1}{3} \)
4. (a) \( \frac{17}{30} \) (b) \( \frac{11}{18} \) (c) \( \frac{28}{55} \) (d) \( \frac{4}{9} \)
5. \( \frac{3}{8} \) m
6. \( 1 \frac{1}{2} \)
ADDITION AND SUBTRACTION INVOLVING MIXED NUMBERS

Suggested Duration
3 periods (120 minutes)

Learning Outcomes
Pupils should be able to:
• to add mixed numbers
• to subtract mixed numbers

Instructions
Let’s Learn…
Activity 1 (40 min): Adding / subtracting mixed numbers
1. Recall the idea of mixed number, e.g. 1 1/2 with pictures of circle and half circle.
2. Show the process of combination:
   \[ 1\frac{1}{2} + 1\frac{1}{2} = 3\frac{1}{2} \]
There are two methods given on pages 64-65 of the Student’s Book for addition of mixed numbers. Either method can be used. The steps involved are:
• First add the whole numbers
• Add the fractions (it can be like or unlike fractions)
• Finally express the fraction in its simplest form.
The same procedure is used for subtracting mixed numbers.
3. Go through with the pupils, the examples on pages 64-67 of the Student’s Book. Solve each sum on the board and explain the steps followed to solve these.
4. Remind the pupils to always express the answer in its simplest form.
5. Provide more such examples other those than given in the Student's Book.
Let’s Try…
Activity 2 (40 min): Individual practice
1. Ask pupils to do exercises on page 67 of the Student’s Book.

Homework
Ask pupils to do Workbook 4A—Worksheet 16 and Practice 3.

Answers
1. (a) 4\frac{1}{2}  (b) 1\frac{1}{2}  (c) 4\frac{1}{4}  (d) 1\frac{1}{2}
2. (a) $\frac{7}{9}$  (b) $\frac{4}{9}$  (c) $\frac{1}{8}$  (d) $\frac{1}{2}$

**WORKSHEET** 16

1. (a) $\frac{1}{2}$  (b) $\frac{3}{5}$  (c) $\frac{7}{10}$  (d) $\frac{5}{8}$  
   (e) $\frac{1}{6}$  (f) $\frac{1}{12}$  (g) $\frac{3}{8}$  (h) $\frac{1}{8}$

2. (a) $\frac{2}{7}$  (b) $\frac{2}{3}$  (c) $\frac{1}{4}$  (d) $\frac{1}{9}$  (e) $\frac{1}{12}$  (f) $\frac{7}{12}$

**Practice 3**

1. (a) $\frac{3}{4}$, $\frac{7}{4}$  (b) $\frac{3}{2}$, $\frac{5}{2}$  (c) $\frac{3}{3}$, $\frac{11}{3}$  (d) $\frac{7}{8}$, $\frac{31}{8}$

2. (a) $\frac{1}{8}$  (b) $\frac{1}{2}$  (c) $\frac{1}{3}$  (d) $\frac{5}{12}$  (e) $\frac{2}{9}$  (f) $\frac{3}{8}$

3. (a) $\frac{1}{10}$  (b) 2  (c) $\frac{1}{2}$  (d) $\frac{7}{10}$

4. (a) $\frac{2}{1}$  (b) $\frac{7}{12}$  (c) $\frac{1}{8}$  (d) $\frac{1}{9}$ 1/9

**Revision (40 min)**

**Fun With Maths**

1. Pair up the pupils and let them play the game on page 68 of the Student's Book.
2. Revise and go through pupils’ homework.

**Revision 1**

1. (a) Twenty-three thousand and twelve  
   (b) Fifty-four thousand, six hundred and eight  
   (c) Eighty-nine thousand and five  (d) Ninety thousand and one

2. (a) $\frac{1}{10}$  (b) $\frac{1}{4}$  (c) $\frac{2}{3}$  (d) $\frac{8}{9}$  (e) $\frac{3}{7}$  (f) $\frac{7}{5}$

3. (a) 41 529  (b) 65 480  (c) 65 326  (d) 98 474  (e) 86 736  
   (f) 7, 80, 400, 9000, 30 000  
   (g) 54 656  (d) 57 060  
   (h) 359  (f) 436  (g) 2835 R2  (h) 1268 R4
11. | Number | Is the last digit divisible by 2? | Is the sum of the digits a multiple of 3? | Divisible by 6? |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>56 821</td>
<td>(1) no</td>
<td>(5 + 6 + 8 + 2 + 1 = 22) no</td>
<td>no</td>
</tr>
<tr>
<td>56 232</td>
<td>yes</td>
<td>(5 + 6 + 2 + 3 + 2 = 18) yes</td>
<td>yes</td>
</tr>
<tr>
<td>11 151</td>
<td>no</td>
<td>(1 + 1 + 1 + 5 + 1 = 9) yes</td>
<td>no</td>
</tr>
<tr>
<td>60 054</td>
<td>yes</td>
<td>(6 + 0 + 0 + 5 + 4 = 17) no</td>
<td>no</td>
</tr>
<tr>
<td>23 112</td>
<td>yes</td>
<td>(2 + 3 + 1 + 1 + 2 = 9) yes</td>
<td>no</td>
</tr>
<tr>
<td>10 026</td>
<td>yes</td>
<td>(1 + 0 + 0 + 2 + 6 = 9) yes</td>
<td>no</td>
</tr>
<tr>
<td>38 520</td>
<td>yes</td>
<td>(3 + 8 + 5 + 2 + 0 = 18) yes</td>
<td>yes</td>
</tr>
<tr>
<td>99 156</td>
<td>yes</td>
<td>(9 + 9 + 1 + 5 + 6 = 30) no</td>
<td>yes</td>
</tr>
<tr>
<td>20 038</td>
<td>yes</td>
<td>(2 + 0 + 0 + 3 + 8 = 13) no</td>
<td>no</td>
</tr>
<tr>
<td>32 316</td>
<td>yes</td>
<td>(3 + 2 + 3 + 1 + 6 = 15) yes</td>
<td>no</td>
</tr>
</tbody>
</table>

12. (a) \( \frac{9}{5} \)  (b) \( \frac{7}{2} \)  (c) \( \frac{11}{4} \)  (d) \( \frac{65}{12} \)  (e) \( \frac{29}{6} \)  (f) \( \frac{20}{7} \)

13. (a) \( \frac{2 \ 1}{3} \)  (b) \( \frac{25}{10} \)  (c) \( \frac{2 \ 1}{7} \)  (d) \( \frac{3 \ 1}{8} \)  (e) \( \frac{6 \ 3}{9} \)  (f) \( \frac{6 \ 1}{7} \)

14. (a) \( 1 \frac{1}{2} \)  (b) \( 13 \frac{2}{8} \)

Revision 2

1. (a) 17 980  (b) 86 190  (c) 10 100  (d) 97 610
2. (a) 4900  (b) 36 000  (c) 68 200  (d) 73 500
3. (a) 500  (b) 5000  (c) 50 000  (d) 5
4. (a) Yes  (b) No
5. (a) (i) 35 420, 35 265, 25 938  (ii) 19 239, 19 234, 19 132, 18 234
    (b) (i) 29 295, 29 375, 47 310  (ii) 10 046, 10 164, 10 246, 10 346
6. (a) 273 R2  (b) 338 R3  (c) 401 R2  (d) 706 R5
7. (a) 2000, 2000, 16 000  (b) 400, 20, 400 × 20 = 8000
    (c) 400, 400, 50  (d) 8100, 8100, 900
8. (a) \( \frac{1}{24} \)  (b) \( \frac{13}{20} \)  (c) \( \frac{10}{39} \)  (d) \( \frac{18}{35} \)
9. (a) \( \frac{1 \ 1}{5} \)  (b) \( \frac{3}{4} \)  (c) \( \frac{2 \ 1}{9} \)  (d) \( \frac{1}{3} \)
10. \( \frac{9}{10} \) km
11. \( \frac{1}{4} \)
12. (a) 299  (b) 155  (c) 20  (d) Yes  (e) 2
13. Check that the children match the correct fractions.
14. Rs 9000 \( \times 3 = Rs 27000 \)
15. Rs 8300 – Rs 7000 = Rs1300
16. 475
17. 263
18. 9250
19. Rs 1704
20. 436
21. 204
22. 384
23. 25 200
24. 192
25. Rs 220
Unit 4: Fractions (II)

FRACTION OF A SET

Suggested Duration
5 periods (200 min)

Learning Outcomes
Pupils should be able to:
- interpret fraction as part of a set of objects.
- express the fraction in its simplest form.

Instructions

Let’s Learn...

Activity 1 (40 min): Use fractions to represent a number of objects out of a total number of objects in a set

Things you need: Coloured cubes

1. Display 20 cubes (7 blue and 13 red) on the table. Tell the class that the 20 cubes represent one complete set. Arrange the cubes such that the blue and red cubes are grouped separately. Tell the class that you are going to represent the blue and red cubes using fractions. Explain as follows:

What fraction of the cubes is blue?
Total number of cubes in the set is $20 \Rightarrow$ So, the denominator is 20
Number of blue cubes is 7 $\Rightarrow$ So, the numerator is 7
Therefore, the fraction of the cubes that are blue is $\frac{7}{20}$

What fraction of the cubes is red?
Total number of cubes in the set is $20 \Rightarrow$ So, the denominator is 20
Number of red cubes is 13 $\Rightarrow$ So, the numerator is 13
Therefore, the fraction of the cubes that are red is $\frac{13}{20}$

2. Add 4 yellow cubes to the 20 cubes. Tell the class that there are now 24 cubes in the set. Explain how to find the fractions representing the blue, red, and yellow cubes as follows:

What fraction of the cubes is blue?
Total number of cubes in the set is $24 \Rightarrow$ So, the denominator is 24
Number of blue cubes is 7 $\Rightarrow$ So, the numerator is 7
Therefore, the fraction of the cubes that are blue is $\frac{7}{24}$

What fraction of the cubes is red?
Total number of cubes in the set is 24 \(\Rightarrow\) So, the denominator is 24
Number of red cubes is 13 \(\Rightarrow\) So, the numerator is 13
Therefore, the fraction of the cubes that are red is \(\frac{13}{24}\)

**What fraction of the cubes is yellow?**
Total number of cubes in the set is 24 \(\Rightarrow\) So, the denominator is 24
Number of yellow cubes is 4 \(\Rightarrow\) So, the numerator is 4
Therefore, the fraction of the cubes that are yellow is \(\frac{4}{24}\)
Express the answer in its simplest form \(\Rightarrow\) \(\frac{4}{24} = \frac{1}{6}\) (divide by 4)

**Activity 2 (40 min): Class practice**
1. Go through with the class the examples on pages 70–71 of the Student’s Book. Ask some pupils to share their answers.

**Activity 3 (40 min): Group activity**
1. Divide the class into 3 groups. Give each pupil a piece of paper to record certain information about the profile of their group. Ask the pupils to go round and ask one another in the group to find out the following:
   - What fraction of the group members travel to school by public transport?
   - What fraction of the group members travel to school by private car?
   - What fraction of the group members were born in the first half of the year?
   - What fraction of the group members are the youngest in the family?
   - What fraction of the group members are the eldest in the family?
2. Have a representative from each group to present their findings. Make sure that the pupils express the fractions in the simplest form.

**Let’s Think**

**Activity 4 (40 min): Find the number of objects in a set given its representation in fraction**
1. Refer the pupils to page 72 of the Student’s Book and ask them to think through how to solve the problems. After about 10 mins, ask if there is anyone who knows how to solve the problems.
2. Next, point out to the pupils that so far, they have been taught how to find the fractional representation given a certain number of objects in a set. Tell the pupils that the problems on page 72 of the Student’s Book are examples of finding the number of objects given its fractional representation, in the other words, the opposite of what they have learnt so far.
3. Explain the examples as follows:
   - Example 1(a): \(\frac{3}{5}\) of the stars are to be circled.
   - Tell the class that \(\frac{3}{5}\) refers to 3 out of 5 groups
   - Count the total number of stars
     \(\Rightarrow\) 10 stars altogether
• Divide the total number of stars into 5 equal groups and find the number of stars in each group
  \[10 \div 5 = 2\]
• Multiply the number of stars in each group by the number of groups
  \[2 \times 3 = 6\]
• Therefore, 6 stars are to be circled.

**Example 1(b): \(\frac{1}{3}\) of the fish are to be given away**
• Tell the class that \(\frac{1}{3}\) refers to 1 out of 3 groups
• Count the total number of fish
  \[9\] fish altogether
• Divide the total number of fish into 3 equal groups and find the number of fish in each group
  \[9 \div 3 = 3\]
• Multiply the number of fish in each group by the number of groups
  \[3 \times 3 = 9\]
• Therefore, 9 fish are to be given away.

**Example 2:** \(\frac{1}{2}\) of the doughnuts have been bitten, is this correct
• Count the total number of doughnuts
  \[14\] doughnuts altogether
• Find the number representing \(\frac{1}{2}\) of the doughnuts
  \[14 \div 2 = 7\]
• Count the number of doughnuts bitten
  \[8\] doughnuts bitten
• Therefore it is not correct

**Let’s Try…**

**Activity 5 (40 min): Individual practice**
1. Ask pupils to do the exercises on page 73 of the Student's Book. Go through with the pupils the answers.

**Homework**
Ask pupils to do Workbook 4A—Worksheet 17.

**Answers**

page 73

1. (a) \(\frac{8}{10}\)  (b) \(\frac{9}{12}\)
2. \(\frac{1}{8}\)  3. \(\frac{2}{7}\)  4. (b)
1. (a) \( \frac{4}{5} \)  
(b) 8, 6, \( \frac{6}{8} \), \( \frac{3}{4} \)  
(c) 12, 6, \( \frac{6}{12} \), \( \frac{1}{2} \) 
(d) 9, 4, \( \frac{4}{9} \)  
(e) 15, 9, \( \frac{9}{15} \), \( \frac{3}{5} \) 

2. (a) children will colour 9 pears  
(b) children will colour 4 trees  
(c) children will colour 6 gifts  
(d) children will colour 5 turtles

### MULTIPLICATION OF A PROPER FRACTION AND A WHOLE NUMBER

**Suggested Duration**

3 periods (120 min)

**Learning Outcomes**

Pupils should be able to:

- multiply a proper fraction and a whole number.

**Instructions**

*Let’s Learn…*

**Activity 1 (40 min): Multiply a proper fraction and a whole number**

1. Recall with the pupils the two types of word problems involving fractions:
   
   Type 1: Given the number of objects, find its corresponding fraction
   
   Example: There are 5 red ribbons out of a box of 14 ribbons. What fraction of the ribbons is red?

   Type 2: Given a fraction, find its corresponding number of objects
   
   Example: \( \frac{3}{4} \) of 20 apples were eaten. How many apples were eaten?

2. Explain to the pupils that Type 1 word problems can be solved by identifying the numerator and the denominator so as to find the fractional representation. Recall that this has been taught before and revise with the pupils with some examples.

3. Explain to the pupils that Type 2 word problems can be solved by 2 methods:

   (Word problem: \( \frac{3}{4} \) of 20 apples were eaten. How many apples were eaten?)

   Method 1: Unitary method

   ![Diagram of 20 apples with 3/4 shaded]
• Explain that \( \frac{3}{4} \) means 3 units out of 4 units.
• Draw a model with 4 equal units to represent 20 apples
• Shade 3 units to represent \( \frac{3}{4} \)
• 4 units represent 20 apples, so 1 unit represent \( 20 \div 4 = 5 \) apples
• To find what is 3 units, multiply 3 by 5 \( \Rightarrow 3 \times 5 = 15 \)
• Therefore, the answer is: 15 apples were eaten

Method 2: Multiplication of a proper number and a whole number
• Explain that \( \frac{3}{4} \) means 3 groups out of 4 groups
• \( \frac{3}{4} \) of 20 apples means \( \frac{3}{4} \times 20 \). Show the multiplication as follows:
  \[
  \frac{3}{4} \times 20 = \frac{3}{4} \times \frac{20}{1} = \frac{60}{4}
  \]
• Therefore 15 apples were eaten.

4. Ask the pupils which method they prefer. The pupils should know both methods.

**Activity 2 (20 min): Class practice**
1. Go through with the pupils the examples on pages 74–76 of the Student’s Book. Ask the pupils to work out the solutions on the board.

**Let’s Try…**

**Activity 3 (20 min): Individual practice**
1. Ask pupils to do the exercises on page 77 of the Student’s Book.

**Homework**

Ask pupils to do Workbook 4A—Worksheet 18.

**Let’s Explore**

**Activity 4 (40 min): Interesting activity to enhance learning**
1. Ask the pupils to work in pairs on the Let’s Explore activity on page 78 of the Student’s Book.

**Answers**

**Page 77**

(a) 5  (b) \( \frac{13}{3} \)  (c) 4  (d) \( \frac{3}{5} \)
(e) 10  (f) \( \frac{47}{7} \)  (g) 16  (h) \( \frac{55}{8} \)

**Worksheet 18**

1. (a) 6  (b) 10  (c) 3
2. (a) 9  (b) 8  (c) 12  (d) 30  (e) 24  (f) 9
   (g) 36  (h) 12  (i) 10  (j) \( \frac{1}{3} \)  (k) 30  (l) 35
WORD PROBLEMS

Suggested Duration
4 periods (160 min)

Learning Outcomes
Pupils should be able to:

• solve word problems involving multiplication of fractions with whole numbers.

Instructions

Let’s Learn…

Activity 1 (40 min): Solve word problems involving fractions using the multiplication method and the unitary method

1. Revise with the pupils the multiplication method and the unitary method in solving word problems involving fractions:

   (Word Problem: Ali has 70 marbles. He gave \( \frac{2}{7} \) of the marbles to Thomas. How many marbles did he give to Thomas?)

   Multiplication Method

   \[
   \frac{2}{7} \text{ of the marbles means } \frac{2}{7} \times 70
   \]

   \[
   \frac{2}{7} \times 70 = \frac{2 \times 70}{7}
   \]

   \[
   = \frac{140}{7}
   \]

   \[
   = 20
   \]

   Unitary Method

   70 marbles

   \[
   \frac{2}{7}
   \]

   • Explain that \( \frac{2}{7} \) means 2 units out of 7 units.
   • Draw a model with 7 equal units representing 70 marbles
   • Shade 2 units to represent \( \frac{2}{7} \)
   • 7 units represent 70 marbles, so 1 unit represent \( 70 \div 7 = 10 \) marbles
   • To find what is 2 units, multiply 2 by 10 \( \Rightarrow 2 \times 10 = 20 \)
   • Therefore, the answer is: 20 marbles were given to Thomas
2. Provide more examples for pupils to try out on the board.

**Activity 2 (20 min): Class practice**

1. Go through with the pupils the examples on pages 79–82 of the Student’s Book. Display each example on the table and explain both the multiplication and unitary methods in solving them.

**Let’s Try…**

**Activity 3 (20 min): Individual practice**

1. Ask pupils to do the exercises on page 83 of the Student’s Book. Ask pupils to present their answers on the board.

**Homework**

Ask pupils to do Workbook 4A—Worksheet 19 and Practice 4

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**Answers**

**F Pakistan**

page 83

1. 400 coins  2. 106  3. 32 kg  4. 260  5. $\frac{2}{5}$

**Worksheet 19**

1. 32  2. 60  3. 25  4. Rs 104  5. 9  6. 49 kg  7. 30  8. Rs 25

**Practice 4**

1. $\frac{1}{4}$

4. (a) 24  (b) 75  (c) 8  (d) 33  (e) $4\frac{2}{7}$  (f) 6  (g) $13\frac{1}{3}$  (h) $8\frac{3}{4}$

5. $\frac{3}{10}$

6. 5

7. 104

**Fun With Maths**

**Activity 4 (40 min): Interesting game to enhance learning**

*Things you need: Stacks of 2 sets of cards, one set with multiplication sums and the other with the corresponding answers*

1. Pair up the pupils and let them play the game on page 78 of the Student’s Book.

**Revision (40 min)**

Revise and go through pupils’ homework.
Unit 5: Tables and Line Graphs

TABLES

Suggested Duration
6 periods (240 min)

Learning Outcomes
Pupils should be able to:
- complete a table from given data
- read and interpret tables
- solve problems using information presented in tables.

Instructions

Let’s Learn…

Activity 1 (40 min): Present data in a table

1. Show on the table the 4 test scores by Jeya on page 80 of the Student’s Book. Ask the pupils, ‘What is the one common word to describe Maths, English, Science, and Arts. The common word should be ‘Subjects’. Next, ask the pupils, ‘What is the one common word to describe the 4 test scores?’ The common word should be ‘Marks’. Point out that the terms ‘Subjects’ and ‘Marks’ represent a group of similar information or data. They are also known as ‘common variables’.

2. Tell the class that Jeya’s test scores can be presented in the form of a ‘table’. Explain step by step on the board how to draw a table to present Jeya’s test scores as follows:

   Step 1
   Identify the common variables. The common variables are ‘Subjects’ and ‘Marks’.

   Step 2
   Draw a table of 2 columns with the common variables as their headings

<table>
<thead>
<tr>
<th>Subject</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

   columns

   Step 3
   Divide the table into 4 rows to correspond to the 4 sets of subjects and marks.
Fill in the data for subjects and marks accordingly

<table>
<thead>
<tr>
<th>Subject</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maths</td>
<td>90</td>
</tr>
<tr>
<td>English</td>
<td>80</td>
</tr>
<tr>
<td>Science</td>
<td>85</td>
</tr>
<tr>
<td>Arts</td>
<td>86</td>
</tr>
</tbody>
</table>

3. Show a few more pictorial examples of data and go through the steps in presenting the data in a table.

Activity 2 (40 min): Class activity to practise presenting data in a table

Things you need: 7 clear containers, each labelled with the name of a fruit and 40 cubes

1. Tell the class that you are going to lead the class to draw a table to show the different number of pupils that like the different types of fruits.
   - Display in front of the class 7 clear containers each labelled with the name of a fruit, e.g. Apple, Orange, Apricot, Mango, Water melon, Papaya and Grapes.
   - Give the pupils, each a cube and ask him/her to drop the cube into the container that bears his/her most preferred fruit. Explain that the cubes in each container represent the number of pupils preferring that fruit. Ask 6 volunteers to count the number of cubes in the containers and then write the number on the fruit label.
   - Ask the class, ‘What are the common variables?’ The pupils should be able to identify ‘Fruits’ and ‘Number of pupils’ as the 2 common variables.
   - Ask a pupil to draw on the board, the table with two columns, ‘Fruits’ and ‘Number of pupils’.
   - Ask another pupils to draw 7 rows to correspond to the 7 fruits.
   - Ask another pupil to fill in the data for the ‘Fruits’ column and another pupil to fill in the data for ‘Number of pupils’ column.

2. You may repeat the above activity using different common variables.

Activity 3 (40 min): Present more sets of data in a table

1. Refer the pupils to page 79 of the Student’s Book. Ask them, ‘What do they notice about the two sets of numbers?’ Lead the class to see that the two sets of numbers are two types
of temperature. Explain that this is an example where more sets of similar type of data are being presented.

2. Show other examples of tables where two or more sets of similar type of data are being presented.

Example 1: Two sets of marks for each subject

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Mid-year exam marks</th>
<th>Final exam marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maths</td>
<td>90</td>
<td>85</td>
</tr>
<tr>
<td>English</td>
<td>80</td>
<td>84</td>
</tr>
<tr>
<td>Science</td>
<td>85</td>
<td>82</td>
</tr>
<tr>
<td>Arts</td>
<td>86</td>
<td>90</td>
</tr>
</tbody>
</table>

Example 2: Two sets of number of visitors to two places of interest

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Number of visitors to the Zoo</th>
<th>No. of visitors to the Bird Park</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday</td>
<td>434</td>
<td>276</td>
</tr>
<tr>
<td>Tuesday</td>
<td>450</td>
<td>310</td>
</tr>
<tr>
<td>Wednesday</td>
<td>532</td>
<td>405</td>
</tr>
<tr>
<td>Thursday</td>
<td>480</td>
<td>389</td>
</tr>
<tr>
<td>Friday</td>
<td>680</td>
<td>430</td>
</tr>
<tr>
<td>Saturday</td>
<td>1030</td>
<td>845</td>
</tr>
<tr>
<td>Sunday</td>
<td>1200</td>
<td>731</td>
</tr>
</tbody>
</table>

Activity 4 (40 min): Read and interpret tables

1. Tell the pupils that by presenting data in the form of a table, one can easily extract useful information about the data such as which group has the highest or the smallest number. One can also compare two data easily from a table.

2. Show how to extract information using the following table as an example:

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Number of visitors to the Zoo</th>
<th>No. of visitors to the Bird Park</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday</td>
<td>434</td>
<td>276</td>
</tr>
<tr>
<td>Tuesday</td>
<td>450</td>
<td>310</td>
</tr>
<tr>
<td>Wednesday</td>
<td>532</td>
<td>405</td>
</tr>
<tr>
<td>Thursday</td>
<td>480</td>
<td>389</td>
</tr>
<tr>
<td>Friday</td>
<td>680</td>
<td>430</td>
</tr>
<tr>
<td>Saturday</td>
<td>1030</td>
<td>845</td>
</tr>
<tr>
<td>Sunday</td>
<td>1200</td>
<td>731</td>
</tr>
</tbody>
</table>

Some examples of information that you can extract from the table:
• The most number of visitors to the zoo is on Sunday
• The total number of visitors to the Bird Park in a week is $276 + 310 + 405 + 389 + 430 + 845 + 731 = ____$
• There are ____ more visitors to the Zoo than to the Bird Park on ____
• There are a total of ____ visitors to the Zoo and the Bird Park on ____
• In a week, a total of ____ visitors visited the Zoo and the Bird park.

Activity 5 (20 min): Class practice
1. Go through with the pupils the examples on pages 86–88 of the Student’s Book.

Let’s Try...

Activity 6 (20 min): Individual practice
1. Let the pupils try out the exercises on pages 89–90 of the Student’s Book.

Homework
Ask the pupils to do Workbook 4A—Worksheet 20.

Let’s Explore

Activity 7 (40 min): Challenging group activity to enhance learning
1. Ask the pupils to work in groups of 4 or 5 on the activity on page 91 of the Student’s Book.
   Ensure that the pupils follow the steps in the same order as described in the textbook.
   Ask some groups to present their findings to the rest of the class.

Answers

page 89

2. (a) Cat  (b) Rabbit  (c) Cat  (d) 6
3. (a) Joyce, 5 cm  (b) Rabia, 6 kg  (c) 149 kg

WORKSheet 20

2. (a) Jane  (b) Mary  (c) Mary & Karen  (d) Jane & Karen
3. (a) 4C & 4F  (b) 4E  (c) 40  (d) 238  (e) Yes, 8
4. (a) White  (b) Yellow  (c) 24  (d) 38

LINE GRAPHS

Suggested Duration
6 periods (240 min)
Learning Outcomes

Pupils should be able to:

• read and interpret line graphs
• solve problems using information presented in line graphs

Instructions

Let's Learn…

Activity 1 (40 min): Recall bar graphs and introduce line graphs

Things you need: Pictures of bar graphs and the corresponding line graphs

1. Refer pupils to the table and the bar graph on page 92 of the Student’s Book. Display the page on the table and show how the data in the table relate to the bar graph. Point out that the vertical axis corresponds to the ‘Savings’ variable and the horizontal axis corresponds to the ‘Months’ variable.

2. Tell the class that another way of presenting data is the line graph. Point out that line graph is similar to bar graph. The difference between the two is that bar graph uses bars to represent the data while line graphs uses points joined by lines to represent data. Display on the table the line graph of Laila’s savings on page 93 of the Student’s Book side by side with the bar graph. Lead the class to see that the points on the line graph correspond to the height of the bars in the bar graph. Tell the class that the points are marked by either a dot or a cross ‘x’ and are joined by straight lines.

3. Show a few more examples of bar graphs and their corresponding line graphs.

Activity 2 (40 min): Read and interpret line graphs

1. Refer the pupils again to the line graph on page 93 of the Student’s Book. Go through (a) to (d) to show how to read the line graph to provide useful information.

2. Ask the pupils to work in pairs to write down as much information on Laila’s savings as possible from the line graph. Ask some pairs to share their findings.

3. Go through with the pupils another example of the line graph on page 94 of the Student’s Book and use the information presented in the graph to solve the problems (a) to (d).

Activity 3 (40 min): More practice on using information in line graphs to solve problems

1. Pair up the pupils. Give each pupil an example of line graph and get him/her to create 4 to 5 problems/questions on the line graph. The pupils will solve each other’s problems/questions created based on the line graph.

Let’s Think

Activity 4 (40 min): Interesting activity to discover

Let’s Try…

Activity 5 (40 min): Individual practice

1. Ask the pupils to try out the exercises on pages 96–98 of the Student’s Book.
Homework
Ask the pupils to do Workbook 4A—Worksheet 21 and Practice 5.

Answers

1. (a) 2008 (b) 2003, 2005, 2007, 2008 (c) 2004, 2006 (d) 500
2. (a) 20000 (b) 2002–2003 (c) 2003 (d) 70000
3. (a) 5, 6 (b) 6 (c) 1 (d) 40 (e) 380

WORK SHEET 21
1. (a) Jan (b) Jun, Rs 1500 (c) May
2. (a) Oct (b) Aug (c) 5 (d) 2 (e) 29
3. (a) Mon (b) 3200 l (c) 7000 l

PRACTICE 5
1. (a) Thursday (b) Friday (c) Wednesday, Saturday & Sunday
2. (a) Peter (b) Peter (c) May
3. (a) 2007 (b) 2006 (c) 2004
4. (a) 2005, Rs 7000 (b) Rs 17 000 (c) 2004, 2005 (d) Rs109 000
5. (a) 50, 30, 40, 20, 35 (b) Mary (c) Saima (d) 20 (e) 75 (f) 175

Revision (40 min)
1. Revise and go through pupils’ homework.
Unit 6: Perpendicular and Parallel Lines

DRAWING PERPENDICULAR LINES

Suggested Duration
4 periods (240 min)

Learning Outcomes
Pupils should be able to:
- draw perpendicular lines using ruler and set squares.

Instructions

Let’s Learn…

Activity 1 (40 min): Recall perpendicular lines
1. Recall the definition of perpendicular lines as two straight lines meeting at a right angle.
   Show perpendicular lines as follows:

   \[ \overline{AB} \perp \overline{CD} \] and read it as ‘AB is perpendicular to CD’. Remind the pupils to put in the right angle symbol, ‘\( \perp \)’, at the point where the lines meet.

2. Draw on the board several pairs of intersecting lines and ask the pupils to identify which pairs are perpendicular. Ask them to explain the reasons too.

3. Ask the pupils to turn to page 97 of the Student’s Book and identify as many as possible pairs of perpendicular lines in the picture.

4. Ask the pupils to work in pairs to identify perpendicular lines formed by objects in the classroom. Ask a few pupils to share their findings.

Activity 2 (40 min): Draw and check for perpendicular lines using ruler and set squares.
1. Show the class a set square. Ask the pupils to take out their set squares and examine them. Point out that even though it is known as a ‘set square’, its shape is actually a triangle.

2. Ask the pupils what they can say about the sides of the set square. Lead them to see that the 2 sides of a set square are actually perpendicular to each other or are at right angle with each other.
3. Show page 100 of the Student’s Book. Demonstrate on the board, steps in drawing perpendicular lines using a ruler and a set square following the steps shown in the textbook. Ask a few pupils to practise drawing on the board.

4. Show page 101 of the Student’s Book. Demonstrate on the board the steps in drawing perpendicular lines through a given point using the ruler and set square, following the steps shown in the textbook. Ask a few pupils to practise drawing on the board.

5. Tell the pupils that a set square can also be used to check if 2 lines are perpendicular to each other. Show page 102 of the Student’s Book. Draw a pair of perpendicular lines and a pair of non perpendicular intersecting lines on the board. Demonstrate on the board the steps in checking whether the pairs of lines are perpendicular using a set square. Draw more pairs of intersecting lines and ask some pupils to practise checking if they are perpendicular using a ruler and a set square.

**Activity 3 (40 min): Class practice**

1. Ask a pupil to draw a pair of perpendicular lines on the board and then ask another pupil to check if they are perpendicular. Do this as many times as possible until everyone knows how to draw and check for perpendicular lines using a ruler and a set square.

*Let’s Try…*

**Activity 3 (40 min): Individual practice**

1. Let the pupils try out the exercises on page 103 of the Student’s Book.

**Homework**

Ask the pupils to do Workbook 4A—Worksheet 22.

**Answers**

*Let's Try* page 103

3. (a) YZ ⊥ WX (b) None (c) MN ⊥ NO

**Worksheet 22**

3. (a) ✓,✓ (b) ✓,✗ (c) ✓,✓

**PARALLEL LINES**

**Suggested Duration**

4 periods (160 min)

**Learning Outcomes**

Pupils should be able to:

- draw parallel lines using ruler and set squares.
Instructions

Let’s Learn…

Activity 1 (40 min): Recall parallel lines

1. Recall the definition of parallel lines as two straight lines that will never intersect, no matter how far they are extended. Show a pair of parallel lines as follows:

   A
   |
   |
   B
   |
   |
   C
   |
   D

2. Write on the board, AB // CD and read it as ‘AB is parallel to CD’. Remind the pupils to put in the arrow on each line to denote that they are parallel. Also remind them that in writing the mathematical representation, the sign ‘//’ is to be used.

3. Draw on the board several pairs of lines and ask the pupils to identify which pairs are parallel. Ask them to explain the reasons too.

4. Ask the pupils to turn to page 97 of the Student’s Book and identify as many as possible pairs of parallel lines in the picture.

5. Ask the pupils to work in pairs to identify parallel lines formed by objects in the classroom. Ask a few pupils to share their findings.

Activity 2 (40 min): Draw and check for parallel lines using ruler and set squares.

1. Ask the pupils to take out their rulers and set squares. Turn to page 104 of the Student’s Book. Demonstrate on the board the steps in drawing parallel lines using a ruler and a set square following the steps shown in the textbook. Ask a few pupils to practise drawing on the board.

4. Turn to page 105 of the Student’s Book. Demonstrate on the board the steps in drawing parallel lines through a given point using a ruler and a set square following the steps shown in the textbook. Ask a few pupils to practise drawing on the board.

5. Tell the pupils that a ruler and a set square can also be used to check if 2 lines are parallel. Turn to page 106 of the Student’s Book. Draw a pair of parallel lines and a pair of non parallel lines on the board. Demonstrate on the board the steps in checking whether the pairs of lines are parallel using a ruler and a set square. Draw more pairs of parallel and non parallel lines on the board and ask some pupils to practise checking for parallel lines a ruler and a set square.

Activity 3 (40 min): Class practice

1. Ask a pupil to draw a pair of parallel lines on the board and then ask another pupil to check if they are parallel. Do this as many times as possible until everyone knows how to draw and check for parallel lines using a ruler and a set square.
Let's Try…
Activity 4 (40 min): Individual practice
1. Let the pupils try out the exercises on page 107 of the Student's Book. Ask the pupils to check their answers with their partner.

Homework
Ask the pupils to do Workbook 4A—Worksheet 23.

Answers

page 107
3. EF // GH, TU // VW

WORK SHEET 23
3. (b), (d), (e)
4. (a) ✓  (b) ✗  (c) ✓

VERTICAL AND HORIZONTAL LINES

Suggested Duration
3 periods (120 min)

Learning Outcomes
Pupils should be able to:
• use the terms ‘vertical’ and ‘horizontal’

Instructions
Let’s Learn . . .

Activity 1 (40 min): Introduce the terms ‘vertical’ and ‘horizontal’
1. Write the words ‘vertical’ and ‘horizontal’ on the board. Explain the meaning of vertical and horizontal by showing different positions of a taut string. Ask the class to repeat the words ‘vertical’ and ‘horizontal’ after you
2. Draw a vertical line and a horizontal line on the board. Point out to the class that slanted lines are not vertical or horizontal lines.
3. Ask the pupils to look around the classroom and identify objects that shows either a vertical or horizontal line.
4. Go through with the pupils the examples on page 108 of the Student's Book.
5. Tell the class that a vertical line and a horizontal line form a pair of perpendicular lines.
Let's Explore

Activity 2 (40 min): Challenging activity
1. Pair up the pupils and let them try out the activity on page 109 of the Student's Book.

Let's Try...

Activity 3 (40 min): Individual practice
1. Ask the pupils to try out the exercises on page 110 of the Student’s Book.

Homework
Ask the pupils to do Workbook 4A—Worksheet 24 and Practice 6.

Answers

page 110
(a) AE, BF, CG, DH
(b) AB, BC, CD, AD
(c) AB // CD, AD // BC, AE // BF // CG // DH
(d) AE ⊥ AB, AE ⊥ AD, BF ⊥ AB, BF ⊥ BC, CG ⊥ BC, CG ⊥ CD, DH ⊥ CD, DH ⊥ AD

WORK Check 24
1. (a) AB, CD (b) AD, BC
   (c) AB // CD, AD // BC
   (d) AB ⊥ BC, CD ⊥ BC, AD ⊥ AB, BC ⊥ AB, CD ⊥ AD
2. (a) EA, HD, FB, GC (b) AB, DC, EF, HG, AD, BC, EH, FG
   (c) AB // EF, EH // FG, AB // DC (d) FB ⊥ BC, HD ⊥ DC, AB ⊥ FB

Practice 6
1. (a) CD // EF (b) GH // JK (c) AB ⊥ JK (d) AB ⊥ GH
2. (a) AB, CD, EF, EG, FG, HI, HJ, IJ
   (b) AC, AI, CF, FI, EH

Revision (80 min)

Fun with Maths
Things you need: Newspapers
1. Guide the pupils on the activity on page 111 of the Student's Book. Divide the class into groups of 4 or 5. Hand out a several pages of newspapers to each group and ask them to do accordingly to the instructions given. Ask each group to share their work
2. Revise and go through pupils’ homework.
Unit 7: Symmetry

IDENTIFYING SYMMETRIC FIGURES

Suggested Duration
6 periods (240 min)

Learning Outcomes
Pupils should be able to:
- identify symmetric figures
- determine whether a straight line is a line of symmetry of a symmetric figure

Instructions
Let’s Learn...

Activity 1 (40 min): Identify symmetric and non symmetric figures
1. Show the class a big piece of rectangle. Fold it into 2 equal halves. Explain that the rectangle is an example of a ‘symmetric figure’ because it can be divided into 2 identical parts. Write on the board, ‘symmetric figure’ and ask the class to repeat after you.
2. Trace the folding line with a marker and tell the class that the line is called the ‘line of symmetry’. Write on the board, ‘line of symmetry’ and ask the class to repeat after you.
3. Explain further that in general, any figure which can be divided to form 2 identical parts is a symmetric figure and the dividing line is known as the ‘line of symmetry’.
4. Show more symmetric figures with the lines of symmetry:

![Symmetric Figures](image)

5. Ask 4 pupils to fold the figures along the line of symmetry to show that the two halves fit exactly. Tell the class that the folding method can be used to determine whether a figure is a symmetric figure.
6. Show some figures that are not symmetric figures:

![Non-Symmetric Figures](image)

8. Ask 3 pupils to come forward and try to fold them into two identical parts that fit each other. Lead the class to see that it is not possible to fold the figures into two identical parts no matter how you try. Tell them that such figures are not symmetric figures.
Activity 2 (40 min): Symmetric figures and lines of symmetry
1. Show on the table a triangle and a star with lines cutting through as follows:

2. Ask the class, ‘Does the dotted line represent a line of symmetry?’ Tell the pupils to imagine folding the figure about the dotted line and visualise whether the part when flipped over, can fit exactly on the other part. Lead them to see that both lines are not lines of symmetry

3. Ask the class, ‘Are the figures symmetric?’ Draw another line as follows:

4. Show the class that by drawing the correct line of symmetry, it can be shown that the figures are symmetric figures. Hence, explain that it is important to try to find the line of symmetry in order to determine if a figure is a symmetric figure.

Activity 3 (25 min): Symmetric figures with more than 1 line of symmetry
1. Show the following figure on the board and draw all the lines of symmetry:

2. Explain to the pupils that a symmetric figure may have more than one line of symmetry but a symmetric figure must always have at least one line of symmetry.

Activity 4 (15 min): Class practice
1. Go through with the pupils the examples on pages 113–115 of the Student’s Book.

Activity 5 (40 min): Symmetric objects
1. Refer the pupils to the objects shown on page 115 of the Student’s Book. Lead the pupils through the items one at a time to determine if the item is a symmetric object.

2. Ask the pupils to name as many symmetric objects as they can think of.
Let’s Explore
Activity 6 (25 min): Determine if a line is the line of symmetry
Things you need: Rectangular papers
1. Give each pupil a piece of rectangular paper. Ask them to follow the steps described on page 116 of the Student’s Book. Lead the class to see that the rectangle has 2 lines of symmetry and the diagonal lines are not lines of symmetry.
2. Ask the pupils to work in pairs the examples on page 117 of the Student’s Book.

Let’s Try...
Activity 6 (15 min): Individual practice
1. Ask the pupils to try out the exercises on page 118 of the Student’s Book.

Homework
Ask the pupils to do Workbook 4A—Worksheet 25.

Let’s Explore
Activity 7 (40 min): Interesting activity to enhance learning
1. Guide the pupils through the steps on page 114 of the Student’s Book to create a symmetric figure.
2. Show that when the paper is folded into two, the resulting figure is a symmetric figure with one line of symmetry.
3. Ask the class, ‘What if the paper is folded into 4 quarters?’ Show that the result is a symmetric figure with 2 lines of symmetry.

Answers
page 118
1. (a) Yes  (b) Yes  (c) Yes  (d) No
2. (a) Yes  (b) No  (c) Yes  (d) No

Worksheet 25
1. (a), (b), (c), (e), (g), (h), (j), (k), (l)
2. (a), (c), (d), (e), (g), (i)

COMPLETING SYMMETRIC FIGURES

Suggested Duration
5 periods (200 min)
Learning Outcomes
Pupils should be able to:

- complete a symmetric figure with respect to a given horizontal / vertical line of symmetry
- design and make patterns

Instructions

Let’s Learn…

Activity 1 (40 min): Complete symmetric figure given a vertical or horizontal line

Things you need: Square grid paper

1. Show a square grid paper on the table. Demonstrate how to draw figures on the grid by joining straight lines and using the corners of the square as joining points. Ask a few pupils to come forward to draw some figures on the grid.

2. Show a new square grid paper on the table. Draw a vertical line, AB in the middle of the grid. Starting from the left side of the vertical line, draw any figure by joining straight lines. The figure should start and end on the vertical line.

3. Draw a similar figure on the right side of AB by counting horizontal and vertical squares. For example, if the line on the left side of AB moves horizontally to the left by 3 squares and vertically down by 4 squares, then the corresponding line on the right of AB must also move horizontally to the right by 3 squares and vertically down by 4 squares. Demonstrate this on the table.

4. Explain that the figure on the right is actually a mirror reflection of the figure on the left. Also, tell them that the left and right figures are joined to form one complete symmetric figure and the line AB is the line of symmetry.

5. Repeat the above using horizontal line as the line of symmetry.

6. Show more examples on the table and ask pupils to practise completing the symmetric figures. Ensure that they use the counting of squares method.

Activity 2 (40 min): Class practice

Things you need: Square grid paper

1. Go through with the pupils the examples on page 120 of the Student’s Book.

2. Give each pupil a square grid paper. Draw half of a symmetric figure on the board and ask the pupils to draw it on the grid paper and then complete the figure by drawing the other half.

3. Ask the pupils to compare their answers with their partners. Go around to check the pupils’ work.

Let’s Try…

Activity 3 (40 min): Individual practice

1. Give out square grid paper to the class and instruct the pupils to try out the exercises on page 121 of the Student’s Book. Go around to check the pupils’ work and guide them individually if necessary.
Homework
Ask the pupils to do Workbook 4A—Worksheet 26 and Practice 7.

Answers

page 121
Check the patterns that the children complete.

Worksheet 26
Check the patterns that the children complete.

Practice 7
3. (d), (f)

Revision 3

1. (a) 8  (b) 21  (c) 6  (d) \( \frac{3}{7} \)  (e) \( 1 \frac{1}{8} \)  (f) \( 16 \frac{1}{3} \)
2. (a), (c), (d)
5. (a) BC \( \perp \) CD, AB // EF  (b) NO \( \perp \) OP, OP \( \perp \) PQ, NO // PQ, PQ // MS  
   (c) UV \( \perp \) VW, WX \( \perp \) XY, TY // UV  (d) GH \( \perp \) HI, IJ \( \perp \) JK, FK // GH
6. (a), (c), (d)
7. (b), (c), (d)
8. 24
9. 7
10. (a) A, 114  (b) 479  (c) 838
12. Rs 300
13. 140
14. (a) Apr  (b) Jul  (c) Jan  (d) 10 400
15. 6
16. \( \frac{1}{2} \) m
17. (a) 90  (b) 50  (c) 10  (d) 2 pm – 3 pm
Revision (80 min)

Let’s Explore
1. Ask the pupils to work on the activity on page 122 of the Student’s Book. The pupils can draw any pattern of their choice.

Fun With Maths
2. For this activity, instead of ink, you may ask the pupils to use different poster colours to create colourful and creative pictures. Pin up all the pupils’ work as a decoration for the classroom.
3. Revise and go through pupils’ homework.

Revision 4

1. Rs 35
2. \( \frac{3}{10} \)
3. (a) 35 (b) 12 (c) 6 (d) 3
4. 35
5. \( \frac{3}{8} \)
6. (a) 4 (b) 4 (c) 9 (d) 27
7. (a) Parker Road & Central Street (b) Market Street & Main Street (c) Market Street & Main Street (d) Market Street
8. 23
9. Rs 320
10. (a) 300, 200, 500, 500, 450, 600 (b) 2 (c) 6 (d) 3 & 4 (e) 300 (f) 1950 (g) 550
11. (a), (c), (d), (e), (f)
12. (a) \( AE \bot ED, AB \bot BC, BC \bot CD, CD \bot DE \) (b) \( AB // CD, BC // DE \)
13. (a) \( \frac{10}{12} = \frac{5}{6} \) (b) \( \frac{6}{12} = \frac{1}{2} \) (c) \( \frac{9}{21} = \frac{3}{7} \) (d) \( \frac{8}{20} = \frac{2}{5} \)
14. \( \frac{7}{15} \)
15. \( \frac{4}{15} \)
16. (a) √ (b) √ (c) ×
17. (a) √ (b) × (c) √
18. 24
19. 45
Unit 8: Decimals (I)

TENTHS

Suggested Duration
2 periods (80 min)

Learning Outcomes
Pupils should be able to:
- read and write the correct notation for tenths
- identify the place values and values of the digits in a decimal
- use the number line to display decimals up to tenths

Instructions

Let’s Learn...

Activity 1 (20 min): Read and write tenths in decimal notation
1. Draw a long rectangle on the board. Tell the class that the rectangle represents one whole. Next, divide the rectangle into 10 equal parts. Shade one part and ask the class, ‘What is the fraction representing one equal part?’ Lead the class to see that each part represents a fraction of \(\frac{1}{10}\) or ‘one tenth’ in words.
2. Tell the class that there is another way to represent the fraction, \(\frac{1}{10}\). It is called a decimal. Write on the board, ‘\(\frac{1}{10} = 0.1\)’ and explain that ‘0.1’ is a decimal. Read it as ‘zero point one’. Ask the class to repeat it after you.
3. Shade two equal parts and ask the class, ‘What is the decimal representing the two equal parts?’ Lead the class to see that the two equal parts which is ‘two tenths’ or ‘\(\frac{2}{10}\)’ can be written in the decimal notation as ‘0.2’ and read it as ‘zero point two’. Repeat this for ‘0.3’, ‘0.4’, ‘0.5’, ‘0.6’, ‘0.7’, ‘0.8’ and ‘0.9’.
4. Ask the class, ‘What comes after 0.9?’ (one whole or 1) Write 10 tenths = 1 whole.
5. Write on the board:
   - one tenth = \(\frac{1}{10}\) = 0.1
   - two tenths = \(\frac{2}{10}\) = 0.2
   - three tenths = \(\frac{3}{10}\) = 0.3
   - four tenths = \(\frac{4}{10}\) = 0.4
   - five tenths = \(\frac{5}{10}\) = 0.5
   - six tenths = \(\frac{6}{10}\) = 0.6
seven tenths $= \frac{7}{10} = 0.7$

eight tenths $= \frac{8}{10} = 0.8$

nine tenths $= \frac{9}{10} = 0.9$

ten tenths $= \frac{10}{10} = 1$

6. Draw two rectangles of the same size on the board. Divide one of the rectangles into 10 equal parts. Shade the rectangle and the parts to show one whole and three tenths as follows:

<table>
<thead>
<tr>
<th>$\frac{1}{10}$</th>
<th>$\frac{1}{10}$</th>
<th>$\frac{1}{10}$</th>
<th></th>
<th></th>
<th>$\frac{1}{7}$</th>
<th></th>
</tr>
</thead>
</table>

7. Ask the class, ‘How to write one whole and three tenths in decimal notation?’ Write on the board to show that the decimal is ‘1.3’ and read it as ‘one point three’. Show more examples of decimals that are more than one whole. Write a fraction on the board and ask a pupil to write the corresponding decimal. Do this several times for the pupils to practise

**Activity 2 (20 min): Identify place values and values of the digits in a decimal**

*Things you need: Place Value Chart showing ones and tenths.*

1. Write on the board a decimal and explain the place values and values of the digits in a decimal as follows:

   ![Place Value Diagram]

   Pin up a Place Value Chart showing ones and tenths on the board and ask some pupils to practise writing the digits of decimal numbers onto the chart. For example, for the decimal 2.6, the pupils should write the digits in the Chart as follows:

<table>
<thead>
<tr>
<th>Ones</th>
<th>Tenths</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>6</td>
</tr>
</tbody>
</table>

3. Point out to the class that number immediately to the right of the decimal point has place value of tenths and number immediately to the left of the decimal point has place value of ones.
4. Let the pupils practise writing the digits in the Place Value Chart given any decimal and vice versa.

**Activity 3 (20 min): Use the number line to display decimals up to tenths**

1. Draw a number line and mark it to show 10 equal parts. Label the start of the number line with the digit 0 and the end point with digit 1. Lead the pupils to see that each marking represent one tenth or \( \frac{1}{10} \). Lead the class to see that the first marking after the digit 0 is 0.1 and the next is 0.2. Ask the pupils to name the rest of the markings.
2. Repeat No. 1 using different start and end numbers.
3. Draw another number line, but this time divides it into 20 equal parts. Label the start of the number line with the digit 4, the mid point with digit 5 and the end point the digit 6. Point out that from 4 to 5, there 10 equal parts and each part is 1/10 or 0.1. Similarly, from 5 to 6, there are also 10 equal parts and each part is also 1/10 or 0.1. Say out a decimal and ask a pupil to show the decimal on the number line. Do these several times for the pupils to practise.
4. Provide examples of different number lines and let pupils practise marking on the number line to show a given decimal and vice versa.

**Activity 4 (10 min): Class practice**

1. Go through with the pupils the examples on pages 125–126 of the Student’s Book.

**Let’s Try…**

**Activity 5 (10 min): Individual practice**

Ask pupils to do the exercises on pages 127–128 of the Student’s Book. Go through with the pupils the answers.

**Homework**

Ask pupils to do Workbook 4B—Worksheet 27.

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**Answers**

*page 127*

1. A: 0.2, B: 0.8, C: 1.4, D: 1.6
2. 2 wholes + 8 tenths = 20 tenths + 8 tenths
   = 28 tenths
3. 3.6 l
4. 2.9 kg
5. (a) 8.2  (b) 5.3  (c) 7.6  (d) 9.9

**Worksheet 27**

1. (a) \( \frac{3}{10} = 0.3 \)  (b) \( \frac{5}{10} = 0.5 \)  (c) \( \frac{7}{10} = 0.7 \)  (d) \( \frac{6}{10} = 0.6 \)  (e) \( \frac{9}{10} = 0.9 \)
2. (a) 23.5  (b) 40.9  (c) 65.3
3. (a) 3.7  (b) 1.2
4. (a) 0.3  (b) 1.5
5. (a) 1.2  (b) 3.3  (c) 0.7  (d) 2.5  (e) 0.3  (f) 4.9
6. (a) 0.7, 2.1, 4.3  (b) 29.2, 30.9, 32.6  (c) 98.3, 100.4, 101.5

**HUNDREDTHS**

**Suggested Duration**
2 periods (80 min)

**Learning Outcomes**
Pupils should be able to:
- read and write the correct notation for hundredths
- identify the place values and values of the digits in a decimal
- use the number line to display decimals up to hundredths

**Instructions**

*Let’s Learn…*

**Activity 1 (20 min): Read and write hundredths in decimal notation**

*Things you need: A transparency that is drawn with a large square that is divided into 100 small squares.*

1. Show the transparency on the OHP. Tell the class that the big square represents 1 whole and it is divided into 100 small squares. Shade one small square and ask the class, ‘What is the fraction that represents one small square?’ Lead the class to see that each small square is represented by the fraction \( \frac{1}{100} \) or ‘one hundredth’.

2. Tell the class that the fraction, \( \frac{1}{100} \), can also be represented by the decimal, ‘0.01’. Write on the board, \( \frac{1}{100} = 0.01 \). Read it as ‘zero point zero one’. Ask the class to repeat it after you.

3. Shade two small squares and ask the class, ‘What is the decimal that represents the two small squares?’ Lead the class to see that the two small squares which is ‘two hundredths’ or \( \frac{2}{100} \) can be written in the decimal notation as ‘0.02’ and read it as ‘zero point zero two’.

4. Shade another 8 small squares so that there are now one row of 10 small squares shaded. Write on the board the corresponding fraction \( \frac{10}{100} \), or ‘ten hundredths’. Lead the class to see that there are 10 such rows, so that each row can also be represented by the fraction \( \frac{1}{10} \) or ‘one tenth’. Finally, lead the class to see that \( \frac{10}{100} \) or ‘ten hundredths’ is equal to \( \frac{1}{10} \) or ‘one tenth’.

(Emphasize ten hundredths = one tenth)
5. Write on the board: 10 hundredths $= \frac{10}{100}$

$= \frac{1}{10}$

$= 0.1$

6. By shading different number of squares, show different examples of decimals and show how the decimals can be obtained by re-writing the hundredths into tenths and hundredths. For example, shade 34 small squares to show 34 hundredths. Then write on the board,

34 hundredths $= 3$ tenths + 4 hundredths

$= \frac{3}{10} + \frac{4}{100}$

$= 0.34$

Tell the class that all the decimals shown so far are less than 1 whole. Shade different number of squares and ask some pupils to come forward to practise writing the decimal notation by re-writing the hundredths into tenths and hundredths.

Show the class how to write decimals that are more than one whole and involve both tenths and hundredths. For example, ask the class, ‘How to write one whole, 3 tenths and 5 hundredths in decimal notation?’ Write on the board to show that the decimal is ‘1.35’ and read it as ‘one point three five.’ Show more examples of decimals that are more than one whole.

Activity 2 (20 min): Identify place values and values of the digits in a decimal

*Things you need: Place Value Chart showing ones, tenths and hundredths.*

1. Write on the board a decimal and explain the place values and values of the digits in a decimal as follows:

   6.5 7

   Place value

   ones place

   tenths place

   hundredths place

   6 ones

   decimal Point

   5 tenths

   or 0.5

   7 hundredths

   or 0.07

2. Ask the pupils to identify the value of each digit as follows:

   For example: 2.563

   Write on the board:

   **The digit 3 is in the ______ place. (Pupils should fill ‘thousandths’)**

   **It stands for _____ or ______. (Pupils should fill in ‘3 thousandths’ or ‘0.003’.)**

   Pin up a Place Value Chart showing ones, tenths and hundredths on the board and ask
some pupils to practise writing the digits of decimal numbers onto the chart. For example, for the decimal 6.57, the pupils should write the digits on the Chart as follows:

<table>
<thead>
<tr>
<th>Ones</th>
<th>Tenths</th>
<th>Hundredths</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>5</td>
<td>7</td>
</tr>
</tbody>
</table>

4. Emphasize that the digit immediately to the right of the decimal point has the place value of tenths and the digit to the right of the tenths place has the place value of hundredths.
5. Let the pupils practise writing the digits in the Place Value Chart given any decimal and vice versa.

**Activity 3 (20 min): Use the number line to display decimals up to hundredths**

1. Recall that one tenth is made up of 10 hundredths. \(\frac{1}{10} = \frac{10}{100}\)
2. Draw a number line and label it such that it is one tenth or \(\frac{1}{10}\) long. For example, the start of the number line can be 0.6 and the end point will be 0.7. Mark the line into 10 equal parts so that each part represents one hundredth or \(\frac{1}{100}\). Lead the class to see that the first marking after the decimal 0.6 is 0.61 and the next is 0.62. Ask the pupils to name the rest of the markings.
3. Repeat No.2 using different start and end decimals.
4. Provide examples of different number lines and let pupils practise marking on the number line to show a given decimal and vice versa.

**Activity 4 (10 min): Class practice**

1. Go through with the pupils the examples on pages 129–130 of the Student’s Book.

**Let’s Try…**

**Activity 5 (10 min): Individual practice**

Ask pupils to do the exercises on page 131 of the Student’s Book. Go through with the pupils the answers.

**Homework**

Ask pupils to do Workbook 4B—Worksheet 28.

**Answers**

page 131

1. (a) 0.92 (b) 2.59
2. A: 0.52, B: 0.67, C: 0.72, D: 0.78

**Worksheet 28**

1. (a) 0.93 (b) 4.06 (c) 7.36
2. (a) 2.06, 2.13, 2.22 (b) 6.33, 6.42, 6.56
Suggested Duration
2 periods (80 min)

Learning Outcomes
Pupils should be able to:
- read and write the correct notation for thousandths
- identify the place values and values of the digits in a decimal
- use the number line to display decimals up to thousandths

Instructions
Let’s Learn...

Activity 1 (20 min): Read and write thousandths in decimal notation
Things you need: A large square drawn on the board and divided into 1000 small squares.

Tell the class that the big square represents 1 whole and there are a total of 1000 small squares. Write on the board:

1 whole = 1000 parts
Each part = 1 thousandth

\[ \frac{1}{1000} \]

= 0.001 (read it as zero point zero zero one)

(Emphasize 1 whole = 1000 thousandths)

Draw a bold boundary around 10 small squares and tell the class that 10 thousandths is equal to 1 hundredth. Write on the board:

10 thousandths = \( \frac{10}{1000} \)

= \( \frac{1}{100} \)

= one hundredth

= 0.01

(Emphasize 10 thousandths = one hundredth)

3. Now draw a boundary around 100 small squares and tell the class that 100 thousandths is equal to 1 tenth. Write on the board:

100 thousandths = \( \frac{100}{1000} \)
4 By grouping different number of squares, show different examples of decimals and show how the decimals can be obtained by re-writing the thousandths into tenths, hundredths and thousandths. For example, group 267 small squares to show 267 thousandths. Then write on the board,

\[
267 \text{ thousandths} = 2 \text{ tenths} + 6 \text{ hundredths} + 7 \text{ thousandths}
\]

\[
= \frac{2}{10} + \frac{6}{100} + \frac{7}{1000}
\]

\[
= 0.267
\]

Shade different number of squares and ask some pupils to come forward to practise writing the decimal notation by re-writing the thousandths into tenths, hundredths and thousandths.

Show the class how to write decimals that are more than one whole and involve tenths, hundredths and thousandths. For example, ask the class, ‘How to write one whole, 3 tenths, 5 hundredths and 9 thousandths in decimal notation?’ Write on the board to show that the decimal is ‘1.359’ and read it as ‘one point three five nine’. Show more examples of decimals that are more than one whole.

**Activity 2 (20 min): Identify place values and values of the digits in a decimal**

*Things you need: Place Value Chart showing ones, tenths, hundredths and thousandths.*

1. Write on the board a decimal and explain the place values and values of the digits in a decimal as follows:

   ![Place Value Chart](image)

   - 6 ones
   - 5 tenths or 0.5
   - 7 hundredths or 0.07
   - 8 thousandths or 0.008

2. Ask the pupils to identify the value of each digit as follows:

   **For example: 2.563**
   
   **Write on the board:**
   
   The digit 3 is in the _______ place. (Pupils should fill ‘thousandths’)
   
   It stands for _____ or______. (Pupils should fill in ‘3 thousandths’ or ‘0.003’.)
Pin up a Place Value Chart showing ones, tenths, hundredths and thousandths on the board and ask some pupils to practise writing the digits of decimal numbers onto the chart. For example, for the decimal 6.578, the pupils should write the digits in the Chart as follows:

<table>
<thead>
<tr>
<th>Ones</th>
<th>Tenths</th>
<th>Hundredths</th>
<th>Thousandths</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>5</td>
<td>7</td>
<td>8</td>
</tr>
</tbody>
</table>

4. Emphasize that the digit immediately to the right of the decimal point has place value of tenths and the digit next to the right of the tenths place has the place value of hundredths and the digit next to the right of hundredths place has the place value of thousandths.

5. Let the pupils practise writing the digits in the Place Value Chart given any decimal and vice versa.

**Activity 3 (20 min): Use the number line to display decimals up to thousandths**

1. Recall that one hundredth is made up of 10 thousandths. \( \frac{1}{100} = \frac{10}{1000} \)

2. Draw a number line and label it such that it is one hundredth or 1/100 long. For example, the start of the number line can be 0.08 and the end point will be 0.09. Mark the line into 10 equal parts so that each part represents one thousandth or 1/1000. Lead the class to see that the first marking after the decimal 0.08 is 0.081 and the next is 0.082. Ask the pupils to name the rest of the markings.

3. Repeat No.2 using different start and end decimals.

4. Provide examples of different number lines and let pupils practise marking on the number line to show a given decimal and vice versa.

**Activity 4 (10 min): Class practice**

1. Go through with the pupils the examples on pages 132–134 of the Student’s Book.

*Let’s Try…*

**Activity 5 (10 min): Individual practice**

Ask pupils to do the exercises on page 136 of the Student’s Book. Go through with the pupils the answers.

**Homework**

Ask pupils to do Workbook 4B—Worksheet 29.

**Answers**

Let’s Try page 136

1. (a) 0.8  (b) 0.19  (c) 0.125
2. (a) 0.6  (b) 0.36  (c) 0.618
3. 0.003, 0.08, 0.1, 2, 40
4. (a) \( \frac{3}{10} \)  (b) \( \frac{5}{100} \)  (c) 3, 1, 5
CONVERSION BETWEEN FRACTIONS AND DECIMALS

Suggested Duration
3 periods (120 min)

Learning Outcomes
Pupils should be able to:
• convert decimals to fractions and vice versa

Instructions
Let’s Learn...

Activity 1 (40 min): Convert fractions to decimals
Show how to convert a fraction into a decimal by changing the denominator to 10 as follows:
$$\frac{1}{2} \times \frac{5}{5} = \frac{5}{10} = 5 \text{ tenths} = 0.5$$
(Emphasize that both the numerator and denominator must be multiplied by the same number.)

2. Show how to convert a fraction into a decimal by changing the denominator to 100 as follows:
$$\frac{3}{25} \times \frac{4}{4} = \frac{12}{100} = 12 \text{ hundredths} = 0.12$$

3. Show how to convert a mixed number into a decimal by first re-writing the mixed number into whole number and fraction and then convert the fraction into a decimal.

4. Go through with the pupils the examples on pages 137–138 of the Student’s Book.

Activity 2 (40 min): Convert decimals to fraction
1. Show them how to convert a decimal into a fraction by writing the fraction with the denominator of 10 and express it in its simplest form if needed as follows:
$$0.8 = 8 \text{ tenths} = \frac{8}{10} = \frac{4}{5}$$
(Emphasize the need to express the answer in the simplest form.)
2. Show them how to convert a decimal into a fraction by writing the fraction with a denominator of 100 and expressing it in its simplest form if needed as follows:

\[ 0.24 = \frac{24}{100} = \frac{6}{25} \text{ (simplest form)} \]

3. Show them how to convert a decimal into fraction by writing the fraction with a denominator 1000 and expressing it in its simplest form if needed as follows:

\[ 0.452 = \frac{452}{1000} = \frac{226}{500} = \frac{113}{250} \text{ (simplest form)} \]

4. Show them how to convert a decimal that is more than 1 whole into a fraction (mixed number) as follows:

\[ 4.32 = 4 + \frac{32}{100} = 4 \frac{16}{50} \text{ (simplest form)} \]

5. Go through with the pupils the examples on page 139 of the Student’s Book.

Let’s Try…

Activity 3 (40 min): Individual practice

Ask pupils to do the exercises on page 140 of the Student’s Book. Go through with the pupils the answers.

Homework

Ask pupils to do Workbook 4B—Worksheet 30.

Answers

Let’s Try

page 140

1. (a) 0.6  (b) 0.36  (c) 0.15  (d) 2.25  (e) 3.2  
   (f) 5.46  (g) 3.35  (h) 4.44  (i) 6.18

2. (a) \( \frac{9}{100} \)  (b) \( \frac{123}{500} \)  (c) \( \frac{51}{1000} \)  (d) \( \frac{26}{100} \)  (e) \( \frac{371}{1000} \)  (f) \( \frac{398}{1000} \)

Worksheet 30

1. (a) \( \frac{4}{10}, 0.4 \)  (b) \( \frac{35}{100}, 0.35 \)  (c) \( \frac{32}{100}, 0.32 \)  (d) \( \frac{68}{100}, 0.68 \)  (e) \( \frac{22}{100}, 0.22 \)
   
2. (a) 5, 1.5  (b) 2, 3.2  (c) 75, 2.75  
   (d) 15, 4.15  (e) 16, 8.16  (f) 8, 10.08

3. (a) \( \frac{25}{100} = \frac{1}{4} \)  (b) \( \frac{4}{10} = \frac{2}{5} \)  (c) \( \frac{255}{1000} = \frac{51}{200} \)
COMPARING AND ORDERING DECIMALS

Suggested Duration
3 periods (90 min)

Learning Outcomes
Pupils should be able to:

- compare and order decimals

Instructions

Let's Learn...

Activity 1 (40 min): Recall and compare the different place values

Write on the board a number and show the place value of thousands, hundreds, tens, ones, tenths, hundredths, and thousands as follows:

Thousands  tens  tenths  thousandths

1 2 3 4 ...

Hundredths  ones  hundredths

2. Point out to the class that on the left side of the decimal point, thousands place is greater than hundreds place, hundreds place is greater than tens place and tens is greater than ones place whereas on the right side of decimal point, the tenths place is greater than the hundredths place and the hundredths place is greater than the thousandths place.

3. Recall with the class the following:
   1 one = 10 tenths = 100 hundredths = 1000 thousandths
   1 tenth = 10 hundredths = 100 thousandths
   1 hundredth = 10 thousandths

4. Compare them with the following;
   1 thousand = 10 hundreds
   1 hundred = 10 tens
   1 ten = 10 ones

Activity 2 (40 min): Compare and order decimals

Recall the comparison of whole numbers as follows:

Step 1: Compare the digit in the thousands place

(d) \( \frac{75}{100} = \frac{3}{4} \)  
(e) \( \frac{406}{1000} = \frac{203}{500} \)  
(f) \( \frac{92}{100} = \frac{23}{25} \)
Move to Step 2 if the digits are the same,
If not, the number with the bigger digit is the greater number
Step 2: Compare the digit in the hundreds place
Move to Step 3 if the digits are the same,
If not, the number with the bigger digit is the greater number
Step 3: Compare the digit in the tens place
Move to Step 4 if the digits are the same.
If not, the number with the bigger digit is the greater number
Step 4: Compare the digit in the ones place
If the digits are the same, both numbers are identical
If not, the number with the bigger digit is the greater number

2. Point out to the class that comparing decimals is similar to comparing whole numbers as follows:
   Step 1: Compare the digit in the tenths place
   Move to Step 2 if the digits are the same,
   If not, the number with the bigger digit is the greater number
   Step 2: Compare the digit in the hundredths place
   Move to Step 3 if the digits are the same,
   If not, the number with the bigger digit is the greater number
   Step 3: Compare the digit in the thousandths place
   If the digits are the same, both numbers are identical
   If not, the number with the bigger digit is the greater number

3. Teach the pupils to make use of the Place Value Table in comparing decimals. The pupils should first write the digits of the numbers to be compared in the Place Value Table and then follow the steps outlined in No. 2 above.

4. Provide pairs of decimals for the pupils to practise comparing, using the Place Value Table and the steps outlined. Once the pupils are able to do this well for pairs of decimals, increase it to 3 decimals and then 4 decimals.

5. Go through the examples on pages 141–143 of the Student’s Book.

*Let’s Try…*

**Activity 3 (40 min): Individual practice**

Ask pupils to do the exercises on page 144 of the Student’s Book. Go through with the pupils the answers.

**Homework**

Ask pupils to do Workbook 4B—Worksheet 31.
Answers

1. 169.71
2. (a) > (b) < (c) < (d)
3. (a) 9.932, 9.923, 9.392, 9.3  (b) 5.936, 5.39, 5.369, 5.309
   (c) 23.899, 23.869, 23.692, 21.095

WORK Sheet 31
1. (a) > (b) < (c) < (d) > (e) >
2. (a) 0.88 (b) 1.09 (c) 8.09 (d) 13
3. (a) 4.03 (b) 2.9 (c) 6.937 (d) 7.1
4. (a) 2.89, 2.9, 2.93, 2.99 (b) 23.5, 23.58, 23.69, 23.7 (c) 97.65, 97.79, 97.8, 98.1
   (d) 34.001, 34.021, 34.120, 39.113 (e) 58.567, 58.569, 58.678, 58.876
5. (a) 6.03, 6.003, 6.0, 0.60 (b) 9.988, 9.899, 9.682, 9.395
   (c) 4.9, 4.886, 4.683, 4.3 (d) 4.31, 3.87, 3.81, 3.79
6. (a) smaller than (b) smaller than (c) equal to
   (d) greater than (e) smaller than (f) equal to

ROUNDING OFF DECIMALS

Suggested Duration
5 periods (200 min)

Learning Outcomes
Pupils should be able to:
- round off decimals to
  a) the nearest whole number
  b) 1 decimal place
  c) 2 decimal places

Instructions
Let’s Learn...

Activity 1 (40 min): Round off decimals to the nearest whole number
1. Draw on the board a number line to show the whole numbers 3 and 4 and fill in the decimals, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 3.8 and 3.9.

```
3.0 3.1 3.2 3.3 3.4 3.5 3.6 3.7 3.8 3.9 4.0
```
2. Point out that 3.5 is the midpoint between 3 and 4. Ask the class, ‘Which decimals are nearer to the whole number 3 and which are nearer to the whole number 4?’

3. Explain that all those decimals nearer to the number 3, can be rounded off to the whole number 3 whereas those decimals nearer to the number 4 can be rounded off to the whole number 4. For midpoint 3.5, it is rounded off to 4.

4. Write on the board as follows:
   
<table>
<thead>
<tr>
<th>Decimal</th>
<th>Rounded to</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1</td>
<td>3</td>
</tr>
<tr>
<td>3.2</td>
<td>3</td>
</tr>
<tr>
<td>3.3</td>
<td>3</td>
</tr>
<tr>
<td>3.4</td>
<td>3</td>
</tr>
<tr>
<td>3.5</td>
<td>4</td>
</tr>
<tr>
<td>3.6</td>
<td>4</td>
</tr>
<tr>
<td>3.7</td>
<td>4</td>
</tr>
<tr>
<td>3.8</td>
<td>4</td>
</tr>
<tr>
<td>3.9</td>
<td>4</td>
</tr>
</tbody>
</table>

5. Point out to the pupils that to round off a decimal to the nearest whole number, one has to look at the digit in the tenths place. If the digit is less than 5, the decimal will be rounded to the lower whole number, and if the digit is 5 or more, the decimal is to be rounded off to the next higher whole number.

6. Provide some examples of decimals for pupils to practise rounding off to the nearest whole number.

7. Go through the examples on page 145 of the Student’s Book.

**Activity 2 (40 min): Round off decimals to 1 decimal place**

1. Draw on the board a number line to show decimals 4.2 and 4.3 and fill in the decimals, 4.21, 4.22, 4.23, 4.24, 4.25, 4.26, 4.27, 4.28, and 4.29. Point out that these decimals have 2 decimal places.

   4.2  4.21  4.22  4.23  4.24  4.25  4.26  4.27  4.28  4.29  4.3

2. Point out that 4.25 is the midpoint between 4.2 and 4.3. Ask the class, ‘Which decimals are nearer to the decimal 4.2 and which are nearer to the decimal 4.3?’

3. Explain that the decimals nearer to the decimal 4.2, can be rounded off to 1 decimal place to 4.2 whereas those decimals nearer to the decimal 4.3 can be rounded off to one decimal place to 4.3. For midpoint 4.25, it is rounded off to 4.3.
4. Write on the board as follows:
   4.21 ≈ 4.2
   4.22 ≈ 4.2
   4.23 ≈ 4.2
   4.24 ≈ 4.2
   4.25 ≈ 4.3
   4.26 ≈ 4.3
   4.27 ≈ 4.3
   4.28 ≈ 4.3
   4.29 ≈ 4.3

5. Point out to the pupils that to round off a decimal to 1 decimal place, one has to look at the digit in the hundredths place. If the digit is less than 5, the decimal will be rounded to the lower tenth, but if the digit is 5 or more, the decimal is to be rounded off to the next higher tenth.

6. Provide some examples of decimals for pupils to practise rounding off to the 1 decimal place.

7 Go through the examples on page 146 of the Student's Book.

**Activity 3 (40 min): Round off decimals to 2 decimal places**

1. Draw on the board a number line to show decimals 4.24 and 4.25 and fill in the decimals, 4.241, 4.242, 4.243, 4.244, 4.245, 4.246 4.247. 4.248 and 4.249. Point out that these decimals have 3 decimals places.


2. Point out that 4.245 is the midpoint between 4.24 and 4.25. Ask the class, ‘Which decimals are nearer to the decimal 4.24 and which are nearer to the decimal 4.25?’

3. Explain that the decimals nearer to the decimal 4.24, can be rounded off to 2 decimal places to 4.24 whereas those decimals nearer to the decimal 4.25 can be rounded off to two decimal places to 4.25. For midpoint 4.245, it is rounded off to 4.25

4. Write on the board as follows:
   4.241 ≈ 4.24
   4.242 ≈ 4.24
   4.243 ≈ 4.24
   4.244 ≈ 4.24
   4.245 ≈ 4.24
   4.246 ≈ 4.25
   4.247 ≈ 4.25
   4.248 ≈ 4.25
   4.249 ≈ 4.25
5. Point out to the pupils that to round off a decimal to 2 decimal places, one has to look at the digit in the thousandths place. If the digit is less than 5, the decimal will be rounded to the lower hundredth, but if the digit is 5 or more, the decimal is to be rounded off to the next higher hundredth.

6. Provide some examples of decimals for pupils to practise rounding off to the 2 decimal places.

7. Go through the examples on page 147 of the Student’s Book.

Let’s Explore

Activity 4 (25 min): Pair work on rounding off of decimals
1. Pair up the pupils and ask each pair to work on the activity on page 148 of the Student’s Book.

Let’s Try…

Activity 5 (15 min): Individual practice
1. Ask the pupils to do the exercises on page 149 of the Student’s Book.

Homework
Ask pupils to do Workbook 4B—Worksheet 32 and Practice 8.

Answers

page 149

1. (a) 4  (b) 3.7  (c) 3.7
2. 38 kg, 41 kg
3. 2.2 m, 8.3 m
4. Rs 53
5. 0.22 l

WORK Sheet 32

1. (a) 36  (b) 8.6  (c) 10.4  (d) 12.44
2. (a) 2  (b) 8  (c) 10  (d) 8  (e) 47  (f) 7
3. (a) 1.6  (b) 3.4  (c) 7.5  (d) 6.5  (e) 6.5
   (f) 14.4  (g) 54.6  (h) 10.4  (i) 23.3  (j) 17.6
4. (a) 5.63  (b) 1.04  (c) 2.11  (d) 3.40
   (e) 9.22  (f) 2.28  (g) 13.23  (h) 21.71
5. (a) Rs 19  (b) Rs 30  (c) Rs 83  (d) Rs 49
6. (a) 2 kg  (b) 4 kg
7. 44 kg
8. 18 km
Practice 8

1. (a) 42.6   (b) 16.38   (c) 35.104
2. (a) 6      (b) 3      (c) 7      (d) 14     (e) 28     (f) 16
3. (a) 3.8    (b) 7      (c) 4.3    (d) 91.9   (e) 14.2   (f) 35.2
4. (a) 2.17   (b) 9.07   (c) 6.21   (d) 17.07  (e) 61.83  (f) 27.12
5. (a) 7      (b) 2.207  (c) 5      (d) 6
6. (a) 0.427, 4.27, 40.27, 402.7   (b) 1.055, 1.55, 10.55, 105.5
   (c) 0.2308, 2.308, 20.308, 23.08
7. (a) 0, 0   (b) 9, 0.9 (b) tenths, 0.8   (c) hundredths, 0.09
   (d) thousandths, 0.001 (e) thousandths, 0.008 (f) hundredths, 0.05

Revision (40 min)

Fun with Maths

Ask the pupils to work in pairs on the activity on page 150 of the Student’s Book. Ask a few pupils to share their answers. Go around checking the pupils’ work to ensure that they know how to trace the path using the knowledge learned in comparing and ordering decimals.

2. Revise and go through the pupils’ homework.
Unit 9: Decimals (II)

ADDITION OF DECIMALS

Suggested Duration
3 periods (120 min)

Learning Outcomes
Pupils should be able to:
- add decimals up to 2 decimal places
- estimate answers in calculations
- check if the answers are reasonable
- solve up to 2-step word problems involving addition of decimals

Instructions
Activity 1 (20 min): Add decimals of 1 decimal place
1. Explain to the pupils that addition of decimals follows the same rule as addition of whole numbers. Revise with the pupils on addition of whole numbers.
2. Recall regrouping tenths into ones and tenths and then write the answer in decimal. For example, 17 tenths = 1 one 7 tenths = 1.7
3. Write 1.5 + 0.3 on the board. Read it as 'one point five plus zero point three'. Point out that this addition example is one that does not involve regrouping the tenths into ones and tenths. Go through with the pupils the following steps in adding decimals of 1 decimal place without regrouping:
   Step 1
   Write the addition sentence vertically with the decimal point and digits properly aligned as follows:
   
   
   

   Step 2
   Add the tenths: 5 tenths + 3 tenths = 8 tenths = 0.8
   Since 8 tenths is less than 10 tenths, there is no regrouping needed.
   Write 8 at the tenths place as follows:
   
   
   

   


Step 3
Add the ones: 1 one + 0 one = 1 one
Write 1 at the ones place as follows:

1 . 5
+ 0 . 3
------
1 . 8  \( \Rightarrow \) Answer

4. Show more examples of addition of decimals of 1 decimal place with no regrouping for pupils to practise.

5. Write 1.5 + 0.8 on the board. Read it as ‘one point five plus zero point eight’. Point out that this addition example is one that involves regrouping the tenths into ones and tenths. Go through with the pupils the following steps in adding decimals of 1 decimal place with regrouping:

   Step 1
Write the addition sentence vertically with the decimal point and digits properly aligned as follows:

   1 . 5
+ 0 . 8
------

   Step 2
Add the tenths: 5 tenths + 8 tenths = 13 tenths = 1.3
Since 13 tenths is more than 10 tenths, regroup it into 1 one and 3 tenths.
Write 3 at the tenths place and 1 at the top of the ones column as follows:

   1
  1 . 5
+ 0 . 8
------
   . 3

   Step 3
Add the ones: 1 one + 1 one + 0 one = 2 ones
Write 2 at the ones place as follows:

   1 . 5
+ 0 . 3
------
2 . 8  \( \Rightarrow \) Answer

6. Show more examples of addition of decimals of 1 decimal place with regrouping into ones and tenths for pupils to practise.

Activity 2 (20 min): Addition of decimals of 2 decimal places
1. Write 1.53 + 2.32 on the board. Read it as ‘one point five three plus two point three two’.
Point out that this addition example is one that does not involve regrouping. Go through with the pupils the following steps in adding decimals of 2 decimal places without regrouping:

Step 1
Write the addition sentence vertically with the decimal point and digits properly aligned as follows:

\[
\begin{array}{c}
1.53 \\
+ 2.32 \\
\hline
\end{array}
\]

Step 2
Add the hundredths: 3 hundredths + 2 hundredths = 5 hundredths = 0.5
Since 5 hundredths is less than 10 hundredths, regrouping is not needed.
Write 5 at the hundredths place as follows:

\[
\begin{array}{c}
1.53 \\
+ 2.32 \\
\hline
.5 \\
\end{array}
\]

Step 3
Add the tenths: 5 tenths + 3 tenths = 8 tenths
Since 8 tenths is less than 10 tenths, regrouping is not needed.
Write 8 at the tenths place as follows:

\[
\begin{array}{c}
1.53 \\
+ 2.32 \\
\hline
.85 \\
\end{array}
\]

Step 4
Add the ones: 1 one + 2 ones = 3 ones
Write 3 ones at the ones place as follows:

\[
\begin{array}{c}
1.53 \\
+ 2.32 \\
\hline
3.85 \quad \text{answer} \\
\end{array}
\]

2. Give more examples of addition of decimals of 2 decimal places without regrouping for pupils to practise.

3. Write 1.57 + 2.86 on the board. Read it as ‘one point five seven plus two point eight six’.
Point out that this addition example is one that involves 2 regroupings: (1) hundredths à hundredths and tenths (2) tenths à ones and tenths. Go through with the pupils the following steps in adding decimals of 2 decimal places with regroupings:
Step 1
Write the addition sentence vertically with the decimal point and digits properly aligned as follows:

\[
\begin{array}{c}
1.57 \\
+ 2.86 \\
\hline
\end{array}
\]

Step 2
Add the hundredths: 7 hundredths + 6 hundredths = 13 hundredths = 0.13
Since 13 hundredths is more than 10 hundredths, regroup it into 1 tenth and 3 hundredths.
Write 3 at the hundredths place and 1 at the top of the tenths column as follows:

\[
\begin{array}{c}
1 \\
1.57 \\
+ 2.86 \\
\hline
.3
\end{array}
\]

Step 3
Add the tenths: 1 tenth + 5 tenths + 8 tenths = 14 tenths = 1.4
Since 14 tenths is more than 10 tenths, regroup it into 1 one and 4 tenths.
Write 4 at the tenths place and 1 at the top of the ones column as follows:

\[
\begin{array}{c}
1 \\
1.57 \\
+ 2.86 \\
\hline
.43
\end{array}
\]

Step 4
Add the ones: 1 one + 1 one + 2 ones = 4 ones
Write 4 at the ones place

\[
\begin{array}{c}
1 \\
1.57 \\
+ 2.86 \\
\hline
4.43 \rightarrow \text{answer}
\end{array}
\]

4. Show more examples of addition of decimals of 2 decimal places with regroupings for pupils to practise.
5. Go through with the pupils the examples on pages 152–153 of the Student’s Book.

**Activity 3 (40 min): Estimate answers in calculations**
1. Revise with the pupils, rounding off of decimals. Tell the pupils that:
• To round off to the nearest whole number, look at the digit in the tenths place. If the digit is 5 or more, round off to the higher whole number. If the digit is less than 5, round off to the lower whole number.

Example: 3.4 ≈ 3 and 3.7 ≈ 4

• To round off to 1 decimal place, look at the digit in the hundredths place. If the digit is 5 or more, round off to the next higher tenth. If the digit is less than 5, round off to the lower tenth.

Example: 3.54 ≈ 3.5 and 3.65 ≈ 3.7

• To round off to 2 decimal places, look at the digit in the thousandths place. If the digit is 5 or more, round off to the next higher hundredth. If the digit is less than 5, round off to the lower hundredth.

Example: 7.492 ≈ 7.49 and 7.498 ≈ 7.50

2. Provide more examples for the pupils to practise rounding off.

3. Explain to the pupils that estimating the answers in calculations involves rounding off the decimals before the calculation. Go through with the pupil the examples on pages 154–156 of the Student’s Book. For each of the examples, lead the pupils to determine whether the estimated answer is close to the actual answer. If it is, then we say that the estimation is reasonable.

Activity 4 (25 min): Solve up to 2-step word problems involving addition of decimals

1. Emphasize to the pupils the following steps in solving up to 2-step word problems involving the addition of decimals:

   Step 1
   Analyze the word problem by reading it a few times.
   Determine if it is a 1-step or 2-step word problem.

   Step 2
   Do an estimation of the answer by rounding off the decimals and adding them mentally.

   Step 3
   Write the addition sentence vertically. Make sure that the decimal point and the digits are aligned correctly.

   Step 4
   Add the digits. Do a carry and regroup if necessary.

   Step 5
   Check if the calculated answer is reasonable by comparing it against the estimated one.

   Step 6
   Write the sentence answer.

2. Write some word problems involving addition of decimals and solve them by going through the steps.
3. Ask 3 pupils to write their heights in metres on the board and ask the rest of the class to calculate their total heights. Repeat this using other pupils. You may use weights in kg instead of heights.

Let’s Try...

Activity 6 (15 min): Individual practice
1. Ask the pupils to do the exercises on page 157 of the Student’s Book.

Homework
1. Ask pupils to do Workbook 4B—Worksheet 33.

Answers

1. (a) 11.22 (b) 62.35 (c) 31.74 (d) 107.34
2. 1.73 m
3. Rs 122.85
4. Rs 88.10
5. 21.25 ≈ 21.3 kg

WORK 33

1. (a) 7, 0.7 (b) 14, 1.4 (c) 6, 0.6
2. (a) 4.6 (b) 9.9 (c) 25.4 (d) 55.7 (e) 112.8 (f) 27.5
3. (a) 27.5 (b) 60.51 (c) 57.09 (d) 90 (e) 76.94 (f) 53.35
4. (a) 100.11, 100, 100 (b) 100.27, 100, 100 (c) 96.15, 97, 97
5. 6.7 kg
6. Rs 185.05

SUBTRACTION OF DECIMALS

Suggested Duration
4 periods (160 min)

Learning Outcomes
Pupils should be able to:
- subtract decimals up to 2 decimal places
- estimate answers in calculations
- check reasonableness of answers
- solve up to 2-step word problems involving subtraction of decimals
Instructions

Activity 1 (40 min): Subtract decimals of 1 decimal place

1. Explain to the pupils that subtraction of decimals follows the same rule as subtraction of whole numbers. Revise with the pupils subtraction of whole numbers.

2. Recall the concept of borrowing and renaming: minus 1 one from the digit in the ones place and rename it as 10 tenths and then add the 10 tenths to the digit in the tenths place.

   Give an example (3.4 – 1.7):
   \[
   \begin{array}{c}
   2 \quad 14 \\
   \hline
   3 \quad . \quad 4 \\
   - \quad 1 \quad . \quad 7 \\
   \hline
   1 \quad . \quad 7
   \end{array}
   \]

3. Write 4.8 – 3.5 on the board. Read it as ‘four point eight minus three point five’. Point out that this subtraction example is one that does not involve borrowing and renaming. Go through with the pupils the following steps in subtracting decimals of 1 decimal place without borrowing and renaming:

   Step 1
   Write the subtraction sentence vertically with the decimal point and digits properly aligned as follows:
   \[
   \begin{array}{c}
   4 \quad . \quad 8 \\
   - \quad 3 \quad . \quad 5 \\
   \hline
   \end{array}
   \]

   Step 2
   Subtract tenths: 8 tenths – 5 tenths = 3 tenths = 0.3
   Write 3 at the tenths place as follows:
   \[
   \begin{array}{c}
   4 \quad . \quad 8 \\
   - \quad 3 \quad . \quad 5 \\
   \hline
   . \quad 3
   \end{array}
   \]

   Step 3
   Subtract the ones: 4 ones – 3 ones = 1 one
   Write 1 at the ones place as follows:
   \[
   \begin{array}{c}
   4 \quad . \quad 8 \\
   - \quad 3 \quad . \quad 5 \\
   \hline
   1 \quad . \quad 3 \quad \leftarrow \text{answer}
   \end{array}
   \]
4. Give more examples of subtraction of decimals of 1 decimal place with no borrowing and renaming for pupils to practise.

5. Write $6.5 - 2.8$ on the board. Read it as ‘six point five minus two point eight’. Point out that this subtraction example is one that involves borrowing and renaming. Go through with the pupils the following steps in subtracting decimals of 1 decimal place involving borrowing and renaming:

**Step 1**
Write the subtraction sentence vertically with the decimal point and digits properly aligned as follows:

\[
\begin{array}{c}
6.5 \\
- 2.8 \\
\hline
\end{array}
\]

**Step 2**
Subtract the tenths: $5$ tenths – $8$ tenth, but this is not possible, so borrow 1 one from 6 ones, rename it to $10$ tenths and add to the 5 tenths to become $15$ tenths.

Then subtract $8$ tenths from $15$ tenths: $15$ tenths – $8$ tenths = $7$ tenths = $0.7$

Write $7$ at the tenths place as follows:

\[
\begin{array}{c}
5 \\
6.5 \\
- 2.8 \\
\hline
7 \\
\end{array}
\]

**Step 3**
Subtract the ones: $5$ ones – $2$ ones = $3$ ones

Write $3$ at the ones place as follows:

\[
\begin{array}{c}
5 \\
6.5 \\
- 2.8 \\
\hline
3.7 \\
\end{array}
\]

6. Show more examples of subtraction of decimals of 1 decimal place involving borrowing and renaming. Let pupils practise the steps taught.

**Activity 2 (40 min): Subtraction of decimals of 2 decimal places**

1. Write $6.53 - 2.32$ on the board. Read it as ‘six point five three minus two point three two’. Point out that this subtraction example does not involve borrowing and renaming. Go through with the pupils the following steps in subtracting decimals of 2 decimal places without borrowing and renaming:
Step 1
Write the subtraction sentence vertically with the decimal point and digits properly aligned as follows:

\begin{align*}
6.53 \\
- 2.32 \\
\hline
\end{align*}

Step 2
Subtract the hundredths: 3 hundredths – 2 hundredths = 1 hundredth = 0.01
Write 1 at the hundredths place as follows:

\begin{align*}
6.53 \\
- 2.32 \\
\hline
0.1
\end{align*}

Step 3
Subtract the tenths: 5 tenths – 3 tenths = 2 tenths = 0.2
Write 2 at the tenths place as follows:

\begin{align*}
6.53 \\
- 2.32 \\
\hline
2.1
\end{align*}

Step 4
Subtract the ones: 6 ones – 2 ones = 4 ones
Write 4 at the ones place as follows:

\begin{align*}
6.53 \\
- 2.32 \\
\hline
4.21 \quad \text{answer}
\end{align*}

2. Give more examples of subtraction of decimals of 2 decimal places with no borrowing and renaming for pupils to practise.

3. Write 9.53 – 2.86 on the board. Read it as ‘nine point five three minus two point eight six’. Point out that this subtraction example is one that involves borrowing and renaming. Go through with the pupils the following steps in subtracting decimals of 2 decimal places:

Step 1
Write the subtraction sentence vertically with the decimal point and digits properly aligned as follows:

\begin{align*}
9.53 \\
- 2.86 \\
\hline
\end{align*}
Step 2
Subtract the hundredths: 3 hundredths – 6 hundredths, but this is not possible, so borrow 1 tenth from 5 tenths, rename it to 10 hundredths and add to the 3 hundredths to give 13 hundredths.
Then subtract 6 hundredths from 13 hundredths: 13 hundredths – 6 hundredths = 7 hundredths = 0.07
Write 7 at the hundredths place as follows:

\[
\begin{array}{c}
4 \\
9.53 \\
\hline
- 2.86 \\
\hline
.3 \\
\end{array}
\]

Step 3
Subtract the tenths: 4 tenths – 8 tenths, but this is impossible, so borrow 1 one from the 9 ones, rename it to 10 tenths and add to the 4 tenths to give 14 tenths.
Then subtract 8 tenths from 14 tenths: 14 tenths – 8 tenths = 6 tenths = 0.6
Write 6 at the tenths place as follows:

\[
\begin{array}{c}
8 \\
9.53 \\
\hline
- 2.86 \\
\hline
6.7 \\
\end{array}
\]

Step 4
Subtract ones: 8 ones – 2 ones = 6 ones
Write 6 at the ones place

\[
\begin{array}{c}
8 \\
9.53 \\
\hline
- 2.86 \\
\hline
6.67 \\
\end{array}
\]

\[
\text{answer}
\]

4. Give more examples of subtraction of decimals of 2 decimal places involving borrowing and renaming. Let pupils practise on the steps taught.

5. Go through with the pupils the examples on pages 158–159 of the Student’s Book.

**Activity 3 (40 min): Estimate answers in calculations**

1. Revise with the pupils, rounding off of decimals.
2. Provide examples for the pupils to practise rounding off.
3. Remind the pupils that estimating the answers in calculations involves rounding off the decimals before the calculation. Go through with the pupil the examples on pages 160–161 of the Student’s Book. For each of the examples, lead the pupils to determine whether the
estimated answer is close to the actual answer. If it is, then we say that the estimation is reasonable.

Activity 4 (25 min): Solve up to 2-step word problems involving subtraction of decimals

1. Emphasize to the pupils the following steps in solving up to 2-step word problems involving the subtraction of decimals:
   Step 1
   Analyze the word problem by reading it a few times.
   Determine if it is a 1-step or 2-step word problem.
   Step 2
   Do an estimation of the answer by rounding off the decimals and subtracting them mentally.
   Step 3
   Write the subtraction sentence vertically. Make sure that the decimal point and the digits are aligned correctly.
   Step 4
   Subtract the digits. Do a borrowing and renaming if necessary.
   Step 5
   Check if the calculated answer is reasonable by comparing it against the estimated one.
   Step 6
   Write the sentence answer.

2. Write on the board some word problems involving subtraction of decimals and solve the problem by going through the steps.

3. Ask 2 pupils to write their heights in metres on the board and ask the rest of the class to calculate the difference in their heights. Repeat this using other pupils.

Let’s Try…

Activity 5 (15 min): Individual practice

1. Ask the pupils to do the exercises on page 162 of the Student’s Book. Ask the pupils to check their answer with their partner and to help each other. Go around assessing pupils’ ability to perform subtraction of decimals.

Homework

1. Ask pupils to do Workbook 4B—Worksheet 34.

Answers

<table>
<thead>
<tr>
<th>Exercise</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a)</td>
<td>0.4</td>
</tr>
<tr>
<td>(b)</td>
<td>0.51</td>
</tr>
<tr>
<td>(c)</td>
<td>1.8</td>
</tr>
<tr>
<td>(d)</td>
<td>10.4</td>
</tr>
<tr>
<td>(e)</td>
<td>1.36</td>
</tr>
<tr>
<td>(f)</td>
<td>9.87</td>
</tr>
</tbody>
</table>
2. Rs 14.65
3. 21.8 kg
4. 0.85 l
5. $3.18 \approx 3$ km
6. 0.2 l

**WORK**

**WORK**

**SHEET 34**

1. (a) 6, 0.6  (b) 4, 0.4  (c) 2, 0.2  (d) 1, 0.1
2. (a) 7.9  (b) 16.3  (c) 4.9  (d) 6.9  (e) 5.2  (f) 3.1
3. (a) 5, 0.05  (b) 3, 2, 0.32  (c) 0.74  (d) 0.93
4. (a) 4.57  (b) 13.48  (c) 19.66  (d) 5.66
   (e) 7.79  (f) 18.15  (g) 6.94  (h) 17.65
5. (a) 16.05, 16, 16  (b) 16.54, 16, 16  (c) 8.03, 8, 8
6. 51.35 kg
7. Rs 13.30

---

**MULTIPLICATION OF DECIMALS**

**Suggested Duration**

4 periods (160 min)

**Learning Outcomes**

Pupils should be able to:

- multiply decimals up to 2 decimal places by a 1-digit whole number
- estimate answers in calculations
- check if the answers are reasonable
- solve up to 2-step word problems involving multiplication

**Instructions**

*Let's Learn…*

**Activity 3 (40 min): Multiply decimals of 1 decimal place by a 1-digit number**

1. Explain to the pupils that multiplication of decimals follows the same rule as multiplication of whole numbers. Revise with the pupils multiplication of whole numbers using the vertical method as follows:

   To multiply 312 by 3:
   
   \[
   \begin{array}{c}
   312 \\
   \times 3 \\
   \hline
   936
   \end{array}
   \]
2. Write 43.2 × 2 on the board. Read it as ‘forty three point two times two’. Point out that this multiplication example is one that does not involve regrouping. Go through with the pupils the following steps in multiplying decimals of 1 decimal place without regrouping:

Step 1
Write the multiplication sentence vertically with the decimal point and digits properly aligned as follows:

\[
\begin{array}{c}
4.3\,2 \\
\times 2 \\
\hline
\end{array}
\]

Step 2
Multiply the tenths: 2 tenths × 2 = 4 tenths = 0.4
Since 4 tenths is less than 10 tenths, there is no regrouping needed.
Write 4 at the tenths place as follows:

\[
\begin{array}{c}
4.3\,2 \\
\times 2 \\
\hline
.4 \\
\end{array}
\]

Step 3
Multiply the ones: 3 ones × 2 = 6 ones = 6
Write 6 at the ones place as follows:

\[
\begin{array}{c}
4.3\,2 \\
\times 2 \\
\hline
6.4 \\
\end{array}
\]

Step 4
Multiply the tens: 4 tens × 2 = 8 tens = 80
Write 8 at the tens place as follows:

\[
\begin{array}{c}
4.3\,2 \\
\times 2 \\
\hline
86.4 \quad \text{answer} \\
\end{array}
\]

3. Give more examples of multiplication of decimals of 1 decimal place with no regrouping for the pupils to practise.

4. Write 24.7 × 8 on the board. Read it as ‘twenty four point seven times eight’. Point out that this multiplication example is one that involves regrouping the tenths into ones and tenths. Go through with the pupils the following steps in multiplying decimals of 1 decimal place with regrouping:
Step 1
Write the multiplication sentence vertically with the decimal point and digits properly aligned as follows:
\[
\begin{array}{c}
2.42 \\
\times \\
8 \\
\end{array}
\]

Step 2
Multiply the tenths: 7 tenths \(\times 8 = 56\) tenths = 5.6
Since 56 tenths is more than 10 tenths, regroup it into 5 ones and 6 tenths.
Write 6 at the tenths place and 5 at the top of the ones place as follows:
\[
\begin{array}{c}
5 \\
2.47 \\
\times \\
8 \\
\end{array}
\]

Step 3
Multiply the ones: 4 ones \(\times 8 = 32\) ones
Add 32 ones and 5 ones \(\Rightarrow 37\) ones
Since 37 ones is more than 10 ones, regroup it into 3 tens and 7 ones.
Write 2 at the ones place and 7 at the top of the tens column as follows:
\[
\begin{array}{c}
35 \\
2.47 \\
\times \\
8 \\
\end{array}
\]

Step 4
Multiply the tens: 2 tens \(\times 8 = 16\) tens
Add 16 tens and 3 tens \(\Rightarrow 19\) tens
Write 9 at the tens place and 1 at the hundreds place as follows:
\[
\begin{array}{c}
35 \\
24.7 \\
\times \\
8 \\
\end{array}
\]

Answer: 197.6

5. Give more examples of multiplication of decimals of 1 decimal place with regrouping for pupils to practise.

Activity 2 (40 min): Multiplication of decimals of 2 decimal places
1. Write 3.21 \(\times 2\) on the board. Read it as ‘three point two one times two’. Point out that this
multiplication example is one that does not involve regrouping. Go through with the pupils the following steps in multiplying decimals of 2 decimal place without regrouping:

Step 1
Write the multiplication sentence vertically with the decimal point and digits properly aligned as follows:

\[
\begin{array}{c}
3.21 \\
\times \\
2 \\
\end{array}
\]

Step 2
Multiply the hundredths: 1 hundredth × 2 = 2 hundredths = 0.02
Since 2 hundredths is less than 10 hundredths, there is no regrouping needed.
Write 2 at the hundredths place as follows:

\[
\begin{array}{c}
3.21 \\
\times \\
2 \\
\end{array}
\]
\[
.2
\]

Step 3
Multiply the tenths: 2 tenths × 2 = 4 tenths = 0.4
Since 4 tenths is less than 10 tenths, there is no regrouping needed.
Write 4 at the tenths place as follows:

\[
\begin{array}{c}
3.21 \\
\times \\
2 \\
\end{array}
\]
\[
.42
\]

Step 4
Multiply the ones: 3 ones × 2 = 6 ones = 6
Write 6 at the ones place as follows:

\[
\begin{array}{c}
3.21 \\
\times \\
2 \\
\end{array}
\]
\[
6.42 \quad \leftarrow \text{answer}
\]

2. Give more examples of multiplication of decimals of 2 decimal places with no regrouping for pupils to practise.

3. Write 3.27 × 9 on the board. Read it as 'three point two seven times nine'. Point out that this multiplication example is one that involves regrouping. Go through with the pupils the following steps in multiplying decimals of 2 decimal places with regrouping:
Step 1
Write the multiplication sentence vertically with the decimal point and digits properly aligned as follows:
\[
\begin{array}{c}
3.27 \\
\times \\
9 \\
\hline \\
.3
\end{array}
\]

Step 2
Multiply the hundredths: 7 hundredths \(\times 9 = 63\) hundredths = 0.63
Since 63 hundredths is more than 10 hundredths, regroup it into 6 tenths and 3 hundredths.
Write 3 at the hundredths place and 6 at the top of the tenths column as follows:
\[
\begin{array}{c}
6 \\
3.27 \\
\times \\
9 \\
\hline \\
.3
\end{array}
\]

Step 3
Multiply the tenths: 2 tenths \(\times 9 = 18\) tenths
Add 18 tenths and 6 tenths \(\Rightarrow 24\) tenths
Since 24 tenths is more than 10 tenths, regroup it into 2 ones and 4 tenths.
Write 4 at the tenths place and 2 at the top of the ones column as follows:
\[
\begin{array}{c}
2 \\
6 \\
3.27 \\
\times \\
9 \\
\hline \\
.43
\end{array}
\]

Step 4
Multiply the ones: 3 ones \(\times 9 = 27\) ones
Add 27 ones and 2 ones \(\Rightarrow 29\) tens
Write 7 at the ones place and 2 at the tens place as follows:
\[
\begin{array}{c}
2 \\
6 \\
3.27 \\
\times \\
9 \\
\hline \\
29.43
\end{array}
\]

4. Give more examples of multiplication of decimals of 2 decimal places with regrouping for pupils to practise.

5. Go through with the pupils the examples on pages 163–164 of the Student’s Book.
Activity 3 (30 min): Estimate answers in calculations
1. Revise with the pupils on rounding off of decimals.
2. Provide examples for the pupils to practise rounding off.
3. Remind the pupils that estimating the answers in calculations involves rounding off the decimals to the nearest whole number and then perform mental multiplication to arrive at the estimated answer.
   For example, $5.67 \times 6 \approx 6 \times 6 = 36$ ($5.67$ is rounded off to $6$)
4. Provide more examples of multiplication sums for pupils to practise estimating the answer.
5. Go through with the pupil the examples on pages 165–166 of the Student’s Book. For each of the examples, lead the pupils to determine whether the estimated answer is close to the actual answer. If it is, then we say that the estimation is reasonable.

Activity 4 (40 min): Solve up to 2-step word problems involving multiplication of decimals
1. Emphasize to the pupils the following steps in solving up to 2-step word problems involving the multiplication of decimals:
   Step 1
   Analyze the word problem by reading it a few times.
   Determine if it is a 1-step or 2-step word problem.
   Step 2
   Do an estimation of the answer by rounding off the decimals and subtracting them mentally.
   Step 3
   Draw a model to represent the word problem.
   Step 4
   Write the multiplication sentence vertically. Make sure that the decimal point and the digits are aligned correctly.
   Step 5
   Multiply the digits. Do regrouping if necessary.
   Step 6
   Check if the calculated answer is reasonable by comparing it against the estimated one.
   Step 7
   Write the sentence answer.
2. Write on the board more word problems involving multiplication of decimals and solve the problem by going through the steps.
**Let's Try...**

**Activity 5 (40 min): Individual practice**
1. Ask the pupils to do the exercises on page 167 of the Student's Book. Ask the pupils to check their answers with their partner and to help each other. Go around assessing pupils' ability to carry out multiplication of decimals.

**Homework**
1. Ask pupils to do Workbook 4B—Worksheet 35.

### Answers

**page 167**

1. (a) 45  (b) 51.92  (c) 74.34  (d) 128.73  (e) 82  (f) 222.12
2. 1 kg
3. 5.25 = 5 l
4. Rs 418.8
5. Rs 502.8

**WORKSHEET 35**

1. (a) 6, 0.6  (b) 21, 2.1  (c) 72, 7.2  (d) 2.4
2. (a) 11.2  (b) 230.4  (c) 72.1  (d) 91.55  (e) 2.34  (f) 511.65
3. (a) 38.1, 13 × 3 = 39, 39  (b) 41.8, 8 × 5 = 40, 40  (c) 316.32, 40 × 8 = 320, 320
4. 2.1 l
5. Rs 174.60
6. Rs 112.95

### DIVISIONS OF DECIMALS

**Suggested Duration**
5 periods (200 min)

**Learning Outcomes**

Pupils should be able to:
- divide decimals up to 2 decimal places by a 1-digit whole number
- divide a whole number by a whole number with answer in decimal form
- estimate answers in calculations
- check reasonableness of answers
- solve up to 2-step word problems involving division of decimals
Instructions

Let’s Learn…

Activity 1 (40 min): Divide decimals up to 2 decimal places by a 1-digit number

1. Revise with the pupils the long division algorithm to divide numbers by a 1-digit whole number. Recall the terms quotient and remainder. Give some examples for the pupils to practise on the board.

2. Explain to the pupils that division of decimals follows the same rule as division of whole numbers. Remind the pupils that in division, the digit in the highest place value is divided first i.e. from left to right. This is different from multiplication where the multiplication starts from the digit in the lowest place value. For example to divide a decimal of 2 decimal places such as 234.56, the steps are as follows:
   - Step 1: Divide the hundreds
   - Step 2: Divide the tens
   - Step 3: Divide the ones
   - Step 4: Divide the tenths
   - Step 5: Divide the hundredths

3. Reproduce on the board Example 1 on page 168 of the Student’s Book. Ask the pupils to read the word problem together. Go through with the pupils the drawing of model and the long division algorithm. Point out that this is an example of dividing decimals of 1 decimal point.

4. Reproduce on the board Example 2 on page 169 of the Student’s Book. Ask the pupils to read the word problem together and explain by drawing a model. Then, lead the pupils through the long division algorithm. Point out that this is an example of dividing decimals of 2 decimal points.

5. Provide more division examples, both word problems and division sentences for pupils to practise.

Activity 2 (40 min): Divide a whole number by a whole number with answer in decimal form

1. Reproduce on the board Example 4 on page 171 of the Student’s Book. Ask the pupils to read the word problem together and explain by drawing a model. Point out that this is an example of dividing a whole number by another whole number and the answer is in decimal form. Lead the pupils through the long division algorithm. Show how you add in the decimal point and put the zeros after the decimal point.

2. Reproduce on the board Example 5 on page 172 of the Student’s Book. Ask a few pupils to come forward to work out the division on the board.

Activity 3 (40 min): Estimate answers in calculations

1. Revise with the pupils, rounding off of decimals.

2. Provide examples for the pupils to practise rounding off.
3. Remind the pupils that estimating the answers in calculations involves rounding off the decimals to the nearest whole number and then perform mental multiplication to arrive at the estimated answer.

For example, $5.67 \div 3 \approx 6 \div 3 = 2$ (5.67 is rounded off to 6)

4. Provide more examples of division sums for pupils to practise estimating the answer.

5. Go through with the pupil Example 3 on page 48 of the Student’s Book. Lead the pupils to determine whether the estimated answer is close to the actual answer. If it is, then we say that the estimation is reasonable.

**Activity 4 (40 min): Group activity to practise dividing decimals of 2 decimal places by a 1-digit whole number**

1. Lead the pupils to practise dividing decimals of 2 decimal places by a 1-digit whole number by getting them to find the average height as follows:
   - Divide the pupils into groups of 6
   - Have the pupils write down their heights in metres up to 2 decimal places.
   - Ask each group to add up their heights to find their total heights.
   - Each pupil is to find the average height in their group by dividing the total heights by 6.
   - The pupils are to compare their answer and find out who has the correct answer

2. Repeat No. 1 for finding the average weights.

**Let’s Try**

**Activity 5 (40 min): Individual practice**

1. Ask the pupils try out the exercises on page 173 of the Student’s Book. Go around checking pupils’ work and providing individual guidance where necessary.

**Homework**

Ask the pupils to do Workbook 4B—Worksheet 36.

**Answers**

Let’s Try

page 173

1. (a) 3.6   (b) 0.3   (c) 0.3   (d) 1.58   (e) 2.4   (f) 1.5
2. 14.4 = 14 kg
3. 0.26 kg
4. 0.73 l
5. Rs 6.96
1. (a) 2, 0.2  (b) 5, 0.5  (c) 6, 0.6  (d) 7, 0.7
2. (a) 2, 0.02  (b) 5, 0.05  (c) 5, 0.05  (d) 9, 0.09
3. (a) 1.9  (b) 2.7  (c) 0.12  (d) 7.73
   (e) 2.4  (f) 3.75  (g) 25.5  (h) 3.25
4. (a) 5.2, 30 ÷ 6 = 5, 5  (b) 6.31, 18 ÷ 3 = 6  (c) 9.25, 36 ÷ 4 = 9, 9
5. 23.5 kg
6. 0.6 kg

WORD PROBLEMS

Suggested Duration
5 periods (200 min)

Learning Outcomes
Pupils should be able to:
• To solve up to 2-step word problems involving the 4 operations

Instructions

Let’s Learn...

Activity 1 (80 min): Solve 2-step word problems involving the 4 operations
1. Revise with the pupils on drawing models to represent addition, subtraction, multiplication and division. Remind the pupils that solving word problems involving decimals is exactly the same as solving word problems involving whole numbers.
2. Provide examples of word problems to illustrate the use of different operations in solving 2-step word problems involving decimals. Each word problem should involve any 2 operations. Provide for as many combinations as possible. You may use the following examples:
   Addition and addition
   Ali has Rs 2.40 and his brother has Rs 4.30. How much do they have altogether?
   Subtraction and subtraction
   Mary is taller than Ann by 0.07 m. Ann is taller than Jessica by 0.08 m. If Mary is 1.56 m tall, how tall is Jessica?
   Addition and subtraction
   John is 1.45 m tall. His sister is 0.12 m shorter than him. What is their total height?
   Addition and multiplication
   One bag of flour weighs 1.6 kg and one bag of sugar weighs 0.9 kg. Mrs Khan bought 3 bags of flour and 2 bags of sugar. What is the total weight of the items she bought?
Addition and division
Wasif has Rs 5.60 and Tom has Rs 8.90. They decided to put their money together and share them equally between themselves. What is the amount that each will get?

Subtraction and multiplication
A kg of prawns cost Rs 350.50. Nadia bought 3 kg of prawns. If she gives the seller a Rs 5000 note, how much change should she get back?

Subtraction and division
Mr Ahmed has Rs 95.60. After buying 5 identical pens, he is left with Rs 68.40. How much does each chairs cost?

Multiplication and division
Ali saved Rs 0.75 everyday. At the end of the week, he used up all his savings to buy 3 identical bars of chocolates. How much does a bar of chocolates cost?

(For each of the above word problem, draw models as part of your explanation)

2. Go through with the pupils the examples on pages 174–176 of the Student’s Book. Read together with the class each of the word problems. Work out the word problems on the board. Point out that these are 2-step word problems involving combinations of the 4 operations.

3. Write on the board more examples of 2-step word problems involving the 4 operations and ask pupils to solve them.

Activity 2 (40 min): Class activity
1. Pair up the pupils. Each pupil will create 2 word problems involving decimals. Each word problem will require the use of a combination of any 2 operations. They will then solve each other’s word problems created.

Let’s Try…

Activity 3 (40 min): Individual practice
1. Ask the pupils to work out the word problems on page 177 of the Student’s Book. Ask some pupils to show their workings on the board.

Homework
Ask the pupils to do Workbook 4B—Worksheet 37 and Practice 9.

Answers

page 177
1. Rs 107.60
2. Rs 16.45
3. Rs 17
4. 4 m
5. 38 kg
**Worksheet 37**

1. Rs 283.70  
2. 22.5 l $\approx$ 23 l  
3. 10.7 cm  
4. Rs 39.90  
5. Rs 14.95  
6. 26.85 m $\approx$ 26.9 m

**Practice 9**

1. 39.36  
2. 47.43  
3. 163.44  
4. (a) 1.02  (b) 31.75  
5. Rs 58.45 $\approx$ Rs 58  
6. Rs 3.60

**Revision (40 min)**

*Fun with Maths*

1. Ask the pupils to work individually on the fun activity on page 178 of the Student’s Book. Once they have finished, ask them to compare their results with their partners and to check their answers. Ask a few pupils to show their results on the visualiser.

2. Revise and go through pupils’ homework done.
Unit 10: Angles

ESTIMATING AND MEASURING ANGLES

Suggested Duration
5 periods (200 min)

Learning Outcomes
Pupils should be able to:
- estimate angles in degrees
- associate a $\frac{1}{4}$ turn with 90°, a $\frac{1}{2}$ turn with 180°, a $\frac{3}{4}$ turn with 270° and a complete turn with 360°
- measure angles in degrees with a protractor
- use notation such as $\angle$ABC and $\angle$x to name angles

Instructions

Let’s Learn...

Activity 1 (15 min): Recall what an angle is
Things you need: 4 Chinese fans
1. Show a Chinese fan and use it to demonstrate different angles as you open it in different positions.
2. Ask 4 pupils as volunteers. Give each pupil a fan and ask them to open the fan in different positions. Ask pupils to identify which fan has the biggest angle and which the smallest angle.
3. Repeat No.2 with different pupils.
4. Point out to the pupils that an angle is formed when an object rotates about a point.
5. Go through with the pupils the pizza example on page 180 of the Student’s Book.

Activity 2 (25 min): Measure angles in degrees
1. Explain to the class that angles are measured in degrees. For example, 10 degrees is 10°.
2. Enlarge by photocopying the picture on page 181 of the Student’s Book, showing a circle that is divided into 36 equal parts and with one part further divided into 10 smaller equal parts. Use the picture to show what is 10° and 1°. Lead the class to see that the angle formed by one complete round is 360°.

Activity 3 (40 min): Estimate angles in terms of right angles
Things you need: A paper clock, a large rectangular card, a large circle, paper strips made from cardboard material and fasteners
1. Recall what a right angle is by one or more of the following ways:
   - Point at a corner of a rectangle or square
   - Draw one vertical line and one horizontal line intersecting each other. The angle between the two lines is a right angle
   - Cut out a quadrant from a circle. The angle formed is a right angle
   - Show a clock and move the hour hand to the 12 position and the minute hand to the 3 position. The angle formed between the two hands is a right angle

2. Point out the following:
   - one right angle = 90°
   - two right angles = 180° (90° + 90°)
   - three right angles = 270° (90° + 90° + 90°)
   - four right angles = 360° (90° + 90° + 90° + 90°)

3. Give each pupil two paper strips made from cardboard material and a fastener. Guide the pupils to fasten the two strips at the ends using the fastener. The fastener should also act as the pivot for the strips to move freely to form different angles. Lead everyone in the class to follow you in making 90°, 180°, 270° and 360° using the strips.

4. Tell the class to make angles using the strips for the following categories of angles:
   - Less than 90°
   - Between 90° and 180°
   - Between 180° and 270°
   - Between 270° and 360°

5. Test the pupils ability to estimate angles in terms of right angles by showing an angle using the strips and then asking the pupils which category the angle belongs to. You may also call a category of angles and ask the pupils to show using the strips.

**Activity 4 (20 min):** Associate a \( \frac{1}{4} \) turn with 90°, a \( \frac{1}{2} \) turn with 180°, a \( \frac{3}{4} \) turn with 270° and a complete turn with 360°

1. Show a clock with only one hand. By moving the hand, show how to associate a \( \frac{1}{4} \) turn with 90°, a \( \frac{1}{2} \) turn with 180°, a \( \frac{3}{4} \) turn with 270° and a complete turn with 360°.

2. Ask one pupil to come forward. Let him/her face the class. Ask him/her to turn to his/her right. Explain that he has just made a \( \frac{1}{4} \) turn or 90° right. Ask 3 other pupils to demonstrate for \( \frac{1}{2} \) turn or 180° turn, \( \frac{3}{4} \) turn or 270° turn and a complete turn or 360° turn.

3. Go through with the pupils Example 3 on pages 182–183 of the Student’s Book.

**Activity 5 (20 min):** Use notation such as \( \angle ABC \) and \( \angle x \) to name angles

1. Draw a triangle on the board. Name the 3 vertices A, B and C. Emphasize that the letters are in the upper case. Explain to the class that the sign for angles ‘\( \angle \)’ and the following are examples of notations for naming angles:
   - Angle at the point A is written as \( \angle BAC \)
• Angle at the point B is ∠ABC
• Angle at point C is ∠BCA

2. Point out to the pupils that the middle letter is the pivot from which the angle extends.
3. Another notation to represent angles is to write a small letter by the side of the angle and draw a curve from one line to the other line. For example,

4. The angle x is written as ∠x. Emphasize that for this notation, the letter is in the lower case.

**Activity 6 (40 min): Measure angles in degrees using a protractor**
1. Show an enlarged picture of the protractor shown on page 181 of the Student's Book. Point out that the protractor is a mathematical instrument for measuring angles in degrees. Go through with the pupils the different parts of the protractor.
2. Using the board, demonstrate how to use the protractor to measure an angle using the steps illustrated on page 184 of the Student's Book. Emphasize that one of the lines of forming the angle must be aligned with the baseline of the protractor. Tell the class to always read from the 0° mark.
3. Go through with the pupils the examples on page 185 of the Student's Book.
4. Draw more angles on the board and ask pupils to come forward to practise measuring the angles using the protractor.

**Let's Explore**

**Activity 7 (25 min): Interesting activity to enhance learning**

*Things you need: Refer to the activity on page 186 of the Student's Book*
1. Pair up the pupils and ask them to work on the activity on page 188 of the Student’s Book.

**Let’s Try…**

**Activity 8 (15 min): Individual practice**
1. Ask the pupils to try out the exercises on page 188–189 of the Student’s Book.

**Homework**
Ask the pupils to do Workbook 4B—Worksheet 38.
Answers

page 188

1. \( \angle DOB = 100^\circ, \angle FGH = 62^\circ, \angle IHK = 90^\circ \)
2. \( \angle a = 30^\circ, \angle b = 30^\circ, \angle c = 110^\circ, \angle d = 105^\circ, \angle e = 125^\circ \)

WORK Sheeet 38

1. (a) 26°  (b) 150°  (c) 100°  (d) 85°
2. (a) 50°  (b) 40°  (c) 30°  (d) 30°  (e) 50°  (f) 50°
3. (a) 110°  (b) 70°  (c) 130°  (d) 60°
4. (a) 2, 180°  (b) 1, 90°  (c) 3/4, 270°  (d) 1, 360°
5. (a) acute  (b) reflex  (c) acute  (d) obtuse
   (e) reflex  (f) obtuse  (g) obtuse  (h) reflex

DRAWING ANGLES

Suggested Duration
2 periods (80 min)

Learning Outcomes
Pupils should be able to:

• draw angles using a protractor

Instructions

Let’s Learn...

Activity 1 (40 min): Draw angles using a protractor
1. Ask the pupils to turn to page 190 of the Student’s Book. Lead the class to draw angles using a protractor based on the steps shown.
2. Let the pupils practise on the example on page 191 of the Student’s Book.
3. Go around to guide the pupils individually and ensure that all follow the steps taught.
4. Write more angles on the board and let the pupils practise drawing the angles using their protractors.

Let’s Try...

Activity 2 (40 min): Individual practice
1. Ask the pupils to try out the exercises on page 192 of the Student’s Book.

Homework
Ask the pupils to do Workbook 4B—Worksheet 39.
8-POINT COMPASS

Suggested Duration
5 periods (200 min)

Learning Outcomes
Pupils should be able to:
• To associate the 8-point compass with the size of turns

Instructions
Let’s Learn…

Activity 1 (40 min): Know the 8-point compass and its corresponding directions
1. Show the class the compass. Tell them that the compass is used to find directions.
2. Pass it around and let every pupil has the chance to look at it. Ask the pupils to note the
   markings on the compass.
3. Explain to the class that there are 8 different markings on the face of a compass and each
   of these markings tells a specific direction. Ask the pupils to see the picture on page 193
   of the Student’s Book and go through with the pupils the 8 directions.
4. Point out that the angle between 2 direction arrows is 45°.
5. Draw on the board the 8 direction arrows without showing the directions. Ask 8 pupils
   to come forward to label the arrows with the correct directions. Ask the class to check if
   the directions are correctly labelled.
6. Emphasize that in writing the 8 directions, the North direction should always be the arrow
   pointing vertically upwards.
7. Ask the pupils to look at the picture on page 194 of the Student’s Book and teach them
   how to describe directions with respect to two locations. Explain that one of the 2
   locations is the reference location while the other is where you want to find its direction.
   For example, in the sentence, ‘Location A is _____ of Location B, Location B is the
   reference position while Location A is the location which you wish to find its direction.
8. Give some other examples of using 8-point compass to point to 8 different locations from
   a reference location. Ask the pupils questions on the directions of the locations with
   respect to the reference location. You may also change the reference location and ask
   similar questions on the directions of the other locations.

Activity 2 (40 min): Relate turning to directions
1. Explain to the class the terms ‘clockwise’ and ‘anticlockwise’.
2. Show a drawing of the 8-point compass. Point out that moving from one direction arrow
   to the next direction arrow in the 8-point compass involves turning an angle of 45°.
3. Show how different angles (45°, 90°, 135°, 180°, 225° and 270°, 315°) result in different
   directions. Explain that these angles are multiples of 45°. Emphasize that to find
   the direction after turning a certain angle, it is important to first know the initial position
from which the turning takes place. Explain this concept by asking a pupil to come forward and using different initial directions, find the the direction he faces after turning a certain angle clockwise or anticlockwise.

4. Go through with the pupils the examples on page 195 of the Student’s Book.

Let’s Explore

Activity 3 (40 min): Outdoor activity to practise using the 8-point compass
1. Bring the whole class to the school field and try out the activity as described on page 196 of the Student’s Book.
2. Ask a few pupils to share with the class their findings. Have everyone submit their drawings and go through them to ensure the pupils have clear understanding of using the 8-point compass in telling directions.

Let’s Try…

Activity 4 (40 min): Individual practice
1. Ask pupils to do the exercises on pages 197–198 of the Student’s Book. Go through with the pupils the answers.

Homework
Ask pupils to do Workbook 4B–Worksheet 39 and Practice 10.

Answers

page 197

1. (a) D  (b) A  (c) northeast  (d) south
   (e) west  (f) southwest  (g) E
2. (a) north  (b) southeast  (c) ferris wheel ride
   (d) exit  (e) roller coaster ride

WORKSHEET 40
1. (a) east  (b) north-west  (c) south  (d) south-east
2. (a) south  (b) south-west  (c) northeast  (d) south-east
   (e) bakery  (f) playground  (g) petrol station  (h) cinema
3. (a) west  (b) north-east  (c) south-east
   (d) south-west  (e) west  (f) north
4. penguins, ostriches, 135°, 90°, north-east
Practice 10

1. (a) 35°  (b) 130°  (c) 75°  (d) 90°

3. (a) west  (b) south  (c) north-west  (d) west  (e) east  (f) west

Revision (40 min)

Fun With Maths

1. Let the pupils work in pairs on the Fun With Maths activity on page 199 of the Student's Book.

2. Revise and go through pupils' homework.

Revision 1

1. (a) <  (b) >  (c) =  (d) <

2. (a) 4  (b) 8  (c) 152  (d) 1000  (e) 2

3. (a) 6, 0.06  (b) 4, 0.4  (c) thousandth, 0.006
   (d) ones, 7  (e) hundredths, 0.02  (f) tenths, 0.3

4. (a) 145°  (b) 110°  (c) 47°  (d) 160°

5. (a) (i) 43  (ii) 12  (iii) 13  (iv) 46  (v) 39  (vi) 6
   (b) (i) 2.6  (ii) 8.5  (iii) 15.5  (iv) 4.5  (v) 41.4  (vi) 24.6
   (c) (i) 1.64  (ii) 18.54  (iii) 36.73  (iv) 49.81  (v) 65.22  (vi) 3.27

6. (a) PQR, 70°  (b) ABC, 120°  (c) JKL, 80°  (d) XYZ, 120°

7. (a) 31.2  (b) 51.93  (c) 82.38  (d) 123.61  (e) 59.16  (f) 80.04

8. (a) 1.44  (b) 5.04  (c) 2.35  (d) 20.91  (e) 18.87  (f) 45.87

9. (a) 64.62  (b) 348.84  (c) 157.01  (d) 349.52

10. (a) 0.45  (b) 2.35  (c) 7.19  (d) 0.475
1. (a) 6.025, 6.2, 6.205, 6.25  
   (b) 2, 2.01, 2.1, 2.12  
   (c) 5.039, 5.309, 5.39, 5.9
2. (a) 3/4  
   (b) 360°
3. (a) 7/20  
   (b) 2 9/25  
   (c) 3 671/1000  
   (d) 4 11/20
4. (a) 0.2  
   (b) 0.15  
   (c) 0.48  
   (d) 2.37
5. (a) 49.06, 24 + 26 = 50, 50  
   (b) 24.46, 50 – 26 = 24, 24  
   (c) 52.44, 9 × 6 = 54, 54  
   (d) 2.96, 24 ÷ 8 = 3, 3
7. (a) 19.9  
   (b) 0.75  
   (c) 0.6  
   (d) 18.1
8. Rs 45.40
9. Rs 184.90
10. north-west, anticlockwise, south-west, south-west, 225°, north, south-east, anticlockwise
11. Rs 369
12. Rs 2
13. Rs 2
14. Rs 190.65
15. Rs 26.14
16. 50 l
17. 0.76 kg
Unit 11: Squares and Rectangles

SQUARES AND RECTANGLES

Suggested Duration
6 periods (240 min)

Learning Outcomes
Pupils should be able to:
- identify the properties of a square and a rectangle
- find unknown angles

Instructions

Let’s Learn…

Activity 1 (40 min): Identify the properties of a square

Things you need: 40 cut-out shapes of a square

1. Give each pupil a cut-out shape of a square. Ask the class, ‘How many straight sides a square has?’ Lead the class to see that a square has 4 sides. This is the first property of a square.

2. Ask the pupils to measure the length of each side using their rulers and record the measurements. Ask them what they noticed about the length of each side. Lead the class to see that all 4 sides of a square are of the same length. This is the second property of a square.

3. Ask the pupils to measure the 4 angles in the square. Lead the class to see that all 4 angles are 90° or right angles. This is the third property of a square.

4. Ask the pupils to use a ruler and a set square to check for perpendicular lines. Lead the class to see that there are 2 pairs of perpendicular lines in a square. This is the fourth property of a square.

5. Ask the pupils to use a ruler and a set square to check for parallel lines. Lead the class to see that there are 2 pairs of parallel lines in a square.

6. Test the pupils’ understanding by asking them to write down, on a piece of paper all the properties of a square.

7. Go through with the pupils the example on page 201 of the Student’s Book.

8. Provide more examples on the board for the pupils to practise.

Activity 2 (45 min): Identify the properties of rectangle

Things you need: 40 cut-out shapes of a rectangle

1. Give each pupil a cut-out shape of a rectangle. Ask the class, ‘How many straight sides does a rectangle has?’ Lead the class to see that just like a square, a rectangle too has 4 sides.
This is the first property of a rectangle.

2. Ask the pupils to measure the length of each side of the rectangle using their rulers and record down the measurements. Ask them what they noticed about the length of each side. *Lead the class to see that the opposite sides are equal in length.* This is the second property of a rectangle.

3. Ask the pupils to measure the 4 angles in the rectangle. *Lead the class to see that all 4 angles are 90° or right angles.* This is the third property of a rectangle.

4. Ask the pupils to use a ruler and a set square to check for perpendicular lines. *Lead the class to see that there are 2 pairs of perpendicular lines in a rectangle.* This is the fourth property of a rectangle.

5. Ask the pupils to use the ruler and a set square to check for parallel lines. *Lead the class to see that there are 2 pairs of parallel lines in a rectangle.*

6. Test the pupils’ understanding by asking them to write down on a piece of paper all the properties of a rectangle.

7. Go through with the pupils the example on page 203 of the Student’s Book.

8. Provide more examples on the board for the pupils to practise.

**Activity 3 (40 min): To find unknown angles**

1. Ask pupils to recall how angles are represented. For example: ∠ABC refers to the angle formed at B by the lines AB and BC.

2. Go through with the pupils the examples on page 202 of the Student’s Book.

3. Show more examples on the board for the pupils to practise.

4. Go through with the pupils the Examples 1-3 on pages 204–205 of the Student’s Book. *Lead the class to see that finding unknown angles in a rectangle is the same as for square.*

5. Give more examples on the board for pupils to practise.

**Activity 4 (40 min): Find the lengths of the sides of a figure made from combination of rectangles and squares**

1. Go through with the pupils Example 4 on page 205 of the Student’s Book. Guide the pupils in drawing lines to break up the figure into squares and rectangles. Then, using the property of opposites sides are equal in length, find the lengths of all the sides of the figure.

2. Give more examples on the board for the pupils to practise.

**Activity 5 (40 min): Create squares and rectangles**

*Things you need: Wooden toothpicks*

1. Test the pupils’ understanding of squares and rectangles by asking every pupil to make squares and rectangles of different sizes using wooden toothpicks as follows:
   - Give each pupil about 20 toothpicks.
   - Tell them that each toothpick represents one unit of measure.
   - Ask the pupils to form the smallest square, the smallest rectangle, the biggest square and the biggest rectangle.
• Lead the pupils to see that by joining squares, a rectangle can be formed and by dividing rectangles, squares can be formed.

Let’s Try...
Activity 6 (40 min): Individual practice
1. Let the pupils try out the exercises on page 206 of the Student’s Book.

Homework
Ask pupils to do Workbook 4B—Worksheets 41-42 and Practice 11.

Revision (40 min)
1. Revise and go through pupils’ homework.

Answers

page 206
1. QR // ST, QT // RS, QR \(⊥\) QT, QR \(⊥\) RS, RS \(⊥\) ST, QT \(⊥\) ST
2. \(< a = 50°, < b = 8°\)
3. 30°
4. QS = 10 cm, UV = 6 cm

Worksheet 41
1. 17, 17
2. 90°, 90°, 90°
3. (a) No (b) No (c) No
4. (a) 90° – 45° = 45° (b) 90° – 76° = 14° (c) 90° – 63° = 27°
   (d) 90° – 22° = 68° (e) 90° – 25° – 15° = 50° (f) 90° – 45° – 23° = 22°

Worksheet 42
1. DC, AD, AD & BC, AD & BC, 4, rectangle
2. 14, 27
3. 90°, 90°, 90°, 90°
4. (a) 90° – 50° = 40° (b) 90° – 43° = 47° (c) 90° – 19° = 71°
   (d) 90° – 55° = 35° (e) 90° – 40° – 20° = 30°

Practice 11
1. 20°
2. 17°
3. GC = 3 cm, AE = 10 cm
4. AM = 3 cm
Unit 12: Area and Perimeter

Area and Perimeter of a Square

Suggested Duration
4 periods (160 min)

Learning Outcomes
Pupils should be able to:
- find the area and perimeter of squares
- find the length of one side of a square given its area/perimeter
- solve word problems involving the area/perimeter of squares

Instructions
Let's Learn...

Activity 1 (40 min): Find area and perimeter of squares
Things you need: Cards written with true and false statements regarding area, perimeter, square, area of a square and perimeter of a square

1. Write on cards the following true and false statements regarding area, perimeter, square, area of a square, perimeter of a square, and units for measuring area and perimeter:
   - Area of a figure is the distance around.
   - Area of a figure is the amount of space it occupies.
   - Perimeter of a figure is the amount of space it occupies.
   - Perimeter of a figure is the distance around it.
   - A unit of measuring area is cm.
   - A unit for measuring area is cm².
   - A unit for measuring perimeter is cm.
   - A unit for measuring perimeter is cm².
   - A square has 4 unequal sides.
   - A square has 4 equal sides.
   - A square has 4 right angles.
   - A square has 4 unequal angles.
   - Area of a square is length + length.
   - Area of a square is length × length.
   - Perimeter of a square is length × length.
   - Perimeter of a square is 4 × length.
2. Flash each of the cards and ask the pupils to read and say whether the statement is true or false.

3. Go through with the pupils the examples on page 208 of the Student’s Book.

4. Provide more examples of squares with given length and let pupils practise finding areas and perimeters.

**Activity 2 (40 min):** Find length of one side of a square given its area/perimeter

1. Go through with the pupils the examples on page 209 of the Student’s Book to show how to find the length of one side of a square given its area. Provide more examples for the pupils to practise.

2. Go through with the pupils the examples on page 210 of the Student’s Book to show how to find the length of one side of a square given its perimeter. Provide more examples for the pupils to practise.

**Activity 3 (40 min): Solve word problems involving area/perimeter of squares**

1. Create word problems involving area/perimeter of squares using the following variations:
   - A square field – to find the area given the length of one of its sides
   - A square field – to find the length given its area
   - A square field – to find the perimeter given the length of one of its sides
   - A square field – to find the length given its perimeter

2. Pair up the pupils. One pupil creates a word problem involving area while the other creates a word problem involving perimeter. The pupils take turns to answer each other’s problems. Tell the pupils to create word problems using one of the following items:
   - A square table
   - A square floor
   - A square bed
   - A square poster

3. Have a few pairs share their word problems and the answers to the word problems.

**Let’s Try…**

**Activity 4 (40 min): Individual practice**

1. Ask the pupils to try out the exercises on page 211 of the Student’s Book.

**Homework**

Ask the pupils to do Workbook 4B—Worksheet 43.

**Answers**

page 211

1. (a) 18 cm, 324 cm²   (b) 14 m, 196 m²
2. (a) 7 m, 28 m       (b) 4 cm, 16 cm 
3. 32 m

**WORK SHEET 43**

1. (a) 9 cm, $9 \times 4 = 36$ cm   (b) 8 m, $8 \times 4 = 32$ m   (c) 10 cm, $10 \times 4 = 40$ cm
2. (a) $36 \div 4 = 9$ m, $9 \times 9 = 81$ m²   (b) $80 \div 4 = 20$ cm, $20 \times 20 = 400$ cm² 
   (c) $120 \div 4 = 30$ cm, $30 \times 30 = 900$ cm²
3. (a) 50 cm   (b) 2500 cm² 
4. (a) 6 cm   (b) 24 cm

**AREA AND PERIMETER OF A RECTANGLE**

**Suggested Duration**

4 periods (160 min)

**Learning Outcomes**

Pupils should be able to:
- find the area and perimeter of rectangles
- find the length of one dimension of a rectangle given one dimension and its area / perimeter
- solve word problems involving the area / perimeter of rectangles

**Instructions**

*Let’s Learn…*

**Activity 1 (40 min): Find area and perimeter of rectangles**

1. Recall what a rectangle is and how to find its area and perimeter. Write on the board, ‘Area of rectangle = Length x Breadth’ and ‘Perimeter of rectangle = Length + Length + Breadth + Breadth’.
2. Assess the pupils’ understanding of rectangles by asking them to name some differences between a square and a rectangle.
3. Go through with the pupils the examples on page 212 of the Student’s Book.
4. Provide more examples of rectangles with given lengths and breadths and let pupils practise finding areas and perimeters.

**Activity 2 (40 min): Find length of one dimension of a rectangle given one dimension and its area/perimeter.**

1. Go through with the pupils Examples 3 and 4 on page 213 of the Student’s Book to show how to find the length of one dimension of a rectangle given one dimension and its area. Provide more examples for pupils to practise.
2. Go through with the pupils Examples 5 and 6 on pages 213–214 of the Student’s Book to
show how to find the length of one side of a rectangle given its perimeter. Provide more examples for the pupils to practise.

**Activity 3 (40 min): Solve word problems involving area/perimeter of rectangles**
1. Create word problems involving area/perimeter of rectangles using the following variations:
   - A rectangular field – to find the area given the length and breadth
   - A rectangular field – to find the length given its area and breadth
   - A rectangular field – to find the breadth given its area and length
   - A rectangular field – to find the perimeter given the length and breadth
   - A rectangular field – to find the length given its perimeter and breadth
   - A rectangular field – to find the breadth given its perimeter and length
2. Pair up the pupils. One pupil creates a word problem involving area while the other creates a word problem involving perimeter. The pupils take turns to solve each other’s problems. Ask the pupils to create word problems using one of the following items:
   - A rectangular football field
   - A rectangular table
   - A rectangular swimming pool
   - A rectangular stage
3. Have a few pairs share their word problems and their answers.

**Let’s Explore**

**Activity 4 (25 min): Challenging exercise**
1. Pair up the pupils and have them try out the activity on page 214 of the Student’s Book. Lead the pupils to conclude that rectangles of equal areas do not necessarily mean they have equal perimeters and vice versa.

**Let’s Try…**

**Activity 5 (15 min): Individual practice**
1. Ask the pupils to try out the exercises on page 215 of the Student’s Book.

**Homework**
Ask the pupils to do Workbook 4B—Worksheet 44.

**Answers**

page 215

1. 138 m², 58 m
2. 6, 20 m
3. 11 cm, 198 cm²
4. 26 cm
5. 8 cm
6. 2795 m², 216 m

**WORKSHEET 44**

1. (a) $\frac{63}{9} = 7$ cm, $9 + 9 + 7 + 7 = 32$ cm
   (b) $\frac{168}{7} = 24$ m, $24 + 24 + 7 + 7 = 62$ m
   (c) $\frac{216}{6} = 36$ cm, $36 + 36 + 6 + 6 = 84$ cm
   (d) $\frac{225}{9} = 25$ cm, $25 + 25 + 9 + 9 = 68$ cm
2. (a) 18 cm, 252 cm²  (b) 24 m, 264 m²
   (c) 27 cm, 648 cm²  (d) 32 m, 1120 m²
3. (a) 28 m  (b) 448 m²
4. (a) 39 cm  (b) 94 cm

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**AREA OF COMPOSITE FIGURES**

**Suggested Duration**

3 periods (120 min)

**Learning Outcomes**

Pupils should be able to:
- find the area of a composite figure made up of rectangles and squares

**Instructions**

*Let’s Learn…*

**Activity 1 (40 min): Find area and perimeter of rectangles**

1. Explain to the pupils what a composite figure is. Show some examples of composite figures.
2. Explain that there are two methods to find the area of composite figure:
   - Method 1
     - Divide the composite figure into rectangles and/or squares.
     - Find the areas of the rectangles/squares using the standard formulae.
     - Add up the areas to obtain the total area of the composite figure.
   - Method 2
     - Re-draw the composite figure such that an additional a square or rectangle is introduced to the composite figure to form either a big rectangle or square.
     - Find the area of the big rectangle or square.
     - Find the area of the additional rectangle/square.
     - Subtract the area of the additional rectangle/square from the area of the big rectangle/square to obtain the area of the composite figure.
3. Go through with the pupils the examples on pages 216–218 of the Student’s Book. Provide more examples for the pupils to practise. For every example, ask the pupils to explore both Methods of finding area of composite figures.

**Activity 2 (40 min): Group work to enhance learning**

*Things you need:* Cut-outs shapes of composite figures. Scissors. Ensure that all the sides have length that are exactly in cm

1. Divide the class into groups of 5-6 pupils. Give each group 4 composite figures and 2 pairs of scissors. Every group is given the task to find the total areas of all the composite figures in the shortest time possible. Advise the pupils that they are to first cut the composite figures into rectangles and squares and then measure their dimensions to find their areas. The group that has the correct answers in the shortest time is the winner.

**Let’s Think**

**Activity 3 (25 min): Challenging Activity**

1. Let the pupils work in pairs to solve the challenging activity on page 219 of the Student's Book. Ask some pupils to share their answers with the class.

**Let’s Try…**

**Activity 4 (15 min): Individual practice**

1. Ask the pupils to try out the exercises on page 220 of the Student’s Book.

**Homework**

Ask the pupils to do Workbook 4B—Worksheet 45.

**Answers**

Page 220

1. (a) 40 m²  (b) 1150 cm²  (c) 28 cm²  (d) 148 cm²  (e) 28 cm²

**Word Problems**

**Suggested Duration**

4 periods (160 min)

**Learning Outcomes**

Pupils should be able to:

- solve word problems involving the area/perimeter of squares and rectangles
Instructions

Let's Learn...

Activity 1 (80 min): Solve word problems involving the area/ perimeter of squares and rectangles

1. Go through with the pupils the examples on pages 221–222 of the Student's Book. For each example, ask the pupils to read together the word problems and then work through the solutions together with them. Point out that in solving word problems involving area and perimeter of squares and rectangle, it is important to draw the figure and label the length and breadth with the given information.

2. Provide more examples for the pupils to practise.

Let's Try...

Activity 3 (40 min): Individual practice

1. Ask the pupils to work out the word problems on page 223–224 of the Student's Book. Go around checking the pupils' work and provide individual guidance where necessary. Ask some pupils to show their workings on the board.

Homework

Ask the pupils to do Workbook 4B—Worksheet 46 and Practice 12.

Answers

page 223

1. 18 m²
2. 210 cm²  (b) 43 m²
3. Rs 4680
4. 50
5. 6 m²
6. 64 cm²

Worksheet 46

1. 60 cm²
2. (a) 2100 m²  (b) 1500 m²
3. 12 800 cm²
4. 124 m²
5. (a) 120 m²  (b) 14 m²  (c) 58 m²
Practice 12

1. 57 m²
2. 227 cm²
3. (a) 2700 m²   (b) 2820 m²
4. (a) 10 cm    (b) 40 cm
5. 42 m²
6. Rs 9900
7. Rs 6240

Revision (40 min)

Fun With Maths

1. Pair up the pupils and ask them to work on the interesting activity on page 225 of the Student’s Book. Ask some pupils to share with the class their solutions.
2. Revise and go through the pupils’ homework.
Unit 13: Time

MEASURING TIME IN SECONDS

Suggested Duration
2 periods (80 min)

Learning Outcomes
Pupils should be able to:

- measure time in seconds

Instructions

Let’s Learn

Activity 1 (25 min): Measure time in seconds

Things you need: A real clock with 3 hands.

1. Show a real clock with 3 hands: hour hand, minute hand and second hand. Ask the pupils to identify the hour hand, the minute hand and the second hand. The hour hand is the shortest hand while the second hand is the fastest moving hand. The remaining hand is the minute hand.

2. Tell the class that the second hand measures time in seconds. Write ‘second’ on the board and ask the pupils to repeat it after you. Point out that the short form for writing second is ‘s’.

3. Recall that the other units of time are minute (min) and hour (h).

4. Go through with the pupils the examples on pages 227–228 of the Student’s Book.

5. Ask the pupils to think of events that are measured in seconds. For example, running a 100 m race, shuttle run, the ringing of the school bell, etc.

6. Ask the pupils to recite ‘one thousand’, ‘two thousand’, ‘three thousand’ at a normal reading pace. Point out that the time taken to recite each of these is about 1 second.

Let’s Try…

Activity 2 (15 min): Individual practice

1. Ask the pupils to try out the exercises on page 229 of the Student’s Book.

Homework

Ask the pupils to do Workbook 4B—Worksheet 47.
Answers

page 229

(a) 25  (b) 35  (c) 40  (d) 50

WORKSheet 47

1.  (a) 15  (b) 20  (c) 22  (d) 26  John
2.  (a) 30  (b) 25  (c) 40  (d) 55  (e) 20  (f) 20

Let’s Explore

Activity 3 (40 min): Class activity to enhance understanding

1. Have the pupils work through the activity on page 230 of the Student’s Book as follows:

   For A
   • Ask the pupils to work in pair to identify the things that can be done in 1 second.
   • Have some pupils to share what they have come up with.

   For B
   • Divide the class into 3 groups.
   • Have each group take turns to come forward to observe the second hand as it moves one round. Tell the pupils to observe what happens to the minute hand as the second hand makes one round. Ask some pupils to share what they have observed.
   • Lead the class to see that as the second hand makes one round, it moves past the 60 markings while the minute hand moves forward by one marking at the same time. Point out that as the second hand moves past 60 seconds, the minute hand moves past 1 minute. Hence 60 seconds is equal to 1 minute and vice versa.
   • Write on the board, ‘1 minute = 60 seconds’ and in short, ‘1 min = 60 s’

24-HOUR CLOCK

Suggested Duration

3 periods (120 min)

Learning Outcomes

Pupils should be able to:
• read time on the 24-hour clock

Instructions

Let’s Learn

Activity 1 (40 min): Read time on the 24-hour clock.
Things you need: A real clock.

1. Ask the class how many hours make one complete day. Show the clock and point out that there are 12 hours from the numbers 1 to 12. Tell them that one round by the hour hand is a 12-hour cycle. Lead the pupils to see that for one complete day, the hour hand must turn 2 complete cycles of 12 hours. Recall that ‘a.m.’ and ‘p.m.’ are used to denote time in the two 12-hour cycles.

2. Illustrate how the 12-hour clock corresponds to the 24-hour clock with the following diagram:

<table>
<thead>
<tr>
<th>12-hour clock</th>
<th>24-hour clock</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.00 a.m.</td>
<td>00 00</td>
</tr>
<tr>
<td>1.00 a.m.</td>
<td>01 00</td>
</tr>
<tr>
<td>2.00 a.m.</td>
<td>02 00</td>
</tr>
<tr>
<td>3.00 a.m.</td>
<td>03 00</td>
</tr>
<tr>
<td>4.00 a.m.</td>
<td>04 00</td>
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<tr>
<td>5.00 a.m.</td>
<td>05 00</td>
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<tr>
<td>6.00 a.m.</td>
<td>06 00</td>
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<tr>
<td>7.00 a.m.</td>
<td>07 00</td>
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<td>8.00 a.m.</td>
<td>08 00</td>
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<tr>
<td>9.00 a.m.</td>
<td>09 00</td>
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<td>10.00 a.m.</td>
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<tr>
<td>11.00 a.m.</td>
<td>11 00</td>
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<tr>
<td>12.00 p.m.</td>
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<tr>
<td>1.00 p.m.</td>
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<td>4.00 p.m.</td>
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<tr>
<td>5.00 p.m.</td>
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<tr>
<td>6.00 p.m.</td>
<td>18 00</td>
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<tr>
<td>7.00 p.m.</td>
<td>19 00</td>
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<td>8.00 p.m.</td>
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<td>9.00 p.m.</td>
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<td>10.00 p.m.</td>
<td>22 00</td>
</tr>
<tr>
<td>11.00 p.m.</td>
<td>23 00</td>
</tr>
<tr>
<td>12.00 a.m.</td>
<td>00 00</td>
</tr>
</tbody>
</table>

3. Point out that for time written in the 24-hour clock format, there is no need to use ‘a.m.’ and ‘p.m.’ Also point out that the time expressed in this format always consists of 4 digits.
4. Go through with the pupils the explanations on pages 231–232 of the Student’s Book on the 24-hour clock.

**Activity 2 (40 min): Convert time from the 12-hour clock format to the 24-hour clock format and vice versa**

1. Explain to the class as follows:
   - To convert time from the 12-hour clock to the 24-hour clock format
     - If the time is in ‘a.m.’ and the hour number is from 1 to 9, put a zero in front of the hour number and remove the ‘a.m.’ For example, 1.00 a.m. = 01 00.
     - If the time is in ‘a.m.’ and the hour number is 10 or 11, just remove the ‘a.m.’ For example, 11.15 a.m. = 11 15
     (Ask the class, ‘How to express 12.00 a.m. in the 24-hour clock format?’)
     - If the time is in ‘p.m.’ and the hour number is from 1 to 11, add 12 to the hour number and remove the ‘p.m.’ For example 8.00 p.m. = 20 00
     (Ask the class, ‘How to express 12.00 p.m. in the 24-hour clock format?’)
   - To convert time from the 24-hour clock to the 12-hour clock format
     - If the hour number is less than 12, then the time is in a.m. No need to subtract 12, just add in ‘a.m.’ For example, 09 45 = 9.45 a.m.
     - If the hour number is more than 12, then it is in the p.m. time. Subtract 12 and add in ‘p.m.’ For example, 16 25 = 4.25 p.m.
     (Ask the class, ‘How to express 00 00 and 12 00 in the 12-hour clock format?’)

2. Go through with the pupils the examples on page 233 of the Student’s Book. Assess the pupils’ understanding by giving examples for the pupils to try converting time in 12-hour and 24-hour clock format.

**Let’s Think**

**Activity 3 (25 min): Challenging activity**

1. Ask the pupils to work in pairs on the activity on page 234 of the Student’s Book. Ask some pupils to share with the class their answers before telling them the correct answers.

**Let’s Try…**

**Activity 4 (15 min): Individual practice**

1. Ask the pupils to try out the exercises on page 235 of the Student’s Book. Ask some pupils to share their answers with the rest of the class.

**Homework**

Ask the pupils to do Workbook 4B—Worksheet 48.
Answers

page 235

1. (a) 12.30 p.m.  (b) 4.50 a.m.  (c) 3.20 p.m.
2. (a) 01 36  (b) 14 55  (c) 23 45

WORK Sheet  48

1. 11 00, 12 00, 13 00, 14 00, 15 00
2. 10.25 am, 11.25 am, 12.25 pm, 1.25 pm, 2.25 pm
3. (a) 06 00, (b) 09 10 (c) 12 00 (d) 14 40
   (e) 20 04  (f) 00 00  (g) 00 15  (h) 10 57
4. (a) 4.40 am  (b) 8.50 am  (c) 11.11 am  (d) 1.27 pm
   (e) 5.22 pm  (f) 8.40 pm  (g) 12.35 am  (h) 12.08 am

DURATION WORD PROBLEMS

Suggested Duration
6 periods (240 min)

Learning Outcomes
Pupils should be able to:
  • tell duration of time
  • solve word problems involving time in 24-hour clock

Instructions

Let’s Learn

Activity 1 (40 min): Tell duration of time
1. Recall that there are 60 minutes in 1 hour and the minute hand makes one complete round in 1 h. Write 1 h = 60 min.
2. Define the duration of time as the difference between the ending time and the starting time. Give some examples. Recall the concept of finding duration using a time-line.
3. Introduce the following strategies in finding duration given the starting and ending times using a time-line:
   Example 1 on page 236 of the Student’s Book
   1) From the starting time, count the number of complete hours until it is near the ending time.
   2) Next, count the remaining number of minutes to the ending time
3) Then, add up the hours found in (1) and the minutes found in (2) to give the total duration

Example 2 on page 236 of the Student's Book
1) From the starting time, count the number of hours until it is near the ending time.
2) Next, count the number of minutes that leads to the next nearest hour.
3) Next, count the remaining number of minutes to the ending time.
4) Then add up the hours found in (1), the minutes found in (2) and the minutes found in (3).

4. Provide more examples for pupils to practise finding duration given the starting and ending times.

Activity 2 (40 min): Work in pairs to practise finding duration of time given the starting and ending times
1. Pair up the students and ask each pair to test each other using the following examples:
   One pupil tells the other pupil the starting and finishing times for the following activities:
   • School starts and school ends
   • Recess starts and recess ends
   • Dinner starts and dinner ends
   • Movie starts and movie ends
   • Sleep time and wake time
   The other pupil will find the duration by first drawing the time-line and then finding the duration by breaking up the time by the hour.
   Have the pupils exchanged roles.

Activity 3 (40 min): Find the starting time / ending time given the duration and one of the two times
1. Explain the following strategies to find starting or ending time given the duration and one of the times:
   If the duration is expressed exactly in hours
   • To find ending time, count forward the duration in hours from the starting time. The minute portion remains unchanged.
   • To find starting time, count backward the duration in hours from the finishing time. The minute portion remains unchanged.
   If the duration is expressed in minutes and less than 1 hour
   • To find ending time, count forward part of the duration in minutes from the starting time so that it brings the time to the next hour and then starting from this next hour, count forward further the remaining part of the duration in minutes.
   • To find the starting time, count backwards part of the duration in minutes from the finishing time so that it brings the time to the earlier hour and then from this earlier
hour, count backwards further the remaining part of the duration in minutes.

If duration is expressed in hours and minutes
To find ending time, count forward the hour portion of the duration and then count forward further the minute portion of the duration.
To find the starting time, count backward the hour portion of the duration and then count backward further the minute portion of the duration.

2. For each of the above variations, provide more examples for the pupils to practise.
3. Go through with the pupils Example 4 on page 237 of the Student's Book.

Activity 4 (40 min): Solve word problems involving time in 24-hour clock
1. Recall adding and subtracting time expressed in hours and minutes. Remind the pupils to use 1 hour = 60 mins when converting hours into minutes and vice versa.
2. Open the page 238 of the Student's Book and go through with the pupils the steps in solving the word problem involving addition and subtraction of times in hours and minutes.
3. Revise with the pupils on the 24-hour clock. Ask pupils to convert time in the 12-hour clock format to the 24-hour clock format and vice versa.
4. Open the page 239 of the Student's Book and go through with the pupils the steps in solving word problems involving time in the 24-hour clock format.
5. Provide more word problem examples for pupils to practise.

Let's Try...

Activity 5 (40 min): Individual practice
1. Ask the pupils to try out the exercises on page 240 of the Student's Book. Go around checking the pupils’ answer and provide individual guidance where necessary.

Homework
Ask the pupils to do Workbook 4B—Worksheet 49 and Practice 13.

Answers

page 240

1. 14 05
2. 13 55
3. 6 h 5 min
4. 1 h 15 min

WORK SHEET 49

1. (a) 30, 15, 45 (b) 5, 25, 5h 25 min (c) 4, 15, 20, 4h 35 min
   (d) 18, 30, 18h 30 min (e) 17, 30, 17h 30 min (f) 7, 40, 10, 7h 50 min
2. 10 15
3. 18 30
4. 6h 5 min
5. 40 min
6. 10 min
7. 13 00

Practice 13

4. (a) 4h 20 min   (b) 2h 50 min   (c) 2h 45 min
    (d) 5h 5 min     (e) 22h 15 min  (f) 10h 20 min
5. 37 min
6. 29 min
7. 10 25
8. 2h 5 min

Revision (40 min)

Fun with Maths

1. Ask the pupils to work in pairs on the activity on page 240 of the Student's Book. Ask the pupils to compare their answers with their partners

2. Revise and go through pupils' homework.
Unit 14: Tessellations

RECOGNIZING TESSELLATIONS

Suggested Duration
5 periods (200 min)

Learning Outcomes
Pupils should be able to:
• recognize shapes that can tessellate
• identify the unit shape in a tessellation
• make different tessellations with a given shape

Instructions
Let’s Learn...
Activity 1 (40 min): Recognize shapes that can tessellate and identify the unit shape in a tessellation
Things you need: Two pineapples, an A4 size page with 3 colourful tessellations using triangles, rectangles and hexagons respectively

1. Bring two pineapples to the class. Ask the pupils to come and take a close look at the pineapple skin. Ask the pupils to comment on the pattern they see on the pineapple skin.

2. Point out that the pattern found on a pineapple skin is made up of identical shapes. Explain that such a pattern is also known as a tessellation. Write the word ‘tessellation’ on the board and ask the class to repeat the word after you.

3. Draw on the board three colourful tessellations involving triangles, rectangles and hexagons. Ask the pupils, ‘What is common among the tessellations?’ Point out that the tessellations are formed by identical shapes fitted together and there are no gaps and no overlapping among the shapes.

4. Turn to the patterns on pages 243–245 of the Student’s Book. For each pattern, ask the pupils, ‘Is this a tessellation?’ and then ask, ‘Why?’ Point out that not all shapes can be fitted together to form a tessellation. For a shape that can form a tessellation, we say that ‘the shape tessellates’.

5. Explain that all tessellations are formed by a unit shape. Ask the pupils to identify the unit shape that forms each of the tessellations shown.

Activity 2 (40 min): Make different tessellations with a given shape
Things you need: 7 different colourful shapes printed separately on A5 size coloured art paper. Each shape should have 12 pieces
1. Divide the class into 7 groups of 5 to 6 pupils each. Ask each group to cut 12 pieces of a specific shape to form a tessellation. Once completed, have the pupils look at the work done by other groups.

2. Next, ask each group to re-arrange the shapes to form another tessellation. Have the pupils go around again seeing each other’s work.

3. Explain to the pupils that a given shape can sometimes form different tessellations by re-arranging them.

**Let’s Explore**

**Activity 3 (40 min): Find tessellations in things around us**

*Things you need: Pictures of floor tiles, honeycomb, a brick wall and a football that show tessellations*

1. Go through with the pupils the different tessellations shown on page 246 of the Student’s Book.

2. Show some close-up shots of partially covered floor tiles, honeycomb, a brick wall and a football but without showing the full pictures. Ask pupils to guess what the items are and then reveal the full pictures. Point out that these are tessellations found in things around us.

3. Ask the pupils if they could think of some more tessellations in things around us. Give a simple reward to those who manage to.

**Activity 4 (40 min): Design figures to make tessellations**

*Things you need: Coloured art paper, scissors and transparent tapes*

1. Demonstrate in front of the pupils how to make a tessellation using the example on page 248 of the Student’s Book. First, you design the tessellating figure and explain to the pupils as you work through the steps of drawing, cutting and taping. You need to do this very slowly so that all pupils can see and understand how it is done. Once the first figure is completed, use it to trace out 3 identical figures before cutting them out. Finally, arrange the 4 figures on the white board to form a tessellation.

2. Pair up the pupils and ask each group to work on any tessellation of their choice using the method that was demonstrated. Each pair will be given 6 pieces of square coloured papers to work on. Each pupil should take turns to draw, cut and tape the figures. The pair is free to design their own tessellating figures.

3. Once completed, pupils will go around to look at each other’s work and vote for the top 3 best tessellations.

**Let’s Try**

**Activity 5 (40 min): Individual practice**

1. Let the pupils try out the exercises on pages 249–250 of the Student’s Book.

**Homework**

1. Ask the pupils to do Workbook 4B—Worksheet 50.

2. Ask the pupils to bring to class for the next lesson, an example of a tessellation. It can be
a real life object, a photograph, a poster or a colourful printout from the Internet. Tell the pupils that this is not compulsory but you will give a simple reward to those who bring.

Answers

page 249

2. (a), (d)
3. (b), (c), (d), (e), (f)

WORK SHEET 50

2. (a) No (b) Yes (c) Yes (d) Yes (e) Yes (f) No (g) Yes (h) No (i) No (j) Yes
3. (a) √ (b) √ (c) X (d) √ (e) √ (f) √ (g) X

DRAWING TESSELLATIONS

Suggested Duration
4 periods (160 min)

Learning Outcomes
Pupils should be able to:
- draw a tessellation on dot paper
- design and make patterns

Instructions
Let’s Learn…

Activity 1 (40 min): Draw tessellations on dot grid paper

Things you need: Dot grid paper

1. Introduce and show to pupils what a dot grid paper is. Point out that the dots are meant to help in drawing and connecting lines to form identical figures.
2. Demonstrate on the OHP how to draw on the dot grid paper by counting and joining the dots.
3. Draw a tessellating figure on the board and ask 4 to 5 pupils one at a time to complete the tessellation. Do this for 3 to 4 other tessellations

Activity 2 (30 min): Work in Pairs

Things you need: Blank dot grid paper

1. Pair up the pupils. One pupil draws a figure on the dot grid paper while the other pupil will try to create a tessellation out of it. The figure must be one with straight sides. If the
figure cannot be tessellated, then the first pupil has to draw another figure. Both pupils will take turns to draw the tessellating figure and create the tessellation.

Let’s Try

Activity 3 (40 min): Individual practice

Things you need: Blank dot grid paper

1. Give each pupil a piece of dot grid paper and ask them to go through the exercises on page 252 of the Student’s Book.

Homework

Ask pupils to do Workbook 4B—Worksheet 51 and Practice 14.

Revision (40 min)

Fun with Maths

1. Encourage the pupils to search the Internet to look for a suitable website that can create tessellations. Another way is to use a word-processing software to create tessellations by adding and inserting pictures.

2. Revise and go through pupils’ homework.

Revision 3

1. (a) CD, BC, AD⊥BC, AD⊥BC, 5, 5  (b) RS, PS, PS⊥QR, PS⊥QR, 3, 8
2. 60°
3. 26°
4. (a) 07 50  (b) 15 15  (c) 00 20  (d) 12 50  (e) 02 20  (f) 16 05
5. (a) 8.10 am  (b) 8.45 pm  (c) 12.34 am  
   (d) 12.10 pm  (e) 3.35 pm  (f) 11.17 pm
6. 66°
7. 51°
8. (a) 130 cm² (b) 74 cm² (c) 102 cm² (d) 54 cm²
9. (a), (c), (f)
10. (a) 38 s  (b) 40 s  (c) 45 s
11.

<table>
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<tr>
<th>Figure</th>
<th>Area</th>
<th>Length</th>
<th>Breadth</th>
<th>Perimeter</th>
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<td>A</td>
<td>48 cm²</td>
<td>8 cm</td>
<td>6 cm</td>
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<td>B</td>
<td>160 m²</td>
<td>16 m</td>
<td>10 m</td>
<td>52 m</td>
</tr>
<tr>
<td>C</td>
<td>100 cm²</td>
<td>10 cm</td>
<td>10 cm</td>
<td>40 cm</td>
</tr>
<tr>
<td>D</td>
<td>135 cm²</td>
<td>15 cm</td>
<td>9 cm</td>
<td>48 cm</td>
</tr>
<tr>
<td>E</td>
<td>112 m²</td>
<td>14 m</td>
<td>8 m</td>
<td>44 m</td>
</tr>
</tbody>
</table>

12. 44°
13. 17°
14. 1h 20 min
15. 1 hr

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Revision 4

2. A: 64 m², 40 m;
   B: 64 m², 32 m;
   C: 144 m², 52 m;
   D: 160 m², 52 m;
   E: 196 m², 56 m

3. 6 cm

4. (a) 15 cm  (b) 5 cm

6. (a) 6h 20 min  (b) 13h 15 min  (c) 6h 45 min
   (d) 2h 45 min  (e) 10h 55 min  (f) 18h 50 min

8. 36 cm
9. 169 cm²
10. 96 m²
11. (a) 210 cm²  (b) 78 cm
12. 06 55
13. 11h 50 min
14. (a) 18 cm  (b) 108 cm²
15. 430 m², 124 m
16. 20 55
17. 2 h 55 min