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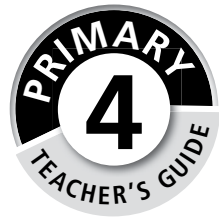

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University Printing House, Cambridge CB2 8BS, United Kingdom

One Liberty Plaza, 20th Floor, New York, NY 10006, USA

477 Williamstown Road, Port Melbourne, VIC 3207, Australia

314–321, 3rd Floor, Plot 3, Splendor Forum, Jasola District Centre, New Delhi – 110025, India

79 Anson Road, #06–04/06, Singapore 079906

Cambridge University Press is part of the University of Cambridge.

It furthers the University's mission by disseminating knowledge in the pursuit of education, learning and research at the highest international levels of excellence.

www.cambridge.org

First published 2016
New edition published 2018

Contributing author: Zonia Jooste
Editor: Christine de Nobrega
Typesetter: Brink Publishing & Design
Cover image: Marie-Reine Mattera / Getty Images

Contents

Term 3

Introduction

The purpose of the curriculum

The main objectives of the curriculum are to prepare the pupils to:

- acquire the mathematical literacy necessary to function in an information age
- cultivate the understanding and application of mathematical concepts and skills necessary to thrive in the ever-changing technological world
- develop the essential elements of problem-solving, communication, reasoning and connection in the study of Mathematics
- take advantage of the numerous career opportunities provided by Mathematics
- further their studies in Mathematics and related fields.

The role of the teacher

One of the principal duties of a Mathematics teacher is to prepare and present good lessons to his or her pupils. The teacher needs to:

- be as well-informed as possible on the Mathematics scheme of work
- know the aims and objective of each topic
- select appropriate content material
- decide on the best methods of presentation such as group work, worksheets, question-answer sessions and debates, etc.
- remain informed about social and environmental issues, and other current news in Nigeria and the rest of the world
- through innovative teaching approaches encourage learning that will promote creativity and critical thinking in pupils.

To be effective in presentation, the teacher must prepare a written or typed plan for each lesson. This plan must include aims, objectives, resources, time frames, content for the lesson, activities, homework, assessment, and ideas or additional worksheets to cater for pupils who require extension or learning support (remedial).

The teacher must prepare each topic in advance. Many teachers go into the classroom without adequate preparation. It is the Mathematics teacher's responsibility to involve all pupils actively in the learning process. It is a proven fact that pupils learn far more by *doing* than by *listening*.

Mathematics involves being curious and asking questions. When possible, teachers must ask questions to engage the pupils, encourage independent thought processes

and help pupils develop problem-solving skills. Teachers need to start their lessons by asking the pupils to write down answers to a few questions that are related to the lesson. This will help pupils focus on the lesson. Teachers can use different types of questions in lessons:

- **diagnostic** questions enable teachers to determine pupils' prior knowledge on a topic
- **consolidation** questions help pupils master challenging concepts
- questions can **stimulate** pupils' interest in the subject
- questions can be used to help **conclude** a lesson. This will help teachers to find out whether pupils have understood concepts and terminology that were used in a lesson. Such questions will also highlight areas that pupils need to revise at home or that teachers will need to revisit in the next lesson.

Teachers must ensure that they do not appear to have favourites in a class. They must devise a system to ensure that they ask questions fairly and are careful not to embarrass pupils who struggle to answer questions.

How to use the scheme of work

A scheme of work is defined as the part of the curriculum that teachers are required to teach in their subjects. The primary function of a scheme of work is to provide an outline of the subject matter and its content, and to indicate how much work to cover in a particular class. A scheme of work allows teachers to clarify their thinking about a subject, and to plan and develop particular curriculum experiences that they believe may require more time and attention when preparing lessons. The criteria all teachers should bear in mind when planning a scheme of work are continuity in learning and progression of experience. Teachers can add their own notes to the scheme of work provided on pages viii–xii.

The scheme of work is sequential. The sequence of the scheme of work is aligned with the textbook. Teachers should not be tempted to select material at random. It is better to spend time planning the work for a term to ensure that they adhere to the scheme of work.

Planning for the year

The year is divided into three terms. Each term is divided into 13 weeks. For Mathematics, there are 11 topics for Term 1, 11 topics for Term 2 and 10 topics for Term 3. At the end of each term, it is important to ensure that there is time for revision and an examination. This time frame may differ depending on the planning of a particular school. The exercises in the Workbook give pupils the opportunity to

apply what they have learnt. References in the Pupil's Book indicate the best time to use the exercises in the Workbook.

Each teacher's management of each class will have an enormous influence on the teacher's ability to adhere to the time frames. Focus on effective strategies for discipline. Teachers will have fewer problems regarding discipline if they are punctual, well-prepared, follow a plan (write this on the board at the start of the lesson), keep their word (and do not, for example, make empty threats) and consistently adhere to rules.

A teacher of Mathematics is a professional instructor who facilitates, promotes and influences pupils to achieve the outcomes of the scheme of work. It is the wish of the authors that the pupils will, at the end of each course in the series attain a level of Mathematics proficiency that will equip them for future studies in this field.

Scheme of work

Term 1

Topic	Lesson objectives Pupils should be able to:	PB pages	WB pages
Whole numbers Unit 1: Count, write and find place value of numbers up to 99 999	1. count in thousands up to one million 2. solve problems on quantitative reasoning	1–10	1–5
Whole numbers Unit 2: Count, write and find place value of numbers up to one million	1. count in thousands up to one million 2. solve problems on quantitative reasoning 3. solve problems on quantitative reasoning involving whole numbers 4. add and subtract whole numbers in TH, H, T, U with or without renaming 5. carry out correct addition and subtraction in everyday life activities 6. add and subtract three 4-digit numbers taking two at a time 7. solve problems on quantitative aptitude involving addition and subtraction of 4-digit whole numbers	11–16	6–9
Whole numbers Unit 3: Count in groups of 5, 7 and 60	1. apply knowledge of counting in local counting groups of fives, market days, sevens, sixties	17–24	9–13
Whole numbers Unit 4: Order and compare numbers up to 100 000 using <, > and =	1. order whole numbers up to 1 000 using the symbols < and > 2. solve problems on quantitative reasoning involving ordering whole numbers	25–30	14–16
Whole numbers Unit 5: Count, read and write in Roman numerals	1. count in Roman numerals up to 100 2. solve problems on quantitative reasoning involving Roman numerals	31–33	17–18
Derived functions: Estimates Unit 6: Estimate and round off numbers	1. give meaningful estimates of sums and products of numbers	34–38	18–21

Topic	Lesson objectives Pupils should be able to:	PB pages	WB pages
Basic operations: Addition and subtraction Unit 7: Add and subtract 3- and 4-digit numbers	1. state the place value of a digit in 4-digit numbers	39–45	21–26
Whole numbers: LCM Unit 8: Find lowest common multiples (LCM)	1. find the LCM of numbers up to 9	46–49	26–29
Whole numbers: HCF Unit 9: Find highest common factors (HCF)	1. find the HCF of 2-digit numbers	50–53	30–31
Basic operations: Multiplication Unit 10: Multiply whole numbers and decimals	1. multiply whole numbers by 2-digit numbers not exceeding 50 2. solve problems on quantitative aptitude involving multiplying whole numbers by 2-digit numbers	54–59	31–35
Basic operations: Division Unit 11: Divide 2- or 3-digit numbers	1. divide 2- and 3-digit numbers by: • numbers up to 9 with and without remainder • multiples of 10 up to 50 2. solve problems on quantitative reasoning involving division	60–66	35–39
Term 1 Revision		67–70	n/a

Term 2

Topic	Lesson objectives Pupils should be able to:	PB pages	WB pages
Basic operations: Multiplication Unit 1: Squares and square roots	1. calculate the squares of 1- and 2-digit numbers 2. identify objects with perfect faces like cubes and square shapes 3. solve problems on quantitative aptitude involving squares 4. find square roots of perfect squares up to 400 5. solve problems on quantitative aptitude of square roots of perfect squares not greater than 400	71–78	40–43

Topic	Lesson objectives Pupils should be able to:	PB pages	WB pages
Algebraic operations: Open sentences Unit 2: Add, subtract, multiply and divide with open sentences	1. define open sentences 2. find missing numbers in open sentences 3. solve problems on quantitative aptitude on open sentences involving multiplication and division	79–87	43–46
Fractions Unit 3: Proper, improper and mixed fractions	1. differentiate between proper and improper fractions 2. change improper fractions to mixed numbers and vice versa 3. apply fractions in sharing commodities in home, market, school etc. 4. solve problems on quantitative reasoning involving fractions	88–96	46–49
Fractions Unit 4: Equivalent fractions	1. obtain equivalent fractions of a given fraction 2. order pairs of fractions 3. solve problems on quantitative reasoning on equivalent fractions	97–102	50–52
Basic operations: Addition and subtraction Unit 5: Add and subtract fractions	1. add and subtract: • two proper fractions • improper fractions and mixed fractions 2. correctly add and subtract proper and improper fractions in everyday life activities 3. solve problems on quantitative aptitude involving adding and subtracting fractions	103–109	52–55
Fractions Unit 6: Decimals	1. use decimals up to hundredths 2. solve problems on quantitative reasoning involving decimals	110–115	55–56
Basic operations: Addition and subtraction Unit 7: Add, subtract, multiply and divide decimals	1. add and subtract decimals up to 3 places 2. correctly add and subtract decimals 3. solve problems on quantitative reasoning involving adding and subtracting decimals 4. multiply decimals by 2-digit numbers 5. solve problems on quantitative aptitude involving multiplying decimals by 2-digit numbers	116–126	57–62

Topic	Lesson objectives Pupils should be able to:	PB pages	WB pages
Primary measure: Money Unit 8: Add and subtract money	1. solve problems on addition of money 2. solve problems on quantitative aptitude on adding money 3. solve problems on subtracting money 4. solve problems on quantitative aptitude involving subtracting money	127–133	63–66
Primary measure: Money Unit 9: Multiply money values	1. multiply money by a whole number 2. solve problems on quantitative reasoning on multiplying money	134–138	67–69
Primary measure: Money Unit 10: Divide money amounts	1. divide money by a whole number 2. solve problems on quantitative reasoning in real-life situations	139–143	69–72
Primary measure: Money Unit 11: Calculate profit and loss	1. calculate profit and loss 2. solve problems on quantitative aptitude on profit and loss	144–147	72–74
Term 2 Revision		148–152	n/a

Term 3

Topic	Lesson objectives Pupils should be able to:	PB pages	WB pages
Primary measure: Time Unit 1: Time, calendars and dates	1. give time on the clock, read calendars and write dates 2. solve problems on quantitative aptitude relating to time 3. use the notation a.m. and p.m. for time of day	153–166	75–82
Primary measure: Length Unit 2: Estimate and compare length	1. estimate distances in kilometres and length in metres and centimetres and compare with measurements 2. add and subtract length	167–175	83–87
Primary measure: Mass Unit 3: Add, subtract, multiply and divide mass	1. compute addition and subtraction of mass using kg and g 2. multiply and divide mass by whole numbers	176–188	87–94

Topic	Lesson objectives Pupils should be able to:	PB pages	WB pages
Secondary measure: Capacity Unit 4: Add and subtract capacity	1. add and subtract in litres 2. solve problems on quantitative aptitude related to adding and subtracting litres	189–194	94–96
Secondary measure: Capacity Unit 5: Multiply and divide capacity	1. multiply and divide in litres with whole numbers 2. solve problems on quantitative aptitude related to multiplying and dividing litres	195–200	97–100
Secondary measure: Area Unit 6: Find the areas of rectangles and squares	1. find the area of rectangles using the formula 2. calculate areas of shapes, farmland etc. in the environment 3. solve problems on quantitative aptitude relating to area	201–210	100–106
Shapes: Plane shapes Unit 7: Plane (2-D) shapes	1. identify symmetrical plane shapes 2. locate lines of symmetry of objects in the school and at home 3. distinguish between horizontal and vertical lines 4. indicate the four cardinal points and relate the setting and rising of the sun on the cardinal points of east and west	211–222	107–112
Shapes: 3-D shapes Unit 8: Three-dimensional (3-D) objects	1. distinguish between open and closed shapes 2. identify the uses of 3-D shapes in the environment and at home	223–229	112–117
Data collection and presentation: Graphs Unit 9: Pictograms and modes	1. draw pictograms 2. identify the mode	230–235	118–119
Data collection and presentation: Bar graphs Unit 10: Bar graphs and modes	1. draw bar graphs 2. read bar graphs 3. identify bar graph mode 4. identify the most common events / data in daily life activities	236–244	120–124
Term 3 Revision		245–251	n/a

Numbers and numeration
Whole numbers up to 99 999

Topic 1: Count, write and find place value of numbers up to 99 999

Teaching guidelines and solutions

Instructional resources
Counting grids/charts; number chains; place value tables; abaci; Dienes blocks; overlay cards

Pupils will create their own overlay cards, and label and draw beads on abaci to represent numbers.

Count and write up to 99 999

Ask the pupils whether they know that the word "digit" means "finger". Explain that the word comes from ancient times when people used their fingers and other body parts to count. Write 1-, 2-, 3-, 4- and 5-digit numbers on the board and ask the pupils to identify the different number of digits and name the numbers.

Help pupils to understand that counting is a human activity. Ask pupils to explore or study the pictures showing how people used their fingers to count sheep in the olden days. Help them to understand the counting method and let them find out that 34 sheep were counted.

Work through the examples. Ask the pupils why we have to count numbers and where in real life we count numbers, for example money in banks, fruit and vegetables at the market, products at wholesalers, fish from boats and fish markets, and so on. Let them count the real-life objects in the pictures in the example question 1. They count naira notes in 500s, books in 100s and toothpicks in 1 000s.

Write these number sequences on the board:

3; 13; 23; 33; …
0; 10; 20; 30; …

Ask pupils what is different between the sequences. When you count in 10 from any number, you count in intervals of 10,

which are not multiples of 10. Also, explain that the lists of numbers are number patterns or number sequences.

Ask pupils to count in their groups. They count in 1s from 7 988 to 8 001, in 10s from 8 980 to 9 100, in 100s from 4 800 to 6 200 and in 1 000s from 1 999 to 9 999. Let them write the sequences on the board. Let the pupils read the numbers in symbols and words on the cards in the example question 2. Then ask pupils to work in pairs to write these numbers in words on the board: 6 830, 7 994, 8 107, 4 058.

6 830 = six thousand eight hundred and thirty
7 994 = seven thousand nine hundred and ninety-four
8 107 = eight thousand one hundred and seven
4 058 = four thousand and fifty-eight

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 1

(PB page 2)

1. 3 500; 4 500; 5 500; 6 500; 7 500; 8 500; 9 500; 10 500; 11 500; 12 500

2. 9 990; 9 991; 9 992; 9 993; 9 994; 9 995; 9 996; 9 997; 9 998; 9 999; 10 000

3. 9 991; 9 993; 9 995; 9 997

4. **a)** 6 090; 6 100; 6 110; 6 120
b) 7 800; 7 900; 8 000; 8 100
c) 5 200; 6 200; 7 200; 8 200
d) 8 100; 8 102; 8 104; 8 106

Exercise 2

(PB page 3)

1. **a)** 3 946 **b)** 860
c) 9 750 **d)** 6 034
e) 2 001 **f)** 333
g) 7 211 **h)** 9 061
i) 5 604 **j)** 2 197

2. **a)** five thousand and six
b) eight thousand seven hundred and one
c) nine thousand and ninety
d) three thousand nine hundred and twenty-five
e) seven thousand two hundred and nineteen
f) four thousand four hundred and eighty-two
g) six thousand seven hundred and ninety-four
h) one thousand five hundred and seventy-six

i) eight thousand three hundred and twenty-one
j) five thousand nine hundred and fifty-seven
k) three thousand two hundred and sixty-eight
l) two thousand four hundred and seventeen

Workbook: Exercise 1

(WB page 1)

1. 4 998

2. **a)** 4 998; 5 000; 5 001
b) 8 080; 8 090; 8 100; 8 110; 8 130
c) 3 400; 3 500; 3 600; 3 700; 3 800
d) 9 975; 9 980; 9 985; 9 990; 9 995
e) 7 794; 7 796; 7 798; 7 800; 7 802

3. **a)** 100 **b)** 10; 10
c) 100 **d)** 100; 100
e) 1 000 **f)** 1 000; 6 084
g) 900 **h)** 2; 2

Place value up to 99 999

Work with the whole class. Ask which number is represented on the abacus in the example on page 3. Explain that an abacus is a counting tool (device) first used in China. We say one abacus and many abacuses or abaci.

Pupils name the place value of each digit. Write the abbreviations TH (thousands), H (hundreds), T (tens) and U (units) in full on the board. Find out if each pupil knows the place values.

Ask the pupils to explore the numbers 4 263 and 7 503 written in digits in their place values. Make sure they understand that expanded notation means the number is broken up into its place value parts. Then help them understand the difference between the place value and value of a digit.

Ask the pupils to identify the number represented by the Dienes blocks in the example on page 4. Explain that the blocks are named after a famous Dutch mathematician. (Dienes blocks are a volume model used for place value and counting.). They should notice the value of each block in the margin and understand the blocks represent powers of 10, i.e. 1, 10, 100 and 1 000 and recognise the number represented as 3 000 + 500 + 70 + 4 = 3 574.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 3

(PB page 4)

1. TH = 4 thousands, H = 2 hundreds, T = 6 tens, U = 3 units
4 000 + 100 + 60 + 3 = 4 263

2. TH = 3 thousands, H = 4 hundreds, T = 4 tens, U = 5 units
3 000 + 400 + 40 + 5 = 3 445

3. TH = 5 thousands, H = 6 hundreds, T = 5 tens, U = 7 units
4 000 + 600 + 50 + 7 = 4 657

4. TH = 9 thousands, H = 4 hundreds, T = 2 tens, U = 7 units
9 000 + 400 + 20 + 7 = 9 427

Exercise 4

(PB page 5)

1. **a)** TH = 9 thousands, H = 1 hundred, T = 4 tens, U = 6 units
9 000 + 100 + 40 + 6

b) TH, H = 0 hundreds, T, 5, units, 7, 0, thousands

2. **a)** 6 000 + 900 + 40 + 1 = 6 941

b) 4 000 + 600 + 5 = 4 605

c) 3 + 300 + 1 000 + 50 = 1 353

d) 90 + 2 000 + 600 = 2 690

e) 7 000 + 9 = 7 009

3. **a)** 8 000 + 200 + 10 + 3 = 8 213

b) 2 000 + 20 + 5 = 2 025

c) 7 000 + 400 + 30 + 7 = 7 437

d) 5 000 + 600 + 80 + 9 = 5 689

4. **Quantitative reasoning**

a) 100 + 70 + 1 = <u>171</u>

b) 2 000 + <u>300</u> + 50 + 2 = 2 352

c) 6 000 + <u>800</u> + 30 + 6 = 6 836

d) <u>4 000</u> + 900 + <u>20</u> + <u>7</u> = 4 927

e) 7 000 + <u>0</u> + <u>10</u> + <u>3</u> = 7 013

Exercise 5

(PB page 6)

1. **a)** 2 000 + 500 + 60 + 4 = 2 564

b) 6 000 + 9 = 6 009

2. **a)** 7 000 + 800 + 20 + 1

b) 4 000 + 600 + 50 + 4

c) 2 000 + 80

d) 9 000 + 9

e) 8 000 + 30 + 4

f) 6 000 + 600 + 6

g) 5 000 + 500 + 50 + 5

h) 1 000 + 200 + 10 + 2

3. **a)** 5 943 **b)** 7 617
c) 2 638 **d)** 6 023
e) 5 206 **f)** 1 854
g) 4 111 **h)** 9 702

Exercise 6

(PB page 6)

1. 9 hundreds = 900 **2.** 8 thousands = 8 000
3. 9 hundreds = 900 **4.** 2 units = 2
5. 8 units = 8 **6.** 8 hundreds = 800
7. 6 tens = 60 **8.** 9 thousands = 9 000
9. 6 hundreds = 600 **10.** 4 thousands = 4 000
11. 2 tens = 20 **12.** 5 units = 5

Workbook: Exercise 2

(WB page 2)

1. 5 000 + 600 + 50 + 8 = 5 658

2. **a)** nine hundred and eighty-six
b) one thousand two hundred and thirty-seven
c) two thousand seven hundred and sixty-five
d) three thousand eight hundred and ninety-seven
e) three thousand nine hundred and sixty-six

3. **a)** 3 507 **b)** 9 868 **c)** 4 059 **d)** 5 370

4. **a)** 5 263 **b)** 8 431 **c)** 2 902 **d)** 745

Place value of numbers up to 99 999

Let pupils look at the number cards the children are holding up. They should observe that the TTH place is now added. Explain that each place from left is 10 times bigger than the next place:

1 (U) → 1 × 10 = 10 (T) → 10 × 10 = 100 (H)
→ 100 × 10 = 1 000 (TH) → 1 000 × 10 = 10 000 (TTH).

Introduce them to the place ten thousand (10 × 1 000) and the value 10 000.

Let them read the number represented on the cards and give the place value and value of each digit.

Ask pupils to explore the places and numbers in the place value chart and to read the numbers. Ask them to read the place value and the value of the number 27 634 represented in expanded notation. Ask individual pupils to write the number 83 293 on the board in expanded notation using the place values and values of the digits. Ask the class to assist.

Tell the pupils that we can also represent numbers on overlay cards if they have not worked with overlay cards before. Explain that we use these cards that give the values of digits to build numbers. You should have a set of overlay cards to demonstrate how to use them. Later they will create their own set of overlay cards. Let them explore the numbers represented by the overlay cards to observe the values in expanded notation.

Pupils explore the 5-digit numbers on the abaci, read them aloud and name the place value and value of each digit. Explain that they do not have to write the place value or value where the digit is zero in a number.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 7

(PB page 8)

1. a) 5 ten thousands + 1 thousand + 6 hundreds + 3 tens + 2 units = 50 000 + 1 000 + 600 + 30 + 2

b) 9 ten thousands + 2 thousands + 4 hundreds + 5 tens + 0 units = 90 000 + 2 000 + 400 + 50 + 0

c) 2 ten thousands + 2 thousands + 2 hundreds + 0 tens + 2 units = 20 000 + 2 000 + 200 + 0 + 20

d) 7 ten thousands + 8 thousands + 0 hundreds + 7 tens + 5 units = 70 000 + 8 000 + 0 + 70 + 5

e) 8 ten thousands + 0 thousands + 9 hundreds + 7 tens + 6 units = 80 000 + 0 + 900 + 70 + 6

f) 4 ten thousands + 3 thousands + 5 hundreds + 8 tens + 1 unit = 40 000 + 3 000 + 500 + 80 + 1

2. a) 58 093 **b)** 90 412
c) 73 025 **d)** 26 531
e) 11 208 **f)** 35 089

3. a) 4 000 **b)** 50 **c)** 80 000
d) 600 **e)** 0 **f)** 8 000

4. a) 2 ten thousands + 4 thousands + 7 hundreds + 3 tens + 9 units

b) 1 ten thousand + 6 thousands + 7 hundreds + 5 tens + 2 units

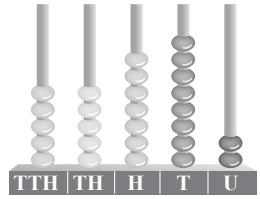
c) 8 ten thousands + 4 thousands + 7 hundreds + 3 tens + 1 unit

d) 7 ten thousands + 4 thousands + 6 hundreds + 2 tens + 9 units

e) 9 ten thousands + 2 thousands + 2 hundreds + 1 ten + 0 units

f) 6 ten thousands + 8 thousands + 0 hundreds + 7 tens + 6 units

5. a)



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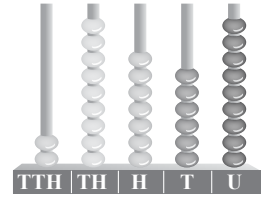

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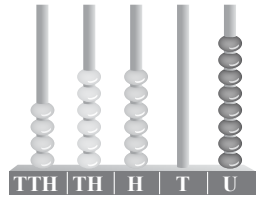

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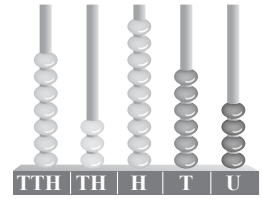
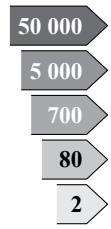


6. a)



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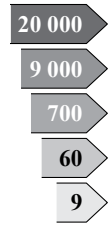

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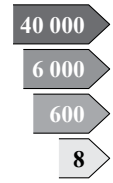

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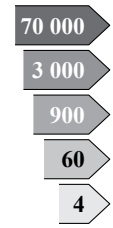


7. Quantitative reasoning

a) 20 000 + 500 + 20 + 5 = 20 525

b) 10 000 + 2 000 + 300 + 2 = 12 302

c) 80 000 + 1 000 + 800 + 60 + 0 = 81 860

d) 40 000 + 7 000 + 700 + 90 + 7 = 47 797

e) 30 000 + 9 000 + 70 + 1 = 39 071

Exercise 8

(PB page 9)

1. a) 53 644 **b)** 17 914

c) 44 773 **d)** 99 167

2. a) 80 000 + 5 000 + 200 + 60 + 7

b) 60 000 + 3 000 + 500 + 10 + 2

c) 10 000 + 2 000 + 700 + 60 + 9

d) 50 000 + 5 000 + 100 + 90 + 5

3. The number is 96 384 so the value of the 3 is 300. John is wrong.

Project: Make your own overlay cards (PB page 10)

Ensure that all pupils have stiff card, pencils, rulers and pairs of scissors. Explain the steps they should follow to create the cards. If possible, ask the pupils to get colour card for the different powers of ten or they could use colour pencils. You could also use copies of the card from a template you created. Pupils cut out and colour the powers of 10 in different shades.

Let the pupils read and give the values of the numbers on the overlay cards.

14 028 93 650 70 102

Let them build five of their own numbers using their overlay cards. They ask their group members to read their numbers aloud and then ask a partner to write or show the numbers in expanded notation using their cards.

Exercise 9 Quantitative reasoning (PB page 8)

1. 10 000 + 4 000 + 20 + 8
90 000 + 3 000 + 600 + 50 + 6
70 000 + 100 + 2

2. Pupils' own work

3. **a)** 

b) 

c) 

d) Increase by 20 000

Workbook: Exercise 3 (WB page 3)

1. **a)** 500 **b)** 4 500
c) 3 411 **d)** 4 862

2. **a)** 2 566 **b)** 4 238
c) 1 594 **d)** 2 781

3. **a)** 9 000 + 200 + 3
b) 7 000 + 700 + 70
c) 9 000 + 9
d) 8 000 + 900 + 70 + 6

4. **a)** 60 **b)** 4 000
c) 30 **d)** 8
e) 600 **f)** 70

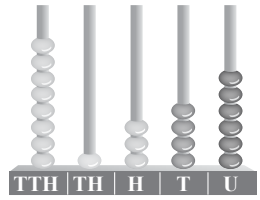
5.

	TTH	TH	H	T	U
24 869	20 000	4 000	800	60	9
17 037	10 000	7 000	0	30	7
54 852	50 000	4 000	800	50	2

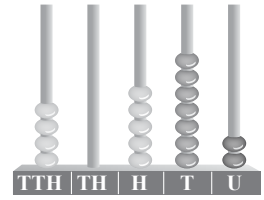
Workbook: Exercise 4

(WB page 4)

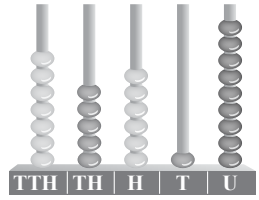
1. a)



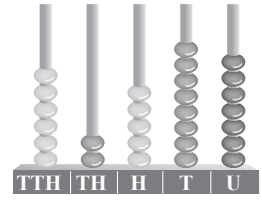
b)



c)



d)



2. a) 1 000; 40
b) 40 000; 500; 70
c) 5 thousands; 6 hundreds; 1 tens
d) 6 ten thousands; 4 hundreds; 7 units

3. a) 1 000
b) 80 000
c) 4
d) 600

4. a) 71 285
b) 68 492
c) 91 116
d) 29 347

5. a) 20 000 + 4 000 + 100 + 30 + 4
b) 70 000 + 2 000 + 400 + 80 + 7
c) 10 000 + 5 000 + 300 + 20 + 9
d) 40 000 + 6 000 + 900 + 30 + 8

Topic 2: Count, write and find place value of numbers up to one million

Teaching guidelines and solutions

Instructional resources
Place value chart; powers of 10 chart; beads; sticks; map; overlay cards; abaci; number lines; Dienes blocks; beans

Numbers up to millions

Ask pupils whether they know how many people are living in Nigeria and the number of people living cities such as Lagos. Tell them populations (inhabitants) of countries across the world are normally counted in millions.

Help the pupils to understand how the number in the example is written and read. Explain that 99 999 + 1 = 100 000 (hundred thousand – HTH) and 999 999 + 1 = 1 000 000 (one million – M).

Write the number of Nigerians in 2014, i.e. 178 516 904, on the board. Let them explore the place values and values of the digits in the place value chart. They should notice the grouping of the digits in hundreds, thousands and millions.

Write more numbers in millions on the board and let them read them and give the values and place values of the digits.

Ask the class which numbers come after the numbers on the cards if they count in 1s, 10s, 100s and 1 000s:

9 + 1 = 10	99 + 1 = 100	999 + 1 = 1 000
9 999 + 1 = 10 000	99 999 = 100 000	999 999 = 1 000 000

Draw the place value table on the board. Let individuals write the numbers they counted in the table, read the numbers aloud and give the place values and values of the digits.

M	HTH	TTH	TH	H	T	U
					1	0
				1	0	0
			1	0	0	0
		1	0	0	0	0
	1	0	0	0	0	0
1	0	0	0	0	0	0

In Exercise 1, let the class explore and name the countries on the map. They read the populations of the countries in the key aloud. Pupils should realise that Nigeria is the highest populated country on the map (and in Africa). Nigeria is the third highest populated country in the world.

Find out if the class knows why it is important that they know numbers into the millions. They could mention the money system, prices of items, counting products in big numbers, counting people, and so on.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 1

(PB page 12)

1. Equatorial Guinea
2. Nigeria
3. Pupils count digits and discuss in class.
4. 616 459; 1 485 832; 3 903 318; 4 434 873; 10 111 337; 18 467 692; 178 516 904

Exercise 2

(PB page 12)

1. **a)** 2 315 894 **b)** 6 251 442
c) 4 755 180 **d)** 6 174 250

2.

	M	HTH	TTH	TH	H	T	U
a)	4	7	1	9	1	8	0
b)	5	1	0	2	8	6	6
c)	8	4	5	3	2	0	0
d)	4	6	3	0	9	0	7

3. **a)** 1 260 000
b) 659 325
c) 13 375 211

4. 9 765 310

Exercise 3

(PB page 13)

1. **a)** 6 **b)** 2 **c)** 5 **d)** 4 **e)** 1 **f)** 3

2. 3 333 303

3.

How many are in each power of 10?	1	10	100	1 000	10 000	100 000	1 000 000
1s	1	10	100	1 000	10 000	100 000	1 000 000
10s	0	1	10	100	1 000	10 000	100 000
100s	0	0	1	10	100	1 000	10 000
1 000s	0	0	0	1	10	100	1 000

Workbook: Exercise 1

(WB page 6)

1. **a)** 9 864 310
b) 7 653 211

2. **a)** 134 689
b) 1 123 567

3. **a)** 899 800 **b)** 899 809
c) 899 899 **d)** 900 799
e) 909 799 **f)** 999 799
g) 1 899 799

4. **a)** 9 980;9 990; 10 000; 10 010
b) 20 506; 20 706; 20 806
c) 405 983; 406 083; 406 183

5. 10; 100; 1 000; 10 000; 100 000

6. 7; 40; 500; 8 000; 60 000

7. 0.9; 6; 90; 300; 8 000

Count up to one million

Explain to the pupils the beads have special values – each bead has the value of a power of 10. Let them explore the values of the different coloured beads. They then use the values of the beads to count and determine the number represented on the abacus.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 4

(PB page 14)

1. 15 + 90 = 105
2. 80 + 800 = 880
3. 16 000 + 800 = 16 800
4. 100 000 + 1 000 000 = 1 100 000
5. 8 000 + 800 000 = 808 000
6. 6 000 + 60 000 + 600 000 = 666 000

Exercise 5

(PB page 15)

1. **a)** 9 999, 10 000, 10 001, 10 002, 10 003, 10 004, 10 006
b) 97 525, 98 525, 99 525, 100 525, 102 525, 103 525
c) 323 432, 423 432, 523 432, 623 432, 823 432, 923 432, 1 023 432
d) 935 046, 945 056, 965 076, 975 086, 985 096, 1 005 116, 1 015 126

2. 10 + 10 + 10 + 10 + 10 + 10 = 60

Exercise 6

(PB page 15)

1. 100 sticks
2. 200 beans

Exercise 7 Quantitative reasoning

(PB page 15)

1. 15 000 peanuts
2. 10 500 oranges
3. 15 000 buttons
4. 15 bags × 10 kg = 150 kg
5. 200 000 tissues

Workbook: Exercise 2

(WB page 7)

1.

	M	HTH	TTH	TH	H	T	U
	millions	hundred thousands	ten thousands	thousands	hundreds	tens	units
a)	1	6	0	0	4	1	5
b)	6	0	0	1	4	5	2
c)	2	5	4	1	6	0	0
d)	4	2	0	1	0	6	5

2. **a)** 5 046 201
b) 6 400 521

3. **a)** 500 000
b) 5 000 000
c) 500
d) 50 000

4. **a)** 1 000 000 + 900 000 + 8 000 + 400 + 30 + 6
b) 9 000 000 + 700 000 + 1 000 + 300 + 5

Workbook: Exercise 3

(WB page 8)

1. **a)** 601 000; 601 001; 601 002
b) 998 350; 1 000 350; 1 001 350
c) 999 999; 1 000 000; 1 000 001

2. 10 000 + 1 500 = 11 500 glasses
1 600; 1 700; 1 800; 1 900; 2 000; 2 100; 2 200; 2 300; 2 400; 2 500

Topic 3: Count in groups of 5, 7 and 60

Teaching guidelines and solutions

Instructional resources
Objects in pictures; fingers of pupils; fruit; calendar; tables; naira and kobo; shapes; Mayan numerals; clock

Tell the pupils they will count objects in groups of 5, 7 and 60. This links to Unit 1 in Term 3, which deals with time.

Find out if pupils know where we count objects in 5, 7 and 60 or which objects come in 5s, 7s and 60s in real life. They should know there are 5 school days in a week, 5 vowels in the alphabet, 5-minute intervals on a clock, and that a starfish has 5 arms, a pentagon has 5 sides, and there are 5 days in a school week.

Ask pupils to explore the picture on page 17. Let them find an effective way to count the number of people in the waiting room and explain how they do it. They should find out if they can count the number of people in multiples of 5, i.e. 5 + 5 + 5 + 5 = 5, 10, 15, 20 or 4 × 5 = 20. Help them to understand the relationship between counting, repeated addition and multiplication.

Count in groups of 5

Pupils explore the objects in the picture to recognise the groups of 5 in the real-life objects, i.e. 5 petals on a flower, 5 sides on a pentagon, 5 Olympic rings, 5 arms of the starfish and 5 fingers on a hand. Let them read the facts involving objects and events and recognise the number 5 in the sides of a pentagon, the points in a 5-point star (pentagram or pentacle), Muslims praying 5 times a day and 5 players in a basketball game.

Ask pupils to put up their right hands and count the number of fingers on one hand of all the pupils in multiples of 5. They multiply the number by 2 to find the total number of fingers of the pupils. Let the pupils count in 5s and emphasise the relationship between counting or repeated addition, grouping

in 5s and multiplication. Explain what a number sentence and an expression are. They should understand that multiplication is a short way of doing addition:

4 groups of 5 = 4 × 5 = 20 7 groups of 5 = 7 × 5 = 35
5 groups of 5 = 5 × 5 = 25 10 groups of 5 = 10 × 5 = 50
8 groups of 5 = 8 × 5 = 40 9 groups of 5 = 9 × 5 = 45

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 1

(PB page 18)

1. **a)** 5 bags **b)** 8 bags

2. 6 times a month

3. 13 cages

4. **a)** 2 coins **b)** 10 coins **c)** 20 coins **d)** 200 coins

5. 12 intervals

6. **a)** 20 school days
b) 40 school days
c) 160 school days

Exercise 2

(PB page 19)

1. 8 pentagons = 40 sides
2. 19 starfish = 95 arms

The Mayan number system

Assist the pupils in understanding the ancient Mayan number system from 1 to 19. Explain where the ancient Mayans where located in Central America. They should realise that Mayan numbers from 5 are in groups of 5. Let them explore the symbols for the number 12. They find and explain the numbers represented in Mayan symbols. If you or the class have access to computers and the Internet, encourage the pupils to explore websites to find out more about the ancient Mayans, such as:

http://www.storyofmathematics.com/mayan.html

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 3

(PB page 19)

1. 5 + 5 + 4 = 2 × 5 + 4 = 14
2. 5 + 5 + 1 = 2 × 5 + 1 = 11
3. 5 + 5 + 5 = 5 × 3 = 15
4. 5 + 5 + 5 + 2 = 3 × 5 + 2 = 17

5. $5 + 5 + 5 + 3 = 3 \times 5 + 3 = 18$
6. $5 + 5 + 5 + 4 = 3 \times 5 + 4 = 19$

Workbook: Exercise 1

(WB page 9)

1. **a)** $5 \times 3 = 15$
b) $5 \times 6 = 30$
c) $5 \times 8 = 40$
d) $5 \times 7 = 35$

2. **a)** 20; 25; 30; 40; 45
b) 80; 85; 90; 100; 105; 110
c) 590; 595; 600; 605; 610; 615
d) 3 470; 3 475; 3 480; 3 485; 3 490

3. $24 \times 5 = 120$

4. **a)** 13 **b)** 14 **c)** 19

Count in groups of 7

Ask the class to explore the shape and the instrument on page 19 to find the heptagon has 7 sides. The instrument with 7 strings is called a *hepta*cord. Help them understand that the prefixes (first parts of the words) *hepta-* and *septa-* mean seven. A septennium is a period of 7 years. September was originally the 7th month of the year when a year had only 10 months. Julius Caesar and Augustus Caesar (Roman Emperors) decided they wanted months named after themselves so July and August were included, resulting in 12 months in a year.

Let the pupils look at the calendar for February 2017 in the example. Work through the answers with them. Explain that February has 29 days in a leap year. Each year has $365\frac{1}{4}$ days. After 4 years, the quarters are added to make a whole day and February gets the extra day, making it a leap year. Years that are leap years are multiples of 4, we can see that in the last 2 digits of a year – 17 is not a multiple of 4 so 2017 is not a leap year.

Ask the pupils to count in 7s and write multiplication number sentences for repeated addition. They should realise that counting in 7s involves adding 7 each time.

4 groups of 7 → $4 \times 7 = 28$ 7 groups of 7 → $7 \times 7 = 49$
5 groups of 7 → $5 \times 7 = 35$ 3 groups of 7 → $3 \times 7 = 21$
8 groups of 7 → $8 \times 7 = 56$ 9 groups of 7 → $9 \times 7 = 63$

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 4

(PB page 21)

1.

February 2017						
Su	Mo	Tu	We	Th	Fr	Sa
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28				

2. **a)** 33; 40; 47 **b)** 30; 37; 44
c) 31; 38; 45 **d)** 29; 36; 43
e) 32; 39; 46 **f)** 35; 42; 49
g) 34, 41, 48

3. 7 is added in each pattern.

4. No, only 2.f) is counted in multiples of 7.

5. 7; 14; 21; 28; 35; 42; 49; 56; 63; 70

Exercise 5

(PB page 21)

1. **a)** 7 days **b)** 14 days
c) 28 days **d)** 56 days
e) 21 days **f)** 42 days
g) 84 days **h)** 168 days
i) 35 days **j)** 70 days
k) 140 days **l)** 280 days

2. They are all multiples of 7.

3. **a)** 1 week and 3 days
b) 2 weeks and 1 day
c) 3 weeks and 4 days
d) 4 weeks
e) 5 weeks
f) 6 weeks and 5 days

Exercise 6 Quantitative reasoning

(PB page 21)

1. $56 \div 7 = 8 \rightarrow$ Helen must buy 8 bundles.

2. $88 \div 14 = 6$ rem $4 \rightarrow$ James must buy 7 boxes of tiles.

3. $365 \div 52 = 7$ rem $1 \rightarrow$ There are 52 weeks and 1 day in every year.

Workbook: Exercise 2

(WB page 10)

1. **a)** $7 \times 7 = 49$ **b)** $7 \times 8 = 56$
c) $7 \times 6 = 42$ **d)** $7 \times 10 = 70$

2. **a)** 33; 40; 49; 56
b) 32; 39; 46; 53
c) 28; 35; 42; 49
d) 105; 112; 119; 126

3. **a)** 7 **b)** 21
c) 42 **d)** 63
e) 70 **f)** 84

4. **a)** 1 week 2 days
b) 2 weeks 4 days
c) 4 weeks 2 days
d) 7 weeks 1day
e) 8 weeks
f) 9 weeks

5. $20 \times 7 = 140$

Count in groups of 60

Go through the social information about real-life situations involving the number 60. Explain to the pupils that the Sumerians in the ancient Middle East first used a number system based on 60. Show them where Sumeria was on a map. Most professional women retire at the age of 60 and couples married for 60 years celebrate a diamond anniversary.

Ask individuals to give the answers to the multiplication and division calculations by 60. Check if pupils use their knowledge of multiplying and dividing by 6 to solve the problems, i.e. $1 \times 6 = 6$ and $1 \times 60 = 60$ because $6 \times 10 = 60$.

Guide the pupils to find out that most numbers between 1 and 10 can be multiplied by numbers to give an answer of 60 except 7, 8 and 9. Sixty can be divided by many numbers without a remainder meaning 60 is the smallest number having 12 numbers that can divide into it. These numbers are factors of 60. They will learn about factors later in the term.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 7 (PB page 22)

1. 60; 120; 180; 240; 300; 360; 420; 480; 540; 600.
These multiples of 10 are also multiples of 6.

2. $4 \times 60 = 240$ potatoes

3. **a)** $2 \times 60 = 120$ dots
b) $3 \times 60 = 180$ dots
c) $4 \times 60 = 240$ dots
d) $5 \times 60 = 300$ dots
e) $6 \times 60 = 360$ dots

4. **a)** 26; 86; 146; 232; 292; 352
b) 63; 123; 183; 243; 303; 363
c) 39; 99; 159; 219; 279; 339

Workbook: Exercise 3 (WB page 11)

1. 18; 30; 42; 48; 54; 60
180; 300; 420; 480; 540; 600

2. **a)** 1 **b)** 2 **c)** 180 **d)** 240 **e)** 10
f) 6 **g)** 420 **h)** 300 **i)** 480 **j)** 540

3. $300 + 540 = 840$

Time and groups of 60

Explain to the pupils they will now work with groups of 60 and time. They will apply this knowledge in Unit 1 in Term 3 when they work with time. Let them explore the numbers in the picture of the clock. Ask how many minutes in an hour and seconds in a minute. They use the clock to find the number of minutes in fractions of an hour.

Pupils should know multiples of 60 already as they dealt with this in the previous lesson. Assist the pupils in understanding the method to find the number of minutes in the number of seconds that is a multiple of 60. They use the method to find the number of hours in 400 minutes.

400 minutes ÷ 60 = ▩ hours
400 ÷ 60 = 40 ÷ 6
= 6 remainder 4
= 6 hours 40 minutes

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 8

(PB page 24)

1. a) $2 \times 60 = 120$ min

b) $2\frac{1}{2} \times 60 = 150$ min

c) $2\frac{1}{4} \times 60 = 135$ min

d) $12 \times 60 = 720$ min

e) $2\frac{3}{4} \times 60 = 165$ min

f) $4 \times 60 = 240$ min

g) $8 \times 60 = 480$ min

h) $24 \times 60 = 1\,440$ min

2. a) $120 \div 60 = 60 \times 2 = 2$ hours

b) $240 \div 60 = 4$ hours

c) $180 \div 60 = 3$ hours

d) $200 \div 60$; $60 \times 3 = 180$
$200 - 180 = 20 \rightarrow$ 3 hours and 20 min

e) $300 \div 60 = 60 \times 5 = 5$ hours

f) $600 \div 60 = 10$ hours

g) $360 \div 60 = 6$ hours

h) $485 \div 60$; $8 \times 60 = 480$
$485 - 480 = 5 \rightarrow$ 8 hours and 5 min

3. a) $1 \times 60 = 60$ seconds

b) $2 \times 60 = 120$ seconds

c) $5 \times 60 = 300$ seconds

d) $8 \times 60 = 480$ seconds

e) $3 \times 60 = 180$ seconds

f) $4 \times 60 = 240$ seconds

g) $6 \times 60 = 360$ seconds

h) $10 \times 60 = 600$ seconds

4. a) $180 \div 60 = 3$ minutes

b) $120 \div 60 = 2$ minutes

c) $90 \div 60$; $1 \times 60 = 60$; $90 - 60 = 30 \rightarrow$ 1 minute and 30 seconds

d) $280 \div 60$; $4 \times 60 = 240$; $280 - 240 = 40 \rightarrow$ 4 minutes and 40 seconds

e) $60 \div 60 = 1$ minute

f) $300 \div 60 = 5$ minutes

g) $360 \div 60 = 6$ minutes

h) $150 \div 60 = 2$ minutes 30 seconds

Exercise 9 Quantitative reasoning (PB page 24)

1. 60 km

2. $10\frac{1}{2}$ km

3. 70 min

4. 1 hour 33 minutes

5. 360 s + 390 s = 750 s ÷ 60 = 12 min 30 s

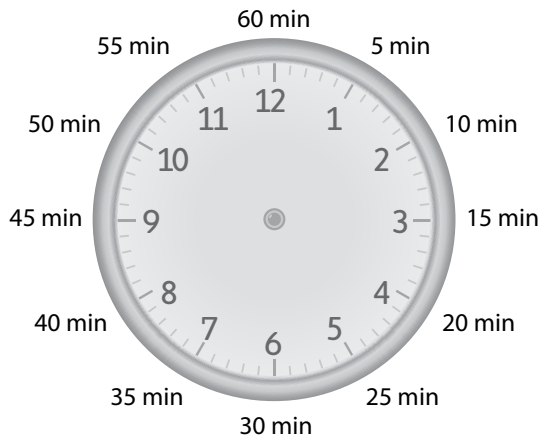
Workbook: Exercise 4 (WB page 12)

1. **a)** 120 **b)** 300
c) 30 **d)** 90
e) 15 **f)** 105
g) 45 **h)** 225

2. **a)** 60 **b)** 30
c) 180 **d)** 360
e) 480 **f)** 540

3. **a)** 5 **b)** 9
c) 10 **d)** 20
e) 3 **f)** $1\frac{1}{2}$

4.



Topic 4: Order and compare numbers up to 100 000 using <, > and =

Teaching guidelines and solutions

Instructional resources
Pictures of objects; digit cards; scales; number lines; abaci; tables/charts

Tell the class they will order (arrange) and compare (match) numbers up to 100 000 (one hundred thousand) using the relation signs less or smaller than (<), more or bigger than (>) and equal to (=). We also use the relation sign not equal to (≠). Relation signs show the connection or link between numbers and we use the signs to compare numbers. They will use relation signs to compare numbers in real-life situations.

Ask the pupils to look at the picture with the relation signs showing the comparison between apples and coins. Let them read the expressions aloud: *Four apples are more than 2 apples; two naira are less than 5 naira.* Pupils memorise the signs <, > and = by forming the signs with their hands. They also note that 3 oranges are equal to 3 oranges.

Ask the class where in real life they compare and order numbers or objects. They should realise we often compare and order sizes and prices of objects, distances, times and lengths, for example. They will now compare numbers using the relation signs.

Revise counting and comparing numbers

Explain that ordering numbers is closely connected to counting. Let pupils count the volume of petrol in litres emptied into the big drum in 10s to get the total volume in the big drum. Let them write the numbers on the board.

5 975 ℓ; 5 985 ℓ; 5 995 ℓ; 6 005 ℓ; 6 015 ℓ; 6 025 ℓ; 6 035 ℓ

Ask the pupils how these numbers are ordered. They should observe the numbers are written from the smallest to the biggest, i.e. in ascending order.

Ask pupils to find the numbers that are halfway between the numbers on the number lines. They compare numbers to find 20 000 is halfway between 15 000 and 25 000, and 275 000 is halfway between 250 000 and 300 000.

Write these expressions on the board. Ask the pupils to fill in the correct relation signs to compare the numbers.

15 000 < 25 000 25 000 > 20 000
300 000 = 3 hundred thousand 25 000 < 25 500

Ask the pupils to find out how much less and how much more the one number is than the other. Explain that they are comparing the sizes of numbers by adding and subtracting numbers.

299 990 is 10 less than 300 000.
249 000 is 1 000 less than 250 000.

300 000 is 5 000 more than 295 000.
12 500 is 2 500 less than 15 000.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 1

(PB page 26)

1. a) 204 567 **b)** 765 420

2. a) 589 672 + 10 = 589 682
b) 901 015 – 100 = 900 915
c) 589 672 + 1 000 = 590 672
d) 901 015 – 1 000 = 900 015

Workbook: Exercise 1

(WB page 14)

1. a) F **b)** F **c)** T **d)** F **e)** F **f)** F

2. a) 5 500 **b)** 2 999 **c)** 12 902
d) 599 993 **e)** 41 003 **f)** 7 996

Exercise 2

(PB page 27)

1. Any 3 of the following: 605 000, 605 001, 605 002, 605 003, 605 004, 605 005, 605 006, 605 007, 605 008, 605 009

2. a) 950 000 **b)** 806 600 **c)** 70 750 **d)** 902 000

3. a) blue SUV
b) SUV ₦7 500 000; car ₦5 650 000, motorbike ₦450 000; bicycle ₦75 000
c) bicycle **d)** Pupils' own answers

Order and compare numbers

Ask the pupils to work in groups. They explore and compare the volume of water in the water tanks to find that the third tank holds the most water, i.e. 132 463 ℓ. They write the volumes from the smallest to the biggest (in ascending order) on the board.

Help the pupils understand that numbers arranged from smallest to biggest are ordered in ascending order and from biggest to smallest are arranged in descending order. "Ascend" means going up and "descend" means going down.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 3

(PB page 28)

1. a) 1 783; 1 782; 1 781; 1 780; 1 779
b) 3 238; 3 237; 3 236; 3 235; 3 234
c) 5 006; 5 005; 5 004; 5 003; 5 002
d) 7 479; 7 478; 7 477; 7 476; 7 475
e) 4 996; 4 995; 4 994; 4 993; 4 992

2. a) 11 009; 10 509; 10 009; 9 509; 9 009; 8 509
b) 30 400; 20 800; 20 000; 19 600; 19 200; 18 800
c) 35 500; 35 250; 35 000; 34 750; 34 500; 34 250
d) 100 050; 100 000; 99 950; 99 900; 99 850; 99 800

3. a) 4 010; 5 010; 6 010; 7 010; 8 010; 9 010
b) 16 406; 16 506; 16 606; 16 706; 16 806
c) 18 870; 18 880; 18 890; 18 900; 18 910
d) 99 500; 99 600; 99 700; 99 800; 99 900; 100 000

Workbook: Exercise 2

(WB page 14)

1. 52 674; 54 746; 54 762; 56 274; 27 264
2. 811 903; 813 901; 819 301; 891 031; 893 110
3. 705 606; 705 660; 706 605; 750 606; 750 660
4. 93 399; 93 993; 94 399; 94 939; 94 993
5. 110 011; 110 101; 110 110; 111 011; 111 110

Use <, > and = to compare numbers

Work as a class. Ask the groups to read the expressions in the example aloud. They say whether the expressions are true or false, give reasons and rectify the false expressions.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 4

(PB page 29)

1. **a)** true **b)** true **c)** false **d)** true **e)** false
f) false **g)** false **h)** false **i)** true

2. **a)** = **b)** < **c)** > **d)** = **e)** = **f)** <

Workbook: Exercise 3

(WB page 15)

1. **a)** > **b)** = **c)** > **d)** >
e) = **f)** < **g)** = **h)** >

2. **a)** <32 **b)** 308 **c)** 4 795 **d)** 77

3. **a)** > **b)** < **c)** < **d)** <

Order and compare numbers in real life

Remind the pupils that they have compared numbers into millions in Unit 2. They will compare smaller numbers as found in real-life situations. Assist them in understanding the data (information) in the example displaying animal types (species) found in Nigeria from 1992 to 2002 as recorded by researchers. Explain that researchers are people who do studies or surveys on environmental and human matters or issues. Ask the pupils to explore and compare the numbers and types of animals on the cards. Ask groups to work together to answer the questions. Let the pupils give examples of each type of animal species.

Have a class discussion about the losses that plant and animal life experience in the country. Ask the pupils' opinions about the reasons for this and what they think could be done to save the animal and plant life.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 5

(PB page 30)

1. C, B, A, D

2. Benue 249 000; Oyo 286 700; Osun 313 400; Kogi 444 900; Delta 500 900; Ogun 529 700

3. **a)** Benue **b)** Ogun **c)** Delta **d)** Oyo

4. No, new people are born or Yes, people have moved away.

Workbook: Exercise 4

(WB page 16)

1. Nile River **2.** Lena River

3. Nile, Amazon, Mississippi **4.** Mississippi, Amazon, Nile

5. 4 180; 4 260; 4 350; 4 410; 4 670; 4 670; 4 990; 6 270; 6 280; 6 690

Topic 5: Count, read and write in Roman numerals

Teaching guidelines and solutions

Instructional resources
Clock; fingers of pupils; flow diagrams; book; charts; number cards

Remind the class that they worked with ancient finger counting in Unit 1 to find out how shepherds counted their sheep. People also used pebbles (stones), sticks and animal bones to count. In this unit, they will work with the ancient Roman numeral (number) system that is still in use today as shown on the clock in the Pupil's Book.

Ask the pupils to study the numbers on the clock. They should observe the numbers on the clock and deduce that the numbers I to XII are 1 to 12 because they know the Arabic numerals on a clock. Let them read the numbers. Explain to the class that Roman numbers are represented by capital letters. The Romans did not have a symbol for zero (0). The numbers we use today are Arabic numerals.

Ask the class to explore the hand signs representing Roman numerals in the picture and read the numbers. Let them model the numbers using their fingers and make sure that all pupils are able to interpret the signs. You can even take photos of pupils' hands with a camera or a cell phone. Make your own chart with your own pupils' hand signs representing the Roman numbers.

Ask the pupils how they think the Roman numbers for the numbers 4 and 9 would look. Tell them they will learn later how the numerals are created. Then pupils write the Roman numbers 1 to 10 (I to X), 50 (L) and 100 (C) on the board and the Arabic numbers below them.

Write and count in Roman numerals

Ask the class to explore the Roman and Arabic numbers on the chart. Let them explain how they think each number is formed by the combinations of the symbols I, V and X.

Explain to the class that the Romans used an additive number system, i.e. they added symbols to others to create bigger numbers and they took away or subtracted symbols to make smaller numbers. Explore the numbers on the cards. Assist pupils in understanding how the numbers 4 and 9 (IV) and IX) are created by subtraction and the numbers 7 and 11 (VII and XI) by addition.

Let the class explain how these numbers are formed.

VI → 5 + 1 = 6
IX → 10 – 1 = 9
XIV → 10 + 5 – 1 = 14
XVI → 10 + 5 + 1 = 16
XIX → 10 + 10 – 1 = 10 + 9 = 19

Explain that the numerals I, X and C cannot be repeated in numbers 10 or less than 50 (L), 100 (C), 500 (D) and 1 000 (M). Explain the formation of the Roman multiples of 10 and 100:

XL → 50 – 10 = 40
XC → 100 – 10 = 90
CD → 500 – 100 = 400
CM → 1 000 – 100 = 900

Now explain that the numerals I, X, C and M can be repeated up to three times in a number. The numerals V, L and D cannot be repeated.

XXX → 10 + 10 + 10 = 30
CL → 100 + 50 = 150
CC → 100 + 100 = 200
DC → 500 + 100 = 600
MD → 1 000 + 500 = 1 500
MM → 1 000 + 1 000 = 2 000

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 1

(PB page 32)

1. **a)** XXIX **b)** CLXV
c) DCVL **d)** MDCLVI
e) LXXV **f)** XCII
g) XXCVI **h)** CDXXXV
i) DCCL **j)** IIID
k) XXXM **l)** MCCDV

2. **a)** 39 **b)** 61
c) 98 **d)** 446
e) 819 **f)** 992
g) 545 **h)** 27
i) 800 **j)** 550
k) 750 **l)** 450

Exercise 2

(PB page 33)

1. 31 = XXXI

2. 83 = LXXXIII

3. 122 = CXXII

4. 2 500 = MMD

5. 284 = CCLXXXIV

6. 420 = CDXX

Exercise 3

(PB page 33)

1. 24 = XXIV; 26 = XXVI; 29 = XXIX; 42 = XLII; 43 = XLIII;
44 = XLIV; 51 = LI; 52 = LII; 53 = LIII; 54 = LIV;
56 = LVI; 57 = LVII; 58 = LVIII; 59 = LVIV; 65 = LXV;
72 = LXXII; 74 = LXXIV; 76 = LXXVI; 79 = LXXIX;
84 = LXXXIV; 86 = LXXXVI; 98 = XCVIII; 99 = IC

2. **a)** 40 = XL
b) CX = 110
c) L = 50; XXV = 25; XV = 15

3. **a)** < **b)** >
b) > **d)** >

4. **a)** X **b)** XCI
c) XXV **d)** XLV

Workbook: Exercise 1

(WB page 17)

1. **a)** XXXV **b)** CCCXXV
c) LXXIX **d)** XC
e) XLV **f)** LXXXVI

2. **a)** 14 **b)** 41
c) 27 **d)** 75
e) 94 **f)** 262
g) 805 **h)** 950
i) 1 190

3. **a)** XLVII **b)** LX
c) CCCXCIV **d)** DXIV
e) CMLXXV

Workbook: Exercise 2

(WB page 17)

1.

10	20	30	40	50	60	70	80	90	100
X	XX	XXX	XL	L	LX	LXX	LXXX	XC	C

2. **a)** 10 + 5 + 3 = 18
b) 10 + 10 – 1 = 19
c) 10 + 10 + 5 + 1 = 26
d) 50 – 10 = 40
e) 50 + 10 + 5 – 1 = 64
f) 100 + 50 = 150

3. **a)** > **b)** >
c) > **d)** <
e) > **f)** >

4. **a)** 15 + 13 = XV + XIII = XXVIII
b) 54 + 15 = LIV + XV = LXIX
c) 42 + 18 = LXII + XVIII = LX
d) 85 + 25 = LXXXV + XXV = CX

Topic 6: Estimate and round off numbers

Teaching guidelines and solutions

Instructional resources
Beans; objects in pictures; calculation cards; tables; cubes; number lines; number cards

Estimation is an integral part of Mathematics. Pupils need to make estimations in almost all topics dealing with numbers to find the reasonableness of and to justify solutions. It is therefore necessary that they master the skill of estimation or approximation early in the year to apply the skill in all topics involving numbers. In this unit, pupils will apply estimation to whole numbers.

Explain to the pupils that they will learn to make meaningful estimates or approximation for the sums, differences and products in calculations. They will compare estimates to actual answers. They will round numbers up and down to make estimations. In Term 2, they will learn more about estimations. Make sure that each pupil knows what the terms *sum*, *difference* and *product* mean.

Explain that we often use estimation or estimates in real life. An estimate is a guess but not a wild guess – it is informed by something you already know about an object or topic. Write some of the terms on the board, such as *about*, *almost*, *roughly*, and so on. Pupils can suggest more words.

Help the pupils understand that we make estimates in mathematics to check answers for reasonableness so we know solutions are right or wrong and that they make sense.

Count to estimate whole numbers

Look at the picture in the example in the Pupil's Book.
Explain that Primary 4 pupils use colour beans to count.
Let them estimate the number of beans in picture A and make

a list of their estimates on the board to compare to the actual solutions later.

Now ask the pupils to look at picture B. Ask how they can use the beans in each small frame to make a closer estimate. Some pupils might suggest they count the number of beans in the small frame and multiply by 4 because there are 4 quarters in the whole. Let them write this estimate on the board.

Ask the pupils how they can calculate the actual number of beans. Some may suggest they count the number of beans in each colour. Let them make a list of the colours on the board and do the counting. They calculate the total number of beans.

Green beans = 20	Yellow beans = 20
Pink beans = 20	Purple beans = 20
Red beans = 20	Total number of beans = 100

Pupils find the difference between their estimates and the actual number of beans. Tell the pupils they will use this strategy (method) to make estimates in the following exercises.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 1

(PB page 35)

1. a) Pupils' estimates

b) Pupils' own methods. Explain the idea of dividing the frame into smaller equal groups, as shown in picture A.

c) Pupils' own answers

2. a) Pupils' estimates

b) 70 people

c) Pupils work out differences

Workbook: Exercise 1

(WB page 18)

(The estimates are examples only.)

1. 50 faces, 40 flowers, 30 soccer balls

2. 52 faces, 36 flowers, 31 soccer balls

3.

Box	Estimate	Actual number	Difference
a)	50	52	2
b)	40	36	4
c)	30	31	1

Round off to estimate

Explain that we often round off numbers, even in real life, to estimate numbers. Pupils name examples of how people round off numbers, such as there are about 180 000 000 people in Nigeria. Tell them the lengths of the longest rivers they worked with before are rounded off. Sometimes we round off numbers to calculate easily in multiples of 10, 100, 1 000 and even millions. Tell them they will round off numbers to the nearest 10 and 100 in Primary 4. Ask the pupils to count in multiples of 10 from 0 to 200. These numbers are rounded numbers.

Let the pupils explore the numbers and labels on the number line in the example. They explain what they observe. They should notice that numbers with units 1, 2, 3 and 4 are rounded off to the previous multiple of 10 and numbers with units 5, 6, 7, 8 and 9 are rounded up to the next multiple of 10.

Ask the class to say the multiples of 100 from 0 to 1 000. Let them explore the numbers and labels on the number line and explain how numbers are rounded off to the nearest 100. They should realise when the 10s are less than 50, the numbers are rounded off to the previous multiple of 100. If the 10s are 50 and more, the numbers are rounded up to the next multiple of 100.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 2

(PB page 37)

1. **a)** 10 **b)** 20
c) 30 **d)** 100
e) 130 **f)** 190
g) 120 **h)** 210

2. **a)** 100 **b)** 300
c) 400 **d)** 100
e) 100 **f)** 900
g) 3900 **h)** 1 200

Exercise 3

(PB page 38)

1. **a)** 10 + 20 **b)** 60 + 20
c) 90 – 40 **d)** 90 – 50

2. **a)** Actual → 30; Approx. → 30
b) Actual → 79; Approx. → 80
c) Actual → 45; Approx. → 50
d) Actual → 38; Approx. → 40

3. **a)** 0 **b)** 1 **c)** 5 **d)** 2

4. **a)** 800 **b)** 450 **c)** 600
d) 550 **e)** 450 **f)** 300

Exercise 4

(PB page 38)

1. **a)** 100 + 50 = 150
b) 40 + 40 = 80
c) 120 + 55 = 175
d) 210 + 40 = 250
e) 350 – 50 = 300
f) 100 – 70 = 30
g) 20 × 7 = 140
h) 90 × 6 = 540

2. **a)** 145 **b)** 80 **c)** 177 **d)** 243
e) 299 **f)** 27 **g)** 154 **h)** 510

3. **a)** 5 **b)** 0 **c)** 2 **d)** 7
e) 1 **f)** 3 **g)** 14 **h)** 30

4. **a)** 100 + 200 = 300
b) 600 + 300 = 900
c) 800 – 700 = 100
d) 2 500 + 4 400 = 6 900
e) 8 000 – 4 300 = 3 700
f) 10 600 + 2 500 = 13 100

5. **a)** 327 **b)** 881
c) 159 **d)** 6 967
e) 3 732 **f)** 13 014

6. **a)** 27 **b)** 19 **c)** 59
d) 67 **e)** 32 **f)** 86

Workbook: Exercise 2

(WB page 19)

1.

	Number	Round off to nearest 10	Round off to nearest 100
a)	3 697	3 700	3 700
b)	8 755	8 760	8 800
c)	9 632	9 630	9 600
d)	7 968	7 970	8 000
e)	2 595	2 600	2 600
f)	4 566	4 570	4 600
g)	1 098	1 100	1 100

2.

	Number sentence	Estimate	Actual answer	Difference
a)	18 + 39	60	57	3
b)	57 + 126	190	183	13
c)	94 – 37	50	57	7
d)	235 – 58	180	177	3
e)	12 × 8	100	96	4
f)	19 × 11	200	209	9

Workbook: Exercise 3

(WB page 20)

1. **a)** 400 **b)** 580 **c)** 1 000
d) 320 **e)** 35 **f)** 40

2. **a)** 200 **b)** 600 **c)** 190
d) 150 **e)** 120 **f)** 200

3. **a)** 450 **b)** 160 **c)** 220
d) 240 **e)** 270 **f)** 1 800

Topic 7: Add and subtract 3- and 4-digit numbers

Teaching guidelines and solutions

Instructional resources
Calculation cards; charts with methods; place value tables; number cards; diagrams; abaci; addition grid

It is important that pupils experience and develop knowledge of addition and subtraction simultaneously so that they realise the inverse relationship between the operations.

Ask the pupils where they apply addition and subtraction in real life. They might mention prices of items they buy, adding and subtracting ages of people, for example.

Let them explore and do the addition and subtraction calculations on the cards. They should observe the relationship, i.e. $8 + 6 = 14$ and $14 – 6 = 8$; $16 – 9 = 7$ and $7 + 9 = 16$. We say addition and subtraction are opposite or inverse operations. Explain to pupils that we often use inverse operations to check our answers.

Add and subtract units, multiples and powers of 10 with renaming

Ask the pupils to explore and discuss the method to find out how much less units are than 4-digit numbers (research has shown that pupils normally struggle with these type of calculations). Pupils should notice the units are broken up to subtract easily. In A they first subtract 3 from 1 003 and then subtract 5. In method B, you add 4 and then 5 to add easily.

Let the pupils work together as a class to find the numbers, which are more or less by adding and subtracting units from 4-digit numbers in Exercise 1. They find the missing addends in diagrams involving addition of 2-digit numbers and add and subtract multiples of 10, 100 and 1 000 by looking for patterns.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 1

(PB page 39)

1. **a)** 3 005 **b)** 996 **c)** 5 304
d) 4 410 **e)** 6 196 **f)** 3 572

2. **a)** Has been done as example.
b) 53 **c)** 45 **d)** 112

3. **a)** 12; 120; 1 200; 12 000
b) 17; 170; 1 700; 17 000
c) 6; 60; 600

Exercise 2

(PB page 40)

1. 600
2. 6 800
3. 4 140; 7 080

Workbook: Exercise 1

(WB page 21)

1. **a)** 2 003 **b)** 3 997 **c)** 7 105
d) 7 993 **e)** 4 918 **f)** 4 996

2. **a)** 9; 90; 900
b) 5; 50; 500
c) 16; 160; 1 600; 16 000
d) 13; 130; 1 300; 13 000

Workbook: Exercise 2

(WB page 22)

1. **a)** 1 000 cm **b)** 97 cm
c) 500 km **d)** 160 cm
e) 9 days **f)** 150 ml

2. **a)**

+	4	9	7	5	6
6	10	15	13	11	12
9	13	18	16	14	15
7	11	16	14	12	13
8	12	17	15	13	14

b)

–	15	11	16	13	17
8	7	3	8	5	9
6	9	5	10	7	11
9	6	2	7	4	8
7	8	4	9	6	10

Use the values of digits to add and subtract 3-digit numbers

Remind the pupils about the names for parts of an addition and subtraction calculation, i.e. subtrahend, minuend, difference, addends and sum. [Note to teacher: Subtrahend is on top and minuend below.]

Refer the pupils to the addition and subtraction methods used by Primary 4 pupils. Ask pupils to explore and explain the methods. They should notice the digits in the numbers broken up into place value parts and the renaming (carrying and decomposition).

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 3

(PB page 41)

1. 342	**2.** 104	**3.** 775	**4.** 902
5. 219	**6.** 547	**7.** 328	**8.** 1 442

Workbook: Exercise 3

(WB page 22)

1. 512	**2.** 965	**3.** 496	**4.** 508

Use addition to do subtraction

Explain to the class that traders and hawkers often count on or add when they give change for notes or coins, which are multiples of 10 or 100, when you buy their products. When you subtract from multiples or powers of 10, it is often not so easy to subtract from the zeros. It is therefore easier to add on when you actually have to do subtraction.

Let the pupils explore and explain the method showing how you use addition to do subtraction by adding on.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 4

(PB page 41)

1. 163	**2.** 322	**3.** 1 066	**4.** 3 211
5. 3 357	**6.** 1 742	**7.** 4 079	**8.** 4 464

Workbook: Exercise 4

(WB page 23)

1. 633	**2.** 355	**3.** 461	**4.** 4 219
5. 1 307	**6.** 824	**7.** 1 157	**8.** 1 413

Add and subtract 4-digit numbers in columns without renaming

Explain that addition and subtraction without renaming is quite easy. You make sure the digits are in the correct places and just add or subtract single digits.

Ask pupils to explore and explain the addition and subtraction methods on the abaci.

Addition: Place beads on abacus to represent the 1st addend. Add the beads representing the 2nd addend in a different colour. Write the solution: 3 456 + 2 341 = 5 797.

Subtraction: Put the beads on the abacus to represent the subtrahend. Take away or replace the green beads by the pink beads, e.g. for 3 – 2, replace 2 green beads with 2 pink beads so that 1 green bead remains. Write the solution for the green beads: 4 653 – 2 312 = 2 341.

Draw two abaci on the board. Ask two groups of pupils to use beads to represent and solve the two given problems while the class assists them.

4 325 + 3 241 = 7 566 5 644 – 3 531 = 2 113

Now ask the class to explore and explain the addition and subtraction column methods without renaming, showing how to add 3 addends and subtract 2 minuends taking two at a time in place value tables.

Draw place value tables on the board. Ask individual pupils to write the numbers in the tables and demonstrate the addition and subtraction of digits.

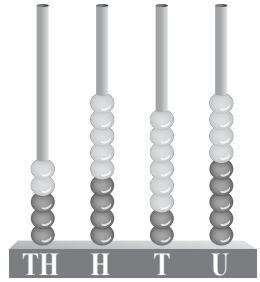
3 035 + 2 741 + 2 103 = 7 879 9 678 – 3 210 – 2 357 = 4 111

The pupils work on their own to complete the workbook exercises either in class or as homework.

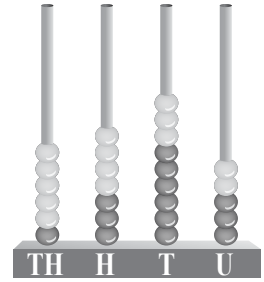
Exercise 5

(PB page 42)

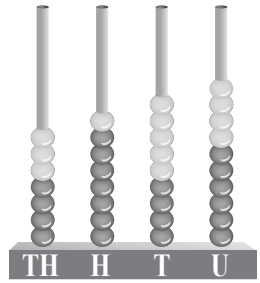
1. a)



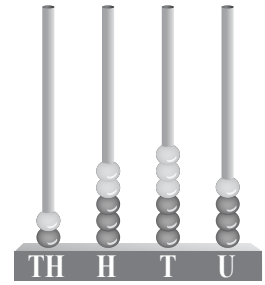
b)



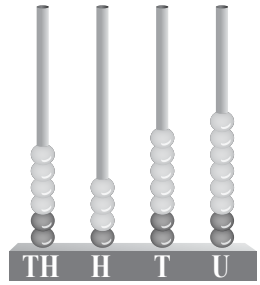
c)



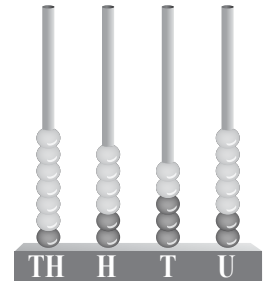
d)



e)



f)



2. a)

	TH	H	T	U
	6	5	4	3
+	2	3	2	4
	8	8	6	7
+	1	1	3	2
	9	9	9	9

b)

	TH	H	T	U
	2	4	1	2
+	3	5	6	3
	5	9	7	5
+	1	0	2	4
	6	9	9	9

c)

	TH	H	T	U
	1	5	2	4
+	4	0	6	5
	5	5	8	9
+	2	3	1	0
	7	8	9	9

d)

	TH	H	T	U
	9	5	6	8
–	5	3	2	1
	4	2	4	7
–	2	1	3	5
	2	1	1	2

e)

	TH	H	T	U
	7	8	7	9
–	3	4	3	5
	4	4	4	4
–	3	4	2	3
	1	0	2	1

f)

	TH	H	T	U
	8	6	9	8
–	6	2	6	4
	2	4	3	4
–	1	2	2	1
	1	2	1	3

3. **a)** 6 868 **b)** 354
c) 1 504 **d)** 9 944
e) 6 598 **f)** 6 545
g) 7 668 **h)** 3 304

4.

+	1 311	**4 430**	314	4 335	**3 220**
2 562	**3 873**	6 993	**2 876**	**6 897**	5 782

5. **a)** 7 679 **b)** 8 047
c) 2 041 **d)** 1 630

Exercise 6 Quantitative reasoning

(PB page 43)

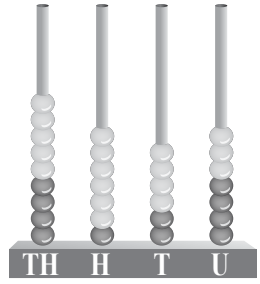
(Pupils should present their calculations on an abacus or place value table.)

1. 3 143 + 4 545 = 7 688
2. 4 234 + 3 552 + 2 223 = 10 009
3. 8 568 – 4 142 – 3 305 = 1 121
4. 5 675 – 2 463 = 3 212

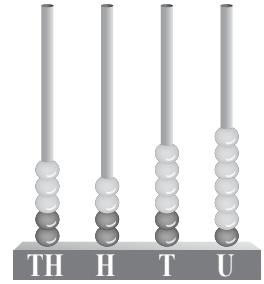
Workbook: Exercise 5

(WB page 23)

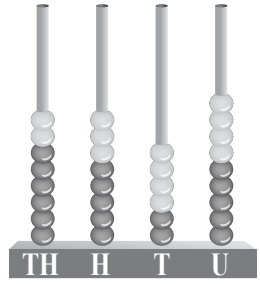
1. **a)** 9 767



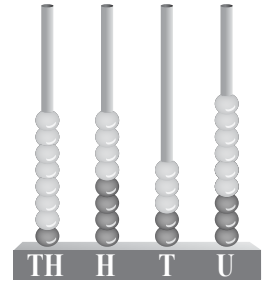
b) 2 221



c) 8 869



d) 1 423



2. **a)** 8 998
b) 1 304
c) 1 121
d) 7 989

Add and subtract 4-digit numbers with renaming

Pupils should understand that renaming occurs when the digits in the 1st addends and subtrahends are smaller than in the 2nd or 3rd addends or in the minuends.

Ask the groups to explore and explain the methods to do addition and subtraction with renaming using the column method.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 7

(PB page 44)

1. a) 2 992 **b)** 11 334
c) 1 755 **d)** 1 601
e) 14 440 **f)** 4 825
g) 12 640 **h)** 2 170

2. a) 1 530 **b)** 2 897
c) 1 316 **d)** 7 305

3. a) 22 437 **b)** 2 282 **c)** 9 742

Exercise 8

(PB page 45)

(Pupils should present their calculations using the column method.)

1. 6 133 **2.** 5 735
3. 4 867 **4.** 3 889
5. 9 139 **6.** 9 647
7. 558 **8.** 890

Exercise 9 Quantitative reasoning

(PB page 45)

1. 6 712 – 3 964 = 2 748 books

2. 7 590 – 6 295 = 1 295 g

3. 7 268 – 5 859 = 1 409 yams

4. 365 – 181 (January to June) = 184 (July to December)

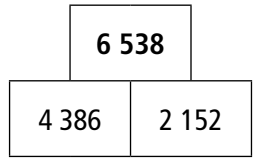
Workbook: Exercise 6

(WB page 24)

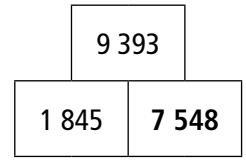
1. a) 9 950
b) 11 465
c) 9 641
d) 10 873; 11 371

2. **a)** 882; 489
b) 1 236; 393
c) 1 872; 778
d) 7 351; 4 569

3. **a)**



b)



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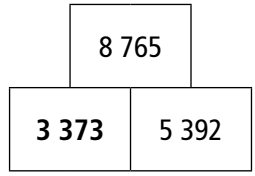

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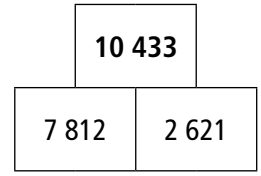

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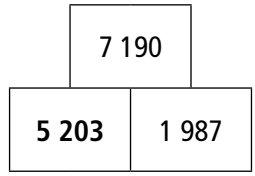
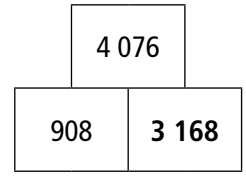


f)



Workbook: Exercise 7

(WB page 26)

1. 8 352 – 3 645 = 4 707
2. 3 003 – 2 084 = 919 eggs
3. 3 000 – 1 800 = 1 200 km
4. 4 100 – 3 500 = 600 m

Topic 8: Find lowest common multiples (LCM)

Teaching guidelines and solutions

Instructional resources
Bead strings; multiples tables/charts

Pupils should understand how to find the lowest common multiples (LCM) and the highest common factors (HCF) before they work with multiplication, division and fractions. In this unit, they will find the LCM of numbers using different methods. They will find out or revise multiples before working with the LCM of numbers.

Remind the class they have worked with groups of 5, 7 and 60 in Unit 3. List multiples of these numbers on the board. Find out if the class knows the numbers are multiples of 5, 7 and 60 and that the lists are number patterns or number sequences. Let them fill in the missing multiples in the sequences. Make sure the pupils know that the answers in multiplying whole numbers are called products or multiples.

Write the multiplication by 5 number sentences shown on the board. Ask pupils to name the multiples. Ask if zero (0) is a multiple of 5. Some pupils might say no. However, zero is a multiple of 5 because it is the product of 0×5, which makes it qualify as a multiple of 5. Zero is a multiple of any number.

Ask the pupils to explore the beads on the necklace. They calculate the number of green and pink beads and explain their counting methods. Let the pupils explore the counting methods of Bode and Adeole. Pupils should understand they use repeated addition, counting on in multiples and multiplication. These strategies are all related to counting.

Find multiples

Ask the class to explore the multiples in the chart and answer the questions. Then ask the class what they think the lowest common multiple (LCM) means. They should realise it is the smallest or lowest number that is a common multiple of two or three numbers.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 1

(PB page 47)

1. 6, 12, 18, 24, 30
2. 8, 16, 24, 32, 40
3. 7, 14, 21, 28, 35
4. 11, 22, 33, 44, 55
5. 12, 24, 36, 48, 60
6. 4, 8, 12, 16, 20
7. 2, 4, 6, 8, 10
8. 5, 10, 15, 20, 25
9. 1, 2, 3, 4, 5
10. 9, 18, 27, 36, 42
11. 3, 6, 9, 12, 15
12. 10, 20, 30, 40, 50

Exercise 2

(PB page 47)

1. 5, 10, 15, 20, 25, 30, 35, 40, 45

2. 24, 28, 32, 36, 40

Workbook: Exercise 1

(WB page 26)

1.b):
[Errata: 64 must be 56]

1. **a)** 2
b) 8
c) 7
d) 4
e) 7

2. **a)** 4, 8, 12, 16, 20, 24, 28, 32, 36, 40, 44, 48
b) 6, 12, 18, 24, 30, 36, 42, 48
c) 8, 16, 24, 32, 40, 48
d) 10, 20, 30, 40, 50
e) 5, 10, 15, 20, 25, 30, 35, 40, 45, 50
f) 9, 18, 27, 36, 45
g) 7, 14, 21, 28, 35, 42, 49

3. 3, 4, 6, 7, 8, 9

4. 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120

5. **a)** 7, 14, 21, 28, 35, 42
b) 4, 8, 12, 16, 20, 24
c) 6, 12, 18, 24, 30, 36

Find out if numbers are multiples

Let the pupils explore and explain the division methods showing how to determine whether numbers are multiples of others. Pupils should notice the strategies involve breaking up the dividends to divide by the closest multiple of the dividend, which is a multiple of 10. They should realise that calculations with remainders imply that the dividend is not a multiple of the divisor.

Ask two groups to work on the board using the division method to find out if 92 and 104 are multiples of 8.

Is 92 a multiple of 8?	Is 104 a multiple of 8?
80 ÷ 10 = 8	80 ÷ 10 = 8
12 ÷ 8 = 1 remainder 4	24 ÷ 8 = 3
92 is not a multiple of 8.	104 is a multiple of 8.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 3

(PB page 48)

1. No
2. Yes
3. No
4. No
5. No
6. No

Workbook: Exercise 2

(WB page 28)

1. 14 rem 2 (not multiple)
2. 21 rem 2 (not multiple)
3. 12 (multiple)
4. 12 rem 1 (not multiple)
5. 14 (multiple)
6. 12 rem 4 (not multiple)

Lowest common multiple (LCM)

Remind the class they have determined the first number that is a multiple of 3 and 5 in the example on page 48. Ask pupils to explain what a multiple is.

Ask the class to explore and explain what they observe about the numbers on the board in the example. They should notice the multiples of 3 and 5 in the sequences. Let them answer the questions and find the common multiples in the sequences, the common multiple that is the smallest and the LCM of 3 and 5.

Ask the class to explain what LCM means, i.e. the smallest multiple of or the smallest number that can be divided by 3 and 5 without a remainder.

Ask the pupils to explore the multiples of 4 and 6 to find the LCM of 4 and 6. They list the multiples of 4 and 6 on the board, find the common multiples, find the smallest common multiple and thus find the LCM of 4 and 6. Pupils should realise that they do not have to list all the multiples of the two numbers. They list multiples until they notice a common multiple.

Multiples of 4 → 4; 8; 12; 16; 20; 24
Multiples of 6 → 6; 12; 18; 24; 30
Common multiples of 4 and 6 → 12; 24
Smallest common multiple → 12
LCM of 4 and 6 → 12

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 4

(PB page 49)

1. a) 4 → 4, 8, 12, 16, 20, 24, 28, 32, 36, 40, 44, 48
5 → 5, 10, 15, 20, 25, 30, 35, 40, 45, 50

b) 20 and 40

c) 20

2. a) 6 → 6, 12, 18, 24, 30, 36, 42, 48
7 → 7, 14, 21, 28, 35, 42, 49

b) 42

c) 42

Exercise 5

(PB page 49)

1. 3 → 3, 6, 12
6 → 6, 12
LCM = 12

2. 3 → 3, 6, 9, 12, 15, 18, 21
7 → 7, 14, 21
LCM = 21

3. 2 → 2, 4, 6, 8, 10
5 → 5, 10
LCM = 10

4. 4 → 4, 8, 12, 16, 20
5 → 5, 10, 15, 20
LCM = 20

5. 6 → 6, 12, 18, 24
8 → 8, 16, 24
LCM = 24

6. 6 → 6, 12
12 → 12
LCM = 12

7. 5 → 5, 10, 15, 20, 25, 30, 35
7 → 7, 14, 21, 28, 35
LCM = 35

8. 3 → 3, 6, 9
9 → 9
LCM = 9

9. 6 → 6, 12, 18, 24, 30
10 → 10, 20, 30
LCM = 30

10. 4 → 4, 8, 12
6 → 6, 12
LCM = 12

11. 16 → 16, 32, 48
24 → 24, 48
LCM = 48

12. Too many multiples of
40 and 82 to list
LCM = 1 640

13. 24 → 24, 48
16 → 16, 32, 48
LCM = 48

14. Too many multiples of
5, 7 and 82 to list
LCM = 2 870

15. Too many multiples of 9, 30
and 12 to list
LCM = 180

16. Too many multiples of
21, 75 and 105 to list
LCM = 1 575

Exercise 6 Quantitative reasoning (PB page 49)

1. 12 m **2.** 150 g

3. 70 pupils **4.** 10

5. 20 × ₦5; 5 × ₦20; 2 × ₦50; 4 × ₦25; 50 × ₦2

Workbook: Exercise 3 (WB page 28)

1. a) Multiples of 6: 6, 12, 18, 24, 30, 36, 42, 48
Multiples of 8: 8, 16, 24, 32, 40, 48
Common multiple: 24 and 48
LCM: 24

b) Multiples of 5: 5, 10, 15, 20, 25, 30, 35, 40, 45, 50
Multiples of 7: 7, 14, 21, 28, 35, 42, 49
Common multiple: 35
LCM: 35

c) Multiples of 2: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36,38, 40
Multiples of 13: 13, 26, 39
Common multiple: 26
LCM: 26

2. a) Multiples of 6: 6, 12, 18, 24, 30, 36, 42, 48
Multiples of 7: 7, 14, 21, 28, 35, 42
LCM: 42

b) Multiples of 4: 4, 8, 12, 16
Multiples of 8: 8, 16
LCM: 8

c) Multiples of 4: 4, 8, 12, 16, 20, 24, 28, 32, 36
Multiples of 9: 9, 18, 27, 36
LCM: 36

3. a) 6 **b)** 8 **c)** 10
d) 30 **e)** 40 **f)** 30
g) 14 **h)** 36 **i)** 20

Topic 9: Find highest common factors (HCF)

Teaching guidelines and solutions

Instructional resources
Factor tables/charts; pictures; flow diagrams

Pupils should have found that multiples are important for finding the LCM of pairs of numbers. To find the HCF, it is important that they know the factors of numbers. They will need knowledge of the HCF when they work with fractions in Term 2.

Remind the pupils that in Unit 3 they learnt that 60 is the smallest 2-digit number with the most numbers that it can be divided by, i.e. 12 numbers. These numbers are factors.

Ask the class if they can explain what a factor is. Let them name the factors of 60 and list them on the board. Pupils should know that a factor is the divisor you divide into the dividend or multiple to get a product without a remainder. List the following number sentences on the board so that pupils understand the relationships between factors and multiples: 6 and 10 are factors of 60 because $6 \times 10 = 60$; $10 \times 6 = 60$; $60 \div 10 = 6$ and $60 \div 6 = 10$.

Find factors of whole numbers

Ask the class to name the factors of 12 and 20. List the factors they give on the board. Let the pupils explore the methods to find the factors of 12 and 20. They should observe that the numbers are listed systematically starting with 1 and the list of factors is arranged in ascending order. Pupils should find out that 1 and the multiple itself are always factors of a number.

Ask the class to explore and explain the numbers and labels in the factor chart. They answer the questions by referring to the chart and only list the factors appearing on the chart. Explain to pupils that these are not the only factors of the multiples mentioned.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 1 (PB page 51)

1. 1, 2, 3, 6, 9, 18
2. 1, 3, 5, 15
3. 1, 3, 7, 21
4. 1, 2, 3, 4, 6, 8, 12, 24
5. 1, 3, 9, 27
6. 1, 2, 4, 7, 28
7. 1, 2, 3, 5, 6, 10, 15, 30
8. 1, 2, 4, 8, 16, 32
9. 1, 2, 3, 4, 6, 9, 12, 18, 36
10. 1, 2, 4, 5, 8, 10, 20, 40
11. 1, 2, 3, 6, 7, 14, 21, 42
12. 1, 2, 3, 5, 9, 15, 21, 45

Exercise 2 (PB page 51)

1. 18, 9, 72, 63
2. 25, 10
3. 9
4. 18, 72
5. 7 and 10
6. 63
7. 72
8. 9, 18
9. 72
10. 18, 9, 72

Workbook: Exercise 1 (WB page 30)

1. **a)** 1; 2; 4 Factors of 16 are 1, 2, 4, 8, 16
b) 1; 2; 3; 6 Factors of 12 are 1, 2, 3, 4, 6, 12
c) 1; 3 Factors of 27 are 1, 3, 9, 27

2. **a)** 15: 1, 3, 5, 15
b) 36: 1, 2, 3, 4, 6, 9, 12, 18, 36
c) 48: 1, 2, 3, 4, 6, 8, 12, 16, 24, 48
d) 54: 1, 2, 3, 6, 9, 18, 27, 54
e) 100: 1, 2, 4, 4, 10, 20, 25, 50, 100

Highest common factor (HCF)

Ask the class to explore and explain the numbers in the picture. They should notice the factors of 20 and 30 listed on the children's charts and realise that 10 is the highest common factor (HCF) of 20 and 30. Assist the pupils in understanding that the highest common factor is the biggest factor that can divide into 20 and 30. Let the pupils answer the questions and list the numbers on the board.

1. Factors of 20 → 1; 2; 4; 5; 10; 20

2. Factors of 30 → 1; 2; 3; 5; 6; 10; 15; 30

3. The numbers 1; 2; 5 and 10 are common factors.

4. 10 is the biggest number.

5. 10 is the HCF of 20 and 30.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 3

(PB page 52)

1. 3
2. 12
3. 10
4. 3
5. 4
6. 5
7. 6
8. 32
9. 7
10. 6
11. 9
12. 15

Exercise 4

(PB page 52)

1. 27
2. 5
3. 8
4. 2
5. 3
6. 70
7. 50
8. 9
9. 15

Exercise 5 Quantitative reasoning

(PB page 53)

1. 5 tables with 3 adults and 4 children

2. 3 packs with 2 sandwiches and 3 bottles of water

3. 2 pages with 1 photo and 10 newspaper clippings

4. 5 groups with 3 stuffed cats and 1 stuffed dog

Workbook: Exercise 2

(WB page 30)

1. **a)** Factors of 8: 1, 2, 4, 8; factors of 16: 1, 2, 4, 8, 16; common factors: 2, 4, 8; HCF: 8

b) Factors of 9: 1, 3, 9; factors of 12: 1, 2, 3, 4, 6, 12; common factors: 1, 3; HCF: 3

c) Factors of 6: 1, 2, 3, 6; factors of 15: 1, 3, 5, 15; common factors: 1, 3; HCF: 3

2. **a)** 3 **b)** 13 **c)** 7
d) 20 **e)** 5 **f)** 9

Topic 10: Multiply whole numbers and decimals

Teaching guidelines and solutions

Instructional resources
Objects in pictures; puzzle pieces; multiplication charts; flow diagrams

Ask pupils to explain what multiplication means. They should recall that multiplication is a short way of doing addition. Let them give examples.

Let them find out how many balloons there are in the picture in the example. Ask pupils to explain the method they use. Let them explore the methods showing repeated addition, counting on in multiples and multiplication.

Revise basic multiplication and division facts

Ask the class to explore the puzzle pieces to find the relationship between multiplication and division. They should notice the swapping of numbers in multiplication (commutative property) and the inverse (opposite) relationship between multiplication and division. We use inverse operations to check solutions.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 1

(PB page 55)

1. C **2.** B **3.** F **4.** E **5.** D **6.** A

Exercise 2

(PB page 55)

1. **A.** $4 \times 5 = 20$ pearls
B. $6 \times 4 = 24$ pearls
C. $5 \times 8 = 40$ pearls
D. $9 \times 6 = 54$ pearls
E. $3 \times 8 = 24$ pearls

2. **a)** 5 × 20 = 100 pearls **b)** 10 × 24 = 240 pearls
c) 6 × 40 = 240 pearls **d)** 2 × 54 = 108 pearls
e) 3 × 24 = 72 pearls

Workbook: Exercise 1

(WB page 31)

1. 120 beats
2. 135 seconds
3. 6 beds
4. 24 ÷ 6 = 4 km/min; 4 × 60 min = 240 km
5. 45 × 2 = 90 min
6. 35 ÷ 5 = 7 shoes

Multiply by multiples of 10

Explain that multiplication by 10 and multiples of 10 could be done quickly in your head or mentally without long paper and pen calculations. Let them explore and explain the strategies on the board. They should understand that you add a zero when multiplying by 10 and add 2 zeros when multiplying by 100 because 40 × 5 = (4 × 5) × 10 and 40 × 50 = (4 × 5) × 100.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 3

(PB page 56)

1. **a)** 20; 200; 2 000 **b)** 48; 480; 4 800
c) 81; 810; 8 100 **d)** 35; 350; 3 500
e) 21; 210; 2 100 **f)** 36; 360; 3 600

2. **a)** 10; 450 **b)** 2 600; 20; 10

Workbook: Exercise 2

(WB page 32)

1. **a)** 15 **b)** 18 **c)** 20
d) 27 **e)** 30 **f)** 35
g) 38 **h)** 41 **i)** 45

2. **a)** 5 × 10 = 50 glasses **b)** 4 × 10 = 40 oranges
c) 7 × 10 = 70 keys **d)** 8 × 10 = 80 bottle tops
e) 11 × 10 = 110 bottle tops

3. **a)** 220 **b)** 390
c) 400 **d)** 1 600
e) 420 **f)** 2 400

4. **a)** 500 bars of soap **b)** 360 batteries
c) 480 pineapples **d)** 2 000 plantains

Multiply by 2-digit numbers

Ask the class to find the number of eggs in the trays in the picture. Find out if they know they have to multiply 14 by 36 and how to do it.

Let the pupils explore and explain the methods showing how to calculate 14 × 36. The methods shown are the array strategy (area method) in a grid and the vertical column method. They should notice that the array method helps them to make sense of the column method.

Let the pupils revise the names of parts of a multiplication calculation. They should be able to explain that you break down the multiplicand and the multiplier into place value parts to calculate the product in the array method. Let the pupils explain the vertical column method.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 4

(PB page 58)

1. 288 **2.** 224 **3.** 221

4. 414 **5.** 832 **6.** 1 080

7. 1 224 **8.** 1 886 **9.** 1 131

10. 72 × 19 **11.** 48 × 49 **12.** 97 × 41

13. 45 × 63 **14.** 28 × 25 **15.** 14 × 57

Workbook: Exercise 3

(WB page 34)

1. **a)** 860 + 172 = 1 032
b) 1 110 + 185 = 1 295
c) 280 + 196 = 476
d) 870 + 116 = 986

2. **a)** 390 + 312 = 702
b) 430 + 86 = 516
c) 750 + 150 = 900
d) 180 + 126 = 306

3. **a)** 1 020 **b)** 1 134
c) 621 **d)** 4 872

Solve real-life multiplication problems

Ask the pupils to explore the boxes of fish in the picture in Exercise 5. Help them with the first answer, then allow them to finish the rest of the exercise in class.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 5 Quantitative reasoning (PB page 58)

1. 30 boxes

2. 45 × 30 = 1 350 fish

3. 34 boxes

4. 45 × 34 = 1 530 fish

Exercise 6 Quantitative reasoning (PB page 59)

1. 15 × 12 = 180 m

2. 25 × 12 = 300 eggs

3. 25 × 14 = 350 seats

4. 35 × 18 = 630 so **630** ÷ 35 = 18

5. 14 × 28 = 392 cows

Exercise 7 (PB page 59)

1. 65 × 34 = **2 210**

2. **12** × 90 = 1 080

3. 30 × **42** = 1 260

4. 14 × 68 = **952**

Workbook: Exercise 4 (WB page 35)

1. 450 fish

2. 345 gorillas

3. 1 120 oranges

4. 616 bananas

Basic operations
Division

Topic 11: Divide 2- or 3-digit numbers

Teaching guidelines and solutions

Instructional resources
Objects in pictures; flow diagrams

Ask the class to explain what they think division means and where they apply division in real life. Pupils should realise that division and sharing are everyday activities – they share objects at home all the time.

Pupils explore the objects in the example and calculate the number of objects each child will get if the objects are shared equally. Let the pupils write division number sentences on the board to show their reasoning. Ask pupils to write multiplication number sentences to check their solutions.

A. 16 apples ÷ 4 children
16 ÷ 4 = ☐
16 ÷ 4 = 4 apples each
4 × 4 = 16

B. 30 bananas ÷ 5 children
30 ÷ 5 = ☐
30 ÷ 5 = 6 bananas each
6 × 5 = 30

C. 15 sweets ÷ 3 children
15 ÷ 3 = ☐
15 ÷ 3 = 5 sweets each
3 × 5 = 15

Divide and share equally with and without remainders

Ask the class to explore the products sold by traders at the market in the example. Tell them the products are sold in small groups, which are cheaper than single items. Ask whether they think it is a good idea. They might reason that the trader sells more products and makes more money in this way. Ask the pupils to write number sentences on the board to show their reasoning for the real-life problems. They count the number of objects in the picture.

Pupils should realise that they ignore the remainders. The calculations in which products are left over (remainders) are not multiples of the divisors.

Remind the pupils about the names of parts in a division calculation. Encourage them to use these terms when they explain or discuss procedures and solutions. Ask the pupils to explore the method showing division with a remainder, and the method to check the answer.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 1

(PB page 62)

1. a) 9; 9 × 9 = 81 **b)** 9; 8 × 9 = 72
c) 9; 9 × 7 = 63 **d)** 6; 6 × 9 = 54
e) 8; 8 × 10 = 80 **f)** 8; 6 × 8 = 48
g) 8; 8 × 8 = 64 **h)** 6; 6 × 7 = 42

2. a) 16; 4 remain **b)** 12; 4 remain
c) 8; 4 remain **d)** 11; 1 remains
e) 14; 2 remain

3. a) (16 × 6) + 4 = 100 **b)** (12 × 8) + 4 = 100
c) (12 × 8) + 4 = 100 **d)** (9 × 11) + 1 = 100
e) (7 × 14) + 2 = 100

4. a) 120 → 6 → **20**; 125 → **5** → 25
b) 64 → **8** → 8; **72** → 8 → 9; 84 → **12** → 7
c) 48 → **12** → 4; 65 → 5 → **13**; 96 → **12** → 8

Exercise 2

(PB page 62)

1. 59 **2.** 33
3. 54 **4.** 38
5. 61 **6.** 6
7. 15 **8.** 277

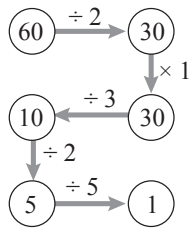
Workbook: Exercise 1

(WB page 35)

1. a) 16 **b)** 10 rem 6 **c)** 12
d) 13 rem 5 **e)** 19 rem 1 **f)** 24
g) 32 **h)** 9 rem 6

2. 76 + 54 = 130 marbles

3. a)



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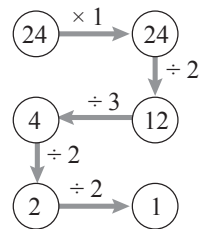

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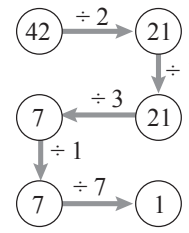


Divide by multiples of 10

Ask the class which products they know are sold in multiples of 10, for examples sweets, fruit, and so on. Ask pupils to count in 10s and multiples of 10 as a whole class, groups and individuals. They should know the numbers in the counting sequences are multiples of 10.

Ask different groups to find the number of bunches a florist can make with the flowers in the picture. They count the flowers to find there are 100 flowers. Pupils should realise that remainders are discarded.

1. 100 ÷ 10 = 10 bunches
2. 100 ÷ 5 = 20 bunches
3. 100 ÷ 20 = 5 bunches
4. 100 ÷ 25 = 4 bunches
5. 100 ÷ 40 = 2 bunches
6. 100 ÷ 50 = 2 bunches
7. 100 ÷ 30 = 3 bunches
8. 100 ÷ 1 = 1 bunch

In Exercise 2, first ask the class to explore and explain the methods showing division of 3-digit numbers by multiples of 10. Tell them that these calculations could be done mentally without paper and pen.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 3

(PB page 63)

1. a) 50; 25; 42; 30 **b)** 90; 65; 89; 10

2. a) 2 rem 4 **b)** 9 rem 8
c) 10 rem 6 **d)** 73 rem 5
e) 25 rem 9 **f)** 50 rem 2

Exercise 4

(PB page 64)

1. 20 **2.** 11 **3.** 5 **4.** 9 **5.** 15
6. 11 **7.** 25 **8.** 10 **9.** 5

Workbook: Exercise 2

(WB page 36)

1. a) 35 **b)** 910 **c)** 42
d) 88 **e)** 570 **f)** 320

2. a) 8 rem 7 **b)** 12 rem 3
c) 9 rem 4 **d)** 20 rem 9
e) 15 rem 1 **f)** 28 rem 8

3. a) 20 **b)** 11
c) 6 **d)** 9
e) 9 **f)** 28

Break up numbers to divide and do long division

Ask the class to explore and explain what they observe in the picture in the example. They should notice that the grazers are busy dividing the number of cows (592) among themselves and that there are 8 grazers in the picture. Let them show on the board how they calculate the number of cows that each grazer will tend.

Let them explore and explain Modele's method to solve the problem. Modele takes the nearest (closest) multiple of 8, subtract it from the dividend to divide, and divide the remainder. He adds the quotients to get the final quotient.

Then explore and explain Sekirat's method and reasoning showing the problem above solved by long division. Assist the pupils in understanding the procedures in long division.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 5

(PB page 65)

1. 66
2. 54
3. 69
4. 87
5. 184
6. 20 remainder 7
7. 44 remainder 4
8. 94 remainder 7

Exercise 6

(PB page 65)

(Pupils should present their calculations using the long division method.)

1. 103
2. 106
3. 42
4. 144 remainder 4
5. 242
6. 255 remainder 1
7. 125 remainder 1
8. 143 remainder 5
9. 37
10. 42 remainder 2
11. 114
12. 127 remainder 3

Exercise 7 Quantitative reasoning (PB page 66)

1. 8 boxes with 2 eggs remaining
2. 8 tables with 2 children remaining
3. 73 containers
4. 102 packets with 4 sweets remaining
5. 79 pairs

Workbook: Exercise 3 (WB page 37)

1. 23
2. 56
3. 56
4. 41
5. 216
6. 211 rem 2

Workbook: Exercise 4 (WB page 38)

(Pupils must show their long division calculations.)

1. 42
2. 141
3. 71
4. 52 rem 1
5. 202 rem 1
6. 251 rem 2
7. 189 rem 4
8. 121 rem 4

Workbook: Exercise 5 (WB page 39)

1. 16 rem 6
2. No, 102 rem 1 is correct
3. 146 rem 2
4. 132 rem 3
5. 15 rem 10

TERM 1

Revision

You may use the revision questions or a selection thereof for the final assessment at the end of the term. The questions and problems involve work covered in topics during the term. The problems include routine problems and those involving quantitative reasoning.

Revision solutions

(PB page 67)

1. a) 8 900; 8 910; 8 920; 8 930; 8 940
b) 7 998; 7 999; 8 000; 8 001; 8 002
c) 761 075; 861 075; 961 075; 1 061 075; 1 161 075
d) 1 000 004; 1 000 014; 1 000 024; 1 000 034; 1 000 044

2. a) 4 526 **b)** 8 050 **c)** 94 735 **d)** 3 740 007

3. a) two thousand eight hundred and sixteen
b) six thousand nine hundred and ninety-two
c) eighty-one thousand four hundred and thirty-five

4. a) 5 624 **b)** 65 624 **c)** 4 437

5. a) 7 000 + 600 + 80 + 7 = 7 687
b) 9 000 + 400 + 80 + 4 = 9 484
c) 1 000 + 700 + 50 + 3 = 1 753

6. a) 1 000 **b)** 200 **c)** 50 000 **d)** 7

7. a) 25 **b)** 21

8. a) 10 000 + 400 + 80 + 2 = 10 482
b) 30 000 + 2 000 + 700 + 10 = 32 710

9. 6 251 442

10.

	M	HTH	TTH	TH	H	T	U
8.a	0	0	1	0	4	8	2
8.b	0	0	3	2	7	1	0
9	6	2	5	1	4	4	2
11.a	8	4	6	7	0	8	2
11.b	92	1	0	9	7	0	4

11. See table above

12. a) 60; 65; 70; 75 **b)** 42; 49; 56; 63
c) 180; 240; 300; 360 **d)** 33; 40; 47; 54

13. a) 39 805 **b)** 40 795 **c)** 39 895
d) 29 795 **e)** 39 695 **f)** 39 785

14. a) 100 **b)** 1 600 **c)** 19 500

15. 437 586; 456 783; 465 873; 478 653; 546 783; 564 873

16. a) false **b)** true **c)** false **d)** false

17. a) < **b)** = **c)** >

18.

IV	XVI	XXI	XL	L	XC	LXX	CL	MD
4	16	21	40	50	90	70	150	1 500

19. (i) a) 80 **b)** 150
c) 5 290 **d)** 2 000
(ii) a) 100 **b)** 100
c) 5 300 **d)** 2 000

20. a) 360; 363; 3 **b)** 250; 253; 3

21. a) 17; 170; 1 700; 17 000 **b)** 9; 90; 900; 9 000

22. a) 1 502 **b)** 8 889 **c)** 4 222

23. a) ₦2 367 + ₦1 785 + ₦4 157 = ₦8 309
b) ₦4 157 – ₦2 367 = ₦1 790
c) No. ₦2 367 + ₦1 785 = ₦4 152 < ₦4 157

24. a) 3 → 3, 6, 9, 12, 15, 18, 21
7 → 7, 14, 21
LCM = 21
b) 4 → 4, 8, 12, 16, 20
10 → 10, 20
LCM = 20

25. a) 8 → 1, 2, 4, 8
12 → 1, 2, 3, 4, 6, 12
HCF = 2
b) 14 → 1, 2, 7, 14
21 → 1, 3, 7, 21
HCF = 7

26. a) 480 **b)** 1 500 **c)** 1 044 **d)** 782

27. a) 432 sweets
b) 210 books
c) 12 bunches with 4 flowers remaining
d) 14 packets
e) 7 tables

28. a) 119
b) 154 rem 4

Topic 1: Squares and square roots

Teaching guidelines and solutions

Instructional resources
Objects in pictures; flow diagrams; squared grid paper; 20 × 20 square chart

Tell the class that objects around them have different shapes. Ask them to identify and describe the shapes in the objects on page 71. They explain in which objects they see squares. Find out if they can describe a square as a shape with all sides even in length. Let them name objects om the classroom and school that look like squares.

Square numbers

Ask the class to look at the squares in the example showing the number of squares in the 8 × 8 grid and the 6 × 6 grid. They find the number of squares in a row and a column in each square. Explain there are 8 squares in a row and 8 squares in the column of the first square. So multiply the number of squares in a row by the number of squares in a column to get the total number of squares. Ask them how many squares are in the row and column of the other square.

Help the pupils understand that 64 and 36 are square numbers. The small ^{2} in 8^2 and 6^2 is the index or exponent. 8^2 = 8 squared and 6^2 = 6 squared. Let the pupils explain why they think 64 and 36 are square numbers. They should notice that a square number is the product of a factor multiplied by itself or the multiplicand and the multiplier are the same number.

Pupils explore the sets of squares and calculate the number of squares in each big square.

Encourage them to use multiplication and let them write number sentences on the board.

1 × 1 = **1**	2 × 2 = **4**	3 × 3 = **9**
4 × 4 = **16**	5 × 5 = **25**	6 × 6 = **36**

Let them write the exponential forms:

$1^2 = \mathbf{1}$ $2^2 = \mathbf{4}$ $3^2 = \mathbf{9}$ $4^2 = \mathbf{16}$ $5^2 = \mathbf{25}$ $6^2 = \mathbf{36}$

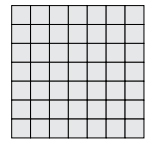
The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 1

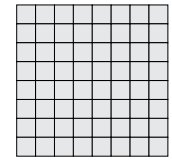
(PB page 72)

1. a) 1; 4; 9; 16; 25; 36

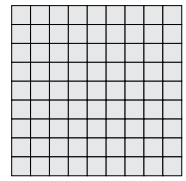
b) G



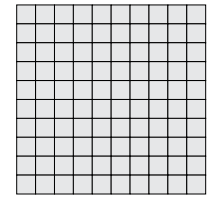
H



I



J



2. 49; 64; 81; 100

3. b) 4 **c)** $3^2 = 9$ **d)** $4^2 = 16$
e) $11 \times 11 = 121$ **f)** $12 \times 12 = 144$

4. a) 4 **b)** 9 **c)** 1 **d)** 16

Workbook: Exercise 1

(WB page 40)

1. a) 9 **b)** 49 **c)** 100 **d)** 1 **e)** 16 **f)** 36
g) 64 **h)** 4 **i)** 81 **j)** 25 **k)** 121 **l)** 144

2. 4; 9; 16; 49; 64; 121

Ask the pupils to explore the small squares (13) and the two squares created on the squared grid paper. Explain to them that you can use 13 small squares to create 2 squares with no squares remaining. Ask them to calculate the number of squares in each square created and find out if the total is 13 squares. Explain to them that 13 is expressed as the sum of its squares.

$13 = 4 + 9 \rightarrow 13 = (2 \times 2) + (3 \times 3) \rightarrow 13 = 2^2 + 3^2$

Let the pupils explore the number sentences on the cards and explain what they notice. They should observe that the different numbers are expressed as the sum of squares. Help them understand that any number can be written as the sum of square numbers.

For Exercise 2, write the factors that give square numbers on the board to explain why the products are square numbers.

4 = $2^2 \times 1$ **16** = $2^2 \times 2^2$ **9** = 3^2 **36** = $3^2 \times 2^2$
64 = $4^2 \times 2^2$ **81** = $3^2 \times 3^2$ **256** = $4^2 \times 4^2$

Exercise 2

(PB page 73)

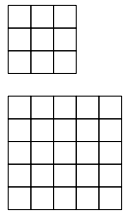
Square products:

$2 \times 2 \times 1 = 4$
$2 \times 2 \times 2 = 8$
$2 \times 2 \times 4 = 16$
$2 \times 2 \times 2 \times 4 = 32$
$2 \times 2 \times 2 \times 5 = 40$
$3 \times 3 = 9$
$3 \times 4 = 12$
$3 \times 3 \times 4 = 36$
$3 \times 3 \times 6 = 54$
$3 \times 3 \times 3 \times 3 = 81$
$4 \times 4 = 16$
$4 \times 4 \times 2 = 32$
$4 \times 4 \times 4 = 64$
$4 \times 4 \times 6 = 96$
$4 \times 4 \times 4 \times 4 = 256$

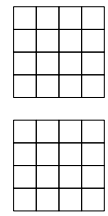
Exercise 3

(PB page 73)

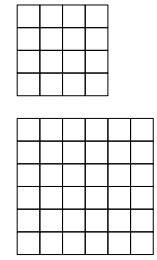
1.



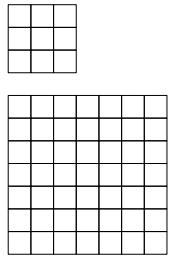
2.



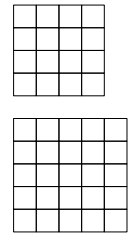
3.



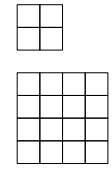
4.



5.



6.



Exercise 4 Quantitative reasoning

(PB page 74)

1. $13 = 2^2 + 3^2$
2. $15 = 1^2 + 1^2 + 2^2 + 3^2$
3. $30 = 1^2 + 2^2 + 3^2 + 4^2$
4. $26 = 1^2 + 5^2$
5. $40 = 6^2 + 2^2$
6. $45 = 6^2 + 3^2$
7. $38 = 5^2 + 3^2 + 2^2$
8. $58 = 3^2 + 7^2$

Exercise 5

(PB page 74)

1. 16; square number
2. 18
3. 100; square number
4. 36, square number
5. 24
6. 125
7. 81, square number
8. 49; square number
9. 64; square number
10. 48

Exercise 6

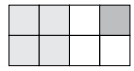
(PB page 74)

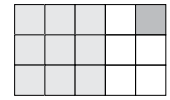
1. **a)** $16 + 36 = 52$ **b)** $25 - 9 = 16$
c) $81 + 49 = 130$ **d)** $100 + 4 = 104$
e) $36 + 64 - 25 = 75$ **f)** $9 \times 4 = 36$
g) $4 \times 25 - 64 = 36$ **h)** $9 \times 25 \times 4 = 900$

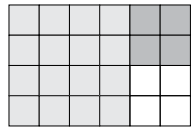
2. **a)** 16
b) 64 4 096
c) Pupils' own answers
d) 9 81
e) 6 36

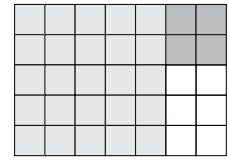
Workbook: Exercise 2

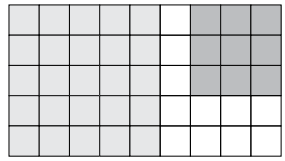
(WB page 40)

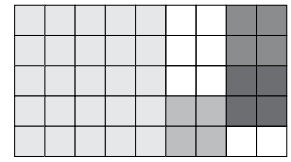
1. **a)** 

b) 

c) 

d) 

e) 

f) 

2. **a)** $4 + 1 = 5$ **b)** $1 + 9 = 10$
c) $16 + 4 = 20$ **d)** $25 + 4 = 29$
e) $25 + 9 = 34$ **f)** $25 + 4 + 4 + 4 = 37$

Workbook: Exercise 3

(WB page 41)

1. **a)** $9 + 4 + 1$ **b)** $16 + 4 + 4$
c) $25 + 4$ **d)** $25 + 9 + 1$
e) $25 + 4 + 1 + 1$ **f)** $81 + 4$
g) $49 + 4$ **h)** $64 + 4 + 1 + 1$

2. **a)** $9 + 81 = 90$
b) $81 - 25 = 56$
c) $100 + 25 = 125$
d) $26 + 16 = 42$
e) $9 + 64 - 16 = 57$
f) $25 \times 49 - 4 = 3\,721$

Workbook: Exercise 4

(WB page 41)

1. **a)** $(5 \times 5) + (2 \times 2)$ **b)** $(7 \times 7) + (10 \times 10)$ f)
c) $(6 \times 6) + (8 \times 8)$ **d)** $(12 \times 12) + (11 \times 11)$
e) $(10 \times 10) + (12 \times 12)$ **f)** $(9 \times 9) + (11 \times 11)$

2.

×	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	1																			
2		4																		
3			9																	
4				16																
5					25															
6						36														
7							49													
8								64												
9									81											
10										100										
11											121									
12												144								
13													169							
14														196						
15															225					
16																256				
17																	289			
18																		324		
19																			361	
20																				400

Square roots

Ask the class to explore the multiplication expressions on the leaves in the pear tree in the example and give the solutions. They should recognise the products as square numbers. Ask them to give the answers to the division expressions on the roots of the tree. Explain the difference between a number sentence ($4 \times 4 = 16$) and an expression (4×4) .

Explain that the answers on the roots of the tree are square roots. Let them read the statements on the cards. Ask the pupils to give the square roots of the squares. They should understand that the square roots are the factors that you multiply by themselves to give a square number as a product.

Ask the pupils to explore the statements on the cards to understand the symbol used for "the square of". They find out how to check

the solutions using the square roots. Let the pupils explain to the class in their own words what a square and a square root are.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 7

(PB page 76)

1. a) 15 **b)** 2 **c)** 4 **d)** 1 **e)** 16 **f)** 12

2.

×	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
2	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
3	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60
4	4	8	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80
5	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
6	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120
7	7	14	21	28	35	42	49	56	63	70	77	84	91	98	105	112	119	126	133	140
8	8	16	24	32	40	48	56	63	72	80	88	96	104	112	120	128	136	144	152	160
9	9	18	27	36	45	54	63	72	81	90	99	108	117	126	135	144	153	162	171	180
10	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200
11	11	22	33	44	55	66	77	88	99	110	121	132	143	154	165	176	187	198	209	220
12	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240
13	13	26	39	52	65	78	91	104	117	130	143	156	169	182	195	208	221	234	247	260
14	14	28	42	56	70	84	98	112	126	140	154	168	182	196	210	224	238	252	266	280
15	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270	285	300
16	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240	256	272	288	304	320
17	17	34	51	68	85	102	119	136	153	170	187	204	221	238	255	272	289	306	323	340
18	18	36	54	72	90	108	126	144	162	180	198	216	234	252	270	288	306	324	342	360
19	19	38	57	76	95	114	133	152	171	190	209	228	247	266	285	304	323	342	361	380
20	20	40	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400

Workbook: Exercise 5

(WB page 42)

1. a) 11 **b)** 7 **c)** 5
d) 9 **e)** 3 **f)** 0
g) 6 **h)** 8 **i)** 10
j) 13 **k)** 18 **l)** 16

2. a) 8; 16 **b)** 11; 20 **c)** 17; 15

Calculate with square roots

Tell the class that they can do the four basic operations (addition, subtraction, multiplication and division) with squares and square roots. Let them explore and explain the calculations on the cards showing the four basic operations with square roots.

Ask the pupils to find the solutions for the calculations with squares and square roots. They explore and explain the methods to solve the problems.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 8

(PB page 77)

1. a) 27 **b)** 39 **c)** 5 **d)** 9

2. a) 3 **b)** 10 **c)** 5 **d)** 8

3. a) 2 **b)** 2 **c)** 4 **d)** 6

4. a) 20 **b)** 11 **c)** 14 **d)** 36

Exercise 9

(PB page 78)

1. 43 **2.** 73 **3.** 133

4. 385 **5.** 115 **6.** 36

7. 23 **8.** 344 **9.** 308

Exercise 10

(PB page 78)

125 10 11 $\sqrt{400}$	5 $\sqrt{121}$ 9 16
20 $\sqrt{324}$ 3 225	$\sqrt{256}$ $\sqrt{9}$ 25 100

Workbook: Exercise 6

(WB page 43)

1. 30 **2.** 9 **3.** 16

4. 240 **5.** 0 **6.** 0

7. 20 **8.** 2 **9.** 1

10. 133 **11.** 215 **12.** 388

Topic 2: Add, subtract, multiply and divide with open sentences

Teaching guidelines and solutions

Instructional resources
Objects in pictures; flow diagrams; number cards

Remind pupils that they worked with number sentences and open number sentences in all topics in Unit 1. We use open sentences in a section of Mathematics called algebra. Write some open sentences on the board, for example:

$3 \times 4 = \square$ $\quad \blacklozenge + 5 = 13$ $\quad x - 4 = 8$ $\quad 36 \div m = 4$

Explain to the class that open sentences consist of equal signs (=), place holders such as $\square$, $\blacklozenge$ or $\triangle$, and letters of the alphabet such as a, x or y to represent missing numbers or unknown values. The values on both sides of = sign should be equal when you solve an open sentence ($3 \times 4 = 12$ or $2 + 3 = 8 - 3$, for example). We apply the four basic operations (+, –, × and ÷) in open sentences.

What are open sentences?

Ask the class to read the statements in the speech bubbles. They should understand that we use sentences or statements in Language to convey ideas. In Mathematics, we also use sentences or statements to describe problems. We describe mathematical ideas in sentences in short ways using number sentences or open sentences. Open sentences or number sentences are also called equations.

Double a number is 4 less than 10 $\rightarrow 2 \times \square = 10 - 4$

Mathematical sentences or statement — Open sentence or equation

Ask the class to explore and solve the open sentences on the cards. They will probably solve the problems by trial and improvement.

△ + 9 = 16	50 ÷ □ = 25	10 × ◆ = 40	18 – 9 = x
16 – 9 = 7	50 ÷ 25 = y	40 ÷ 10 = ◆	18 – 9 = **9**
7 + 9 = 16	50 ÷ 25 = 2	40 ÷ 10 = 4	
	50 ÷ **2** = 25	10 × **4** = 40	

Let the class explore and explain the methods to solve open sentences with the four basic operations including doubling (×2) and halving (÷2).

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 1

(PB page 80)

1. addition, subtraction, multiplication, and division

2. **a)** 15 **b)** 12 **c)** 7 **d)** 9
e) 35 **f)** 55 **g)** 5 **h)** 9
i) 25 **j)** 1

Workbook: Exercise 1

(WB page 43)

1. 26 **2.** 78 **3.** 11 **4.** 35
5. 20 **6.** 12 **7.** 7 **8.** 12
9. 51 **10.** 77 **11.** 56 **12.** 254

Add and subtract open number sentences

Ask the pupils to explain what they learnt in Unit 1 about addition and subtraction operations. Find out if they recall that addition and subtraction are opposite or inverse operations and that they use inverse operations to check solutions. Tell them that they can use subtraction to solve addition open sentences.

Let the class explore and explain the methods to solve addition and subtraction open sentences. They should observe that the methods show easy ways to add and subtract, i.e. breaking up addends to add and counting on to subtract.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 2

(PB page 81)

1. 85 **2.** 130
3. 228 **4.** 35
5. 246 **6.** 176

Exercise 3 Quantitative reasoning (PB page 81)

1.

6	5	10
11	7	3
4	9	8

2.

14	16	6
4	12	20
18	8	10

3.

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

4.

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

Workbook: Exercise 2 (WB page 44)

1. 14 **2.** 11 **3.** 187 **4.** 38
5. 238 **6.** 150 **7.** 38 **8.** 279

Multiply and divide open sentences

Ask the pupils what they remember about the multiplication and division operations they dealt with in Unit 1. They should recall that multiplication and division are opposite or inverse operations. They could therefore solve multiplication open sentences by doing division.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 4 (PB page 82)

1. **a)** 5 **b)** 7 **c)** 9
d) 50 **e)** 25 **f)** 30
g) 6 **h)** 4 **i)** 49

2. **a)** 15 **b)** 28 **c)** 210
d) 250 **e)** 10 **f)** 3 240
g) 3 **h)** 9

Exercise 5 (PB page 83)

1. 7 **2.** 15 **3.** 14 **4.** 40

Workbook: Exercise 3 (WB page 44)

1. 8	**2.** 50	**3.** 20	**4.** 100
5. 1 000	**6.** 640	**7.** 6 400	**8.** 80

Write and solve open sentences

Tell the class that Primary 4 pupils play a number puzzle game. Let them explore the statements in the speech bubbles and ask them to find the numbers the pupils' think of. The pupils would probably use trial and improvement to find the answers.

Explain the steps used to find the pupils' unknown values. They start solving the problems by writing open sentences, working backwards using inverse operations and using brackets to show which operations they perform first. They then substitute the solutions in the open sentences to check the solutions.

Let the pupils explore and explain the methods to find Kola and Adeola's unknown numbers.

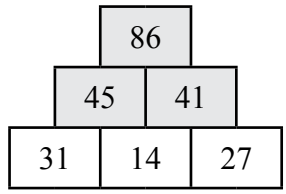
The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 6 Quantitative reasoning (PB page 84)

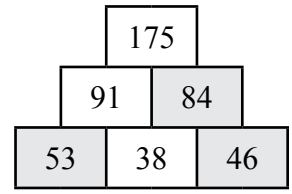
1. $\square \times 2 - 13 = 37$; $\square = 25$
2. $\square \div 2 \times 4 = 40$; $\square = 20$
3. $\square \div 3 + 9 = 30$; $\square = 63$
4. $\square + 40 \div 2 = 35$; $\square = 30$
5. $123 \times 25 = \square$; $\square = 3\,075$
6. ₦3 600 – ₦2 325 – ₦307 = $\square$; $\square$ = ₦968
7. ₦35 000 + ₦52 320 – ₦63 000 = $\square$; $\square$ = ₦24 320

Exercise 7 Quantitative reasoning (PB page 85)

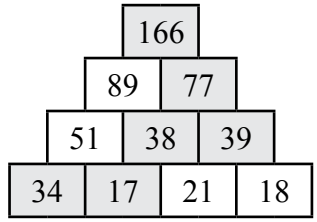
1.



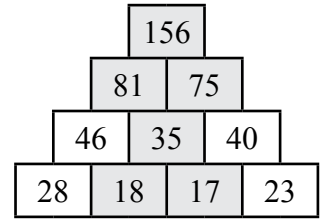
2.



3.



4.



Workbook: Exercise 4

(WB page 44)

1. **a)** 8 **b)** 20 **c)** 64 **d)** 250 **e)** 10 **f)** 100

2. **a)** $60 \div 5 = \square$; $\square = 12$

b) $6 + \frac{1}{2}\square = 18$; $\square = 24$

c) $8 \times \square = 96$; $\square = 12$

d) $\square$ = half $(17 + 3)$; $\square = 15$

e) $\square - 9 = 58$; $\square = 67$

Open sentences with operations on both sides of =

Tell the class that some open sentences require doing operations on both sides of the = sign to make the values equal. The values on both sides of = sign should balance, as weights on balancing scales. Ask the pupils to explore and describe the objects they observe on the balancing scale. Tell them that they have to find the mass of one pineapple on the scale. Assist them in understanding the processes in the method to find the mass of one pineapple, i.e. $1\frac{1}{2}$ kg.

In Exercise 7, ask pupils to explore and explain the method showing how to find the value of unknowns without balancing scales. They should understand that *x* takes the place of the place holder $\square$.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 8

(PB page 87)

1. $\square + \square + \square + \square + \square = 5$ kg + 5 kg $\quad 5\square = 10$ kg
$\square = 2$ kg

2. $\square + \square + \square + \square = 5$ kg + 5 kg $\quad 4\square = 10$ kg
$\square = 2.5$ kg

3. $\square + \square + \square + \square + \square + \square = 5$ kg + 2 kg + 2 kg
$6\square = 9$ kg $\quad \square = 1.5$ kg

Exercise 9

(PB page 87)

1. 50 **2.** 8 **3.** 10 **4.** 10 **5.** 33 **6.** 48

Workbook: Exercise 5

(WB page 45)

1. $10 \times \square = 100$; $\square = 10$ **2.** $30 = \square \times 6$; $\square = 5$

3. $100 \div \square = 25$; $\square = 4$ **4.** $90 \div \square = 45$; $\square = 2$

5. $24 - \square = 18$; $\square = 6$ **6.** $40 = 80 \div \square$; $\square = 2$

Topic 3: Proper, improper and mixed fractions

Teaching guidelines and solutions

Instructional resources
Objects in pictures; diagrams; shapes; fraction chains; tables/charts; number lines

Ask the pupils what they normally share in real life, who they share objects with and how they do the sharing. Some pupils might mention bread, fruit, sweets, money, and so on. with siblings and family members and friends.

Ask the class to explore and explain what they observe in the picture in the example. They should notice the loaves of bread are divided into equal pieces.

Ask the questions to find out what the pupils know about equal sharing. If the loaf of bread is divided into 3 equal pieces, each piece is one third $\left(\frac{1}{3}\right)$. If a loaf is divided into 4 equal pieces, each piece is one quarter $\left(\frac{1}{4}\right)$.

Share objects equally using proper fractions

Ask the class to explore the objects in the example to observe that the wholes are divided into equal parts. They use the objects to answer the questions.

Pupils name the number of equal parts and the names of the fractions. They name the fractions if objects are divided equally.

List the fractions on the board. Tell the pupils these fractions are proper fractions.

$\frac{1}{4}$ $\frac{1}{2}$ $\frac{1}{6}$ $\frac{1}{12}$ $\frac{1}{18}$ $\frac{1}{8}$

The fractions in the list are also called unitary fractions because the numerator in each fraction is 1. Explain the parts of a

fraction to the class using $\frac{3}{4}$ as in the picture in the Pupil's Book. The **denominator** shows how many equal parts are in the whole. The **numerator** shows the number of equal parts. The **division line** separates the two parts.

Make pupils aware that they will use fractions such as fifths or $\frac{1}{5}$ s and hundredths or $\frac{1}{100}$ s when they work with decimal fractions in Unit 6 this term. Explain to the class that a fraction is another way of writing a division expression: $\frac{1}{4} = 1 \div 4$ so that pupils to realise the relationship between a fraction and division.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 1

(PB page 90)

1. $\frac{4}{10}$ or $\frac{2}{5}$ **2.** $\frac{5}{8}$ **3.** $\frac{3}{4}$

4. $\frac{4}{9}$ or $\frac{2}{3}$ **5.** $\frac{3}{7}$ **6.** $\frac{5}{12}$

7. $\frac{3}{4}$ **8.** $\frac{2}{8}$ or $\frac{1}{4}$ **9.** $\frac{2}{3}$

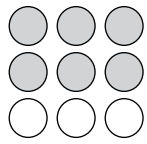
10. $\frac{3}{5}$

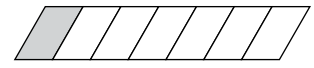
Workbook: Exercise 1

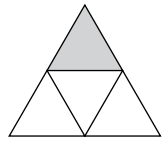
(WB page 46)

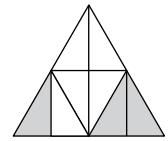
1.

	Number of grandchildren	Number of apples	Fraction of apples
a)	2	12	$\frac{1}{2}$
b)	3	8	$\frac{1}{3}$
c)	4	6	$\frac{1}{4}$
d)	6	4	$\frac{1}{6}$
e)	8	3	$\frac{1}{8}$
f)	12	2	$\frac{1}{12}$

2. **a)** 

b) 

c) 

d) 

e) 

Improper and mixed fractions

Ask the class to explore the real-life problems and the methods to solve them. Pupils should observe that $\frac{1}{5}$ is added repeatedly seven times. Bola eats $\frac{1}{5}$ of a packet of sweets for 7 days. Bose's family drinks $\frac{2}{3}$ ℓ milk each day for 7 days so $\frac{2}{3}$ is added repeatedly 7 times. Explain that $\frac{7}{5}$ and $\frac{14}{3}$ are improper fractions and $1\frac{2}{5}$ and $4\frac{2}{3}$ are mixed fractions. Ask them what they notice about these fractions. Knowing proper fractions, they can see that the numerators in improper fractions are bigger than the denominators. In the mixed fractions, there are whole numbers mixed with fractions.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 2

(PB page 92)

1.

Proper fraction	Improper fraction	Mixed number
$\frac{4}{5}$; $\frac{7}{8}$; $\frac{6}{18}$; $\frac{7}{13}$; $\frac{1}{50}$; $\frac{90}{100}$; $\frac{1}{6}$	$\frac{8}{9}$; $\frac{17}{8}$; $\frac{11}{10}$; $\frac{10}{7}$; $\frac{9}{3}$; $\frac{13}{12}$; $\frac{13}{7}$; $\frac{7}{2}$	$1\frac{1}{2}$; $2\frac{1}{3}$; $1\frac{1}{6}$; $2\frac{1}{12}$; $5\frac{3}{4}$; $2\frac{2}{11}$; $1\frac{1}{8}$; $10\frac{1}{2}$; $3\frac{1}{14}$

2. The fractions increase by $\frac{1}{3}$ each time.

3. **a)** 1 **b)** 4 **c)** $\frac{6}{3}$ **d)** $\frac{9}{3}$ **e)** $3\frac{1}{3}$

f) $\frac{5}{3}$ **g)** $2\frac{1}{3}$ **h)** $\frac{8}{3}$ **i)** $\frac{11}{3}$

Workbook: Exercise 2

(WB page 47)

1. **a)** $\frac{1}{5}$; $\frac{2}{8}$; $\frac{4}{7}$; $\frac{1}{2}$; $\frac{3}{4}$ **b)** $\frac{7}{4}$; $\frac{2}{1}$; $\frac{3}{2}$; $\frac{12}{9}$; $\frac{13}{4}$

c) $1\frac{1}{2}$; $2\frac{2}{3}$; $12\frac{3}{8}$; $4\frac{1}{5}$; $3\frac{1}{12}$

2. **a)** $\frac{8}{5}$; $1\frac{3}{5}$ **b)** $\frac{8}{3}$; $2\frac{2}{3}$ **c)** $\frac{13}{5}$; $2\frac{3}{5}$

d) $\frac{13}{8}$; $1\frac{5}{8}$ **e)** $\frac{12}{4}$; 3 **f)** $\frac{27}{8}$; $3\frac{3}{8}$

Workbook: Exercise 3

(WB page 48)

1. **a)** $\frac{4}{4}$; $\frac{5}{4}$; $\frac{7}{4}$; $\frac{10}{4}$; $\frac{11}{4}$; $\frac{12}{4}$

b) $\frac{3}{5}$; $\frac{4}{5}$; $1\frac{2}{5}$; $1\frac{3}{5}$; $1\frac{4}{5}$; $2\frac{2}{5}$; $2\frac{3}{5}$; $2\frac{4}{5}$; 3; $3\frac{1}{5}$; $3\frac{2}{5}$

2. $\frac{1}{2}$; 1; $1\frac{1}{2}$; 2; $2\frac{1}{2}$; 3; $3\frac{1}{2}$; 4; $4\frac{1}{2}$; 5; $5\frac{1}{2}$

Convert between improper and mixed fractions

Remind the class that they explored real-life word problems and methods to solve the problems in the example on page 93. They have observed that improper fractions can be changed or converted to mixed fractions.

Ask them to explore and explain methods to change an improper fraction to a mixed fraction and a mixed fraction to an improper fraction by doing multiplication, division and addition. Remind the pupils how important it is that they know the four basic operations. They apply these in almost all topics in Mathematics.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 3

(PB page 94)

1. **a)** $1\frac{3}{5}$ **b)** $1\frac{5}{6}$ **c)** $2\frac{3}{7}$ **d)** $5\frac{1}{3}$

e) $5\frac{1}{4}$ **f)** $6\frac{2}{8} = 6\frac{1}{4}$ **g)** $1\frac{43}{100}$ **h)** $4\frac{3}{10}$

i) $3\frac{1}{2}$ **j)** $7\frac{1}{9}$ **k)** $7\frac{1}{2}$ **l)** $6\frac{3}{5}$

2. **a)** $\frac{5}{3}$ **b)** $\frac{37}{8}$ **c)** $\frac{25}{4}$ **d)** $\frac{18}{7}$

e) $\frac{38}{5}$ **f)** $\frac{31}{8}$ **g)** $\frac{41}{6}$ **h)** $\frac{52}{9}$

i) $\frac{34}{10}$ **j)** $\frac{257}{100}$ **k)** $\frac{31}{4}$ **l)** $\frac{50}{9}$

m) $\frac{19}{2}$ **n)** $\frac{29}{7}$ **o)** $\frac{47}{5}$

3. **a)** $1\frac{5}{7}$ **b)** $1\frac{7}{8}$ **c)** $4\frac{1}{4}$ **d)** $5\frac{5}{6}$

e) $\frac{11}{4}$ **f)** $\frac{9}{5}$ **g)** $\frac{43}{12}$ **h)** $\frac{11}{2}$

Exercise 4 Quantitative reasoning

(PB page 94)

1. $\frac{10}{3} = 3\frac{1}{3}$ **2.** $\frac{32}{5} = 6\frac{2}{5}$

3. $\frac{9}{2} = 4\frac{1}{2}$ **4.** $\frac{35}{8} = 4\frac{3}{8}$

5. $\frac{5}{2} = 2\frac{1}{2}$ **6.** $\frac{1}{5} \times 7 = 1\frac{2}{5}$ packets of sweets

7. $\frac{2}{3} \times 7 = 4\frac{2}{3}$ ℓ of milk

Workbook: Exercise 4

(WB page 48)

1. **a)** $\frac{5}{2}$ **b)** $\frac{23}{12}$ **c)** $\frac{22}{8}$ **d)** $\frac{23}{6}$ **e)** $\frac{37}{10}$ **f)** $\frac{26}{9}$

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

Workbook: Exercise 5

(WB page 49)

1. $\frac{3}{4} \times 4 = 3$ packs of rice **2.** $\frac{3}{5} \times 7 = 4\frac{1}{5}$

3. $\frac{5}{8} \times 4 = 2\frac{1}{2}$ **4.** $\frac{10}{12} \times 8 = 6\frac{2}{3}$

Express fractions in the lowest terms

Let the class explore the pairs of fractions on the cards. They explain what they observe about the relationships between the fractions and find which operations are performed with the numbers in the first fractions to get the second fractions in the pairs. Pupils should realise that the numerators and denominators are divided by the same numbers (HCF) to create the second fractions in the pairs. Explain to the class that the second fractions do not have common factors except 1 to divide further. The second fraction in each pair is written in its lowest or simplest term or form.

Let the pupils explore and explain what they observe in the picture in the example. They should notice the men are breaking down the fractions into their simplest or lowest forms with their axes.

If the man axes down $\frac{10}{16}$ by dividing by 2, he will get $\frac{10}{16} \div \frac{2}{2} = \frac{5}{8}$. $\frac{16}{24}$ broken down by the axe is $\frac{16}{24} \div \frac{8}{8} = \frac{2}{3}$.

$\frac{10}{16} \div \frac{2}{2} = \frac{5}{8}$ $\frac{12}{16} \div \frac{4}{4} = \frac{3}{4}$ $\frac{8}{16} \div \frac{8}{8} = \frac{1}{2}$ $\frac{6}{16} \div \frac{2}{2} = \frac{3}{8}$

Ask the class to explore and explain the methods to write fractions in the lowest terms or simplest forms. Pupils explain which fractions in the list are in the simplest form and give reasons for their answers.

$\frac{1}{3}$; $\frac{2}{5}$ and $\frac{3}{7}$ are in their simplest forms. The fractions have no common factor other than 1 to divide them further. Pupils should now understand how we apply the highest common factor (HCF) to write fractions in their simplest forms.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 5

(PB page 96)

1. $\frac{5}{12}$	**2.** $\frac{1}{4}$	**3.** $\frac{1}{3}$	**4.** $\frac{1}{5}$	**5.** $\frac{1}{4}$
6. $4\frac{1}{2}$	**7.** $\frac{1}{5}$	**8.** $\frac{1}{4}$	**9.** $\frac{2}{3}$	**10.** $\frac{1}{4}$
11. $\frac{1}{2}$	**12.** $\frac{2}{3}$	**13.** $\frac{1}{5}$	**14.** $\frac{3}{10}$	**15.** $\frac{1}{8}$
16. $\frac{1}{6}$	**17.** $\frac{1}{3}$	**18.** $\frac{1}{4}$	**19.** $\frac{5}{6}$	**20.** 5
21. $\frac{4}{43}$	**22.** $\frac{17}{25}$	**23.** $\frac{1}{6}$	**24.** $\frac{1}{31}$	

Workbook: Exercise 6

(WB page 49)

1. $\frac{1}{2}$	**2.** $\frac{3}{4}$	**3.** $\frac{5}{6}$	**4.** $\frac{2}{3}$	**5.** $\frac{3}{4}$
6. $\frac{3}{5}$	**7.** $\frac{2}{3}$	**8.** $\frac{5}{6}$	**9.** $\frac{3}{5}$	

Topic 4: Equivalent fractions

Teaching guidelines and solutions

Instructional resources
Objects in pictures; diagrams; shapes; tables/charts; fraction rods

Ask the class to explore and explain the fraction symbols in the picture. Pupils should observe that Mama Sayo gets $\frac{3}{5}$ of the rice and Mama Sola $\frac{2}{5}$. Pose the questions and let pupils answer them. Mama Sayo gets more rice because $\frac{3}{5}$ is more than $\frac{2}{5}$, i.e $\frac{3}{5} > \frac{2}{5}$. They could refer to diagrams to reason that 3 parts of 5 are more than 2 parts of 5.

Pupils decide which expressions are true and explain their answers. You could give them blank copies of diagrams divided into 5 equal parts, circles and rectangles and let them shade the diagrams to prove their answers. They write the fractions on the board and fill in the correct relation signs. $\frac{3}{5} = \frac{2}{5}$ is true.

Ask the class what they notice about the denominators in the fractions above. They should realise that all the denominators are 5 and the smaller the numerator, the smaller the fraction.

Equivalent fractions

Explain to the class that the fractions with the same sizes are equivalent fractions. Let the pupils explore and explain the fractions represented in the shapes in Example 1.

A. $\rightarrow \frac{1}{2} = \frac{2}{4} = \frac{4}{8}$ **B.** $\rightarrow \frac{1}{3} = \frac{3}{9}$

C. $\rightarrow \frac{1}{3} = \frac{2}{6} = \frac{4}{12}$ **D.** $\rightarrow \frac{1}{5} = \frac{2}{10} = \frac{4}{20}$

In Example 2, ask the class what they notice about the fractions of the containers on the trucks. They should observe that the orange parts of the three containers are the same size but the fractions are different. Let the class work through the questions.

Ask the pupils to explore and explain the numbers and operations in the diagrams. They should notice that you multiply and divide numerators and denominators by the same common factors, i.e. the highest common factors (HCF).

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 1

(PB page 99)

1. $\frac{3}{4}$ **2.** 28; 8

3. 2; 4; 18 **4.** 10; 20; 8

5. 6; 18; 18 **6.** 20; 4

7. 5 **8.** 8; 3

Exercise 2

(PB page 99)

1. a) $\frac{2}{6} = \frac{4}{12} = \frac{8}{24}$ **b)** $\frac{4}{10} = \frac{8}{20} = \frac{16}{40}$ **c)** $\frac{2}{8} = \frac{4}{16} = \frac{8}{32}$

d) $\frac{6}{8} = \frac{12}{16} = \frac{24}{32}$ **e)** $\frac{2}{12} = \frac{4}{24} = \frac{8}{48}$ **f)** $\frac{1}{3} = \frac{20}{60} = \frac{4}{12}$

g) $\frac{2}{20} = \frac{4}{40} = \frac{8}{80}$ **h)** $\frac{6}{20} = \frac{12}{40} = \frac{24}{80}$ **i)** $\frac{2}{18} = \frac{4}{36} = \frac{8}{72}$

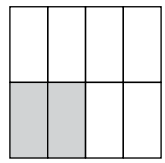
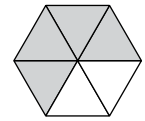
j) $\frac{8}{18}; \frac{16}{36}; \frac{32}{72}$ **k)** $\frac{2}{16}; \frac{4}{32}; \frac{8}{64}$ **l)** $\frac{6}{16} = \frac{12}{32} = \frac{24}{64}$

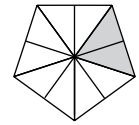
2. a) True **b)** True **c)** False

d) False **e)** True

3. a) = **b)** > **c)** < **d)** < **e)** <

Workbook: Exercise 3 (WB page 51)

1. **a)**  **b)** 

c)  **d)** 

2. **a)** 3; 4 **b)** 4; 5; 5 **c)** 4; 8 **d)** 2; 1; 3

3. **a)** 6 **b)** 18 **c)** 90
d) 9 **e)** 56 **f)** 60

4. **a)** $\frac{5}{35}$ **b)** $\frac{8}{18}$ **c)** $\frac{21}{28}$ **d)** $\frac{6}{15}$ **e)** $\frac{18}{27}$ **f)** $\frac{12}{32}$

$\frac{2}{5}$ $\frac{3}{8}$ $\frac{1}{7}$ $\frac{4}{9}$ $\frac{3}{4}$ $\frac{2}{3}$

5. **a)** $\frac{2}{8}$; $\frac{3}{12}$; $\frac{4}{16}$ **b)** $\frac{4}{18}$; $\frac{6}{27}$; $\frac{8}{36}$ **c)** $\frac{8}{10}$; $\frac{12}{15}$; $\frac{16}{20}$

d) $\frac{14}{22}$; $\frac{21}{33}$; $\frac{28}{44}$ **e)** $\frac{26}{38}$; $\frac{52}{76}$; $\frac{104}{152}$ **f)** $\frac{4}{10}$; $\frac{8}{20}$; $\frac{16}{40}$

g) $\frac{16}{26}$; $\frac{160}{260}$; $\frac{1\,600}{2\,600}$ **h)** $\frac{10}{14}$; $\frac{15}{21}$; $\frac{20}{28}$ **i)** $\frac{18}{42}$; $\frac{27}{63}$; $\frac{36}{84}$

j) $\frac{14}{30}$; $\frac{21}{45}$; $\frac{42}{90}$

Compare and order fractions

Ask the class to explore the fraction parts represented in the fraction rods in the example. They say which fraction is shaded in each rod. The shaded parts get smaller as the rods are divided into more parts.

The 1s in the numerators indicate that 1 out of the number of equal parts (shown by the denominators) is shaded. Explain to pupils that fractions with a numerator 1 are unitary fractions – only one unit out of a number of equal units is considered.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 3 (PB page 101)

1. $\frac{1}{2}$ **2.** $\frac{1}{10}$

3. **a)** False **b)** False **c)** True **d)** False
e) False **f)** True **g)** True **h)** True
i) True **j)** True **k)** True **l)** False

Exercise 4 (PB page 101)

1. > **2.** = **3.** = **4.** =
5. = **6.** > **7.** = **8.** >
9. < **10.** = **11.** = **12.** <
13. < **14.** = **15.** = **16.** <

Exercise 5 (PB page 102)

1. **a)** > **b)** > **c)** <
d) < **e)** > **f)** =
g) < **h)** < **i)** <

2. **a)** $\frac{1}{8}, \frac{1}{7}, \frac{1}{5}, \frac{1}{4}, \frac{1}{3}$ **b)** $\frac{1}{10}, \frac{1}{9}, \frac{1}{7}, \frac{1}{6}, \frac{1}{2}$
c) $\frac{2}{10}, \frac{1}{3}, \frac{5}{9}, \frac{4}{5}, \frac{7}{8}$ **d)** $\frac{3}{6}, \frac{3}{5}, \frac{2}{3}, \frac{5}{7}, \frac{9}{10}$
e) $\frac{3}{10}, \frac{4}{9}, \frac{1}{2}, \frac{3}{4}, \frac{5}{6}$ **f)** $\frac{1}{5}, \frac{3}{10}, \frac{5}{8}, \frac{2}{3}, \frac{4}{5}$

3. **a)** $\frac{1}{2}$ of ₦100 = ₦50 **b)** $\frac{3}{4}$

4. **a)** $\frac{7}{10}$ **b)** $\frac{3}{9}$ **c)** $\frac{1}{4}$ **d)** $\frac{1}{6}$

Exercise 6 Quantitative reasoning (PB page 102)

1. Sade

2. Oni's

3. Community forest

Workbook: Exercise 1 (WB page 50)

1. Deji

2. **a)** > **b)** > **c)** > **d)** > **e)** <
f) < **g)** > **h)** > **i)** >

Workbook: Exercise 2 (WB page 50)

1. **a)** $\frac{1}{10}, \frac{1}{6}, \frac{1}{5}, \frac{1}{4}, \frac{1}{2}$ **b)** $\frac{1}{9}, \frac{1}{8}, \frac{1}{5}, \frac{1}{4}, \frac{1}{3}$
c) $\frac{3}{10}, \frac{3}{9}, \frac{3}{7}, \frac{3}{4}, \frac{3}{3}$ **d)** $\frac{5}{9}, \frac{5}{8}, \frac{5}{7}, \frac{5}{6}, \frac{5}{5}$

2. fresh food

3. Kole

Topic 5: Add and subtract fractions

Teaching guidelines and solutions

Instructional resources
Fraction strips; fraction chains; objects in pictures; flow diagrams

Remind pupils that they worked with the HCF and LCM, gave fractions in the simplest form, worked with equivalent fractions and converted improper to mixed fractions. They will apply all this knowledge in this unit. Revise the text to find out what the class remembers about fractions.

Add and subtract proper fractions

Ask the class to explore the problem in the example. They should realise they have to add the fractions of wood cut altogether and subtract to find out how much longer the one strip is than the other. They cannot add or subtract fractions with different denominators but have to make fractions with the same denominators, i.e. use equivalent fractions.

Tell the class they can use a drawing to represent the problem above using equivalent fractions and changing improper to mixed fractions. Let them explore the drawing showing $\frac{1}{2}$ s and $\frac{1}{4}$ s. To find the fraction of wood cut altogether, you put the strips cut together. Explain to the class that $\frac{1}{2} + \frac{3}{4} = \frac{2}{4} + \frac{3}{4}$. The fractions can now be added because the denominators are the same. Ask them to notice the answer is an improper fraction changed to a mixed fraction.

To find out how much longer the one strip of wood is than the other, we put the longer strip above the short one to subtract. They should now realise that $\frac{3}{4} - \frac{1}{2} = \frac{3}{4} - \frac{2}{4} = \frac{1}{4}$ m.

Ask the class to explore and explain the methods showing addition and subtraction of fractions without drawings. Go through the steps with the class.

Ask groups of pupils to show how they solve the problems on the board.

$$\frac{5}{8} + \frac{3}{4} = \frac{5}{8} + \frac{6}{8} = \frac{11}{8} = 1\frac{3}{8}$$

$$\frac{9}{10} - \frac{1}{2} = \frac{9}{10} - \frac{5}{10} = \frac{4}{10} = \frac{2}{5}$$

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 1

(PB page 105)

1. a) $\frac{7}{6} = 1\frac{1}{6}$ **b)** $\frac{9}{10}$ **c)** $\frac{33}{28} = 1\frac{5}{28}$

d) $\frac{11}{24}$ **e)** $\frac{5}{8}$ **f)** $\frac{3}{2} = 1\frac{1}{2}$

g) $\frac{19}{20}$ **h)** $\frac{23}{30}$ **i)** $\frac{5}{10} = \frac{1}{2}$

j) $\frac{58}{48} = 1\frac{10}{48}$ **k)** $\frac{129}{99} = 1\frac{30}{99} = 1\frac{10}{33}$ **l)** $\frac{106}{107}$

2. a) $\frac{1}{15}$ **b)** $\frac{1}{12}$ **c)** $\frac{13}{30}$

d) $\frac{1}{35}$ **e)** $\frac{1}{6}$ **f)** $\frac{1}{2}$

g) $-\frac{1}{12}$ **h)** $-\frac{1}{18}$ **i)** $\frac{1}{6}$

j) $\frac{1}{6}$ **k)** $\frac{11}{15}$ **l)** $\frac{13}{30}$

Exercise 2 Quantitative reasoning

(PB page 105)

1. a) $\frac{5}{4} = 1\frac{1}{4}$ **b)** $\frac{1}{2}$

c) $\frac{3}{2} = 1\frac{1}{2}$ **d)** $\frac{15}{28}$

2. a) $\frac{3}{10}$ **b)** $\frac{45}{28} = 1\frac{17}{28}$ **c)** $\frac{38}{63}$

Workbook: Exercise 1

(WB page 52)

1. $1\frac{5}{12}$ **2.** $1\frac{1}{15}$ **3.** $1\frac{5}{24}$

4. $\frac{21}{40}$ **5.** $1\frac{11}{72}$ **6.** $1\frac{1}{18}$

Workbook: Exercise 2

(WB page 53)

1. $\frac{21}{40}$ **2.** $1\frac{1}{2}$

3. $\frac{13}{18}$ **4.** $\frac{23}{45}$

Add proper fractions and mixed fractions

Ask the class to explore and explain the real-life problem in the example, and the method showing addition of mixed and proper fractions.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 3 (PB page 107)

1. $\frac{43}{20} = 2\frac{3}{20}$ **2.** $1\frac{1}{8}$ **3.** $\frac{99}{40} = 2\frac{9}{40}$

4. $\frac{61}{18} = 3\frac{7}{18}$ **5.** $3\frac{13}{21}$ **6.** $3\frac{9}{20}$

7. $4\frac{29}{30}$ **8.** $7\frac{2}{5}$ **9.** $4\frac{11}{45}$

10. $12\frac{32}{24}$ **11.** $2\frac{23}{24}$ **12.** $15\frac{7}{12}$

13. $11\frac{49}{60}$ **14.** $16\frac{1}{30}$ **15.** $10\frac{3}{5}$

Exercise 4 Quantitative reasoning (PB page 107)

1. a) $\frac{37}{12} = 3\frac{1}{12}$ **b)** $2\frac{31}{40}$ **c)** $\frac{71}{20} = 3\frac{11}{20}$

d) $\frac{17}{4} = 4\frac{1}{4}$ **e)** $\frac{47}{14} = 3\frac{5}{14}$

2. a) $\frac{88}{35} = 2\frac{18}{35}$ **b)** $\frac{91}{24} = 3\frac{19}{24}$ **c)** $1\frac{14}{15}$

Workbook: Exercise 3 (WB page 53)

1. $1\frac{39}{40}$ **2.** $3\frac{7}{12}$ **3.** $2\frac{3}{14}$

4. $4\frac{1}{20}$ **5.** $3\frac{23}{40}$ **6.** $2\frac{5}{12}$

Workbook: Exercise 4 (WB page 54)

1. $2\frac{1}{6}$ **2.** $2\frac{5}{12}$ **3.** $3\frac{27}{40}$

Subtract proper fractions and mixed fractions

Ask the class to explore the real-life problem in the example, and the method showing how to subtract mixed and proper fractions.

Ask pairs of pupils to show how they solve the problems shown on the board.

$2\frac{5}{6} - \frac{3}{4} = 2 + \frac{10}{12} - \frac{8}{12} = 2\frac{2}{12} = 2\frac{1}{6}$

$3\frac{6}{7} - \frac{2}{3} = 3 + \frac{18}{21} - \frac{14}{21} = 3\frac{4}{21}$

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 5 (PB page 108)

1. $3\frac{8}{35}$ **2.** $4\frac{7}{15}$ **3.** $4\frac{9}{70}$

4. $5\frac{11}{40}$ **5.** $5\frac{9}{56}$ **6.** $6\frac{1}{8}$

7. $7\frac{22}{63}$ **8.** $7\frac{19}{60}$ **9.** $8\frac{68}{165}$

10. $7\frac{1}{5}$ **11.** $4\frac{2}{10} = 4\frac{1}{5}$ **12.** $2\frac{6}{8} = 2\frac{3}{4}$

13. $\frac{6}{12} = \frac{1}{2}$ **14.** $3\frac{3}{5}$ **15.** $5\frac{7}{12}$

Exercise 6 Quantitative reasoning (PB page 109)

1. a) $1\frac{2}{15}$ **b)** $2\frac{1}{72}$

c) $1\frac{1}{10}$ **d)** $1\frac{3}{20}$

2. a) $3\frac{13}{18}$ **b)** $2\frac{17}{28}$ **c)** $1\frac{7}{40}$

Workbook: Exercise 5 (WB page 54)

1. $2\frac{1}{8}$ **2.** $2\frac{5}{6}$ **3.** $5\frac{1}{10}$

4. $1\frac{17}{45}$ **5.** $2\frac{13}{36}$ **6.** $6\frac{9}{20}$

Workbook: Exercise 6 (WB page 55)

1. $1\frac{9}{20}$ **2.** $1\frac{1}{6}$

3. $2\frac{1}{12}$ **4.** $1\frac{2}{15}$

Topic 6: Decimals

Teaching guidelines and solutions

Instructional resources
Decimal place value charts; abaci; number lines; Dienes blocks; cubes; sticks/rods; shapes/diagrams; rulers; tables

Tell the class that decimals might not be new to them. Ask them where they use decimals in real life. They use the pictures as references. Encourage them to identify decimals in prices, mass, length, capacity (volume) and temperature.

Write the decimals on the board and let the class read the numbers aloud.

Identify decimal tenths and hundredths

Remind the class that they already know fractions like $\frac{1}{10}$ (one tenth) and $\frac{1}{100}$ (1 hundredth). These fractions are closely related to decimals.

Ask the class to explore and explain the numbers in the decimal place value table. Assist them in understanding the place value and values of the digits in the number 111.11 and the parts of a decimal, i.e. the decimal point and the number of places after the point. Let them read the number aloud.

Explain the value and place value of the numbers represented on the abaci. Let individual pupils write the numbers on the board and read them aloud.

Let the pupils use calculators or cell phones to observe that a decimal is displayed as 23.5 and not 23.50, i.e. it does not show the zero at the end because .5 is the same as .50, i.e. $\frac{5}{10} = \frac{50}{100}$.

Ask the pupils to explore the lengths of the caterpillars. Explain how the lengths in millimetres are written as decimal tenths of centimetres.

Pupils explore equivalent fractions and decimals on the number lines. They identify and name the missing fractions and decimals and write them on the board.

Ask the pupils to explore the Dienes blocks. They find out which fraction the small cube is of the big cubes.

A. The small cube is one tenth $\left(\frac{1}{10}\right)$ of the 10-cube rod
$\rightarrow \frac{1}{10} = 0.1$

B. The small cube is one hundredth $\left(\frac{1}{100}\right)$ of the 100-cube block
$\rightarrow \frac{1}{100} = 0.01$

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 1

(PB page 113)

1. a) $\frac{6}{10} = 0.6$ **b)** $\frac{20}{100} = 0.2$ **c)** $\frac{4}{16} = 0.25$

d) $\frac{28}{100} = 0.28$ **e)** $\frac{3}{10} = 0.3$ **f)** $\frac{15}{100} = 0.15$

g) $\frac{1}{100} = 0.01$ **h)** $\frac{75}{100} = 0.75$ **i)** $\frac{5}{10} = 0.5$

j) $\frac{8}{10} = 0.8$ **k)** $\frac{49}{100} = 0.49$

2. **a)** $\frac{4}{10} = 0.4$ **b)** $\frac{80}{100} = 0.8$ **c)** $\frac{12}{16} = 0.75$

d) $\frac{72}{100} = 0.72$ **e)** $\frac{7}{10} = 0.7$ **f)** $\frac{85}{100} = 0.85$

g) $\frac{99}{100} = 0.99$ **h)** $\frac{25}{100} = 0.25$ **i)** $\frac{5}{10} = 0.5$

j) $\frac{2}{10} = 0.2$ **k)** $\frac{51}{100} = 0.51$

Exercise 2

(PB page 113)

1. **a)** 3 **b)** 0.9 **c)** 10

d) 1; 5 **e)** 12.6 **f)** 2.3

g) 46 **h)** 2 **i)** 0.07

j) 1.09 **k)** 0.3 **l)** 0.57

m) 85 **n)** $100\frac{1}{100}$ **o)** 1.25

2.

	Length in mm	Fractions of cm	Decimals of cm
a)	1	$\frac{1}{10}$	0.1
b)	8	$\frac{8}{10}$	0.8
c)	15	$1\frac{5}{10}$	1.5
d)	23	$2\frac{3}{10}$	2.3
e)	27	$2\frac{7}{10}$	2.7
f)	36	$3\frac{6}{10}$	3.6
g)	45	$4\frac{5}{10}$	4.5
h)	102	$10\frac{2}{10}$	10.2
i)	209	$20\frac{9}{10}$	20.9
j)	104	$10\frac{4}{10}$	10.4

3. **a)** 0.75 **b)** 0.6 **c)** 0.75 **d)** 0.8

e) 0.75 **f)** 0.5 **g)** 0.25 **h)** 0.4375

i) 2.625 **j)** 1.45 **k)** 6.6 **l)** 5.2

4. **a)** $\frac{1}{5}$ **b)** $\frac{3}{10}$ **c)** $\frac{3}{5}$ **d)** $\frac{9}{10}$

e) $\frac{4}{5}$ **f)** $\frac{6}{25}$ **g)** $\frac{3}{4}$ **h)** $\frac{1}{8}$

i) $\frac{7}{8}$ **j)** $14\frac{3}{10}$ **k)** $12\frac{1}{5}$ **l)** $5\frac{423}{1\,000}$

m) $2\frac{241}{250}$ **n)** $4\frac{78}{125}$ **o)** $6\frac{79}{100}$ **p)** $1\frac{81}{125}$

Workbook: Exercise 1

(WB page 55)

1. **a)** $\frac{5}{10} = 0.5$ **b)** $\frac{8}{10} = 0.8$

c) $1\frac{1}{10} = 1.1$ **d)** $2\frac{3}{10} = 2.3$

2. **a)** 0.3 **b)** 5.6

c) 1 **d)** 1.1

e) 1.5 **f)** 2.7

3. **a)** 0.01 **b)** 1.23

c) 0.09 **d)** 5.06

e) 0.99 **f)** 1.02

4.

2.64	$2\frac{16}{25}$
5.66	$5\frac{2}{3}$
0.85	$\frac{17}{20}$
3.15	$3\frac{3}{20}$
1.116	$1\frac{29}{250}$

Round off decimals

Remind the class that they have worked with estimation of whole numbers in Term 1. They will now round off decimals to the nearest whole numbers (units). Remind the pupils that the sign ≈ means approximately equal to or almost, roughly or about equal to.

Ask the pupils to explore the rods in the example. Then let them explore the groups of rods to find the closest units to the decimals.

Ask the pupils to work on the board to round off the decimals to the nearest units. Encourage them to use the approximately equal to sign, i.e. ≈. Let them read the expressions aloud: *three point six is approximately equal to 7.*

$3.6 \approx 7$ $1.1 \approx 1$ $0.9 \approx 1$ $2.5 \approx 3$ $0.4 \approx 0$ $3.3 \approx 3$

$2.2 \approx 2$ $3.5 \approx 4$ $0.7 \approx 1$ $3.8 \approx 4$ $0.5 \approx 1$ $2.9 \approx 3$

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 3

(PB page 115)

1. 4 **2.** 1 **3.** 1 **4.** 3

5. 0 **6.** 3 **7.** 2 **8.** 4

9. 1 **10.** 4 **11.** 1 **12.** 3

Exercise 4

(PB page 115)

1. 5	**2.** 6	**3.** 6	**4.** 50
5. 51	**6.** 51	**7.** 10	**8.** 20
9. 120	**10.** 8	**11.** 9	**12.** 9
13. 80	**14.** 81	**15.** 81	

Workbook: Exercise 2

(WB page 56)

	Number rounded to:	Nearest unit	To 1 decimal place	To 2 decimal places
1.	0.94	1	0.9	0.94
2.	1.561	2	1.6	1.56
3.	2.078	2	2.1	2.08
4.	36.92	37	37.0	36.92
5.	20.600	21	20.6	20.60
6.	9.998	10	10.0	10.00

Topic 7: Add, subtract, multiply and divide decimals

Teaching guidelines and solutions

Instructional resources
Decimal place value charts; estimation calculation cards; number lines; flow diagrams; division diagrams; objects in pictures; decimal squares

The decimal value table

Ask the pupils to explore the decimal place value table and explain what they notice is different from the table they worked with in Unit 6. Find out if they know how to read the number in the table. Let them name the place value and the value of the digits.

Pupils should notice the decimal thousandths in the table. They read the number 235.685 as two hundred and thirty-five point six eight five.

Ask the class to read the numbers listed and to give the place value and value of each digit.

$6.417 \rightarrow 6 + \frac{4}{10} + \frac{10}{100} + \frac{7}{1\,000}$

$28.509 \rightarrow 20 + 8 + \frac{5}{10} + \frac{9}{1\,000}$

$98.076 \rightarrow 90 + 8 + \frac{7}{100} + \frac{6}{1\,000}$

$0.008 \rightarrow \frac{8}{1\,000}$

$20.734 \rightarrow 20 + \frac{7}{10} + \frac{3}{100} + \frac{4}{1\,000}$

Let the class explore the numbers in the table showing how to round off decimals to 1 and 2 places after the decimal point. Explain to them that the rounding off works the same as for whole numbers except here they round off to the nearest tenth $\left(\frac{1}{10}\right)$ and hundredth $\left(\frac{1}{100}\right)$.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 1

(PB page 117)

1. **a)** $\frac{2}{100}$ **b)** $\frac{4}{1\,000}$ **c)** 7 **d)** 40
e) $\frac{1}{10}$ **f)** $\frac{6}{1\,000}$ **g)** $\frac{8}{10}$ **h)** $\frac{2}{1\,000}$

2.

	Whole number	Tenths	Hundredths	Thousandths
a)	0.123	1	2	3
b)	0.567	5	6	7
c)	25.436	4	3	6
d)	31.006	0	0	6

3.

	Number	Round off to whole number	Round off to 1 decimal place	Round off to 2 decimal places
a)	1.546	2	1.5	1.55
b)	19.947	20	19.9	19.95
c)	10.508	11	10.5	10.51
d)	78.965	79	79.0	78.97

4. **a)** Estimate: 0.6
Actual: 0.59
Difference: 0.01

b) Estimate: 0.9
Actual: 0.887
Difference: 0.013

Add and subtract decimals

Let pupils explore and explain the calculations represented on the number lines in the example and complete the number sentences shown. They should realise the arrows move right for addition and left for subtraction.

A. 0.5 + 0.8 = 1.3 1.4 – 10.0 = 0.4
B. 0.08 + 0.09 = 0.17 0.16 – 0.07 = 0.09
C. 0.074 + 0.007 = 0.081 0.076 – 0.008 = 0.068

Ask the pupils to explore and explain the methods on the cards showing addition and subtraction of decimals with up to 3 places after the decimal point. They should realise that addition and subtraction of decimals are not much different from doing these calculations with whole numbers, except for the decimal point. Remind them to use zeros as place holders for empty decimal places.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 2

(PB page 119)

1. **a)** 1.5 **b)** 2.6 **c)** 0.11
d) 3.41 **e)** 0.009 **f)** 7.07

2. **a)** 0.4 **b)** 0.9 **c)** 0.02
d) 4.25 **e)** 0.004 **f)** 1.143

3. **a)** 2.1 **b)** 8
c) 2.9 **d)** 0.6
e) 5.7 **f)** 8
g) 4.6 **h)** 5.9
i) 5.2 **j)** 3.1

Exercise 3

(PB page 119)

1. 18.99 **2.** 9.16 **3.** 25.13

Exercise 4

(PB page 119)

1. **a)** 1.343 **b)** 1.129 **c)** 2.45 **d)** 50.202
e) 709.632 **f)** 262.917 **g)** 0.963 **h)** 0.773

2. **a)** 0.417 **b)** 0.654 **c)** 5.361 **d)** 27.77
e) 194.356 **f)** 0.154 **g)** 11.066 **h)** 45.642

3. a)

	4.4	
2.3		2.1
0.8	1.5	0.6

b)

	9.6	
3.7		5.9
0.9	2.8	3.1

c)

		5.3	
	2.7		2.6
1.3		1.4	1.2
0.7	0.6	0.8	0.4

Exercise 5

(PB page 120)

1. 6.794 cm **2.** 1.109 cm **3.** 5.834 cm
4. 13.737 cm **5.** 2.151 cm

Workbook: Exercise 1

(WB page 57)

1. a) 2.2 **b)** 0.13 **c)** 2.45 **d)** 22.1 **e)** 0.01
f) 10.09 **g)** 31.4 **h)** 0.17 **i)** 7.013 **j)** 1.015
2. a) 124 + 100 = 224 **b)** 81 – 8 = 73
c) 678 – 27 = 651
3. a) 223.22 **b)** 73.75 **c)** 650.68
4. a) 0.78 **b)** 0.75 **c)** 0.32

Workbook: Exercise 2

(WB page 58)

1. 177 cm **2.** 49.5 cm **3.** 5.25 kg
4. 1.17 ℓ **5.** 1.2 m **6.** 0.18 m
7. a) 7.6 **b)** 0.99 **c)** 1.02
d) 1.66 **e)** 0.27 **f)** 0.4
8. a) 4.54 **b)** 0.00 **c)** 0.10
d) 6.78 **e)** 25.12 **f)** 2.19

Workbook: Exercise 3

(WB page 59)

1.

5.6	5.4	11
3.2	4.1	7.3
2.4	1.3	3.7

2.

7.1	8.9	16
3.5	8.9	12.4
3.6	0	3.6

3.

1.8	1.8	3.6
0.9	0.7	1.6
0.9	1.1	2

4.

2.03	2.73	4.76
1.07	1.57	2.64
0.96	1.16	2.12

Workbook: Exercise 4

(WB page 59)

1. **a)** 1.277 **b)** 1 **c)** 2.515 **d)** 50.369

2. **a)** 1.668 **b)** 0.834 **c)** 2.800 **d)** 58.235

Multiply decimals

Tell the class that now they know how to round off decimals they will round off numbers in multiplication calculations to estimate solutions. They multiplied by multiples of 10 in Term 1. Now let them round off the numbers in the number sentences to the nearest whole numbers and find the approximate solutions.

Ask the pupils to explore the boxes on the scales. They estimate the mass of the boxes and write it on the board.

$13.8 + 13.8 + 13.8 + 13.8 \approx 14 + 14 + 14 + 14 = 56$ kg

Let the class explore and explain the methods showing repeated addition and multiplication. Let them discuss which method is easier. Ask the pupils to find the difference between the estimate and the actual solution.

56 kg – 55.2 kg = 0.8 kg

Pupils use the method to check their solution.

Tell the class that multiplication with decimals is not different from multiplying whole numbers, except for the decimal point. They should keep in mind that they should have the same number of decimals after the decimal point in the product as in the multiplicand. Decimal points should be kept below each other. They can also multiply without the decimal point and just put it in the product.

In the example on page 122, pupils find out if the reading on the scale is correct for the mass of the three boxes. Let them calculate the mass on the board and check their solution by division (inverse operation).

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 6

(PB page 122)

1. **a)** 2.4 **b)** 2.4 **c)** 8.1 **d)** 2.4 **e)** 2.6
f) 0.08 **g)** 0.09 **h)** 0.24 **i)** 0.88

2. **a)** 2.25 **b)** 4.6 **c)** 7.2 **d)** 1.56

Exercise 7

(PB page 123)

1. 2.8 **2.** 5.4 **3.** 2.7 **4.** 4.2

5. 8.8 **6.** 6.3 **7.** 4.5 **8.** 4.6

9. 1.21 **10.** 1.44 **11.** 2.25 **12.** 1.69

Exercise 8 (PB page 123)

1. 13.5	**2.** 51.2	**3.** 45	**4.** 24.3
5. 25.2	**6.** 27.6	**7.** 18	**8.** 58.8
9. 2.16	**10.** 1.82	**11.** 6.48	**12.** 5.12
13. 11.48	**14.** 14.72	**15.** 18.25	**16.** 8.46

Exercise 9 Quantitative reasoning (PB page 123)

1. 273.75 jumps	**2.** 24 m	**3.** 86.4 m
4. 57.6 m	**5.** 24.5 ℓ	

Workbook: Exercise 5 (WB page 60)

1. **a)** $6 \times 4 = 24$	**b)** $15 \times 2 = 30$	**c)** $30 \times 40 = 1\,200$	
2. **a)** 20.9	**b)** 36.48	**c)** 1 169.2	
3. **a)** 3.1	**b)** 6.48	**c)** 30.8	
4. **a)** 4.9	**b)** 5.4	**c)** 6.5	**d)** 6.8
e) 11.5	**f)** 12.5	**g)** 0.64	**h)** 0.16

Workbook: Exercise 6 (WB page 60)

1. 249 + 16.6 = 265.6	**2.** 368 + 18.4 = 386.4
3. 3.4 + 0.68 = 4.08	**4.** 7.8 + 0.26 = 8.06

Workbook: Exercise 7 (WB page 61)

1. 10 kg	**2.** ₦66.15	**3.** 47.5 m
4. 715.56	**5.** 19.20 m^2	**6.** ₦12 644.32
7. 149.59 kg	**8.** ₦982.80	

Divide decimals

Ask the pupils to round off the numbers in the number sentences to the nearest whole numbers to estimate the solutions. They then calculate the actual solutions and find the differences between the estimates and actual solutions. They should not find it difficult to divide. The dividends are multiples of the divisors.

Tell the pupils that estimates with a difference less than 10 are good estimates.

Let the pupils explore and explain the calculations in the division diagram. They should notice the whole numbers divided by 10 and the whole number quotients. Division of the dividends between the whole numbers will result in decimals as quotients.

Ask the class to explore and explain the flow diagrams that show methods to divide by multiples of 10. They solve the open sentences. The multiples are broken up into factors so they first divide by 10 and the quotient by the single-digit factors.

$260 \div 20 \rightarrow 260 \div 10 \div 2 \rightarrow 26 \div 2 = 13$
$360 \div 30 \rightarrow 360 \div 10 \div 3 \rightarrow 36 \div 3 = 12$
$26 \div 20 \rightarrow 26 \div 2 \div 10 \rightarrow 13 \div 10 = 1.3$
$36 \div 30 \rightarrow 36 \div 3 \div 10 \rightarrow 12 \div 10 = 1.2$

Let the class explore the cheeses on the scales. They should find out they have to divide to find the mass of one piece of cheese. The pupils try the long division calculations first before reading them in the book.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 10

(PB page 125)

1. a) 8; 2 **b)** 18; 1.8

2. a) $120 \div 3 = 40$ **b)** $64 \div 8 = 8$ **c)** $42 \div 6 = 7$
d) $44 \div 4 = 11$ **e)** $54 \div 9 = 6$ **f)** $64 \div 2 = 32$

3. a) 39.93333 **b)** 7.95 **c)** 7.3
d) 10.9 **e)** 5.9 **f)** 31.8

4. a) 0.066667 **b)** 0.05 **c)** 0.3
d) 0.1 **e)** 0.1 **f)** 0.2

Exercise 11

(PB page 126)

(Pupils must show their calculations in long division format.)

1. 7.11 **2.** 1.415 **3.** 2.49 **4.** 1.21 **5.** 3.12
6. 0.328 **7.** 1.22 **8.** 0.1045 **9.** 1.021

Exercise 12 Quantitative reasoning

(PB page 126)

1. 132.6 jugs **2.** 32.08 rolls **3.** 107.21 cm **4.** 5.625 ℓ

Exercise 13 Quantitative reasoning

(PB page 126)

1. 2.1; pupil added 8 and not 0.8
2. 22.9; pupil subtracted 2.1 from 2.5 and not 25
3. 35; pupil added 3 to 0.5 and not 30 to 5
4. 0.2; pupil divided 10 by 2 and not 2 by 10
5. 7.1; pupil added 0.5 to 2.1 and not 5 to 2.1
6. 0.5; pupil divided 10 by 5 and not 5 by 10

Workbook: Exercise 8

(WB page 61)

1. a) $15 \div 5 = 3$ **b)** $24 \div 8 = 3$ **c)** $60 \div 5 = 12$

2. a) 31 **b)** 3.1 **c)** 7 **d)** 0.7
e) 7 **f)** 0.7 **g)** 2.8 **h)** 1.6

Workbook: Exercise 9

(WB page 62)

1. a) 11.15 **b)** 6.02 **c)** 66.3

2. 20.25 ℓ **3.** 7.21 ℓ **4.** 0.25 ℓ **5.** 20.31 cm

Topic 8: Add and subtract money

Teaching guidelines and solutions

Instructional resources
Banknotes and coins; products in pictures; price lists

Ask the class which products they normally buy at shops or markets and how much money they pay. Let them name the coins and notes they use to buy products and how they ensure they get the correct change or balance. Let them explore the products in the picture in the example and estimate the prices of the items sold.

Estimate money amounts

Ask the class to explore the coins, banknotes and prices of food items in the example. Remind the pupils that we often estimate prices of items in real life and we often do not have the actual or exact amounts of money to pay for items. Ask them to give rounded amounts closest to the actual prices of the items stated. Explain how to round off to the nearest 1 000.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 1

(PB page 129)

1. ₦650 = ₦200 + ₦200 + ₦200 + ₦50
2. ₦358.50 = ₦200 + ₦100 + ₦50 + ₦5 + ₦1 + ₦1 + ₦1 + 50 kobo
3. ₦673 = ₦200 + ₦200 + ₦200 + ₦50 + ₦20 + ₦1 + ₦1 + ₦1
4. ₦562.50 = ₦200 + ₦200 + ₦100 + ₦50 + ₦10 + ₦1 + ₦1 + 50 kobo
5. ₦365.50 = ₦200 + ₦100 + ₦50 + ₦10 + ₦5
6. ₦1 399.50 = ₦1 000 + ₦200 + ₦100 + ₦50 + ₦20 + ₦20 + ₦5 + ₦1 + ₦1 + ₦1 + ₦1 + 50 kobo

7. ₦636 = ₦200 + ₦200 + ₦200 + ₦20 + ₦10 + ₦5 + ₦1

8. ₦2 301 = ₦1 000 + ₦1 000 + ₦200 + ₦100 + ₦1

9. ₦960.50 = ₦200 + ₦200 + ₦200 + ₦200 + ₦100 + ₦50 + ₦10 + 50 kobo

Workbook: Exercise 1

(WB page 63)

	Prices	Rounded off to the nearest:			
		Unit	Ten	Hundred	Thousand
1.	₦358.22	₦358	₦360	₦400	₦0
2.	₦1 085.36	₦1 085	₦1 090	₦1 100	₦1 000
3.	₦365.48	₦365	₦370	₦400	₦0
4.	₦413.45	₦413	₦410	₦400	₦0
5.	₦310.25	₦310	₦310	₦300	₦0
6.	₦1 740.00	₦1 740	₦1 740	₦1 700	₦2 000

Workbook: Exercise 2

(WB page 63)

1. **a)** 50 kobo **b)** 350 kobo **c)** 2 550 kobo
d) 22 600 kobo **e)** 109 000 kobo **f)** 145 900 kobo

2. **a)** ₦2.80 **b)** ₦0.50 **c)** ₦5.80
d) ₦9.50 **e)** ₦17.50 **f)** ₦347.60

Workbook: Exercise 3

(WB page 63)

There are several possible combinations of currency. Accept all correct ones.

1. **a)** 3 ℓ of milk = 3 × ₦358.50 = ₦1 075.50
₦1 000 + ₦50 + ₦5 notes and 50 kobo coin

b) 1 kg of apples = ₦413.50
2 × ₦200 + ₦10 + ₦2 + ₦1 notes and 50 kobo coin

c) 4 loaves of bread = ₦236.50 × 4 = ₦946
₦500 + 2 × ₦200 + 2 × ₦20 + ₦5 + ₦1 notes

2. **a)** 1 kg of cheese = ₦1 740
b) 1 kg of chicken = ₦1 085
c) 1 kg of potatoes = ₦310

Add and subtract money

Let pupils explore and discuss the problem and the addition method shown in the example that is used to solve the problem with renaming or carrying. They should understand that we first write an open sentence to show our reasoning. Tell the pupils that adding and subtracting money amounts are not much different from these calculations with whole numbers. Make sure the pupils understand the renaming.

They explore and discuss the subtraction problem and the method to solve it using the column method with renaming or decomposition.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 2

(PB page 130)

1. **a)** ₦11 **b)** ₦8.85 **c)** ₦63.80
d) ₦83.50 **e)** ₦276.79 **f)** ₦101
g) ₦85.80 **h)** ₦114.05 **i)** ₦52.29
j) ₦33.41 **k)** ₦61.06 **l)** ₦126.50

2. **a)** ₦4.55 **b)** ₦45 **c)** ₦4.75
d) ₦23.20 **e)** ₦54.54 **f)** ₦21.91
g) ₦75.20 **h)** ₦124.30 **i)** ₦11.74
j) ₦82.64 **k)** ₦1.50 **l)** ₦3.62

3. **a)** ₦9.77 **b)** ₦26.75 **c)** ₦7.28 **d)** ₦32.07
e) ₦41.39 **f)** ₦27.83 **g)** 4 183 k **h)** ₦18.11

Exercise 3 Quantitative reasoning

(PB page 131)

1. ₦923 + ₦142.20 = ₦1 065.20
2. ₦81.52 + ₦98.11 + ₦46.19 = ₦225.82
3. ₦298.78 + ₦164.27 = ₦463.05
4. ₦69.56 – ₦45.50 = ₦24.06
5. ₦10.75 – ₦5.37 = ₦5.38
6. Pupils' answers will differ. Check for comprehension.

Workbook: Exercise 4

(WB page 64)

1. **a)** ₦753.10 = ₦700 + ₦50 + ₦3 + ₦0.10
b) ₦148.39 = ₦100 + ₦40 + ₦8 + ₦0.30 + ₦0.09

2. **a)** ₦597.78 **b)** ₦151.02
c) ₦5.59 **d)** ₦680.79

3. a)

₦21.60	₦15.71	₦4.05
₦1.41	₦11.20	₦28.75
₦18.35	₦14.45	₦8.56

b)

₦11.06	₦11.19	₦24.47	₦11.02
₦16.80	₦24.25	₦5.74	₦10.95
₦16.48	₦8.32	₦9.80	₦23.14
₦13.40	₦13.98	₦17.73	₦12.63

3.a):
[Errata: diagonal bottom left to top right doesn't add up to 41.36]

3.b):
[Errata: diagonal bottom left to top right doesn't add up to 57.74]

Workbook: Exercise 5

(WB page 65)

1. ₦1 091
2. ₦3 332.50
3. ₦5 093.50
4. ₦200.64
5. ₦181.57

Find the balance

Ask the class to explore and discuss the real-life problem in the example and the vendor's calculation while giving change. They will realise the vendor uses addition to do subtraction by counting on. Let them also look at the column method to calculate the change. Pupils discuss the importance of checking change or balance when you buy products.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 4 Quantitative reasoning

(PB page 133)

1. ₦5
2. ₦416.50
3. ₦524.50
4. ₦121.50
5. ₦5 049

Workbook: Exercise 6

(WB page 66)

1. ₦33.75
2. ₦589
3. ₦2

Topic 9: Multiply money values

Teaching guidelines and solutions

Instructional resources
Multiplication charts; money game board and cards

Multiply 1-digit money amounts

Ask the class to study the solutions in the tables. They should notice the doubling across the tables:

$4 \rightarrow 8 \rightarrow 16$ $8 \rightarrow 16 \rightarrow 32$ $20 \rightarrow 40 \rightarrow 80$ etc.

Let them give the missing products in the table and write them on the board. If your pupils do not know the tables by heart yet, give them copies of the tables to study and memorise at home.

Create copies of the games board in Exercise 1 for pupils to use.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 1

(PB page 134)

₦6 × 7 = ₦42	₦8 × 4 = ₦32	₦1 × 9 = ₦9	₦3 × 4 = ₦12
₦2 × 5 = ₦10	₦5 × 6 = ₦30	₦7 × 4 = ₦28	₦9 × 6 = ₦54
₦8 × 3 = ₦24	₦7 × 7 = ₦49	₦6 × 8 = ₦48	₦5 × 7 = ₦35
₦10 × 4 = ₦40	₦9 × 8 = ₦72	₦5 × 9 =₦45	₦8 × 8 = ₦64
₦7 × 2 = ₦14	₦4 × 5 = ₦20	₦3 × 9 = ₦27	₦4 × 6 = ₦24
₦5 × 0 = ₦0	₦8 × 5 = ₦40	₦9 × 2 = ₦18	₦3 × 7 = ₦21
₦6 × 3 = ₦18	₦8 × 7 = ₦56	₦9 × 0 = ₦0	₦3 × 10 = ₦30

Workbook: Exercise 1

(WB page 67)

×	₦3	₦8	₦1	₦6	₦9
7	₦21	₦56	₦7	₦42	₦63
2	₦6	₦16	₦2	₦12	₦18
4	₦12	₦32	₦4	₦24	₦36
10	₦30	₦80	₦10	₦60	₦90
5	₦15	₦40	₦5	₦30	₦45

Multiply amounts that are whole numbers

Ask the class to explore the prices of the food items sold at a market stall. They explore and discuss the real-life problem and the calculations. They should notice that Funke does the calculations mentally by breaking up the numbers and multiplying by 10.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 2

(PB page 136)

1. a) 9 × ₦34 = ₦306 **b)** 6 × ₦28 = ₦168
c) 4 × ₦83 = ₦332 **d)** 12 × ₦23 = ₦276
e) 8 × ₦42 = ₦336 **f)** 8 × ₦87 = ₦696
g) 15 × ₦23 = ₦345 **h)** 7 × ₦156 = ₦1 092

2. ₦3 551

Workbook: Exercise 2

(WB page 67)

1. 1 bag of oranges at ₦5.40

2. 6 pineapples at ₦2.50 each

3. Buying products in bulk is usually better because it is usually cheaper.

Multiply bigger amounts by whole numbers

Tell the class they will use their knowledge of basic multiplication facts to solve multiplication of bigger amounts. They will multiply amounts by 2-digit whole numbers. Let the class explore and discuss the methods showing breaking up numbers and the column method in the example.

Ask pupils to show how they solve the real-life problems on the board. Let them use both methods.

8 mangos @ ₦0.90 = ₦7.20 6 oranges @ ₦1.55 = ₦9.30

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 3

(PB page 136)

1. ₦988.50 **2.** ₦5 128 **3.** ₦3 424
4. ₦16 657.50 **5.** ₦14 664 **6.** ₦7 695
7. ₦6.65 **8.** ₦15.12 **9.** ₦4.48
10. ₦482.98 **11.** ₦4 735.90 **12.** ₦378.56

Workbook: Exercise 3 (WB page 68)

1. ₦72.96 **2.** ₦1 354.7 **3.** ₦277.16
4. ₦899.86 **5.** ₦954.75 **6.** ₦322

Workbook: Exercise 4 (WB page 68)

1. ₦97.37 **2.** ₦72.54 **3.** ₦38.20 **4.** ₦470.83

Solve real-life problems

Ask the pupils to explain where they apply multiplication in real life. They will use knowledge of basic multiplication facts to solve real-life multiplication problems. Let them explore and explain the problem in the example and the methods used to solve it. In A we use doubling, and in B we break up numbers to multiply. Let the pupils explain which method they find easier.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 4 Quantitative reasoning (PB page 137)

1. ₦525 **2.** ₦33
3. ₦84.50 **4.** ₦408 + ₦182 = ₦590
5. ₦17.50 **6.** ₦9.20
7. ₦1 901.28 + ₦458.01 = ₦2 359.29
8. ₦819 + ₦3 605 = ₦4 424

Workbook: Exercise 5 (WB page 68)

1. ₦2 695 **2.** ₦1 050
3. ₦45 **4.** ₦2 125

Topic 10: Divide money amounts

Teaching guidelines and solutions

Instructional resources
Division wheels; division grids; division game board and cards; flow diagrams

Revise basic division facts

Tell the class it is important that they know basic division facts by heart to solve problems with bigger numbers. Ask individual pupils to provide the missing factors in the division wheels.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 1

(PB page 139)

1.

÷	80	40	60	20	100
4	20	10	15	5	25
1	80	40	60	20	100
10	8	4	6	2	10
2	40	20	30	10	50
5	16	8	12	4	20

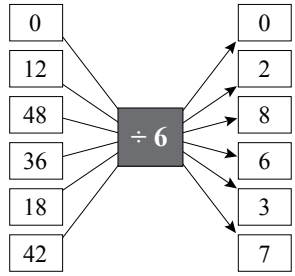
2.

÷	18	36	72	180	360
9	2	4	8	20	40
3	6	12	24	60	120
6	3	6	12	30	60
2	9	18	36	90	180
12	1.5	3	6	15	30

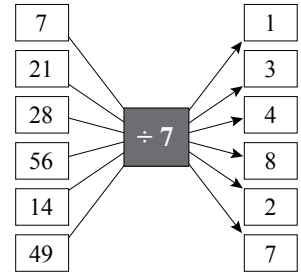
Workbook: Exercise 1

(WB page 69)

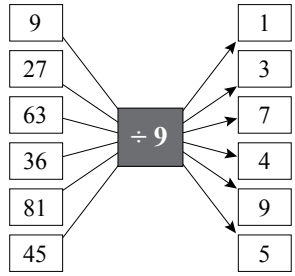
1.



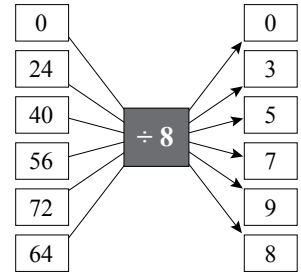
2.



3.



4.



Divide 2-digit money amounts without remainders

Ask the pupils to find out how quickly they can solve the division problems in their heads (mentally). They divide 2-digit amounts by 1-digit divisors and find fractions of ₦60 by doing division.

Make copies of the game for the pupils to use.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Workbook: Exercise 2

(WB page 69)

1. ₦6 **2.** ₦13.50 **3.** ₦9
4. ₦9.50 **5.** ₦15 **6.** ₦18.50

Workbook: Exercise 3

(WB page 70)

1. ₦17.50 **2.** ₦12.50 **3.** ₦3.50 **4.** ₦8.50

Divide money amounts by multiples of 10

Tell the class we often work with amounts that are multiples of 10 in real life and work with decimals. Remind them they have worked with decimals in Units 6 and 7 this term. Let them explore and discuss the pupils' reasoning in the speech bubbles. They explore the problems and solutions to find out if they are correct.

1. 1 apple costs → ₦8.50 ÷ 10 = ₦0.85
2. 1 orange costs → ₦14 ÷ 2 ÷ 10 = ₦0.70
3. 1 book costs → ₦179.90 ÷ 10 = ₦17.99
4. 1 shirt costs → ₦132 ÷ 10 = ₦13.20

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 2

(PB page 140)

1. ₦4.50 **2.** ₦0.95 **3.** ₦1.85 **4.** ₦12.50
5. ₦2 **6.** ₦3.125 **7.** ₦1 **8.** ₦3

Workbook: Exercise 4

(WB page 70)

1. ₦22.25 **2.** ₦0.22 **3.** ₦0.11
4. ₦1.11 **5.** ₦10.01 **6.** ₦11.01

Divide naira and kobo by whole numbers

Pupils explore the methods in the example before starting the exercises. Ask some pupils to apply the method on the board first to make sure they all understand.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 3

(PB page 141)

(Pupils must show Method A in their calculations.)

1. a) ₦1.125 **b)** ₦8 **c)** ₦7 **d)** ₦10.50
e) ₦11 **f)** ₦12.25 **g)** ₦6.65 **h)** ₦11.79

(Pupils must show Method B in their calculations.)

2. a) ₦14.62 **b)** ₦9.41 **c)** ₦7.04 **d)** ₦5.01
e) ₦4.73 **f)** ₦9.13 **g)** ₦4.19 **h)** ₦12.11

Workbook: Exercise 5

(WB page 70)

1. 24; 48; ₦4; ₦0.08; ₦4.08

2. 5; 5; ₦3.60; ₦0.11; ₦3.71

3. a) ₦12.11 **b)** ₦10.29 **c)** ₦9.03

Workbook: Exercise 6

(WB page 71)

1. a)

			5	.	2	1
9	₦	4	6	.	8	9
	-	4	5			
			1	.	8	
	-		1	.	8	
					0	9
	-					9
						0

b)

			4	.	5	1
8	₦	3	6	.	0	8
	-	3	2			
			4	.	0	
	-		4	.	0	
					0	8
	-					8
						0

2. a) ₦61.73 **b)** ₦9.41 **c)** ₦15.15

Solve real-life problems

Ask the class to explore and discuss the methods to solve the given problem. They should notice that the breaking up method is applied in A and the column method in B.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 4 Quantitative reasoning (PB page 142)

1. **a)** ₦615 **b)** ₦205
2. ₦304.83
3. ₦156
4. ₦103.42
5. 12 days
6. ₦138.28
7. ₦614
8. 5 sweets

Exercise 5 (PB page 143)

1.

÷	96	144	48	264	120
4	24	36	12	66	30
6	16	24	8	44	20
8	12	18	6	33	15

2.

÷	72	18	162	90	126
2.25	32	8	72	40	56
3.75	19.2	4.8	43.2	24	33.6
5	14.4	3.6	32.4	18	25.2

Workbook: Exercise 7 (WB page 72)

1. ₦3.38
2. ₦90.15
3. ₦1 041.10
4. ₦471.10

Topic 11: Calculate profit and loss

Teaching guidelines and solutions

Instructional resources
Prices of objects in pictures; tables; price lists

Calculate profit and loss

Pose some questions to find out how much the pupils know about profit and loss. Ask them when a profit is made, when you make a loss, if they think they have paid too much for goods and whether they think prices of goods they buy are fair.

In the example, tell them a Primary 4 class is raising funds to go on a tour to the Yankari National Park. They sell products in groups. Ask the pupils to explore the products and prices. Pose the questions to help pupils understand cost price, selling price and profit and loss.

Ask the class to explore and discuss the method to find the profit that Group 1 makes. Ask them if they think the price of the cookies is reasonable and if people will buy their product. Go through the formulas to calculate profit, loss, cost price and selling price.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 1

(PB page 145)

Group	CP	SP	Profit/loss
2	₦120	₦637.50	₦517.50 Profit
3	₦500	₦468	₦32 Loss
4	₦400	₦1 004	₦604 Profit

Exercise 2 Quantitative reasoning

(PB page 145)

1. Cost price ₦13
2. Selling price ₦24
3. Selling price ₦911
4. Cost price ₦2 289
5. Cost price ₦527

Exercise 3

(PB page 146)

1. **a)** ₦34.30 **b)** ₦21.05 **c)** ₦61.10 **d)** ₦27.15

2. **a)** ₦37.60 **b)** ₦96.10 **c)** ₦48.79 **d)** ₦81.10

3.

Cost Price	Selling Price	Profit/loss
₦95.63	₦119.22	₦23.59
₦285.32	₦154.81	₦130.51 loss
₦418.74	₦569.10	₦150.36
₦598.68	₦1 187.30	₦1 588.62
₦815.65	₦1 441.12	₦625.47

3. line 4:
[Errata: Change ₦1 588.62 to ₦588.62]

Workbook: Exercise 1

(WB page 72)

1. **a)** ₦75 **b)** ₦42 **c)** ₦1.70
d) ₦56 **e)** ₦9.70 **f)** ₦0.70

2. **a)** Profit; ₦29
b) ₦44.45; Profit
c) Loss; ₦51
d) ₦100.05; Profit

3. **a)** ₦4.00 **b)** ₦7.40 **c)** 19.50
d) ₦10.00 **e)** ₦17.30

Workbook: Exercise 2

(WB page 73)

1. ₦874.95

2. $\frac{₦1\ 456.32}{12}$ = ₦121.36; She made a profit.

3. **a)** ₦18 055
b) ₦26 575
c) ₦8 520

4. ₦172.50

5. ₦4 325

Buying at wholesale prices

Tell the class that wholesalers (people selling products in bulk or large numbers) make buyers believe they will make a profit when buying products in bulk. People then buy more products because they think they make a profit. This is however not always the case.

Ask the class to explore the prices of single and bulk items. Tell them they will now find out which is the better buy (cheaper). They explore and discuss the price of 6 single bottles of water and the price of 1 bottle in a six-pack. Pupils notice that buying single bottles is cheaper than buying the six-pack.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 4

(PB page 147)

1. 5 kg of oranges

2. 1 slice of cheese

3. 30 eggs

4. 1 ℓ cool drink

Workbook: Exercise 3

(WB page 74)

1. **a)** ₦927.63
b) ₦716.44
c) ₦1 634.35

2. **a)** Wholesale
b) Single items
c) They are the same; neither one is cheaper.

TERM 2

Revision

You may use the revision questions or a selection thereof for the final assessment at the end of the term. The questions and problems involve work covered in topics during the term. The problems include routine problems and those involving quantitative reasoning.

Revision solutions

(PB page 127)

1. a) $9^2 = 81$ **b)** $10^2 = 100$ **c)** $12 \times 12 = 144$
d) $15 \times 15 = 225$ **e)** $20 \times 20 = 400$ **f)** $11 \times 11 = 121$

2.

×	6	7	9	11	12
6	36	42	54	66	72
7	42	49	63	77	84
9	54	63	81	99	108
11	66	77	99	121	132
12	72	84	108	132	144

3. a) 3; 1 **b)** 4; 2; 2 **c)** 6; 2 **d)** 11; 11; 2; 2

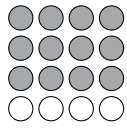
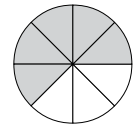
4. a) $9 + 6 = 15$ **b)** 9 **c)** 13
d) 3 **e)** $122 - 8 = 114$ **f)** $162 - 11 = 151$

5. a) 35 **b)** 9 **c)** 18 **d)** 6

6. a) 25 **b)** 100

7. a) $m = 9$ **b)** $p = 10$ **c)** $x = 5$ **d)** $n = 4$

8. a) 6 children **b)** 4 children
c) 3 children **d)** $\frac{1}{6}$; $\frac{1}{4}$; $\frac{1}{3}$

9. a)  **b)** 

10. a) $\frac{1}{4}$; $\frac{4}{12}$ **b)** $\frac{9}{7}$; $\frac{101}{100}$ **c)** $2\frac{2}{3}$; $1\frac{6}{8}$

11. a) $2\frac{2}{3}$ **b)** $2\frac{3}{7}$ **c)** $6\frac{9}{10}$ **d)** $6\frac{2}{3}$

12. a) False **b)** False

13. a) $\frac{16}{24}$ changes to $\frac{2}{3}$
b) proper changes to mixed fraction

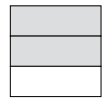
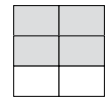
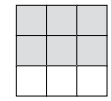
14. 11 pairs of socks

15. a) < **b)** > **c)** = **d)** =

16. $\frac{1}{12}$; $\frac{1}{10}$; $\frac{5}{12}$; $\frac{7}{12}$; $\frac{6}{10}$; $\frac{9}{10}$

17. Rotini

18. a) 4; 8; 16 **b)** 6; 2

19. a) **A.**  **B.**  **C.** 

b) $\frac{2}{3}$; $\frac{1}{3}$ $\frac{4}{6}$; $\frac{2}{6}$ $\frac{6}{9}$; $\frac{3}{9}$

20. a) $\frac{2}{12} = \frac{4}{24} = \frac{8}{48}$ **b)** $\frac{4}{10} = \frac{8}{20} = \frac{16}{40}$

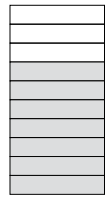
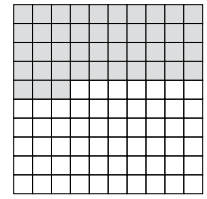
21. a) $\frac{49}{30} = 1\frac{19}{30}$ **b)** $\frac{2}{9}$

c) $\frac{17}{8} = 2\frac{1}{8}$ **d)** $\frac{67}{21} = 3\frac{4}{21}$

22. $\frac{13}{24}$ **23.** $\frac{11}{40}$

24. $\frac{5}{4} = 1\frac{1}{4}$ **25.** $3\frac{1}{3}$; 4; $4\frac{2}{3}$

26. a) 21.45 **b)** 12.63

27. a) **A.**  **B.** 

b) 0.7; 0.43

28. a) 0.1 **b)** 8 **c)** 1.5
d) 2; 100 **e)** 1; 35 **f)** 12; 5

29. a) 14.5; 14.48; 0.02 **b)** 1.5; 1.559; 0.059

30. a) 3.2 **b)** 2.2 **c)** 1.59 **d)** 3.08
e) 1.016 **f)** 4.09 **g)** 1.4 **h)** 18.2

31. a) 19.921 **b)** 12.157 **c)** 4.8 **d)** 16.06

32. a) 3.15 kg **b)** 224.206 km
c) 23.75 km **d)** 0.95 kg

33. a) ₦86 **b)** ₦140 **c)** ₦7.50 **d)** ₦95

34. a) ₦305 **b)** ₦805

35. ₦126.25

36. a) ₦280 **b)** ₦600 **c)** ₦32.50 **d)** ₦93

37. a) ₦6 **b)** ₦6 **c)** ₦1.25
d) ₦2.725 **e)** ₦0.9125 **f)** ₦2.01

38. ₦18.90

39. a) ₦1.10 **b)** ₦5.05

40. a) ₦31 **b)** ₦51.80

41. ₦136

Topic 1: Time, calendars and dates

Teaching guidelines and solutions

Instructional resources
Analogue and digital clocks; flow diagrams; tables; time charts; calendars; timetables

Have a class discussion and let pupils explain what they think time is, why they think it is important to know how to tell time, and what they think would happen if we do not have time measuring instruments. Ask them to name the type of instruments we use to measure time.

Tell them that people did not have time measuring instruments like we have long, long ago. They used the sun, moon, stars, seasons, day and night to measure time, and animal bones and tree trunks to record times. Let them explain how they think people used these natural forms to tell and record time.

Read and write time on digital and analogue clocks

Ask the class to explore the analogue and digital clocks, and to identify and explain what the second, minute and hour hands show on an analogue clock. They should realise that the hands on a clock move clockwise. Explain that anti-clockwise is in the opposite direction.

Find out if they can read the times in hours, minutes and seconds on the clocks shown.

Explain the movement of the hands of a 12-hour clock in the colour box to the class and let them explore the movements on the clocks. Find out if the can identify $\frac{1}{4}$, $\frac{1}{2}$ and $\frac{3}{4}$ hours and minutes on the clocks. Let them show the fractions of time on the clocks. Remind the class they have counted in groups of 5 and 6 in Term 1.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 1

(PB page 154)

1–2. a) 6:05 or five past six

b) 5:50 or ten to six

c) 7:50 or ten to eight

d) 12:05 or five past midnight

e) 6:15 or quarter past six

f) 11:45 or quarter to twelve

g) 12.30 or half past twelve

h) 10.15 or quarter past ten

i) 7.35 or twenty-five to eight

j) 14:20 or twenty past two

k) 09:50 or ten to ten

l) 11:05 or five past eleven

3. 5 minutes earlier

a) 6:00	**b)** 5:45	**c)** 7:45
d) 00:00	**e)** 18:10	**f)** 11:40
g) 12.25	**h)** 10.10	**i)** 7.30
j) 14:15	**k)** 09:45	**l)** 11:00

10 minutes earlier

a) 5:55	**b)** 5:40	**c)** 7:40
d) 11:55	**e)** 18:05	**f)** 11:35
g) 12.20	**h)** 10.05	**i)** 7.25
j) 14:10	**k)** 09:40	**l)** 10:55

15 minutes earlier

a) 5:50	**b)** 5:35	**c)** 7:35
d) 11:50	**e)** 18:00	**f)** 11:30
g) 12.15	**h)** 10.00	**i)** 7.20
j) 14:05	**k)** 09:35	**l)** 10:50

30 minutes earlier

a) 5:35	**b)** 5:20	**c)** 7:20
d) 11:35	**e)** 17:45	**f)** 11:15
g) 12.00	**h)** 09.45	**i)** 7.05
j) 13:50	**k)** 09:20	**l)** 10:35

4. 5 minutes later

a) 6:10	**b)** 5:55	**c)** 7:55
d) 00:10	**e)** 18:20	**f)** 11:50
g) 12.35	**h)** 10.20	**i)** 7.40
j) 14:25	**k)** 09:55	**l)** 11:10

10 minutes later

a) 6:15	**b)** 6:00	**c)** 8:00
d) 00:15	**e)** 18:25	**f)** 11:55
g) 12.40	**h)** 10.25	**i)** 7.45
j) 14:30	**k)** 10:00	**l)** 11:15

15 minutes later

a) 6:20	**b)** 6:05	**c)** 8:05
d) 00:20	**e)** 18:30	**f)** 12:00
g) 12.45	**h)** 10.30	**i)** 7.50
j) 14:35	**k)** 10:05	**l)** 11:20

30 minutes later

a) 6:35	**b)** 6:20	**c)** 8:20
d) 00:35	**e)** 18:45	**f)** 12:15
g) 01.00	**h)** 10.45	**i)** 8.05
j) 14:50	**k)** 10:20	**l)** 11:35

Exercise 2

(PB page 155)

1. 

2. 

3. 

4. 

5. 

6. 

7. 

8. 

Exercise 3

(PB page 155)

1. 

2. 8:10

3. 

4. 3:00

5. 7:25

6. 

7. 

8. 02:22

9. 19:08

Workbook: Exercise 1

(WB page 75)

1. **a)** 3:40 **b)** 6:30 **c)** 4:00 **d)** 8:55 **e)** 7:45 **f)** 2:20

2. **a)**  **b)**  **c)** 

d)  **e)**  **f)** 

Workbook: Exercise 2

(WB page 76)

1.  **2.**  **3.**  **4.** 

Morning and afternoon time and events

Tell the class that we have morning and afternoon time during a day. Pose the questions to find out what pupils know about morning and afternoon time. They should know there are 24 hours in a day, from 12 midnight to 12 midday (noon) it is morning and from 12 noon to 12 midnight, it is afternoon time.

Let the pupils explore and explain the events and times on the timeline. For example 1, they mention what they do during a school week, the weekend and the holidays in the morning, afternoon and evening.

In example 2, explain a.m. (ante meridian) and p.m. (post meridian) to the class and the difference between 12- and 24-hour clock times. Let them explore the clocks to find out which shows 12- and 24-hour times and for which we use a.m. and p.m.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 4

(PB page 158)

1. **a)** a.m. **b)** a.m. **c)** p.m.
d) a.m. **e)** a.m. **f)** p.m.

2. **a)** 23 hours 3 minutes **b)** 22 hours 10 minutes
c) 1 hour 5 minutes **d)** 1 hour 25 minutes
e) 40 minutes **f)** 5 hours 30 minutes

3. **a)** 07:30 **b)** 19:30 **c)** 16:15
d) 01:50 **e)** 20:45 **f)** 24:00

Exercise 5 (PB page 159)

1–2. Pupils' own answers

3. a) 4 hours and 25 minutes **b)** 35 minutes
c) 1 hour and 45 minutes **d)** 2 hours and 25 minutes
e) Pupils discuss reasons in class.

Workbook: Exercise 3 (WB page 76)

Questions 1–4 are pupils' own answers. These are simply examples.

1. a)  **b)**  **c)**  **d)** 

e)  **f)**  **g)**  **h)** 

2. a) 1 hour **b)** 6 hours **c)** 14.5 hours
3. a) 6:30 a.m. **b)** 8:00 a.m. **c)** 2:00 p.m.
d) 8:30 a.m. **e)** 9:30 a.m. **f)** 2:00 p.m.
g) 4:00 p.m. **h)** 9:00 p.m.
4. a) 06:30 **b)** 08:00 **c)** 14:00 **d)** 08:30
e) 09:30 **f)** 14:00 **g)** 16:00 **h)** 21:00
5. a) 7:10 p.m. **b)** 5:55 a.m. **c)** 8:50 p.m.
d) 5:05 p.m. **e)** 11:40 a.m. **f)** 12:45 p.m.
6. a) a.m. **b)** a.m. **c)** p.m. **d)** p.m. **e)** a.m. **f)** p.m.

Workbook: Exercise 4 (WB page 79)

1. a) 5 hours **b)** 7 hours 45 minutes
c) 3 hours 15 minutes **d)** 9 hours 30 minutes
e) 9 hours 45 minutes **f)** 9 hours 30 minutes
2. 7:20 a.m. **3.** 12:35

Convert units of time and 24-hour time

Remind the class they have worked with groups of 60 in Term 1. They discuss the units of time they have worked with and explain how the number 60 is connected to time.

Ask the class to convert between units of time, including fractions of minutes and hours.

60 seconds = 1 minute	$\frac{1}{2}$ hour = 30 minutes	15 seconds = $\frac{1}{4}$ minute
60 minutes = 1 hour	$\frac{1}{4}$ hour = 15 minutes	30 seconds = $\frac{1}{2}$ minute
1 minute = 60 seconds	$\frac{3}{4}$ hour = 45 minutes	45 seconds = $\frac{3}{4}$ minute
$\frac{1}{2}$ minute = 30 seconds	$\frac{1}{4}$ minute = 15 seconds	$\frac{3}{4}$ minute = 45 seconds

Ask the class to explore the 12- and 24-hour times in the timelines in the example and explain what they notice. They look for patterns in the timeline tables to recognise differences and similarities in 12- and 24-hour times listed. Go through the method showing how to read digital time on clocks correctly. They complete number sentences to help them understand conversion between 12-hour and 24-hour time.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 6

(PB page 161)

1. 30 min **2.** 15 min **3.** 20 min
4. 5 min **5.** 45 min **6.** 40 min
7. 6 min **8.** 10 min **9.** 12 min

Exercise 7

(PB page 161)

1. a) 2 h **b)** $1\frac{1}{3}$ h **c)** $\frac{1}{2}$ h
d) $\frac{1}{6}$ h **e)** $5\frac{1}{3}$ h **f)** $7\frac{2}{3}$ h
g) $2\frac{5}{12}$ h **h)** $\frac{1}{3}$ h **i)** $4\frac{4}{5}$ h
j) $2\frac{7}{10}$ h **k)** $\frac{3}{4}$ h **l)** $11\frac{1}{2}$ h

2. a) 75 min **b)** 40 min **c)** 60 min
d) 6 000 min **e)** 192 min **f)** 480 min
g) 210 min **h)** 840 min **i)** 465 min
j) $1\,387\frac{1}{2}$ minutes **k)** 680 minutes **l)** 408 minutes

Exercise 8

(PB page 162)

1.

12-hour	20:40	23:30	15:25	22:36	20:15	00:54	18:12	19:45	16:18	17:01
24-hour	8:40 p.m.	11:30 p.m.	3:25 p.m.	10:36 p.m.	8:15 p.m.	12:54 a.m.	6:12 p.m.	7:45 p.m.	4:18 p.m.	5:01 p.m.

2. a) ten past twelve **b)** twenty-five past six
c) quarter to ten **d)** twenty-nine past four
e) thirteen past eight **f)** twenty-five to eight
g) nine past eleven **h)** eighteen past five
i) six to ten

3. **a)** 17:35 **b)** 7:30 **c)** 24:00
d) 22:00 **e)** 9:45 **f)** 23:15
g) 20:10 **h)** 06:05 **i)** 23:22
j) 09:38 **k)** 12:52 **l)** 14:40

4. **a)** 10:20 **b)** 20 minutes **c)** 5 minutes

Exercise 9 Quantitative reasoning (PB page 163)

1. 7:48 **2.** 7:40
3. 33 min **4.** 1 hour 55 minutes
5. 10.05 a.m. **6.** 08:10
7. 07:14 **8.** 18:47

Workbook: Exercise 5 (WB page 79)

1. **a)** 60 s **b)** 480 s **c)** 480 s
d) 600 s **e)** 1 200 s **f)** 90 s

2. **a)** 1 min **b)** 3 min **c)** 3 min
d) 4 min **e)** 6 min **f)** 1.5 min
g) 1.67 min **h)** 10 min

Workbook: Exercise 6 (WB page 80)

1. **a)** 13:00 **b)** 04:30
c) 21:15 **d)** 00:45

2. **a)** 4:00 p.m. **b)** 11:30 p.m.
c) 7:00 p.m. **d)** 6:00 a.m.

3. 4:15 a.m. **4.** 16:20
5. 25 minutes **6.** 15:25
7. 16:30 **8.** 200 km

Calendars and dates

Remind the class that they worked with groups of 7 and a calendar in Term 1. Let them explain what they remember about the arrangement of numbers and the patterns they observed in a calendar.

Write the poem in the Pupil's Book on the board and ask pupils to recite the poem with the months and number of days in months. Ask the class how they can check the number of days in the months mentioned in the poem. Tell the class about the ancient Mayans' contributions to create the first accurate calendar. You can also use the knuckle method to help pupils remember how many days are in each month. The knuckle is 31 days and the dent in between is 30 days (or 28/29 for February).

Let the pupils explore the pictures to identify important days and events. They write the events and dates they celebrate on the board.

Let the class read Biodun's sentence and explore the different ways to write the date he mentions. They say which format (notation) they prefer.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 10

(PB page 164)

Pupils' own answers

Exercise 11

(PB page 165)

1. Pupils' own answers

2. **a)** 20 December
b) 10 January
c) 15 January

3. **a)** February to May **b)** June to September
c) January/December **d)** April
e) September to December; January to April; April to July

4. **a)** C **b)** E **c)** B
d) A **e)** D

Exercise 12

(PB page 166)

1. **a)** April, June, August, September, November
b) January, March, May, July, August, October, December
c) February

2. A leap year

3. 4 weeks

4. Answers will differ based on calandar for the year of teaching. Check for comprehension.

Workbook: Exercise 7

(WB page 81)

(Pupils' answers may vary slightly. Use these as guidelines and make sure the answers match those relevant in your school.)

1. September–July

2. 38 to 39

3. June or July

4. September for millet; September/October for beans; October/November for sorghum; September–March for cocoa

5. (any two)
New Year's Day – 1 January
Good Friday
Easter Monday
Worker's Day – 1 May
Democracy Day – 29 May
Independence Day – 1 October
Christmas Day – 25 December
Boxing Day – 26 December
Mawlid
Eid al-Fitr
Eid al-Adha

6. 365

7. 366

8. Because there is an extra day, 29 February, due to the fact that the earth does not orbit the sun in exactly 365 days. The extra day is a corrective measure to keep the calendar in sync.

9. 91 days

10. 52

11. a) 365.25 days/$365\frac{1}{4}$ days

b) 365.5 days/$365\frac{1}{2}$ days

c) 365.75 days/$365\frac{3}{4}$ days

d) 366 days

Workbook: Exercise 8

(WB page 82)

1. 60

2. 24

3. 1 440

4. 60

5. 86 400

6. 365

7. 10

8. 100

9. 100

10. 1 000

11. 1 000

Topic 2: Estimate and compare length

Teaching guidelines and solutions

Instructional resources
Measurements in pictures; maps; measuring tools; tables/charts

Ask the class what people normally measure in length, height and distance in daily life and the tools people use to measure objects and distance. They explore and use the pictures in the example as references.

Tell the pupils that they have to memorise the conversions between km, m and cm. Let them read the conversions aloud. Make a chart with these conversions to put up on the classroom wall.

Estimate and compare widths, heights and distances

Remind the class that estimation or approximation is a human mathematical activity integral to our daily lives. However, estimations are not wild guesses; they are informed by our existing knowledge of something. Ask the class to explore the boy's height in the picture in the example and compare it with the height of the tree. They use the boy's height to estimate the height of the tree. They should estimate the tree's height as three times the boy's height so the tree is about $1.2 \times 5 = 6$ m.

Ask the pupils which units of length they would use to measure the lengths and distances of the objects stated. Pupils explain how they make estimates in real life.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 1

(PB page 168)

1. **A.** 4.5 m **B.** 15 m **C.** 12 m **D.** 22.5 m

2. **a)** 375 km **b)** 625 km **c)** 500 km **d)** $\frac{1}{5}$

Workbook: Exercise 1

(WB page 83)

1. a) A **b)** C **c)** See table in d)

d)

Line	Estimate	Actual measurement	Difference
A	4.2 cm	4.6 cm	0.4 cm
B	4.1 cm	4.5 cm	0.4 cm
C	4 cm	4.5 cm	0.5 cm

2.

Line	Estimate	Actual measurement	Difference
a)	3.1 cm	2.7 cm	0.4 cm
b)	5.2 cm	5.8 cm	0.6 cm
c)	1.6 cm	1.5 cm	0.1 cm
d)	3.9 cm	4.4 cm	0.5 cm

Workbook: Exercise 2

(WB page 84)

1. a) $\frac{1}{4}$ km **b)** 1 km **c)** $\frac{3}{4}$ m **d)** 750 m

2. a) Tinuke **b)** Tosin **c)** 0.12 m

3. a) $\frac{3}{4}$ km **b)** $\frac{1}{2}$ km **c)** 1 km **d)** $1\frac{1}{4}$ km

Workbook: Exercise 3

(WB page 85)

1. a) 1 km **b)** $\frac{3}{4}$ km **c)** $\frac{1}{2}$ km

d) $\frac{1}{4}$ km **e)** $\frac{1}{2}$ m **f)** $\frac{1}{4}$ m

g) 1 500 m **h)** 150 cm **i)** 2 250 m

j) 325 cm

2. a) 120 km **b)** 150 km

c) 75 km **d)** 45 km

Estimate and measure objects

Pupils should know that we use different tools or instruments to measure length and distance. Ask them to explore and discuss the measuring instruments in the picture. Go with them through the social knowledge to assist them in understanding what is measured by each instrument.

Ask the class which instruments and units of length they would use to measure the objects in the picture.

Exercise 2

(PB page 170)

Pupils' own answers

Exercise 3

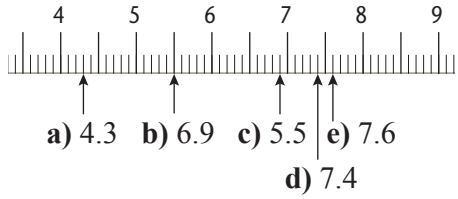
(PB page 171)

1. Pupils' own answers
2. Pupils' own answers
3. Pupils' own answers
Sample answer: Actual – estimate = 2 m – 1.9 m = 0.1 m
4. Pupils' own answers

Workbook: Exercise 4

(WB page 85)

1.



2. 19.5 m

Convert between units of length

Tell pupils that we often need to convert between different units of length. This is because when we add or subtract lengths, they need to be in the same unit for us to calculate it. When we are given a mix of units, for example m and cm, in the same calculation, we need to convert them all to the same unit before finding the answer.

Work through the examples with the class.

Exercise 4

(PB page 172)

1. **a)** 1.73 m **b)** 15.62 m **c)** 38.95 m
d) 7.41 m **e)** 0.85 m **f)** 2 350 m
g) 3 890 m **h)** 5 987 m **i)** 963 000 m
j) 250 m **k)** 670 m **l)** 152 000 m

2. **a)** 530 cm **b)** 524 cm **c)** 239 cm
d) 44 cm **e)** 181 cm **f)** 19 cm
g) 120 000 cm **h)** 301 200 cm

3. **a)** 8.602 km **b)** 7.306 km **c)** 4.587 km
d) 3.283 km **e)** 2.108 km **f)** 2.309 km
g) 5.715 km **h)** 1.359 km

Add and subtract length

Tell the pupils that we often add and subtract lengths and distances in real life. Tell them they will add and subtract lengths and distances in kilometres and metres. Ask them to explore and explain the problem in the example involving distances that a bus travels. They find the distances between stops.

Let the class explore and discuss the methods Damola uses to solve addition and subtraction problems with renaming. They should notice the use of zeros as place holders. The methods involve horizontal and vertical column addition and subtraction.

Let the pupils work on the board to solve the addition and subtraction problems.

5 km + 2 km 315 m + 15 m = 9 km 630 m
7 km 540 m + 3 km 5 m = 10 km 545 m
12 km + 7 km 9 m = 19 km 900 m
9 km 86 m – 3 km 34 m = 13 km 320 m
8 km – 3 km 480 m = 4 km 520 m
(36 + 44) km = 80 km
(75 – 68) km = 7 km

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 5

(PB page 174)

1. 272 m
2. 561 m
3. 713 m
4. 854 m
5. 182 m
6. 889 m

Exercise 6

(PB page 174)

1. 11 km 230 m
2. 20 km 505 m
3. 18 km 690 m
4. 12 km 765 m
5. 12 km 550 m
6. 10 km 84 m
7. 7 km 6 m
8. 1 km 7 m
9. 2 km 500 m
10. 1 km 175 m
11. 4 km
12. 69 km
13. 8 km 15 m
14. 13 km 50 m

Exercise 7

(PB page 174)

1. 1.24 m
2. 9.51 m
3. 3.93 m
4. 27.61 m
5. 7.02 m
6. 21.38 km
7. 14.36 km
8. 23.62 km

Exercise 8

(PB page 175)

1. 1 000 m

2. 1 km

3. **a)** 500 m

b) 750 m

c) 1 000 m

4. **a)** $\frac{1}{2}$ km

b) $\frac{3}{4}$ km

c) 1 km

5. 875 m

Workbook: Exercise 5

(WB page 86)

1. **a)** 42 km **b)** 78 km

c) 30 km **d)** 8 km

e) 70 km **f)** 53 km

2. **a)** 12 km 279 m **b)** 4 km 10 m

c) 4 km 185 m **d)** 93 km

e) 67 km

3. **a)** 4.87 m **b)** 11.16 m

c) 105.94 m **d)** 181.82 m

e) 182.61 m **f)** 670.67 m

Workbook: Exercise 6

(WB page 87)

1. 2 km 85 m

2. 6 km 480 m

3. 9 km

4. 480 km

Topic 3: Add, subtract, multiply and divide mass

Teaching guidelines and solutions

Instructional resources
Objects in pictures; scales; physical objects; flow diagrams; tables/ charts; number lines

Ask the class where we use mass in real life, which objects we normally weigh, which units of mass we use and the instruments we use to weigh objects.

A. kg **B.** g **C.** kg **D.** g
E. kg **F.** g **G.** g **H.** kg

Let them estimate the mass of the objects in the picture.

Know and convert between units of mass

Ask the class which instrument they would use to measure each object in the picture. They read the mass of the baby on the scale.

Pupils should know that we measure objects in grams (light objects) and kilograms (heavy objects). Let them convert the fractions of kg to g and g to kg. Ask them to memorise the conversions. Pupils explore and discuss the methods to convert between grams and kilograms and understand that the prefix *kilo-* means thousand.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 1

(PB page 177)

1. a) 62 kg **b)** 3.8 kg **c)** 2 kg 500 g
d) 1 kg **e)** 5 kg 300 g

2. a) 1 645 g **b)** 2 321 g **c)** 3 150 g **d)** 3 638 g
e) 4 066 g **f)** 5 085 g **g)** 1 005 g **h)** 1 006 g

3. **a)** 1 kg 344 g **b)** 1 kg 506 g **c)** 3 kg 7 g
d) 2 kg 38 g **e)** 4 kg 9 g **f)** 5 kg 85 g
g) 26 kg 132 g **h)** 14 kg 10 g

4. **a)** 3 475 g **b)** 1 398 g **c)** 5 305 g
d) 2 960 g **e)** 964 g **f)** 21 450 g

5. **a)** 6.441 kg **b)** 2.098 kg **c)** 6.733 kg
d) 2.306 kg **e)** 0.596 kg **f)** 0.362 kg

Workbook: Exercise 1

(WB page 87)

1. **a)** 1 000 g **b)** $\frac{1}{4}$ kg **c)** $\frac{3}{4}$ kg
d) 1 500 g **e)** $1\frac{1}{2}$ kg **f)** 1 750 g
g) $1\frac{1}{4}$ kg **h)** 2 000 g **i)** 3 250 g
j) 5 500 g **k)** 10 750 g **l)** $\frac{1}{2}$ kg

2. **a)** A: 57 kg; B: 64 kg; C: 75 kg; D: 90 kg
b) A: 570 g; B: 640 g; C: 750 g; D: 900 g

Workbook: Exercise 2

(WB page 88)

1. 250 g; 500 g; 1 kg; 2.5 kg; 3 kg; 5 kg

2. **a)** 5
b) $7\frac{1}{5}$ bags

3. 5 kg

4.

	250 g washing powder	500 g washing powder
5 kg washing powder	20	10
3 kg washing powder	12	6
2.5 kg washing powder	10	5
1 kg washing powder	4	2

5. **a)** 27 kg
b) **i)** 5 kg + 2 kg + 2 kg
ii) 10 kg + 5 kg
iii) 10 kg + 5 kg + 2 kg
iv) 10 kg + 2 kg

Compare masses and weigh objects

Tell the class that we often compare masses of objects in real life. Let them explore the mass of the 1 kg nails and 1 kg feathers in the picture to find out whether the objects have the same mass.

Ask them to explore the masses of the objects in the number 2. They find out how many of the smaller quantities would have the same mass as the bigger quantities. Let them explore the objects in the picture to find out which objects weigh more or less than 1 kg.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 2

(PB page 179)

	Object	1. Estimate	2. Actual mass	3. Difference
A.	Red pepper	40 g	43 g	3 g
B.	Tennis ball	30 g	34 g	4 g
C.	Bar of soap	110 g	100 g	10 g
D.	Toothbrush	50 g	70 g	20 g
E.	Book	1 kg	1.1 kg	0.1 kg
F.	Mango	0.5 kg	0.53 kg	0.05 kg
G.	Sugar cube	5 g	6 g	1 g
H.	Sweet	10 g	9 g	1 g

Exercise 3

(PB page 180)

Pupils collect the following objects and weigh them: apples, bag of rice, cup of sugar, cup of water, paper clips, beans, matchsticks. They then answer the questions that follow.

Workbook: Exercise 3

(WB page 90)

1. a) 1 000 **b)** 500 **c)** 750

2. a) D. a chicken egg **b)** A. a baby elephant
c) E. a small car **d)** B. a block of butter
e) C. a small child

Add and subtract mass

Tell the class that we often add and subtract masses when we buy products in real life. Let them explore the masses of the items in the picture in the example. They read the masses aloud and find the total mass and difference in mass of the objects.

Pupils explore and discuss the column methods to add and subtract masses. They should notice the use of zeros as place holders.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 4 (PB page 182)

1. 668 g **2.** 1 144 g **3.** 1 210 g **4.** 998 g
5. 46.31 kg **6.** 50.13 kg **7.** 13.21 kg **8.** 27.89 kg
9. 8 kg 421 g **10.** 4 kg 969 g

Exercise 5 (PB page 183)

(Pupils may write their answers in kg and g as well.)

1. 3.125 kg **2.** 6.215 kg **3.** 8.114 kg
4. 22.432 kg **5.** 18.164 kg **6.** 13.018 kg
7. 1.8 kg **8.** 0.82 kg **9.** 11.67 kg

Exercise 6 Quantitative reasoning (PB page 183)

1. 13.753 kg **2.** 3.025 kg **3.** 6.401 kg **4.** 2.953 kg
5. Double the ingredients:

1.5 kg rice	2 onions	1 kg tomatoes
40 g spices	40 g curry powder	30 g thyme
3 kg chicken	10 g salt	10 g pepper

Workbook: Exercise 4 (WB page 90)

1. **a)** 5 kg 442 g **b)** 5 kg 375 g
c) 10 kg 643 g **d)** 10 kg 106 g
2. **a)** 385 g **b)** 3 kg 172 g
c) 2 kg 134 g **d)** 1 kg 93 g

Workbook: Exercise 5 (WB page 91)

1. 17 kg 900 g **2.** 7 kg 150 g
3. 11 kg 500 g **4.** 17 kg 700 g

Multiply mass by 1-digit numbers

Ask the class to explore the masses of the cakes in the example. They calculate the mass of $\frac{1}{2}$ dozen (6) cupcakes and explain their strategies. Let the class explore and discuss the methods the pupils' use to solve the problem. The methods involve repeated addition, breaking up numbers and the column method. Let them explain which method they prefer.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 7 (PB page 185)

1. **a)** 585 g **b)** 830 g **c)** 5.81 kg
d) 600 g **e)** 3.048 kg **f)** 4.382 kg

2. **a)** 2.486 kg **b)** 12.976 kg **c)** 15.792 kg **d)** 35.79 kg
e) 36.484 kg **f)** 66.81 kg **g)** 2 884 kg **h)** 3 692 kg
i) 4 524 kg **j)** 12.096 kg **k)** 16.432 kg **l)** 45.234 kg

Exercise 8 Quantitative reasoning (PB page 185)

1. ₦2 **2.** 180 kg **3.** 455 kg
4. 398.179 kg **5.** 72.496 kg

Workbook: Exercise 6 (WB page 91)

1. **a)** 14 kg 808 g **b)** 18 kg 417 g
c) 84 kg 760 g **d)** 67 kg 230 g

2. **a)** 1 kg 368 g **b)** 2 kg 784 g **c)** 4 kg 864 g
d) 35 kg 245 g **e)** 18 kg 162 g **f)** 9 kg 129 g

Workbook: Exercise 7 (WB page 92)

1. 10 kg 500 g **2.** 3 kg 807 g
3. 42 kg 300 g **4.** 49 kg

Divide mass by 1-digit numbers

Ask the class to explore the scales and the masses of the fish they hold in the example. They read the masses on the scales and find the mass of one fish on each scale. Let them write number sentences on the board to show their reasoning. They look at the mass of the box of fish in the example. They find the mass of smaller boxes of fish in the big box.

Let the class explore and discuss the methods Funmi uses to solve the problems. In method 1, she uses brackets to divide kg and g separately. In method 2, she applies long division.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 9 (PB page 186)

1. 2 kg 250 g **2.** 2 kg 675 g **3.** 3 kg 31 g
4. 7 kg 9 g **5.** 74 kg 22 5g **6.** 48 kg 6 g
7. 15 kg 113 g **8.** 12 kg 21 g **9.** 3 kg 12 g
10. 2 kg 22 g **11.** 4 kg 149 g **12.** 15 kg 173 g

Exercise 10 (PB page 186)

1. a) 6 kg 7 g **b)** 8 kg 2 g **c)** 8 kg 212 g
d) 4 kg 1 g **e)** 7 kg 60 g **f)** 5 kg 70 g
2. a) 16 kg **b)** 13 kg; 20 kg

Workbook: Exercise 8 (WB page 93)

1. 8 kg 121 g **2.** 4 kg 135 g **3.** 2 kg 84 g
4. 9 kg 61.25 g **5.** 41 kg 644.67 g **6.** 50 kg 8 g

Solve division word problems involving mass

Ask the class to explore the products on sale in the example and the mass shown on the scale. They give the mass on the scale as a fraction, i.e. 4.5 kg = $4\frac{1}{2}$ kg. They give the mass in kg in grams, i.e. 4.5 kg = 4 500 g.

Let the class find out what the mass of one packet is if the quantity of fish is divided into 5 packets. They explore the suggested method showing conversion of kg to g to divide by 5.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 11 Quantitative reasoning (PB page 188)

1. 30 packets **2.** 200 g
3. 571 g **4.** 2 kg 61 g
5. 2 kg 82 g **6.** 1 kg 401 g
7. 1 kg 469 g **8.** 1.25 kg

Workbook: Exercise 9 (WB page 94)

1. 119 g **2.** 1 kg 290 g **3.** 27 g
4. a) 800 g **b)** 900 g **c)** 1 kg 200 g

Topic 4: Add and subtract capacity

Teaching guidelines and solutions

Instructional resources
Objects in pictures; number lines; conversion chart; flow diagrams

Ask the class what they remember about measurement and which units of measurement people use in real life, referring to the objects in the example. They should observe people are measuring length and capacity or volume in the pictures.

Ask the pupils what the woman in B is measuring, what the capacity of the container is and which other liquids are measured in real life, i.e. water, oil, juice, petrol, milk, wine, medicine, kerosene, etc.

Revise measurement (capacity) of liquids

Ask the class to explore and discuss the containers and measurements in the example and pose the questions to find out what pupils' existing knowledge is about capacity.

Ask the pupils to look at container A with paint in the picture. Ask them why containers are not filled to their full capacity. They should realise that liquids spill when containers are filled to capacity and you open them.

Ask the pupils what they think the difference is between volume and capacity. Explain that capacity is the amount a container can hold and volume is the amount of liquid in the container.

Capacity of containers:
A. Paint → 2.5 ℓ
B. Milk → 2 ℓ
C. Glasses → 25 cl/250 ml
D. Kerosene can → 20 ℓ
E. Bottle → 1 ℓ

Volume of containers:

A. Paint → 2.5 ℓ

B. Milk → 2 ℓ and 1 ℓ

C. Water → 25 cl and $\frac{1}{4}$ of 250 = 62.5 ml

D. Kerosene can → $\frac{3}{4}$ of 20 ℓ = 15 ℓ

E. Bottle → $\frac{3}{4}$ of 1 ℓ (1 000 ml) = 750 ml

Ask the pupils what they notice about the capacity of the two glasses in the picture. They should observe that 250 ml = 25 cl, the capacity is the same.

Let the class explore and discuss the measurements on the number line. They should notice it is calibrated (marked) in millilitres and centilitres. Let them explore the measurements on the number line. They give the missing calibrations.

10 cl = 100 ml	30 cl = 300 ml	500 ml = 50 cl
70 cl = 700 ml	90 cl = 900 ml	1 000 ml = 100 cl

Let the pupils read the measurements on the conversion chart. Encourage them to memorise the conversions. Make a chart and put it up on the wall as reference.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 1

(PB page 191)

1. C: 50 cl; A: 250 cl; B: 300 cl; D: 2 075 cl

2. C: 0.5 ℓ; A: 2.5 ℓ; B: 3 ℓ; D: 20.75 ℓ

Exercise 2

(PB page 191)

1.

a) 10 cl	**b)** 5 cl	**c)** 15 cl	**d)** 90 cl
e) 6 cl	**f)** 100 cl	**g)** 50 cl	**h)** 25 cl
i) 200 cl	**j)** 35 cl	**k)** 7 cl	**l)** 60 cl
m) 70 cl	**n)** 8 cl	**o)** 80 cl	**p)** 350 cl

2.

a) 5 ℓ	**b)** 15 ℓ	**c)** 25 ℓ	**d)** 7 ℓ
e) 10 ℓ	**f)** 7.5 ℓ	**g)** 3.5 ℓ	**h)** 40 ℓ
i) 9 ℓ	**j)** 35 ℓ	**k)** 8 ℓ	**l)** 20 ℓ
m) 0.5 ℓ	**n)** 0.75 ℓ	**o)** 0.25 ℓ	**p)** 0.05 ℓ

3.

a) 4 000 ml	**b)** 500 ml
c) 1 500 ml	**d)** 5 000 ml
e) 750 ml	**f)** 2 250 ml
g) 2 500 ml	**h)** 3 750 ml
i) 1 250 ml	**j)** 10 000 ml
k) 8 500 ml	**l)** 7 750 ml

4. **a)** 3.850 ℓ **b)** 1.296 ℓ
c) 0.588 ℓ **d)** 4.123 ℓ
e) 6.985 ℓ **f)** 0.321 ℓ
g) 11.562 ℓ **h)** 0.875 ℓ

5. **a)** 1 690 ml **b)** 4 300 ml
c) 5 020 ml **d)** 2 258 ml
e) 2 600 ml **f)** 775 ml
g) 3 285 ml **h)** 819 ml

Workbook: Exercise 1

(WB page 94)

1. **a)** 3 000 ml **b)** 500 cl **c)** 500 ml
d) 10 cl **e)** 70 ml **f)** $\frac{4}{5}$ ℓ
g) 3.5 ℓ **h)** 400 cl **i)** $\frac{3}{5}$ ℓ
j) 50 ml

2. **a)** $\frac{1}{2}$ ℓ; 500 ml
b) **i)** 300 cl
ii) The bucket
c) 3 340 ml cans

3. Jack: 3 ℓ + 5 ℓ + 9 ℓ = 17 ℓ; Jill: 2 ℓ + 7 ℓ + 8 ℓ = 17 ℓ

Add and subtract litres

Remind the class that they worked with decimals in Term 2. Let them give the fractions for the decimals listed. They explore and discuss the capacity of the containers with palm oil marked in decimals of litres. They find the capacity of each container and the total capacity of the containers.

Let the pupils explore and discuss the column methods to calculate the capacity. They should notice the use of zeros as place holders.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 3

(PB page 193)

1. **a)** 0.75 ℓ **b)** 0.25 ℓ **c)** 0.5 ℓ **d)** 0.01 ℓ
e) 1.25 ℓ **f)** 1.75 ℓ **g)** 0.5 ℓ **h)** 1.25 ℓ
i) 4 ℓ **j)** 2.25 ℓ **k)** 4.99 ℓ **l)** 2.24 ℓ

2. **a)** 8.1 ℓ **b)** 8.3 ℓ **c)** 10.7 ℓ **d)** 9.1 ℓ
e) 8.2 ℓ **f)** 10.2 ℓ **g)** 3.35 ℓ **h)** 6.35 ℓ
i) 2.15 ℓ **j)** 2.08 ℓ **k)** 3.25 ℓ **l)** 3.04 ℓ

Exercise 4 (PB page 193)

1. a) 2.25 ℓ **b)** 1.75 ℓ

2. a) $\frac{1}{8}$ of 1.25 ℓ = 0.157 ℓ **b)** $\frac{1}{2}$ of 1.25 ℓ = 0.625 ℓ

c) $\frac{1}{4}$ of 1.25 ℓ = 0.313 ℓ **d)** $\frac{3}{4}$ of 1.25 ℓ = 0.938 ℓ

3. 1.15 ℓ

4. 0.85 ℓ

Exercise 5 (PB page 194)

1. 3.8 ℓ **2.** 6.3 ℓ

3. 12.9 ℓ **4.** 9.4 ℓ

5. 10 ℓ **6.** 5.4 ℓ

Workbook: Exercise 2 (WB page 96)

1. 0.9 ℓ **2.** 2.05 ℓ **3.** 7.4 ℓ **4.** 2.25 ℓ

5. 5.66 ℓ **6.** 2.22 ℓ **7.** 10.31 ℓ **8.** 2.68 ℓ

9. 16.84 ℓ **10.** 9.58 ℓ

Workbook: Exercise 3 (WB page 96)

1. 17.5 ℓ **2.** 1.5 ℓ **3.** 0.95 ℓ

4. 222.5 litres **5.** 16.99 litres

Topic 5: Multiply and divide capacity

Teaching guidelines and solutions

Instructional resources
Objects in pictures; number lines; calculation cards; flow diagrams; recipe chart

Use litres as a capacity measuring unit

Ask the class which liquids are measured in litres in real life, and which capacities are more and less than 1 ℓ in the example. They should realise that capacities marked in millilitres (ml) and centilitres (cl) are less than 1 ℓ. Tell the class that very large capacities (petrol and water in dams) are measured in kilolitres (kl). 1 kl = 1 000 ℓ

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 1

(PB page 196)

1. **a)** 40 ℓ **b)** 100 ℓ **c)** 5 ℓ

2. 200 ml

3. 6 glasses

4. 4 cans

5. 1 glass

Workbook: Exercise 1

(WB page 97)

1. **a)** $6\frac{2}{3}$ cups **b)** $5\frac{5}{9}$ cups **c)** 5 cups

2. Yes, 20 cl + 15 cl + 180 ml = 0.53 ℓ which is less than 1 ℓ.

3. **a)** $\frac{1}{2}$ ℓ **b)** $\frac{3}{20}$ ℓ **c)** $\frac{7}{10}$ ℓ **d)** $\frac{3}{10}$ ℓ
e) $\frac{3}{5}$ ℓ **f)** $\frac{2}{5}$ ℓ **g)** $\frac{4}{5}$ ℓ

4. g); c); e); a); f); d); b)

Multiply litres by whole numbers

Ask the class to explore and explain the measurements on the containers to find the number of each type of container. They find the total capacity of each type of container.

1. 7 × 25 ℓ drums → 175 ℓ
2. 9 × 6.5 ℓ buckets → 58.5 ℓ
3. 5 × 8.8 ℓ cans → 44 ℓ

Ask the pupils to explore and discuss the methods to find the capacity of the 6.5 ℓ buckets showing breaking up numbers to multiply easily and the column method.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 2

(PB page 197)

1. 44 ℓ cans + 175 ℓ drums = 219 ℓ = 21 900 cl

2. **a)** 17.4 ℓ **b)** 18.5 ℓ
c) 12.6 ℓ **d)** 52.8 ℓ

3. **a)** 38 ℓ **b)** 14.7 ℓ **c)** 13.6 ℓ
d) 52.8 ℓ **e)** 43.8 ℓ **f)** 35.1 ℓ
g) 28 ℓ **h)** 72.9 ℓ **i)** 69.7 ℓ

Exercise 3

(PB page 198)

1. 26.4 **2.** 23.4 **3.** 68.8
4. 22.8 **5.** 5.4 **6.** 28.8

Exercise 4 Quantitative reasoning (PB page 198)

1. 13.5 ℓ
2. 30 ml garlic, 2.46 ℓ tomatoes, 0.6 ℓ tomato paste, 7.5 beef stock cubes, 9.9 ℓ hot water, 45 ml sugar, 1.2 ℓ macaroni
3. 94.14 ℓ
4. 5.4 ℓ
5. 37.65 ℓ
6. 18.2 ℓ
7. 6.4 ℓ

Workbook: Exercise 2 (WB page 98)

1. 6.3 ℓ; 9.8 ℓ; 39.2 ℓ; 33.6 ℓ; 16.1 ℓ; 11.9 ℓ
2. Capacity: 0.3 ℓ, 0.5 ℓ, 0.7 ℓ
Total: 10.8 ℓ, 8.1 ℓ, 26.1 ℓ

Workbook: Exercise 3 (WB page 98)

1. 19.6 ℓ **2.** 2.4 ℓ
3. 23.2 ℓ **4.** 7.2 ℓ

Divide litres by whole numbers

Ask the pupils to explore the containers in the example. They find the capacity of each bottle if the 8.75 ℓ drum is emptied into the five bottles. They apply division to find that each bottle has a capacity of 1.75 ℓ.

They explore and discuss the breaking up and the column methods used to divide.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 5 (PB page 199)

1. **a)** 1.61 ℓ **b)** 1.07 ℓ
c) 1.71 ℓ **d)** 1.31 ℓ
e) 1.45 ℓ **f)** 1.12 ℓ
2. **a)** 1.15 ℓ **b)** 0.62 ℓ
c) 0.21 ℓ **d)** 2.13 ℓ
e) 0.37 ℓ **f)** 0.31 ℓ

Exercise 6 Quantitative reasoning (PB page 200)

1. *[Errata: Divide the 4.48 ℓ container equally among the glasses each time. Ignore the sentence saying each glass is 250 ml.]*

1. **a)** 2.24 ℓ **b)** 1.12 ℓ
c) 0.56 ℓ

2. **a)** 0.65 ℓ **b)** 0.24 ℓ
c) 0.25 ℓ

3. 0.79 ℓ

4. 24 glasses

5. 1.138 ml of water

Workbook: Exercise 4 (WB page 99)

1. **a)** 2.5 ℓ **b)** 1.56 ℓ
c) 0.66 ℓ **d)** 1.6 ℓ
e) 0.46 ℓ **f)** 0.68 ℓ

2. **a)** 0.64 ℓ **b)** 1.14 ℓ
c) 0.39 ℓ **d)** 0.61 ℓ
e) 0.63 ℓ **f)** 0.47 ℓ
g) 0.25 ℓ **h)** 0.23 ℓ

Workbook: Exercise 5 (WB page 99)

1. 8 friends + Muyiwa = 9 children; They each drank 0.24 ℓ.

2. **a)** $\frac{2}{9}$ ℓ **b)** None

3. $\frac{7}{36}$ ℓ

4. $\frac{1}{4}$ ℓ

Topic 6: Find the areas of rectangles and squares

Teaching guidelines and solutions

Instructional resources
Objects in pictures; squares and rectangles; tables; physical objects; squared grid paper; rulers and pencils; flow diagrams

Properties of squares and rectangles

Ask questions to find out what the class knows about squares and rectangles. Find out if they can describe a square and rectangle and identify these shapes in their environment. They use the pictures as references.

Draw a square and rectangle on the board. Explain to the class that squares and rectangles are flat or two-dimensional (2-D) shapes that have length and breadth or width. Squares and rectangles are also quadrilaterals, i.e. shapes with 4 sides and 4 angles. Quadrilaterals like squares and rectangles are also polygons. *Poly-* means many and *-gon* means angle. *Polygon* is a Greek word. Let the class explore the dimensions of the square and rectangle in diagrams.

Ask the pupils to explore the shapes in the example and name the squares and rectangles. Pupils explore and discuss the properties of a square and rectangle listed in the table. Let the class name the similarities and differences between a square and rectangle.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 1

(PB page 202)

1. a) A, B, D, E, G **b)** C, F, H

2. a) four; four **b)** four; equal **c)** two; equal
d) four; equal **e)** two; equal

Workbook: Exercise 1

(WB page 100)

1. **a)** 2 cm **b)** 2 cm **c)** 2 cm

2. **a)** 1 cm **b)** 4 cm **c)** 1.5 cm
d) 1.5 cm **e)** 1.5 cm **f)** 2.5 cm

3. **A:** 1.3 cm by 1.3 cm **B:** 2.7 cm by 1.6 cm
C: 1 cm by 1 cm **D:** 1.5 cm by 2.6 cm
E: 1.8 cm by 1.8 cm **F:** 2 cm by 1.7 cm
G: 2.5 cm by 2.5 cm

4. **a)** A; C; E; G **b)** B; D; F

5. **A.** 1.3 cm × 1.3 cm = 1.69 cm^2
B. 2.7 cm × 1.6 cm = 4.32 cm^2
C. 1 cm × 1 cm = 1 cm^2
D. 1.5 cm × 2.6 cm = 3.9 cm^2
E. 1.8 cm × 1.8 cm = 3.24 cm^2
F. 2 cm × 1.7 cm = 3.4 cm^2
G. 2.5 cm × 2.5 cm = 6.25 cm^2

Workbook: Exercise 2

(WB page 102)

1. Two pairs of opposite sides parallel.
Two pairs of opposite sides equal.
All angles are equal and are all right angles.

2. In a square all sides are equal, but in a rectangle the two pairs of equal sides are different lengths.

Find area of squares and rectangles using square units

Ask the class to estimate the length of each side of the square. They measure the sides of the square to find the sides are equal in length. Remind the class they have worked with square numbers in Term 1 and explain that 1 cm × 1 cm = 1 square centimetre (1 cm^2).

Let them find the number of square tiles that are needed to tile (cover) the floor. They should find the number of squares by multiplying the number of squares in the length and breadth, i.e. 6 × 3 = 18 tiles.

Ask the pupils to rub the surface of their desk, a book or a pencil case. Explain that they are busy touching the surface or area of the objects. The flat surface of the objects is the area. We use square units to measure area.

Let the pupils explore the pictures on the squared grid paper in the example. They find the area of the pictures in square units.

Area of A. → 4 × 3 = 12 square units
Area of B. → 4 × 4 = 16 square units
Area of C. → 4 × 2 = 8 square units

Ask the class to explore the method showing the calculation of the area of photo A using square centimetres. Tell the class that we measure area of objects with small surfaces (such as the photos in the picture) in square millimetres (mm^2) or square centimetres (cm^2). Areas of objects with bigger surfaces are measured in square metres (m^2) and square hectares (ha^2).

Ask the pupils to give examples of small and large areas that could be measured in mm^2, cm^2, m^2 and ha^2, e.g. surfaces of a book, matchbox, playground and a farm.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 2

(PB page 204)

1. a) 4 square units **b)** 6 square units
c) 9 square units **d)** 12 square units
e) 16 square units **f)** 24 square units

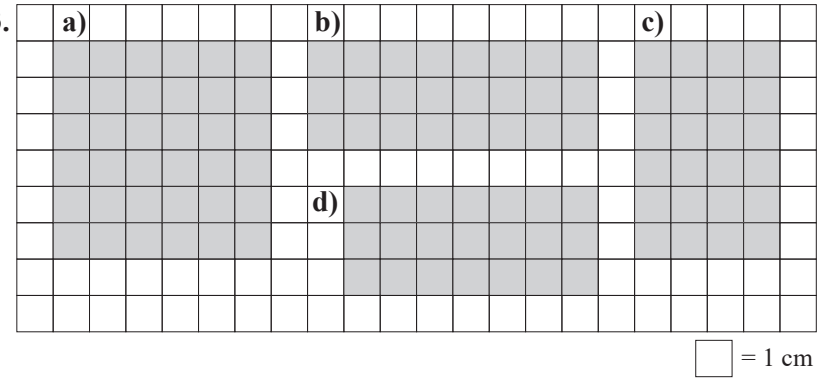
Workbook: Exercise 3

(WB page 102)

1. a) 8 cm^2 **b)** 8 cm^2 **c)** 12 cm^2

2. a) 36 cm^2 **b)** 24 cm^2
c) 24 cm^2 **d)** 21 cm^2

3.



Find areas of rectangles using the formula

Tell the class that we often do not have squared grid paper to find the area of objects. We need a method, formula or rule to calculate area. Let them explore and discuss the rectangles in the drawings and find the length, breadth and area of the shapes. They explore and discuss the formulas to calculate the area of the shapes and understand that the formula for calculating area of rectangles = L × B or L × W.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 3

(PB page 205)

1. 36 m^2 **2.** 70 m^2 **3.** 1 650 m^2
4. 64 m^2 **5.** 10 cm^2 **6.** 9 cm^2
7. 28 cm^2 **8.** 120 cm^2 **9.** 400 cm^2

Exercise 4

(PB page 206)

1. 18 cm^2 **2.** 16 cm^2 **3.** 36 cm^2
4. 80 cm^2 **5.** 30 cm^2 **6.** 24 cm^2
7. 45 cm^2 **8.** 56 cm^2 **9.** 9 cm^2
10. 8 cm^2 **11.** 28 cm^2 **12.** 30 cm^2

Exercise 5

(PB page 206)

1. 40 cm^2 **2.** 63 cm^2 **3.** 54 cm^2
4. 6 cm **5.** 6 cm **6.** 3 cm and 9 cm

Workbook: Exercise 4

(WB page 103)

1. 4 cm × 10 cm = 40 cm^2 **2.** 2 cm × 9 cm = 18 cm^2
3. 2 cm × 12 cm = 24 cm^2 **4.** 3 cm × 7 cm = 21 cm^2

Calculate area in metres and hectares

Ask the class which unit of length they think is the best to measure the area of the classroom floor: millimetres, centimetres or metres. They should realise that millimetres and centimetres are too small to measure such a big area and metres would therefore be best to measure the length and breadth of the classroom floor to calculate the area. Assist the class in understanding that 100 cm × 100 cm = 10 000 cm^2 = 1 m^2 (1 square metre).

Ask the class to explore and discuss the measurements of the pineapple field and find its area in m^2.

L × B → 20 m × 15 m = 300 m^2

Explain to the class that a farmer uses square hectares (ha^2) to measure the area of her cow field. Assist them in understanding that 100 m × 100 m = 10 000 m^2 = 1 ha^2.

They calculate the area of the cow field.

Area of cow field → L × B → 8 ha × 7 ha = 56 ha^2

Let the class explore and discuss the methods to calculate the area of the pineapple field and the cow field.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 6

(PB page 208)

1. Pupils' own answers

2. **a)** housing area
b) farmland area
c) 1 270 ha^2
d) 3 241 ha^2

3. **a)** 3 m
b) 72 m
c) 4 m

Exercise 7 Quantitative reasoning

(PB page 209)

1. **a)** 28 m^2
b) 20 m^2
c) 15 m^2

2.
[Errata in SB: Delete question d)]

2. **a)** 63 m^2
b) 40 m^2
c) 48 m^2

3. (15 × 9) – (3 × 4) = 123 m^2

Exercise 8 Quantitative reasoning

(PB page 209)

1. 8 cm

2. 7 cm each

3. 8 km

4. $16\frac{1}{10}$ m^2

5. width = 4 cm, length = 8 cm

6. 150 m × 250 m = 37 500 m^2 = 37.5 km^2

Workbook: Exercise 5

(WB page 104)

1.

	Length	Width	Area
a)	10 cm	6 cm	60 cm^2
b)	10 cm	12 cm	120 cm^2
c)	40 cm	3 cm	120 cm^2
d)	3 cm	15 cm	45 cm^2
e)	13 cm	3 cm	39 cm^2

2. **a)** 20 cm
b) 12 cm
c) 3 cm

Workbook: Exercise 6

(WB page 105)

1. Lounge: 30 m^2 Bedroom: 20 m^2 Bedroom: 12 m^2
Bathroom: 6 m^2 Kitchen: 8 m^2

2. 7 m^2

3. 83 m^2

4. **a)** 1.5 ha **b)** 1.6326 ha
c) 3 900 ha **d)** 8 600 ha

5. **a)** 62 300 m^2 **b)** 124 500 m^2
c) 32 400 m^2 **d)** 8 540 m^2

Workbook: Exercise 7

(WB page 106)

1. **a)** 30 m^2 **b)** 21 km^2
c) 72 km^2 **d)** 44 m^2

2. **a)** 43.2 km^2 **b)** 28.8 km^2
c) 57.2 km^2

3. 35 km^2

4. 164.2 km^2

5. **a)** 4 320 ha **b)** 2 880 ha **c)** 5 720 ha

Topic 7: Plane (2-D) shapes

Teaching guidelines and solutions

Instructional resources
Objects in pictures; flags of countries; shapes; tables; rulers; paper and scissors; physical objects; clocks; maps; pupils' photos; small mirrors; dotty paper; colouring pencils

Ask the class to explore and discuss the two people in the pictures A and B. They should note that patterns in some things do not balance, i.e. there is no symmetry. The clothes we wear, objects we use, objects in nature and buildings are often symmetrical while some manmade objects could be asymmetrical or not displaying symmetry. Ask the class what they think symmetry means.

Find symmetry in plane shapes

Ask the class to explore the pictures in the example and explain what they observe about the left and right sides of the objects divided in two halves or quarters. They should realise that, when you fold the pictures in half, the sides on top of each other would be identical or symmetrical. Explain to the class that the imaginary lines dividing the shapes in identical parts are lines of symmetry.

An interesting fact to tell the class is that 19 of the 53 countries in Africa have flags that are symmetrical in shape and colour. The flags of three countries, Nigeria, Botswana and Libya, are the only ones that have two lines of symmetry.

Assist the class to understand that when a shape has imaginary lines on which you can fold it so that the side(s) are identical, it is symmetrical. The one side is a mirror image of the other. Symmetrical shapes or objects are identical in shape and colour. Ask them to identify the number of symmetry lines in the objects in the picture.

Pupils explore and explain whether the flags of Zimbabwe, Brazil and South Africa are symmetrical. You will need to provide examples of these flag.

Zimbabwean flag → non-symmetrical because of the object on the star
Brazilian flag → 2 lines of symmetry
South African flag → non-symmetrical because of the colours

Ask the pupils to look around in the classroom to recognise symmetrical objects. They explore and identify the number of symmetry lines in the square and rectangle. Pupils explore the lines in the shapes, and state which lines are symmetry lines in the shapes. Draw the shapes on the board and ask them to draw the correct symmetry lines. Remind the pupils that squares and rectangles are polygons. Tell them they will explore symmetry in other polygons and quadrilaterals.

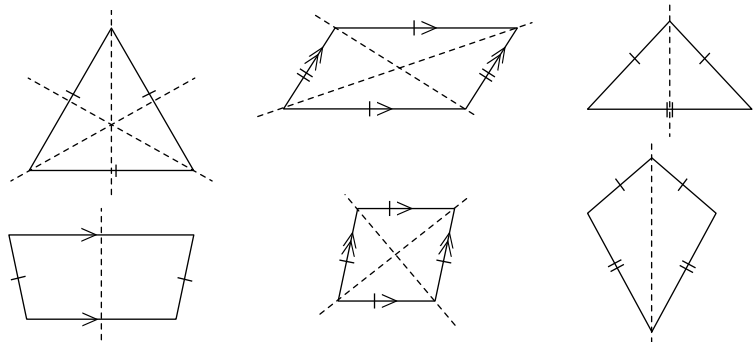
The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 1

(PB page 213)

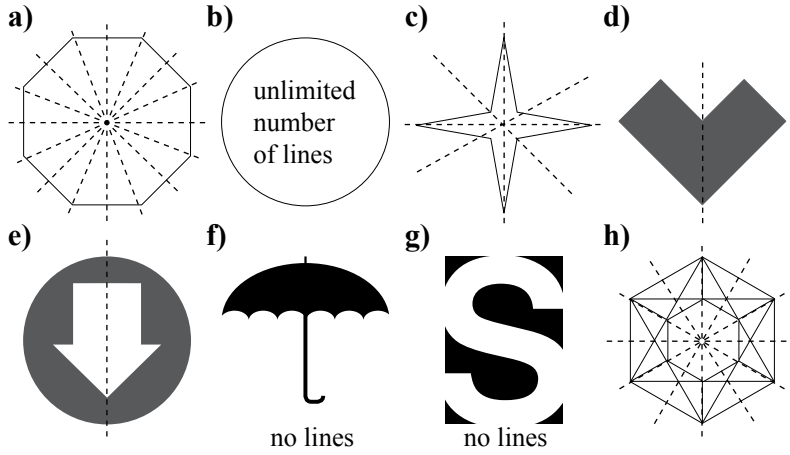
1. Symmetrical: equilateral triangle, isosceles triangle, rhombus, trapezium, kite
Not symmetrical: Parallelogram

2.



3.

Shape (polygon)	Is the shape symmetrical		No. of symmetry lines
	Yes	No	
Equilateral triangle	✓		3
Isosceles triangle	✓		1
Rhombus	✓		2
Kite	✓		1
Parallelogram		✓	0
Trapezium	✓		1



Exercise 2

(PB page 214)

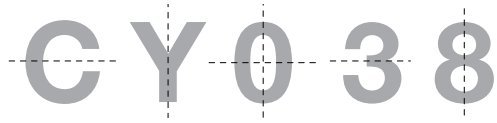
Pupils copy and cut out the shapes. You can provide them with a template to colour in. They work in groups to find the answers.

Workbook: Exercise 1

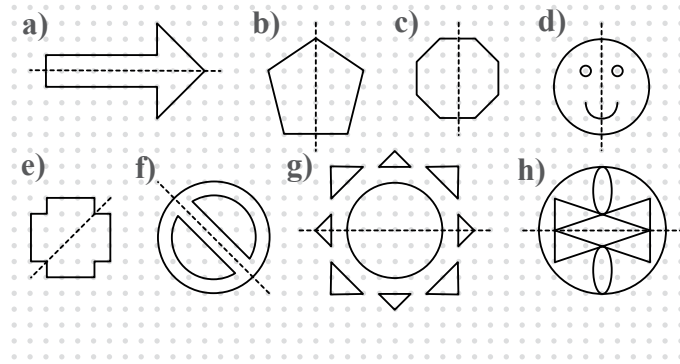
(WB page 107)

1.

2.



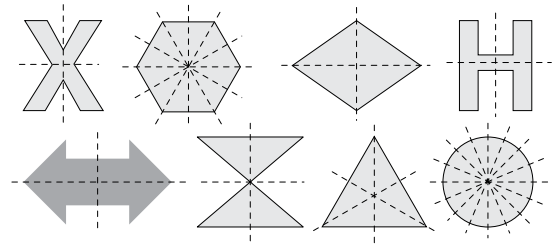
3.



Workbook: Exercise 2

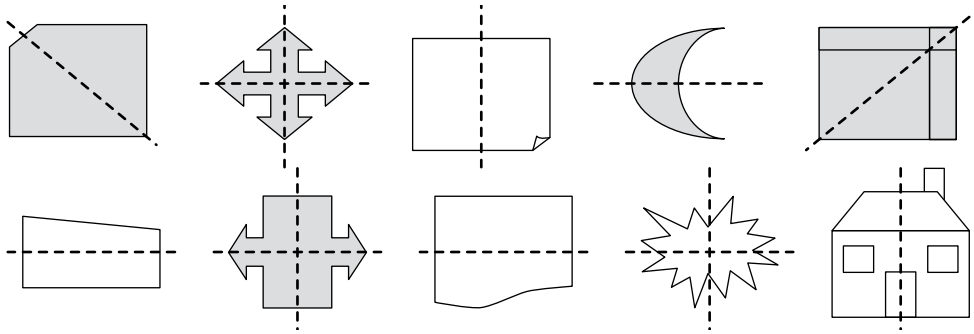
(WB page 108)

1.



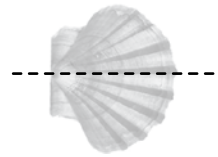
The circle has infinite lines.

2. No they are not all lines of symmetry.



3.

Dresser

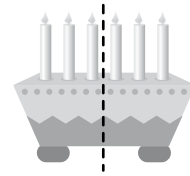


Sea shell

Guitar

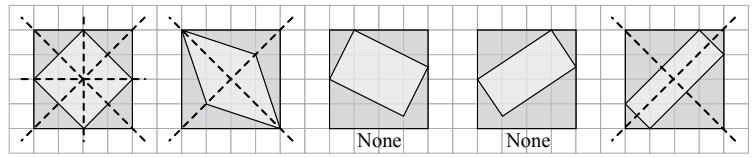
School

Air balloon



Candles

4.



Horizontal and vertical lines

Ask the class to explore the pictures and the imaginary symmetry lines in the objects. Tell them the story about the Taj Mahal in India. Explain to them that the objects have horizontal and vertical lines of symmetry. Pupils then explore objects in the classroom to find horizontal and vertical lines.

Ask the class to identify the horizontal and vertical lines in the objects in the example.

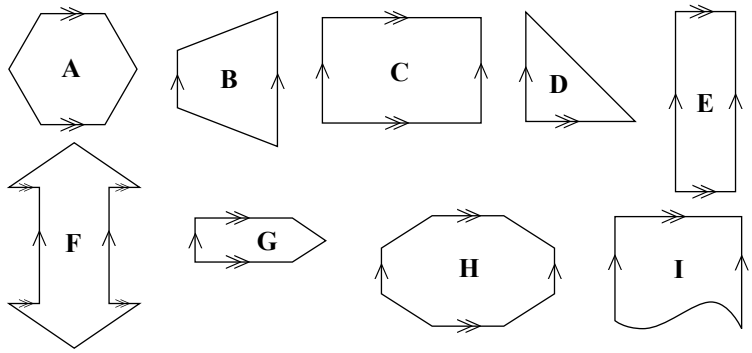
The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 3

(PB page 215)

1. a) 7 **b)** 4

2.



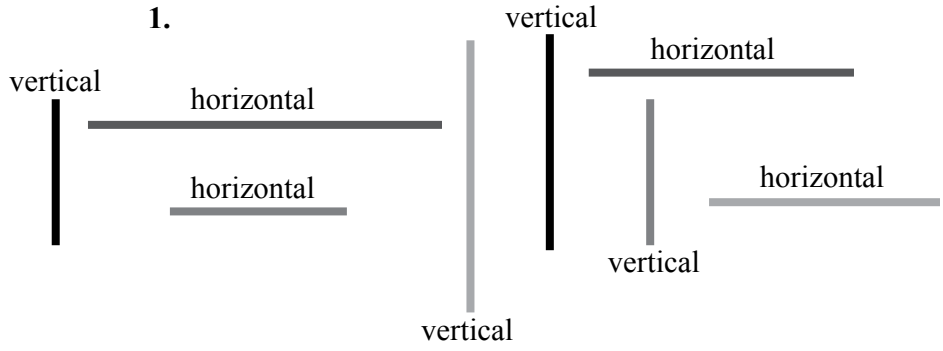
3. Vertical: 16, Horizontal: 17

4. Measuring ruler, pencil, desk, chalk board, door

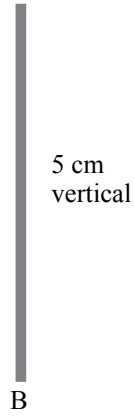
Workbook: Exercise 3

(WB page 109)

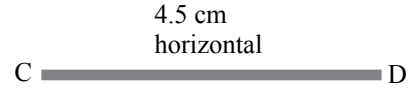
1.



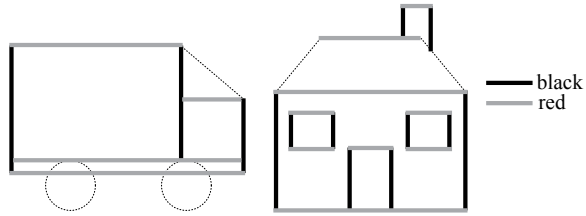
2. a)



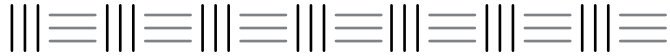
b)



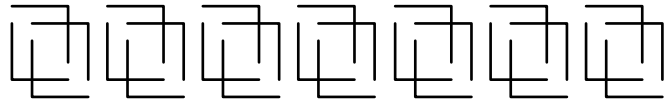
3.



4. **a)**



b)



Angles in plane shapes

Ask the class to use a book or they can use two rulers. They open the books' covers and gradually move the cover away from the first page or move the rulers bit by bit away from each other while keeping the left ends on top of each other. They look at the space forming between the two parts and explain what happens as they turn the parts further and further away from each other until the sides are flat on the desk or in a straight line. Explain to the class that the point where the cover and the page meet is called an angle. The further the cover is moved from the page, the bigger the angle gets. We think of an angle as the amount of turn that one line moves through away from the other.

Let them explore and name the angles in the examples and say whether the statements are true or false.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 4

(PB page 217)

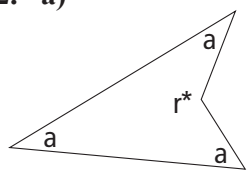
1.

	Shape	Acute angles	Right angles	Obtuse angles
A	Rectangle	0	1, 2, 3, 4	0
B	Trapezium	1	0	2
C	Rhombus	2	0	1
D	Right-angled triangle	2	1	0
E	Parallelogram	1	0	2
F	Kite	2	0	1

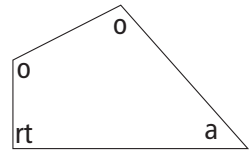
*[Errata: Pupils have not been taught about reflex angles. As extension, explain what a reflex angle is and if they can identify it here (the ones marked *).]*

a = acute, o = obtuse, r = reflex, rt = right

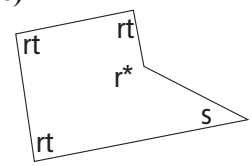
2. a)



b)



c)



Exercise 5

(PB page 218)

1. Right angle, 3 o'clock
2. Obtuse angle, 12:20
3. Acute angle, 1 o'clock
4. Obtuse angle, 11:15
5. Right angle, 11:45
6. Acute angle, 10 o'clock
7. Obtuse angle, 11:35
8. Right angle, 9:30

Exercise 6

(PB page 219)

[Errata: Pupils have not been taught about reflex angles. As extension, explain what a reflex angle is and if they can identify it here.]

1. obtuse
2. acute
3. acute
4. obtuse
5. straight
6. reflex

Workbook: Exercise 4

(WB page 110)

1. Acute
2. Right-angle
3. Reflex
4. Obtuse
5. Obtuse
6. Right-angle
7. Right-angle
8. Acute
9. Acute
10. Obtuse

The four cardinal compass points

Ask the pupils why they think it is important that we know how to find direction and know positions of things and places. Tell them how ancient people found directions in the past and name the terms we usually use to describe directions or positions. The pupils name the four main cardinal points on a compass or map.

Let them stand up in class. They demonstrate the positions of the sun during the times or periods stated.

Pupils explore the pictures in the example and determine the position of the sun in relation to the children to realise that the sun rises in the east and sets in the west. Tell them that we use a compass, weather vane or weathercock to determine direction and a windsock at airports shows the direction of the wind. Let them look at the pictures of the instruments.

Explain the parts of the compass and the information about north and true north. They explore the four cardinal points in the picture and recite the rhyme to memorise the points. Also, explain the main cardinal and the secondary cardinal points.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 7

(PB page 221)

1. Kola is facing east.
2. Posi is facing north.
3. Sade is facing west.
4. Sayo is facing south.

Exercise 8

(PB page 222)

1. Abuja
2. Okigwe/Umuahia
3. Abuja, Enugu, Onitsha
4. North
5. Abuja
6. North
7. East
8. Gulf of Guinea

Workbook: Exercise 5

(WB page 111)

1. a) 16 **b)** 1 **c)** 10 **d)** 15

2. a) NE **b)** NW **c)** SW **d)** NW **e)** SE

Topic 8: Three-dimensional (3-D) objects

Teaching guidelines and solutions

Instructional resources
Objects in pictures; open shapes; closed shapes; tables/charts; nets; paper and pencils; dotty paper

Tell the pupils they will compare open and closed shapes, learn about three-dimensional (3-D) shapes or objects and their properties, and the use of 3-D shapes in homes and the environment.

Ask the class to explore the shapes and their dimensions in the example. Assist them in understanding that horizontal and vertical lines, curved lines, diagonal lines, spirals and angles are open or one-dimensional shapes. They only have length (or breadth).

Closed shapes are plane, flat or 2-D shapes (quadrilaterals and polygons). They have length and breadth. 3-D shapes or objects such as cubes, cuboids, cylinders, etc. are also closed shapes. They have length, breadth and height.

Ask the pupils to name the open and closed shapes in the pictures, the difference between closed and open shapes, the 3-D objects and the difference between 2-D and 3-D shapes. Ask the pupils to name examples of open and closed shapes they observe in the classroom, at home and in the environment.

Open and closed shapes

Remind the class they worked with angles in Unit 7. Ask them to name the different angles. Tell the pupils that an angle on a straight line is called a straight angle. The point where the two lines meet in the centre is the angle.

Assist the class in understanding that open shapes could be curved or straight lines. The lines start at a point and end at a different point. The start and endpoints do not meet. Ask the class to explore the lines or open shapes in the picture. They should observe that the start and endpoints are in different directions.

The class explore the shapes in the example. They should notice that the shapes have curved and straight lines. The curved shapes have only one side. Explain to them that closed shapes with curved or crooked lines are topological shapes. Shapes with smooth curves and straight lines are geometrical shapes. The circle, oval, crescent and semi-circle are closed shapes but not polygons. Polygons have more than 2 sides.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 1

(PB page 225)

1.

Description	Letters of shapes
Open shapes	A, B, D, F, G, J, K, N
Closed shapes	C, E, H, I, L, M, O, P
One line to measure	G, I
Two lines to measure	B, E, H, J, L, M, N
More than two lines to measure	A, C, D, F, K, O, P
Curved sides only	A, D, I
Curved and straight sides	F, K, O, P
Straight sides only	B, C, E, G, H, J, L, M, N
Polygons	C, E, H, L, M
Non-polygons	A, B, D, F, G, I, J, K, N, O, P

2. a) Open shapes have one or two lines and are non-polygons. The lines can be curved or straight.

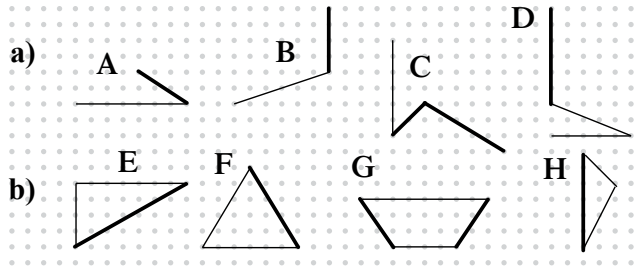
b) Closed shapes have three or more lines that enclose the surface. They are flat 2-D shapes. The sides can be curved or straight. Closed shapes with straight sides are called polygons.

Workbook: Exercise 1

(WB page 112)

1. Same: They are both 2-D geometrical shapes drawn with lines.
Different: open shapes do not enclose an area while closed shapes do have an enclosed internal area.

2.



Cylinders, cubes and cuboids

Ask the class to explore the two groups of shapes in the picture. They name the shapes. Ask the class to explore the dimensions on the rectangle and the cuboid. They should notice and describe the difference in dimensions.

Tell the class they will explore properties of cuboids (prisms), cubes and cylinders. Ask them to explore the 3-D shapes in the different groups in the picture. Pupils explain the difference between cylinders and cubes and between cubes and cuboids. Explain to them that cubes and cuboids are examples of prisms, that a cube is a special cuboid and that 3-D shapes are also called solids.

Pupils explain where they see cubes, cuboids and cylinders in real-life objects in class, at home and in the environment. Let them use the pictures of objects at the beginning of this unit.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 2

(PB page 227)

1.

	Object	Cube	Cuboid	Cylinder
A.	Package	✓		
B.	Nido tin			✓
C.	Butter		✓	
D.	Die	✓		
E.	Bread		✓	

Exercise 3

(PB page 227)

1. Cylinder: c, f, i

Cube: b, d, g

Cuboid: a, e, h

2. **a)** squares, rectangles **b)** squares
c) circles, rectangle **d)** squares
e) squares, rectangles **f)** circles, rectangle
g) squares **h)** squares, rectangles
i) circles, rectangle

Workbook: Exercise 2

(WB page 113)

1. **a)** cube **b)** cylinder
c) square **d)** cuboid
e) rectangle **f)** cuboid
g) cone **h)** sphere
i) cylinder **j)** square-based pyramid
k) cuboid **l)** cube

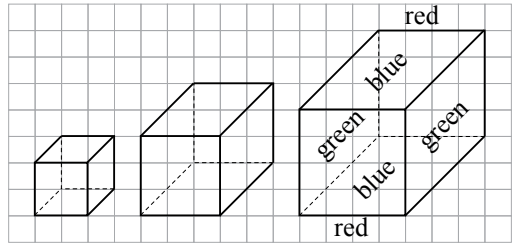
2. A cylinder is an extruded circle; it is based on a circular shape. A cube has all sides equal in length and is based on a square shape.

A cuboid is similar to a cube, but not all the sides are equal in length. It is based on a rectangular shape.

Workbook: Exercise 3

(WB page 114)

1–2.



3. **a)** 6 **b)** 8
c) 12 **d)** square

Properties of 3-D objects

Tell the class they will discover the properties (features) of 3-D shapes. Let them explore the labels of the cylinder, cube and cuboid in the example. Assist them in understanding the faces, edges and vertices in the 3-D shapes. Ask the pupils to determine the number of faces, edges and vertices in each 3-D drawing.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 4

(PB page 228)

1. **a)** A cylinder has **one** curved face.

b) The top and bottom faces of a cylinder have the shape of a **circle**.

c) The faces of a cube and cuboid are **rectangular/ square** shapes.

d) A cube has faces in the shape of **squares**.

e) A cuboid has faces in the shape of **rectangles**.

2.

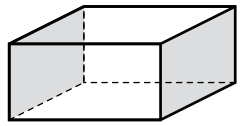
3-D object	Number of faces	Number of vertices	Number of edges
Cylinder	3	0	2
Cube	6	8	12
Cuboid	6	8	12

3. **a)** vertex E **b)** vertex C **c)** vertex B **d)** vertex G

Exercise 5

(PB page 229)

1.



2. **a)** $6 \times 6 \times 6 = 216$ boxes
b) $6 \times 6 = 36$ times
c) $6 \times 6 \times 4 = 144$ times

Workbook: Exercise 4

(WB page 115)

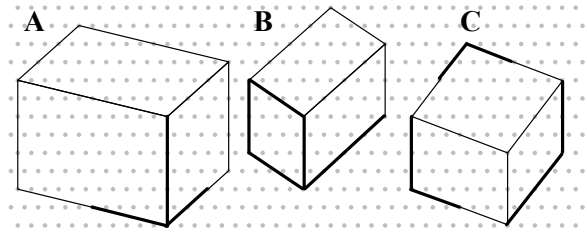
1. **a)** 2 circles and 1 rectangle
b) 12 circles and 6 rectangles
c) 30 circles and 15 rectangles
d) 40 circles and 20 rectangles

2. **a)** 12 **b)** 8

Workbook: Exercise 5

(WB page 115)

1.



2. **a)** A: Green; B: Red; C: Blue
b) D: Green; E: Blue; F: Red

4. **a)** rectangular prism
b) cylinder
c) cube
d) cylinder
e) rectangular prism
f) cube

Topic 9: Pictograms and modes

Teaching guidelines and solutions

Instructional resources
Tally chart; pens/pencils and paper; pictures; frequency tables; colour pencils or crayons

Remind the class they have counted in millions and worked with large numbers to compare populations of countries in West Africa and states in Nigeria. The information they worked with is data collected and recorded by people. Ask the pupils what type of data researchers collect and record and why they collect data.

Let the pupils explore the example to find out what data the Primary 4 pupils are collecting, what they are writing down and why they are collecting data. Explain to the class that people who collect data are researchers. They collect and record data by doing research, inquiries, surveys, inspection or studies about human, natural (the weather, for example) or other environmental issues or topics.

Collect and represent data in pictograms

Explain to the class that we often record raw or rough data/ information using tally marks when we collect data. Tell them the Primary 4 pupils used a tally table or a frequency table to record their raw data. They explore and discuss the tally table in the example. Explain to the class that tally marks are simple, short lines used to show the number of items (objects) counted during the survey or research performed. Assist the class in understanding that it is easier to make the tallies than writing down and scratching out numbers each time. They should notice that the tallies are represented in groups of 5.

Pose the questions to assist pupils in understanding the frequency or tally table. The data was collected during March month at the Botanic Gardens. They count the number of each

type of bird represented by the tallies. They find out which type of bird was observed the most.

Ask the class why they think the graph is called a pictogram and what each bird in the pictogram represents. They should observe that we use pictures to represent the number of items counted during the research. They look at the key to find out that each bird represents 5 birds counted. They explain why the pupils used a bird to represent the number of items. Go through the information in the box explaining the numbers represented by pictures with the class.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 1

(PB page 232)

Pupils' own answers

Exercise 2

(PB page 233)

1.

Ice cream flavours that children like	
Flavours	**Number of children**
Chocolate	
Banana	
Strawberry	
Vanilla	
Peppermint	

2. **a)** 340 pupils **b)** Chocolate **c)** Peppermint
d) 60 pupils **e)** 20 pupils

Exercise 3

(PB page 234)

1. **a)** Comedy **b)** Other **c)** 25 pupils
d) 5 pupils **e)** 100 pupils

Workbook: Exercise 1

(WB page 118)

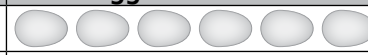
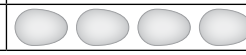
Tree type	No. of trees	No. of trees
Oak	140	
Maple	50	
Hickory	80	
Pine	180	
Sycamore	30	
Others	220	

Key:
= 20
= 10

Workbook: Exercise 2

(WB page 118)

1.

Day	No. of eggs	No. of eggs
Sunday	60	
Monday	55	
Tuesday	70	
Wednesday	45	
Thursday	65	
Friday	80	
Saturday	40	

Key:
 = 10
 = 5

2. Friday
3. Saturday
4. 100
5. 315

Find the mode of a data set

In the example, the Primary 4 pupils went on a school trip to the nature reserve and this time they observed the types of birds in the list. The pupils find out which bird type the pupils observed the most, i.e. doves.

Explain to the class that we often look for one single number, item or object to describe the set of data. We use the mode to describe which items appear the most in the data. The mode gives us important information about the data. It tells us there are more doves than other birds in the nature reserve.

Let the pupils draw a pictogram on the board to present the data. They decide on an appropriate picture and key for the pictogram and answer the questions.

Exercise 4

(PB page 235)

1. a)

Type of movie	Number of people
Comedy	
Musical	
Adventure	
Science fiction	
Drama	
Others	

Key:
 = 10
 = 5

 represents 10 people,  represents 5 people

b) 10

2.

Shoe size	No. of children
> 8	
7 or 8	
5 or 6	
< 5	

Key:
 = 10
 = 5

The mode is size 5 or 6 (40 children).

3. **a)** 4 and 8 **b)** 142 **c)** 13
d) 4.3 **e)** 90

Topic 10: Bar graphs and modes

Teaching guidelines and solutions

Instructional resources
Vertical number lines; axes of bar graphs; pens/pencils and colour pencils or crayons; frequency tables; graph paper; game board; matchsticks

Remind the pupils they worked with pictograms in Unit 9. Pictograms, bar graphs (column graphs), double bar graphs and pie charts (pie graphs) are different forms of graphs in which data is presented. They will deal with graphs other than pictograms and bar graphs in higher classes. Let the pupils explain how they present data in pictograms.

Explain to them that data is presented in bar graphs using bars (rectangles) to show the number of items counted in surveys. The bars can be drawn vertically or horizontally on vertical and horizontal axes. The title of the graphs is shown on top and numbers are shown in different intervals. The horizontal (x-axis) and vertical (y-axis) are labelled according to categories and numbers counted in the data set.

Read and interpret bar graphs and mode

Pupils explore the bar graph in the example representing the performance of Primary 4 pupils. They answer the questions to discover the use of the different parts of a bar graph.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 1

(PB page 237)

1. Geography: 30 pupils passed
History: 25 pupils passed
Mathematics: 15 pupils passed
English: 25 pupils passed
Science: 20 pupils passed

2. Mathematics has the lowest pass rate. Only 15 pupils passed.
3. Geography has the highest pass rate. 30 pupils passed.
4. History and English
5. It tells us which pass rate appears most frequently.
6. It is the most challenging/difficult subject.

Exercise 2

(PB page 238)

1. The number of different types of animals on a farm
2. The different animals
3. The number of animals
4. Goats
5. Horses
6. Roosters and pigs
7. 20 goats, 16 sheep, 14 roosters, 14 pigs, 12 cows, 10 hens, 8 horses
8. 10 hens + 14 roosters = 24 birds
9. 12
10. 94

Exercise 3

(PB page 240)

1. Crossriver and Kogi
2. Imo
3. Benue
4. Ogun
5. Ondo and Osun
6. Imo, Benue, Ondo, Osun, Crossriver, Kogi, Ogun, Enugu
7. No, because it is a rounded off number. The populations are all in units of 10 000. If they displayed the actual number of people then they would end in more specific numbers e.g. 531 254.
8. It tells you which states have the same populations.
9. Wikipedia

Exercise 4

(PB page 241)

Titi picked up the most cans while Kole picked up the least. Arranged in order from most cans picked up to least cans picked up it goes Titi, Nike, Habib, Rilwan and then Kole. Titi picked up 5 more cans than Kole. Altogether 18 cans were picked up. The mode tells us who picked up the same number of cans.

Workbook: Exercise 1

(WB page 120)

1. **a)** 30 **b)** 18 **c)** 18 **d)** 9
e) 30 apples **f)** Grapes and mangos
g) 138 **h)** 30
i) It tells us the fruit that occurred the most frequently i.e. the fruit she has the most of.

2. School with most bottles collected: School F
School with least bottles collected: School E
Highest number of bottles collected: 7 500
Lowest number of bottles collected: 2 000
Difference between highest and lowest: 5 500
Total number of bottles collected: 29 500

Draw your own bar graph

Discuss with the class how there are many babies around the world that are not well fed – they are malnourished. Hospitals and clinics collect and record data about these babies.

Ask the class to read and interpret the data in the frequency table representing the ages of babies' mass, below which babies are regarded as malnourished. Consider the number of babies found malnourished in a year in a big city hospital.

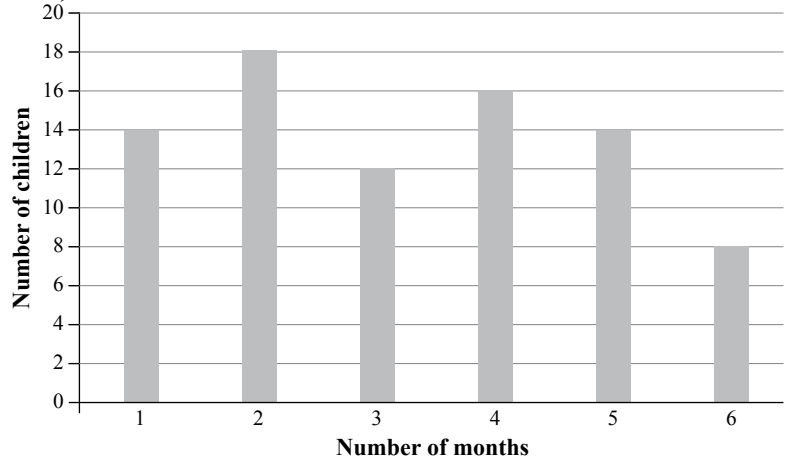
Work through the steps to construct a bar graph and assist pupils to interpret the different processes.

The pupils work on their own to complete the workbook exercises either in class or as homework.

Exercise 5

(PB page 243)

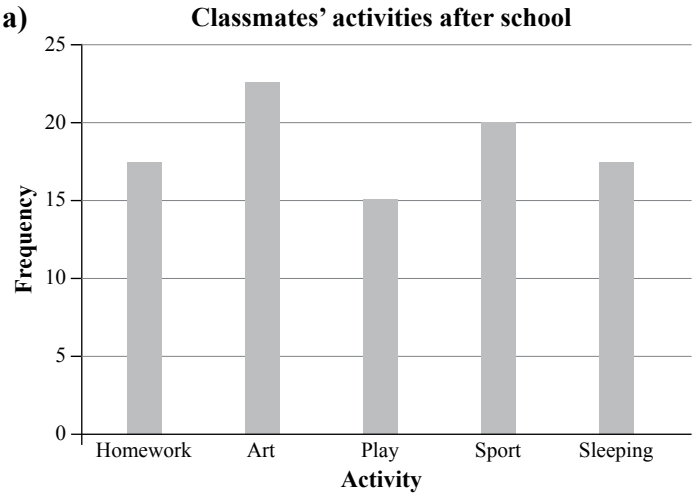
1. **a)** **Number of children who suffer from abuse over six months**



b) Discuss the types of child abuse with the pupils in class. Be sensitive as some pupils may have experienced this before.

c) Ask pupils to offer suggestions on the possible consequences of abuse. Again, be sensitive to pupils' replies and observe carefully if any pupils may need help.

2. a)



b) 61 classmates

c) homework

d) 8 more

Exercise 6 Quantitative reasoning (PB page 243)

The answers to this exercise are dependent on data obtained from the class.

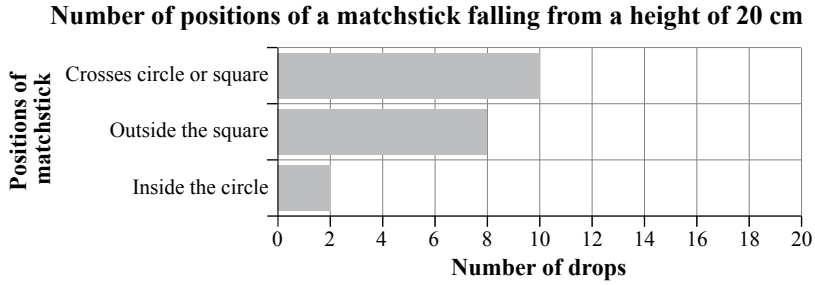
Exercise 7 (PB page 244)

1–2. Pupils' own work

3. The answer will be different for each pupil. The following is a sample solution:

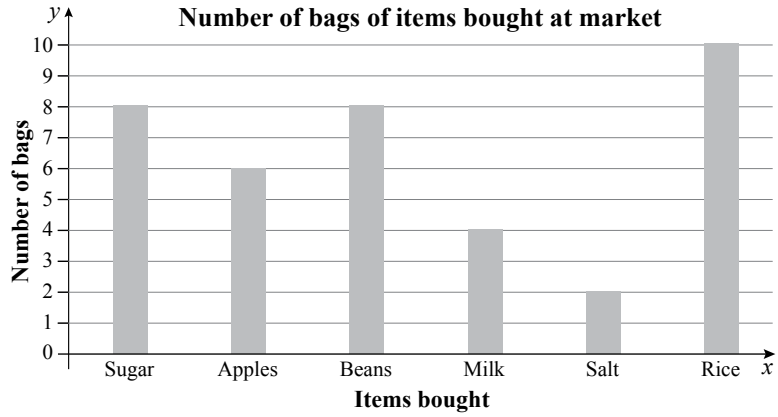
Position if matchstick is:	Tally marks	Total
inside the circle	𝍸	2
outside the square	𝍸 𝍸 | | |	8
crosses circle or square	𝍸 𝍸 | | | |	10

4.



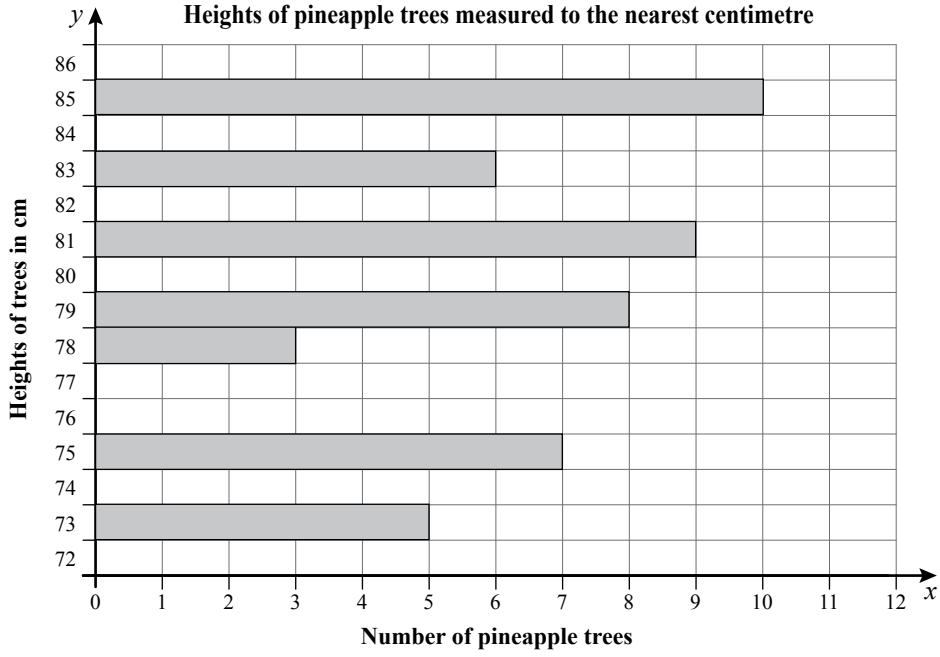
Workbook: Exercise 2

(WB page 122)



Workbook: Exercise 3

(WB page 124)



TERM 3

Revision

You may use the revision questions or a selection thereof for the final assessment at the end of the term. The questions and problems involve work covered in topics during the term. The problems include routine problems and those involving quantitative reasoning.

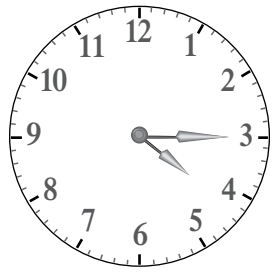
Revision solutions

(PB page 245)

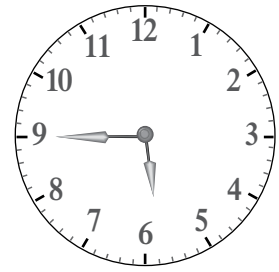
1. a) twenty past three **b)** ten to eight

2. a) twenty-five to four, five past eight
b) twenty to four, ten past eight

3. a)



b)



4. a) 7:10 a.m. **b)** 2:40 p.m.
c) 11:50 a.m. **d)** 10:25 p.m.

5. A. cherry tree **B.** apple tree
C. pear tree **D.** plum tree

6. 13 500 kg **7.** 1 kg 70 g

8. 300 sheets **9.** 1 kg 600 g

10. 325 g **11.** 14.8 g

12. 7.4 g

13. a) A: syringe, E: spoonful
b) B: tin of soup
c) C: a bath, D: a petrol tank, F: watering jug

14. a) 3 kg **b)** 3 kg **c)** 7 kg

15. 30 cl

16. 15 ml

17. a) A: 100 cl; B: 1 ℓ; C: 3 ℓ
b) A: 55 ml; B: 85 cl; C: $\frac{3}{4}$ ℓ

18. a) 1 000 ml **b)** 100 cl
c) 10 ml **d)** 500 ml
e) 50 cl **f)** 75 cl
g) 25 cl **h)** 25 ℓ
i) 37.5 ℓ **j)** 2.47 ℓ

19. a) 0.5 ℓ **b)** 0.75 ℓ
c) 3.8 ℓ **d)** 2.31 ℓ
e) 3.4 ℓ **f)** 1.7 ℓ

20. a) 20.8 ℓ **b)** 32.4 ℓ
c) 0.77 ℓ **d)** 0.82 ℓ

21. 1.15 ℓ

22. 3.95 ℓ

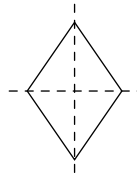
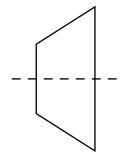
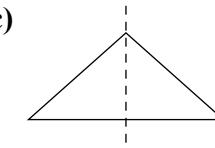
23. 8 times

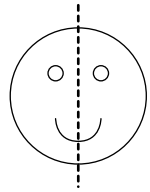
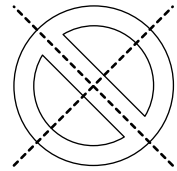
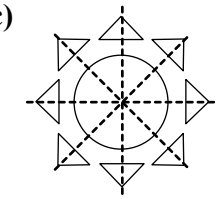
24. 6.8 ℓ

25. a) 24 cm^2 **b)** 72 cm^2

26. a) $4 \times 1.5 = 6\ m^2$

b) "ha" is already a unit of area. The sides of the square cannot be in "ha" so assume that they are in "m" → $9\ m \times 9\ m = 81\ m^2$

27. a)  **b)**  **c)** 

28. a)  **b)**  **c)** 

29. a) AC and BD **b)** AB and CD

30. a) Afternoon, because the sun is still high in the sky but in the west (where it sets).

b) East **c)** South **d)** C

31. a) Edo State **b)** Edo/Ondo/Ekiti/Kwara
c) Delta State

32. a) Name: cube/cuboid, Vertices: 8, Edges: 12

b) Name: cube/cuboid, Number of faces: 6, Number of edges: 12

c) Name: cylinder, Number of faces: 3,
Number of vertices: 0

33. a)

Height in cm	Tally
100–109	𝍸
110–119	𝍸 ‖
120–129	𝍸 𝍸
130–139	𝍸 𝍸
140–149	𝍸
150–159	|

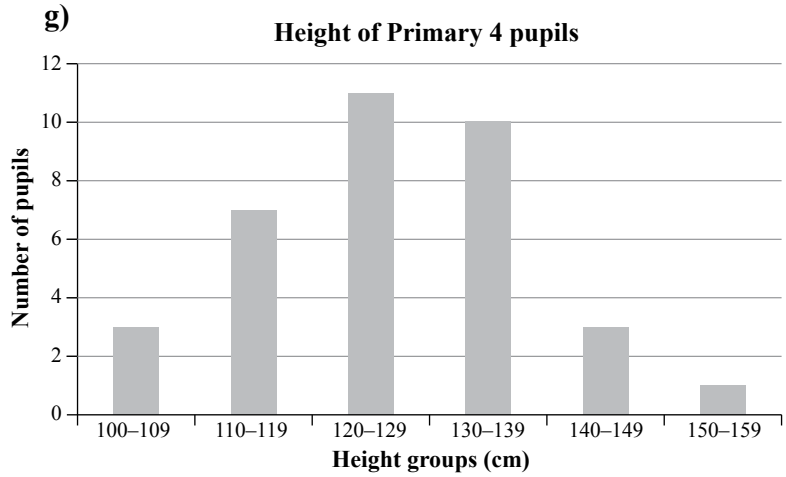
b) 35 pupils
c) 120–129 (11 pupils)
d) 150 cm
e) 109 cm

f)

100–109	
110–119	
120–129	
130–139	
140–149	
150–159	

Key:
= 5 people

g)



34. Pencil holder: Cylinder
Cube-shaped box: Cube
Milk carton: Cuboid

35. Bayo (340 ℓ)

Project

(PB page 252)

In this project, pupils construct their own geo-boards to assist them in exploring, learning more about and practising 2-D or plane or flat shapes.

Let the class explore the shapes on the geo-boards in the picture. They name the different shapes (polygons) and tell the class what they remember about the properties of an equilateral triangle, an isosceles triangle, rectangle, square, rhombus, kite, parallelogram and trapezium.

Pupils collect the materials needed and follow the steps to construct the geo-boards. You could supply them with some of the materials. Pupils construct different 2-D shapes and angles with the rubber bands. They could use the geo-boards to experiment with making models of houses, boats, etc. and identify angles and shapes in the figures.

You could let the pupils create 2-D shapes as you name them to assess pupils' knowledge about open shapes (angles) and closed 2-D shapes (quadrilaterals and polygons).

Answers

1. A. Equilateral triangle: All 3 sides and all angles equal.

Isosceles triangle: 2 sides are equal and 2 angles are equal.

B. Rectangle: Opposite sides are equal, all angles are right angles.

Rhombus: 4 equal sides, opposite angles are equal.

Square: 4 equal sides, all angles are right angles.

C. Kite: 2 adjacent sides are equal.

Parallelogram: Opposite sides are equal, opposite angles are equal.

Trapezium: 1 pair of sides are equal, adjacent angles are equal.