## Objectives

By the end of this unit, pupils will be able to:
- Calculate squares of whole numbers more than 50 and calculate square roots of perfect squares greater than 400
- Solve quantitative aptitude problems involving squares of numbers more than 50 and square roots of numbers greater than 400.

### 🔧 Suggested resources

Charts of whole numbers more than 50 and perfect squares greater than 400; Charts on quantitative aptitude problems on square roots and squares of whole numbers; Paper (for square charts)

### abc Key word definitions

*square numbers:* numbers you get when you multiply a number by itself

*square root:* a number which when multiplied by itself produces the given number. Square rooting is the inverse operation of squaring a number

### ✏️ Evaluation guide

Pupils to:
1. Calculate the squares and square roots of given numbers more than 50 and greater than 400.
2. Solve quantitative aptitude problems on squares of numbers more than 50 and square root numbers greater than 400.

---

**Lesson 1**   *Pupil's Book page 70*

### ⚙️ Preparation

You will need to have:
- Pupil's Book
- Workbook
- Charts of whole numbers more than 50 and perfect squares greater than 400
- Paper (for square charts).

### ⮕ Starter activity

Revise the perfect squares between 1 and 100. Remind pupils that in order to obtain a perfect square we multiply a chosen number by itself. Run through the perfect squares viz. 1, 4, 9, 16, 25, etc. and show pupils how each of theses numbers are products of the first few sequential counting number i.e. 1 × 1, 2 × 2, 3 × 3, etc. Let pupils complete a table with all the perfect squares up to 100.

### 🔍 Lesson focus

The lesson extends the starter activity by considering seemingly large numbers. Take care to relate a square such as 50 × 50 to the basic square 5 × 5. Also remind pupils that the concept of the square number is directly related to the concept of the geometric square. The square has all sides equal and in order to calculate the area of the square, we multiply one side by another. Thus, obtaining a square number. Work through the example in the PB on page 71. Explain how a square number can be obtained using the skill of multiplication acquired previously. Work through Worksheet 11 page 21 Question 1 and 2 in class. Complete Exercise 1 on page 71 of the PB.

### 📚 Answers

**Exercise 1**

1. Pupils to draw in their note books.
2. a) $53^2 = 2\,809$    b) $65^2 = 4\,225$
   c) $68^2 = 4\,624$    d) $54^2 = 2\,916$
   e) $57^2 = 3\,249$    f) $69^2 = 4\,761$
3. a) $71^2 = 5\,041$    b) $79^2 = 6\,241$
   c) $67^2 = 4\,489$    d) $82^2 = 6\,724$
   e) $72^2 = 5\,184$    f) $51^2 = 2\,601$
   g) $83^2 = 6\,889$    h) $80^2 = 6\,400$
   i) $99^2 = 9\,801$    j) $100^2 = 10\,000$

**k)** $89^2 = 7\,921$     **l)** $85^2 = 7\,225$
**m)** $58^2 = 3\,364$     **n)** $84^2 = 7\,056$
**o)** $91^2 = 8\,281$

### Assessment
Check that pupils understand that a square number is a number multiplied by itself and that they can square any given number.

### Extension activity
Find the areas of squares with the following side lengths: 12 cm, 23 cm, 4 cm and 39 cm.

### Homework activity
Worksheet 11 page 22 Question 3.

## Lesson 2 *Pupil's Book page 72*

### ⚙ Preparation
You will need to have:
- Pupil's Book
- Charts of whole numbers more than 50 and perfect squares greater than 400
- Paper (for square charts).

### ➲ Starter activity
Draw several geometric squares of various sizes on a photocopiable hand out. Each square should have its area written on the inside. Ask pupils to work out what the dimensions of each of the squares are. They should look for a number which was multiplied by itself to give the area. For example, if the area is 4 cm², then the dimensions must be 2 × 2. Avoid giving areas that are not perfect squares.

### 🔍 Lesson focus
Before working with square roots, make sure pupils know the difference between a square and a square root. Emphasis that the processes of obtaining these are inverse processes of each other. Work through the example in the PB on page 72. Show pupils that the square root of 900 can be obtained by finding the square root of 9 i.e. 3 and then multiplying the answer by 10. Thus, obtaining 30. Complete Exercise 2 on page 72 PB.
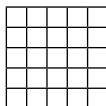
## 📖 Answers

### Exercise 2

| 1 | 2 |
|---|---|
| 900 — 30 | ? 160 — 40 |
| **3** | **4** |
| 36 — 6, 216 | ? 49 — ?, 343 |

### Assessment
Make sure that pupils know the difference between a square and a square root and can find the square root of a given number. Give extra practice of easy examples if needed.

### Extension activity
If $\sqrt{25} = 5$, it can represented in a model like the one below.

Now complete the table below.

| Square roots | Side length | Model | Verbal description of model |
|---|---|---|---|
| | | | |
| $\sqrt{64}$ | | | |
| | | | 10 rows of 10 squares |
| | 9 | | |

### Homework activity
Worksheet 11 page 22 Question 4.

## Lesson 3 *Pupil's Book page 72*

### ⚙ Preparation
You will need to have:
- Pupil's Book

- Workbook
- Charts of whole numbers more than 50 and perfect squares greater than 400
- Charts on quantitative aptitude problems on square roots and squares of whole numbers
- Paper (for square charts).

## ⬌ Starter activity

Revise the perfect squares between 1 and 100 from Lesson 1.

## 🔍 Lesson focus

Guide pupils through the quantitative reasoning and revision exercises. Ensure that they have grasped the concepts and that they understand how these inverse operations are related. Complete the Revision exercise on page 73.

## 📚 Answers

### Revision exercise

| | |
|---|---|
| 1. $6^2 = 36$ | 2. $8^2 = 64$ |
| 3. $36^2 = 1\ 296$ | 4. $11^2 = 121$ |
| 5. $46^2 = 2\ 116$ | 6. $47^2 = 2\ 209$ |
| 7. $17^2 = 289$ | 8. $10^2 = 100$ |
| 9. $34^2 = 1\ 156$ | 10. $16^2 = 256$ |
| 11. $50^2 = 2\ 500$ | 12. $19^2 = 361$ |
| 13. $44^2 = 1\ 936$ | 14. $43^2 = 1\ 849$ |
| 15. $30^2 = 900$ | 16. $42^2 = 1\ 764$ |
| 17. $35^2 = 1\ 225$ | 18. $23^2 = 529$ |
| 19. $33^2 = 1\ 089$ | 20. $32^2 = 1\ 024$ |
| 21. $\sqrt{484} = 22$ | 22. $\sqrt{784} = 28$ |
| 23. $\sqrt{841} = 29$ | 24. $\sqrt{900} = 30$ |
| 25. $\sqrt{1\ 296} = 36$ | 26. $\sqrt{1\ 764} = 42$ |
| 27. $\sqrt{1\ 225} = 35$ | 28. $\sqrt{529} = 23$ |
| 29. $\sqrt{2\ 304} = 48$ | 30. $\sqrt{2\ 401} = 49$ |

### Assessment
Check that pupils extract the correct mathematical information from the text. Can pupils apply an algorithm to solve the given problem?

### Extension activity
Ask pupils to create more quantitative reasoning questions.

### Homework activity
Worksheet 11 page 22 questions 5–7.

### Workbook answers worksheet 11

2. Pupils must use their rulers to measure the sides of each square and then work out the area.
3. a) $6 \times 6 = 36$     b) $10 \times 10 = 100$
   c) $2 \times 2 = 4$     d) $11 \times 11 = 121$
   e) $16 \times 16 = 256$     f) $12 \times 12 = 144$
   g) $1.1 \times 1.1 = 1.21$     h) $0.3 \times 0.3 = 0.09$
   i) $0.7 \times 0.7 = 0.49$
4. a) 1 cm = 10 mm. $1\ cm^2 = 10\ mm^2$
   b) 1 m = 100 cm. $1\ m^2 = 100\ cm^2$
   c) 1 m = 0.001 km. $1\ m^2 = 0.001\ km^2$
   d) 1 mm = 0.001 m. $1\ mm^2 = 0.001\ m^2$
   e) $1\ h = 10\ 000\ m^2$
   f) $1\ acre = 4046.85\ m^2$
5. a) $36\ mm^2$     b) $400\ m^2$
   c) $90\ cm^2$     d) $1\ 960\ km^2$
   e) $400\ cm^2$
6. 6 m
7. a) 8 m     b) 7 cm     c) 9 m
   d) 11 m     e) 3 km     f) 10 m

# Unit 12  Dividing by 10s

## Objectives

By the end of this unit, pupils will be able to:
- Divide whole numbers by 10 and its multiples up to 90
- Solve problems on quantitative reasoning involving division of numbers by 10 and multiples of ten up to 90.

## Suggested resources

Charts on division of number of 10 and multiples of 10 up to 90; Multiplication chart; Number line; Place value tables

## abc  Key word definitions

*litre:* metric unit of capacity, equal to 1 cubic decimetre
*remainder:* the amount that is left over
*multiples:* quantity that contains another number of times without a remainder

## Teaching this unit

In this unit, pupils revise the relationship between multiplication and division. The pupils use their knowledge of multiplication tables to find products and divisions of larger numbers. Pupils revise the relationship between multiplication and division. They then use inverses to find missing numbers in multiplication and division sentences. Pupils learn division by 10 and use this skill to solve problems.

## Evaluation guide

Pupils to:
1. Divide given numbers by 10 and multiples of 10.
2. Solve quantitative aptitude problems involving division of number by 10 and multiples of 10 up to 90.

**Lesson 1**  *Pupil's Book page 74*

## Preparation

You will need to have:
- Pupil's Book
- Workbook
- Charts on division of number of 10 and multiples of 10 up to 90
- Multiplication chart
- Number line
- Place value tables.

## Starter activity

Revise counting forwards and backwards in 10s, starting at any multiple of 10 to 1 000. Then, count forwards and backwards in 10s starting at any other two- or three-digit number. Then, practise multiplying and dividing mentally by 10, for example 34 × 10; 45 × 10; 560 ÷ 10 and 2 300 ÷ 10. Ask the pupils if they can see any pattern in the answers. Make sure that they can see that the digits move one place to the left in multiplication (the units' digit becomes the tens' digit, the tens' digit become the hundreds' digit and so on) and that in division the reverse happens: the digits move one place to the right (the thousands' digit becomes the hundreds' digit, the hundreds' digit becomes the tens' digit and so on).

## Lesson focus

In this lesson pupils are taught how to divide whole numbers by 10, and they explore the changes in place value. Establish that the digits now move one place when dividing by ten, thereby making the number smaller in value. Show how this process is the inverse of multiplying by to i.e. making the number larger in value. As inverses these processes undo each other. Thus, when you divide a number by 10, the comma moves one place to the left e.g.

$\frac{98,3}{10}$ = 9,83. Work through the example in the PB on page 74 then complete Exercise 1 page 74.

## 📖 Answers

### Exercise 1

1. 210 ÷ 10 = 21
2. 740 ÷ 10 = 74
3. 1 360 ÷ 10 = 136
4. 1 240 ÷ 10 = 124
5. 900 ÷ 10 = 90
6. 194 ÷ 10 = 19.4
7. 407 ÷ 10 = 40.7
8. 824 ÷ 10 = 82.4
9. 357 ÷ 10 = 35.7
10. 765 ÷ 10 = 76.5
11. Ido can make 680 ÷ 20 = 34 bags
12. 150 km ÷ 650 = 0.231 tanks of petrol for the journey.

### Assessment
Pupils should be able to divide whole numbers by 10 and to understand what happens to whole numbers when they are divided by 10.

### Extension activity
Ask pupils to complete the Challenge activity on page 75 of the PB.

### Homework activity
Complete the following exercise.
1. A teacher has ₦3,500 to buy workbooks. If each workbook costs ₦5, how many workbooks can the teacher buy?
2. A soccer league has ₦35,000 to buy new soccer balls. If each ball costs ₦5, how many balls can the league buy?
3. A house painter has ₦2,700 to buy paint. If each can of paint costs ₦90, how many cans of paint can the painter buy?
4. A new science website has ₦600 to buy online ads. If each ad costs ₦200, how many ads can the website purchase?
5. There are 25,000 DVDs in a film store. Each rack holds 50 DVDs. How many racks does the store need to use to hold all the DVDs?

6. A farmer needs to ship 42,000 pumpkins to a grocery store. If each crate can hold 6 pumpkins, how many crates will the farmer need?
7. The Peterson Fruit Co. needs to ship an order of 7,200 bananas. If each box can hold 800 bananas, how many boxes will the company need?
8. Tamir bought some tins and decided to fill them with brownies to give to his friends. Tamir baked 300 brownies. He put 10 brownies in each tin and made sure to fill as many tins as he could. How many tins was Tamir able to fill with brownies?

## Lesson 2    *Pupil's Book page75*

### ⚙️ Preparation
You will need to have:
- Pupil's Book
- Workbook
- Charts on division of number of 10 and multiples of 10 up to 90
- Multiplication chart.

### ➲ Starter activity
Draw on some real life examples where division into equal parts are required. For example, 25 sweets have to be shared amongst 5 friends. Think of a few more examples each time working with bigger numbers.

Revise the long division method and explain to pupils again the steps involved.

### 🔍 Lesson focus
In this lesson pupils are taught how to divide whole numbers by multiples of 10. Work through the examples on page 75 of the PB. Show how the we can divide a large number by a multiple of 10 by breaking the multiple of 10 into its factors. For example, 840 divided by 30, where 30 is broken up into 10 and 3. Therefore, 840 divided by 10 = 84 which is divided by 3 to yield 28. Alternately, the long division method could also be used. Complete Exercise 2 page 76 of PB.

## 📖 Answers

**Exercise 2**

1. 6 480 ÷ 40 = 162
2. 2 940 ÷ 70 = 42
3. 10 500 ÷ 50 = 210
4. 7 600 ÷ 40 = 190
5. 10 980 ÷ 90 = 122
6. 720 ÷ 30 = 24
7. 7 440 ÷ 30 = 248
8. 4 080 ÷ 80 = 51
9. 6 120 ÷ 60 = 102

### Assessment

Check that pupils can split division into multiples of 10 and also use the long division method.

### Extension activity

1. Which of these numbers are multiples of 10, 100 and 1000?
   - **a)** 8,000
   - **b)** 6,500
   - **c)** 20,000
   - **d)** 8,790
   - **e)** 65,000
   - **f)** 5,000
   - **g)** 6,543
   - **h)** 2,000
   - **i)** 1,200
   - **j)** 3,000
   - **k)** 50,300
   - **l)** 75,000
   - **m)** 456
   - **n)** 7,000
   - **o)** 12,00
2. Divide each of your multiples of 1,000 by ten.
3. Now divide each of your multiples of 1 000 by:
   - **a)** 20
   - **b)** 30
   - **c)** 50

### Homework activity

Worksheet 12 page 23 Questions 1,2,3.

### Lesson 3 *Pupil's Book page 77*

## ⚙️ Preparation

You will need to have:
- Pupil's Book
- Workbook
- Charts on division of number of 10 and multiples of 10 up to 90
- Place value tables.

## ➲ Starter activity

Again revise the long division method by giving pupils a few easy numbers to divided into each other.

## 🔍 Lesson focus

Work through the example on page 77 of the PB together. Remember to explain where they write each of the numbers and make sure that they know what to do if there are no remainders, or the divisor does not divide into the first number. Emphasise that when a number occurs that is no longer divisible by the divisor, this number is called the remainder. Complete Exercise 3 page 77 and Exercise 4 page 77.

## 📖 Answers

**Exercise 3**

1. 4 567 ÷ 20 = 228 remainder 7
2. 428 ÷ 30 = 14 remainder 8
3. 668 ÷ 40 = 16 remainder 28
4. 927 ÷ 60 = 15 remainder 27
5. 905 ÷ 50 = 18 remainder 5
6. 2 861 ÷ 90 = 31 remainder 71

**Exercise 4**

1. 930 ÷ 30 pupils = 31 notebooks each
2. 500 ÷ 20 floors = 25 rooms per floor
3. 8 470 ÷ a factor of 70 = 121 as the other factor
4. 1 320 minutes ÷ 60 minutes per hour = 22 hours
5. 6 840 cm ÷ 90 cm = 76 pieces of string
6. 8 100 kg ÷ 50 kg = 162 bags of rice
7. 714 pencils ÷ 30 children = 23 pencils each with 24 pencils remaining
8. 8 632 litres ÷ 80 people = 107 litres each with 72 litres remaining

### Assessment

Check that pupils can divide multiples of 10 into whole numbers that are not divisible by 10.

## Lesson 4   *Pupil's Book page 78*

### Preparation

You will need to have:
- Pupil's Book
- Workbook.

### Starter activity

Revise the Quantitative reasoning exercise that
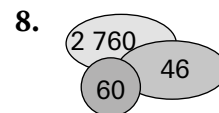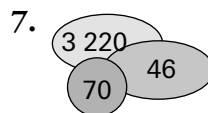pupils completed for homework.

### Lesson focus

Pupils revise the concepts covered in this unit by
working through the Revision exercise page 79 of
PB. Check pupils' progress and monitor carefully
how they cope with integrating the content covered
in this unit.

### Answers

**Exercise 5 (quantitative reasoning)**

1.

2.

3.

4.

5.   24 000

6.

7.

8.

### Revision exercise

1.  $610 \div 10 = 61$           2.  $900 \div 10 = 90$
3.  $8\,470 \div 10 = 847$       4.  $4\,560 \div 20 = 228$
5.  $1\,020 \div 20 = 51$        6.  $1\,710 \div 30 = 57$
7.  $3\,550 \div 50 = 71$        8.  $3\,780 \div 60 = 63$
9.  $7\,040 \div 80 = 88$        10. $8\,370 \div 90 = 93$
11. $451 \div 10 = 45.1$         12. $678 \div 10 = 67.8$
13. $2\,856 \div 20 = 142$ remainder 16
14. $1\,016 \div 40 = 25$ remainder 16
15. $356 \div 60 = 5$ remainder 56
16. $259 \div 70 = 3$ remainder 49
17. $240$ cm² $\div 20$ cm $= 12$ cm
18. $4\,874 \div 40$ people $= 121$ candies each with a
    remainder of 34 candies.

### Workbook answers worksheet 12

1.  **a)** 12        **b)** 8
    **c)** 9         **d)** 50
    **e)** 121       **f)** 8
    **g)** 11.2      **h)** 72.3
2.  27
3.  37 and 25 remainder
4.  131.2 cm long, 25.4 cm wide and 2 cm deep
5.  29
6.  11

### Objectives

By the end of this unit, pupils will be able to:
- Divide whole numbers by 100 and its multiples
- Solve problems on quantitative reasoning involving division of numbers by 100 and 200.

### 🔧 Suggested resources

Counting blocks; Calculators (optional); Charts containing worked problems involving division of number by 100 and 200; Dice; Paper

### abc Key word definitions

*express:* make known in words or by gestures
*cuboid:* cube shaped

### 💬 Frequently asked questions

Q *What prior knowledge should the pupil have?*
A  Pupils should have a well developed idea of how to work with multiples and how to divide using the long division method. Pupils should also have an understanding of how division by 10 shifts a decimal comma to the left by one place, thus making the number smaller, and how multiplication by 10 shifts the decimal comma to the right by one place, thus making the number bigger.

### ✏️ Evaluation guide

Pupils to:
1. Solve given exercises on division by 100 and 200.

### Lesson 1 *Pupil's Book page 80*

### ⚙️ Preparation

You will need to have:
- Pupil's Book
- Counting blocks
- Dice
- Workbook
- Calculators (optional)
- Paper.

### ➡️ Starter activity

Divide the class into groups of 4-6 pupils and give each group a number of counting blocks that can divided evenly amongst each member of the group. Give the blocks to the group leader and instruct him/her not to reveal the total number of blocks received. Now ask him/her to divide the blocks amongst the group members so that each one has an equal number of blocks. Then ask pupils to use an inverse process to work out how many blocks the group leaders received. Repeat the activity, this time giving each group a number of blocks that cannot be divided equally amongst its members.

### 🔍 Lesson focus

Explain to pupils that division of a whole number moves the decimal comma 2 place to the left and making the original number even smaller than when we divided by 10. Refer to the examples on page 80 of the PB and illustrate how the comma moves 2 places to make 1500 become 15. Also point out to pupils that the number of zeroes in the divisor will guide us as to the number of places the comma will move. Furthermore, illustrate how applying the inverse of division (i.e. multiplication by 100) restores the number to its original value. Division by 100 will not yield remainders when the whole number being divided end in zeroes e.g. 5 900 (page 80 PB). However when we divide a number like 920 by 100 and the comma shifts 2 places, we get and answer of 9,2, i.e. a remainder of 2. Complete Exercise 1 on page 81 of the PB.

### 📖 Answers

**Exercise 1**

1. $8\,600 \div 100 = 86$
2. $9\,400 \div 100 = 94$
3. $10\,200 \div 100 = 102$
4. $28\,700 \div 100 = 287$
5. $14\,700 \div 100 = 147$
6. $43\,600 \div 100 = 436$

**7.** 19 800 ÷ 100 = 198      **8.** 82 700 ÷ 100 = 827

**9.** 39 600 ÷ 100 = 396      **10.** 8 934 ÷ 100 = 89.34

**11.** 6 001 ÷ 100 = 60.01

**12.** 28 056 ÷ 100 = 280.56

**13.** 29 321 ÷ 100 = 293.21

**14.** 30 660 ÷ 100 = 306.6

**15.** 699 ÷ 100 = 6.99      **16.** 828 ÷ 100 = 8.28

**17.** 14 789 ÷ 100 = 147.89 **18.** 906 ÷ 100 = 9.06

---

### Assessment

Make sure that pupils have understood the previous unit on multiples of 10. Pupils should be confident with place values. Give extra practice with 10 and 100 if needed.

---

### Extension activity

Ask pupils to do the Challenge activity on page 81 of the PB.

---

### Homework

This investigation looks at dividing by 10, 100 and 1,000. You'll need dice, a calculator, a pen and paper. You're going to use the dice to make numbers to use in the investigation. You can do this in two steps. Here's an example:

Step 1: how many digits does the number have? Throw one die to decide.

If you throw a 3 the number has 3 digits. If you throw a 6 then it has 6 digits, etc.

---

Step 2: throw dice to find each of the digits.

Example

Step 1 gives a 4

Step 2 is to find 4 digits

Now:

1. Put your numbers into the first column and then fill in the rows by dividing your numbers by 10, 100 and 1,000. (The first row has been filled in for you.)
2. Fill in the first 4 rows of the table.
3. Check your answers with a calculator.
4. Can you see a quick way to work out the answers?

---

**5.** Try completing the last 6 rows to fill the whole table.

| NUMBER | ÷ 10 | ÷ 100 | ÷ 1 000 |
|---|---|---|---|
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

---

### Lesson 2      *Pupil's Book page 81*

### ⚙ Preparation

You will need to have:
- Pupil's Book
- counting blocks
- Workbook
- calculators (optional).

### ⮕ Starter activity

Revise division by 100 which yields no remainder and remainders. Do a few carefully selected examples that pupils have not encountered previously, but which are not too difficult. You may wish to refresh their memories by illustrating a few on the board for them. Alternatively, call out a few numbers that are easily divisible by 10 and 100 e.g. 1 000, 120, 150, 2 000, etc. and ask for the answers mentally.

### 🔍 Lesson focus

This lesson extends the concept of division by focusing on division by 200. Show the pupils that when we divide a whole number by 200, we split the divisor, 200, up into its factors 100 and 2. Refer to the example on page 81 of the PB and explain how 4600 is divided by 100 to give 46, which is in turn divided by 2 to give 23. If the whole number which is divided by 200 gives a remainder, it will be easier if pupils use the long division method. The example on page 82 of the PB shows that when 9282 is divided by 200 gives an answer of 46,41. However, note that splitting the 200 into factors is still an option which pupils can employ i.e. 9282 divide by 100 gives 92,82 divided by 2 = 46,41. Complete Exercise 2 on page 82 of the PB.

## Answers

**Exercise 2**

1. 36 400 ÷ 200 = 182    **2.** 25 600 ÷ 200 = 128
3. 6 300 ÷ 200 = 31 remainder 100
4. 96 000 ÷ 200 = 480    **5.** 81 600 ÷ 200 = 408
6. 53 500 ÷ 200 = 267 remainder 100
7. 41 200 ÷ 200 = 206    **8.** 29 400 ÷ 200 = 147
9. 33 900 ÷ 200 = 169 remainder 100
10. 17 700 ÷ 200 = 88 remainder 100
11. 28 280 ÷ 200 = 141 remainder 80
12. 25 680 ÷ 200 = 128 remainder 80
13. 41 800 ÷ 200 = 209
14. 19 730 ÷ 200 = 98 remainder 130
15. 10 650 ÷ 200 = 53 remainder 50

### Assessment
Make sure that pupils are comfortable with moving the decimal point two places to the left.

### Extension activity
The following exercise should be assigned for additional practice in division by 200. However, note that the dividend do not end in zero.

1. 22 957 ÷ 200        **2.** 94 962 ÷ 200
3. 38 027 ÷ 200        **4.** 86 445 ÷ 200
5. 7 555 448 ÷ 200     **6.** 12 836 ÷ 200

### Homework activity
Worksheet 13 page 24 Question 1.

## Lesson 3    *Pupil's Book page 82*

### Preparation
You will need to have:
- Pupil's Book
- Counting blocks
- Workbook
- Calculators (optional)
- Charts containing worked problems involving division of number by 100 and 200.

### Starter activity
Revise the processes of division by 10, 100 and 200 with pupils. Use examples from real life which involve fairly simple numbers for pupils to work with mentally. E.g. take examples from a shopping context, number of people a bus can transport, etc.

## Lesson focus
Work through the example on page 83 of the PB and illustrate how the mathematical information is lifted from the text and the appropriate operation performed using the division drills taught in earlier lessons. Complete Exercise 3 on page 83.

## Answers

**Exercise 3**

1. 9 600 litres ÷ 100 litres = 96 drums
2. 13 420 bottle tops ÷ 200 children = 67 bottle tops for each child with 20 remaining
3. A volume of 12 320 cm$^3$ ÷ a base area of 200 cm$^2$ = a height of 61.6 cm
4. 10 463 notebooks ÷ by 200 per box = 52 boxes with 63 notebooks remaining
5. 17 600 ÷ a factor 100 = 176 as the other factor
6. 17 040 pencils ÷ 200 pupils = 85 pencils each with 40 pencils remaining

### Assessment
Make sure that pupils are familiar with long division of large numbers. Give extra practice if required.

### Extension activity
The country of Sierra Leone extends for approximately 334 km from East to West. Algeria extends about ten times further. Approximately how far is Algeria from East to West?

### Homework activity
The following exercise can be assigned for homework.

1. How many times larger is 4 300 than 43?
2. 380 people wish to go to a soccer match by bus. Only one bus is available and it has a capacity of 60 passengers. How many trips will the bus have to make?
3. How many times smaller is 4 than 800?

## Lesson 4    *Pupil's Book page 83*

### Preparation
You will need to have:
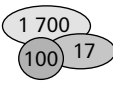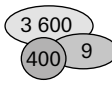- Pupil's Book
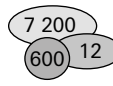- Workbook.

## ➲ Starter activity

Call out a few numbers that are easily divisible by 10 and 100 e.g. 1 000, 120, 150, 2 000, etc and ask for the answers mentally. Depending on the size of the class you might want to get each pupil to give an answer.

## 🔍 Lesson focus

Before asking pupils to work through the Quantitative reasoning exercise on page 84 and the Revision exercise on page 85, go through the summary on page 85 and recap the essential points contained in it. Check the homework assignments while moving around the class and make sure that all pupils are familiar with the processes required for division by 100 and 200. Complete Exercise 4 on page 84 of the PB.

## 📚 Answers

**Exercise 4**

**1.** 1 700 / 100 → 17
**2.** 3 600 / 400 → 9
**3.** 7 200 / 600 → 12
**4.** 4 200 / 300 → 14
**5.** 8 650 / 500 → 173
**6.** 56 700 / 900 → 63

> **Assessment**
> Pupils should be familiar with multiples of 100 and 200.

> **Extension activity**
> The population of Gambia in Africa is approximately 1.7 million people. About ten times fewer people live in Telford in the UK? Estimate how many people live in Telford.

> **Homework activity**
> Worksheet 13 page 24 Question 2.

### Lesson 5  *Workbook page 24*

## ⚙ Preparation

You will need to have:
- Pupil's Book
- Workbook.

## ➲ Starter activity

Remind pupils of multiples of 100 (200, 300 etc.) and have an informal quiz, getting them to shout out the answers.

## 🔍 Lesson focus

This lesson revises the previous lessons in this unit. Use the Revision exercise as an assessment tool.

## 📚 Answers

**Revision exercise**

**1.** 12 000 ÷ 100 = 120    **2.** 16 200 ÷ 100 = 162
**3.** 6 400 ÷ 100 = 64      **4.** 4 800 ÷ 100 = 48
**5.** 28 800 ÷ 100 = 288
**6.** 10 500 ÷ 200 = 52 remainder 100
**7.** 50 480 ÷ 200 = 252 remainder 80
**8.** 19 800 ÷ 200 = 99
**9.** 17 100 ÷ 200 = 85 remainder 100
**10.** 42 500 ÷ 200 = 212 remainder 100
**11.** 22 800 ÷ 200 = 114
**12.** 16 200 grams ÷ 100 small packs = 162 grams per pack

> **Assessment**
> Collect in the answers to mark them, identify any problem areas and revisit those areas if necessary.

> **Extension activity**
> Pupils to make up their own questions.

> **Homework activity**
> Worksheet 13 page 24 questions 3, 4, 5.

**Workbook answers worksheet 13**

**1. a)** 96        **b)** 212      **c)** 405
   **d)** 313       **e)** 543      **f)** 314
   **g)** 15.56     **h)** 21.69
**2. a)** 4 m       **b)** 3.16 m   **c)** 0.88ℓ
   **d)** 75.66₦    **e)** 0.2₦     **f)** 178.062 ha
   **g)** 13.50     **h)** 2        **i)** 32.5
   **j)** 1 055₦
**3.** 26 400       **4.** 13       **5.** 0.75

## Objectives

By the end of this unit, pupils will be able to:
- Divide decimals by 10
- Divide decimals by multiples of 10 up to 90
- Solve quantitative aptitude problems on decimals.

### 🔧 Suggested resources

Calculators; Copies of place value tables

### 💬 Frequently asked questions

Q *What is the difference between long and short multiplication and division?*

A Short multiplication and division is when the multiplier and divisor are single digits. In long multiplication and division, the multiplier and divisor have more than one digit. Go back over the Unit 4 work if necessary.

### ✏️ Evaluation guide

Pupils to:
1. Solve given problems on division decimals by multiples of 10.
2. Solve quantitative aptitude problems involving division of decimals by multiples of 10.

### Lesson 1 *Pupil's Book page 86*

### ⚙️ Preparation

You will need to have:
- Pupil's Book
- Workbook
- Calculators
- Copies of place value tables.

### ➲ Starter activity

Revise multiplication and division of whole numbers by 10. Ask the pupils to use inverses to undo the results of a chosen operation.

### 🔍 Lesson focus

In this unit we continue the same operation, dividing by 10 but working with decimal numbers. We apply the same principle we used with whole numbers when we divide the decimal number by 10 i.e. the comma shifts one space to the right so that the given number becomes smaller. Refer to the examples on page 86 of the PB in which long division is used to derive the answers. While pupils have to be familiar with the long division method, point out to pupils that if they apply the shifting rule, division by 10 is very quick and easy. Complete Exercise 1 page 87 of PB.

### 📖 Answers

**Exercise 1**

**1.** 4.8; **2.** 24.7; **3.** 23.8; **4.** 4.57; **5.** 1.215;
**6.** 51.2; **7.** 0.82; **8.** 0.78; **9.** 26.85; **10.** 4.96;
**11.** 0.059; **12.** 8.267; **13.** 4.23; **14.** 21.1; **15.** 19.7

### Assessment

Make sure that pupils understand the principle of dividing by a power of ten will make a number smaller. Give extra practice examples if needed.

### Extension activity

Complete the challenge on page 89.

### Lesson 2 *Pupil's Book page 87*

### ⚙️ Preparation

You will need to have:
- Pupil's Book
- Workbook
- Copies of place value tables.

### ➲ Starter activity

Revise the 2 different methods of division by 10 i.e. long division and shifting the comma. Also revise how to divide a whole number by multiples of 10

by breaking the multiple of 10 apart into its tens component and units component.

## 🔍 Lesson focus

Show pupils how to use long division when we divide a decimal number by a multiple of 10. Ensure that pupils are familiar with powers of 10 and that dividing by any power of ten makes the number smaller. Refer to the examples on page 87 of the PB. Also show how we break the multiple of 10 apart into its factors e.g. The factors of 20 are 10 and 2. Therefore if we divide 35,4 by 20, we start by first dividing 35,4 by 10 = 3,54 and dividing again by 2 = 1,77. Complete Exercise 2 on page 88.

## 📖 Answers

**Exercise 2**

1. 85 ÷ 50 = 1.7
2. 352 ÷ 80 = 4.4
3. 20.9 ÷ 20 = 1.045
4. 135.8 ÷ 40 = 3.395
5. 943.2 ÷ 30 = 31.44
6. 996.5 ÷ 50 = 19.93
7. 138 ÷ 60 = 2.3
8. 32.2 ÷ 70 = 0.46
9. 86.4 ÷ 90 = 0.96
10. 19.2 ÷ 60 = 0.32
11. 46.8 ÷ 20 = 2.34
12. 90.8 ÷ 40 = 2.27
13. 50.4 ÷ 70 = 0.72
14. 72.24 ÷ 80 = 0.903
15. 41.4 ÷ 90 = 0.46

> **Assessment**
> Revise long division with any pupils who need extra help.

> **Extension activity**
> Workbook page 24 Question 6.

> **Homework activity**
> Worksheet 14 page 24 questions 1 and 2.

---

**Lesson 3**   *Pupil's Book page 89*

## ⚙️ Preparation

You will need to have:
- Pupil's Book
- Workbook.

## ➲ Starter activity

Give pupils some large numbers to divide by 1 000 and 2 000 and challenge them to see how quickly

they can find the answer in their heads and shout out the answers.

## 🔍 Lesson focus

This lesson should complete Unit 14. Briefly revise lessons 1 and 2 and then complete Exercise 3 on page 88 with pupils. Walk around the classroom to check that pupils are managing.

## 📖 Answers

**Exercise 3**

1. 102 / 40 / 2.55
2. 43.8 / 20 / 2.19
3. 11.5 / 50 / 0.23
4. 68.4 / 90 / 0.76
5. 62.7 / 30 / 2.09
6. 41.6 / 80 / 0.52
7. 18.6 / 60 / 0.31
8. 109.2 / 70 / 1.56

> **Assessment**
> Check the pupils' answers to the Quantitative reasoning exercise. Check that pupils are all on track in terms of attaining the outcomes of this unit.

> **Homework activity**
> Worksheet 14 page questions 3, 4 and 5.

**Workbook answers Worksheet 14**

1. a) 0.375   b) $3\frac{3}{4}$   c) 3.75   d) 3.75
2. a) 3.875   b) $\frac{133}{400}$
   c) 0.3875   d) 0.3875
3. a) Pupils to mark on number line
   b) 0.015
   c and d) Pupils to mark on number line
4. Pupils to mark on number line
5. a) 0.314   b) 5.47   c) 0.036
   d) 14.14   e) 10   f) 7.77
   g) 0.004
6. 12.5 cm

# Unit 15 Dividing decimals by 100 and 200

### Objectives

By the end of this unit, pupils will be able to:
- Divide decimals by 100 and 200
- Divide whole numbers by 2-digit numbers.

## Suggested resources

Colour coded beans/tiles to represent different place values; Place value tables similar to ones used in Unit 14 but with more decimal place values; Division charts of worked examples on division of decimals.

## abc Key word definitions

*place value:* the position of the digit within the number

## Frequently asked questions

Q *What prior knowledge should the pupils have?*

A By now pupil s should have a very good understanding of the concept of place value and should be able to identify different place values with ease. Pupils should also know how the process of division works. In particular, they should know how to long divide and should also know how to use the factor method of division. Pupils must also know how the comma moves when a whole number is divided by 10, 100, 200 or multiples of 10.

## Common errors that pupils make

Pupils tend to move the decimal comma too many places to the left. In these cases the teacher should take care to point out that division by 10, 100, 1 000, etc will move the comma the same number of places as there are zeroes in the divisors, i.e. 10 comma moves once, 100 comma moves twice, etc.

## Evaluation guide

Pupils to:
1. Divide given decimals by 100 and 200.
2. Solve problems on division by 2-digit numbers.

---

### Lesson 1 *Pupil's Book page 90*

## Preparation

You will need to have:
- Pupil's Book
- Workbook
- Place value tables similar to ones used in Unit 14 but with more decimal place values.

## Starter activity

Revise multiplication by 100 and ensure that pupils know that when we multiply a number by 100, it becomes a larger number. Call out a few random numbers which are multiplied by 100 and get pupils to volunteer the answers. Now get pupils to apply the inverse i.e. division by 100. Call out a few large numbers which are to be divided by 100 and get pupils to volunteer the answers.

## Lesson focus

This lesson builds on the skills acquired in previous lessons by extending the process of division to divisor of 100. Explain that, as is the case with whole numbers, division of a decimal by 100 merely shifts the decimal comma 2 paces to the left, i.e. the number becomes even smaller than when we divided by 10. Refer to the examples on page 90 of the PB and explain that when 48,00 is divided by 100 it becomes 0,48 and not 0,4800. Point out that the 2 zeroes at the end of the number are not used. In the second example, 13,6 divided by 100, the answer is 0,136. The 6 should not be dropped unless we are asked to round up or down. In this case, the answer should be rounded up to 0,14. Ask the pupils to complete Exercise 1 page 90 on their own and provided guidance where needed.

## 📚 Answers

### Exercise 1

1. $148 \div 100 = 1.48$
2. $330 \div 100 = 3.3$
3. $236 \div 100 = 2.36$
4. $842 \div 100 = 8.42$
5. $445 \div 100 = 4.45$
6. $89.3 \div 100 = 0.893$
7. $27.8 \div 100 = 0.278$
8. $34.2 \div 100 = 0.342$
9. $90.8 \div 100 = 0.908$
10. $45.6 \div 100 = 0.456$
11. $3.2 \div 100 = 0.032$
12. $8.72 \div 100 = 0.0872$
13. $1.7 \div 100 = 0.017$
14. $5.13 \div 100 = 0.0513$
15. $34.2 \div 100 = 0.342$

> **Assessment**
> Check that pupils understand place value from thousands to tens and then through decimal points to tenths, hundredths and thousandths.

> **Extension activity**
> Ask pupils to attempt the Challenge questions on page 91 of the PB for homework.

> **Homework activity**
> Worksheet 15 page 26 Question 1.

---

### Lesson 2 — *Pupil's Book page91*

#### ⚙️ Preparation

You will need to have:
- Pupil's Book
- Workbook
- Place value tables similar to ones used in Unit 14 but with more decimal place values.

#### ➲ Starter activity

Check the homework Challenge by asking a few pupils to give their answers. Also find out who struggled with the Challenge exercise. Check particularly, that pupils understood what they were required to do.

#### 🔍 Lesson focus

When we divide a decimal number by 200, we can again break the 200 into its factors i.e, 100 and 2. First divide the given decimal number by 100, i.e. shift the comma 2 places left so that the number becomes smaller. Then divide the answer by 2, i.e. halve the answer. Also show pupils how to use long division to divide a number by 200. Refer to the examples on page 91 of the PB and work through these to illustrate how each procedure is performed. Also explain to pupils the principle of rounding to a set number of decimal places. Work through some examples to illustrate when we round up i.e. when the following decimal is a number 5 to 9, or rounding down i.e. when the following number is a value of 0 to 4. Ask pupils to do Exercise 2 on page 92 using both methods taught. Move around the class to ensure that all the pupils have a good grasp of what to do and how to perform the procedures.

## 📚 Answers

### Exercise 2

1. $634 \div 200 = 3.17$
2. $892 \div 200 = 4.46$
3. $961.1 \div 200 = 4.806$
4. $456 \div 200 = 2.28$
5. $1\,165 \div 200 = 5.825$
6. $2\,184 \div 200 = 10.92$
7. $541.8 \div 200 = 2.709$
8. $368 \div 200 = 1.84$
9. $473.7 \div 200 = 2.369$
10. $1\,054.8 \div 200 = 5.274$
11. $675.5 \div 200 = 3.378$
12. $713.6 \div 200 = 3.568$
13. $104.4 \div 200 = 0.522$
14. $289 \div 200 = 1.445$

> **Assessment**
> Make sure that pupils understand the ordering of steps in dividing decimals by 200; first divide by 100 move the decimal point and then complete the division. Give extra practice in rounding off numbers to 2 decimal places if needed.

> **Extension activity**
> The following exercise can be given as homework in order to give pupils practice in rounding decimal numbers. Round the following decimal numbers to 2 decimal places.
> 1. 0.459
> 2. 3.931
> 3. 7.775
> 4. 9.382
> 5. 0.007
> 6. 8.884
> 7. 4.455
> 8. 0.036
> 9. 6.666
> 10. 5.118

> **Homework activity**
> Worksheet 15 page 26 Question 2.

⚙ **Preparation**

You will need to have:
- Pupil's Book
- Workbook.

➲ **Starter activity**

Give an informal quiz on rounding off numbers to 1, 2 or 3 decimal places. Pupils can check their own answers.

🔍 **Lesson focus**

Use this lesson to focus on place values and rounding off of decimals. Look at the example on page 92 of the PB and then work through the Quantitative reasoning exercise with them.

📚 **Answers**

**Exercise 3**

1. 894 / 600 / 1.49
2. 68 / 200 / 0.34
3. 825 / 500 / 1.65
4. 270 / 300 / 0.9
5. 348 / 400 / 0.87
6. 1 092 / 700 / 1.56
7. 585 / 900 / 0.65
8. 202.4 / 728.06 / 0.278

**Assessment**

Some pupils may struggle with the concepts in the Quantitative reasoning exercise. Use this as a fun lesson or allow pupils to work in groups and find the answers together. This allows quicker pupils to help slower pupils.

**Extension activity**

Pupils can make up more examples similar to those in the Quantitative reasoning exercise.

**Homework activity**

Worksheet 15 page 26 questions 3, 4 and 5.

---

⚙ **Preparation**

You will need to have:
- Pupil's Book
- Workbook.

➲ **Starter activity**

Give a few short questions changing fractions into decimals, as a reminder activity. Then give a few quick examples of rounding off decimal places.

🔍 **Lesson focus**

This lesson consolidates the work in Unit 15. Pupils should complete the Revision exercise on page 93 on their own.

📚 **Answers**

**Revision exercise**

1. $156 \div 100 = 1.56$
2. $440 \div 100 = 4.4$
3. $243 \div 100 = 2.43$
4. $956 \div 100 = 9.56$
5. $345 \div 100 = 3.45$
6. $2\ 162 \div 200 = 10.81$
7. $631.8 \div 200 = 631.8$
8. $358 \div 200 = 1.79$
9. $477.6 \div 200 = 2.388$
10. $1\ 056.8 \div 200 = 5.284$

**Assessment**

Check pupils' answers to the Revision exercise and identify any pupil that needs extra practice.

**Homework**

Complete Worksheet 15 page 26 questions 6 & 7.

**Workbook answers Worksheet 15**

1. a) 15    b) 37.5    c) 1.5
   d) 0.375    e) 0.00056    f) 0.27
   g) 3.63    h) 0.0063    i) 0.125
   j) 0.0002
2. a) 0.7    b) 18.75    c) 12.5
   d) 0.042    e) 0.1902    f) 0.0048
   g) 0.0244    h) 0.000225    i) 0.0028
   j) 0.03832
3. 12.89 Naira
4. 6.45 m
5. 6.84 m
6. 1.536 ha
7. 0.025 mm

## Objectives

By the end of this unit, pupils will be able to:
- Find the missing number in open sentences
- Use letters to represent boxes in open sentences
- Find the missing numbers that the letters represent
- Interpret each box in a mathematical statement representing a letter that can be found
- Use letters to represent the missing numbers in quantitative aptitude problems and find their values.

### 🔧 Suggested resources

Counting tiles/beads; Flash cards; Sweets (for sharing)

### abc Key word definitions

*expression:* a term used to describe any combination of the various mathematical symbols
*number sentence:* an equation using numbers and symbols
*represent:* stand for or correspond to
*equation:* making equal

### ✗ Common errors that pupils make

Pupils struggle with solving equations because they tend to have a poor understanding of the concept of inverse operations. When an equation like $x + 2 = 5$ has to be solved, pupils might have an intuitive understanding that the only number that can be added to 2 to give 5 is 3. However, when the operations involved are explicated, they tend to get lost. The actual solution to equations involves the use of inverses i.e. $x + 2 - 2 = 5 - 2$. When we use the inverse of addition viz. subtraction, we apply the operation on both sides of the equation in order to maintain the equilibrium.

### ✏️ Evaluation guide

Pupils to:
1. Use letters to represent open sentences.
2. Solve problems on open sentences.
3. Solve given quantitative aptitude problems on open sentences.

### Lesson 1    *Pupil's Book pages 94 and 95*

### ⚙️ Preparation

You will need to have:
- Pupil's Book
- Workbook
- Flash cards with numbers available ; some cards should have a blank block only
- Sweets.

### ➲ Starter activity

Share 20 sweets between 2 pupils by handing out 10 sweets to the first pupil. Explain that the other 10 sweets can be referred to as the remainder and we can call this $x$. They should be able to see what the remaining out is. Point out that they have now found a value for $x$, i.e. 10.

### 🔍 Lesson focus

Explain how we find the answers by using mathematical procedures. Where the open sentence involves addition, they are required to use the inverse operation viz. subtraction. Therefore, $76 - 47 = 29$. Where the sum given involves multiplication, the inverse viz. division, is used. Therefore, $216 \div 13.5 = 16$. Explain how inverses are applied to subtraction and division problems. Explain to pupils that instead of using boxes all the time, we can use letters to represent unknown numbers. Refer to the example on page 94 of the PB and explain how the box is replaced by the letter $x$ so that the sum becomes $6 + x = 18$. Also work through the examples on page 95 of the

PB. It is important that pupils are shown how the variable is made the subject of the equation. Now work through Exercise 1 page 94 of the PB with the class giving them 5 minutes to find solutions as intuitively as they can.

### 📚 Answers

**Exercise 1**

1. $\underline{29} + 47 = 76$
2. $\underline{16} \times 13.5 = 216$
3. $\underline{43} + 157 = 200$
4. $40 \times \underline{45.2} = 1\,808$
5. $4.45 + \underline{2.55} = 7$
6. $\underline{12.5} \times 30 = 375$
7. $\underline{121} - 28 = 93$
8. $44 \div \underline{4} = 11$
9. $\underline{686} - 227 = 459$
10. $\underline{728} \div 13 = 56$
11. $\underline{145} - 96 = 49$
12. $\underline{148.5} \div 27 = 5.5$

---

**Assessment**

Check that pupils have understood the concept of using an abstract for a missing value.

---

**Extension activity**

Challenge page 95.

---

**Homework activity**

Worksheet 16 page 27 Question 1.

---

### Lesson 2  *Pupils Book pages 96 and 97*

### ⚙️ Preparation

You will need to have:
- Pupil's Book
- Workbook
- Flash cards with numbers available; some cards should have a blank block only.

### ➲ Starter activity

Use a few verbal real-life problems for pupils to solve mentally. For example, a shop sells chocolates at ₦3 per bar. I paid ₦15. How many bars of chocolate did I buy?

### 🔍 Lesson focus

Explain to pupils how certain key words are used in word sums to indicate a particular mathematical operation.

Also demonstrate the example on page 95 of the PB showing pupils how the mathematical information is extracted from the text to construct an equation. Emphasise that the key to solving word problems is to read the question carefully. Pupils must now attempt Exercise 2 in the PB on page 95.

### 📚 Answers

**Exercise 2**

1. $x + 47 = 76$
2. $y \times 13.5 = 216$
3. $p + 157 = 200$
4. $40 \times a = 1\,808$
5. $4.45 + z = 7$
6. $b \times 30 = 375$
7. $x - 28 = 93$
8. $44 \div q = 11$
9. $n - 227 = 459$
10. $c \div 13 = 56$
11. $y - 96 = 49$
12. $z \div 27 = 5.5$
13. a) $u + 2 = 13$
      $u = 11$
    b) $q - 10 = 18$
      $q = 28$
    c) $27 + m = 41$
      $m = 14$
    d) $a + 1.8 = 4.6$
      $a = 2.8$
    e) $x - 45.3 = 4.7$
      $x = 50$
    f) $35 - r = 29$
      $r = 6$
    g) $9 + r = 22$
      $r = 13$
    h) $18 - f = 13$
      $f = 5$
    i) $m - 5 = 16$
      $m = 21$
    j) $k - 11 = 22$
      $k = 33$
    k) $d + 45 = 68$
      $d = 23$
    l) $29 + g = 36$
      $g = 7$

---

**Assessment**

Make sure that pupils are familiar with open sentences before moving on to lesson three. Pupils should be able to calculate the answer both when the answer is unknown and when one of the variables is unknown.

---

**Extension activity**

Ask pupils to make up some questions to ask each other.

---

**Homework activity**

Worksheet 16 page 27 Question 2.

## Lesson 3 *Pupil's Book pages 98 and 99*

### ⚙ Preparation
You will need to have:
- Pupil's Book
- Workbook
- Flash cards with numbers available; some cards should have a blank block only.

### ➲ Starter activity
Use the questions that pupils made up as an extension activity in Lesson 2 as a starter activity.

### 🔍 Lesson focus
This lesson introduces fractions into open sentences. Explain to pupils that they will apply exactly the same operations as in the previous 2 lessons. Work through Exercise 3 page 96 of the PB with pupils.

### 📚 Answers
**Exercise 3**

1. $y + 6 = 9$
   $y = 3$
2. $8 + a = 23$
   $a = 15$
3. $7\frac{1}{2}x = 2\frac{1}{3}$
   $x = \frac{4}{25}$
4. $r - 2.8 = 6.8$
   $r = 9.6$
5. $a - 7 = 23$
   $a = 30$
6. $13 + r = 23$
   $r = 10$
7. $m + 15 = 34$
   $m = 19$
8. $12 + y = 30$
   $y = 18$
9. $x - 5\frac{1}{4} = 4\frac{3}{6}$
   $x = 10\frac{1}{12}$
10. $9x = 414$
    $x = 46$
11. $27m = 378$
    $m = 14$
12. $a \times 7 = 32.9$
    $a = 4.7$
13. $\frac{x}{8} = 35$
    $x = 280$
14. $\frac{3}{25} = 30$
    = no valid answer
15. $\frac{33}{m} = 13$
    $m = 27$

### Assessment
Pupils should be able to work through open sentences which include fractions. Some pupils may experience difficulty with this and need extra help. Monitor progress during this exercise and identify any pupils who struggle to correctly work through the examples.

### Extension activity
Quantitative Reasoning exercise page 9 of PB.

### 📚 Answers
**Exercise 5**

1.



15
7 | 8

2.

21
13 | 8

3.

88
76 | 12

4.

342
18 | 19

5.

168
28 | 6

6.

144
36 | 4

### Homework activity
Worksheet 16 page 28 questions 3–6.

## Lesson 4 *Workbook page 27*

### ⚙ Preparation
You will need to have:
- Workbook
- Pupil's Book.

### ➲ Starter activity
Use a few verbal real-life problems for pupils to solve mentally. For example, I have 20 sweets and must share them with my three brothers, how many will we each have? Leave time to go through the Quantitative reasoning exercise on page 98.

## Lesson focus

This lesson demonstrates how open sentences can be used to solve real life problems. Explain to pupils that we can create equations to solve real life problems and demonstrate how to do this, using some simple problems and the board. Make sure that pupils understand how to write a problem using a number sentence/an equation. Work through the example on page 97. Once pupils are familiar with this, complete Exercise 4 on page 96 of the PB.

## Answers

**Exercise 4**

1. $x = 19$ 　　2. $y = 18$ 　　3. $a = 26$
4. $b = 15$ 　　5. $y = 16$ 　　6. $x = 918$
7. $a = 43$ 　　8. $b = 23$
9. $y = 13$ and $4y = 52$ 　　10. $x = 533$

> **Assessment**
> Make sure that pupils are able to create an equation from a word problem. Check that they use logical steps in solving the problem.

> **Homework activity**
> Worksheet 16 page 28 Questions 7-10.

## Lesson 5　　*Page 99 Pupil's Book*

## Preparation

You will need to have:
- Pupil's Book.

## Starter activity

Recap briefly on lessons 1–4 of this unit.

## Lesson focus

This lesson consolidates the unit. Pupils should undertake the Revision exercise on page 99 of the PB as an assessment task in order to identify any problems that exist.

**Revision exercise**

1. **a)** $y + 9 = 17$ 　　**b)** $17 + a = 28$
   　　$y = 8$ 　　　　　　$a = 11$
   **c)** $r - 6 = 13$ 　　**d)** $25 - q = 16$
   　　$r = 19$ 　　　　　　$q = 9$

　　**e)** $x - 11 = 17$ 　　**f)** $y - 12 = 30$
   　　　$x = 28$ 　　　　　　$y = 42$
   **g)** $4r = 56$ 　　　**h)** $8k = 112$
   　　　$r = 14$ 　　　　　　$k = 14$
   **i)** $\frac{66}{x} = 11$ 　　**j)** $\frac{m}{12} = 8$
   　　　$x = 6$ 　　　　　　$m = 96$
2. $2y + ₦680 = ₦2\ 000$
   $y = ₦660$
   Dede gets $₦660 + ₦680 = ₦1\ 340$
   Ijeoma gets $₦660$
3. $b \times 19 \times 5 = 1995$
   $b = 21$

> **Assessment**
> Set aside at least 30 minutes for pupils to complete the Revision exercise. Pupils must work on their own, but while they are busy move around and check they are not making glaring errors. Give assistance in cases where pupils are still experiencing difficulties. Check that pupils are all on track in terms of attaining the outcomes of this unit.

> **Extension activity**
> Pupils can make up some word problems using open sentences if time permits.

> **Homework activity**
> Pupil's to complete any corrections to the Revision exercise.

**Workbook answers Worksheet 16**

1. **a)** 9 110 　**b)** 54 　　**c)** 36 　　**d)** 7
   **e)** 72 　　**f)** 18 　　**g)** 13 　　**h)** 363
   **i)** 70 　　**j)** 840
2. **a)** $f = 6$ 　　　**b)** $k = 14$ 　　**c)** $m = 61$
   **d)** $y = 14$ 　　**e)** $z = 75$ 　　**f)** $v = 46$
   **g)** $v = 473$ 　　**h)** $h = 8208$ 　**i)** $p = 21$
   **j)** $q = 21$
3. 33 　　　　4. 264 　　　5. 10
6. 9 　　　　7. $24 + 6$ 　　8. 60
9. 40
10. 202, 201, 200, 199, 198

# Unit 17 Converting currency

## Objectives

By the end of this unit, pupils will be able to:
- Compare Nigerian units of money with pounds sterling, American dollars and some West African countries.

## Suggested resources

Nigerian bank notes and coins (naira and kobo), foreign currencies, pictures or charts showing currency rates; Stamps; Models of money; Charts of solved examples on quantitative reasoning problems on money; Newspapers with currency information

## abc Key word definitions

*rate of exchange:* the value of one currency for the purpose of conversion to another
*currency:* the system of money in general use in a particular country
*bureau de change:* an establishment at which customers can exchange foreign money

## Frequently asked questions

Q *What prior knowledge should the pupil have?*
A Pupils need a good understanding of addition, subtraction, multiplication and division of numbers. They need knowledge of buying and selling of articles.
Q *How can I ensure that the pupils understand the concepts well?*
A Provide the pupils with real money and pictures of other currencies if real examples are not available. Make the pupils draw the various coins or notes in their books and display images in the classroom. Give pupils enough practical work as possible.

## Common errors that pupils make

Pupils find it difficult to know whether to multiply or divide when changing currencies. Encourage pupils to write down the same currencies underneath each other, and ask themselves,

whether they will get more (then multiply) or less (then divide). E.g. If exchange rate is 240 = £1 then X = £5 (240 × 5, as there will be more) 120 = X (£1 ÷ 2, as there will be less). They need also to be careful when deciding what multiplying factor to use. Remind them of the work they did earlier on ratio. In the above example, the number of £s has been multiplied by 5, so the number of Naira must also be multiplied by 5.

## Evaluation guide

Pupils to:
1. Identify various currencies.
2. Convert one currency to another.

### Lesson 1    *Pupil's Book pages 100-102*

## Preparation

You will need to have:
- Pupil's Book
- Workbook
- Nigerian bank notes and coins (naira and kobo), foreign currencies, pictures or charts showing currency rates
- Newspapers with currency information.

## Starter activity

Bring Nigerian currency denominations to the class for pupils to see and remind them that the notes have higher values than the coins but all are in naira except the 50k coin which is just $\frac{1}{2}$ of a naira. Ask pupils to hold the coins and compare the weights with the notes. Notes are lighter but higher in value.

## Lesson focus

Explain to the pupils that as we have the naira and kobo as Nigerian currency so we have different currencies for different countries except for some countries that use the same currency. Show the pupils the common types of currencies used in other countries, for example Ghana, Sierra Leone, Gambia, Togo, Liberia, Republic of Benin, Japan, United States of America (USA), Britain and Europe (euro). Display images of other currencies in the classroom.

Let pupils know that there is an exchange rate which may change over time. Refer to the exchange rates on page 101 and demonstrate to pupils how we convert local currency into foreign currency using the exchange rates given in the table. Also work through the examples on the same page before asking pupils to complete Exercise 1 on page 102 of the PB.

## Answers

**Exercise 1**

**1.**

| Naira | Dollar | Pound Sterling | Cedis | Leone | SA Rand |
|---|---|---|---|---|---|
| 15 000 | 94 | 58 | 75 000 | 394 737 | 600 |
| 2 500 | 16 | 10 | 12 500 | 65 789 | 100 |
| 28 450 | 178 | 109 | 142 250 | 784 684 | 1 138 |
| 8 500 | 53 | 33 | 42 500 | 223 684 | 340 |
| 37 500 | 234 | 144 | 187 500 | 986 842 | 1 500 |

**2.**  **a)** £6.90 = ₦1 794   **b)** £5.13 = ₦1 334
   **c)** £12.50 = ₦3 250   **d)** $12 = ₦1 920
   **e)** $1.99 = ₦318   **f)** $250 = ₦40 000
   **g)** c800 = ₦160   **h)** 600 Rands = ₦15 000
   **i)** Le312 = ₦12   **j)** Le1 300 = ₦49
**3.**  **a)** £5 192   **b)** $8 438
   **c)** 54 000 Rands
**4.** ₦915 800 = $5 724
**5.**  **a)** Biola received more cash
   **b)** They received ₦266 000 together

### Assessment

Make sure that pupils understand why currencies need to be exchanged and how to read the exchange rate of one currency for another.

### Extension activity

Pin or write the exchange rates for currencies on the board and change it every day for a week. Pupils can monitor the changes in rates and comment about it.

### Homework activity

Ask pupils to do some research in order to answer the Challenge activity on page 101 of the PB. In order to extend pupils a little more you may want to add a few other countries to the list e.g. South Africa, China, etc.

## Lesson 2   *Pupil's Book page 103*

### Preparation

You will need to have:
*   Pupil's Book
*   Newspapers with currency information.

### Starter activity

Check the answers to the Challenge activity and get feedback from pupils. See if pupils can remember the names of some of the main currencies.

### Lesson focus

Make sure that pupils understand how to convert one currency to another. Ask pupils to complete the Revision exercise on page 103 of the PB. If there is time available also ask pupils to complete the Extension activity below.

### Answers

**Revision exercise**

**1.**  £18.50 = ₦4 810   **2.**  c360 = ₦72
**3.**  $26 = ₦4 160   **4.**  Le10 500 = ₦399
**5.**  58 Rands = ₦1 450   **6.**  ₦1 050 = $6.56
**7.**  ₦7 250 = 290 Rands   **8.**  ₦32 214 = £123.90

## Assessment

Pupils should be able to do simple currency conversions. Give extra examples to any pupils who need them. Check that pupils can name the currencies of Nigeria, its immediate neighbours and countries such as the USA.

## Extension activity

At the end my recent travels around the world I came home with the following amounts of foreign currency:

| COUNTRY | CURRENCY | NAIRA |
|---|---|---|
| Australia | 150 | |
| Europe | 885 | |
| Canada | 38 | |
| England | 8, 75 | |
| USA | 22,50 | |
| China | 40 | |
| South Africa | 120 | |
| | TOTAL: | |

Change all the different amounts of currencies in the table into Nigerian Naira and calculate how much Naira I came home with in total.

## Homework activity

Pupils to research and find the names of currencies of as many African countries as they can.

## Lesson 3    *Workbook page 29*

## ⚙ Preparation

You will need to have:
- Workbook
- Pictures of flags of different countries.

## ➲ Starter activity

Hold up the flags of the different countries and ask pupils to call out the correct currency.

## 🔍 Lesson focus

In this lesson Pupils will complete Worksheet 17 in the WB. The focus is on how well pupils have

understood and assimilated the content of this unit. Pupils work on their own in trying to find solution to the problems.

## Assessment

Check that pupils have understood how to calculate the value of one currency in another.

## Extension activity

Ask pupils to come up with reasons why currencies such as the dollar and the yen and the euro are so expensive in terms of other currencies.

## Homework activity

Pupils to complete corrections to the worksheet.

## 📚 Answers

**Workbook answers Worksheet 17**

1.  a) dollar          b) pound
    c) euro           d) cedi
    e) leone
2.  a) ₦2460        b) ₦1100
    c) ₦48          d) ₦3780
    e) ₦4034.4      f) 1713.6
    g) ₦0.22        h) ₦68.75
    i) ₦15368       j) ₦4364.06
3.  a) £0.0545      b) €1.77
    c) $3048.78     d) 778 GHS
    e) 2091.8 GHS   f) SLL 714
    g) £0.442       h) $2.846
    i) SLL1700      j) €0.845
4.  ₦59860
5.  ₦17530

> **Objectives**
>
> By the end of this unit, pupils will be able to:
> - Solve problems on profit and loss, simple interest, commission, discount and transactions in the post office and market, etc.

## 🔧 Suggested resources

Price list of shopping goods (advertising supplements in newspapers will do); Calculators; Nigerian bank notes; Items such as packets of sweets, milk

## `abc` Key word definitions

*profit:* excess of returns over outlay
*loss:* something sold for less than what you paid for it
*selling price:* the price at which something is offered for sale
*cost price:* the price at which goods are bought
*dozen:* twelve
*score:* set of twenty
*principal:* an original sum invested or lent
*rate:* a fixed amount paid or charged for something
*discount:* the amount deducted from the full or normal price
*commission:* a sum, typically a set percentage of the value involved, paid to an agent

## 💬 Frequently asked questions

Q  *What prior knowledge should the pupil have?*
A  Pupils need a good understanding of addition, subtraction, multiplication and division of numbers. They need knowledge of buying and selling of articles.
Q  *How can I ensure that the pupils understand the concepts well?*
A  Ensure that pupils understand the difference between the concepts profit and loss. They should also be competent at performing percentage calculations.

## ✗ Common errors that pupils make

Pupils find it difficult to work backwards when they know the selling price and the profit, but need to know the cost price. Encourage pupils to read word problems carefully, and start by defining the information they know, and then deciding what they need to find out. They should be competent in finding profit and loss, being familiar with profit making things bigger, and a loss making them smaller, before tackling the inverse problems. Pupils find the percentage profit as a percentage of the selling price instead of the cost price.

## ✏️ Evaluation guide

Pupils to:
1. Solve problems on profit and loss, simple interest, commission, discount and transactions in the post office and market, etc.

**Lesson 1**    *Pupil's Book page 104*

## ⚙️ Preparation

You will need to have:
- Pupil's Book
- Workbook
- Calculators.

## ➲ Starter activity

Ask pupils to subtract one number from the other up to 1 000. See which of the pupils can supply answers fastest. Let the class clap for correct and quick responses. Ask what is the symbol of percentage and how is it calculated. Give some examples to illustrate and remind pupils of the concept. Pupils should be able to explain that we put

the difference over the original number and multiply by 100 to obtain percentage increase or decrease.

## 🔍 Lesson focus

Remind the pupils that to obtain the gain or loss on an article bought we find the difference between the selling price and the cost price. If the selling price is more than the cost price, we have gain, or profit, but if the cost price is more than the selling price, we have a loss. Use a few concrete examples to illustrate how the Profit and Loss formulae are applied. Give pupils 10–15 minutes to work through Exercise 1 on page 104. Check their answers at the end of the allocated time.

Work through the example on page 105 in the PB with the pupils and give a few more examples if pupils are struggling to understand. Pupils now work on Exercise 2 on page 105 of the PB.

## 📖 Answers

### Exercise 1

1. 12 notebooks cost = ₦306
   12 notebooks sold for 12 × ₦28 = ₦336
   The profit was ₦336 – ₦306 = ₦30
2. Sales price of television = ₦105 200
   Cost price of television = ₦93 500
   Profit = ₦11 700
3. Sales price of clothing = ₦8 500
   Profit = ₦2 349
   Cost of clothing = ₦6 151
4. Cost of radio = ₦9 200
   Loss = ₦3 155
   Sales Price = ₦6 045
5. Cost = 5 × 12 = 60 oranges = ₦2 400
   Sales = 60 – 18 = 42 oranges × ₦60 each
   = ₦2 520
   Profit = ₦120

### Exercise 2

**1.**

| Cost price | Selling price | Profit/Loss | % Profit/Loss |
|---|---|---|---|
| ₦7 200 | ₦8 000 | ₦800 Profit | 11% |
| ₦4 000 | ₦3 800 | ₦200 Loss | 5% |
| ₦8 300 | ₦10 000 | ₦1 700 Profit | 20.5% |
| ₦12 600 | ₦18 270 | ₦5 670 Profit | 45% |
| ₦8 000 | ₦6 600 | ₦1 400 Loss | 17.5% |

| Cost price | Selling price | Profit/Loss | % Profit/Loss |
|---|---|---|---|
| ₦3 360 | ₦3 200 | ₦160 Loss | 4.8% |

2. Cost of 900 eggs = ₦21 000
   Sales = 900 – 90 = 820 eggs at ₦30 each
   = ₦24 600
   Profit = ₦3 600
   % = 17%
3. Cost of trousers = ₦4 500
   Sale of trousers = ₦5 400
   Profit = ₦900
   % = 20%
4. Cost = 3 × 20 = 60 notebooks × ₦60 each
   = ₦3 600
   Sales = 30 × ₦40 each and 30 × ₦55 each
   = ₦2 850
   Loss = ₦750
   % = 20.8%
5. Cost of 10 mugs = ₦3 150
   Sales = 10 × ₦325 each = ₦3 250
   Profit = ₦100
   % = 3.17%

**Assessment**

Ensure that pupils understand how to calculate a percentage profit or loss. Revise with pupils how to calculate percentages and give extra practice if needed.

**Homework activity**

Complete the unfinished problems from Exercise 2.

## Lesson 2 *Pupil's Book page 106*

## ⚙️ Preparation

You will need to have:
- Pupil's Book
- Workbook
- Calculators.

## ➲ Starter activity

In groups, allow the class to practise borrowing, lending and charging interest. For example, a boy borrows 10 and after using it for two weeks pays back 12, the extra 2 paid on the 10 is the interest.

## 🔍 Lesson focus

This lesson focuses on how to calculate simple interest. Explain to pupils that the terms such as principal, rate and time are used when calculating simple interest. Principal refers to the amount borrowed or loaned; rate is the percentage at which the interest is to be calculated while time is the period of borrowing or using the principal. Explain how to calculate simple interest, year by year, or by using the formula:

Simple interest = principal × rate × $\frac{time}{100}$

Work through the given example on page 106 of the PB with the pupils and give them a few more examples if necessary. Pupils can the work through Exercise 3.

## 📖 Answers

**Exercise 3**

1. ₦48 000 × 15% × 3.5 years = ₦25 200
2. ₦52 000 × 10 % × 4 Years = ₦20 800
3. ₦50 000 × 20% = ₦10 000
4. ₦63 000 × 21% × 3 years = ₦39 690
5. ₦60 000 × 6.25% × 2 years = ₦7 500 interest
   + ₦60 000 = ₦67 500
6. ₦15 000 × 5% = ₦750
   ₦20 000 × 4% = ₦800
7. ₦300 000 × 7% = ₦21 000
   ₦350 000 × 8% = ₦28 000

---

**Assessment**
Check that pupils know the formula for simple interest and can work with it.

---

**Extension activity**
Pupils to complete the Challenge activity on page 104.

---

**Lesson 3**   *Pupil's Book page 107*

## ⚙️ Preparation

You will need to have:
* Pupil's Book
* Calculators.

## ➡️ Starter activity

Revise the work covered on equations. In particular, revise the inverse processes we used to change the subject of the equation. Work through a few simple examples involving mainly multiplication and division.

## 🔍 Lesson focus

This lesson is an extension of the previous lesson. It still deals with the topic of simple interest, but instead of work out how much interest is earned or how much the principal amount has grown, pupils have to find values for the other variable viz. the principal itself, the interest rate or the time period. This involves having to make one of these variable the subject of the equation. In order to do so we have draw on or knowledge of how to use inverse processes to change the subject of the equation. Refer to the example on page 107 of the PB and explain step by step how each of the variables, P, R and T, are made the subject of the equation in turn. Now work through the examples on page 108 of the PB in which you demonstrate the types of problems pupils will be expected to solve. Complete Exercise 4 on page 108 of the PB.

## 📖 Answers

**Exercise 4**

1. ₦20 000 ÷ 3 years = ₦6 667 interest per annum ÷ 10% = ₦66 670 principal amount
2. ₦7 200 ÷ 2 years ÷ 6% = ₦60 000
3. ₦12 800 interest ÷ 4 years = ₦3 200 per annum ÷ ₦40 000 principal amount = 8% interest
4. ₦34 000 ÷ 4 years ÷ ₦272 000 = 3.12%5.
   ₦45 000 × 3% = ₦1 350 per annum
   ₦4 050 ÷ ₦1 350 = 3 years
6. ₦576 000 total amount – ₦480 000 principal amount = ₦96 000 interest accumulated
   ₦480 000 × 8% per annum = ₦38 400 annual interest
   ₦96 000 total interest ÷ ₦38 400 annual interest = 2.5 years

## Lesson 4 *Pupil's Book page 109*

### ⚙ Preparation

You will need to have:
* Pupil's Book
* Calculators
* Nigerian bank notes
* Items such as packets of sweets, milk, etc.

### ⮕ Starter activity

Provide the pupils with items such as packets of sweets, milk, etc. to 'sell'. Give pupils a small reward from the sales made. This is commission. Also, give the pupils a real-life market situation where a discount is collected for paying in cash or buying in bulk.

### 🔍 Lesson focus

Let the pupils know the importance of paying commission. It encourages the salesmen to want to sell more so that his/her commission will be more. The lesson also shows how to calculate discounts for paying either in cash or buying so many of an item. Work through the example on page 109 to demonstrate to the pupils how discounts are calculated and give a few more if necessary to prepare them to answer. Also work through the example on page 110 to demonstrate how commissions are calculated. Do a few extra examples if necessary and then ask pupils to complete Exercise 5 page 109 and 6 page 110.

### 📖 Answers

#### Exercise 5

1. ₦14 000 less 8% = ₦12 880
2. ₦2 000 plus 20% = ₦2 400
3. ₦850 000 less 6.5% = ₦794 750
4. ₦120 000 reduced to ₦85 000 = 29.2% discount
5. ₦32 000 less ₦2 240 = 7% discount

#### Exercise 6

1. a) Profit is the amount gained on cost
   b) Discount is the amount reduced from the original price
   c) Loss is a sale for less than the cost
   d) Commission is a percentage of a sale paid to an agent
   e) Simple interest is a percentage added to a loan over a fixed period

2.

| Value of goods sold | Commission received | Percentage commission |
|---|---|---|
| ₦58 000 | ₦3 770 | 6.5% |
| ₦120 000 | ₦6 000 | 5% |
| ₦25 500 | ₦1 402.50 | 5.5% |
| ₦600 000 | ₦30 000 | 5% |
| ₦972 000 | ₦53 460 | 5.5% |

3. The percentage of ₦35 000 on ₦700 000 = 5%
4. a) 80 bags × ₦1 120 × 3% = ₦2 688
   b) 80 bags × ₦1 120 = ₦89 600 − ₦2 688 = ₦86 912
5. a) ₦350 sales − ₦200 cost = ₦150 × 27 crates = ₦4 050 Profit
   b) ₦4 050 × 7% = ₦283.50 commission

**Extension activity**
Quantitative reasoning exercise page 111.

**Homework activity**
Revision exercises on page 112 of the PB. Answers can be checked at the start of the next lesson.

## Lesson 5 *Workbook page 31*

### ⚙ Preparation

You will need to have:
* Workbook.

## ➲ Starter activity

Check the pupils' answers to the Quantitative reasoning and Revision exercises.

## 🔍 Lesson focus

This lesson consolidates and assesses work completed in the earlier lessons of Unit 18. Pupils should complete Worksheet 18 in the WB during the lesson time.

## 📚 Answers

### Quantitative reasoning

1. (₦800 × 3.2) ÷ 100 = ₦25.60
2. (₦200 × 3 × 3 ) ÷ 100 = ₦18
3. (₦400 × 24) ÷ 100 = ₦96
4. (₦350 × 2 × 10) ÷ 100 = ₦70
5. (₦300 × 3 × 5.5) ÷ 100 = ₦49.50
6. (₦2 000 × 4 × 3) ÷ 100 = ₦240
7. (₦5 000 × 20 × 2) ÷ 100 = ₦2 000
8. (₦400 × 3.5 × 5.5) ÷ 100 = ₦77
9. (₦500 × 4.5 × 2.5) ÷ 100 = ₦56.25
10. (₦4 000 × 2.5 × 3) ÷ 100 = ₦300

### Revision exercise

1.  **a)**  Sale of pencils     = ₦5 400
        Cost of pencils     = ₦4 240
        Profit         = ₦1 160
    **b)** ₦1 160 ÷ ₦5 400 = 21.5%
2.  **a)** Cost of rulers     = ₦780
        Sale = 12 − 3 = 9 rulers × ₦55 = ₦495
        Loss = ₦285
    **b)** Percentage loss = 36.5%
3. ₦116 000 × 7.5 % × 3 years = ₦26 100
4.  **a)** ₦205 000 reduced to ₦185 000 = 9.8% discount
    **b)** A sale of ₦205 000 on a cost of ₦162 000 = 21% profit
    **c)** A sale of ₦185 000 on a cost of ₦162 000 = 12.4% profit
5. ₦900 000 × 8% × 8.5 years = ₦612 000 interest + ₦900 000 principal amount = ₦1 512 000 payable
6. ₦20 000 × 12% = ₦2 400 per annum ₦3 600 will accrue after 1.5 years
7. ₦6 500 less 15% discount = ₦5 525

### Assessment

This assessment tests the extent to which the pupils have achieved the objectives stated at the beginning of this unit.

### Extension activity

Pupils can create their own questions involving commission.

### Homework activity

Correct any wrong answers from Worksheet 18.

### Workbook answers Worksheet 18

1.  **a)** ₦72 000     **b)** ₦630
    **c)** ₦2520      **d)** ₦9.07
    **e)** ₦0.33      **f)** ₦18.71
    **g)** ₦5 872.50   **h)** ₦24 532.20
    **i)** ₦1 212      **j)** ₦699.3
2.  **a)** 8%        **b)** ₦30 000
    **c)** 21 years     **d)** ₦12 000
    **e)** 0.15 years
3. ₦76623
4. ₦46 240
5. 1%
6. 20 years
7. ₦20 000
8. ₦5001
9. ₦702 000

# Unit 19   Social transactions with money

## Objectives

By the end of this unit, pupils will be able to:
- Solve quantitative reasoning problems on transactions involving money such as bank cheques and bank drafts, mail, postal orders and money orders.

## 🔧 Suggested resources

Examples of cheques, bank deposit and withdrawal slips postal orders mail orders; Nigerian bank notes

## ✗ Common errors that pupils make

Pupils cannot interpret the information given in the tables. Pay particular attention to the way the post office charges for multiples of 20 g, and always rounds up the masses to the next multiple, rather than charging by each gram. Explain that the additional charge is an administration charge, so if three separate orders are bought, there will be three additional charges. Discuss with the class whether it is better to buy two postal orders for 50, or one for 100. If they are sending the money to a single person then it would be better to send a single order.

## ✏ Evaluation guide

Pupils to:
1. Solve quantitative reasoning problems on transactions involving money such as bank cheques and bank drafts, mail, postal orders and money orders.

### Lesson 1   *Pupil's Book page 114*

## ⚙ Preparation

You will need to have:
- Pupil's Book
- Workbook
- Nigerian bank notes
- Examples of cheques, bank deposit and withdrawal slips postal orders mail orders.

## ➲ Starter activity

Ask pupils to carry out some buying and selling exercises using Naira values up to ₦100, involving making change. Also show pupils how cheques, deposit and withdrawal slips and postal/mail orders are filled out.

## 🔍 Lesson focus

Read through the text on page 114 of the PB. Work through the example on page 115 and check that pupils understand the mathematical operations involved. Complete Exercise 1 on page 115 of the PB. Give pupils the following rates of exchange: £1 = ₦260, $1 = ₦160, €1 = ₦226, R1 = ₦15.34. Have pupils complete the Challenge on page 115.

## 📖 Answers

### Exercise 1

1. ₦137 850
2. ₦156 050
3. ₦136 050
4. ₦160 050
5. ₦250 050
6. ₦85 600
7. ₦102 950
8. ₦83 458

---

### Assessment

Pupils should be able to calculate the value of one currency in terms of another.

---

### Homework activity

Worksheet 19 page 33 questions 1 and 2.

---

### Lesson 2   *Pupil's Book page 115*

## ⚙ Preparation

You will need to have:
- Pupil's Book
- Workbook
- Nigerian bank notes
- Examples of cheques, bank deposit and withdrawal slips postal orders mail orders.

## Lesson focus

Read through the table about postal charges on page 116 of the PB and explain how to read the information to decide how much it would cost to post a letter or parcel. Give lots of examples, using different weights. Ask pupils to work through Exercise 2.

## Answers

**Exercise 2**

**1.** ₦70; **2.** ₦1 060; **3.** ₦630; **4.** ₦3 210; **5.** No

### Assessment

Some pupils may have difficulty understanding that additional weight is calculated in multiples of 20 g, therefore give some board work examples of this if needed.

### Homework activity

Worksheet 19 page 33 questions 3 and 4.

## Lesson 3 *Pupils Book page 118*

## Preparation

You will need to have:
- Pupil's Book
- Workbook
- Nigerian bank notes
- Examples of cheques, bank deposit and withdrawal slips postal orders mail orders.

## Starter activity

Ask the pupils to suggest ways to send money to a relative in another town. Ask how they would arrange it if the person they are sending the money to does not have a bank account.

## Lesson focus

Use the tables on page 116 of the PB to explain how the extra charges are made at different levels, depending on how much money is being sent. Pupils should then use the information in these tables to complete Exercise 3 page 118 of the PB.

## Answers

**Exercise 3**

**1. a)** ₦110, **b)** ₦2 160; **2.** ₦900; **3.** ₦900

### Assessment

Check that pupils understand that there is a commission which is paid on postal and money orders and that this must be factored into the cost of purchasing the postal or money order. Give extra examples if needed.

### Homework activity

Worksheet 19 page 33 questions 5 and 6.

## Lesson 4 *Pupil's Book page 118*

## Starter activity

Talk to pupils about why we use money, and we can transfer money from one person to another.

## Lesson focus

Hand out photo copied cheques and postal orders and ask pupils to fill them in for a specific amount and person. Remind pupils of the charges involved in sending money. Ask pupils to calculated the weight of a parcel to send to a relative. Then ask pupils to complete the Revision exercise on page 118 of the PB (pupils can use the exchange rates on page 29 of the WB).

## Answers

**Revision exercise**

**1.** ₦41 320; **2.** ₦110; **3. a)** ₦210 650, **b)** ₦97 180, **c)** ₦192 050, **d)** ₦200 050, **e)** ₦ 111730

### Assessment

The revision exercise tests the extent to which the learners have achieved the objectives stated at the beginning of this unit.

### Homework activity

Worksheet 19 page 33 questions 7, 8, 9 & 10.

**Workbook answers Worksheet 19**

**1.** ₦61 change; **2.** ₦2 695; **3.** ₦555; **4.** ₦315; **5.** ₦50; **6.** ₦5 400; **7. a)** €4 400, **b)** No, **c)** €4 300; **8.** ₦40 500; **9.** ₦556 000; **10.** 2.5%

# Unit 20    Perimeter

## Objectives

By the end of this unit, pupils will be able to:
- Find the perimeter of given shapes by measurement
- Calculate the perimeter of rectangle and square.

## 🔧 Suggested resources

Rulers, string; Cardboard/wooden/plastic geometric shapes of all sizes (as many as possible); Pencils; Scrap paper; Measuring wheel; Tape measure

## abc Key word definitions

*perimeter:* circumference or outline of an area (also called the fence)
*rectangle:* a four sided figure with four right angles
*square:* a four sided figure with four right and all sides of equal length

## 💬 Frequently asked questions

Q *What prior knowledge should the pupils have?*
A  Pupils need a good understanding of the concept of length. They need to be able to measure the length of straight and curved lines. Pupils also need to understand and be able to choose the most appropriate unit of length.
Q *How can I make sure that the pupils do not confuse perimeter with other concepts, such as area?*
A  Give the pupils as much practice as possible. Give them opportunities to explore shapes that are cut out of, or are drawn on paper. You can also give pupils the chance to walk on the school grounds to practically measure perimeter.

## ✏️ Evaluation guide

Pupils to:
1. Find perimeter of regular shapes.

### Lesson 1    *Pupil's Book page 119*

## ⚙️ Preparation

You will need to have:
- Pupil's Book
- Workbook

- Rulers, string
- Cardboard/wooden/plastic geometric shapes of all sizes (as many as possible).

## ➡️ Starter activity

Provide the pupils with the cut out geometric shapes (triangles, circles, squares, etc). Ask them to use a length of string and to wrap it all around the outside edges of the given shapes. They must then place the string along a ruler to measure the length of the string as it fitted along the edges of the shapes.

## 🔍 Lesson focus

This lesson focuses on two aspects:
1. Measuring to work out perimeter.
2. Perimeters of rectangles.

The lesson builds the pupils' skill of measuring length. Show pupils how we can use a ruler to measure the lengths of the two dimensional shapes on page 119 of the PB. All the measured sides of the shapes can be added to find the perimeter. When pupils complete Exercise 1 on page 119 of the PB it is advisable that they only use a ruler to measure the sides. The use of string may prove awkward and inaccurate.

## 📑 Answers

**Exercise 1**

Pupils conduct measurements.

### Assessment

Make sure that pupils are able to correctly measure with both thread and a ruler.

## Lesson 2 *Pupil's Book page 119*

### ⚙ Preparation

You will need to have:
- Pupil's Book
- Rulers, string
- Cardboard/wooden/plastic geometric shapes of all sizes (as many as possible).

### ➲ Starter activity

Check the answers to the previous exercise.

### 🔍 Lesson focus

Introduce the formula for calculating the perimeter of the rectangle and explain the process of substitution again. Show pupils that if they add one length and one width of a rectangle, then the answer is half the perimeter of the rectangle. This will help them to understand why they need to multiply the sum of the length and the width by 2, giving the formula $2(l + w)$. It is also important that the pupils understand that the letter l represents the length of the rectangle and w represents the width. Point out to the pupils that we leave out the multiplication sign in front of brackets.

Work through the examples on page 121 of the PB paying particular attention to how we extract the mathematical information from all the words. Pupils now complete Exercise 2.

### Exercise 2

**1.**

| Length (l) | 21 cm | 1.52 m | 28.5 cm | 3.5 m | 1.3 m | 35 cm |
|---|---|---|---|---|---|---|
| Width (w) | 13 cm | 1.2 m | 18.5 cm | 2.2 m | 0.8 m | 21 cm |
| Perimeter | 68 cm | 5.44 m | 94 cm | 11.4 m | 4.2 m | 112 cm |

**2.** The rope must be 63 m long
**3.** The width of the farm is 500 m
**4.** Malik walked 300 m

## Lesson 3 *Pupil's Book page 122*

### ⚙ Preparation

You will need to have:
- Pupil's Book
- Workbook.

### ➲ Starter activity

Give pupils some easy objects to measure the perimeter of using a ruler such as their note books and their desks. Introduce the lesson by telling pupils that there is an easier way of finding the perimeter of objects using a formula.

### 🔍 Lesson focus

This lesson is a continuation and extension of the previous lesson. This lesson introduces the skill of determining the perimeter of squares by using formulae. For pupils to understand the formula to find the perimeter of a square, it is important that you go through the examples in the PB carefully. Make sure that you work through the worked examples at a pace that the pupils can manage, with the opportunity to ask questions as you go along. Motivate pupils to work through all the questions in Exercise 3 page 123 PB.

### 📖 Answers

**Exercise 3**

**1.** **a)** 11.2 cm    **b)** 21.2 cm    **c)** 39.2 cm
   **d)** 22 cm    **e)** 32.8 cm    **f)** 26 cm

**2.**

| Sides (s) | 4 cm | 10.5 cm | 12.1 cm | 14 cm | 77 mm | 6.48 m | 1.03 m |
|---|---|---|---|---|---|---|---|
| Peri-meter | 16 cm | 42 cm | 48.4 cm | 56 cm | 3.08 cm | 25.92 m | 4.12 m |

**3.** The perimeter of the carpet is 16 m
**4.** The sides are 7.4 m

## Assessment

Revise measurement of rectangles and ensure that pupils understand how to use the short cut method of calculating the perimeters of rectangles.

## Lesson 4 *Pupils Book page 124*

### ⚙ Preparation

You will need to have:
- Pupil's Book
- Workbook.

### ⤵ Starter activity

Go through the summary on page 124 of the PB, reminding pupils of what they have learned in lessons 1 to 3.

### 🔍 Lesson focus

Lesson 4 checks that pupils have correctly assimilated the new knowledge and understand how to correctly measure perimeters of rectangles and squares. Pupils are to complete questions 3–7 of Worksheet 20 on their own. Collect in their WBs at the end of the lesson to mark. (omit Question 2 and use for extension as it is quite hard.)

### 📚 Answers

See WB answers at the end of this unit.

### Assessment

This assessment tests the extent to which the pupils have achieved the objectives stated at the beginning of this unit.

### Extension activity

Pupils who finish early can attempt Question 2 from the worksheet on page 35 on their own.

### Homework activity

Revision exercise page 125 PB.

### 📚 Answers

**Revision exercise**

| 1. | 22.8 cm | 2. | 14.6 cm |
|---|---|---|---|
| 3. | 14.4 cm | 4. | 20.4 cm |

| Length | Breadth | Perimeter |
|---|---|---|
| 8 cm | 2.2 cm | 20.4 cm |
| 16.4 cm | 5 cm | 42.8 cm |
| 13 cm | 11 cm | 48 cm |
| 41 cm | 26.2 cm | 134.4 cm |
| 17 cm | 12.7 cm | 59.4 cm |

| Sides | Perimeter |
|---|---|
| 6.5 cm | 26 cm |
| 10 cm | 40 cm |
| 16.25 cm | 65 cm |
| 7.5 cm | 30 cm |
| 8.8 cm | 35.2 cm |

**Workbook answers Worksheet 20**

1. **a)** 12 m    **b)** 26 cm
   **c)** 12 m    **d)** 9 cm
   **e)** 12 m
2. Pupils to draw
3. 8m
4. Pupils to measure BC and then add
   9 + 3 + 5 + 6 (BC) = 23 cm
5. Pupils to draw rectangle 10 cm long and 5 cm wide
6. 20m
7. Pupils to draw triangle with 15 cm perimeter.

# Unit 21 | Circumference

> ### Objectives
> By the end of the unit, pupils will be able to:
> * Find the circumference of a circle when the radius is given
>
> * Establish the relationship between c/d and pi and find the circumference.

## 🔧 Suggested resources

String, rope, objects with circular faces, pairs of compasses, pins, nails, pencils; Cardboard cut-outs of various sizes of circles; Chart containing regular shapes; Concrete objects that are circular in shape, such as a wall clock, oranges, coins; Charts containing circle and its properties

## `abc` Key word definitions

*diameter:* straight line passing from side to side through the centre of a circle
*radius:* straight line from centre to circumference of circle
*semi-circle:* half of circle or of its circumference
*circumference:* line enclosing circle

## 💬 Frequently asked questions

Q  *What prior knowledge should the pupil have?*
A  Pupils need a good understanding of the concept of circles. They need to be able to measure length and distance round a circle. They also need to understand and be able to choose the appropriate unit of circumference.
Q  *How do I ensure that pupils learn the concept of circumference effectively?*
A  Give pupils as much practice as possible. Make them draw circles and measure round them. You can also allow pupils to practise measuring of circumference on the school playing ground and on paper.

## ✗ Common errors that pupils make

Some pupils may find it difficult to measure the circumference with string. Ensure that pupils mark the starting point on the edge of the circle so that they know when the have completed a circuit. Also they need to edge around the circle carefully, keeping the string firm, but not stretching it. Make sure that all have come to the same conclusion – that the circumference is always just over three times the diameter. If anyone does not get this ratio, observe how they have made their measurement and advise them on where they may have gone wrong.

Pupils are inaccurate in finding the diameter of a sphere. Ensure that pupils are using perpendicular lines when placing the sphere against the ruler, when following the instructions.

Pupils fail to find the radius of a sphere. They may find this difficult as they cannot find the centre of the sphere without cutting it open. They need to understand that if the measure the diameter as described, then all they have to do, is find half of this measurement.

Pupils find it confusing that there are two values for the ratio $\pi$. Explain that 3.14 and 22/7 are both merely approximations of the ratio. Each gives an estimate for the circumference. If the diameter is a multiple of 7 units, then we usually use the value of $\frac{22}{7}$ as this avoids the use of decimals, and gives a whole number answer. If numbers aren't multiples of 7 we can use either approximation.

## ✎ Evaluation guide

Pupils to:
1.  Find the circumference of a circle when the radius is given.
2.  Establish the relationship between c/d and pi and find the circumference.

## ⚙ Preparation

You will need to have:

*   Pupil's Book
*   String, rope, objects with circular faces, pairs of compasses, pins, nails, pencils
*   Cardboard cut-outs of various sizes of circles
*   Chart containing regular shapes
*   Concrete objects that are circular in shape, such as a wall clock, oranges, coins.

## ➲ Starter activity

Provide the pupils with cardboard cut outs of circles of different sizes. Pupils use string to find the circumference (perimeter) of a few circles. Provide pupils with objects like a tin of milk, a wall clock, coins and oranges and show the circular faces of the objects to the pupils. Again pupils use string to measure the circumferences. This time they also measure the diameters of the objects.

## 🔍 Lesson focus

This lesson focuses on the relationship between the length of the diameter of a circle and its circumference. Use the measurements pupils obtained during the started activity and ask them to calculate circumference divided by diameter. Ask pupils to measure the circumferences of several circles and record them with their corresponding diameters. They can then do Exercise 1 on page 126 of the PB.

## 📚 Answers

**Exercise 1**

Learners conduct measurements.

> **Assessment**
> Make sure that the pupils notice that each circumference is a little more than three times its diameter. In fact, the circumference is 3.14 ($\pi$) times the diameter of the circle.

> **Extension activity**
> Challenge page 126 of PB.

> **Homework activity**
> Pupils to complete any unfinished questions from Exercise 1.

## ⚙ Preparation

You will need to have:

*   Pupil's Book
*   String, rope, objects with circular faces, pairs of compasses, pins, nails, pencils
*   Ruler.

## ➲ Starter activity

Check the Homework/Extension exercise and verify whether the pupils have been able to work out that the circumferences could be found by multiplying the diameters by pi.

## 🔍 Lesson focus

In this lesson we find the circumference by means of calculation. From the starter activity, pupils should understand that a formula can be derived i.e. Circumference = pi × diameter. We now have to explain the relationship between diameter and radius. Make sure that pupils understand that the radius is half the length of the diameter. Thus, the circumference formula can be modified to Circumference = pi × 2 × radius (C = $2p^2$). Work through the examples on page 128 in the PB and make sure pupils have understood the procedures before asking them to complete Exercise 2 on page 128 PB. Let pupils complete Worksheet 21 page 38 Question 1 together in groups.

## 📚 Answers

**Exercise 2**

**1.**

| Diameter (D) | 5 cm | 9 cm | 11 cm | 21 cm | 13 cm |
|---|---|---|---|---|---|
| Circumference | 15.71 cm | 28.29 cm | 34.57 cm | 66 cm | 40.86 cm |

**2.**

| Radius (r) | 3.5 cm | 84 m | 1 438 m | 147 cm | 35 cm | 42.7 cm |
|---|---|---|---|---|---|---|
| Circumference | 6.29 cm | 528 m | 9 039 m | 924 cm | 220 cm | 268.4 cm |

**3.**  **a)** 163.43 cm  **b)** 113.14 cm
    **c)** 264 cm  **d)** 207.43 cm
    **e)** 226.29 cm  **f)** 174.43 cm

**4.**  **a)** (i) 56 cm (ii) 28 cm
    **b)** (i) 294 cm (ii) 147 cm
    **c)** (i) 42 cm (ii) 21 cm
    **d)** (i) 345 cm (ii) 172.5 cm
    **e)** (i) 106.9 cm (ii) 53.5 cm

**5.** 176 cm

**Assessment**

Make sure that pupils are able to understand the concept of π and work with it. Use board work to explain the relationship between π and circumference and also to give extra examples of how to calculate circumference using the formula.

**Extension activity**

Ask pupils to use C = π × d where π = $\frac{22}{7}$ to find the circumference of a circle with:

**a)** $d$ = 2.8 cm          **b)** $d$ = 15 cm

**c)** $d$ = 77 cm

**Homework activity**

Pupils to complete the Worksheet Question 1 if not completed in class.

**Lesson 3**     *Pupil's Book page 129*

## ⚙ Preparation

You will need to have:
* Pupil's Book
* Workbook.

## ➲ Starter activity

Go over Worksheet 21 Question 1 with pupils. Ask pupils if they can remember the formula and then write it on the board. Recap lessons 1 and 2 of this unit.

## 🔍 Lesson focus

This lesson recaps and tests the new learning in this unit. Go through the unit summary with pupils and then ask them to complete the Revision exercise on page 129 of the PB.

## 📚 Answers

**Revision exercise**

**1. a)** 220 cm     **b)** 176 cm     **c)** 110 cm
    **d)** 440 cm     **e)** 308 cm     **f)** 396 cm
    **g)** 1 144 cm

**2.** The circumference of the garden is 509 m

**3.** 302 cm          **4.** 239 cm

**Assessment**

Make sure that pupils are able to complete the Revision exercise independently and check for any pupils who have not grasped this section of work.

**Extension activity**

Pupils to create word problems involving circumference.

**Lesson 4**     *Workbook page 38*

## ⚙ Preparation

You will need to have:
* Workbook.

## ➲ Starter activity

Go over the homework from Lesson 3.

## 🔍 Lesson focus

In this lesson pupils must complete the remainder of Worksheet 21 on page 38.

**Assessment**

Collect in the answers to mark them, identify any problem areas and revisit those areas if necessary.

**Extension/Homework**

Pupils to measure the radius of 3 circular objects at home such as saucepans and work out their circumference.

**Workbook answers Worksheet 21**

**1.** Pupils to complete

**2. a)** 21.99     **b)** 17.64     **c)** 10.99
    **d)** 26.39     **e)** 3.99     **f)** 28.59

**3.** 17.59 cm

**4. a)** 31.4     **b)** 50.24     **c)** 9.42
    **d)** 67.82     **e)** 18.84     **f)** 81.64

## Objectives

By the end of this unit, pupils will be able to:
- Solve word problems on weight
- Solve problems on quantitative aptitude involving weight.

## 🔧 Suggested resources

Objects that have a mass of about 1 g (for example a teabag and a paperclip), an object that has a mass of about 1 kg (for example a bag of 5 or 6 tomatoes or bananas); Line with ten divisions, each division is further divided into ten; Products that have different masses (for example 500 g, 2.5 kg and 1 kg); A poster with pictures of different products with their masses written on them; Scales for measuring the mass of objects; A bag of cement; A bag of groundnut; A bag of rice; Dot poster (optional)

## abc Key word definitions

*tonne:* metric ton of 1 000 kg
*scale:* an instrument that you use to measure the weight of an object
*metric:* based on the metre

## 💬 Frequently asked questions

Q *What prior knowledge should the pupil have?*
A  The pupils should have a good understanding of the units the kilogram and the gram. They should also know that 1 000 g = 1 kg. Pupils should know that to convert kilograms to grams, they need to multiply by 1 000, and to convert grams to kilograms they need to divide by 1 000. The pupils should be able to explain why they are multiplying or dividing. Pupils should be able to add, subtract, multiply and divide within the number range for the grade. The better their skill at the four basic operations, the better their confidence will be when engaging with the problems. Pupils will also need to be able to read and interpret the problems.

## ✗ Common errors that pupils make

Pupils do not know how many grams are in a kilogram and vice versa. Pupils often confuse the different units of measurement. Use visual clues and ideas of association to help them remember. For example, design a poster of a balance scale with 1 000 g on one side and 1 kg on the other. The scale should be balanced. Design a poster with an elephant sitting on a scale. As a caption for the poster you could write something like 'Killer-grams!' Pupils do not multiply or divide by 1 000 correctly. Explain again how to multiply by 1 000. You could do this by giving the pupils an investigation and allowing them to work with a calculator. Then make a general rule for multiplying and dividing by 1 000.

## ✏️ Evaluation guidePupils to:

1. Add the weights of given objects.
2. Solve problems on quantitative aptitude involving weight.

**Lesson 1**    *Pupil's Book page 130*

## ⚙️ Preparation

You will need to have:
- Pupil's Book
- Workbook
- Objects that have a mass of about 1 g (for example a teabag and a paperclip), an object that has a mass of about 1 kg (for example a bag of 5 or 6 tomatoes or bananas)
- Products that have different masses (for example 500 g, 2.5 kg and 1 kg)
- Scales for measuring the mass of objects
- Dot poster (optional).

## ➲ Starter activity

Remind the pupils how many grams make up 1 kg. Remind them how much 1 000 is. You could create a 1 000 dot poster by grouping 10 groups of 100 dots on a poster. Explain that each dot represents 1 g. This will give pupils a mental image of just how many grams make 1 kg. You could ask the pupils to help you create the 1 000 dot poster. Revise with them how to multiply and divide by 1 000. You could ask them these questions or make up your own.

$7 \times 1\,000$; $4.5 \times 1\,000$; $6\,000 \div 1\,000$; $13\,500 \div 1\,000$; $18\,000 \div 1\,000$; $25 \times 1\,000$; $25\,600 \div 1\,000$.

## 🔍 Lesson focus

In this lesson, pupils are taught to convert between grams and kilograms and vice versa. They are also required to converting using decimal numbers. Work through the examples on page 130 in the PB explaining to convert grams to kilograms, we divide by 1 000 and to convert kilograms to grams, we multiply by 1 000. Emphasise the importance of understanding and working with inverses. When working through the worked examples, pay special attention to converting with decimal numbers. This may challenge the pupils at first. Allow them to work through all the questions as this skill requires practice. Complete Exercise 1 on page 131 of the PB.

## 📚 Answers

**Exercise 1**

1. **a)** 4.2 kg  **b)** 5.3 kg  **c)** 6. 972 kg
   **d)** 0.6 kg  **e)** 0.57 kg  **f)** 4.05 kg
   **g)** 2. 015 kg  **h)** 0.020 kg  **i)** 0.005 kg
   **j)** 0.201 kg
2. **a)** 5 000 g  **b)** 2 450 g  **c)** 7 658 g
   **d)** 123 g  **e)** 1 240 g  **f)** 700 g
   **g)** 630 g  **h)** 12 060 g
3. **a)** 600 g = $\frac{3}{5}$ kg  **b)** 1 899 g < 2 kg
   **c)** $\frac{1}{2}$ kg > 250 g  **d)** $\frac{2}{5}$ kg = 400 g
   **e)** 7.5 kg > 6 000 g  **f)** 0.001 kg < 0.25 kg

**Lesson 2**  *Pupil's Book page 131*

## ⚙ Preparation

You will need to have:
- Pupil's Book
- Workbook.

## ➲ Starter activity

Revise conversion of weights. Ask pupils to complete the table below.

| Kg (decimal) | Kg and g | G |
|---|---|---|
|  | 1 kg 250 g |  |
|  |  | 1 700 g |
| 2.30 kg |  |  |
|  | 2 kg 400g |  |
|  |  | 2 800 g |
| 2.75 kg |  |  |

Also revise the 4 mathematical operations with decimals. Demonstrate a few examples on the board in order to refresh pupils' memories.

## 🔍 Lesson focus

This lesson will cover the 4 basic mathematical operation with weights. Refer to the examples on addition and subtraction of weights on page 131 of the PB. Explain to pupils how we use the column method when adding and subtracting weights.

Advise them that it is best that all the weights are in the same units e.g. 0,45 kg can be converted to grams and they same can be done with other items before adding or subtracting them. Also refer to the examples on multiplication and division on page 132 of the PB and work through these examples on the board. Now ask the pupils to complete Exercise 2 on page 132 in the PB.

## 📚 Answers

### Exercise 2

1. 1.02 kg + 1.35 kg + 1.1 kg + 1.2 kg = 4.67 kg
2. 3 kg + 1 500 g + 1 kg 750 g + 1 kg 600 g = 7.85 kg
3. 0.5 kg + 0.55 kg + 0.575 kg = 1.625 kg
4. 8 kg 657 g – 4 kg 520 g = 4.137 kg
5. 5 kg 40 g – 2 kg 501 g = 2.539 kg
6. 13.206 kg – 9.825 kg = 3.381 kg
7. 65 kg + 55.3 kg + 60 kg + 61.9 kg + 47.2 kg + 59 kg = 384.4 kg ÷ 6 pupils = 58.1 kg average weight
8. 1.25 kg – 0.93 kg = 0.32 kg of meat left
9. 9.287 kg – 7.655 kg = 1.632 kg heavier
10. a) 3 180 kg truck + 35 × 88 kg mugs = 6 260 kg total weight (or 6 tonnes 260 kg)
    b) 3 180 kg truck – 3 080 kg mugs = 100 kg weight difference

---

**Assessment**
Pupils should be able to add and subject weights. Pupils should be able to use the column method when adding and subtracting weights.

---

**Extension activity**
Challenge activity on page 130 in the PB.

---

**Homework activity**
Worksheet 22 page 40 questions 3 and 4.

---

**Lesson 3**    *Pupil's Book page 134*

## ⚙️ Preparation

You will need to have:
- Pupil's Book
- Workbook.

## ➲ Starter activity

Give pupils some examples of real life problems involving the multiplication and division of weights, such as "if a box of chocolates weighs 0.35 kg how much will 8 boxes weigh in total?"

## 🔍 Lesson focus

Pupils need to be able to multiply and divide weights. Use the example on page 133 to explain the method for multiplying and dividing weight to pupils. Complete Exercise 3 on page 134 of the PB with the class.

## 📚 Answers

### Exercise 3

1. 6.073 kg × 6 = 36.438 kg
2. 0.682 kg × 8 = 5.456 kg
3. 12.34 kg × 4 = 49.36 kg
4. 6 kg 73 g × 9 = 60.57 kg
5. 3.142 kg ÷ 2 = 1.571 kg
6. 4.104 kg ÷ 9 = 0.456 kg
7. 2.622 kg ÷ 3 = 0.874 kg
8. 87 kg 857 g ÷ 7 = 12.551 kg
9. 60 bags × 22 kg 501 g each = 1 350.06 kg of onions
10. a) 2.5 kg ÷ 50 g = 50 candies
    b) 3.5 kg ÷ 50 g = 70 candies
    c) 5.25 kg ÷ 50 g = 105 candies
11. 1.08 kg of pencils ÷ 8 packets = 135 g per packet
12. 1 800 litres of petrol × 0.78 kg per litre = 1 404 kg

---

**Assessment**
Revise units of weight with pupils to be absolutely sure pupils understand them.

---

**Extension activity**
Pupils to make up word problems involving weight.

---

**Homework activity**
Worksheet 22 page 41 questions 5 and 6.

## Lesson 4 *Pupil's Book page 134*

### ⚙ Preparation

You will need to have:
- Pupil's Book
- Workbook.

### ➲ Starter activity

Discuss the summary on page 134 of the PB with pupils.

### 🔍 Lesson focus

Use the lesson for pupils to complete the Revision exercise on page 134 of the PB.

### 📚 Answers

**Revision exercise**

1.  a) 900 g = 0.9 kg
    b) 061 g = 3.061 kg
    c) 18% of 75 kg = 13.5 kg
    d) 25% of 45 kg = 11.25 kg
    e) $\frac{3}{5}$ kg = 600 g
    f) $6\frac{3}{5}$ kg = 6 375 g
    g) 1.2 kg = 1 200 g
    h) $18\frac{3}{4}$ kg = 18 750 g
2.  a) 1.74 kg + 3.658 kg = 5.398 kg
    b) 8.006 kg – 5.885 kg = 2.121 kg
    c) 17.34 kg × 8 = 138.72 kg
    d) 30.824 kg ÷ 8 = 3.853 kg
3.  7 000 kg ÷ 40 bags = 175 kg per bag
4.  3 × 51 kg = 153 kg + 55.7 kg + 57.3 kg = 266 kg ÷ 5 pupils = 53.2 kg average weight
5.  a) 160 000 kg can be carried (this is equal to 400 logs of 400 kg each)
    b) 265 rice bags × 25 kg each = 6 625 kg which leaves 153 375 kg for logs ÷ 400 kg each = 383 logs

### Assessment

Check pupil's answers to the Revision exercise to ascertain who is having difficulties. Create extra practice for any pupil needing help.

### Homework activity
Worksheet 22 page 41 questions 7 & 8.

### Workbook answers Worksheet 22

1.  8.8 kg
2.  a) No
    b) Because it is a very large weight
    c) 31.5 kg
3.  24500 kg = 22685.18 litres
4.  800 kg, no this is more than 0.75 of a tonne
5.  990 kg, yes this is less than a tonne
6.  Imagine the nine coins in three stacks of three coins each. In one move we can find which of the three stacks is lighter (i.e. the one containing the lighter coin). It then takes only one more move to identify the light coin from within that lighter stack. So in two weighings we can find a single light coin from a set of 3 × 3 = 9.
7.  1ˢᵗ = 36 kg, 2ⁿᵈ = 72 kg and 3ʳᵈ = 48 kg
8.  Mrs Abu = 162 kg, Mrs Martins = 166.5 kg and Mrs Omi = 157 kg.

**Pupil's Book page 136**

### Objectives

This project teaches pupils the basics of being an entrepreneur because they must buy and sell for a profit. Pupils will practice setting prices, calculating total costs and also calculating change.

### ⚙ Preparation

You will need to have:
- Pupil's Book
- Calculators
- Objects for sale such as fruit, groceries, rice, beans, beverages, cool drinks etc.
- Provide improvised money by cutting up sheets of paper and writing different denominations on them. Improvise coins by using buttons or boiled sweets.

### 🔎 Guidelines

Set up 4 different stalls and price all the objects. Provide measuring spoons and scales where suitable. Allow pupils to buy and sell in groups. They should also give discounts. Pupils should keep a record of their sales when it is their time to be the seller.

This is a fun activity that pupils will enjoy so allow plenty of time and it can be extended over more than one lesson if time permits.

### ➲ Starter activity

Talk to pupils about shopping. Find out which pupils are allowed to go shopping on their own for their families to buy things for themselves. Talk to pupils about checking change and why it is important. See if any pupils volunteer information about having received the wrong change.

If time permits create a quick game by telling pupils the price of an item you want to buy, e.g. apples, the price of the apples and how much money you are handing over to the shopkeeper. Pupils can shout out the correct amount of change that you should be given. This will helps pupils to

think quickly about money and subtraction of one amount from another.

### 🔎 Lesson focus

Explain to pupils that they will be buying and selling in a class market. Demonstrate how the shops are to be set up and show pupils the pretend money. Make sure that the prices of goods are clearly displayed. Pupils should be divided into groups and take turns in being the shopkeeper. The shopkeeper should have spare paper for prices so that they can change the prices and add discounts. Monitor the time during the lesson and get pupils to change roles regularly. This lesson may become quite noisy.

### Assessment

Check on the different groups during the lesson and monitor any pupils who are having difficulty with change or discounts. Pupils should be able to give and receive the correct change. Shopkeepers should be able to calculate simple discounts.

### Extension activity

Pupils to make a list of items on which they think discounts should be offered and why.

### Homework activity

1. Ask pupils to create a list of prices of different objects when they next go to the shops.
2. Ask pupils to make a list of items being offered with a discount and to write down the amount of the discount offered.

**Pupil's Book page 137**

### Objectives
- To assess the extent to which pupils have understood and mastered the content of Units 11–22
- To provide feedback on areas in which intervention is needed.

## 🔍 Guidelines

The questions in this test cover Units 11–22, and so includes questions on perimeter, weight, currencies, interest and word problems amongst other topics. Pupils should work through the questions on their own, taking as much time as they need. Encourage pupils not to spend too much time on a question if they get stuck. Instead, they should go on to the next question, and come back to the question they were struggling with if they have time. Encourage all pupils who have completed the task to spend at least five minutes checking their work. You may need to allocate more time for this assessment than usual for a lesson and you will need a follow up lesson to go through the assessment with the class.

## Lesson 1

Pupils will need paper or note books to work in. Explain to pupils how much time they will be allowed. Collect in paper or books for marking at the end of the allocated time. Mark each pupils work individually and assess areas that may need extra practice.

### 📖 Answers

1.  **a)** 28        **b)** 40        **c)** 57
    **d)** 43        **e)** 93
2.  **a)** 29        **b)** 42        **c)** 38
    **d)** 44.5      **e)** 26.5
3.  **a)** 15, 7.5, 5          **b)** 200, 100, 66.6
    **c)** 180, 90, 60         **d)** 408, 204, 136
    **e)** 164, 82, 54.6
4.  **a)** 0.567, 0.283        **b)** 4.883, 2.4417
    **c)** 0.642, 0.321        **d)** 0.983, 0.491
    **e)** 1.0425, 0. 5212

5.  **a)** 97      **b)** 13      **c)** 13.7    **d)** 15.4
    **e)** 11      **f)** $1\frac{1}{4}$      **g)** 9      **h)** $2\frac{4}{8}$
    **i)** $4\frac{1}{2}$      **j)** 1.5
6.  ?        **7.** 100        **8.** 400        **9.** 0.5
10. Fr40      **11.** ₦1 824 000
12. Nigeria = naira and kobo = ₦ & k
    Gambia = dalasi = D & b
    Sierra Leone = Leone & cents = Le & c
    Britain = pounds and pence = £ & p
    Ghana = cedi and cents = ¢ & p
    U.S.A = dollars and cents = $ & ¢
    Togo = Francs and cents = fr & ¢
    Japan = yen = ¥
13. **a)** 800      **b)** 16%
14. ₦ 7125    **15.** 1035    **16.** 5175
17. ₦9408      **18.** 72 m    **19.** 8.9, 6.28 5, 6.6, 14
20. 1 836 ℓ    **21.** 9.152 ℓ
22. 9.4 ℓ
23. **a)** $6\frac{3}{4}$ ℓ    **b)** **12.**375
24. 165 ℓ        **25.** 505.07 litres left

## Lesson 2

### 🔍 Lesson focus

Use this lesson to go through the assessment answers and also to encourage pupils to ask questions if there are any answers that they do not understand.

### Assessment

Use the results of the assessment to identify pupils who need extra help. Organise groups to work on specific areas of the content of Units 11–22, as needed.