Nigeria

Primary Maths

Gr 2

Teacher’s Guide
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How to use this course

The New General Mathematics Primary 2 Pupil’s Book consists of 30 units. Each unit starts with a list of objectives, or commonly known as performance objectives (as listed in NERDC, 2013) that will be covered in each unit.

In addition, the exercises in the Pupil’s Book have been carefully developed to ensure integration of the performance objectives from the curriculum, and a steady progression of skills throughout the year.

It is important that you follow the order of the units, especially for related sub-topics, as units build on the knowledge and skills acquired in preceding units.

The units follow a ‘teach and practise’ approach:
- New concepts are explained and given context in their meaning.
- Worked-through examples show pupils how to approach problem solving.
- Exercises allow pupils to practise on their own.
- Revision exercises round off each unit as a mixed exercise covering all the problems addressed in the unit.

Summative assessment activities are provided at the end of every term in the form of Term assessments, along with a term project. These assessments test pupils on all the knowledge and skills they have gained in each term, and the projects enable the pupils to apply the work they have learnt in practice.

Additional features include:
- Key words: Key terminology is highlighted for the pupils. Definitions are given in the Pupil’s Book and in the Teacher’s Guide.
- Puzzles: Additional problems, usual in a real-life context to help grow an appreciation of mathematics in everyday life.
- Challenges: Extension problems for stronger pupils to attempt. These exercises generally extend the scope of content covered in each unit.
- Teaching notes: Advice and ideas for teachers in dealing with the content on each page.

Features of the Teacher’s Guide
This New General Mathematics Primary 2 Teacher’s Guide is lesson-based. The units of the Pupil’s Book are organised into a series of lessons. Units include most of the following features:
- The performance objectives from the curriculum that are covered in the unit.
- A list of suggested resources you will need.
- Definitions for the key words in the Pupil’s Book, as well as some additional key words and their descriptions.
- Frequently asked questions relating to teaching the unit’s content (not always applicable).
- Common errors pupils make (not always applicable).
- An evaluation guide showing the key learning milestones.

Each lesson includes the following:
- Preparation for the lesson (all the suggested resources) – remember, these can be tailor-made to suit the requirements of your classroom situation.
- A starter activity, which helps you focus on the topic, or revise previous required knowledge.
- Lesson focus, which suggests how you should teach the lesson, and the main strategies you can incorporate.
- Answers to all exercises, puzzles and challenges in the Pupil’s Book and Workbook.
- Assessment guidance on how to effectively assess pupils in each lesson.
- Extension activities (not always applicable).
- Suggestions for homework activities, where necessary.

Note: The lesson-based guidelines are suggestions only. You, as the teacher, will need to assess how much your pupils are able to cover in each lesson.

Features of the Workbook
The New General Mathematics Primary 2 Workbook provides a worksheet for every unit.
in the Pupil’s Book. Pupils use these worksheets to practise the specific mathematical skills and concepts covered in each unit. It forms as a consolidation of the pupils’ understanding and is a useful resource for homework assignments. Pupils can record their answers and calculations in the spaces provided on each of the worksheets.

The answers to these worksheets are all provided in the Teacher’s Guide.

**Methodology**

Mathematics teaching and learning goes beyond reaching the correct answer. Many mathematical problems have a range of possible answers. Pupils need to understand that mathematics is a tool for solving problems in the real world; not just about giving the correct answers.

The Mathematics classroom must therefore provide an environment in which problem solving is seen as integral to the teaching programme, and where learning activities are designed to provide pupils with opportunities to think.

Working mathematically involves:
- questioning
- applying strategies
- communicating
- reasoning
- reflecting.

Pupils will require some, or all of the above processes, to make sense of any mathematical concept.

Problem-solving strategies include:
- trial and improvement
- acting it out
- making a model
- drawing a diagram or picture
- looking for patterns
- working backwards (inverse operations)
- using tables and data
- making a list.

Primary Level 2 focuses primarily on building and strengthening the first five strategies listed above, and then in the later primary levels, builds on the other strategies.

Alongside developing these problem-solving strategies, it is important for pupils to gain specific mathematical knowledge as tools for problem solving. At Primary level 2, these tools include:
- counting, ordering, reading and writing numbers from 0 to 99
- identifying, reading and counting numbers from 100 to 200
- working with place value
- ordering and writing numbers from 0 to 200
- working with fractions (in halves, one-quarter and three-quarters)
- adding two-digit and three-digit numbers without exchanging or renaming
- adding two-digit numbers with exchanging or renaming
- subtracting two-digit numbers without exchanging or renaming
- subtracting two-digit numbers with exchanging or renaming
- adding three numbers together
- working with multiplication using repeated addition
- working with open sentences and word problems
- working with money (identifying the uses of money, recognising all types of Nigerian money, and changing money up to and no greater than ₦20)
- measuring and comparing lengths (natural units, such as hand spans, arm spans, footsteps and strides; and standard measures, such as centimetres and metres)
- telling the time (in hours and half hours), and naming and arranging days of the week
- ordering and comparing objects of weight
- working with capacity (identifying objects that can measure capacity and order containers according to their capacities)
- comparing areas of surfaces and identifying the use of standard measuring units
- working with two-dimensional shapes (square, rectangle, circle and triangle), and identifying corners of a square
- working with three-dimensional shapes (cube and cuboid, sphere and cylinder)
- collecting and arranging data.
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**Theme 4: Mensuration and geometry**  
**Sub-theme: Secondary measures**

| 1. Capacity | 1. Identify and name objects that could be used for measuring capacity, e.g. cups, empty containers, buckets | Unit 25 Capacity | 92 | 37 |
|             | 2. Order containers based on their capacities | | | |
| 2. Area    | 1. Compare areas of surfaces | Unit 26 Area | 96 | 39 |
|            | 2. Identify the use of standard measuring units | | | |

**Theme 4: Mensuration and geometry**  
**Sub-theme: Shapes**

| 1. Three-dimensional shapes | 1. Identify and count the flat faces of a cube and a cuboid | Unit 27 Three-dimensional shapes: cubes and cuboids | 102 | 41 |
|                            | 2. Identify and count the corners of a cube and a cuboid | | | |
|                            | 3. Identify and count the edges of a cube and a cuboid | | | |
|                            | 4. Identify objects at home that are cuboid and cubes | | | |
|                            | 5. Identify the curved surfaces of a cylinder | Unit 28 Three-dimensional shapes: spheres and cylinders | 108 | 43 |
|                            | 6. Mention three-dimensional objects in the home that are cylinders and spheres | | | |
| 2. Two-dimensional shapes  | 1. Identify a square, a rectangle, a circle and a triangle | Unit 29 Two-dimensional shapes | 110 | 45 |
|                            | 2. Indicate which corner of a two-dimensional shape is a 'square corner' | | | |

**Theme 5: Everyday statistics**  
**Sub-theme: Data collection and presentation**

| 1. Data collection | 1. Collect data and arrange them in arrays | Unit 30 Data collection | 116 | 47 |
|                    | 2. Collect data and arrange them in groups, such as groups of boys and groups of girls | Project: Data collection | 120 | |
Objectives
By the end of this unit, pupils will be able to:
• Count numbers correctly up to 99
• Identify and read numbers from 1 to 99
• Identify order and write numbers up to 99.

Suggested resources
• Wall chart showing the numbers 1 to 100
• Number cards
• Overlay cards
• Concrete objects such as matchsticks, bottle tops, sticks, seeds, pebbles or buttons to use as counters

Key word definitions
count on: counting up or forward from a number
count back: counting down or backwards from a number

Frequently asked questions
Q. What prior knowledge do the pupils need?
A. Pupils need to be able to read and write and count numbers up to 100. Pupils should be able to write all numerals without reversals.

Common errors pupils make
• Pupils may confuse ‘teen’ with ‘ty’ when saying a number, for example, saying ‘thirteen’ when they mean ‘thirty’ and vice versa.
• When counting forwards or backwards, the decade change can cause difficulties so you should give extra emphasis to saying the numbers after 29, 39, 49, etc. and the numbers before 20, 30, 40, etc.

Evaluation guide
Assess whether pupils can:
1. Count numbers correctly up to 99.
2. Identify and read numbers from 1 to 99.
3. Identify order and write numbers up to 99.

Lesson 1
Pupil’s Book p 8; Workbook page 5

Preparation
For the lesson, you will need:
• 100 chart
• Pupil’s Book
• Workbook

Starter activity
Play the ‘Beep’ game. Your pupils stand or sit in a large circle and count around the circle. One pupil starts at ‘one’, the next says ‘two’, and so forth. (You can start at any number and count forwards or backwards to create variations in the game.)
Every time a decade number should be spoken, the pupil says ‘beep’ instead. The next pupil must say the number after (or before if you are playing backwards) the missing number.

All pupils need to listen and concentrate in order to play the game successfully. As an added challenge, you could ask the pupils to say ‘beep’ on numbers ending in 5.

Lesson focus
Use the 100 chart and a pointer and ask the pupils to rote count from a given number. You can ask the whole class, a group from the class or an individual to count a particular sequence as you point to the numbers. Invite pupils to take turns at being the person who points to the number. Can they move the stick from number to number in time with the counting?

Ask the pupils to complete Exercise 1 (Pupil’s Book page 8). They can do this individually or with a
partner. You may wish to pair up less confident pupils with the more able pupils. Discuss with the pupils all the things they can think of that counting is used for.

Answers

Exercise 1
This is an oral activity. Check the pupils' counting.

Puzzle (Page 8)
20, 24, 28, 40, 42, 48, 80, 82, 84, 204, 208, 240, 248, 280, 284, 402, 408, 420, 428, 480, 482, 802, 804, 820, 840, 824, 842. There are other possible answers if digits are permitted more than once, for example, 244.

Worksheet 1
1. 120 beads including the four at the end of the string.

Assessment
Observe and listen to the pupils during the lesson. Find time to check individual pupils on their ability to count on and count back. At any point in the school day you can withdraw a pupil and ask him or her to count up to 100. Observe and listen to how pupils respond while completing Exercise 1. Pupils should be able to rote count to 100.

Extension activity
Provide opportunities for pupils to count beyond 100. This is so that your pupils do not get the impression that numbers stop at 100.

Ask the pupils to look for, and keep a record of, all the places they see or hear numbers being used.

Homework activity
Worksheet 1, page 5, Question 1.

Lesson 2
Pupil’s Book pages 8 and 9; Workbook page 5

Preparation
For the lesson, you will need:
- 100 chart
- Board and chalk
- Strips of paper marked into ten spaces
- Number line with the numbers 0–100 written on it
- Pupil’s Book
- Workbook

Starter activity
Play the ‘Squeeze’ game. The object of this game is for pupils to identify the mystery number you select and to ask questions. You have two markers, which you initially place at either end of the number line. The pupils might ask ‘Is the number more than thirty?’ If it is, you move the marker from 0 to 30, so the mystery number is now between 30 and 100. The game continues until the mystery number is identified by being squeezed between the two pegs. Challenge the pupils to find the mystery number in less than ten questions (quite easy) or less than five questions (not so easy!).

Lesson focus
Use the example on page 8 in the Pupil’s Book and the board to demonstrate how to write the numbers 0–9.

Draw a series of ten boxes on the board and write a number in the first and last boxes. Point to any of the empty boxes and ask the pupils which number would go in the box. For example: Write 63 in the first box and 72 in the last box. Point to the box next to 63 and ask ‘What number goes here?’ When a pupil responds with the correct number it is important to follow up with the question, ‘How do you know that?’ The response you are looking for is ‘64 comes after 63,’ or ‘64 is one more than 63’.

Use empty boxes that will require the pupil to respond using knowledge of the number before as well as the number after and numbers between.

Hand out a number strip to each group or pair.
Each strip should have a different start and end number so they can be swapped to provide another exercise. One person in the group or pair acts as teacher and asks what number will go here. The partner or remainder of the group must identify the number and give the reasons why the number is correct using the language, ‘before’, ‘after’, and ‘more or less than’.

Pupils complete Exercise 2 (Pupil’s Book page 9).

Answers

Exercise 2
1. 44, 69, 50, 76, 99
2. 57, 29, 68, 44, 89
3. 56, 68, 80, 95, 99
4. 39, 54, 59, 74, 89

Worksheet 1

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Assessment
Do a spot check. Ask pupils at any time ‘Give me the number before/after …’, or ‘Give the number one more and one less than a given number in the range zero to a hundred.’

Pupils should be able to give the number before and after a given number in the range 0–100.

Extension activity
Use numbers larger than 100 on the paper strips.

Homework activity
Worksheet 1, page 5, Question 2. Pupils are to complete the number chart.
Once pupils can successfully create ordered sequences complete they do Exercise 3 of Numbers to 99 (Pupil’s Book page 9).

### Answers

**Exercise 3**

1. 47, 56, 68, 96
2. 57, 78, 84, 92
3. 27, 34, 45, 65, 94
4. 14, 22, 42, 61, 89

**Challenge (page 9)**

Two hundred and thirty-one
Three hundred and seventy-five
One hundred and six
Four hundred and ninety
Five hundred and eighty-four

**Worksheet 1**

3. a) twenty-eight
   b) thirty-seven
   c) fifty-eight
   d) sixty-nine
   e) ninety-nine
   f) seventy-four

**Assessment**

Do a spot check. Ask pupils at any time ‘Give me the number before/after ...’ or ‘Give the number one more and one less than a given number in the range zero to one hundred.’

Pupils should be able to give the number before and after a given number in the range 0–100.

**Extension activity**

Provide pupils with numbers in the range 100–200 and beyond and allow them to practise ordering.

**Homework activity**

Worksheet 1, page 5, Question 3.

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**Lesson 4** Pupil’s Book page 8

### Preparation

For the lesson, you will need:
- Cards with numerals 0–99 written on them
- Cards with number words written on – number words one to nine and the decade numbers ten, twenty, thirty, forty, fifty, sixty, seventy, eighty and ninety
- Pupil’s Book

### Starter activity

Draw a 3 × 3 grid on the board and invite the pupils to give a two-digit number to be written in each square. Place the decade word cards face down spread out on one table and the 1–9 cards face down spread out on another table. Ask a pupil to select a decade number and another pupil to select a 1–9 number. Hold the two cards up together to make a two-digit number. Pupils read the number and if the number is on the grid they can cross it off. Once a card has been used it cannot be used again. The pupils will need to think carefully about the numbers they put on the grid. Pupils can draw a grid in their books and choose nine two-digit numbers for themselves and play the game, like a Bingo game.

### Lesson focus

The starter activity provides much of the lesson focus as it provides the opportunity for reading number words.

Pupils also need to be able to write the number words as well as the digits. The game could be played with the pupils writing the number words on their game boards and two-digit numeral cards being drawn from a bag or box. When the pupil has a number word matching a numeral they can cross it off.

Pupils are to draw a 10 × 10 grid of squares and put the decade digits in using a coloured pencil. They can then fill in the remaining numerals using a different colour pencil.
Lesson 5  Pupil’s Book pages 8 and 9

Preparation
For the lesson, you will need:
- Large box of bottle tops
- Box of buttons or other small items
- Pupil’s Book

Starter activity
Play the ‘Beep’ game, from Lesson 1. You can extend the game to have the pupils counting in 2s around the circle and ‘Beep’ on every decade number.

Lesson focus
Pupils should be able to use different counting strategies to count large sets of objects. Give pupils some practice in counting in 2s, 5s and 10s. Let them use their 100 number squares to help them.

Ask the pupils to count out 20 bottle tops. Discuss with the pupils how they counted. Some may have counted in ones, some should have counted in twos, and some may have seen the tens arrangement.

Discuss the efficiency and speed of counting using the different methods. Ask the pupils to count the number of bottle tops in twos. Ask the pupils to specifically arrange the bottle tops for ease of counting in 1s, 2s, 5s and 10s. Provide opportunity for counting large sets of objects. Write larger numbers on the board for pupils to count out.

Answers

Class activity
Check that pupils have counted correctly.

Assessment
Pupils should be able to count out large groups and also be able to find more convenient methods of counting than in 1s.

Extension activity
Using the number grid from homework, pupils can put a cross on 5, 10, 15, etc.

Homework activity
Pupils to draw a 10 × 10 number square and fill it in. They must then circle every even number.
Unit 2: Counting up to 200

Objectives
By the end of this, unit pupils will be able to:
• Count numbers correctly up to 200
• Identify and read numbers from 1 to 200
• Identify order and write numbers up to 200.

Suggested resources
• Drinking straws
• Elastic bands
• Wall chart showing the numbers 1–200
• Number cards
• Overlay cards
• Objects such as matchsticks, bottle tops, sticks, seeds, pebbles or buttons to use as counters

Key word definitions
There are no new key words in Unit 2. Remind pupils of the key words from Unit 1: count on and count back.

Frequently asked questions
Q What prior knowledge do the pupils need?
A Pupils should be able to understand the teens numbers as 10 and _____? They should be able to rote count beyond 100. They should also be able to read any two-digit number.

Common errors pupils make
Pupils will often reverse the digits in two-digit numbers. This is most often just a ‘careless’ mistake, however, encourage pupils to look carefully at the number they have written and check for themselves that it is correct. As pupils gain an understanding of place value and the importance of having the digits in the correct order then mistakes are less likely to occur.

Evaluation guide
Assess whether pupils can:
1. Count numbers correctly up to 200.
2. Identify and read numbers from 1 to 200.
3. Identify order and write numbers up to 200.

Lesson 1 Pupil’s Book page 10; Workbook page 6

Preparation
For the lesson, you will need:
• Wall chart showing the numbers 100–200
• Drinking straws, elastic bands or other counters
• Pupil’s Book
• Workbook

Starter activity
Spread a set of large digit cards out on the floor. You could also fix them to the board, but they must be moveable. Ask pupils to make two-digit numbers using the cards.

You could ask:
• Make the largest two-digit number you can.
• Make the smallest two-digit number you can.
• Make a number larger than 62 (or any number of your choice).
• Make a number smaller than 35 (or any number of your choice).
• Make a number that is between 34 and 56 (or any two numbers of your choice).
• Now do the same thing adding on a hundred card to make numbers such as 120.

Allow them to refer to the 100 board if necessary, but note which ones still require the support. This activity could also be done by writing the digits 0–9 on the board and asking the pupils to record the answer or possible answer to each question.

It is good that pupils see that there is not always just one correct answer. If you use this method, then it is important that pupils share their answers after each question has been asked.
Lesson focus

Encourage pupils to recognise numbers up to 200 and to be comfortable counting forwards or backwards up to 200.

Be aware of any pupils who have difficulty counting with three-digit numbers and give them extra practice.

Complete Exercise 1 with the class (Pupil’s Book page 10).

Answers

Exercise 1

This is a class activity. Make sure to demonstrate to pupils how to count in tens. Use a pointer and the numbers chart to help them with this activity.

Worksheet 2

1. 103

Assessment

Find time to check pupils individually to make sure they are confident with the numbers 100–200. Some pupils may have difficulty counting in 10s.

Extension activity

Use the five apple tree illustrations in the Pupil’s Book to introduce pupils to counting in groups of 40.

Homework activity

Worksheet 2, page 6, Question 1.

Lesson 2  Pupil’s Book page 11; Workbook page 6

Preparation

For the lesson, you will need:

- Straws and elastic bands
- Ten beakers with ten coloured pencils in each beaker, or you can use straws if there are not enough pencils available
- Pupil’s Book
- Workbook

Starter activity

Use ten beakers and coloured pencils to demonstrate how to make bundles of 10 in the ten different beakers. Get pupils to guess how many pencils there are altogether and then let the class count out loud in tens.

Lesson focus

Provide pupils with sufficient equipment to make bundles for themselves (drinking straws, sticks or anything else that can be grouped into tens). Ask them to count out 26 items. Write 26 on the board. Ask them ‘How many groups of ten do you expect to be able to make?’ Many pupils will be able to use their knowledge of grouping in tens to count large sets of objects into this situation. Ask pupils to physically group their items into groups of 10.

Ask: ‘What part of the number 26 tells us we have two groups of ten? What does the six tell us?’

Repeat with more numbers until you are fairly certain that most pupils understand.

Repeat with a number where the tens and ones digits are the same, for example, 44.

Can pupils still identify that it is the 4 on the left that indicates there are four tens?

Complete Exercise 2 on groups of 10 (Pupil’s Book page 11) when you are sure that pupils have understood the activity. They can work in groups if there are not enough straws and beakers for each pupil to work individually.
**Answers**

**Exercise 2**
This is an oral activity. Pupils should have eighty straws divided between eight beakers and then 100 straws divided between ten beakers.

**Worksheet 2**
2. 167

**Assessment**
Throughout the teaching you should make continuous formative assessments through questioning of the pupils and by listening to their responses. Also listen to the conversations and questions of the pupils as they manipulate the equipment. Pupils should be able to say how many groups of 10 are in any two-digit number.

**Homework activity**
Worksheet 2, page 6, Question 2.

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**Lesson 3**  
*Pupil’s Book page 11; Workbook page 6*

**Preparation**
For the lesson, you will need:
- Box of drinking straws (plenty) and elastic bands
- Small items for grouping in tens – buttons, beads, pebbles, sticks
- 100 chart for the class
- 200 chart (Pupil’s Book page 10)
- Set of overlapping number cards with decade numbers 10–90 on cards twice the size as the 1–9 digit cards. The 1–9 digit card must fit exactly over the 0 on the decade card
- Pupil’s Book
- Workbook

**Starter activity**
Draw a 4 × 4 grid on the board (or ask each pupil to draw a grid in their book) and ask pupils to choose a two-digit number to go in each square. From a bag of numeral cards draw out a two-digit number and read it as: ‘My number is ... tens and ... ones.’ For example, if you draw 34 say: ‘My number is three tens and four ones.’ Any pupil with number 34 on their board can cross it off. The first pupil to get a line, horizontal, vertical or diagonal is the winner.

**Lesson focus**
Revise the work carried out in the previous lesson. Particularly focus on any pupils who had difficulty with the starter activity. These pupils require further practical work making bundles of 10 as they have not yet generalised the rule.

The remainder of the pupils can continue with Exercise 3 (Pupil’s Book page 11) and also practise the spelling of number words.

**Answers**

**Exercise 3**
146

**Worksheet 2**
3. 134
Assessment
Throughout the teaching of the activity make continuous formative assessments through questioning of the pupils and by listening to their responses. Also listen to the conversations and questions of the pupils as they manipulate the equipment. Pupils should be able to say how many groups of 10 are in any two-digit number.

Extension activity
Provide pupils with further numbers in numerals and words.

Homework activity
Worksheet 2, page 6, Question 3.

Lesson 4  Pupil’s Book page 11; Workbook page 6

Preparation
For the lesson, you will need:
• 200 chart (Pupil’s Book page 10)
• Set of overlapping number cards with decade numbers 10–90 on cards twice the size as the 1–9 digit cards. The 1–9 digit cards must fit exactly over the 0 on the decade card
• Pupil’s Book
• Workbook

Starter activity
Repeat the starter activity from the previous lesson. When calling the number, sometimes give the ones number before the tens number.

Lesson focus
Pupils now need to transfer their knowledge of tens and ones to their knowledge of addition and see a two-digit number as an addition of a tens number and a single-digit number. This is knowledge that will be used when learning to add and subtract two-digit numbers with understanding.

Using the overlapping digit cards pupils can see how the ones digit replaces the zero in the decade number.

Make a class odometer: Set up a pair of chairs. One pupil is the tens number and the other pupil the ones number. The tens number pupil has a set of 10–90 digit cards and the ones pupil has a set of 1–9 digit cards. The pupils hold these cards in order. (It would be even better if they can be fixed on a ring so they can just be flipped over.) The remaining pupils count slowly. As they count the odometer must show the number being said. Stop each time the ones number is on 9 and ask: ‘What will happen next?’ When the ones number gets to 9, on the next number the decade changes one more and the ones number is 0.

Practise on the board looking at two-digit numbers as a decade number plus a single-digit. Record on the board, for example, 28 = 20 + 8.

Practise a few examples with the pupils before completing Exercise 4 (Pupil’s Book page 11).
Answers
Exercise 4
1. This will vary according to your class numbers.
2. There are 128 pages in the book.

Worksheet 2
4. 186

Assessment
Continuous observation during teaching will highlight pupils struggling and those who have firmly grasped the concept of counting. Successful completion of Exercise 4 should also indicate that pupils have grasped the idea.

Extension activity
Encourage pupils to repeat Exercise 4 counting in groups of 10.

Homework activity
Worksheet 2, page 6, Question 4.

Lesson 5

Preparation
For the lesson, you will need:
• 100 number board
• 200 number board
• Box of drinking straws (plenty) and elastic bands
• Small items for grouping in tens, such as buttons, beads, pebbles and sticks
• Pupil’s Book

Starter activity
Get the pupils to stand in the middle of the room in a big group. Ask them to form pairs and then count how many pairs there are. Notice if there is a remainder. Now do the same for groups of three, five and ten. Each time point out the remainder.

Lesson focus
This lesson should help pupils to understand that we can group in bundles of different sizes. Make sure each pupil has counters. Now write on the board different numbers and amounts to group the numbers into. For example, 21 in groups of 3, or 85 in groups of 5. Pupils can work in pairs or individually. To speed up the exercise, use pairs to place a pupil that works quickly with a slower pupil.

When pupils are confident with making groups of different sizes, use the number boards to show them how to count forward from a number in groups. For example, count forward from 10 in groups of 2, 3 and 5.

Pupils are to complete Exercise 5 (Pupil’s Book page 11).

Answers
Exercise 5
1. 8, 11, 14, 17, 20, 23, 27, 29, 32, 35, 38, 41, 44, 47
2. 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 100, 105, 110, 115, 120, 125, 130, 135, 140, 145, 150, 155, 160, 165, 170, 175, 180, 185, 190, 195, 200
3. 16, 26, 36, 46, 56, 66, 76, 86, 96, 106, 116, 126, 136, 146, 156, 166, 176, 186

**Challenge (page 11)**

The answer will depend on the number of pupils in the class.

**Assessment**

Check that pupils understand the concept of counting forward in groups. Some pupils will be able to do this without using the number board. Allow pupils to use the number board if needed and give extra practice where required.

**Extension activity**

Give pupils other numbers to count in groups, for example, 16–48 in groups of 4, or 18–180 in groups of 6.

**Homework activity**

Ask pupils to complete the Challenge activity (Pupils’ Book page 11). Before attempting this activity make sure pupils know how many pupils are in the class.
Unit 3: Identifying and reading numbers up to 200

Objectives
By the end of this unit, pupils will be able to:
• Identify and read numbers up to 200
• Write numbers up to 200 in figures and words
• Count forwards and backwards up to 200.

Suggested resources
• Number cards
• Number square up to 100
• Number square 100–200
• Blank sheets of paper or card for pupils to use

Key word definitions
identify: give the correct name or amount of
figures: numbers

Frequently asked questions
Q What prior knowledge do the pupils need?
A Pupils should be able to recognise numbers up to 100 and also to recognise the numerals 1–100. By now pupils should be becoming confident with grouping of bundles, counting in bundles of 10, remainders, counting up and down of numbers between 1 and 99.

Common errors pupils make
Pupils do not always understand that counting through tens, for example, 10, 20, 30, involves groupings in tens. Pupils should be able to expand a two-digit number into the decade number and the ones. Make sure that they have mastered this concept before introducing hundreds. Some pupils may also reverse the position of digits when writing numbers between 100 and 200.

Evaluation guide
Assess whether pupils can:
1. Identify and read numbers up to 200.
2. Write numbers up to 200 in figures and words.
3. Count forwards and backwards up to 200.

Lesson 1: Pupil’s Book page 12; Workbook page 7
Preparation
For the lesson, you will need:
• Wall chart of a 100 square
• Wall chart of a 200 square
• Three to four pieces of card or paper per pupil
• Pupil’s Book
• Workbook

Starter activity
Give out the pieces of card or paper to pupils. Call out a number between 100 and 200 and get pupils to write the number on their piece of card and hold it up in the air. Write the number correctly on the board so that pupils can correct their own mistakes.

Lesson focus
The focus of this lesson is on correct identification of numbers, between 1 and 200. Pupils should be able to write the numbers between 1 and 20 without assistance. Give extra time for practice if needed. Use the wall charts to point to different numbers and get pupils to call out the correct answer. Pupils then complete Exercise 1 on page 12 using the numbers squares on pages 8 and 10.
Answers

Exercise 1
Check the pupil's books to make sure they have circled the correct numbers.

Worksheet 3
1. Check that pupils have circled the correct numbers.

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Assessment
Pupils should be able to correctly identify numbers and circle them. When checking pupil's books for the correct answers to Exercise 1, try to notice any pupil who is having difficulty identifying numbers correctly. Allow extra examples for any pupils requiring more practice.

Extension activity
Write a series of numbers on the board for example, 251, 272, etc., and ask pupils to count back four from each number and identify the correct answer.

Homework activity
Worksheet 3, page 7, Question 1.
Lesson 2  Pupil’s Book page 12; Workbook page 7

Preparation
For the lesson, you will need:
• Five blank cards or squares of paper per pupil. Ask pupils to write any numbers between 1 and 200 on each card or paper. Collect all the numbers and use them as flashcards with the class
• Bingo cards for each pupil, with a number square on them containing different numbers
• Workbook

Starter activity
Play ‘Bingo’ with the class. Hand out the pre-made Bingo cards and call out different numbers. If pupils recognise the number called on their cards they raise their hand.

Lesson focus
The lesson focuses on being able to identify and read a number quickly and correctly. Pupils should be able to identify a number without confusion or error. Use the board to play a game in which pupils call out the number being written. Pupils can also play the game in groups.

Pupils complete Exercise 2 (Pupil’s Book page 12).

Answers

Exercise 2
Check that pupils have correctly identified the flashcard numbers in the Pupil’s Book.

Worksheet 3
2. This is an oral question that needs to be completed out loud in groups or individually.

Assessment
Pupils who have difficulty identifying and naming numbers can be given time to play with Bingo cards in small groups. You could also use flashcards to give more practice in recognising numbers.

Extension activity
Write a selection of numbers between 200 and 300 on the board for pupils to identify and name.

Homework activity
Worksheet 3, page 7, Question 2.
Lesson 3  Pupil’s Book page 13; Workbook page 7

Preparation
For the lesson, you will need:
• The flashcards from the previous lesson
• Objects to use as counters, such as pebbles, straws and twigs
• Pupil’s Book
• Workbook

Starter activity
Repeat the ‘Bingo’ game from the previous lesson.

Lesson focus
This lesson reinforces the previous lesson by continuing with finding and recognising numbers. Use the number squares on pages 8 and 10 of the Pupil’s Book. Get pupils to find numbers that you call out and them to count forward or backwards, for example to find 50 and then count forwards to 58. Do the same thing with pupils reading backwards. Complete Exercise 3 (Pupil’s Book page 13). Pupils can work in pairs to check each other or individually with you if time permits.

Answers
Exercise 3
This is a verbal activity. Check that the pupils are able to recognise and read numbers.

Worksheet 3
Questions 3 and 4 are oral questions that need to be completed out loud in groups or individually.

Assessment
Pupils should be able to recognise all two- and three-digit numbers up to 299.

Extension activity
Pupils are to write numbers between 200 and 250 backwards.

Homework activity
Worksheet 3, page 7, Questions 3 and 4.

Lesson 4  Pupil’s Book page 14; Workbook page 7

Preparation
For the lesson, you will need:
• Flashcards from the previous lesson
• Objects to use as counters, such as pebbles, straws and twigs
• Pupil’s Book
• Workbook

Starter activity
Write numbers less than 200 on the board, in figures. Read through the figures with the class and get them to say the figures in words. Play a ‘Numbers’ game where you hold up cards containing the same numbers as those on the board, but written as words. Get pupils to call out the numbers.

Lesson focus
The focus of this lesson is on recognising numbers when written in words. Pupils may have difficulty in associating the written word with the numeric. Use the teaching note and write numbers less than 200 on the board, in words and in figures. Read through the words and figures with the class. Give pupils the numbers 26, 78, 101, 155 and 199 and guide them to write the numbers in words.

Pupils complete Exercise 4 (Pupil’s Book page 14).

Answers
Exercise 4
142, 98, 163, 185, 200

Worksheet 3
5. Answers will vary. Examples are 155, 115, 53, 175 and 159.
Assessment
Pupils should be able to understand the importance of 10 and 100 in the number system and the relation to how numbers are written. Pupils should be able to read and write three-digit numbers. Some pupils may have difficulty in understanding the relationship between words such as one hundred and twenty and the written number form of 120. Give extra practice to pupils who have not mastered the written form.

Extension activity
Write a series of numbers from 300–350 on the board. Pupils are to write out the numbers in words.

Homework activity
Worksheet 3, page 7, Question 5.

Lesson 5 Pupil’s Book page 15; Workbook page 7

Preparation
For the lesson, you will need:
• Flashcards from the previous lesson
• Pupil’s Book
• Workbook

Starter activity
This is a continuation of the previous lesson. Repeat the previous starter exercise.

Lesson focus
Continue to give pupils practice in writing and recognising numbers in complete words. Let pupils complete Exercise 5 (Pupil’s Book page 15).

Answers
Exercise 5
1. four
2. twenty
3. forty-seven
4. sixty-one
5. eighty-eight
6. one hundred and two
7. one hundred and sixteen
8. one hundred and thirty-seven
9. one hundred and seventy-four
10. two hundred

Worksheet 3
6. Any number between 50 and 150 is suitable.

Assessment
Pupils should be able to translate numbers into written words and vice versa. Assess pupils by giving a variety of numbers to write as words.

Extension activity
Use the Bingo cards from Unit 3, Lesson 3 and ask pupils to write the numbers as words.

Homework activity
Worksheet 3, page 7, Question 6.
Objectives
By the end of this unit, pupils will be able to:
• Understand the importance of 10 in the number system with regard to two-digit numbers
• Say how many groups of 10 are in any two-digit number
• Read and write any two-digit number in numerals and words
• Expand a two-digit number into decade number and remainder
• Understand that the position of a digit in a number determines its value
• State the value of a digit in any three-digit number.

Suggested resources
• Wall chart of the 300 board
• Drinking straws
• Elastic bands
• Small 0–9 digit cards
• Large 0–9 digit cards
• 0–9 numeral cards
• Overlapping digit cards
• Paper base 10 equipment

Key word definitions
place value: the numerical value that a digit has by virtue of its position in a number
decade: a group or series of ten
digit: a single whole number (0 to 9) in a number 10 or larger

Frequently asked questions
Q  What prior knowledge do the pupils need?
A  Pupils should be able to understand the teens numbers as 10. They should be able to rote count beyond 100. They should also be able to read any two-digit number.

Common errors pupils make
• Pupils will often reverse the digits in two-digit numbers. This is most often just a careless mistake and you should encourage pupils to look carefully at the numbers they have written and check for themselves that they are correct.

As pupils gain an understanding of place value and the importance of having the digits in the correct order then mistakes are less likely to occur.
• Before pupils have generalised the understanding that the left-hand digit in a two-digit number represents the number of groups of 10 they will often believe that the left-hand digit indicates the number in each group. For example, in the number 67 you will have to group in sixes, and in the number 58 you will have to group in fives. Exploring what happens when you test a pupil’s hypothesis and they prove themselves wrong can be a learning step towards generalising that the groups must always be groups of 10.

Evaluation guide
Assess whether pupils can:
1. Understand the importance of 10 in the number system with regard to two-digit numbers.
2. Say how many groups of 10 are in any two-digit number.
3. Read and write any two-digit number in numerals and words.
4. Expand a two-digit number into decade number and remainder.
5. Understand that the position of a digit in a number determines its value.
6. State the value of a digit in any three-digit number.
Lesson 1  Pupil’s Book page 16; Workbook page 8

Preparation
For the lesson, you will need:
• Box of drinking straws (plenty) and elastic bands
• Small items for grouping in tens, such as buttons, beads, pebbles and sticks
• 100 chart (Pupil’s Book page 8)
• Set of large 0–9 digit cards
• Pupil’s Book
• Workbook

Starter activity
Using a set of large digit cards, spread the cards out on the floor (or fix them to the board, but they must be moveable). Ask pupils to use the cards to make two-digit numbers.

You could ask:
• Make the largest two-digit number you can.
• Make the smallest two-digit number you can.
• Make a number larger than 62 (or any number of your choice).
• Make a number smaller than 35 (or any number of your choice).
• Make a number that is between 34 and 56 (or any two numbers of your choice).

Allow pupils to refer to the 100 board if they need to, but note which ones still require the support.

You could also teach this activity by writing the digits 0–9 on the board and asking the pupils to record the answer or possible answer to each question. It is good for pupils to see that there is not always just one correct answer. If you use this method it is important that pupils share their answers after each question has been asked.

Lesson focus
Pupils can read and write two-digit numbers but they need to understand the meaning of the digits in terms of groups of 10 and remainders. It is not enough to just tell pupils that the digit on the left is the number of groups of 10 and the number on the right is the remainder. Pupils need to actually see this for themselves and preferably handle the equipment and check for themselves that it is always true and not just for the numbers you have given them. You are working towards pupils generalising the rule for two-digit numbers – the digit on the left tells you how many groups of 10 in a number and the digit on the right tells you how many ones are left over.

Provide pupils with sufficient equipment to make bundles for themselves (drinking straws, sticks or anything else that can be grouped into tens).

Ask them to count out 26 items. Write 26 on the board. Ask them ‘How many groups of 10 do you expect to be able to make?’ Many pupils will be able to use their knowledge of grouping in tens to count large sets of objects into this situation. Ask pupils to physically group their items into groups of 10.

Ask: ‘What part of the number 26 tells us we have two groups of ten? What does the six tell us?’

Complete Exercise 1 (Pupil’s Book page 16) when you are sure pupils have understood the activity. Provide pupils with equipment for carrying out the exercise.

Answers

Exercise 1
1. 58
2. 35
3. 74
4. 34
4. 83
6. 58

Puzzle (page 16)
Pupil’s answers will differ.

Worksheet 4
1. a) 5 tens and 7 units
   b) 10 tens
   c) 11 tens and 5 units
   d) 13 tens and 6 units
   e) 15 tens and 2 units
   f) 19 tens 7 units
Assessment
Check that pupils can identify the bundles of 10. Repeat with some more numbers until you are fairly certain that most pupils understand.

Repeat with a number where the tens and ones digits are the same. For example, 44. Can pupils still identify that the 4 on the left indicates there are four tens?

Extension activity
Use the puzzle on page 16 of the Pupil’s Book. Ask pupils to think of the largest number they can and write it in their books.

Homework activity
Worksheet 4, page 8, Question 1.

Lesson focus
Revise the meaning of place value and repeat the odometer idea, but this time use three chairs. Pupils can work in threes and practise counting from a starting three-digit number. They should quickly realise that the pupil who has the ones has to work very hard while the pupil with the hundreds has very little to do. Practical exercises like this give pupils an appreciation for the size of larger numbers.

Allow pupils to play ‘Guess my number skeleton’ in small groups.

Pupils complete Exercise 2 of place value with three digits (Pupil’s Book page 17).
Answers

Exercise 2
1. 125 is one hundred, two tens and five ones.
2. 147 one hundred, four tens and seven ones.
3. 200 is two hundreds, no tens and no ones.

Worksheet 4
2. a) This is done for you
   b) 14 tens and 9 units
   c) 15 tens and 6 units
   d) 16 tens and 8 units
   e) 20 tens and 0 units

Assessment
While pupils are playing ‘Guess my number skeleton’ observe and listen to pupils in a group. Are they asking the right numbers for each column? Pupils should be able to understand that the position of a digit in a number relates to its value.

Extension activity
Play ‘Guess my number skeleton’ with four-digit numbers (or more). Encourage pupils to play ‘Guess my number skeleton’ at home.

Homework activity
Worksheet 4, page 8, Question 2.

Lesson 3 Pupil’s Book page 17; Workbook page 8

Preparation
For the lesson, you will need:
• Bundles of ten items, such as straws and sticks
• Bundles of hundred items;
• Single items
• Paper base 10 equipment – a 10 cm square represents 100; a 10 cm by 1 cm strip represents 10 and 1 cm square represents 1. (Pupils can make some equipment for themselves using paper.)
• Pupil’s Book
• Workbook

Starter activity
Place large 0–9 digit cards in a circle on the floor, not in sequence. Mark a third of the cards with a coloured pen and place these cards on one-third of the circle. Mark another third with a different colour pen and the remainder on the remaining third. Those marked cards will be the hundreds and tens digits and the others the single digits. Divide the class into three teams. The first pupil from each team walks around the edge of the circle. When you call ‘stop’ (a pupil should be on each side of the circle) the pupils place their toe on the card they are next to, and looking at both their card and the other pupils card, call out the three-digit number – remembering that the marked card is either the hundreds or tens digit. The first pupil to call the correct number stays in while the others return to the back of their teams. The next in line now joins the circle.

Lesson focus
Write a three-digit number on the board and ask the pupils how they could represent the number using the equipment.

‘How many hundreds, how many tens and how many ones?’

Repeat with further three-digit numbers. You can introduce of the paper equipment to represent hundreds, tens and ones.

Pupils can record diagrams in their books for three-digit numbers written on the board.

Pupils complete Exercise 3 (Pupil’s Book page 17).
Answers

Exercise 3
1. thirty
2. one hundred
3. four
4. sixty
5. zero
6. three hundred

Challenge (page 17)
10

Worksheet 4
3. a) 3
   b) 5
   c) 7
   d) 11
   e) 14
   f) 20

Assessment
Observe pupils making the numbers with equipment and their diagrams. When pupils no longer need to use the equipment and can draw directly in their books, allow them to do so. Others may require the use of equipment for a little longer.

Pupils should be able to able to state the value of a digit in any three-digit number.

Extension activity
Use the Challenge activity as an extension (Pupil’s Book page 17).

Homework activity
Worksheet 4, page 8, Question 3.

Lesson 4 Pupil’s Book page 17

Preparation
For the lesson, you will need:
• Large 0–9 digit cards
• Pupil’s Book

Starter activity
Place large 0–9 digit cards in a circle on the floor, not in sequence. Mark half the cards with a coloured pen and place these cards on one half of the circle and the remainder on the other half. Those marked cards will be the tens digits and the others the single digits. Divide the class into two teams. The first pupil from each team walks around the edge of the circle. When you call ‘stop’ (a pupil should be on each side of the circle) the pupils place their toe on the card they are next to, and looking at both their card and the other person’s card, call out the two-digit number – remembering that the marked card is the tens digit. The first pupil to call the correct number stays in while the other returns to the back of their teams. The next in line now joins the circle.

Lesson focus
Re-introduce the words ‘place value’ and remind the pupils that whichever place or position a digit has in a number tells you the value of that digit. Discuss with the pupils the largest digit you can have in any column. What happens when you have one more in a column of 9? Explore the idea that this goes beyond ones and tens. Nine ones and one more create a new column called ‘tens’. Nine groups of 10 and one more group of 10 creates a new column called ‘hundreds’; nine 100s creates a new column called ‘thousands’, and so on.

Write numbers up to 90 on the board and get pupils to split them into two- and one-digit numbers, for example, 56 is five tens and six ones.

Reverse this and ask the pupils to find the whole number from examples such as four tens and three ones (43).
Answers

Class activity
Answers will vary according to the examples you have made up.

Assessment
Listen to the pupils’ discussion as to the meaning of place value. Pupils should be able to understand the importance of 10 in the number system. Pupils should also be able to understand that the position of the digit in a number determines its value. Pupils should have made the generalisation that the left-hand digit tells you how many groups of 10 in a number. Any pupil still reversing digits in two-digit numbers needs to be questioned as to whether it is visual perception, left-right confusion (laterality) that is the problem or whether they really still do not understand the importance of 10. If the problem still lies with not having grasped the importance of 10 then further practical work making numbers into groups of 10 is required.

Extension activity
You will need a piece of paper, 0–9 digit cards, bottle tops and some small pots (that will fit ten bottle tops in). Pupils are to draw a line down the centre of the piece of paper to make two columns and write ‘Tens’ at the top of the left-hand column and ‘Ones’ at the top of the right-hand column. They lay the digits cards face down on the table, pick up one digit card and take the same number of bottle tops and put them in the Ones column on the piece of paper. They then take another digit card, take the same number of bottle tops and add them to the bottle tops in the Ones column. If they can make a group of ten bottle tops, they put the group of ten into a pot and place the pot in the Tens column. From the equipment on their paper they must read the number of bottle tops they have.

Pupils are to continue to take digits cards and bottle tops and keep making groups of 10. Before taking a new digit card pupils must remember to say the total number of bottle tops on their paper aloud to their partners or write the number down in their books.

Homework activity
Give pupils six questions to do on their own at home. Examples are: 75, 82, 19, 32, 99 and 2.
**Lesson 5**

### Preparation

For the lesson, you will need:
- Bundles of ten items such as straws, sticks and small stones
- Bundles of hundred items
- Single items
- Paper base 10 equipment – a 10 cm square represents 100, a 10 cm by 1 cm strip represents 10 and 1 cm square represents 1. (Pupils can make some equipment for themselves using paper.)
- Pupil’s Book

### Starter activity

Select any starter activity from this unit, but extend it into three-digit numbers.

### Lesson focus

Revise work from previous lesson. Pupils should be able to draw a diagram to represent a number. Write a three-digit number on the board, for example 468, and underline the tens digit. Ask them ‘What is the value of this digit? (pointing to the 6). Pupils should respond with the answer ‘six tens’, which is 60 or just 60.

Repeat with other numbers and underline hundreds, or tens or ones.

Give pupils the following exercise to split into hundreds, tens and units:
1. 724
2. 385
3. 437
4. 629
5. 853
6. 932
7. 574
8. 209

### Answers

#### Class activity

1. 724 is seven hundreds, two tens and four ones.
2. 385 is three hundreds, eight tens and five ones.
3. 437 is four hundreds, three tens and seven ones.
4. 629 is six hundreds, two tens and nine ones.
5. 853 is eight hundreds, five tens and three ones.
6. 932 is nine hundreds, three tens and two ones.
7. 574 is five hundreds, seven tens and four ones.
8. 209 is two hundreds, no tens and nine ones.

#### Assessment

Successful completion of the exercise should indicate whether pupils have grasped the value of digits in three-digit numbers. Pupils should be able to state the value of a digit in any three-digit number. If pupils struggle, ask them to retry the exercises in the Pupil’s Book.

#### Extension activity

Use the numbers from the class exercise and ask pupils to find a number ten more and ten less. Allow them to use counters if they need them.

#### Homework activity

Write any six three-digit numbers on the board for pupils to copy down and split into hundreds, tens and units for homework.
Unit 5 Ordering of numbers up to 200

Objectives
By the end of this unit, pupils will be able to:
• Order numbers in the range 0–200
• Give the number before and after a given number in the range 0–200
• Give the number one more and one less than a given number.

Suggested resources
• Set of cards labelled with the numbers from 0–100, one number on each card

Key word definitions
number sequence: a list of numbers or objects in a special order

Frequently asked questions
Q What prior knowledge do the pupils need?
A Pupils needs to be able to use the number squares on pages 8 and 10 in the Pupil’s Book to count numbers up to 200.

Common errors pupils make
Pupils often get confused when counting forward or backwards over the decade. If need be, revise working in bundles of 10.

Evaluation guide
Assess whether pupils can:
1. Order numbers in the range 0–200.
2. Give the number before and after a given number in the range 0–200.
3. Give the number one more and one less than a given number.

Lesson 1 Pupil’s Book page 18; Workbook page 9

Preparation
For the lesson, you will need:
• Set of cards labelled with the numbers 0–100; one number on each card
• Pupil’s Book
• Workbook

Starter activity
Play the ‘Ladders’ game. On the board draw a ladder with five spaces between rungs. Select a card from the set of cards and ask the pupils to choose which space to write the number. The object of the game is to get the largest number at the top of the ladder and the smallest number at the bottom of the ladder.

When the pupils have decided where to place the number it is important to ask why they have chosen the position. Pupils should explain their reasoning in terms of the size of the number in relation to the other numbers available and chance of selection – 93 should go at the top because there are only a few numbers more than 93 and a lot more less than 93 so the chance of a number more than 93 coming out is only small.

Lesson focus
Pupils should be able to order numbers in the range 0–200. They need to be able to know which number is larger or which is smaller in order for them to be able to judge the reasonableness of their answers when carrying out computation.
Use the cards labelled 0–100 as used in the ‘Ladders’ game and give one number to each pupil. Focus on the range of numbers from 50–100. Ask half the class to find a partner who has a number larger than theirs.

The pairs now join up into groups of four and arrange themselves in order from largest number to smallest number. Send one group of four to join another group of four and fit themselves into the ordered sequence. You can continue until the whole class has made an ordered sequence. This can be repeated as many times as you wish.

Once pupils can successfully create ordered sequences they complete Exercise 1 (Pupil's Book page 18).

**Answers**

**Exercise 1**

1. 49  
2. 65  
3. 78  
4. 90  
5. 11  
6. 149  
7. 90  
8. 200  
9. 53  
10. 70  
11. 84  
12. 99  
13. 155  
14. 189  
15. 199

**Worksheet 5**

1. | Number | Smaller | Bigger |
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<td>109 and 190</td>
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<td>140 and 128</td>
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<td>192 and 159</td>
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<td>145 and 154</td>
<td>145</td>
<td>154</td>
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**Assessment**

Observe pupils when playing the starter activity. By now pupils should be able to order numbers in the range 0–100.

**Extension activity**

Use the numbers in Exercise 1 and ask pupils to find the numbers that are 3 larger than each one.

**Homework activity**

Worksheet 5, page 9, Question 1.
Lesson 2  Pupil’s Book page 18; Workbook page 9

Preparation
For the lesson, you will need:
- Set of cards labelled with the numbers 0–100.
  One number on each card
- Pupil’s Book
- Workbook

Starter activity
Hand the number cards out to pupils and ask them to find the person with the number below theirs. Shuffle the cards first and only hand out as many cards as there are pupils, starting with number 1. This should end up with pupils standing in a line. Ask pupils to hold their cards up so that they can all see the number sequence. Get the pupils to say their numbers, going backwards from the highest number.

Lesson focus
The focus of this lesson is on counting backwards. Pupils should be able to count down from 200 to 0.

Repeat the activity of Lesson 1 with the following variation: Use the cards labelled 0–200 as used in the ‘Ladders’ game and give one number to each pupil. Focus on the range of numbers from 50–200. Ask half the class to find a partner who has a number smaller than theirs. The pairs must join up into groups of four and arrange themselves in order from largest number to smallest number. Send one group of four to join another group of four and fit themselves into the ordered sequence. You can continue until the whole class has made an ordered sequence. This can be repeated as many times as you wish.

Once pupils can successfully create ordered sequences they complete Exercise 2 (Pupil’s Book page 18).

Answers

Exercise 2
1. 45, 56, 58, 69, 74, 94, 120, 121, 137, 142, 156, 158
2. 198, 184, 141, 129, 100, 98, 92, 72, 64, 46, 34, 27

Worksheet 5
2. a) This is done for you.
   b) 92, 45, 37, 26, 19
   c) 98, 88, 78, 68, 58
   d) 140, 114, 110, 104, 101
   e) 200, 178, 148, 124, 112
   f) 200, 191, 182, 149, 115

Assessment
Observe pupils when playing the group activity. Pupils should be able to order numbers in the range 0–100. Check the answers to Exercise 2 as well. Give extra practice to any pupils who have not yet mastered ordering.

Extension activity
Draw a number ladder with the numbers 210–190, starting with the biggest.

Homework activity
Worksheet 5, page 9, Question 2.
Lesson 3  Pupil’s Book page 19; Workbook page 9

Preparation
For the lesson, you will need:
- Set of cards labelled with the numbers 0–200, one number on each card
- Pupil’s Book
- Workbook

Starter activity
Ask for volunteers. Hand out numbered cards at random to the rest of the class. Get the class to hold up their cards. The volunteers must put the pupils into the correct number sequence. Not all the numbers will be used, so pupils must be able to order the sequence correctly even though not all the numbers are there. Repeat the activity several times.

Lesson focus
Pupils must be able to correctly sequence numbers, even when there are gaps in the sequences. They should be able to recognise whether a number is bigger or smaller than another number. Write random pairs of numbers on the board and get pupils to call out ‘bigger than’ or ‘smaller than’. Then write sets of three numbers on the board and ask pupils to identify the smallest or largest number in each set of numbers.

Pupils complete Exercise 3 (Pupil’s Book page 19).

Answers

Exercise 3
1. 25
2. 78
3. 129
4. 178
5. 145

Worksheet 5
3. a) 24
b) 75
c) 95
d) 116
e) 192

Assessment
Check that all pupils are able to identify smaller and bigger numbers. Revert back to the number boards on pages 8 and 10 of the Pupil’s Book and create extra practice in counting forwards and backwards for pupils needing help with this section of the work.

Extension activity
Use Exercise 3 and ask pupils to find the largest number as well.

Homework activity
Worksheet 5, page 9, Question 3.
Lesson 4  Pupil’s Book page 19; Workbook page 9

Preparation
For the lesson, you will need:
• Set of cards labelled with the numbers from 0–200. One number on each card
• Pads of blank paper
• Pupil’s Book
• Workbook

Starter activity
Choose ten to 15 pupils and hand out number cards at random. Get the remainder of the class to put the pupils with the cards into the correct line order from the smallest number to the largest. Repeat the activity several times, handing out different numbers and using different pupils to hold the cards.

Lesson focus
Pupils need to be able to order in the correct sequence and to write numerals in order, in both numbers and words. Arrange the class into groups and give each group sheets to paper to write down numbers. They can choose any numbers between 0 and 200. Now make the groups swap their pads of numbers and lay out the numbers in the correct order from smallest to largest. Groups can swap their numbers several times. Then reverse the exercise to lay out the numbers from largest to smallest.

Pupils complete Exercise 4 (Pupil’s Book page 19).

Answers

Exercise 4
1. 2, 24, 100, 199
2. ten, twenty-six, thirty-five, two hundred
3. 14, eighty-two, one hundred and five, 115

Worksheet 5
4. a) 45, 46, 47, 48, 49, 50
   b) 81, 82, 83, 84, 85, 86
   c) 100, 101, 102, 103, 104, 105, 106
   d) 191, 192, 193, 194, 195, 196, 197, 198, 199, 200
   e) 98, 99, 100, 101, 102, 103, 104, 105

Assessment
Check that pupils can order numbers when presented with a mixture of figures and words.

Extension activity
Provide pupils with numbers in the range 100–200 and beyond and allow them to practise ordering.

Homework activity
Worksheet 5, page 9, Question 4.
Lesson 5  Pupil’s Book pages 18-19

Preparation
For the lesson, you will need:
• Set of cards labelled with the numbers 0–200; one number on each card
• Pads of blank paper
• Pupil’s Book

Starter activity
Shuffle the number cards and hand them out to pupils. Get pupils to arrange themselves in a number ladder and time them to see how long it takes them to do this. Do this three or four times and see how quickly they can make the ladder.

Lesson focus
This is a revision lesson, to ensure that pupils have correctly understood number orders. Use the lesson to extend pupils who have understood quickly and also to provide extra practice for pupils who need help. Make sure that all pupils are able to state a number that is one more or one less than a given number.

Get pupils to find a partner to work with. Hand out packs of random numbers to each pair and ask them to arrange the numbers from smallest to largest. Pupils are to write the answers in their books. Extend fast workers by asking them to write the sequence in words and not figures.

Write the following sequences on the board and ask pupils to fill in the missing blanks:
1. 32, _____, _____, 29, _____, 27
2. 197, 198, _____, _____
3. 67, _____, _____, _____, 71
4. 84, _____, _____, _____, 80
5. 110, _____, 112, _____, 114

Answers

Class exercise
1. 32, 31, 30, 29, 28, 27
2. 197, 198, 199, 200
3. 67, 68, 69, 70, 71
4. 84, 83, 82, 81, 80, 79
5. 110, 111, 112, 113, 114

Assessment
Check that pupils are able to count upwards and backwards and also to create number sequences. Once pupils have completed the exercise, ask them to write out the missing numbers in words.

Extension activity
Pupils are to make a number ladder from 2–20, counting up in twos.
Objectives
By the end of this unit, pupils will be able to:
• Recognise numbers up to 200
• Write numbers up to 200 in numerals and words.

Suggested resources
• Cards with numerals 0–99 written on them
• Cards with number words written on – number words one to nine and the decade numbers, ten, twenty, thirty, forty, fifty, sixty, seventy, eighty, ninety

Key word definitions
There are no key word definitions in this unit.

Frequently asked questions
Q What prior knowledge do the pupils need?
A Pupils should be familiar with recognising and writing numbers up to 100.

Common errors pupils make
Pupils who have difficulty recognising numbers between 1 and 99 will need to be assisted in order to understand the concept of three digits. Some pupils will reverse the order of the digits, not realising that this changes the number completely. Pupils may also not grasp how to write the hundreds and then add the decades and single digits.

Evaluation guide
Assess whether pupils can:
1. Recognise numbers up to 200.
2. Write numbers up to 200 in numerals and words.

Lesson 1  Pupil’s Book page 20; Workbook page 10

Preparation
For the lesson, you will need:
• Cards with numerals 0–99 written on them
• Cards with number words written on – number words one to nine and the decade numbers ten, twenty, thirty, forty, fifty, sixty, seventy, eighty and ninety
• Pupil’s Book
• Workbook

Starter activity
Divide pupils into groups of four. One pupil to have cards with hundreds written on them, one pupil to have cards with decades written on them and one pupil to have cards with digits 0–9 on. The remaining pupil to have one card only with the word ‘and’ on it. The three pupils who have cards with numbers must hold their cards up for the class and say the numbers, but the pupil with the ‘and’ card must always say the word ‘and’ between the hundreds and the other numbers. This game reinforces the correct way to write three-digit numbers in words.

Lesson focus
The focus of this lesson continues from the starter game. Pupils need to be able to write three-digit numbers in words. Read and explain the example on page 20 of the Pupil’s Book then complete Exercise 1 (Pupil’s Book page 20).
Lesson 2  

Preparation
For the lesson, you will need:
- Cards with numerals 0–99 written on them
- Cards with number words written on – number words one to nine and the decade numbers ten, twenty, thirty, forty, fifty, sixty, seventy, eighty and ninety
- Pupil's Book
- Workbook

Starter activity
Divide the class into two teams. One team will have number cards with words on and the other team will have cards with numbers in figures. Pupils must find the correct partner that matches. You can play this game several times by swopping the cards around.

Lesson focus
The focus of this lesson is on recognising a number when it is written in words and being able to translate the words into a figure. Write some number words on the board and get pupils to call out the correct answer.

Pupils complete Exercise 2 (Pupil’s Book page 20).

Answers

Exercise 2
1. 131
2. 108
3. 185
4. 154
5. 200

Worksheet 6
2. a) Pupils should be able to number the stars up to 12.
   b) Pupils can start number at 13 or any other number.
   c) Pupils will need to draw at least ten more stars.
Assessment
Make sure that pupils are confident with writing numbers, such as 200, 100 and 108, where one or more digit is not mentioned in words. Give extra practice if needed.

Extension activity
Create more stars or other shapes with points for pupils to number.

Homework activity
Worksheet 6, page 10, Question 2.

Lesson 3

Preparation
For the lesson, you will need:
- Bottle tops or other counters
- Cards with numerals 0–99 written on them
- Cards with number words written on – number words one to nine and the decade numbers ten, twenty, thirty, forty, fifty, sixty, seventy, eighty, ninety
- Pupil’s Book

Starter activity
Repeat the starter activity in Lesson 2, but this time pupils must state the place value of the cards they are holding.

Lesson focus
Pupils need practice in recognising the place value of numbers. This lesson focuses on recognising place values. Once the starter activity is over, give out the bottle tops. Get pupils to draw around the bottle tops in their books to create five to six rows of three bottle tops. Get pupils to colour the first bottle top circle in each row green, the next one red and the last one blue. Now write five to six three-digit numbers on the board, written as words. Pupils must put the right figure in each of the three circles for each number. This activity reinforces the place value of numbers.

Explain the example on page 21 and then pupils complete Exercise 3 (Pupil’s Book page 21).

Answers

Exercise 3
1. 132
2. 94
3. 153
4. 178
5. 191
6. 200
Challenge (page 21)
1. one hundred and thirty-two
2. ninety-four
3. one hundred and fifty-three
4. one hundred and seventy-eight
5. one hundred and ninety-one
6. two hundred

Assessment
Pupils should be able to identify the place value of a number. If pupils have difficulty, go back over earlier lessons on place value between 1–99 before reintroducing 100–200.

Extension activity
Use the challenge activity as an extension (Pupil’s Book page 21).

Lesson 4  Pupil’s Book pages 20-21; Workbook page 10

Preparation
For the lesson, you will need:
- Bottle tops or other counters
- Cards with numerals 0–99 written on them
- Cards with number words written on – number words one to nine and the decade numbers ten, twenty, thirty, forty, fifty, sixty, seventy, eighty, ninety
- Pupil’s Book
- Workbook

Starter activity
Use this earlier activity but this time draw a 6 × 6 grid on the board (or ask each pupil to draw a grid in their books) and ask pupils to choose a three-digit number to go in each square. From a bag of numeral cards draw out a three-digit number and read it as: ‘My number is _____ hundreds, _____ tens and _____ ones. For example, if you draw 134 say: ‘My number is one hundred, three tens and four ones’. Any pupil with number 134 on their board can cross it off. The first pupil to get a line (horizontal, vertical or diagonal) is the winner.

Lesson focus
This lesson reinforces work done so far on writing numbers. Ask pupils to open their books on page 10 and count through the number square again. Write the correct spelling for the decades and numbers 0–9 on the board. Then write down a selection of numbers from the number square on the board and ask pupils to write the numbers as words in their note books.

Answers
Class exercise
Check that pupils have written the numbers as words correctly.
Worksheet 6
4. a) 27 odd
   b) 12 even
   c) 185 odd
   d) 196 even
   e) 65 odd

Assessment
It is important to use this lesson as a spelling exercise as well. Some pupils may have problems remembering how to spell the different numbers.

Extension activity
Ask pupils to write the numbers 300–310 as words.

Homework activity
Worksheet 6, page 10, Question 4.

Lesson 5
Pupil’s Book pages 20–21; Workbook page 10

Preparation
For the lesson, you will need:
- Bottle tops or other counters
- Cards with numerals 0–99 written on them
- Cards with number words written on – number words one to nine and the decade numbers ten, twenty, thirty, forty, fifty, sixty, seventy, eighty and ninety
- Pupil’s Book
- Workbook

Start activity
Hand out the number cards with number words on them at random and get pupils to order themselves from biggest to smallest.

Lesson focus
This is the final lesson on writing 1–200 in words. By now pupils should be familiar with numbers in words and confident in naming them. Write a series of number words on the board, in no particular order, and ask pupils to write them in their exercise books in the right order, from biggest to smallest. Once they have completed this exercise, write a series of three-digit numbers on the board and get pupils to write them, in the correct order from smallest to biggest, in words.

Now give pupils two to three numbers in words to count down out loud, for example:
- Count down from one hundred and fifty-four to one hundred and forty-nine.
- Count down from one hundred and twenty-one to one hundred and fifteen.

Answers
Class exercise
There are no set answers to the class exercise.

Worksheet 6
1. a) 12 + 100 = 112
   b) 16 + 100 = 116
**Assessment**
By now pupils should be able to recognise numbers in words or as numerals.

**Extension activity**
Pupils can make up their own three-digit numbers by drawing bottle top circles using different colours.

**Homework activity**
Worksheet 6, page 10, Question 5.
Unit 7 Fractions: half and quarter

Objectives
By the end of this unit, pupils will be able to:
• Recognise halves as two equal parts
• Recognise quarters as four equal parts
• Recognise and use the symbols $\frac{1}{2}$, $\frac{1}{4}$, and $\frac{3}{4}$
• Understand fractions as numbers between whole numbers
• Understand fractions as part of a whole
• Construct the whole from a given part.

Suggested resources
• Scrap paper
• Scissors
• Small items such as buttons, shells, seeds and small stones
• Number line
• 3-D items to cut into parts – fruit and vegetables, mud pies, etc.
• Labels: half, quarter, three-quarters – $\frac{1}{2}$, $\frac{1}{4}$, $\frac{3}{4}$

Key word definitions
fraction: a way of expressing a number or portion of a number that has been divided into smaller parts
part: a portion of a larger number or object
whole: a number or object before being divided into parts
half: a whole divided into two equal parts
quarters: a whole divided into four equal parts
denominator: the number of equal parts that one whole is divided into
numerator: the top part of the fraction indicating the number of parts represented by this fraction

Frequently asked questions
Q What prior knowledge do the pupils need?
A Pupils must have knowledge of whole numbers up to at least 20. They should have knowledge of skip counting sequences for 2s and should know the doubles to 20.

Common errors pupils make
Prior to learning about fractions, and sometimes while being taught fractions, pupils construct many misconceptions. Their knowledge of numbers so far has been limited to whole numbers and therefore many pupils do not believe in the existence of numbers between numbers. They know an object can be broken into parts, but then each part becomes a whole. Pupils re-unite and create whole numbers again. A biscuit is broken in half but pupils now see the biscuit as two whole parts of biscuits. The one biscuit has disappeared only to be replaced by two different sized biscuits. The concept of half a biscuit is lost. Much early fractional teaching does not challenge pupils’ understanding of parts of a whole. Exercises in this unit will endeavour to challenge this fractional thinking.

The symbol $\frac{1}{2}$ is often misunderstood, and often the misconception about the symbol is taught. It is important that you fully understand the meaning of the numerator and denominator and take pupils beyond unit fractions as the opportunities arise. If pupils are only exposed to unit fractions they come to believe the denominator 2 means two equal parts, which is correct, but they also believe the numerator 1 refers to one whole which is incorrect.

Evaluation guide
Assess whether pupils can:
1. Recognise halves as two equal parts.
2. Recognise quarters as four equal parts.
3. Recognise and use the symbols $\frac{1}{2}$, $\frac{1}{4}$, and $\frac{3}{4}$.
4. Understand fractions as numbers between whole numbers.
5. Understand fractions as part of a whole.
6. Construct the whole from a given part.
Lesson 1  Pupil’s Book page 22; Workbook page 11

Preparation

For the lesson, you will need:
- Strip of paper (about 50 cm × 10 cm)
- Scissors
- Scrap paper
- Pupil’s Book
- Workbook

Starter activity

Hold up a piece of paper, about 50 cm × 10 cm, and tell the pupils that you are going to cut it in half to share between two of the pupils. Slowly run the scissors along the strip and ask the pupils to tell you when to stop and cut. When you have cut the paper ask the pupils: ‘Was that cut fairly, do both pupils have the same amount?’ Discuss with the pupils how they could check to see whether it was fair.

Lesson focus

Develop the idea of halving, bringing pupils to the idea of folding to create two equal parts. Ask if they could think of another way you could have made sure the cut would be fair, so that each part was the same length. A likely reply would be to fold the paper in half before cutting.

Record on both pieces the word ‘half’ and the symbol $\frac{1}{2}$. Introduce the word ‘denominator’ and discuss why the denominator is 2. The denominator gives the number of equal parts that one whole is divided into. Show on the board $\frac{1}{2} + \frac{1}{2} = \frac{2}{2}$. Introduce the word ‘numerator’ and explain that the numerator tells you how many of the parts you have.

Do the same with different shapes. Record each shape as a diagram on the board. Each time ask the pupils to explain the writing of the symbols as the denominator representing the number of equal parts the shape has been divided into and the numerator representing the number of equal parts that are being counted.

Extend the idea into having two whole circles and folding each in half. Ask how many halves?

Answers

Class exercise

Pupils should be able to cut out or draw shapes and divide them in half.

Worksheet 7

1. Pupils will complete this on the worksheet – half of each shape should be coloured.

Assessment

Observe and listen to any discussions during teaching. Pupils should be able to find half a regular shape by folding. Pupils should be able to use the half symbol $\frac{1}{2}$.

Extension activity

Provide pupils with cut outs of a hexagon, an equilateral triangle and an isosceles triangle and ask them to find how many different ways they can fold them in half.

Homework activity

Worksheet 7, page 11, Question 1.

Record as $\frac{1}{2}, \frac{2}{2}, \frac{3}{2}$ and $\frac{4}{2}$ so they fully understand the numerator as the counting number and the denominator as not a counting number.
Lesson 2  Pupil’s Book page 23

🔥 Preparation

For the lesson, you will need:
- Strip of paper (about 50 cm × 10 cm)
- Scissors
- Scrap paper
- Pupil’s Book

🔍 Starter activity

- Repeat the starter activity from Lesson 1.

🔍 Lesson focus

Repeat the explanation of the previous lesson then work through the example of ‘What is a half?’ (Pupil’s Book page 22). Use this to explain how groups of objects can also be divided into half. The pupils should then complete Exercise 1 (Pupil’s Book page 22).

🎯 Answers

Exercise 1

1. 4  
2. 7  
3. 5  
4. 8  
5. 6

Challenge (page 23)

2 and 1

Assessment

Pupils should be able to share groups of objects into two halves. They should understand the concept of the denominator giving the number of equal parts that one whole is divided into.

Extension activity

Use the challenge activity as an extension (Pupil’s Book page 23).

Homework activity

Ask pupils to draw circles with two, four, six and eight small pictures in and then divide each picture in half.

Lesson 3  Pupil’s Book page 23; Workbook page 11

🔥 Preparation

For the lesson, you will need:
- Circular piece of paper (about 20 cm diameter)
- Scissors
- Scrap paper
- Pupil’s Book
- Workbook

🔍 Starter activity

Show the pupils your circular piece of paper and explain that the piece of paper (or pretend cake or pizza) is to be shared equally between four pupils. Ask them for suggestions as how to cut it. From previous activities, pupils are likely to tell you to fold it. ‘How do you fold something into four equal pieces? Some pupils may already know that you can fold in half and then half again. Show pupils as you think out loud ‘I am folding it in half and then folding in half again.’ Then unfold the circle and mark the fold lines with a pen so all pupils can see the fold lines.

🔍 Lesson focus

Develop the idea of four equal parts. Ask the pupils what the denominator of the fraction symbol for quarter will be and why? The denominator is a 4 because there are four equal parts. Write on each section \( \frac{1}{4} \) then cut the circular piece into the four sections.

Hold up one piece and ask ‘What fraction of my circular piece of paper am I holding up?’ Invite a pupil to come and write \( \frac{1}{4} \) on the board. Hold up two pieces and ask ‘What fraction of my circular piece of paper am I holding up?’ Invite a pupil to come and write \( \frac{2}{4} \) on the board. Ask the remaining pupils if they agree or disagree. If any pupils disagree ask them to come and write what they think. If the first pupil has written the fraction incorrectly, invite another pupil who has disagreed with the incorrect fraction to try and write the fraction. Consensus should agree on \( \frac{2}{4} \). Hold up three pieces and ask ‘What fraction of my circular piece of paper am I holding up?’ Repeat as for \( \frac{2}{4} \), reaching a consensus of \( \frac{3}{4} \) and then repeat for four

Unit 7: Fractions: half and quarter
quarters. Work through the example of Exercise 3 of What is a quarter? together (Pupil’s Book page 23). Record each shape as a diagram on the board. Each time ask the pupils to explain the writing of the symbols as the denominator representing the number of equal parts the shape has been divided into and the numerator representing the number of equal parts that are being counted.

The pupils should then complete Exercise 2 (Pupil’s Book page 24).

Answers

Exercise 2
1. drawn by pupils
2. drawn by pupils
3. 5
4. 2
5. 4
6. \( \frac{2}{4} \) or \( \frac{1}{2} \)

Challenge (page 25)
8 parts, one eighth

Worksheet 7
2. Pupils will complete this on the worksheet – quarter of each shape should be coloured.

Lesson 4  Pupil’s Book page 24

Preparation
For the lesson, you will need:
• Small items for sharing in quarters, such as buttons, shells, seeds and small stones
• Pupil’s Book

Starter activity
Select a group of 12, 16 or 20 pupils. Explain to the pupils you want to make the group into four equal groups. Ask them how you could do this. The most likely reply is to move them one at a time into each group – one for group A, one for group B, one for group C and one for group D, until all the pupils have been allocated to a group.

Lesson focus
Give the pupils practice in sharing into four equal sets by giving them items to share. Initially give them sets that are multiples of 4 so the sharing will always result in a whole number.

Introduce sharing a set of 13 oranges. Ask ‘How can you share this spare orange?’ Pupils need to realise that the extra orange could be cut into quarters and shared so each person would have 3 and \( \frac{1}{4} \) oranges. Extend the idea by sharing a set of 14 oranges. Ask ‘How can we share the two spare oranges?’ Some pupils may suggest cutting both oranges into quarters and sharing the quarter so each pupil would have 3 and \( \frac{2}{4} \), while others may suggest you only need to cut the oranges in half so each pupil would get 3 and \( \frac{1}{2} \) oranges. This confirms that \( \frac{2}{4} = \frac{1}{2} \).

Assessment
Pupils should be able to divide groups of objects into quarters and halves. Check to see if pupils have understood the connection between \( \frac{1}{4} \), \( \frac{1}{2} \) and \( \frac{3}{4} \).

Extension activity
Pupils can experiment with the challenge activities (Pupil’s Book page 25).

Homework activity
Worksheet 7, page 11, Question 2.
Lesson 5  Pupil’s Book pages 23–25; Workbook page 11

Preparation
For the lesson, you will need:
- Small items for sharing in quarters such as buttons, shells, seeds and small stones
- Paper and scissors
- Pupil’s Book
- Workbook

Starter activity
Give each pupil three circles of paper, all the same size. Instruct them to fold one in half and the other in quarters. They must then tear the halves and the quarters. Get pupils to put the halves on the circle that is still intact and then the quarters on top. This will demonstrate to them that there are two halves in a whole and four quarters. They will also see that two quarters equal one half.

Lesson focus
This lesson reinforces previous work on quarters and halves. Write numbers on the board, for example 20, 24, 12 and 6. Get pupils to assemble objects that make up the same number. They must then divide the objects into half and make a note of how many objects in each half. They then divide the objects into half again and note how many objects in each quarter. Show pupils how to make a note of this. For example 8 = 4 + 4 = 2 + 2 + 2 + 2. Put the following numbers on the board for pupils to work with: 12, 16, 20, 24. (Note that these are all numbers that will divide by 2 and 4 easily.)

Answers

Class exercise
1. 12 = 6 + 6 = 3 + 3 + 3 + 3
2. 16 = 8 + 8 = 4 + 4 + 4 + 4
3. 20 = 10 + 10 = 5 + 5 + 5 + 5
4. 24 = 12 + 12 = 6 + 6 + 6 + 6
Worksheet 7
3. a) 7
   b) 18
   c) 41
   d) 3
   e) 24

Assessment
Make sure that pupils understand the relationship between a half and two quarters.

Extension activity
Give pupils more numbers to make into halves and quarters.

Homework activity
Worksheet 7, page 11, Question 3.
Objectives
By the end of this unit, pupils will be able to:
• Sort a set into groups of 2 or 4
• Identify these as halves and quarters
• Find three-quarters of a set
• Find a whole number when given a quarter or half of a set.

Suggested resources
• Items that can be shared into quarters such as buttons, shells, seeds, and small stones

Key word definitions
The key words are the same as for Unit 7

Frequently asked questions
Q  What prior knowledge do the pupils need?
A  Pupils need to have grasped the concept of halves and quarters.

Common errors pupils make
Pupils will often struggle with the idea of which is larger: \( \frac{3}{4}, \frac{1}{2} \) or \( \frac{1}{4} \). Pupils who have not yet grasped the idea of a whole being broken into parts of the whole and re-unite into two bits and four bits will see 4 as larger than 2. They are still thinking in whole numbers where 4 is larger than 2. Some pupils may also believe \( \frac{3}{4} \) is a variable and is sometimes larger and sometimes smaller than \( \frac{1}{4} \). It is therefore important that they understand a fraction as a number that acts as an operator on other numbers to give a result.

Evaluation guide
Assess whether pupils can:
1. Sort a set into groups of 2 or 4.
2. Identify these as halves and quarters.
3. Find three-quarters of a set.
4. Find a whole number when given a quarter or half of a set.

Lesson 1  Pupil’s Book page 26; Workbook page 12

Preparation
For the lesson, you will need:
• Items that can be shared into quarters, such as buttons, shells, seeds, stones and oranges
• Pupil’s Book
• Workbook

Starter activity
Ask a group of eight, 12, 16, or 20 pupils to come out. Split them into four equal groups and remind them that each group is a quarter of the total written \( \frac{1}{4} \). Tell them to put three of the four groups together and count. Let them know that this is three-quarters \( \left( \frac{3}{4} \right) \) of the total.

Lesson focus
Give the pupils practice in sharing into four equal sets by giving them items to share.

Give them sets that are multiples of 4 so that the sharing will always result in a whole number.

Let pupils divide an orange into four equal parts with each having a quarter. Ask them what each part represents. Their likely response will be one quarter. Ask them to put two parts together, what would they call this? Some may say two quarters and some pupils may say one half. They are equally right. Use this to reinforce that two quarters are the same as one half.

Now they should put together three parts of the orange that had been cut into four equal parts. Tell
them that they now have three quarters \(\left(\frac{3}{4}\right)\). So \(\frac{1}{4} + \frac{1}{4} + \frac{1}{4} = \frac{3}{4}\). They are left with one quarter out of the four quarters which makes a whole \((1)\).

Guide the pupils to fold a rectangular cardboard into four parts and shade three parts. Write \(\frac{3}{4}\) on the shaded part. Use the Challenge on page 26 for this activity.

The pupils should then complete Exercise 1 (Pupil’s Book page 26).

**Answers**

**Exercise 1**
1. \(1\)
2. \(\frac{4}{4}\) or a whole
3. Pupils to complete

**Challenge (page 26)**
Check pupils’ efforts. Give support where needed.

**Worksheet 8**
1. Pupils must be able to divide each shape into quarters and colour in three-quarters.

**Assessment**
Check that pupils have correctly coloured three-quarters of the circle and give extra practice to any pupils who have not mastered this concept.

**Extension activity**
Provide other shapes such as a rectangle and ellipse for pupils to divide into quarters and colour in three-quarters. Challenge them to see if they can do this with an equilateral triangle (difficult).

**Homework activity**
Worksheet 8, page 12, Question 1.
**Lesson 3**  
*Pupil’s Book page 26; Workbook page 12*

**Preparation**
For the lesson, you will need:
- Number line
- Selection of shapes cut into halves and quarters
- Pupil’s Book
- Workbook

**Starter activity**
Have a selection of shapes cut into halves and quarters. These can be regular or irregular shapes but each half must be a mirror image of the other half. Ask the pupils to match the halves to make whole shapes and match two-quarters to make a half. Reinforce the idea that each half is equal to the other half.

**Lesson focus**
This lesson starts by reinforcing work completed on halves. Pair pupils up and have them stand facing each other. One pupil spreads his or her arms out to the side and the other pupil identifies the halfway point between the ends of each arm. Reverse places, so each pupil recognises the halfway point between the ends of their fingers when their arms are outstretched. Select four pupils of approximately the same size. Ask them to stand next to each other, arms outstretched, with fingers just touching the person next to them. (You have made a human number line.)

Ask the remaining pupils where on the number line number 1 would go. It would go at the place where the first and second pupil’s fingers meet. Likewise where would 0, 2, 3 and 4 go? At this point you can either, stand the pupils against the wall and mark the point for 0, for 1, for 2, for 3 and for 4 on the wall or have the pupils lie down keeping arms outstretched and just touching and make the marks on the ground. The pupils can then move away from the marks leaving just a number line with the numbers 0, 1, 2, 3, 4.

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**Assessment**
Observe and listen to pupils during class discussion and teaching time.

Pupils should be able to find three-quarters of a set of objects by sharing. Pupils should understand three-quarters of a set as putting together three parts of four equal sets.

**Extension activity**
Give pupils larger numbers under 50 to work with.

**Homework activity**
Worksheet 8, page 12, Question 2.
Ask the pupils where \( \frac{1}{2} \) would go on the number line. A few of the pupils, if not all will tell you the half goes at the same mark as the number 2. What these pupils are doing is finding \( \frac{1}{2} \) of 4, which is not the number \( \frac{1}{2} \). Use the same technique to find \( \frac{1}{4} \) and \( \frac{3}{4} \).

Pupils need to see that \( \frac{1}{2}, \frac{1}{4} \) and \( \frac{3}{4} \) live between 0 and 1. Ask the pupils where will \( \frac{2}{2} \) come? If necessary use another ‘half pupil’ to fill the space from \( \frac{1}{2} \) to 1. Where will \( \frac{3}{2} \) come? Again use another ‘half pupil’ to fill the space from 1 to \( \frac{1}{2} \).

Draw a number line on the board and label it 0–4. Ask the pupils to predict how many halves and quarters are needed to get from 0 to 2. Ask them to explain their reasoning. Expected answers should include that it takes two halves to reach 1 and another two halves to reach 2.

Invite pupils to come and write on the board the positions of \( \frac{1}{2}, \frac{1}{4}, \frac{3}{4} \), etc., but do not ask for them in order.

When you are satisfied that pupils understand that \( \frac{1}{2} \) is a number with its position on the number line between 0 and 1 and that \( \frac{1}{4} \) and \( \frac{3}{4} \) all have places on the number line that may be between the whole numbers or may share a place with a whole number, repeat the exercise using quarters and three-quarters. Pupils should complete Exercise 3 (Pupil’s Book pages 26 and 27). They may need to work in groups in order to have enough counters.

### Answers

**Exercise 3**

1. 6
2. 15
3. 18
4. 42
5. 75

**Worksheet 8**

3. a) 9  
   b) 24  
   c) 45  
   d) 96

### Assessment

Observe and listen to pupils during class discussion and teaching time. Pupils should be able to find three-quarters of a set of objects by sharing. Pupils should be able to find the position of \( \frac{1}{2}, \frac{1}{4} \) and \( \frac{3}{4} \) on a number line. Pupils should understand that numbers exist between whole numbers.

**Extension activity**

Challenge pupils to find three-quarters of a set of objects.

**Homework activity**

Worksheet 8, page 12, Question 3.
Lesson 4  Pupil’s Book page 27

Preparation
For the lesson, you will need:
• Selection of objects that can be cut, such as fruit and vegetables and circles of paper
• Pupil’s Book

Starter activity
Draw a number line on the board labelled 0–4 and ask pupils to mark the positions of \( \frac{1}{4}, \frac{1}{2}, \frac{3}{4}, \frac{2}{2}, \frac{2}{3}, \frac{3}{2}, \frac{4}{4}, \frac{2}{4} \), etc.

Lesson focus
Pupils need to extend their knowledge of the existence of numbers between whole numbers to include the position of quarters. Ask pupils ‘We know where \( \frac{1}{2} \) lives on the number line, where do you think \( \frac{1}{4} \) would live?’ Invite a number of responses and ask the pupils to justify their answers. They might make reference to folding into half and half again to find a quarter to justify a position halfway between 0 and \( \frac{1}{2} \). They may make reference to \( \frac{2}{4} \) being the same as \( \frac{1}{2} \), so \( \frac{1}{4} \) is halfway between 0 and \( \frac{1}{2} \). Repeat the exercise using \( \frac{2}{4} \) and then \( \frac{3}{4} \).

Pupils should complete Exercise 4 (Pupil’s Book page 27).

Answers

Exercise 4

1. Pupils should draw 12 pictures in addition to the pictures given.
2. Pupils should draw 36 pictures in addition to the 12 pictures given.
3. Pupils should draw 24 pictures in addition to the 8 pictures given.
4. Pupils should draw 60 pictures in addition to the 20 pictures given.

Assessment
This exercise may prove difficult for some pupils. Check their answers carefully, and make sure they understand how to make similar groups of objects in order to calculate the answers.

Extension activity
Provide more numbers as quarters for pupils to use to calculate three-quarters.

Homework activity
Give pupils a series of numbers divisible by 4, for example, 16, 20, 24 and 28, and ask them to find three-quarters of the numbers.
Lesson 5  Pupil’s Book pages 26–27

Preparation
For the lesson, you will need:
• Some small items such as seeds, buttons or shells
• Small squares of card, about 5 cm × 5 cm
• Shapes to use as templates for drawing round
  (small square, small rectangle, small right-angled
  triangle, small equilateral triangle)
• Pupil’s Book

Starter activity
Use the pupils as ‘counters’. Ask the pupils to make
groups of three. Tell them ‘You are half of a larger
group. Make your large group. How many pupils
are in your group?’ Pupils need to understand that
two halves make a whole so they need to join with
another group of three. ‘Your group is half of an
even larger group. Make your large group. How
many pupils are in your group now?’

You can play again with a different number in
the starting group, say two or four, and repeat the
exercise making the pupils into quarters.

Lesson focus
Draw a semi-circle on the board and ask the pupils:
‘If this is half a shape what might the whole shape
look like?’ Ask a pupil to complete the shape. The
pupil will most likely draw a circle. But is this
the only shape the whole shape could look like?
Ask ‘Could the whole shape look different than a
complete circle?’ Put some small squares in front of
the pupils. Tell them one square is half of a shape.
Ask them to construct the whole shape on their
desk using the squares. Can they make a different
shape from the person next to them? This activity
will reinforce two equal parts being a half rather
than pupils only recognising a half when it is in a
particular position.

Give pupils some small items to make a set. Ask
them to make a set of five objects. If this set is
only half your set how many objects in the whole
set? Relate back to their doubles knowledge and
encourage them to use doubles knowledge. Repeat
the exercise using quarters.

If pupils struggle, repeat the exercises from Unit 8
of the Pupil’s Book with them.

Answers

Class exercise
Use the answers from previous lessons in this unit.

Assessment
Observe and listen to pupils during the lesson.
Pupils should be able to complete the whole
given quarter a shape or quarter of a set of
objects.

Extension activity
Challenge pupils to find the whole number in a
set when given three-quarters of the set.

Homework activity
Give the pupils a set of numbers to use to
find whole number. Challenge pupils to find
the whole number in a set when given three-
quarters of the set.
Unit 9
Adding two-digit numbers without exchanging or renaming

Objectives
By the end of this unit pupils will be able to:
• Use addition facts to 100 to add decade numbers
• Solve simple addition story problems
• Record addition stories using mathematical notation
• Recognise the patterns in related addition equations
• Understand the equals sign as equality.

Suggested resources
• Bundles of straws in tens and single straws
• Paper base 10 equipment – a 10 cm square = 100, 10 cm × 1 cm strip = 10, 1 cm square = 1
• Digit cards 0–9
• Decade number cards
• Tens frames (2 × 5 grids)
• 100 number line

Key word definitions
addition: the process of uniting two or more numbers into one sum, represented by the symbol +

Frequently asked questions
Q What prior knowledge do the pupils need?
A Pupils need to know the numbers to 100. They need to know how many groups of 10 the digit on the left of a two-digit number represents in the number.

Common errors pupils make
Pupils have learnt that counting is a reliable method to get the right answer. However, to move towards efficient strategies to add and subtract pupils must have instant recall of the basic addition and subtraction facts. Playing games requiring recall of facts (as given in the Grade 1 material) provides a safe environment to take risks. Pupils must learn to trust recall in a safe learning environment.

Evaluation guide
Assess whether pupils can:
1. Use addition facts to 100 to add decade numbers.
2. Solve simple addition story problems.
3. Record addition stories using mathematical notation.
4. Recognise the patterns in related addition equations.
5. Understand the equals sign as equality.

Lesson 1 Pupil’s Book page 28; Workbook page 13
Preparation
For the lesson, you will need:
• Two sets of large 0–9 digit cards
• Table top sets of 1–9 digit cards
• Table top sets of 10–90 decade number cards
• Pupil’s Book
• Workbook

Starter activity
Play ‘Circle addition’. Place two sets of 0–9 large digit cards in a circle on the floor. Divide the class into two teams. The first person from each team walks around the circle. Try and keep pupils on opposite sides of the circle. When you call ‘stop’ the pupils place their toe on the card nearest to them. Pupils add the two numbers their toes are on. The first to call the correct answer stays in and the other returns to the back of their team. The next pupil in that team then walks the circle.
Lesson focus
Revise the place value of digits in a column. Write any two-digit number on the board and ask ‘What does this digit represent?’ pointing to the tens digit and ‘What does this digit represent?’ pointing to the ones digit. Repeat with a few more numbers.

Write on the board 1 + 1 = _____ . The pupils should be able to give you the answer (2) easily.

Write on the board 10 + 10 = _____ . The pupils should be able to give you the answer (20) quite easily. Ask the pupils if they notice anything the same. Expected answers would probably include they both have two in. Or the second answer is the same as the first but the numbers have zeros on the end. You then need to ask the questions: ‘What are we adding in the first equation?’ (adding ones), and ‘What are we adding in the second equation?’ (adding tens).

Write some more equations in ones on the board such as 2 + 3 = _____ . Then write them as decade equations, 20 + 30 = _____ , etc. Use the example on page 28 of the Pupil’s Book to guide pupils through this.

When you are sure pupils have made the connection and can confidently transfer their knowledge of basic facts to the addition of decades complete Exercise 1 (Pupil’s Book page 28).

Answers
Exercise 1
1. 66
2. 65
3. 69
4. 73
5. 99
6. 88
7. 97
8. 57
9. 68
10. 58

Worksheet 9
1. a) 20 tens and 3 units
   b) 30 tens and 8 units
   c) 50 tens and 4 units
   d) 70 tens and 6 units
   e) 80 tens and 1 unit

Assessment
During the teaching observe and listen to pupils’ responses. Are pupils making the connection between basic facts to ten and the addition of decade numbers? Pupils should be able to use addition facts to ten to add decade numbers.

Extension activity
Pupils can make themselves two sets of 10–90 digit cards. They each work with a partner.

Game: Place the sets face down on the table and mix them up. Pupils take it in turns to turn over two cards. If the cards total 100 they keep them. If they do not total 100, they turn them back over and their partner takes a turn.

Homework activity
Worksheet 9, page 13 Question 1.
Lesson 2  Pupil’s Book page 29; Workbook page 15

Preparation
For the lesson, you will need:
• Two sets of large 0–9 digit cards
• Two sets of large 10–90 decade cards
• Pupil’s Book
• Workbook

Starter activity
Play ‘Circle addition’ as in previous lesson using either the 0–9 digit cards or use 10–90 decade cards.

Lesson focus
Use bundles of counters and give pupils simple additions such as 42 + 31. Pupils must put the numbers into bundles of 10, work out how many bundles there are and work out the remainder. This lesson continues from Lesson 1.

Pupils then complete Exercise 2 (Pupil’s Book page 29).

Answers
Exercise 2
1. 5 bundles plus 5
2. 5 bundles plus 9
3. 7 bundles plus 7
4. 9 bundles plus 2
5. 7 bundles plus 9
6. 9 bundles plus 1
7. 7 bundles plus 2
8. 5 bundles plus 9
9. 5 bundles plus 8
10. 4 bundles plus 9

Worksheet 9
2. a) 50 + 1 + 30 + 4 = 80 + 5 = 85
   b) 60 + 3 + 30 + 1 = 90 + 4 = 94
   c) 40 + 5 + 20 + 2 = 60 + 7 = 67
   d) 30 + 8 + 30 + 1 = 60 + 9 = 69
   e) 80 = 10 = 90

Assessment
Pupils should be able to create bundles of 10 using to different two-digit numbers and state the remainder. Pupils should grasp that the bundles represent decades and the remainder represents single digits.

Extension activity
Game: Each pupil has two sets of cards mixed up in a pile in front of them. They take it in turns to turn over one card. They keep turning over cards and placing them on the pile in front of them until the cards on the top of each pile totals 100. The first to call ‘one hundred’ takes both piles of cards and puts them with their own face down pile, and the game starts again.

Homework activity
Worksheet 9, page 13, Question 2.
Lesson 3  Pupil’s Book page 29; Workbook page 13

Preparation
For the lesson, you will need:
• Two sets of large 0–9 digit cards
• Two sets of large 10–90 decade cards
• Pupil’s Book
• Workbook

Starter activity
Play ‘Circle addition’, as in previous lesson using, either the 0–9 digit cards or 10–90 decade cards.

Lesson focus
Draw an addition square on the board.

```
+ | 20 | 40 |
---|----|----|
30 |
---|
10 |
```

Show the pupils how an addition square works.  
20 + 30 = 50, write 50 in the centre square.  
40 + 30 = 70, write 70 in the middle right-hand square.  
20 + 10 = 30, write 30 in the bottom middle square.  
40 + 10 = 50, write 50 in the bottom right-hand square.

Draw another grid on the board and work through it with the pupils or invite pupils to come up and fill in one of the missing squares explaining which numbers they are adding together. When you are sure pupils understand how an addition square works ask them to complete the addition squares in Exercise 3 (Pupil’s Book page 30).

If you think pupils may have difficulty copying the grid ask them to write out the equations instead

Answers

Exercise 3

1. 57  
2. 62  
3. 98  
4. 98  
5. 88  
6. 78  
7. 70  
8. 83  
9. 85  
10. 79  
11. 73  
12. 59

Worksheet 9

3. a) 55  
b) 59  
c) 65  
d) 85  
e) 47  
f) 86  
g) 36  
h) 66

Assessment
While teaching the lesson observe and listen to pupils’ responses. Are pupils able to add decade numbers without counting in 10s? Do they know their facts to 10?

Pupils should be able to add decade numbers. Make sure that pupils have the decades and digits in the correct columns.

Extension activity
Give pupils a 4 × 4 addition square to complete. Give pupils an addition square with the answers in and ask them to fill in the numbers on the edges.

For example:

```
+ |
---|
50 |
---|
60 |
70 |
---|
80 |
```

Homework activity
Worksheet 9, page 13 Question 3.
Lesson 4  Pupil’s Book page 31

**Preparation**
For the lesson, you will need:
- Two sets of large 0–9 digit cards
- Two sets of large 10–90 decade cards
- Pupil’s Book

**Starter activity**
Repeat any activity or game from this unit.

**Lesson focus**
Pupils should be learning to use the number facts in real life contexts. Provide pupils with a story problem using decade numbers and model the story as an equation on the board.

‘[(Pupil’s name)] had 30 pebbles in one pocket and 20 pebbles in his/her other pocket. How many pebbles does he/she have altogether?’
Record on board 30 + 20 = ____.

Repeat with further story problems. Give a story problem such as ‘[(Pupil’s Name)] had 20 oranges and he bought some more oranges. Now he has 30 oranges. How many oranges did he buy?’ This could be recorded as 20 + ____ = 30, which is a direct recording of the problem, or pupils might see it as 30 − 20 = 10.

Exploring both ways assists pupils towards the understanding of subtraction as a reverse of the addition operation. Give a story problem and ask pupils to record the equation in their books. Invite pupils to make up story problems for each other and record the equations.

Pupils complete Exercise 4 (Pupil’s Book page 31).

**Answers**

**Exercise 4**
1. 78
2. 96
3. 85
4. 57
5. 68
6. 90

**Challenge (page 31)**
Answers will depend on the classes used for counting.

**Assessment**
During the teaching of the lesson, observe and listen to the pupils’ responses.

- Are pupils able to add decade numbers? Do they know their facts to 10?
- Pupils should be able to solve simple addition and subtraction story problems.
- Pupils should be able to record addition and subtraction stories using mathematical notation.

**Extension activity**
Use the challenge activity as an extension (Pupil’s Book page 31).

**Homework activity**
Ask pupils to make up story sums of their own to present to the class.
Lesson 5  Pupil’s Book pages 29–31

Preparation
You will need:
• Large 0–9 digit cards
• Wall chart of a 3–100 board
• Pupil’s Book

Starter activity
Play ‘Circle addition’, as in previous lesson using the 0–9 digit cards.

Lesson focus
On a wall chart mark number 3, count on three more and mark number 6. On the board record the equation 3 + 3 = 6. On the wall chart mark number 13 and ask the pupils to count on three more. ‘Where do we finish?’ Mark number 16. Record 13 + 3 = 16 underneath the previous equation on the board. Ask: ‘What do you notice?’ Expected responses may include the numbers are underneath each other and ‘The ones digits are the same in both answers’.

Ask: ‘If I start at 23 and count on three more where will I finish?’ If pupils are unable to give a suggestion or obviously have not noticed the pattern, count on with them and mark 26. If they can give you the answer ask: ‘Why do you think so?’ A correct response would include the fact that 3 + 3 = 6 and the tens digit is unchanged.

As a class, continue the pattern up to 93 + 3 = 96, marking the numbers on the 100 wall chart and recording the equations on the board. If necessary repeat with another addition equation (that does not cross the decade) and make up some examples for pupils to attempt on their own.

Answers
Class exercise
Pupils can demonstrate their made-up questions to the class. Check that their answers are correct.

Assessment
Pupils should be able to see the connection between counting in single digits and adding on decades. Repeat the lesson if needed.

Extension activity
Give additional vertical addition questions.

Homework activity
Pupils to make up more story questions to share with the class.
Unit 10
Adding three-digit numbers without exchanging or renaming

Objectives
By the end of this unit, pupils will be able to:
• Confidently use doubles and teens numbers to solve addition problems with hundreds
• Use place value knowledge to add three-digit numbers
• Add three-digit numbers by expanding both numerals
• To confidently add three-digit numbers using a mental method of personal choice.

Suggested resources
• Number lines
• 100 board
• Place value equipment (straws in bundles of ten and loose straws) or paper equipment from Unit 2.

Key word definitions
total: bringing two or more numbers (or things) together to make a new answer
sum: the result of adding two or more numbers

Frequently asked questions
Q What prior knowledge do the pupils need?
A Pupils should know their doubles to 20, all facts to 10, and teens numbers as 10+. They should be able to expand two-digit numbers into decade + ones, and be aware of number patterns in addition. Pupils must also be able to instantly recall the number 10 more or 10 less than any given number.

Common errors pupils make
Pupils may still rely on using equipment to model and support their thinking, including place value equipment, number lines and 100 squares. Encourage pupils to create a mental image of the equipment and then move to using the numbers in their heads, namely, working mentally with the properties of the numbers. If pupils find operating with just the numbers difficult, encourage them to try and recall a mental image. If they are unable to do this, then go right back to the materials and build up again through imaging the materials to the properties of the numbers. Often just a reminder is required and pupils need only see the materials used once or demonstrated once on a number line to remind them of the thinking required for the problem. In this unit on addition it is the intention to be working mainly at the number properties stage, but you should be prepared to go back to materials for those pupils who still require the support to their thinking.

Evaluation guide
Assess whether pupils can:
1. Confidently use doubles and teens numbers to solve addition problems with hundreds.
2. Use place value knowledge to add three-digit numbers.
3. Add three-digit numbers by expanding both numerals.

Lesson 1 Pupil's Book page 32; Workbook page 13
Preparation
For the lesson, you will need:
• Pupil's Book
• Workbook
Starter activity
Divide the class into two teams. Have the teams line up in front of you next to each other. Ask the first pair a double question, for example, 4 + 4, or a teen question like 10 + 7. The first to call out the answer goes to the back of his or her team, the other stays at the front. Ask a new question to the next pair. The first to respond correctly goes to the back. The first team to have their first person back to the front is the winning team. Include questions such as half of 8 or 17 − 7 or 17 − 10.

Lesson focus
To be able to progress in mathematics, pupils must have more proficient strategies than counting methods to solve addition and subtraction problems. Pupils were first introduced to using teens to solve addition problems. This lesson should revise the strategy. Use the worked example on page 29 of the Pupils Book.

What methods can pupils use that do not involve counting? Ask the pupils for possible solutions. Record the methods pupils used on the board using diagrams and symbols. Encourage all pupils in the class to participate.

These are all possible solutions that are efficient and involve the pupils understanding that numbers can be broken up and used in a way to make the equation easy. Or the numbers can be altered to make the equation easy and then the alterations compensated for at the end.

Although reaching the correct answer is required, it is more important that the pupils are able to explain how they reached their answer. When the pupils have found one solution method, challenge them to find an alternative solution method.

Revisit Exercise 3 (Pupil’s Book page 30) if necessary.

Answers

Exercise 3
See Unit 9 answers.

Worksheet 9
Refer to the answers for Question 3 given in Unit 9, Lesson 3.

Assessment
Listen to pupils’ questions and discussion during teaching time. Are they able to demonstrate non-counting methods of adding numbers together, using doubles and/or teens numbers?

Pupils should be able to select an efficient method to solve problems up to 20.

Extension activity
Write some word problems for other pupils to answer selecting numbers that make using doubles or teens an efficient strategy.

Homework activity
Repeat Worksheet 9 page 13, Question 3 if needed.
Lesson 2  Pupil’s Book page 32; Workbook page 14

 Preparation
For the lesson, you will need:
• Pupil’s Book
• Workbook

 Starter activity
Play ‘Guess my number’. Ask the pupils to think of a number between 1 and 10. Add 5, then subtract 3, then add 4, then subtract 6. ‘Your number is the number you started with.’ Pupils love these types of ‘magic’ games.

 Lesson focus
Pupils should be fairly competent at using doubles to solve addition problems now they need to recognise that the same technique can be used for three-digit numbers. Use the example on page 32 of the Pupil’s Book to demonstrate for them. Then ask pupils to make up their own examples.

Pupils complete Exercise 1 (Pupil’s Book page 32).

 Answers

Exercise 1
1. 496
2. 867
3. 999
4. 883

Worksheet 10
1. a) 239
   b) 385
   c) 565
   d) 979
   e) 428
   f) 679
   g) 589
   h) 280
   i) 835
   j) 355
   k) 597
   l) 958

 Assessment
Listen to pupils’ questions and discussion during teaching time. Are they able to demonstrate non-counting methods of adding numbers, using hundreds and/or teens numbers? Pupils should be able to select an efficient method to solve problems using 100’s. Pupils should be able to create a ‘magic’ number chain and explain why it works.

 Extension activity
Create more complicated magic number chains to try out on each other and their parents and siblings.

 Homework activity
Worksheet 10, page 14, Question 1.
Lesson 3  Pupil’s Book page 33; Workbook page 14

You will need:
• Place value equipment (bundles of ten straws and loose straws)
• Pupil’s Book
• Workbook

Starter activity
Make a number challenge. Draw lines or boxes on the board to signify that pupils will need to write a two-digit number four times. Label the first number, ‘even number’; the second number, ‘number between 20 and 45; the third number, ‘greater than 50’ and fourth number ‘less than 70’. Select three-digit cards and ask the pupils to use two out of the three digits each time to complete the four numbers so the labels are correct. When pupils have got their numbers select some pupils to read their numbers and then ask a pupil to give the number 10 more than the number. Repeat for a number of pupils, asking who has a different number for a particular category.

Lesson focus
Pupils know how to expand numbers and in this method of addition they expand both numbers and then add the decade numbers together and add the single-digit numbers together to make a new addition of a decade number plus a double-digit number. Use symbolic representation to support the pupils’ thinking.

For example $67 + 28 = 60 + 7 + 20 + 8$
$80 + 15 = 95$.

You can use arrows to show the $60 + 20$ and the $7 + 8$.

If necessary use place value equipment to show the split and regrouping so pupils can see what is happening with the numbers. Pupils should be able to add decade numbers and single-digit numbers without counting. Remind pupils that counting is not an option. Work a few more examples on the board. Make sure pupils know how use mathematical symbols to record their thinking. This method leads into using the same the method for adding three-digit numbers.

Pupils complete Exercise 2 (Pupil’s Book page 33).

Answers

Exercise 2
1. 777
2. 856
3. 794
4. 588

Challenge (page 35)
This is one of the solutions:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>8</td>
<td></td>
</tr>
</tbody>
</table>

There are other ways to do the puzzle – as long as the 2 / 8 and 4 / 6 are opposite each other (either on the diagonal or the middle row).

Encourage pupils to see how many ways they can find to do the puzzle. (There are eight combinations possible.)

Worksheet 10
2. 658

Assessment
Observe and listen to pupils during teaching. Pupils should be able to add numbers by adding a decade number and compensating.

Extension activity
Ask pupils to complete the challenge activity as an extension (Pupil’s Book page 35).

Homework activity
Worksheet 10, page 14, Question 2.
Lesson 4  Pupil's Book page 33

**Preparation**
For the lesson, you will need:
- two sets of large 0–9 digit cards
- two sets of large 10–90 decade cards
- the Pupil's Book

**Starter activity**
Play 'Circle addition', as in the previous lesson using either 0–9 digit cards or 10–90 decade cards.

**Lesson focus**
Use the same method as for addition of two-digit numbers, explaining to pupils how to place the numbers vertically one under the other so that the hundreds, tens and single-digits line up. Give some examples for pupils to practice writing correctly before demonstrating how to complete the addition. Pupils should not experience difficulty with this because it is a natural progression from two-digit addition.

Complete Exercise 3 (Pupil's Book page 33).

**Answers**

**Exercise 3**
1. 738  
2. 959  
3. 559  
4. 494  
5. 588  
6. 627  
7. 300  
8. 666  
9. 758  
10. 276  
11. 397  
12. 558

**Assessment**
While teaching the lesson observe and listen to pupils’ responses. Are pupils able to add hundred and decade numbers without counting in tens? Make sure that pupils have the digits in the correct columns.

Lesson 5  Pupil's Book page 34; Workbook page 14

**Preparation**
For the lesson, you will need:
- Two sets of large 0–9 digit cards
- Two sets of large 10–90 decade cards
- Pupil's Book
- Workbook

**Starter activity**
Repeat any activity or game from this unit.

**Lesson focus**
Pupils should be learning to use the number facts in real life contexts. Provide pupils with a story problem using decade numbers and model the story as an equation on the board.

Give a story problem and ask pupils to record the equation in their books. Invite pupils to make up story problems for each other and record the equations.

Pupils complete Exercise 4 (Pupil's Book pages 34 and 35).

**Answers**

**Exercise 4**
1. 759  
2. 358  
3. 567  
4. 365  
5. 348  
6. 689  
7. 677  
8. 678

**Worksheet 10**
3. 556 pages  
4. 684 mangoes
Assessment
During the teaching of the lesson, observe and listen to the pupils’ responses.

Are pupils able to add three-digit numbers?

Pupils should be able to solve simple addition story problems.

Pupils should also be able to record addition stories using mathematical notation.

Extension activity
Ask pupils to make up story sums of their own.

Homework activity
Worksheet 10, page 14, Questions 3 and 4.
Objectives
By the end of this project, pupils will have shown that they are able to:
• Create their own flashcards with numbers 1–20
• Add numbers between 1–200
• Form two-and three-digit numbers
• Record numbers accurately and count forwards and backwards.

Guidelines
This project is designed to encourage pupils to work independently. Introduce the project by explaining to pupils that they are going to be undertaking a survey of the time that pupils arrive at school.

Commence by sorting pupils into pairs or groups and instructing them to create their own flashcards. If you have sufficient pieces of card then pupils can work independently. Point out the examples of flashcards on page 36 of the Pupil’s Book, to give them an idea of what the cards should look like.

Work through instructions 2 to 5 of the project. These can be completed inside the classroom. Pupils should record the answers to 2 and 3 in their note books. Instruction 5 can be completed in the form of a game.

Instruction 6 needs to be completed at the school gates. Pupils will need to record the answer. If they need help in calculating the difference in the number of pupils, they can use the 200 number square on page 10 of the Pupil’s Book and count backwards from the bigger to the smaller number.

Answers
2. 201
There are no set answers to the rest of the questions. Monitor that pupils follow the correct procedures.
Objectives
This assessment is a summative assessment of work covered in Units 1 to 10.
- This assessment is designed to assess the pupils’ mathematical understanding and not their reading ability. It is important that it is completed by individuals and not with the support of others in order to uncover any difficulties a pupil may be having with particular concepts.
- It is therefore best carried out with small groups of pupils under your guidance. You should read each question carefully to the pupils and give them time to complete the question before moving on to the next question.
- A more able group within the class may be able to complete the assessment without needing you to read the questions to them. However observing pupils while they are completing the assessment provides further information about these pupils.

Guidelines
On completion of the assessment look for both correct answers and mistakes made by pupils. Also check to see if there is a pattern in terms of any particular question causing a significant number of pupils difficulties. By analysing the results of the assessment you will be able to identify weaknesses in individual pupils and so provide the necessary support. You will also be able to identify strengths of individual pupils and provide them with more challenging activities. In addition, you will be able to identify any weaknesses in their teaching programme and make adjustments as necessary.

For this assessment pupils should be able to look at any three-digit number and say how many groups of 10 could be made from the number. If they are still reliant on making the groups and then counting out the groups then further work is required making specific links to the way numbers are written and expanding numbers into hundreds, tens and ones. Pupils should be able to add decade numbers by knowing facts to 10 and not by counting forwards or backwards in tens.

Answers

1. 20, 21, 22, 23, etc. to 52
2. 71, 69, 68, etc. to 44
3. tens (forty)
4. 20, 24, 46, 58, 72, 84, 89, 100, 102, 121
5. 18 – eighteen
   60 – sixty
   147 – one hundred and forty-seven
   85 – eighty-five
   176 – one hundred and seventy-six
6. twenty-eight – 28
   one hundred and one – 101
   one hundred and eighty-five – 185
   ninety-six – 96
   one hundred and twelve – 112
7. 57 + 44 = 101
   50 + 49 = 99
   820 + 179 = 999
   208 + 330 = 538
   57 + 44 = 101
   50 + 49 = 99
   820 + 179 = 999
   208 + 330 = 538
8. (No answer provided)
9.

10.15

11.
Unit 11
Subtracting two-digit numbers without exchanging or remaining

Objectives
By the end of this unit, pupils will be able to:

• Use subtraction facts to 10 to subtract decade numbers
• Solve simple subtraction story problems
• Record subtraction stories using mathematical notation
• Recognise the patterns in related subtraction equations.

Suggested resources
• Bundles of ten straws and single straws
• Paper base ten equipment (10 cm square = 100, 10 cm × 1 cm strip = 10, 1 cm square = 1)
• Digit cards 0–9
• Decade number cards
• Tens frames (2 × 5 grids)
• 20 number line

Key word definitions
subtraction: an arithmetic operation in which the difference between two numbers is calculated
equation: an equation says that two things are the same, using mathematical symbols. An equal sign (=) is used

Frequently asked questions
Q What prior knowledge do the pupils need?
A Pupils need to know the facts to 10. They need to know the doubles to 20, the teens numbers as 10 plus, and that the digit on the left of a two-digit number represents how many groups of 10 there are in the number.

Common errors pupils make
Pupils have learnt to solve addition and subtraction problems by counting forwards or counting backwards. They have learnt that counting is a reliable method to get the right answer. However, to move towards efficient strategies to subtract pupils must have instant recall of the basic addition and subtraction facts. Playing games requiring the recall of facts (as given in the Grade 1 material) provides a safe environment to take risks. Pupils must learn to trust recall in a safe learning environment.

Evaluation guide
Assess whether pupils can:
1. Use subtraction facts to 10 to subtract decade numbers.
2. Solve simple subtraction story problems.
3. Record subtraction stories using mathematical notation.
4. Recognise the patterns in related subtraction equations.

Lesson 1  Pupil’s Book page 40; Workbook page 15

Preparation
• You will need:
  • Two sets of large 0–9 digit cards
  • Table top sets of 1–9 digit cards
  • Table top sets of 10–90 decade number cards
  • Pupil’s Book
  • Workbook

Starter activity
Play ‘Circle subtraction’. Place two sets of 0–9 large digit cards in a circle on the floor. Divide the class into two teams. The first pupil from each team walks around the circle. Try and keep pupils on opposite sides of the circle. When you call ‘stop’ the pupils place their toe on the card nearest to them.
Both pupils subtract the two numbers with toes on, subtracting the smaller number from the larger one. The first to call the correct answer stays in and the other returns to the back of his or her team. The next pupil in that team then walks the circle.

**Lesson focus**

Revise the place value of digits in a column. Write any two-digit number on the board and ask ‘What does this digit represent?’ pointing to the tens digit and ‘What does this digit represent?’ pointing to the ones digit. Repeat with a few more numbers.

Write on the board $2 - 1 = ____$. The pupils should be able to give you the answer easily.

Write on the board $20 - 10 = ____$. The pupils should be able to give you the answer quite easily. Ask the pupils if they notice anything the same. You could expect answers such as that they both have ones and twos in, or the second equation is the same as the first but the numbers have zeros on the end. You need to ask the question: ‘What are we subtracting in the first equation?’ (subtracting ones) ‘What are we subtracting in the second equation?’ (subtracting tens).

Revise the breaking down of numbers into tens and units. Give the pupils several examples to work through. Get pupils to make their own questions up to ask each other. Briefly revise addition of two-digit numbers.

**Answers**

**Class exercise**

Check the answers of the examples that pupils make up. Make sure the pupils understand how to split numbers into tens and units.

**Worksheet 11**

1. a) cross out 2 circles
   
   b) 2
   
   c) cross out 17 boxes
   
   d) 17
   
   e) cross out 16 faces
   
   f) 16

**Assessment**

During the teaching observe and listen to pupils’ responses. Are pupils making the connection between basic facts to ten and subtraction of decade numbers?

**Extension activity**

Give examples of two-digit numbers for pupils to find the place value.

**Homework activity**

Worksheet 11, page 15, Question 1.
Lesson 2  Pupil’s book page 40; Workbook page 16

Preparation
You will need:
• Two sets of large 0–9 digit cards
• Two sets of large 10–90 decade cards
• Pupil’s Book
• Workbook

Starter activity
Play ‘Show me’. This game is played in silence. The pupils communicate with you by showing the correct number of fingers. You call out a subtraction equation, for example, ‘seven take away three’. The pupils must respond by showing four fingers.

Encourage pupils to show the answers less than five using just one hand.

Lesson focus
Revise the place value of digits in a column. Write any two-digit number on the board and ask ‘What does this digit represent?’ pointing to the tens digit and ‘What does this digit represent?’ pointing to the ones digit. Repeat with a few more numbers.

Write on the board 5 − 1 = ____. The pupils will be able to give you the answer easily.

Write on the board 50 − 10 = ____. The pupils should be able to give you the answer. Ask them if they notice anything the same. You could expect answers such as that they both have ones and fives and fours in, or the second equation is the same as the first, but the numbers have zeros on the end. You need to ask the question: ‘What are we taking away or subtracting in the first equation?’ (subtracting ones). ‘What are we taking away or subtracting in the second equation?’ (subtracting tens).

Write some more equations in ones on the board, such as 6 − 2 = _____, and then write them as decade equations 60 − 20 = _____, etc. When you are sure pupils have made the connection and are confidently transferring their knowledge of basic facts to the subtraction of decades.

Pupils complete Exercise 1 (Pupil’s Book page 40).

Answers

Exercise 1
1. This is done for you
2. 3 tens and 9 units
3. 1 ten and 3 units
4. 5 tens and 5 units
5. 9 tens and 7 units
6. 4 tens and no units

Worksheet 11
7. 50
8. Pupils must do this on their worksheet.
9. Fifty minus twenty-four
10. 26

Assessment
Observe during the starter activity. Are pupils able to display the correct number of fingers quickly? During the lesson observe and listen to pupils’ responses. Are pupils making the connection between basic facts to 10 and subtraction of decade numbers? Pupils should be able to have instant recall of subtraction facts. Pupils should be able to use subtraction facts to 10 to subtract decade numbers.

During the teaching observe and listen to pupils’ responses. Are pupils making the connection between basic facts to 10 and subtraction of decade numbers?

Extension activity
Introduce pupils to subtraction squares.
Homework activity
Worksheet 11, page 16, Questions 7–10 (Note: Questions 3 and 4 are done with Lessons 4 and 5)

Pupils need to subtract the second number from the first both horizontally and vertically. If they are correct then the bottom right-hand corner is the answer to both the bottom row subtraction and the right-hand column subtraction.

Select appropriate decade numbers to start off a subtraction square. Take care to avoid negative numbers.

Lesson 3  Pupil’s Book page 41; Workbook page 16

Preparation
You will need:
- Two sets of large 0–9 digit cards
- Two sets of large 10–90 decade cards
- Pupil’s Book
- Workbook

Starter activity
Repeat any of the starter activities already used in this unit.

Lesson focus
Pupils should be learning to use the number facts in real life contexts. Provide pupils with a story problem using decade numbers and model the story as an equation on the board.

‘[Pupil’s name] had 30 pebbles in one pocket gives 20 pebbles to his friend. How many pebbles does he have now?’
Record on the board 30 − 20 = _____.

Repeat with further story problems.

Give a story problem like ‘[Pupil’s name] had 20 oranges and he ate ten oranges. How many has he left?’ This could be recorded as 20 − ____ = 10, which is a direct recording of the problem, or pupils might see it as 20 − 10 = 10. Exploring both ways assists pupils towards the understanding of subtraction as a reverse of the addition operation.

Give a story problem and ask pupils to record the equation in their books. Invite pupils to make up story problems for each other and record the equations.

Explain the example on page 40 of the Pupil’s Book. Complete Questions 1 and 2 of Exercise 2 (Pupil’s Book page 41).
Answers

Exercise 2
1. $39 - 24 = 15$
2. $48 - 22 = 26$

Worksheet 11
5. 12
6. 14

Assessment
During the teaching of the lesson, observe and listen to the pupils’ responses. Are pupils able to add decade numbers? Do they know their facts to 10?

Pupils should be able to solve simple addition and subtraction story problems. Pupils should also be able to record addition and subtraction stories using mathematical notation.

Extension activity
Ask pupils to write number stories in words for other pupils to write the equations.

Provide a number of written word stories and written equations for pupils to match up.

Homework activity
Worksheet 11, page 16, Questions 5 and 6 (Note: Questions 3 and 4 are done with Lessons 4 and 5).

Lesson 4  Pupil’s Book page 41; Workbook page 16

Preparation
You will need:
- Number line marked 0–30
- Number cards 1–10 in a bag or box
- Pupil’s Book
- Workbook

Starter activity
Play ‘Zap the digits’. Write the numbers 1–10 on the board. Draw a digit card out of a bag or box. Call out the card, pupils must make a subtraction to equal the number called using two numbers from the numbers 1–10. For example, If you call 7, pupils could use, $8 - 1$, $9 - 2$ or $10 - 3$.

Select a pupil to give an equation and record the equation on board. Cross out the two numbers used. They cannot be used again. Return the digit card to the bag or box. Draw another card and repeat the process. The idea is that pupils can eliminate all the digits 1–10. When pupils know how this game works they can work individually or as a smaller group so each group or individual is selecting which digits to use each time. The winning group or individual is the one who eliminates all their digits first.

Lesson focus
Revise a problem from the previous lesson. Ask pupils to explain to you how they subtract a number without counting backwards. Can pupils explain with or without a number line? Initially pupils may need to explain their thinking by actually acting it out by drawing arrows on a number line. Ultimately, pupils should be able to explain their thinking using words only with no material support. This is a step towards internalising the process, namely, when they use subtraction without counting as their ‘normal’ method or subtracting a single-digit number.
When pupils are confident at explaining the method with a number line, proceed to Exercise 2, Questions 3 and 4 (Pupil’s Book page 41). Look at Question 3 together and discuss how you would reach the answer. Pupils who are confident can then continue with the Question 4 alone. Other pupils may need to work through numbers 1 to 3 again with you before continuing.

**Answers**

**Exercise 2**

3. 12  
4. 10

**Worksheet 11**

3. a) 65  
   b) 62  
   c) 51  
   d) 53

**Assessment**

During the lesson listen to pupils’ responses. Can pupils confidently explain the method of subtracting part of the number to reach the decade and then subtract the remaining part of the number? Look for evidence of pupils still reverting to counting. Pupils should be able to subtract a single digit from a double-digit number without counting.

**Extension activity**

Provide the pupils with more subtractions of single digits from a double-digit number.

**Homework activity**

Worksheet 11, page 15, Question 3.

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**Lesson 5**  
*Pupil’s Book page 41; Workbook page 15*

**Preparation**

You will need:
- Wall chart 3 side 1, 100 board
- Wall chart 3 side 2, blank 100 board
- Number cards 1–10 in a bag or box
- Pupil’s Book
- Workbook

**Starter activity**

Using a blank 100 board. Write 5, 28, 63 and 86 in the correct places on the blank board. Challenge pupils to write a number in the right place on the 100 board. To do this, pupils need to use their number knowledge of sequencing, adding and subtracting in 10s and knowledge of patterns on a 100 board.

**Lesson focus**

Use the 100 board to record the results of subtracting the same number from a column on the 100 board that goes back over the decade. Tell the pupils, ‘Start at 13 and count back 5 – mark the 13 and the 8 on the 100 board. ’Start at 23 and count back 5’ – mark the 23 and the 18. ’Start at 33 and count back 5. Where do you think we will finish?’

Can pupils identify the pattern? Ask them a question out of sequence. ‘If I start at 73 and count back 5 where will I finish?’

Practise a few more making sure the numbers selected go back over the decade. Pupils can then complete Exercise 2, Question 5 (Pupil’s Book page 41).

**Answers**

**Exercise 2**

5. 24

**Worksheet 11**

4. a) 32  
   b) 21  
   c) 12  
   d) 34
Assessment
Pupils should be able to recognise patterns in subtraction.

Extension activity
Allow pupils to continue the patterns into three-digit numbers.

Homework activity
Worksheet 11, page 16, Question 4.
Unit 12
Adding two-digit numbers with exchanging or remaining

Objectives
By the end of this unit, pupils will be able to:
• Use addition and subtraction facts to 10
• Add a single-digit to a double-digit number without counting
• Recognise and use number patterns when adding
• Add double-digit numbers using expanded numerals
• Use addition of double-digit numbers with exchanging and remaining to solve word problems.

Suggested resources
• Number lines
• 3 × 3 grids
• Bundles of ten straws and single straws (place value representations)
• 0–9 digit cards
• 0–100 digit cards

Key word definitions
No new vocabulary.

Frequently asked questions
Q What prior knowledge do the pupils need?
A Pupils should be able to read and write numbers up to 100, expand two-digit numbers into tens and ones and understand place value of two-digit numbers. They need to know the addition facts to 10 and be able to add decades to any number.

Common errors pupils make
Pupils continue to use counting strategies when adding. They have learnt that counting is a reliable method to get the right answer. However, in order to move towards efficient strategies pupils must have instant recall of the basic addition and subtraction facts. This unit introduces methods involving adding two-digit numbers. Place value is of paramount importance. Pupils who struggle with this unit should be given further work on understanding place value as this is the most likely cause of difficulty. Not knowing their basic facts to 10 will also cause pupils difficulty, but this unit provides opportunities for practising basic facts and a reason to have to know them.

Evaluation guide
Assess whether pupils can:
1. Use addition and subtraction facts to 10.
2. Add a single-digit to a double-digit number without counting.
3. Recognise and use number patterns when adding.
4. Add double-digit numbers using expanded numerals.
5. Use addition of double-digit numbers with exchanging and remaining to solve word problems.

Lesson 1 Pupil’s Book page 42; Workbook page 17
Preparation
You will need:
• Blank number lines
• Pupil’s Book
• Workbook

Starter activity
Revise with the pupils expanding numbers into tens and ones. For example, write 57 on the board.
Pupils write or respond orally – fifty add seven (50 + 7). Write 30 + 6 on the board. Pupils write or respond orally – thirty six (36).

**Lesson focus**

Explain to the pupils how you are going to use their previous knowledge of splitting a small number up to add it to a larger number and will now look at splitting a large number into a decade number and a small number before adding the large numbers together.

Write the equation 36 + 27 = ____ on the board. Mark the number 36 on a number line. Ask the pupils to expand the number 27 into 20 + 7. Explain that you want them to add the 20 to the 36. Pupils may want to make two jumps on the number line + 10 then + 10. Show the jumps on the number line using arrows with + 10 and + 10. Ask the pupils if they could make just one big jump? Remind the pupils of the work they have previously done on 3 + 2 = 5 and 30 + 20 = 50, and that 36 is 30 + 6. If necessary use the 100 board to support the pupils’ thinking and show 36 and 20 more is 56 – the ones digit does not change if you are adding tens only. Once established 36 + 20 = 56 the remaining addition to solve is 56 + 7 = ____? Ask the pupils how they are going to solve this. Pupils should be able to explain their thinking from previous lessons of adding a single digit to a double-digit number. If pupils still need a number line to explain their thinking then this indicates they have not yet internalised the process. Practise a few more additions of double-digit numbers. It is important that the single digit additions cross the decade, for example, 45 + 26, 37 + 28, 48 + 36. Allow pupils to complete Exercise 1 (Pupil’s Book page 42).

Give small groups or pairs of pupils a problem to work on so they have to talk through the process to each other. You can listen to their reasoning and thinking.

**Answers**

**Exercise 1**

1. This is done for you.

2. 60 + 10 + 1 = 70 + 1 = 71
3. 67 + 25 = 60 + 7 + 20 + 5 = 80 + 12 = 80 + 10 + 2 = 92
4. 48 + 37 = 40 + 8 + 30 + 7 = 70 + 15 = 70 + 10 + 5 = 85
5. 58 + 36 = 50 + 8 + 30 + 6 = 80 + 14 = 80 + 10 + 4 = 94
6. 44 + 37 = 40 + 4 + 30 + 7 = 70 + 11 = 70 + 10 = 81
7. 56 + 14 = 50 + 6 + 10 + 4 = 60 + 10 = 70
8. 63 + 38 = 60 + 3 + 30 + 8 = 90 + 11 = 90 + 10 + 1 = 101
9. 27 + 46 = 20 + 7 + 40 + 6 = 60 + 13 = 60 + 10 + 3 = 73
10. 36 + 49 = 30 + 6 + 40 + 9 = 70 + 15 = 70 + 10 + 5 = 85
11. 36 + 27 = 30 + 6 + 20 + 7 = 50 + 13 = 50 + 10 + 3 = 63

**Worksheet 12**

1. a) This one is done for you.
   b) 30 + 5 + 20 + 7 = 50 + 12 = 50 + 10 + 2 = 62
   c) 50 + 8 + 20 + 6 = 70 + 14 = 70 + 10 + 4 = 84
   d) 60 + 3 + 10 + 9 = 70 + 12 = 70 + 10 + 2 = 82
   e) 80 + 4 + 10 + 6 = 70 + 10 = 80
   f) 20 + 9 + 10 + 9 = 30 + 18 = 30 + 10 + 8 = 48

**Assessment**

Listen to pupils’ thinking and reasoning when working in small groups to solve a problem.

Pupils should be able to expand a number into tens and ones and add the decade number and then add a single digit. Pupils should be able to explain their methods of mental addition that do not involve counting.

**Extension activity**

Allow pupils to make up their own questions and expand them.

**Homework activity**

Worksheet 12, page 17, Questions 1a) to f).
Lesson 2  Pupil’s Book page 43; Workbook page 17

Preparation
You will need:
• Blank number lines
• Pupil’s Book
• Workbook

Starter activity
Remind pupils of the previous lesson. Play a game from an earlier lesson such as ‘Zap the digits’, but use addition and not subtraction.

Lesson focus
Remind the pupils of the work they have previously done on $3 + 2 = 5$ and $30 + 20 = 50$ and that $36$ is $30 + 6$. If necessary use the 100 board to support the pupils’ thinking and show $36$ and $20$ more is $56$ – the ones digit does not change if you are adding tens only. Once established, $36 + 20 = 56$, the remaining addition to solve is $56 + 7 = ?$ Revise the two examples in the Pupil’s Book on pages 42 and 43.

Pupils complete Exercise 2 (Pupil’s Book page 43).

Answers

Exercise 2
1. This is done for you.
2. $44 + 18 = 40 + 4 + 10 + 8 = 50 + 12 = 50 + 10 + 2 = 62$
3. $57 + 36 = 50 + 7 + 30 + 6 = 80 + 13 = 80 + 10 + 3 = 93$
4. $62 + 29 = 60 + 2 + 20 + 9 = 80 + 11 = 80 + 10 + 1 = 91$
5. $71 + 19 = 70 + 1 + 10 + 9 = 80 + 10 = 90$
6. $25 + 48 = 20 + 5 + 40 + 8 = 60 + 13 = 60 + 10 + 3 = 73$
7. $80 + 12 = 80 + 10 + 2 = 90 + 2 = 92$

Worksheet 1
1. g) $60 + 5 + 20 + 9 = 80 + 14 = 80 + 10 + 4 = 94$
h) $40 + 7 + 10 + 9 = 50 + 16 = 50 + 10 + 6 = 66$
i) $70 + 8 + 20 + 8 = 90 + 60 = 90 + 10 + 6 = 106$
j) $20 + 4 + 60 + 8 = 80 + 12 = 80 + 10 + 2 = 92$

Assessment
Pupils should be able to expand a number into tens and ones and add the decade number and then add a single digit. Pupils should be able to explain their methods of mental addition that do not involve counting. Give those pupils who struggle extra practice of single digit addition that crosses the decade.

Extension activity
Allow pupils to make up their own questions and expand them.

Homework activity
Worksheet 12, page 17, Questions 1 g) to j).
Lesson 3  Pupil’s Book page 43; Workbook page 17

**Preparation**
You will need:
- 3 × 3 grids
- Pupil’s Book
- Workbook

**Starter activity**
Use any starter activity that has been used in this unit.

**Lesson focus**
Addition squares provide pupils with further practice in adding numbers mentally. Draw a 3 × 3 grid on the board. In the top left-hand corner write the addition sign. Write the numbers 8 and 9 on the top row and write 6 and 7 in the left-hand column, as shown here.

```
+ 8 9
6
7
```

Show the pupils that the centre square is the total of the number in the row above the same column and the number in the left column, same row (8 + 6) so the number in the centre square is 14. Complete the grid together. Repeat the exercise with larger numbers. Ask pupils to suggest two two-digit numbers to put along the top, and two more to put down the side. Complete the remaining squares together. When pupils have understood how to complete an addition square they can complete the puzzle in the Pupil’s Book page 43.

**Answers**

**Puzzle (page 43)**

```
2 7 6
9 5 1
4 3 8
```

**Worksheet 12**

3. a) \(20 + 5 + 10 + 8 = 30 + 10 + 3 = 43\)
   b) \(60 + 2 + 10 + 8 = 70 + 10 = 80\)
   c) \(70 + 5 + 20 + 8 = 90 + 10 + 3 = 103\)

**Assessment**
Observe how pupils complete the additions for the addition squares. Do they add mentally or do they still revert to counting methods? Pupils should be able to add two double-digit numbers.

**Extension activity**
You can challenge pupils to make up addition squares for themselves.

**Homework activity**
Worksheet 12, page 17, Question 3.
**Lesson 4**  
*Pupil’s Book page 47; Workbook page 17*

**Preparation**

You will need:
- Number cards 1–20 plus decade cards
- Pupil’s Book
- Workbook

**Starter activity**

Remind pupils of single-digit addition, placing numbers vertically. Write some examples on the board and ask pupils to call out the answers, for example 20 + 2 and 30 + 5. Demonstrate how to write these vertically. Test the pupils by positioning the vertical digits in the wrong places and see if they notice.

**Lesson focus**

Pupils need to make the next step and be able to add two-digit numbers together using vertical addition, rather than grouping in tens and units. Some pupils will find this difficult. Pupils need to be able to add the units and understand that if the units add over the decade then they must make a note to carry the tens into the tens column. Demonstrate to pupils how to carry over the tens.

Explain the example on page 44 of the Pupil’s Book. Before completing Exercise 3, show pupils how to write numbers as vertical addition. Include some examples with a hundreds column.

Pupils complete Exercise 3 (Pupil’s Book page 44).

**Answers**

**Exercise 3**

1. 73
2. 91
3. 81
4. 75
5. 132
6. 80
7. 80
8. 90
9. 100
10. 111

**Worksheet 12**

2. a) 45  
   b) 61  
   c) 103  
   d) 37  
   e) 83  
   f) 64  
   g) 45  
   h) 61

**Assessment**

Make sure that pupils understand how to arrange addition vertically and to carry over into the tens column. Give extra practice to pupils who have difficulty with this.

**Extension activity**

Ask pupils to make up their own number puzzles.

**Homework activity**

Worksheet 12, page 17, Question 2.
Lesson 5  Pupil’s Book page 45

 Preparation
You will need:
• Blank number lines
• Pupil’s Book

 Starter activity
Play ‘Target 80’.

 Lesson focus
Use the word problems in Exercise 4 (Pupil’s Book page 45) to discuss how you could go about solving problems. Comprehension of the written word is important. Pupils need to unpack the problem to find out what it is actually being asked. The tendency is for pupils to read only the numbers and guess what they have to do with the numbers rather than understand the context in which the numbers are presented. Problem solving will always involve words so poor reading will be a barrier. Supported reading allows pupils to learn how to problem solve rather than avoid it. Discussion should allow for a variety of methods to be used. All methods are valid providing they are efficient.

Pupils complete Exercise 4 (Pupil’s Book page 45).

 Answers
Exercise 4
1. 81
2. 61
3. 35
4. 120
5. 82

 Assessment
Listen to pupils’ questions and responses during class discussion. Can pupils identify the mathematics required to solve a problem and are they able to explain a mental method of solving addition problems?

Pupils should be able to use addition to solve word problems.

 Extension activity
Ask pupils to write a story problem that can be solved by addition using three digits.

 Homework activity
Pupils are to make up their own story problems.
Unit 13: Subtracting two-digit numbers with exchanging and remaining

Objectives
By the end of this unit, pupils will be able to:
• Use subtraction facts to 100
• Subtract a single digit from a double-digit number without counting
• Recognise and use number patterns when subtracting
• Subtract double-digit numbers expanded numerals
• Use addition and subtraction to solve word problems.

Suggested resources
• Number lines
• 3 × 3 grids
• Bundles of ten straws and single straws (place value representations)
• 0–9 digit cards
• 0–100 digit cards

Key word definitions
There are no new key words.

Frequently asked questions
Q What prior knowledge do the pupils need?
A Pupils should be able to read and write numbers up to 100, expand two-digit numbers into tens and ones and understand place value of two-digit numbers. They need to know the addition and subtraction facts to 10 and be able to subtract decades to any number.

Common errors pupils make
Pupils continue to use counting strategies when subtracting. This unit introduces methods involving subtracting two-digit numbers. Place value is of paramount importance. Pupils who struggle with this unit should be given further work on understanding place value as this is the most likely cause of difficulty. Not knowing their basic facts to 10 will also cause pupils difficulty, however this unit provides opportunities for practising basic facts and a reason to have to know them.

Evaluation guide
Assess whether pupils can:
1. Use subtraction facts to 100.
2. Subtract a single digit from a double-digit number without counting.
3. Recognise and use number patterns when subtracting.
4. Subtract double-digit numbers expanded numerals.
5. Use addition and subtraction to solve word problems.

Lesson 1 Pupil’s Book page 46; Workbook page 18
Preparation
You will need:
• Digit cards 0–9
• Some place value equipment, such as bundles of ten straws, and some single straws or the paper equipment from Unit 2
• Pupil’s Book
• Workbook

Starter activity
Play ‘Target 80’. The object of the game is to reach as close to the sum of 80 as possible. Use the set of digit cards 1–9. Explain to the pupils that five digit cards are going to be drawn from the set, one at a time. As the card is drawn the pupils must decide whether it is going to be a ones or a tens number. For example, if 3 is drawn, will the pupils use it as
3 or 30? Each time a card is drawn the pupils must write down their number (either ones or decade number). After five draws the pupils total their numbers. Closest to 80 wins the game. Repeated playing of the game allows the pupils to develop the strategies of mentally adding numbers to keep a running total and estimating – gradually learning which digits to use as ones and which as tens as the numbers unfold.

Lesson focus

Explain to the pupils how you are going to use their previous knowledge of splitting a small number up to subtract it from a larger number and now look at splitting a large number into a decade number and a small number before subtracting it. On the board write the equation $52 - 27 = _____$. Show the pupils 52 as five bundles of 10 and 2 odd straws.

Ask the pupils to expand the number 27 into $20 + 7$. Explain you want them to subtract the 20 from the 52. Show them by taking two bundles of 10 from the 52 to leave 32. Draw a number line on the board to further support pupils’ thinking. Mark 52 and draw an arrow back to 32 with – 20 written above it. Pupils may want to make two jumps on the number line, – 10 then – 10, but encourage them to make one large jump. Remind pupils of the work they have previously done on $5 - 2 = 3$ and $50 + 20 = 30$. If necessary, use the 100 board to support the pupils’ thinking and show 52 and 20 less is 32. The ones digit does not change if you are subtracting tens only. Once established $52 - 20 = 32$, the remaining subtraction to solve is $32 - 7 = ?$ Ask pupils how they are going to solve this. Pupils should be able to explain their thinking from previous lessons of subtracting a single digit from a two-digit number.

If pupils still need a number line to explain their thinking then this indicates they have not yet internalised the process. Practise a few more subtractions of double-digit numbers. It is important that the single digit subtractions cross the decade. For example: $45 - 26$, $35 - 28$, $42 - 36$. Give small groups or pairs of pupils a problem to work on so they have to talk through the process to each other and you can listen to their reasoning and thinking.

Pupils complete Exercise 1 (Pupil’s Book page 46).

Answers

Exercise 1

1. $61 - 22 = 5$ tens and 11 units minus 2 tens and 2 units = 39
2. $35 - 18 = 2$ tens and 15 units minus 1 ten and 8 units = 17
3. $46 - 17 = 3$ tens and 16 units minus 1 ten and 7 units = 29
4. $53 - 24 = 4$ tens and 13 units minus 2 tens and 4 units = 29
5. $78 - 19 = 6$ tens and 18 units minus 1 ten and 9 units = 59
6. $54 - 27 = 4$ tens and 14 units minus 2 tens and 7 units = 27
7. $32 - 18 = 2$ tens and 12 units minus 1 ten and 8 units = 14
8. $36 - 17 = 2$ tens and 16 units minus 1 ten and 7 units = 19
9. $63 - 48 = 5$ tens and 13 units minus 4 tens and 8 units = 15
10. $90 - 23 = 8$ tens and 10 units minus 2 tens and 3 units = 67

Worksheet 13

1. a) $30 + 13 - 10 - 8 = 25$
   b) $20 + 16 - 10 - 7 = 19$
   c) $40 + 18 - 30 - 9 = 19$
   d) $10 + 15 - 10 - 8 = 7$

Assessment

Listen to pupils’ thinking and reasoning when working in a small group to solve a problem.

Pupils should be able to expand a number into tens and ones and subtract the decade number and then subtract a single digit.

Pupils should be able to explain their methods of mental subtraction.
Extension activity
Play ‘Target 80’ in pairs or small groups with pupils drawing the digit cards one at a time.

Homework activity
Worksheet 13, page 18, Questions 1 a) to d).

Lesson 2 (Pupil’s Book page 46; Workbook page 18)

Preparation
You will need:
• Blank number line
• Place value equipment
• Some place value equipment such as bundles of ten straws and some single straws, or the paper equipment from Unit 2
• Pupil’s Book
• Workbook

Starter activity
Use any of the starter activities used in this unit.

Lesson focus
Revise a problem from yesterday’s lesson. Ask pupils to explain to you how they subtract a two-digit number from another two-digit number, using expanded numbers. Initially, pupils may need to explain their thinking by actually acting it out by drawing arrows on a number line or using place value equipment; like straws in bundles of ten and single straws. Ultimately, pupils should be able to explain their thinking using words only, no longer needing material support. This is a step towards internalising the process, namely, when they use subtraction, not counting backwards, as their ‘normal’ method for subtracting double-digit numbers mentally.

When pupils are confident at explaining the method with a number line, they complete Worksheet 13, Question 1, which was started for homework yesterday. Check the answers to yesterday’s homework as this will help indicate pupils that are having difficulty with expanded numbers. Pupils who are confident can continue with the worksheet exercise alone.

Other pupils may need to rework though yesterday’s homework with you before continuing with the remainder of the exercise.
Answers

Worksheet 13

1. e) 62 − 27 = 5 tens and 12 units minus 2 tens and 7 units = 35
f) 22 − 19 = 1 ten and 12 units minus 1 ten and 9 units = 3
g) 74 − 27 = 6 tens and 14 units minus 2 tens and 7 units = 47
h) 81 − 35 = 7 tens and 11 units minus 3 tens and 5 units = 46
i) 63 − 55 = 5 tens and 13 units minus 5 tens and 5 units = 8
j) 92 − 48 = 8 tens and 12 units minus 4 tens and 8 units = 44

Assessment

Observing how pupils complete the worksheet will give a strong indication of a pupil's ability to subtract numbers mentally. Can they explain their method of solving a subtraction mentally?

Pupils should be able to subtract a double-digit number by subtracting the decades and then subtracting the single digit.

Extension activity

Give pupils some examples with three-digit numbers to see if they can use the same method of expansion to find the answers.

Lesson 3 Pupil’s Book page 46

Preparation

You will need:
- Blank number line
- Place value equipment
- Some place value equipment, such as bundles of ten straws, and some single straws, or the paper equipment from Unit 2
- Pupil’s Book

Starter activity

Use any game from previous units that the pupils enjoy.

Lesson focus

This lesson introduces the concept of vertical subtraction. Start with simple subtractions that do not involve changing tens into units, so that pupils build up confidence, for example, 57 − 23, 68 − 56 and 49 − 37. Demonstrate how to write vertical addition and give pupils examples to practice. Notice any pupils that have difficulty, and revise single digit subtraction with them.

Answers

Class exercise

The answers will vary according to the practice examples you have given pupils.

Homework activity

Give pupils further examples to complete at home.
**Extension activity**

Those pupils who have found the subtraction work can be given a subtraction question that involves expanding digits to see if they can work out how to do this using vertical addition.

**Homework activity**

Give pupils extra examples of vertical subtraction without exchanging to complete.

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**Lesson focus**

This lesson introduces subtraction with exchanging and renaming. Remind pupils of yesterday’s lesson and also previous lessons of expanding numbers. Ask pupils how they would solve a vertical subtraction sum without writing down an expansion equation. Some pupils will grasp the idea of making a note of the tens digit exchange and be able to work abstractly. Use the example on page 46 of the Pupil’s Book to demonstrate. Give further examples in how to set out and complete vertical subtraction.

Pupils complete Exercise 2 (Pupil’s Book page 47).

**Answers**

**Exercise 2**

1. 39
2. 19
3. 27
4. 22
5. 48
6. 18
7. 46
8. 34
9. 9
10. 16
Lesson 5  
*Pupil’s Book page 47; Workbook page 18*

**Preparation**

You will need:
- Blank number lines
- Counters for pupils needing extra help
- Pupil’s Book
- Workbook

**Starter activity**

Play ‘Target 80’.

**Lesson focus**

Being able to use and apply addition and subtraction to a problem is the whole reason why pupils need to be able to add and subtract. Use the word problems in Exercise 3 (Pupil’s Book page 47) to discuss how you could go about solving the problem. Comprehension of the written word is important. Pupils need to unpack the problem to find out what is actually being asked. The tendency is for pupils to read only the numbers and guess what they have to do with the numbers rather than understand the context in which the numbers are presented.

Pupils complete Exercise 3 (Pupil’s Book page 47) using vertical subtraction to find the answers.

**Answers**

**Exercise 3**

1. 32  
2. 32  
3. 23  
4. 53  
5. 34  
6. 34  
7. 25  
8. 36

**Worksheet 13**

3. a) 58  
   b) 12  
   c) 7
**Assessment**

Listen to pupils’ questions and responses during class discussion. Can pupils identify the mathematics required to solve a problem and are they able to explain a mental method of solving addition and subtraction problems?

Pupils should be able to use subtraction to solve word problems.

**Extension activity**

Ask pupils to write a story problem that can be solved by subtraction.

**Homework activity**

Worksheet 13, page 18, Question 3.
Unit 14: Adding three numbers together

Objectives
By the end of this unit, pupils will be able to:
- Work confidently with number bonds
- Use a number line to add three numbers together
- Use vertical addition to add three numbers together.

Suggested resources
- Number cards
- Number line
- Pupil’s Book

Key word definitions
number bonds: the different pairs of numbers which make up the same whole number

Frequently asked questions
Q: What prior knowledge do the pupils need?
A: Pupils need to have mastered the addition of two numbers and be able to undertake vertical addition.

Common errors pupils make
Make sure that pupils do not confuse addition of three numbers with double-digit addition. They must recognise that three separate numbers are involved.

Evaluation guide
Assess whether pupils can:
1. Work confidently with number bonds.
2. Use a number line to add three numbers together.
3. Use vertical addition to add three numbers together.

Lesson 1  Pupil’s Book page 48; Workbook page 19

Preparation
You will need:
- Number cards
- Number line
- Pupil’s Book
- Workbook

Starter activity
Use any game from previous units that the pupils enjoyed.

Lesson focus
This lesson expands on previous lessons of adding two numbers together. Start by revising examples of addition of two numbers and then write an example with three numbers on the board and ask pupils how they would go about solving the problem. Demonstrate to pupils how to add two of the numbers first and then add the third number.

Go through the example on page 48 of the Pupil’s Book. Pupils then complete Exercise 1 (Pupil’s Book page 48). Make sure pupils show their working.

Answers
Exercise 1
1. 8 + 4 + 9 = 12 + 9 = 21
2. 3 + 7 + 6 = 10 + 6 = 16
3. 9 + 4 + 7 = 13 + 7 = 20
4. 2 + 8 + 5 = 10 + 5 = 15
Worksheet 14

1. a) 12
   b) 23
   c) 12
   d) 27
   e) 19

Assessment
Make sure that pupils use the correct steps and add two numbers then the third. Give extra practice using a number line if needed.

Extension activity
Give extra examples for pupils to work through.

Homework activity
Worksheet 14, page 19, Question 1.

Lesson 2

Preparation
You will need:
• Number cards
• Number line
• Pupil’s Book
• Workbook

Starter activity
Use any game from Term 1 that the pupils enjoyed.

Lesson focus
This lesson expands on the previous lesson of adding three numbers together. In the previous lesson pupils learnt how to add two of the numbers first and then add the third number. Exercise 1 contained examples where the first two numbers made up a two-digit number and then the third number was added as a single-digit number. This lesson reinforces this work and also includes a mix of numbers, some of which will still give a single-digit number then the first two numbers are added together. Pupils should not automatically assume that adding the first two numbers will give a two-digit number. Start by reminding pupils of yesterday’s lesson and then give them more examples to do. Pupils should still use the process of adding the first two numbers and then the third.

Pupils complete Exercise 2 (Pupil’s Book page 48).

Answers

Exercise 2
1. $3 + 5 + 6 = 8 + 6 = 14$
2. $7 + 8 + 9 = 15 + 9 = 24$
3. $4 + 1 + 3 = 5 + 3 = 8$
4. $8 + 1 + 6 = 9 + 6 = 15$
5. $9 + 5 + 9 = 14 + 9 = 24$

Puzzle (page 51)

<p>| | | |</p>
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>31</td>
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<td>7</td>
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<tr>
<td>13</td>
<td>37</td>
<td>61</td>
</tr>
<tr>
<td>67</td>
<td>1</td>
<td>43</td>
</tr>
</tbody>
</table>
Lesson 3  
*Pupil's Book page 49; Workbook page 19*

**Assessment**
Make sure that pupils use the correct steps and add two numbers then the third. Give extra practice using a number line if needed.

**Extension activity**
Puzzle (Pupil’s Book page 51)

**Homework activity**
Worksheet 14, page 19, Question 3. (Leave Question 2 for Lesson 4.)

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**Preparation**
You will need:
- Number cards
- Number line
- Pupil’s Book
- Workbook

**Starter activity**
Get 20 pupils to stand in a straight line and number them from 1 upwards. Give the remaining pupils a series of additions such as 2 + 4 +10 and get them to use your human number line to find the answers. Swap pupils around periodically so that everyone gets a chance to be part of the number line and to work out the answers.

**Lesson focus**
This lesson builds on the previous two lessons and gives pupils practice in using a number line to work out three number additions. Using the method mentioned in the previous paragraph is especially beneficial for pupils who experience difficulty with addition. You can use the number in later lessons to reinforce learning.

Demonstrate how to use the number line on page 49. Do some examples as a class and then pupils complete Exercise 3 (Pupil’s Book page 49).

**Answers**

**Exercise 3**
1. 19
2. 19
3. 20
4. 15
5. 22

**Worksheet 14**
4. 48

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Worksheet 14
3. 115
Lesson 4  Pupil’s Book page 50; Workbook page 19

Preparation
You will need:
• Number cards
• Number line
• Pupil’s Book
• Workbook

Starter activity
Remind pupils of two-digit addition of two numbers using vertical addition. Write some examples on the board and ask pupils to call out the answers, for example 20 + 2 and 30 + 5. Remind pupils how to write these vertically. Test the pupils by positioning the vertical digits in the wrong places and see if they notice.

Lesson focus
Pupils have already learnt how to add two two-digit numbers using vertical addition, therefore this lesson should not present problems but should be a continuation of earlier work. Demonstrate, using the board, how to place three numbers one under the other and write the addition signs.

Show pupils the example on page 50 of the Pupil’s Book. Give pupils extra practice examples of setting out three number additions and then complete Exercise 4 (Pupil’s Book page 50).

Answers

Exercise 4
1. 57
2. 119
3. 87
4. 111
5. 124
6. 110
7. 234
8. 121
9. 103
10. 88
11. 190
12. 138

Assessment
Check pupils’ exercise books to make sure that they have used the number line correctly. Give extra support where needed.

Extension activity
Ask pupils to find a partner and create three number additions to complete together using a number line.

Homework activity
Worksheet 14, page 19, Question 4, using a number line to help.
Worksheet 14

2. a) 126
   b) 132
   c) 49
   d) 146
   e) 119
   f) 132
   g) 60
   h) 99
   i) 91
   j) 93
   k) 67
   l) 105

Assessment

Some pupils may have difficulty in adding three numbers in a vertical line. Check to make sure they have grasped this concept. Provide extra examples for pupils that have difficulty and also make sure they can identify the tens and units in examples.

Extension activity

Give pupils extra practice examples.

Homework activity

Worksheet 14, page 19, Question 2.

Lesson 5  Pupil’s Book page 51; Workbook page 19

Preparation

You will need:
- Number cards
- Number line
- Pupil’s Book
- Workbook

Starter activity

Play ‘Number squeeze’. Choose a mystery number on the number line. Pupils must ask questions such as ‘Is it more than or is it less than?’ Use a marker starting at each end of the line which is moved to show which numbers the question asked has eliminated. For example, if the mystery number was 65 and the pupil asked if the number is more than 70, then the answer is No – and all numbers greater than 70 are eliminated by moving the marker from 100 down to 70. Pupils keep asking questions and the markers are moved to squeeze out the mystery number.

Lesson focus

This lesson consolidates the work done so far on three number additions by giving pupils word problems to solve. Remind pupils of the word problems they have already completed using two numbers. They then complete Exercise 5 (Pupil’s Book page 51). This is a long exercise and may need extra time. Complete the first few questions together with the class, then allow pupils who work quickly to go ahead on their own. Make sure to go over the answers with pupils, explaining how to set out each question correctly.

Answers

Exercise 5

1. 19
2. 158
3. 89
4. 126
5. 176
6. 162
7. 80
8. 185
Lesson 6  Pupil’s Book pages 48–51

Assessment
Pupils should be able to interpret what is needed in a word problem, for example that ‘sum of’ means add up. Go through the questions with pupils and make sure that they understand how to interpret the problems and solve them.

Extension activity
Get pupils to make up their own word problems using three numbers.

Homework activity
Worksheet 14, page 19, Question 5.

Preparation
You will need:
• Place value equipment (bundles of ten straws and loose straws)
• Pupil’s Book

Starter activity
Make a number challenge. Draw lines or boxes on the board to signify that pupils will need to write a two-digit number four times. First number label ‘even number’; second number label ‘number between 20 and 45’; third number label ‘greater than 50’ and fourth number label ‘less than 70’. Select three digit cards and ask the pupils to use two out of the three digits each time to complete the four numbers so the labels are correct. When pupils have their numbers select some pupils to read their numbers and then ask a pupil to give the number 10 more than the number. Repeat for a number of pupils, asking who has a different number for a particular category.

Lesson focus
Pupils should be able to add 10 to any number easily. Show pupils a pile of straws, for example, 54 straws as five bundles of 10 and four loose straws. Ask the pupils to add 9 more straws but pretend you have no more loose straws only bundles of 10 that you don’t want to untie. Ask them if they could think of a way you could add 9 more straws. If pupils have knowledge of money use the scenario of paying ₦9 to the shopkeeper when you only have ₦10. What would the shop keeper do? Pupils with shopping experience are quite happy to say ‘He will give you ₦1 change.’

Show pupils how to add 10 and then take away 1 because 9 is 10 − 1. Model the thinking using symbolic representation by 54 + 10 = 64, 64 − 1 = 63.

Work together through a few more examples of adding 9. When pupils understand the principle, extend their thinking by asking ‘How do you think you could add 19?’
Give pupils examples to work through using three numbers.

**Answers**

**Class exercise**
Check pupils’ answers and repeat any examples that pupils have difficulty with.

**Assessment**
Observe and listen to pupils during teaching. Can pupils explain the principle of adding the 10 and compensating by subtracting 1? Can they do this for three numbers? Pupils should be able to add numbers by adding a decade number and compensating.

**Extension activity**
Make a ‘Number’ challenge. Draw lines or boxes on the board to signify pupils will need to write a two-digit number four times. First number, label ‘even number’; second number label ‘number between 20 and 45’; third number label ‘greater than 50’; and fourth number label ‘less than 70’. Select three digit cards and ask the pupils to use two out of the three digits each time to complete the four numbers so the labels are correct. When pupils have got their numbers select some pupils to read their numbers and then ask a pupil to give the number 10 more than the number. Repeat for a number of pupils, asking who has a different number for a particular category.

**Homework activity**
Give extra practice if needed.
Objectives
By the end of this unit, pupils will be able to:
• Understand multiplication as repeated addition
• Understand and use the commutative property of multiplication
• Use an array to understand multiplication
• Use doubles knowledge to learn the 2x table
• Use place value knowledge to learn the 10x table.

Suggested resources
• Small items for grouping and sharing, such as stones, buttons, seeds and beads
• L-shaped piece of paper (per pupil) for working on an array
• Place value equipment straws and bundles of ten straws

Mathematical vocabulary
multiply: the process of adding a number to itself a certain number of times
multiple: a number that is the product of a given number and some other number

Frequently asked questions
Q What prior knowledge do the pupils need?
A Pupils need to be able to read and write numbers to at least 100, know doubles to 20 (10 + 10), and count in twos, fives and tens. They also need to understand the place value of two-digit numbers.

Common errors pupils make
All too often, a pupil’s first introduction to multiplication is to learn their tables. This will create most of the errors pupils make because they have never been taught what multiplication is and how it is an extension of what they already know (adding) and not something totally different. Likewise, division is an extension of what they already know and are learning about with multiplication. The key ideas to be taught include:
• Learning the connection between multiplication and repeated addition.
• Why the commutative property is true for all multiplications.
• Understanding the two different contexts for division: the sharing idea and ‘groups of’ idea.

Evaluation guide
Assess whether pupils can:
1. Understand multiplication as repeated addition.
2. Understand and use the commutative property of multiplication.
3. Use an array to understand multiplication.
4. Use doubles knowledge to learn the 2x table.
5. Use place value knowledge to learn the 10x table.

Lesson 1 Pupil’s Book page 52; Workbook page 20
Preparation
You will need:
• Small items to create groups
• Pupil’s Book
• Workbook

Starter activity
Use the pupils as objects to demonstrate the principle of multiplication. Invite ten pupils to line up in pairs at the front of the class. Ask the class ‘How many pupils are lining up? How would you count them?’ The expected reply would be to count in twos. Someone else might say ‘I can see two fives.’ The object is for pupils to be counting in groups and not counting in ones. Remind pupils
how they counted large sets of objects. They skip-counted in groups of 5 or 10.

Lesson focus
Refer back to the starter activity and remind the pupils of the ten pupils and how they were counted. Make the pupils into an addition sum 2 + 2 + 2 + 2 + 2 = 10. Explain to the pupils that writing great long addition sums when you are always adding the same number gets tedious and in mathematics there is a shorter way of writing it by using a new symbol.

Ask ‘How many groups of two did we have?’ Count the number of twos written on the board or have the pupils and count the pairs of pupils. Write on the board ‘5 groups of 2’. You can replace the words ‘groups of’ with the symbol ×, so 2 + 2 + 2 + 2 + 2 now looks like 2 × 5.

Use pupils to create a new grouping. Make four groups of three. Ask the pupils how many groups do you have? (four groups). How many in each group? (four groups of three). Write ‘4 groups of 3’ on the board. Invite a pupil to come and write the addition and/or the multiplication for this example: 3 + 3 + 3 + 3 or 3 × 4. Give pupils small items on their table. Write on the board ‘3 groups of 5’ and ask them to make three groups of five. Ask them to record the addition and the multiplication.

Invite someone to write them on the board. Check everyone understands making the groups. Some pupils will need more practice with materials to grasp the concept. When satisfied the pupils have grasped the concept ask them to complete Exercise 1 (Pupil’s Book page 52).

Answers

Exercise 1
1. 1 + 1 + 1 + 1 + 1 = 1 group of 5 = 1 × 5 = 5
2. 10 + 10 + 10 = 3 groups of 10 = 3 × 10 = 30
3. 4 + 4 + 4 + 4 + 4 = 5 groups of 4 = 5 × 4 = 20
4. 4 + 4 + 4 + 4 + 4 + 4 = 4 groups of 7 = 4 × 7 = 28
5. 3 + 3 + 3 + 3 + 3 + 3 = 6 groups of 3 = 6 × 3 = 18

Worksheet 15
1. a) 6 groups of 4; 6 × 4 = 24
   b) 3 groups of 5; 3 × 5 = 15
2. 3 + 3 + 3 + 3 + 3 + 3 = 6

Assessment
Observe and listen to pupils during teaching session. Check if pupils are able to make the grouping using materials and record the addition and multiplication as displayed by their materials? Pupils should be able to understand multiplication as repeated addition.

Extension activity
Play ‘Grab’. You need a pile of small items such as pebbles or stones. A pupil grabs a handful and tries to make the quantity grabbed into equal groups of two. If successful they record the addition and the multiplication. Then they try making equal groups of three. If successful record the addition and multiplication. Try making groups of up to ten from one handful. Who can make the most number of equations from one handful? (Numbers with multiple factors). Did you have a handful where you could make no equations? (prime numbers). Practise skip counting sequences for twos, fives and tens.

Homework activity
Worksheet 15, page 20, Questions 1 and 2.
Lesson 2  Pupil's Book page 52

Preparation
You will need:
• Number line
• Workbook

Starter activity
Play ‘Clap for five’. Pupils stand in a circle and count. As they count they touch parts of the body in a sequence one, head; two, shoulders; three, hips; four, knees; five, clap; six, head; seven, shoulders, etc. When they have the sequence, pupils don’t say the number on the clap aloud. When they are very proficient, all pupils do the body sequence but the numbers go round the circle. The pupil who has the number on the clap doesn’t say it so the next person must really be listening to where they have reached in the counting sequence.

Lesson focus
Give pupils a multiplication, for example, 5 × 6, and ask them to give you the equation as an addition 5 + 5 + 5 + 5 + 5 + 5. Show this addition on a number line as jumps from 0 to 5, 5 to 10, etc. Above each jump, record + 5. (Pupils have used number lines for addition so this is not new for them, but you may need to remind them.) Underline or circle the numbers at the end of each jump and with the pupils read them aloud 5, 10, 15, 20, 25, 30.

Repeat with other multiplications. Restrict your examples to skip counting sequences known to the pupils – twos, fives and tens. Give pupils the example 3 × 5 Ask them to give you the addition 3 + 3 + 3 + 3 + 3. Ask ‘What do we need to count in to solve this problem?’ Ask pupils to record in their books the skip counting sequence for threes up to 30 (3, 6, 9, 12, 15, 18, 21, 24, 27, 30).

Pupils complete Exercise 2 (Pupil’s Book page 53).

Answers

Exercise 2
1. 4 groups of 3 = 12
2. 3 groups of 2 = 2 × 3 = 6
3. 2 groups of 4 = 2 × 4 = 8
4. 4 groups of 8 = 8 × 4 = 32

Worksheet 15
3. a) Draw a number line and show 3, 6, 9, 12.
   b) Draw a number line and show 7, 14, 21, 28.

Assessment
Listen to pupils’ responses during the teaching session. Are pupils able to extract the repeated addition from a multiplication? Can they use skip counting sequences to solve the multiplication? Pupils should be able to give the repeated addition from a multiplication equation.

Pupils should be able to use known skip counting sequences to solve a multiplication problem.

Extension activity
Explore patterns made by skip counting in threes made on the 100 board. Learn the skip counting sequence for threes up to 30.

Homework activity
Worksheet 15, page 20, Question 3.
Lesson 3  Pupil's Book page 54; Workbook page 20

Preparation
You will need:
• Number line
• Pupil's Book
• Workbook

Starter activity
Play 'Clap for five' as for previous lesson.

Lesson focus
Write a multiplication equation 2 × 6 on the board and ask pupils to give you the addition equation. Record the addition equation 2 + 2 + 2 + 2 + 2 + 2. Ask pupils to give you the skip counting sequence to achieve the answer (2, 4, 6, 8, 10, 12). By recording on the board you are assisting pupils in how they will complete the exercise later in the lesson.

Give pupils other examples using 2s, 3s, 5s and 10s. Each time recording on the board as the pupils give you the answers to the addition and the skip counting sequence. Give the pupils the example 4 × 5. Ask them to give you the addition 4 + 4 + 4 + 4 + 4. Ask 'What do we need to count in to solve this problem?'

Ask pupils to record in their books the skip counting sequence for fours up to 40 (4, 8, 12, 16, 20, 24, 28, 32, 36, 40). Look at the number line example on page 53 of the Pupil's Book and then complete Exercise 3 (Pupil’s Book page 54). Remind them that this is exactly what they have been doing on the board together. They now have to record the addition and the counting sequence in their books.

Answers

Exercise 3
1. This one has been done for you.
2. 2 × 5 = 2 + 2 + 2 + 2 + 2 = 10
3. 2 × 9 = 2 + 2 + 2 + 2 + 2 + 2 + 2 + 2 + 2 = 18
4. 3 × 8 = 3 + 3 + 3 + 3 + 3 + 3 + 3 + 3 = 24
5. 6 × 4 = 6 + 6 + 6 + 6 = 24
6. 5 × 9 = 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 = 45

7. 7 × 4 = 7 + 7 + 7 + 7 = 28
8. 8 × 5 = 8 + 8 + 8 + 8 + 8 = 40
9. 9 × 2 = 9 + 9 = 18
10. 10 × 5 = 10 + 10 + 10 + 10 + 10 = 50
11. 6 × 7 = 6 + 6 + 6 + 6 + 6 + 6 = 42
12. 9 × 6 = 9 + 9 + 9 + 9 + 9 + 9 = 54

Worksheet 15
3. See the answer given in Lesson 2.

Assessment
Listen to pupils' responses during the teaching session. Are pupils able to extract the repeated addition from a multiplication? Can they use skip counting sequences to solve the multiplication? Pupils should be able to give the repeated addition from a multiplication equation. Pupils should be able to use known skip counting sequences to solve a multiplication problem.

Extension activity
Explore patterns made by skip counting in fours made on the 100 board. Learn the skip counting sequence for fours up to 40.

Homework activity
Worksheet 15, page 20, Question 3.
Lesson 4  Pupil’s Book page 55; Workbook page 21

Preparation
You will need:
• L-shaped piece of paper
• Pupil’s Book
• Workbook

Starter activity
Introduce the idea of making an array by using
the pupils to build an array. The size of the array
will depend on the number of pupils in the class.
(Do not have the array larger than 10 in either
direction.) For example with a class of 36 build a
6 × 6 array. Ask pupils to sit in one line of six ,cross
legged on the floor with a reasonable space between
them. Sit another line of six in front of them with
a reasonable amount of space between the rows.
Continue until all the pupils have been used.
Direct the pupils to notice they are sitting in a row,
but they are also sitting in a column, with pupils
directly behind and directly in front of them.
Introduce the word ‘array’ as a way of organising a
quantity into rows and columns.

Lesson focus
Write on the board 2 × 4. Ask the pupils to make
themselves into an array to show 2 × 4.

If they need more support you may need to ask
the pupils to find a partner before asking them to
make an array so that they realise they are making
2 + 2 + 2 + 2. Pupils who are not involved can
keep to one side as observers. Ask the pupils to sit
in their arrays as 2 × 4. Have all the pupils facing
the same way. Ask the pupils who are spectators if
they can see another multiplication in the array.
Ask the seated pupils to turn a quarter turn to the
right. If the spectators cannot give an alternative
multiplication, can someone from an array give 4
× 2 or 2 groups of 4? Record on the board 4 × 2
= 2 × 4. Repeat with other small multiplications:
3 × 2, 4 × 3, 5 × 2, 6 × 3, 3 × 3. Examine the
multiplication tables on pages 54 and 55 of the
Pupil’s Book with the pupils and point out how
they can use these to find the correct answer to a
multiplication problem.

Answers
Exercise 4
1. 6  6. 49
2. 12  7. 90
3. 10  8. 77
4. 72  9. 108
5. 30  10. 40

Worksheet 15
4. a) 20  f) 81
   b) 12  g) 18
   c) 48  h) 30
   d) 14  i) 15
   e) 32  j) 36
5. Draw a number line showing 6, 12, 18, 24, 30,
   36, 42, 48, 54.

Challenge (page 55)
7 × 3 + 18 + 18 = 74 years old.

Assessment
Observe and listen to pupils during the
teaching session. Are pupils able to successfully
build an array? Can they extract from an array
two multiplications? Pupils should be able to
build an array for a multiplication.

Extension activity
Complete the challenge activity (Pupil’s Book
page 55).

Homework activity
Worksheet 15, page 21, Questions 4 and 5.
Lesson 5  Pupil’s Book page 56

Preparation
You will need:
• Multiplication cards for 2× and 10×
• Pupil’s Book

Starter activity
Play ‘2× and 10× Bingo’. Pupils draw a 3 × 3 grid in their books. Explain to the pupils that you are going to call out some 2× and 10× multiplication questions. On the grid they choose which numbers to write. Call out 2× and 10× multiplications. (You could have them written down on pieces of card you draw out of a bag or box.) Include commutative equations, for example 7 × 2 and 2 × 7. The first pupil to have crossed off all his or her numbers is the winner.

Lesson focus
Revise the meaning of multiplication with pupils. Remind them that it is repeated addition. Look at the worked tables in the Exercise 3 (Pupil’s Book page 54 and 55). Revise the repeated addition and the multiplication. Give pupils a variety of multiplications to find answers for using the tables.

Answers
Class exercise
Check answers with pupils.

Assessment
Exercise 3
Observe the numbers pupils write on their bingo cards. Are they all multiples of 10 or 2? Use the pictures drawn in Exercise 1 to determine their understanding of multiplication as repeated addition. Pupils should be able to recall the 2× and 10× tables. Pupils should also be able to understand multiplication as repeated addition.

Extension activity
Write and illustrate multiplication stories for commutative multiplication, for example, 2 × 8 and 8 × 2.

Homework activity
Give pupils a selection of multiplication questions to complete for homework.
Lesson 6  Pupil's Book page 56; Workbook page 21

Preparation
You will need:
- Number line
- Counters for pupils needing to use them
- Pupil's Book
- Workbook

Starter activity
Play ‘Clap for four’ (a variation on ‘Clap for five’), creating a new body sequence with the clap is on every fourth number. For example: 1 – arms above head; 2, – arms out to the side; 3 – arms out in front; 4 – clap; 5 – arms above head; 6 – arms out to side.

Encourage the pupils to invent body sequences for different counting sequences.

Lesson focus
This lesson consolidates the previous four lessons by giving pupils word problems to use. The problems are introduced with pictures so that pupils can easily complete the exercise and gain confidence. The aim of this section is to make sure that pupils have understood how to use multiplication as an easier way to find a total than addition when multiples of a number are involved.

Explain Exercise 5 to pupils then let them attempt the exercise alone. This will allow you to identify any pupils having difficulty with this section.

Pupils then complete Exercise 5 (Pupil’s Book page 56). You will notice that Questions 1 to 3 have the same answer. Use this to point out to pupils how multiples of different numbers can create the same end numbers.

Answers

Exercise 5
1. 24
2. 24
3. 24
4. 27
5. 28

Worksheet 15
6. Pupils to write out 4 and 10 multiplication: tables from the Pupils’ Book.
7. a) 6
   b) 3
   c) 8
   d) 5
   e) 2
   f) 8
   g) 35
   h) 7
   i) 3
   j) 8
8. 32
9. 30

Assessment
Make sure that pupils are able to understand groups. Revise earlier lessons on addition if need be.

Extension activity
Worksheet 15, page 21, Questions 8 and 9.

Homework activity
Worksheet 15, page 21, Questions 6 and 7.
Lesson 7  Pupil’s Book pages 54 and 55

Preparation
You will need:
• Multiplication cards for 2×, 5× and 10×
• Small items such as bottle tops
• Pupil’s Book

Starter activity
Play ‘Bingo’ but this time use multiples of five, two and ten on the bingo card. Discuss with the pupils ‘How do you know if a number is a multiple of five?’ The ones number is always a five or a zero. ‘How do you know if a number is a multiple of ten?’ It always ends in a zero. ‘Is a multiple of ten also a multiple of five?’ Yes. ‘How do you know if a number is a multiple of two?’ It is an even number. ‘Is a multiple of ten also a multiple of two?’ Yes.

Lesson focus
Ask the pupils to find a partner. We have made groups of two. Ask each pair to find another pair to make groups of four. How many groups of two in a group of four? Two groups of two make a group of four. Give pupils some bottle tops or other small items on their desks. Ask them to find eight bottle tops. How many groups of four can you make? Record on the board 4 × 2 = 8. How many groups of two can you make? Record directly under the last recording 2 × 4 = 8. Remind pupils of the commutative property of multiplication and this result is not surprising. Ask the pupils to find 12 bottle tops. How many groups of four can you make? Record on the board 4 × 3 = 12. How many groups of two can you make? Record directly under the last recording 2 × 6 = 12. On the board you should have:
4 × 2 = 8
2 × 4 = 8
4 × 3 = 12
2 × 6 = 12

Direct the pupils to look at the pairs of recording. Can they see a pattern? Guide them towards noticing the doubles pattern. When you double one number, the other one halves.

Remind pupils, where have we seen this pattern before? Refer back to the previous lesson on the relationship between the 5 and the 10 times tables. Can pupils predict how many groups of 2 in 4 × 5? Explore all the ways they have of solving 5 × 4 if they didn’t just know the answer.
5 × 4 = 10 × 2
5 × 4 = 4 × 5
4 × 5 = 2 × 10

Give pupils examples to work through.

Answers

Class exercise
Go through the answers to the examples you have given the pupils.

Assessment
Observe how pupils complete the exercise. Are they able to use the pattern or do they still rely on using counters? If still using counters, give further practice on doubling and halving.

Pupils should be able to use the double and half pattern to solve ‘multiplied by four’.

Extension activity
Continue pattern spotting using the multiplication tables on the Pupil’s Book.

Homework activity
Pupils write out the 2× table.
Unit 16: Open sentences

Objectives
By the end of this unit, pupils will be able to:
• Create open sentences that are true using addition and subtraction
• Find missing numbers to complete number squares.

Suggested resources
• Number cards
• Counters or beads

Key word definitions
open sentence: a mathematical statement that can be either true or false depending what values are used

Frequently asked questions
Q What prior knowledge do the pupils need?
A Pupils need to be familiar with addition and subtraction up to 200.

Common errors pupils make
Pupils need to be confident with addition and subtraction. If they are not sure of themselves they will try to make up answers without going through any sort of rational process.

Evaluation guide
Assess whether pupils can:
1. Create open sentences that are true using addition and subtraction.
2. Find missing numbers to complete number squares.

Lesson focus
This unit consolidates earlier work done on addition and subtraction. Explain to pupils what is meant by an open sentence. Use the example on page 58 of the Pupil’s Book. Commence by explaining that just as they find the answer by adding the numbers, so they can find a missing number if they know the answer. You can present this lesson as a game that pupils will find fun. Try a few verbal examples, using ‘spot the missing number’. Discuss with pupils the idea of true or false open sentences. Write some open sentences on the board and complete them, some true and some false, and ask pupils to say whether they are true or false. For example, $3 + 5 = 7$ (false), $3 + 5 = 8$ (true). Demonstrate how to use counters to work backwards from the answer.

Pupil’s complete Exercise 1 (Pupil’s Book page 58).

Starter activity
Play ‘Dart board’: Draw a circle on the board and divide it into quarters. Draw a concentric circle slightly inside the outer circle. Ask the pupils to select four different digits to go in each inner quarter. Explain to pupils that they have three mental darts to throw at the target board – they choose which numbers they are working with. If they have a dart in the section with the number then they use that number; if they have a dart in the outer circle of a section then they use double the number in the inner section. With their three numbers and using addition and subtraction how many of the numbers from 1 to 20 can they make?
Answers

Exercise 1
1. 9
2. 11
3. 10
4. 16
5. 3
6. 5
7. 6
8. 8
9. 2
10. 2
11. 2
12. 3

Worksheet 16
1. No

Assessment
Check pupils’ answers to make sure they have understood the concept of an open sentence. Allow them to use counters if needed.

Extension activity
Pupils to make up their own open sentences and state whether true or false.

Homework activity
Worksheet 16, page 22, Question 1.

Lesson 2
Pupil’s Book page 59; Workbook page 22

Preparation
You will need:
• Counters or beads
• Number line
• Pupil’s Book
• Workbook

Starter activity
Play ‘Clap for five’. Pupils stand in a circle and count. As they count they touch parts of the body in a sequence: 1 head, 2 shoulders, 3 hips, 4 knees, 5 clap, 6 head, 7 shoulders, etc. When they have the sequence, pupils don’t say the number on the clap aloud. When they are very proficient, all pupils do the body sequence but the numbers go round the circle. The pupil who has the number on the clap doesn’t say it so the next person must really be listening to where they have reached in the counting sequence.

Lesson focus
This unit continues from the previous lesson. Explain to pupils that they can solve open sentences using subtraction. Commence by explaining that just as they find the answer by adding the numbers, so they can find a missing number if they know the answer. Use a game approach again to make this lesson fun. Try a few verbal examples, using ‘spot the missing number’. Discuss with pupils the idea of true or false open sentences again. Write some open sentences on the board and complete them, some true and some false, and ask pupils to say whether they are true or false. For example, 5 - 3 = 3 (false), 5 - 3 = 2 (true). Demonstrate how to use counters to work backwards from the answer and find a missing number.

Answers

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

Worksheet 16
2. a) 15
   b) 8
   c) 56
   d) 40
   e) 55
   f) 3
   g) 15
   h) 30
   i) 127
   j) 82

Assessment
Check pupils’ answers to make sure they have understood the concept of an open sentence. Allow them to use counters if needed.

Extension activity
Pupils to make up their own open sentences and state whether they are true or false.

Homework activity
Worksheet 16, page 22, Question 2.

Lesson 3  Pupil’s Book page 59; Workbook page 22

Preparation
You will need:
• Pupil’s Book
• Workbook

Start activity
Play any game from earlier units.

Lesson focus
Explain to pupils how to fill in a square using either addition or subtraction. Remind pupils that they have completed similar activities in earlier lessons. The focus of this lesson is on being able to work comfortably with numbers. Create some examples for pupils to complete.

Complete Exercise 3 (Pupil’s Book page 59) with the pupils.

Answers

Exercise 3
1.  
   \[ + \quad 30 \quad 60 \]
   \[ 20 \quad 50 \quad 80 \]
   \[ 40 \quad 70 \quad 100 \]

2.  
   \[ - \quad 40 \quad 30 \]
   \[ 20 \quad 20 \quad 10 \]
   \[ 10 \quad 30 \quad 20 \]

3.  
   \[ - \quad 50 \quad 60 \]
   \[ 20 \quad 30 \quad 40 \]
   \[ 30 \quad 20 \quad 30 \]
4.  
<table>
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<tr>
<th>+</th>
<th>10</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
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<td>80</td>
<td>90</td>
</tr>
<tr>
<td>20</td>
<td>30</td>
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5.  
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<th>50</th>
<th>80</th>
</tr>
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</tr>
<tr>
<td>30</td>
<td>20</td>
<td>50</td>
</tr>
</tbody>
</table>

6.  
<table>
<thead>
<tr>
<th>+</th>
<th>40</th>
<th>50</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>90</td>
<td>100</td>
</tr>
<tr>
<td>30</td>
<td>70</td>
<td>80</td>
</tr>
</tbody>
</table>

**Worksheet 16**

3.  
   a) 3  
   b) 26  
   c) 24  
   d) 36  
   e) 29

**Assessment**  
Pupils should be able to solve number squares.  
Give extra practice to those who experience difficulties.

**Extension activity**  
Pupils to make up their own open sentences.

**Homework activity**  
Worksheet 16, page 22, Question 3.

**Lesson 4**  
**Pupil’s Book page 59, Workbook page 22**

**Preparation**  
You will need:  
- Pupil’s Book  
- Workbook

**Starter activity**  
Play any game from earlier units.

**Lesson focus**  
Remind pupils of the open sentences of the previous lessons and introduce the idea of using a letter such as ‘x’ or ‘n’ to represent the missing number. This prepares pupils for later equation work. Create some examples for pupils to complete.

Pupils complete Worksheet 16, page 22, Question 4.

**Answers**

**Worksheet 16**

4.  
   a) \( x = 10 \)  
   b) \( y = 48 \)  
   c) \( m = 43 \)  
   d) \( k = 28 \)  
   e) \( n = 1 \)  
   f) \( p = 80 \)  
   g) \( q = 51 \)  
   h) \( k = 32 \)  
   i) \( y = 27 \)  
   j) \( r = 48 \)

**Assessment**  
Pupils should understand the use of letters as a substitute for a missing number.

**Extension activity**  
Pupils to make up their own open sentences.

**Homework activity**  
Pupils to make up their own open sentences.

**Extension activity**  
Give pupils extra open sentences using the letters x or n for the missing number.
Lesson 5  Pupil’s Book page 59

Preparation
You will need:
- 100 chart
- Blank 100 chart

Starter activity
Point to a number on the board and invite a pupil to give you the number ten more or ten less than the number you are pointing to and show where it is on the 100 board, (directly above or below the number). Ask pupils to give you the number one more or one less than the number you are pointing to and show where it is on the 100 board (either to the right or the left of the number). Repeat giving different starting numbers.

Lesson focus
Ask pupils what the 100 board would look like if it started at 101 instead of 1. What number would be where number 10 is? What number would be where number 23 is? If necessary count along the squares counting 101, 102, 103, etc. What would be where number 100 is?

Ask pupils what the 100 board would look like if it started at 201 instead of 1. What number would be where number 12 is? What number would be where number 27 is? If necessary count along the squares counting 201, 202, 203, etc. What would be where number 100 is?

Pretend the 100 board is giving the numbers 101 to 200. Point to number 53 and ask, ‘What number would this be?’ The answer 153. Ask ‘What number is ten more than 153?’ The answer 163. ‘Where would the number 163 be on the chart?’ (If pupils find ‘pretend’ hard then write the numbers 101–200 on the blank 100 board and ask the ten more than 153 question.)

Ask pupils to give the number ten less than 153, one more than 153 and one less than 153.

Draw a $3 \times 3$ grid on the board and write the number 345 in the centre square. Tell the pupils this is a piece of a 100 board. Ask ‘What numbers do you think would be at the beginning and end of the hundreds board?’ Are the pupils able to place the number between 301 and 400. Ask the pupils what numbers would go in the rest of the squares on the grid. Answers: top row, 334, 345, 346, middle row 344, 345, 346 and bottom row, 354, 355, 356.

Give the pupils a list of three-digit numbers and ask them to find the number ten more or ten less than each number.

Answers

Class exercise
Go through the answers with the pupils.

Assessment
Observe pupils completing the exercises. Do they need to use their fingers to count on or count back or can they use the numbers and increase or decrease the tens digit by one?

Pupils should be able to give the number ten more or ten less than a three-digit decade number.

Extension activity
Find the number ten more or ten less than any three-digit number. Give the pupils a list of three-digit numbers and ask them to find the number ten more or ten less than each number.
Objectives
By the end of this unit, pupils will be able to:
• Solve different types of word problems
• Write number sentences from word problems
• Write word problems from number sentences.

Suggested resources
• Number cards

Key word definitions
No new key words.

Frequently asked questions
Q: What prior knowledge do the pupils need?
A: Pupils need to be able to construct number sentences and also use addition and subtraction up to 200.

Common errors pupils make
Pupils often do not read the word problems properly and therefore cannot get the correct number sentence. Pupils need practice in interpreting correctly.

Evaluation guide
Assess whether pupils can:
1. Solve different types of word problems.
2. Write number sentences from word problems.
3. Write word problems from number sentences.

Lesson 1  Pupil’s Book page 60; Workbook page 23

Preparation
You will need:
• Number cards
• Counters if needed
• Pupil’s Book
• Workbook

Starter activity
Remind pupils of earlier work on addition and subtraction. Allow them to vote for a starter activity.

Lesson focus
This lesson reinforces earlier lessons that included word problems. Remind pupils of earlier work and demonstrate how to create a number sentence from a word problem.

Go through the example on page 60 of the Pupil’s Book with pupils then ask them to complete Exercise 1 (Pupil’s Book page 60).

Answers
Exercise 1
1. ₦75
2. 21
3. 46
4. 72
5. 55 m
6. 53
7. 50 m
8. 199
9. Abel is 40
Lesson 2  
*Pupil’s Book page 61; Workbook page 23*

**Preparation**
You will need:
- Number cards
- Counters if needed
- Pupil’s Book
- Workbook

**Starter activity**
Get pupils to sit in a circle and each makes up a short word problem. They can use their own names or make up names. Pupils can solve each other’s problems.

**Lesson focus**
This lesson encourages pupils to be creative and make up their own problems. Do one or two for them and then encourage pupils to make up their own.

Pupils complete Exercise 2 (Pupil’s Book page 61).

**Answers**

**Exercise 2**
Pupils will all have different answers. Allow them to spend time sharing with each other.

**Worksheet 17**
4.  $n + 68 = 73; \ n = 5$
5.  $38 - 9 = n; \ n = 29$

**Puzzle (Pupil’s Book page 61)**
$10 + 5 + 50 + 5 + 9 - 1 = 78$

**Assessment**
Check that pupils have found the correct answers to Exercise 2.

**Extension activity**
Pupils can do the puzzle on page 61 of the Pupil’s Book.

**Homework activity**
Worksheet 17, page 23, Questions 4 and 5.
Objectives
By the end of this unit, pupils will be able to:
• Identify commonly used coins
• Place coins in value order
• Work out the value of up to ten coins by counting in ones, twos, fives and tens
• Select coins to a given value.

Suggested resources
• Coins of each value, if possible
• Photos or pictures of each coin
• Labels: Naira, kobo, 50k, ₦1, ₦2
• Items to buy from a play shop
• Coins – either real or those made from card
• Price tags

Key word definitions
money: acts as a medium of exchange in transaction
total: bringing two or more amounts of money together to make a new total
cost: an amount paid or required in payment for a purchase
value: the amount that an item is considered to be worth in money

Frequently asked questions
Q What prior knowledge do the pupils need?
A Pupils need to be able to add more than two numbers, count in twos, fives and tens and subtract from a larger number.

Common errors pupils make
• Some pupils may confuse Naira with kobo and not know the value order. Practise ordering coins in value.
• Some pupils may have difficulty counting coins. Start by asking pupils to write the value of each coin and then add them together one at a time.

Evaluation guide
Assess whether pupils can:
1. Identify commonly used coins.
2. Place coins in value order.
3. Work out the value of up to ten coins by counting in ones, twos, fives and tens.
4. Select coins to a given value.

Lesson 1 Pupil’s Book page 62; Workbook page 24

Preparation
You will need:
• Coin of each value
• Photos or pictures of each coin
• Labels: Naira, kobo, 50k, ₦1, ₦2
• Pupil’s Book
• Workbook

Starter activity
Hold up the label ‘Naira’. Ask pupils to read the label together. Explain that Naira is the name of the money used in Nigeria. Explain that Naira is broken into even smaller units of money called kobos (hold up the kobos label). Explain that on the next labels you are going to show there will be different amounts of money. Some will be kobos and shown by a ‘k’ next to the amount and some will be in Naira and have an ‘₦’ next to the amount. Hold up each of the coin value cards and ask pupils to read which amount is on the card, for example, 50k = fifty kobo and ₦2 = two Naira.

Explain that coins are made in metals while Naira notes are made with the use of paper materials with labels. Show them the coins materials and example
of Naira notes. Let each of them hold and feel them while they pass them round.

Lesson focus
Either pass round or show a picture of 50k and ₦1 and ₦2 coins. Ask three pupils to come to the front and each hold a picture card of a coin. Ask the class to help match the right value labels to the right coins. Then ask the class to put the coin pictures in order of the smallest amount to the largest.

Either pass round or show a picture of ₦1 and ₦2 coins. Ask another two pupils to come to the front and hold the coin pictures and collect the right label for their coin. Ask the class to put them in order and then add them to the kobos line. Where should they stand? Ask the class to read along the line saying the amounts of each coin. Collect in the pictures and labels and ask a different group of three pupils to come to the front. Give out the coins in no particular order and without the value labels. Ask the class to help put the line in order again from smallest to largest amount.

Read through page 62 of the Pupil’s Book with the class and discuss the uses of money. Pupils then complete Question 1 of Exercise 1 (Pupil’s Book page 63).

Answers

Exercise 1
1. Buy goods and commodities.
2. Pay for services.
3. Save until you need it.

Worksheet 18
1. a) Buy goods.
   b) Pay for services.
   c) Save until you need it.

Assessment
Listen to pupils’ responses. Are they able to identify each coin? Pupils should be able to identify commonly used coins. Pupils should be able to place coins in value order.
Lesson 2  Pupil’s Book page 63; Workbook page 24

Preparation
You will need:
• Coins of each value
• Photos or pictures of each coin
• Labels: Naira, kobo, 50k, ₦1, ₦2
• Pupil’s Book
• Workbook

Starter activity
Hold up a picture card of a coin. How much is this coin? Repeat with all the picture cards. Put coins that the class don’t recognise to the bottom of the pile and review afterwards.

Lesson focus
Explain to the pupils that 2 × 50 kobos = 1 Naira. Ask the pupils to count how many 50k will make ₦2 by grouping them. The pupils count two 50k = ₦1 and another two 50k = ₦1 so that ₦1 + ₦1 = ₦2.

Draw on the board two 50k coins with a + sign in the middle and = sign at the end to form an equation. Ask pupils to complete the number sentence. Repeat with:

₦1 + ₦1 = 50k + 50k = ₦2 + ₦2 + ₦2 = ₦1 + ₦1 + ₦1 + ₦1 = ₦2 + ₦2 + ₦2 + ₦2 =

Remind pupils to look carefully at which coins are being used, kobo or Naira. Then show pupils how coins of different values can be added together.

For example, ₦2 + ₦1 = ₦3; 50k + ₦1 = ₦1 50k, etc.

Ask pupils to complete Worksheet 18, page 24, Questions 2 and 3.

Answers

Challenge (page 63)
Monitor the pupils as they play the game.

Worksheet 18
2. A medium of exchange.
3. Hold up the coins and notes and explain each one to the pupils.

Assessment
Listen to pupils’ responses during the class activities and look at the answers given in the exercises. Pupils should be able to identify commonly used coins. Pupils should be able to place coins in value order. Pupils should be able to solve simple money problems.

Extension activity
Complete the Challenge activity (Pupil’s Book page 63).

Homework activity
Exercise 1, Question 2.
Lesson 3  Pupil's Book page 63; Workbook page 18

Preparation
You will need:
- Coins of each value
- Photos or pictures of each coin
- Labels: Naira, kobo, 50k, ₦1, ₦2
- Pupil’s Book
- Workbook

Starter activity
Hold up a picture card of a coin. How much is this coin? Repeat with all the picture cards. Coins, which the class don’t recognise, put to the bottom of the pile and review afterwards. Count together in twos, fives and tens.

Lesson focus
Draw seven 50k coins on the board. Explain to pupils that as all the coins are 50k we can find the total amount by counting up the coins in 50s. Count together to find the total 350k.

Draw ten 50k coins on the board and ask pupils to find the total amount.

Repeat task with eight ₦2 coins, nine ₦1 coins and six ₦2 coins.

Ask pupils to solve the following problems: If I wanted to buy a ball for ₦2, how many 50k coins would I need? Show pupils how to draw the coins and use the fact that two 50k coins make ₦1 and so count up in twos to get to the total.

If I want to buy a book for ₦20, how many ₦2 coins would I need?

If I wanted to buy some sweets for ₦2, how many 50k coins would I need?

If I wanted to buy a pair of shoes for ₦7 how many ₦1 coins would I need?

Pupils complete Exercise 1, Question 3 (Pupil’s Book page 63).

Exercise 1
Let pupils share their findings and use this as a class discussion on the price of items.

Worksheet 18
3. a) 50k
   b) ₦2
   c) ₦100
   d) ₦1 000
   e) ₦500
   f) ₦20
   g) ₦1
   h) ₦50
   i) ₦200
   j) ₦10
   k) ₦5

Assessment
Listen to pupils’ responses during the class activities. Pupils should be able to add and subtract amounts of money totals up to ten units within the context of shopping.

Pupils should be able to solve simple money problems.

Pupils should be able to work out the value of up to ten coins by counting in ones, twos, fives and tens.

Pupils should be able to lay out coins to a given value.

Extension activity
How many 50k coins would you need to buy crayons for ₦5? (10)

How many ₦2 coins would you need to buy a book for ₦80? (40)

Homework activity
Worksheet 18, page 24, Question 3.
Lesson 4  Pupil’s Book page 63; Workbook page 25

Preparation
You will need:
• Coins of each value
• Photos or pictures of each coin
• Labels: Naira, kobo, 50k, ₦1, ₦2
• Pupil’s Book
• Workbook

Starter activity
Show different notes used in Nigeria. Explain that Naira is the name of money used in Nigeria and tell the pupils that Naira notes can be broken into smaller units of money called kobo (remind them that they are the coins already discussed with them in the previous lessons). Ask them to name all the coins in use in Nigeria. Explain the amount of money in Naira is shown with ₦ written next to it. Hold each of the Naira notes and ask pupils to read the amount written on them. Make a list on the board.

Ask the pupils to look at the sizes of the Naira notes and compare them, with your guidance
Ask the pupils to identify the pictures of notable Nigerians drawn on each of the Naira notes. For example, Chief Obafemi Awolowo is drawn on the ₦100 note while Alhaji Sir Ahmadu Bello is on the ₦200 note.

Lesson focus
Pass round and show pictures of Nigerian Naira notes to the pupils. Direct eight pupils from the class to come to the front and give a note to each. Call some members of the class to match the value labels to the notes. Ask other pairs of pupils to come up and say which is bigger in value among some notes given to them. Give out some notes to pupils to add together. Pupils should draw the notes in their note books and label them.

Answers
Class exercise
Check that drawings are correct.

Worksheet 18
4. a) ₦20
b) ₦500
c) ₦100
d) ₦1 000

Assessment
Listen and observe pupils’ responses. Check whether they are able to recognise each note and label it correctly. Pupils should be able to identify commonly used notes. Pupils should be able to put notes in value order. Pupils should be able to add notes together.

Extension activity
Ask pupils to draw all notes up to ₦500 in their exercise books in value order from smallest to largest.

Homework activity
Worksheet 18, page 25, Question 4.
Lesson 5  Pupil’s Book page 63; Workbook page 25

Preparation
You will need:
- Coins of each value
- Photos or pictures of each coin
- Labels: Naira, kobo, 50k, ₦1, ₦2
- Pupil’s Book
- Workbook

Starter activity
Hold up notes and coins and ask pupils to call out their names.

Lesson focus
Review the earlier lesson on how many kobos make a Naira and give pupils more examples of adding coins and notes together to work through. It is important that pupils grasp currency additions and subtractions before moving on to the next unit.

Pupils to complete Worksheet 18, page 25, Question 5.

Answers

Class exercise
Let pupils share their findings and use this as a class discussion on the price of items.

Worksheet 18
5. ₦812 or eight hundred and twelve Naira.

Assessment
Listen to pupils’ responses during the class activities. Pupils should be able to double amounts of money and perform simple addition.

Extension activity
Ask pupils how much change they would get from ten, 50 and 100 Naira if they spent a specific amount. For example, I have ten Naira, if I spend eight Naira on sweets, how much change will I receive (two Naira)? How much would that be in kobos?
Objectives
By the end of this unit, pupils will be able to:
• Within the context of shopping add and subtract amounts of money, totals up to ten units
• Solve simple money problems
• Select coins to a given value.

Suggested resources
• Coins of each value, if possible
• Photos or pictures of each coin
• Labels: Naira, kobo, 50k, N1, N2
• Items to buy from a play shop
• Coins – either real or those made from card
• Price tags

Key word definitions
No new keywords.

Frequently asked questions
Q What prior knowledge do the pupils need?
A Pupils need to be able to recognise different money denominations and exchange them.

Common errors pupils make
• Some pupils may confuse Naira with kobo and not know the value order. Practise ordering coins in value.
• Some pupils may have difficulty counting coins. Start by asking pupils to write the value of each coin and then add them together one at a time.

Evaluation guide
Assess whether pupils can:
1. Within the context of shopping add and subtract amounts of money, totals up to ten units.
2. Solve simple money problems.
3. Select coins to a given value.

Lesson 1
Pupil’s Book page 63; Workbook page 26

Preparation
You will need:
• Coins of each value
• Photos or pictures of each coin
• Items to buy from a play shop
• Coins – either real or those made from card
• Price tags
• Pupil’s Book
• Workbook

Starter activity
Remind pupils of the different coins and notes in use in Nigeria. Hold up different coins and notes and ask pupils to identify them.

Lesson focus
This lesson is a reinforcement of previous work and an introduction to shopping using money. Pupils should be able to undertake simple addition and subtraction and work out the correct change. Give pupils examples of how we make up larger denominations, for example 20 kobo and 80 kobo equals one Naira. Use the example on page 64 of the Pupil’s Book and then hold up different combinations of coins and ask pupils to work out how much they are when added together.

Pupils complete Exercise 1, Question 3 (Pupil’s Book page 63).
Answers

Exercise 1
Answers will vary because pupils can make up the larger amount using different combinations of smaller ones. Go through some of the different answers with pupils and explain this to them.

Worksheet 19
1. Answers will vary because children can make different combinations of money.
   a) $5 \times \₦10$
   b) $5 \times \₦1$
   c) $10 \times \₦1$ or $2 \times \₦5$
   d) $2 \times \₦10$ or $20 \times \₦1$

Assessment
Listen to pupils’ responses during the class activities. Can pupils work out correct combinations? Pupils should be able to solve simple money problems.

Extension activity
Play a ‘Note changing’ game. Remind pupils to make sure they give correct change.

Homework activity
Worksheet 19, page 26, Question 1.

Lesson 2 Pupil’s Book page 66; Workbook page 26

Preparation
You will need:
- Coins of each value
- Photos or pictures of each coin
- Items to buy from a play shop
- Coins – either real or those made from card
- Price tags
- Pupil’s Book
- Workbook

Starter activity
Ask pupils quick-fire subtraction questions, such as:
$10 - 7 = 10 - 9 =$
$5 - 3 = 5 - 4 =$
$20 - 10 = 20 - 18 =$
$50 - 40 = 50 - 20 =, etc.$

Lesson focus
On a table at the front of the class set up a ‘shop’ or stall. Price items in whole Naira up to $₦10$. Ask a pupil to be ‘shopkeeper’ and ask another five pupils to be customers. Give two of the customers ten $₦1$ coins each and give the others five $₦2$ coins each. Ask each customer to choose an item to buy. The shopkeeper must work out the change. Ask the class to help the shopkeeper. It may help to write the subtraction sentence on the board. Repeat with another shopkeeper and another five customers.

Ask pupils to complete Exercise 2 (Pupil’s Book page 66). Those who need extending could complete the Challenge activity (Pupil’s Book page 67).

Answers

Exercise 2
1. 3 Naira
2. 15 Naira
3. 12 Naira
4. 8 Naira
5. 20 Naira
6. 19 Naira

Challenge (page 67)
$₦2$ and 50 kobo
Lesson 3  Pupil’s Book page 66; Workbook page 27

**Preparation**
You will need:
- Notes and coins of each value
- Photos or pictures of each note and coin
- Items to buy from a play shop
- Coins – either real or those made from card
- Price tags
- Pupil’s Book
- Workbook

**Starter activity**
Show picture cards of each note. Ask pupils to identify the notes shown. Repeat with all other picture cards until the pupils are familiar with all the notes.

**Lesson focus**
Two tables are put at the front of the class as a shop. Priced items in Naira are laid on top of the tables up to ₦500. Let a pupil be a shopkeeper while some other pupils are customers. Give each of them a certain amount of money to shop with. The shopkeeper sells to customers. Ask the class to assist the shopkeeper where necessary. Repeat shopping with more pupils.

Show pupils the example on page 67 of the Pupil’s Book. Pupils then complete Exercise 3 (Pupil’s Book page 67).

**Answers**

**Exercise 3**
1. ₦10 + 50k + 50k = ₦11
2. ₦2.50 + ₦1 + 50k = ₦4
3. ₦1.20 + ₦20 + ₦10 = ₦31.20
4. 50k + ₦1 + ₦2.50 + ₦10 = ₦14
5. ₦10 = ₦20 = ₦30

**Worksheet 19**
3. a) ₦9
   b) ₦17
   c) ₦17
   d) ₦11, ₦3, ₦3
Lesson 4  Pupil’s Book page 66; Workbook page 27

**Preparation**

You will need:
- Notes and coins of each value
- Photos or pictures of each note and coin
- Items to buy from a play shop
- Coins – either real or those made from card
- Price tags
- Pupil’s Book
- Workbook

**Starter activity**

Repeat the previous starter activity and remind pupils of how they shopped using money in the previous lesson.

**Lesson focus**

Set the shop up as in the previous lesson but this time the shopkeeper must also give change. Demonstrate how to use subtraction to work out the correct change to give a customer. Ask the class to assist the shopkeeper where necessary. Repeat shopping with more pupils. Pupils then complete Worksheet 19, page 27, Question 4.

**Answers**

*Worksheet 19*

4. a) This is done for you.
   
   b) ₦5
   
   c) ₦10
   
   d) ₦3
   
   e) ₦8

**Assessment**

Observe and listen to pupils’ responses during the class activities. Pupils should be able to add and subtract amounts of money within the context of shopping. Pupils should be able to find the correct number of notes to buy an article. Pupils should be able to solve simple money problems using notes.
Extension activity
Pupils should continue to play the ‘Shopping’ game at home with their family members. They should ensure they give and take correct change.

Homework activity
Give extra word problems involving money for homework.
Unit 20

Length: Compare and identify differences in natural units

Objectives

By the end of this unit, pupils will be able to:

• Measure, compare, order and estimate using natural units

• Solve simple problems involving length using natural units

Suggested resources

• Items of the same size to measure with, such as bottle tops and paper clips
• Collection of objects to measure, such as a pencil, book, cup and eraser
• Blank pieces of card or paper
• Labels: taller than, shorter than, about

Key word definitions

natural units: an arm’s length, foot, stride, cubit, handspan

Frequently asked questions

Q What prior knowledge do the pupils need?
A Pupils need to be able to recognise, order and write numerals to 100. They need to be able to compare objects and say which is longer or taller. They also need to be able to add and subtract numbers.

Common errors pupils make

When measuring, pupils may not start at the edge and so their measurement will be incorrect. Demonstrate how to measure from edge to edge.

Evaluation guide

Assess whether pupils can:

1. Measure, compare, order and estimate using natural units.
2. Solve simple problems involving length using natural units.

Lesson 1 Pupil’s Book page 68; Workbook page 29

Preparation

You will need:

• Items to measure of different sizes, such as a desk, field, pencil, book, cup and eraser
• Pupil’s Book
• Workbook

Starter activity

Hold up two objects of different length, such as a pencil and a book. Which object is longer and which is shorter? How can we check? Listen to pupils’ responses and encourage ideas, such as, compare together by placing one above the other, measure using bottle tops.

Hold up two objects of different height, such as a cup and a jug. Which object is taller? How can we check? Explain that we measure the length of an object when we want to know how long it is and we measure the height of an object when we want to know how tall it is. Show some more objects and ask if we would be measuring the height or the length.

Lesson focus

How long is the pencil? How can we find out? Lay the pencil on the table and ask a pupil to measure the pencil using his or her hand. What do we need to do to make sure we measure accurately? Remind pupils that they must start at the edge of the object and their hand in such a way that there
is no overlapping and no gaps. Repeat with another pupil measuring the book. Repeat the activity with larger objects using hands to measure. Look at the pictures on pages 69 and 70 of the Pupil’s Book and discuss the different ways of measuring that are depicted.

Pupils complete Exercise 1 (Pupil’s Book page 70).

**Answers**

**Exercise 1**
Answers will vary according to pupils’ own measurements (hand width, stride etc.). Discuss this variation with pupils and ask why it might cause a problem in measuring.

**Worksheet 20**

1. a) foot  
   b) stride  
   c) span  
   d) hand  
   e) cubit

**Assessment**

Observe pupils as they carry out Exercise 1. Watch them as they work – are they measuring accurately? Pupils should be able to measure, compare, order and estimate using natural units.

**Extension activity**

Ask pupils to use hands to measure a friend’s height. Ask pupils to estimate how many hands tall they think their friend will be.

Ask pupils to find and draw items from school and/or home that measure 5 hands wide and 10 hands long or tall.

**Homework activity**

Worksheet 20, page 29, Question 1.

**Lesson 2**  Pupil’s Book page 71; Workbook page 20

**Preparation**

You will need:
- Collection of objects to measure  
- Pupil’s Book  
- Workbook

**Starter activity**

Remind pupils of the last lesson and ask them to show which part of their body they would use to measure a finger, cubit, span, hand foot length and stride. Name various objects that could be measured, such as a door, a book and a person, and ask which natural measurement would be the best to use.

**Lesson focus**

In the last lesson the focus was on measuring fairly small objects. In this lesson, extend measuring to include larger objects, such as the classroom or the school field. This lesson is a lot of fun and can be conducted using groups. Choose pupil in each group to record results of measuring.

Pupils complete Exercise 2 (Pupil’s Book page 71).

**Answers**

**Exercise 2**

Compare pupils’ answers.

**Puzzle (Pupil’s Book page 68)**

Answers will differ. Compare pupils’ answers.

**Worksheet 20**

2. Answers will vary as pupils must use their own natural units.

**Assessment**

Observe pupils as they carry out Exercise 2. Watch them as they work – are they measuring accurately? Pupils should be able to measure, compare, order and estimate using natural units.
Objectives
By the end of this unit, pupils will be able to:
• Measure compare, order estimate lengths to nearest whole unit using standard units: the centimetre (cm) and the metre (m)
• Measure and record lengths in metres to the nearest metre
• Calculate totals and differences for lengths given in metres or in centimetres
• Solve simple problems involving length.

Extension activity
Complete the puzzle (Pupil’s Book page 68).

Homework activity
Worksheet 20, page 29, Question 2.
Objectives
By the end of this unit, pupils will be able to:
• Measure, compare, order and estimate lengths to nearest whole unit using standard units: the centimetre (cm) and the metre (m).
• Measure and record lengths in metres to the nearest metre.
• Calculate totals and differences for lengths given in metres or in centimetres.
• Solve simple problems involving length.

Suggested resources
• Centimetre rulers (if rulers are not available or there are not enough for each pupil, use strips of paper or card. Place the strip above the ruler at the top of the Pupil's Book and measure out marks to make it into ruler).
• Metre sticks (if metre sticks are not available, use the ruler in the Pupil's Book to measure out 100 cm on either strips of paper or card taped together or a length of string or ribbon).
• Blank pieces of card or paper.
• Labels: Taller than 1 metre, Shorter than 1 metre, About 1 metre.

Key word definitions
No new key words.

Frequently asked questions
Q What prior knowledge do the pupils need?
A Pupils need to be able to recognise, order and write numerals to 100. They need to be able to compare objects and say which is longer or taller. They also need to be able to add and subtract numbers.

Common errors pupils make
• When measuring, pupils may not start at the edge and so their measurement will be incorrect. Remind pupils and demonstrate how to measure from edge to edge.
• Pupils may use the incorrect units. Talk about which units are best to measure – long or tall objects, and which are better to measure – smaller objects. List some objects that would be measured in metres, and those that are best measured in centimetres.
• Pupils can get confused when a measurement comes between two numbers on the ruler. Tell pupils to see which number is nearest. Practise with some objects of varying lengths.

Evaluation guide
Assess whether pupils can:
1. Measure, compare, order and estimate lengths to nearest whole unit using standard units: the centimetre (cm) and the metre (m).
2. Measure and record lengths in metres to the nearest metre.
3. Calculate totals and differences for lengths given in metres or in centimetres.
4. Solve simple problems involving length.
**Lesson 1**  
*Pupils’ Book page 72; Workbook page 30*

### Preparation

You will need:
- Metre sticks (if metre sticks are not available, use the ruler in the pupil’s book to measure out 100 cm on either strips of paper or card taped together or a length of string or ribbon)
- Blank pieces of card or paper
- Labels: Taller than 1 metre, Shorter than 1 metre, About 1 metre
- Pupil’s Book
- Workbook

### Starter activity

Ask pupils what they’ve been using to measure with – hands. Explain that when we measure length we use units called metres and centimetres. Hold up the metre stick. Write the word ‘metre’ on the board and show the pupils that when something is 1 metre long you can write 1 m the ‘m’ meaning metre to tell someone else that you are measuring in metres, not hands or anything else. Discuss what happened when different people measured the same object with their hands – they sometimes had different answers. Explain the metre is a standard unit of measure. A metre in South Africa is the same length as a metre in Nigeria.

### Lesson focus

Show the class the metre stick again. Ask pupils what it is called and what unit does it measure. Show the labels – taller than 1 metre, shorter than 1 metre, about 1 metre, and read them together. Stand a chair, a satchel and yourself in a line. Ask a pupil to choose a label and decide whether they place it next to the chair, the satchel or you. Repeat with two other pupils and the other two labels. Ask the class to look at their answers – does the class agree? Can pupils name any more objects that are either taller than, shorter than or about a metre?

Ask the pupils to complete Exercise 1 followed by the Challenge (Pupil’s Book page 72).

### Answers

**Exercise 1**

Compare pupils’ answers.

**Challenge (page 72)**

Compare pupils’ answers.

**Worksheet 21**

1. Measure between the knots:
   - a) 8 cm
   - b) 11.5 cm
   - c) 12.5 cm
   - d) 10 cm
   - e) 10.25 cm

### Assessment

Observe pupils and listen to their responses during the starter activity. Are they able to compare to 1 metre? Pupils should be able to compare dimensions of objects to 1 metre and sort these dimensions according to whether they are more than, less than, or about 1 metre.

### Extension activity

Ask pupils to order the labelled measured objects from the starter activity from shortest to longest/tallest. Ask pupils to find and draw objects from school and/or home which are taller than, shorter than and about a metre.

### Homework activity

Worksheet 21, page 30, Question 1.
Lesson 2  Pupil’s Book page 73; Workbook page 30

**Preparation**

You will need:
- Centimetre rulers (if rulers are not available or there are not enough for each pupil, use strips of paper or card. Place the strip above the ruler at the top of the pupil’s book and measure out marks to make it into a ruler)
- Metre sticks (if metre sticks are not available, use the ruler in the Pupil’s Book to measure out 100 cm on either strips of paper or card taped together or a length of string or ribbon)
- Collection of objects to measure, such as a pencil, book, cup and eraser
- Pupil’s Book
- Workbook

**Starter activity**

Hold up the metre stick. Ask pupils if their book is longer, shorter or about the same as one metre. (Shorter than one metre.) How long is the book?

Ask ‘what have you been using to measure small objects?’ – bottle tops and hands. Explain that when we measure lengths of items shorter than one metre we use units called centimetres. Show pupils a piece of paper 1 cm square. Explain how difficult it would be to measure with lots of little units.

Hold up a centimetre ruler. Tell pupils we use a ruler which is lots of centimetres joined together and that we can use it to measure an object in centimetres. Each mark is 1 centimetre and we read the number of centimetres from the numbers in the ruler. Explain that 100 of these centimetres make 1 metre. Ask pupils if they can see anything that is about 1 cm (may be the thickness of a pencil or a paper clip) and another object that is about a metre (may be a chair or a window). Which unit would be best to use to measure small things, such as a glass, a pencil or a shoe? (cm) Which unit would be best to measure larger objects such as a door, a classroom, a tree? (m)

Pupils complete Exercise 2 (Pupil’s Book page 73).

**Answers**

**Exercise 2**

Let pupils compare answers.

**Worksheet 21**

2. Pupils are to draw lines of 2 cm, 9 cm and 10 cm.

**Lesson focus**

Hold up a book. Ask pupils which unit is best to use to measure the book? (cm) Ask pupils to estimate how many centimetres long the book is. Show pupils how to use the ruler to measure. Remind them to start at the edge of the object and look for the number that the other edge stops on. The book is ____ centimetres long. Tell pupils that if the edge of the book comes between two numbers on the ruler pupils should see which number is nearest.

Hold up a glass or plastic beaker. Ask pupils which unit is best to use and then ask them to estimate how many centimetres tall they think the glass or beaker is. Ask a pupil to come to the front to use the ruler to measure it. Make sure the ruler is used correctly from edge to edge. Ask pupils which unit is best to use to measure the classroom (m). How many metres wide do you think the classroom is?

Ask two pupils to use the metre stick to measure the width of the classroom. Show them how one pupil can mark the end of the metre stick so that the other pupil can move it to measure another metre. Remind pupils that, like the bottle tops, we must not overlap the metre stick or leave a gap. As a class, count how many metres long the classroom is. The last measurement may not be a whole metre. Show pupils how to find the nearest metre by marking the middle of the metre stick. Explain that if the last measurement doesn’t reach the mark then we don’t include that last metre, but if it goes past the mark we include it.
Assessment
Observe pupils throughout classroom activities and listen to pupils’ responses. Pupils should be able to measure compare, order and estimate lengths to nearest whole unit using standard units: the centimetre (cm). Pupils should be able to compare estimates to actual measures.

Extension activity
Practise measuring items.

Homework activity
Worksheet 21, page 30, Question 2.

Lesson 3  Pupil’s Book page 74; Workbook page 30

Preparation
You will need:
• Centimetre rulers (if rulers are not available or there are not enough for each pupil, use strips of paper or card. place the strip above the ruler at the top of the pupil’s book and measure out marks to make it into ruler)
• Metre sticks (if metre sticks are not available, use the ruler in the pupil’s book to measure out 100 cm on either strips of paper or card taped together or a length of string or ribbon)
• Items of same size to measure with – bottle tops, paper clips, etc.
• Collection of objects to measure – pencil, book, cup, eraser, etc.
• Pupil’s Book
• Workbook

Starter activity
Lay out a collection of objects at the front of the class. Ask one pupil at a time to choose an object, hold it up and let the class estimate how long it is. Then ask the pupil to use the ruler to measure the object and then write the measurement on a blank piece of card or paper and lay it next to the object. Repeat with different pupils until all the objects have been measured.

Lesson focus
Ask pupils to work in pairs to complete Exercise 3 (Pupil’s Book page 74).

Answers

Exercise 3
Responses may vary. Check for accurate measuring.

Worksheet 21
3. Measurements will vary. The object of this question is to help pupils acquire a concept of length by first estimating and then measuring. This can be a fun game and pupils can compare their answers.
Assessment
Pupils should be able to measure compare, order and estimate lengths to nearest whole unit using standard units: the centimetre (cm) extending to the metre (m). Pupils should be able to compare estimates to actual measures.

Extension activity
Ask pupils to work in pairs and measure the height of each other in both centimetres and metres. Pupils can start with a metre and then use the ruler to find out how much taller than a metre each pupil is.

Homework activity
Worksheet 21, page 30, Question 3.

Lesson 4  Pupil’s Book page 82; Workbook page 31

Preparation
You will need:
• Two pencils of different lengths
• Centimetre ruler
• Metre stick
• Pupil’s Book
• Workbook

Starter activity
Ask pupils some quick-fire addition and subtraction questions:
10 − 8 (2); 20 + 20 (40); 15 − 6 (9)
50 + 25 (75); 30 − 10 (20)
5 + 5 + 10 (20); 20 + 10 + 5 (35); 25 − 8 (17)

Lesson focus
Measure two pencils using the centimetre ruler. Hold up the longest pencil. How much longer is this pencil than the other one? Place both pencils next to each other and discuss which bit you need to measure to find out how much longer. Talk about the difference in length. If pupils have difficulty with the concept of difference, make a strip of paper the same length as each of the pencils. Put the shorter piece of paper on top of the longer piece making sure they are matched up at one end. Ideally, each piece should be a different colour. If not, colour or shade the piece of paper that is the difference between the shorter and the longer piece. Fold the shaded part back to show the pieces are now the same length and then unfold the piece that makes them different. It is the piece that makes them different that is called the ‘difference’. The difference tells you how much longer or how much shorter an object is when compared to another. (Difference in terms of subtraction is not covered until Grade 3, however, it is in this type of meaningful context that pupils come to an understanding of the meaning of difference between numbers.)

Draw two trees on the board, one shorter than the other. Draw arrows to show the height of the trees, and label the taller one 6 metres and the smaller one 4 metres. How much taller is this tree?
Here they cannot fold down the difference, and it is expected that the pupils will be able to use a counting on method to work out the difference is 2 metres (because 4 metres and 2 more will make the 6 metres). Draw three lines on the board – 30 cm, 20 cm and 10 cm long. Ask a pupil to measure each line and write the measurement next to the line. If we joined these lines together how long would it be? How can we find out? (add together the three measurements to find the total) – 30 cm + 20 cm + 10 cm = 60 cm.

Pupils complete Exercises 4 and 5 (Pupil’s Book page 74).

**Answers**

**Exercises 4 and 5**

Compare the answers given.

**Worksheet 21**

4. a) 6.5 cm length and 2 cm breadth  
   b) 4 cm and 3 cm  
   c) 3 cm and 3 cm  
   d) 2.5 cm length and 1.5 cm breadth

**Assessment**

Listen to pupils’ responses during the class activity. Pupils should be able to find totals and differences for lengths given in metres or in centimetres. Pupils should be able to solve simple problems involving length.

**Extension activity**

Ask pupils to make up their own questions and answers at home.

**Homework activity**

Worksheet 21, page 31, Question 4.
Objectives

By the end of this project, pupils will have shown that they are able to:
• Understand why we need to measure objects
• Understand the difference between natural units and standard units
• Use different measuring tools.

Guidelines

This project is designed to teach pupils to work together measuring different objects. Pupils should record all measurements and compare with them each other. You will need to have already made an accurate recording of the length of the school field.

Start the lesson by discussing why we need to measure objects and the different ways in which we can measure. Pupils are already familiar with different non-standard and standard measurements. Ask them how they would measure a small classroom item such as a book. Pupils should make suggestions such as using an arm’s length (non-standard) or a ruler (standard). Then ask pupils how they would measure a tall building or a skyscraper. If time permits you can explain to pupils how architects and quantity surveyors measure large objects such as buildings and bridges.

Take the pupils onto the school field and let them measure the field using strides. Pupils should record their findings. Compare their measurements. Demonstrate to pupils how to measure the field using different measuring tools, such as a tape measure or a stick. Talk to pupils about the correct units in which to measure large areas (metres).

Answers

The measurements done by pupils will depend on the size of the objects and area of the field measured.
Term 2: Assessment

Pupils’ Book page 78

Objectives
This assessment is a summative assessment of work covered in Units 11 to 21.
- This assessment is designed to assess the children’s mathematical understanding and not their reading ability and is best completed individually or in small groups.

Guidelines
On completion of the assessment you should look for both correct answers and mistakes made by pupils. By analysing the results of the assessment, you will be able to identify weaknesses in individual pupils and so provide the necessary support. You will also be able to identify strengths of individuals and provide them with more challenging activities. In addition, you will be able to identify any weaknesses in their teaching programme and make adjustments as necessary.

For this assessment pupils should be able to add and subtract three-digit numbers, both with exchange and renaming and without. By now pupils should be able to complete the assessment without needing counters, however, you can provide counters or other aids for pupils that still need them.

Answers
1. b) 53
   c) 97
   d) 112
   e) 92
   f) 771
   g) 633
   h) 814
2. a) 19
   b) 34
   c) 26

3. 18
4. 60
5. 27
6. a) 21
   b) 20
7. a) 18
   b) 27
   c) 71
   d) 4
   e) 93
8. 47
9. 147
10. N17
11. N12
12. Answers will vary but should be feasible. Check that pupils know how to use a handspan and foot length.
13. Measure the bench in advance so that you have a correct answer.
Objectives
By the end of this unit, pupils will be able to:
• Give time to the hour and half.

Suggested resources
• Real clocks
• Dummy clocks
• Cardboard clocks – one for each pupil (these will be made in the first lesson)
• To make clocks – card circles, card hour and minute hands, dowel or split pin, scissors, pens or crayons
• Labels: o’clock, half past, numerals 1–12

Key words definitions
digital: a clock or watch that shows the time using numbers, not hands
analogue: a clock that has moving hands and hours marked from 1 to 12 to show the time
duration: length of time that something lasts

Frequently asked questions
Q What prior knowledge do the pupils need?
A Pupils need to recognise, write and order numerals to 12. They also need to understand a whole and a half.

Common errors pupils make
• Pupils may forget that after 12 on an analogue clock, the numbers start from 1 again. Demonstrate on an analogue clock pointing to each hour as you go round 1 o’clock, 2 o’clock, 3 o’clock, etc. When you get to 12 o’clock ask pupils to look at the clock to see which hour comes next.
• Pupils may have difficulty reading the time when it is at half past on an analogue clock as the hour hand is between two numbers. Remind pupils that they must look at which hour it has gone past and not which hour it is going to.

Practise using an analogue clock.

Evaluation guide
Assess whether pupils can:
1. Give time to the hour and half.

Lesson 1 Pupil’s Book page 80; Workbook page 32

Preparation
You will need:
• Analogue clock with numerals 1–12, an hour and a minute hand
• Card analogue clocks – one for each pupil (these will be made in the first lesson)
• To make clocks – card circles, card hour and minute hands, dowel/split pin, rolled card, scissors, pens or crayons
• Pupil’s Book
• Workbook

Starter activity
Hold up an analogue clock (with linked hands). Ask pupils if they know what it is and what it is used for. Where might you see clocks? ‘Is there anything else you can tell me about this clock?’ (Pupils may mention the hands, the numbers, etc.) If the pupils haven’t already mentioned them, talk about the hour hand and the minute hand. Also discuss the numerals around the outside (count them together) and the fact that the hands move round the clock to point at the time. Demonstrate the way the hour hand moves relative to the minute hand. Can pupils see how, when the minute hand moves a complete turn around the clock, the hour hand moves gradually from one hour number to the next?
Lesson focus
Display a wall chart showing the clock face. Ask pupils which number is at the top (12) and which is at the bottom (6). Explain that they are going to make clocks to help them learn to tell the time. Give out the card circles and the pens or crayons. Ask pupils to write a 12 at the top of the circle and a 6 at the bottom. Look at the wall chart again and point to the 3 and the 9. Ask pupils to draw on the 3 and the 9 – make sure they get them the right way round. Ask pupils to fill in the rest of the numbers. They must then carefully use a sharp pencil and make a hole in the centre of the circle. Give out the hour and minute hands and ask pupils to use the pencil to make holes towards the end of the hands. Explain that the minute hand goes around the clock counting the minutes and the hour hand goes round the clock counting the hours. Take a piece of paper or thin piece of card about 5 cm wide and roll it very tightly so that it will fit in the holes just made. Push the rolled paper through (a piece of dowel or a split-pin or a drinking straw can also be used) and tape it to the back if possible. Pupils should now be able to move the hands around on their clocks.

Explain that when the minute hand (big hand) is on the 12, the clock tells us it's an o'clock time. Either use the analogue clock and change the hands accordingly or draw the hands on the wall chart for the following demonstrations.

Put the minute hand on the 12 and the hour hand on the 1. This clock says 1 o’clock. The minute hand is on the 12, which makes it an o’clock time, and the hour hand is on the 1, which makes it 1 o’clock. Move the hour hand to the 5. What time is it now? Ask pupils to move their minute hand onto the 12 to make an o’clock time. Now move their hour hand to the 5 to make 5 o’clock. Now change your clocks to say 7 o’clock. Repeat with different o’clock times.

Pupils complete Question 1 of Exercise 1 (Pupil’s Book page 80).

Answers

Exercise 1
a) five o’clock
b) eleven o’clock
c) one o’clock
d) six o’clock
e) nine o’clock
f) ten o’clock
g) two o’clock
h) seven o’clock
i) three o’clock
j) twelve o’clock

Worksheet 22
1. a) 1 o’clock
   b) 6 o’clock
   c) 12.30 or half past twelve
   d) 4 o’clock
   e) 9 o’clock.

Assessment
Observe pupils’ responses throughout the lesson. Pupils should be able to tell o’clock times displayed on analogue clocks.

Extension activity
Make a list of all the places you know where there is a clock. Make a list of when it is useful to know the time.

Homework activity
Worksheet 22, page 32, Questions 1a) to e).
Lesson 2  Pupil’s Book page 80; Workbook page 32

**Preparation**
You will need:
- Analogue clock
- Digital clock
- Card analogue clocks – one for each pupil (these will be made in the first lesson)
- Labels: o’clock, numerals 1–12
- Pupil’s Book
- Workbook

**Starter activity**
Make sure each pupil has the clock they made from the previous lesson. Ask them to show 3 o’clock. Then hold up the labels ‘6’ and ‘o’clock’ and ask pupils to read these labels together. Show this time. Repeat with different o’clock times.

**Lesson focus**
Either use the analogue clock or draw on the wall chart to show 4 o’clock. Then hold up the digital clock. Explain that this clock doesn’t point to the time but tells you the hour and the minutes. Explain that when it is o’clock the minutes are set to zero, for example, 2 o’clock would be 2:00. So what would 4 o’clock be? (4:00). Draw it on the board or show it on the digital clock. Draw 7:00 on a digital clock. What time is it? Repeat with a few more digital times.

Ask pupils to complete Question 2 of Exercise 1 (Pupil’s Book page 81).

**Answers**

**Exercise 1**
Check pupils’ books to make sure they have completed the drawings correctly.

**Worksheet 22**
1. f) 1.30 or half past one
   g) 4.30 or half past four
   h) 7 o’clock
   i) 10 o’clock
   j) 10.30 or half past ten.

**Assessment**
Listen to pupils’ responses during the class activities. Pupils should be able to tell o’clock times displayed on analogue and digital clocks.

**Extension activity**
Ask pupils to work in pairs with their own clocks and test each other by making an o’clock for their partner to tell the time. Ask pupils to draw an analogue clock face and a digital clock and make them both show 9 o’clock. Repeat for other o’clock times.

**Homework activity**
Worksheet 22, page 32, Questions 1f) to j).
Lesson 3  Pupil’s Book page 81; Workbook page 32

Preparation
You will need:
• Analogue clock
• Digital clock
• Card analogue clocks – one for each pupil (these will be made in the first lesson)
• Labels: o’clock, numerals 1–12
• Pupil’s Book
• Workbook

Starter activity
Make sure each pupil has the clock they made from the first lesson. Ask them to show you 3 o’clock. Hold up the labels ‘6’ and ‘o’clock’ and ask pupils to read these labels together. Ask them to show you this time. Repeat with different o’clock times.

Lesson focus
Explain that when the minute hand (big hand) is on the 6 the clock tells us it’s half past the hour. Use the analogue clock with moving hands for the following demonstration. Start with the minute hand on 12 and the hour hand on 1, and remind pupils that the clock says 1 o’clock. Move the minute hand clockwise from 12 to 6, showing how the hour hand moves halfway between the 1 and 2. This clock now says half past 1. The minute hand is on the 6, which makes it half past and the hour hand is halfway between the 1 and the 2. Hold up the ‘half past’ and ‘1’ labels. Move the hour hand to between the 5 and 6. ‘What time is it now?’ Ask pupils to move their minute hand onto the 6 to make a half past time and the hour hand to between the 9 and 10. ‘What time is that?’ Now change your clocks to say … Hold up the labels to say a half past time for the pupils to change their clocks to. Repeat with different half past times.

Ask pupils to complete Exercise 1, Question 3 (Pupil’s Book page 81).

Answers

Exercise 1
Pupils can use the clocks that they made in Lesson 1 to help them.

Worksheet 22
2. Pupils must draw the clock hands on the clocks, check to make sure they have the big and small hands in the right places.

Assessment
Listen to pupils’ responses during the class activities. Pupils should be able to tell o’clock times displayed on analogue and digital clocks. Pupils should be able to extend to telling the time to the half hour on analogue and digital clocks.

Extension activity
Ask pupils to work in pairs with their own clocks and test each other by making a half past time for their partner to tell the time.

Homework activity
Worksheet 22, page 32, Question 2.

Show the digital clock. Explain that to show half past on a digital clock the minutes must say 30. (You can explain that there are 60 minutes in one hour and so half of that is 30, but if you feel this is too much information at this point, leave it at just being 30). So when the clock says 7:30 it is half past 7. ‘What time is 11:30?’ Repeat with a couple more half past times.
Lesson 4 Pupil’s Book page 81

Preparation
You will need:
- Analogue clock
- Digital clock
- Card analogue clocks – one for each pupil (these will be made in the first lesson)
- Labels: o’clock, numerals 1–12
- Pupil’s Book

Starter activity
Make sure each pupil has their clock they made from the first lesson. Ask them to show you 5 o’clock. This time hold up the labels ‘7’ and ‘o’clock’ and ask pupils to read these labels together. Ask them to show you this time. Hold up the labels ‘half past’ and ‘2’. Ask them to show you this time. Repeat with different o’clock and half past times.

Lesson focus
Show the analogue clock showing 1 o’clock. Ask pupils what time they think it would be in an hour’s time. Move the hands on one hour and show them that it will be 2 o’clock. What time will it be one hour from now? (3 o’clock). Repeat until you reach 12 o’clock. Show the time 12 o’clock and ask: What time will it be one hour from now? Remind pupils that when we get to 12 we then look at the next number which is 1, so 1 o’clock. Repeat starting with half past 4 until half past 1. What time will it be one hour from now? Show times on a digital display showing 3:00 and 9:30. What time will it be one hour from now? Ask pupils to work in pairs and make up their own questions.

Answers

Class activity
Check on pupils’ questions and answers. Check that they understand how to tell time on analogue clocks.

Puzzle (page 80)
10.30 or half past ten.
Preparation

You will need:
• Analogue clock
• Digital clock
• Card analogue clocks – one for each pupil (these will be made in the first lesson)
• Labels: o’clock, numerals 1–12
• Pupil’s Book
• Workbook

Starter activity

Make sure each pupil has their clock they made from the first lesson. Hold up the labels ‘9’ and ‘o’clock’. Ask them to show you this time. Ask them to show you one hour on. Hold up the labels ‘half past’ and ‘2’. Ask them to show you this time. Ask them to show you one hour on. Hold up the labels ‘half past’ and ‘4’. Ask them to show you one hour on or one hour later. Repeat with different o’clock and half past times and ask for one hour on or one hour later.

Lesson focus

Use the following story problem: ‘I started walking to school at 7 o’clock and I arrived at 8 o’clock, how long did it take? Show the analogue clock at 7 o’clock and then move it on to 8 o’clock. It took one hour. Ask pupils to work out how long the next activity took. I started picking mangos at 2 o’clock and I finished at 4 o’clock. How long was I picking mangos for? (two hours) I started marking homework at half past 5 and I finished at half past 6. How long did it take to mark homework? (one hour) If pupils have difficulty in calculating the time duration, ask them to copy you and show them by physically moving the hands of their own clocks. ‘I went to bed at 9 o’clock and something woke me up at 12 o’clock. How long did I sleep?’ (three hours) ‘I then read from 12 o’clock until 2 o’clock. How long did I read for? (two hours)’ Which activity did I spend longer doing? (sleeping)’ Make up additional stories, some using half hour times, and when pupils are confident with the idea they can complete Exercise 2 (Pupil’s Book page 82). Note the digital clock has not been extended to the 24 hour clock.

Exercise 2

1. a) 4 o’clock
   b) 12 o’clock
   c) 8 o’clock
   d) 1 o’clock
   e) 10 o’clock

Worksheet 22

4. Pupils must draw the clocks with clock hands, check to make sure they have the big and small hands in the right places.

Assessment

Listen to pupils’ responses to class activities. Pupils should be able to calculate durations of time in whole units. Pupils should be able to extend to calculating durations of time in both whole and half hours. Pupils should be able to compare the time taken for two events, saying which is longer/shorter and solve simple problems involving time.

Extension activity

Ask the pupils: ‘I started cooking dinner at half past six and it was ready by seven o’clock. How long did it take me to cook dinner?’ (half an hour).

Homework activity

Worksheet 22, page 33. Question 4 (Question 3 is to be done in Lesson 6).
Lesson 6  Pupil’s Book page 82; Workbook page 33

Preparation
You will need:
• Analogue clock
• Digital clock
• Card analogue clocks – one for each pupil (these will be made in the first lesson)
• Labels: o’clock, numerals 1–12
• Pupil’s Book
• Workbook

Starter activity
Remind pupils of the previous lesson and make sure each pupil has their clock they made from the first lesson. Hold up the various labels and get pupils to tell you the time.

Lesson focus
This lesson reinforces previous work and also introduces parts of the hour – half an hour and quarter of an hour. Explain to pupils how the hour is broken up into minutes and how we use the big hand on the clock to show minutes. Explain how this is displayed on a digital clock. Make up some examples for pupils to work out, for example, ‘If it is three o’clock and my bus leaves at half past three, how many minutes must I wait?’

At the same time get pupils to show how this would be displayed on a clock face. Show pupils the examples on page 82 of the Pupil’s Book. Pupils then complete Exercise 3 (Pupil’s Book page 83).

Answers

Exercise 3
1. a) half past one
   b) half past six
   c) six o’clock
   d) half past five
2. Pupils to copy the clocks and draw in the hands correctly. (Check their books.)

3. a) six thirty or half past six
   b) eleven thirty or half past eleven
   c) one thirty or half past one
   d) seven thirty or half past seven.

Worksheet 22
3. a) 2.30 or half past two
   b) 7.30 or half past seven
   c) 12.30 or half past seven
   d) 8.30 or half past eight
   e) 5.30 or half past five

Assessment
Check for pupils who have not mastered the concept of minutes and who need extra practice.

Extension activity
Get pupils to set short time questions to ask each other.

Homework activity
Worksheet 22, page 33, Question 3.
Lesson 7
Revision: Term 1- Counting and writing up to 200

Preparation
You will need:
• A box of drinking straws (plenty) and elastic bands
• Small items for grouping in tens – buttons, beads, pebbles, sticks
• A 100 chart for the class
• A 100 chart (in Pupil’s Book)
• Set of numeral cards 10–99
• Set of overlapping digit cards
• Pupil’s Book

Starter activity
Draw a 4 × 4 grid on the board (or ask each pupil to draw a grid in their book) and ask pupils to choose a two-digit number to go in each square. From a bag of numeral cards draw out a two-digit number and read it as: ‘My number is ___ tens and ___ ones’. For example, if you draw 34 say: ‘My number is three tens and four ones.

Any pupil with number 34 on their board can cross it off. The first pupil to get a line – horizontal, vertical or diagonal – is the winner.

Lesson focus
Revise the work carried out in Units 1 and 2. Particularly focus on any student who had difficulty with the starter activity. These students require further practical work making bundles of 10 as they have not yet generalised the rule. The remainder of the pupils can practise the spelling of number words and draw a number chart for 100–200. Give pupils three-digit numbers and ask them to count forwards and backwards three numbers and name the new number. Make sure some examples go over the decade.

Answers
Class activity
Check pupils can create a number board for 100 to 200 and count forwards and backwards.

Assessment
Pupils should be able to read and write two- and three-digit numbers.

Extension activity
Pupils can share the written set of rules with a partner who uses the rules to colour the numbers on a 100 square. Are the rules correct, have they been followed correctly? If the correct letter or shape is identified then all is correct.

Homework activity
Using a 100 square that can be coloured, pupils write a set of rules for finding numbers. For example, if they want 34 to be coloured the rule is ‘My number has three tens and four ones’.

The numbers chosen should make up a capital letter of the alphabet or a shape on the 100 board when all the numbers with rules have been coloured.
Objectives
By the end of this unit, pupils will be able to:
• Know the days of the week and their order
• Relate events to days
• Solve simple problems involving days of the week.

Suggested resources
• Labels: Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday
• Wall calendars
• Table of days of the week

Key word definitions
There are no new key words.

Frequently asked questions
Q What prior knowledge do the pupils need?
A Pupils will need to understand ordering and be able to confidently use vocabulary such as first, last, next, before and after. They will need to know, read and order the days of the week. They should know when they were born and the dates of special events in their own lives and/or culture.

Common errors pupils make
Pupils may be exposed to dates written in the English form (date/month/year) or in the American form (month/date/year). If this should occur it is best to deal with it at the time rather than making a specific issue out of it as it will have little relevance out of context.

Evaluation guide
Assess whether pupils can:
• Know the days of the week and their order.
• Relate events to days.
• Solve simple problems involving days of the week.

Lesson 1
Preparation
You will need:
• Large labels of the days of the week
• Several sets of 12 small blank cards
• Pupil’s Book
• Workbook

Starter activity
Write the word ‘day’ on the chalkboard and ask pupils what they can tell you about days. Answers may include: the names of some or all the days; that there are seven days in a week.

Write numbers 1 to 7 down the left side of the chalkboard. Ask pupils to name the days of the week.

Lesson focus
Ask pupils which days of the week have special significance for them. Are there any activities that occur on specific days, for example going to mosque or to church? Some pupils may say that they go shopping with their mother on a specific day or that they have a specific meal on one certain day of the week.

Hold up cards with the days of the week written on them and make sure that pupils recognise the names of the days and can write them down.

Pupils complete Exercise 1, Questions 1 to 6 (Pupil’s Book page 85).
Answers

Exercise 1
1. Sunday
2. Fridays
3. Sundays
4. Friday
5. Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, Saturday
6. Monday

Worksheet 23
1. There are seven days in a week.
2. a) Sunday  
   b) Monday  
   c) Tuesday  
   d) Wednesday  
   e) Thursday  
   f) Friday  
   g) Saturday

Assessment
Listen to pupils as they complete the group tasks. Do they use the correct names for the days of the week? Can pupils give the correct answer when reciting the days, one after the other?

Extension activity
Get pupils to make a wall frieze showing the different activities that may happen on different days of the week.

Homework activity
Worksheet 23, page 34, Questions 1 and 2.

Lesson 2 Pupil’s Book page 84; Workbook page 34

Preparation
You will need:
- Large labels of the days of the week
- Several sets of 12 small blank cards
- Wall calendar showing months and days
- Pupil’s Book
- Workbook

Starter activity
Play a ‘Guessing’ game using the days of the week. Think of specific activities that happen on certain days of the week at school. Give the pupils clues and get them to guess the activity and the day of the week.

Lesson focus
This lesson consolidates work done in the previous lesson. Remind pupils of the days of the week and how they are written.

Pupils complete Exercise, Questions 7 to 13. (Pupil’s Book page 85).

Answers

Exercise 1
7. Friday
8. Monday
9. Five
10. Saturday and Sunday
11. Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, Saturday.
12. Saturday
13. Answers will vary

Worksheet 23
3. a) Sunday  
   b) Friday  
   c) Saturday  
   d) Monday to Friday
4. Tuesday
5. Monday
6. Thursday and Saturday
7. Saturday, Friday, Thursday, Wednesday, Tuesday, Monday, Sunday (go backwards from the first day of the week).
Lesson 3  
Revision: Term 1 – Place value units

**Preparation**

You will need:
- Bundles of ten items straws, sticks, etc.
- Bundles of 100 items
- Single items
- Pupil’s Book.

**Starter activity**

Select any starter activity from Units 3 or 4.

**Lesson focus**

Revise work from Lessons 3 and 4. Pupils should be able to draw a diagram to represent a number. Write a three-digit number on the board, for example 572, and underline the tens digit. Ask them ‘What is the value of this digit? (pointing to the 7). Pupils should respond with the answer ‘seven tens’, which is 70, or just ‘70’.

Repeat with other numbers and underline hundreds, or tens or ones. Repeat the exercises from Units 3 and 4 or make up new questions for pupils.

**Answers**

See Units 3 and 4.

**Assessment**

Check whether pupils have remembered the value of digits in three digit numbers. Give extra practice if needed.

**Extension activity**

Pupils can list in fives from 1 to 100.

**Homework activity**

Pupils to revise the number chart from 100–200 and list the tens (110, 120, etc).
Preparation
You will need:
- Labels: 1st–20th and first–twentieth on the back
- Either model or card pictures of a train engine and 20 carriages
- String of 20 coloured beads.

Starter activity
Ask ten pupils to come to the front of the class. Give out the labels ‘1st to 10th’ (not in order) to the pupils. Ask the class to help reorganise the line of pupils so that they are in order according to their position on their label. Encourage pupils to read the label first before positioning. When the task is complete, ask pupils to read along the line to check it is correct.

Repeat the task, but this time use the words ‘first to tenth’ rather than figures. Ask 11 pupils to come to the front and stand in a line facing the class. Hold up the position ‘10th’ and give it to the first pupil in the line. Ask pupils which position they think will come next after tenth. Hold up the label ‘11th’ and ask pupils to say the position. Then turn the label over to show ‘eleventh’ and ask pupils to read together the word on the label before giving it to the next person in the line. Which position will come next? Repeat until the last pupil in the line has received the ‘20th’ label. Ask pupils to read along the line from 10th to 20th, and then ask pupils in the line to turn over their labels so that the words are shown rather than the figures. Ask the class to read along the line again.

Lesson focus
Display or draw a train and 20 carriages on the chalk board. Write in figures underneath the corresponding carriages 2nd, 5th, 9th, 13th, 18th. Ask one pupil at a time to come and write a position underneath one of the carriages. Continue with different pupils until all the carriages have their position written underneath. Ask the class to check if the order is correct.

Write on the board the figures and words for pupils to copy into their books:
11th eleventh
12th twelfth
13th thirteenth
14th fourteenth, etc.

Show the class a string of coloured beads. Ask pupils which bead was the first to be threaded (the one by the knot of the string). ‘What colour is the 5th bead?’ ‘What colour is the 18th bead?’ ‘What position is the last bead?’ Ask pupils to draw a string of 20 beads in their books and colour the beads. Ask pupils to use their own string of beads they have drawn and copy and complete these sentences. Write the following sentences on the board:
1. The first bead is _______ (colour of bead on their picture)
2. The last bead is _______
3. The 11th bead is _______
4. The 19th bead is _______
5. The sixteenth bead is ________

Assessment
Observe pupils’ responses to the activities in both the starter activity and the main lesson focus. Are pupils responding with correct answers? Have they read and completed the sentences correctly? Pupils should be able to read, write and order numbers in figures and words to 20th/twentieth.

Extension activity
Make a class frieze of ordinal numbers. It could be a train to go round the wall. Ask a different pupil to make each of the carriages and write the position in both figures and words on the carriage.

Homework activity
Practise the spellings of eleventh to twentieth.
Objectives
By the end of this unit, pupils will be able to:
• Order objects according to their weight.

Suggested resources
• Stone, oranges, coconut
• Improvised scale, bathroom scale and seesaw
• Strings
• Lengths of sticks

Key word definitions
gram (g): a metric unit of weight.
1000 grams = 1 kilogram
kilogram (kg): the unit of mass and (weight) in the metric system

Frequently asked questions
Q What prior knowledge do the pupils need?
A Pupils need to be able to add together more than two numbers, and count in multiples of ten. They also need to know heavier, lighter and balanced.

Common errors pupils make
Pupils can make errors weighing objects on the balance scale. Remind pupils how to read the scale by seeing which side is higher. Remind pupils that when the scale is level or balanced, the objects weigh about the same.

Evaluation guide
Assess whether pupils can:
1. Order objects according to their weight.

Lesson 1  Pupil's Book page 86; Workbook page 35

Preparation
You will need:
• Hand balancing scales
• Collection of objects for weighing: fruit, duster, flowers, books, bottle tops, crayons, stones, pencils, erasers and a thin book
• Pupil's Book
• Workbook

Starter activity
Show the class the hand balance. Ask pupils to tell you what it is used for, ‘How do we use it?’ Lay the book on one end of the balance and a bottle top on the other. Ask ‘Why is this end up and this end down?’ Once pupils start talking about heavier and lighter ask them what it means when the beam is level (balanced). We know that the book is heavier than the bottle top, but how can we measure just how heavy it is? If pupils don’t make the suggestion, encourage them to think about using the bottle tops as a unit, for example you could ask them ‘How many bottle tops does the book weigh?’ and ‘How will we know how many bottle tops the book weighs?’ (the scales will be balanced). Demonstrate by asking a pupil to add more bottle tops until the scale is balanced. Encourage them to count each bottle top as it is placed on the beam.

Lesson focus
Show the class the hand balancing scales. Explain that these work in the same way as the beam balance. If an object is heavier then that side goes down and the lighter side goes up. When the two sides weigh the same, they are level or balanced.
Lay the book on the balancing scale and ask a pupil to estimate how many crayons the book weighs. Remind pupils that an estimate is a sensible guess. You may like them to give a reason for their estimate. Ask a pupil to measure how heavy the book is using crayons. Remember to count the crayons together as they are placed and to stop counting when the scales are balanced. Why are the number of crayons and the number of bottle tops different for the same book? (The crayons and the bottle tops weigh different amounts.) Look at the pictures and example on page 86 of the Pupil’s Book.

Pupils complete Exercise 1 (Pupil’s Book page 87). If you cannot get hold of all the objects portrayed in the exercise, you can substitute others, or get pupils to guess and estimate answers.

⭐️ Answers

Exercise 1

Answers may vary according to the weight of the objects chosen.
- tin of Milo
- rock
- pear
- coconut
- pineapple

Extension

Pineapple
Bag of rice
Bag of flour
Mango
Orange
Bread

Worksheet 24

1. Hand held balance, bathroom scales, seesaw scales.
2. Pupils must choose one to draw.

Assessment

Observe pupils during the class activities and listen to their responses – do they give good estimates? Pupils should be able to measure, compare, order and estimate the weight of objects using various scales and balances.

Extension activity

Ask pupils to order these items from lightest to heaviest:
- Mango weighs 3 bananas
- Pineapple weighs 10 bananas
- Orange weighs 2 bananas
- Bread weighs 1 banana
- Bag of rice weighs 8 bananas
- Bag of flour weighs 6 bananas.

Homework

Worksheet 24, page 35, Questions 1 and 2.
Lesson 2  Pupil’s Book page 88; Workbook page 35

**Preparation**
You will need:
- Bathroom scales
- Collection of objects for weighing: fruit, bags of food, bottles of water, pails
- Pupil’s Book
- Workbook

**Starter activity**
Explain to the class that mass is often measured in grams and kilograms. Ask four pupils to come to the front. Give each pupil a different weight – 100 g, 10 g, 1 kg, 1 g. Ask pupils to arrange themselves in order of the weights they’re holding from lightest to heaviest. When they are in order explain that a kilogram is actually 1 000 grams. Pass the weights around the class so that each pupil can feel how heavy each weight is.

**Lesson focus**
Explain to pulps how a bathroom scales works and demonstrate how to stand on the scales and weigh yourself. Go through Exercise 2 (Pupil’s Book page 88) together and ask pupils to copy down the list of items to be measured with a space for their estimate and then the measurement. Pass round the objects that are to be weighed and ask pupils to write down their estimates. Ask pupils to work in small groups to complete the task. Ensure they have access to all the equipment needed or that they take turns. Monitor that pupils use the scales correctly.

**Answers**

**Exercise 2**
Pupils should be able to complete this exercise by looking at the weights on the objects in the book, however, it is preferable to actually do the exercise using a scale.
1. a) boy in yellow  
   b) 25 kg  
   c) 1 kg  
   d) bottle of water

**Worksheet 24**
3. a) clay  
   b) books  
   c) bottle of Pepsi

**Assessment**
Observe pupils during the class activities and listen to their responses. Do they give good estimates? Pupils should be able to measure, compare, order and estimate the weight of objects.

**Extension activity**
Ask pupils to estimate how many crayons a stone, a pencil, an eraser and a book will weigh and then measure them. How good were their estimates?

**Homework activity**
Worksheet 24, page 35, Question 3. Pupils should be able to guess at ‘heavier than’ and ‘lighter than’.
Lesson 3  
*Pupil’s Book page 89; Workbook page 36*

**Preparation**

You will need:
- Access to a playground seesaw or make your own temporary one using a plank and box to balance it on
- 1 g, 10 g, 100 g weights (if weights are not available, make your own set using sand in small bags weighed out on scales)
- Collection of objects to weigh, such as bunch of bananas, pineapple, large book, bag of sand, a brick and a box of stones
- Pupil’s Book
- Workbook

**Starter activity**

Remind pupils that an estimate is a sensible guess and ask them to guess how much they weigh. Ask them to guess how much you weigh! Talk about comparisons of ‘heavier than’ and ‘lighter than’, guessing at different objects in the classroom. Talk to pupils about the seesaw and ask them to say why one side will go down while the other side goes up.

**Lesson focus**

Remind pupils that seesaw scales will only be balanced if both sides have the same amount of weight on them. Divide class into groups and let them see which pupils will balance if they are put on the scales in pairs. You can use objects instead of pupils. Whilst groups are working, take one group at a time to weigh each other on the bathroom scales. First explain to the group how to use the scales, that they measure in kilograms, and how to read the marks on the scales. Weigh each pupil and have a different pupil to read the scales each time. The emphasis is on the reading of the scales to the nearest kilogram rather than comparing pupils’ weight. Remind pupils that to be balanced a seesaw scale must have the same weight on either side.

They then complete Exercise 3 (Pupil’s Book page 90).

### Answers

**Exercise 3**

1. 20 (four bunches of five)
2. five
3. five mangoes = ten coconuts

**Extension**

1. 7 g
2. 30 g
3. 200 g
4. 4 kg
5. 12 kg

**Worksheet 24**

4. a) fruit  
   b) television  
   c) pig  
   d) book

**Assessment**

Pupils should be able to weigh people and objects to the nearest kilogram and solve simple problems involving weight.

**Extension activity**

Add together these weights:

1. 1 g + 1 g + 5 g =
2. 10 g + 10 g + 10 g =
3. 100 g + 100 g =
4. 2 kg + 2 kg =
5. 1 kg + 1 kg + 5 kg + 5 kg =

**Homework activity**

Worksheet 24, page 36, Question 4.
Lesson 4  Pupil's Book page 91

Preparation
You will need:
• Balancing scales
• Collection of objects to measure
• Pupil’s Book

Starter activity
Remind pupils of how a balancing scale works. Get different pupils to come to the front of the class and make the scales balance, using different objects. You can also ask them to make one side of the scale heavier or lighter than the other side.

Lesson focus
Pupils complete Exercise 4 (Pupil’s Book page 91).

Answers

Exercise 4
1. a) car
   b) books
   c) man in yellow
   d) pile of dirt/rock
   e) desk

Extension
They weigh the same.

Puzzle (page 91)
Sand.

Assessment
Listen to pupils’ responses during the starter activity. Pupils should be able to measure, compare, order and estimate the weight of objects using standard units.

Lesson 5  Pupil’s Book page 88

Preparation
You will need:
• 1 g weight
• 1 kg bag of sand
• A selection of shopping items with weights marked on them
• Pupil’s Book

Starter activity
Draw on the board a set of scales balanced weighing a box with 1 kg, 2 kg, and 1 kg on the other side. Ask pupils how many kilograms the box weighs. Ask a pupil to come to the front. Give the pupil a 1 g weight in one hand and a 1 kg bag of sand in the other. Ask the pupil to say which weight is 1 kg and which is 1 g. Ask the class what kinds of objects could be measured in kg (piles of school books, pupils) and which can only be measured in grams (pencil, eraser).

Lesson focus
Remind pupils of the exercise on page 88. Explain that we use grams and kilograms to measure and record weight. Ask pupils if they can remember what their weight was, from when they weighed themselves. Put pupils into groups and give each group a selection of shopping items. Each group must record the weights written on the different items. Swap groups around so that each group records each selection of items.

Answers

Class activity
Check that groups have correctly recorded the weights of the different shopping items.

Assessment
Pupils should be able to identify and differentiate between grams and kilograms and record them accurately.
Extension activity
Collect together different types of packaging that has the weight in either grams or kilograms. Pupils must put the collection in order from lightest to heaviest.

Homework
Ask pupils to record the weights on several different items at home.

Lesson 6  Pupil’s Book page 91

Preparation
You will need:
• 1 g weight
• 1 kg bag of sand
• Satchel with a book inside
• Labels: more than 1 kg, less than 1 kg, about 1 kg
• Pupil’s Book

Starter activity
Display a pencil, a satchel with a book inside and a chair in front of the class. Ask one pupil to come to the front and hold the 1 kg bag of sand. Ask the pupil to decide which of the three objects feels less than 1 kg, more than 1 kg or about 1 kg. Give the pupil the labels and ask him or her to place them by the object the pupil thinks corresponds. Ask the class if they agree. Ask for more objects that are less than 1 kg, more than 1 kg or about 1 kg.

Lesson focus
This lesson focuses on making pupils aware of estimates of weight and on getting an understanding of about how heavy a kilogram is. Let pupils make up short ‘Guess the weight’ quizzes for each other. They can do this in pairs or groups and then hold a competition to see which group makes the most correct guesses.

Answers
Check that pupils’ answers to ‘Guess the weight’ are realistic. If pupils find it difficult to understand kilograms and grams then allow time for more play-type practice.

Assessment
Pupils should be able to sort objects according to whether they are heavier than, lighter than or weigh about the same as 1 kg.
**Extension activity**
Get pupils to experiment with their own weights by using a bathroom scale or seesaw on the playground to see who weighs more.

**Homework**
Ask pupils to find items that both weigh a kilogram and record the names of the items. They must also record if both items are the same size or if one is bigger than the other.

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**Lesson 7 Revision: Term 1 – Fractions units**

**Preparation**
You will need:
- Selection of objects that can be cut, such as fruit and vegetables, circles of paper
- Pupil’s Book

**Starter activity**
Draw a number line on the board labelled 0–4 and ask pupils to mark the position of $\frac{1}{2}$, $\frac{2}{2}$, $\frac{3}{2}$, $\frac{4}{2}$, etc.

**Lesson focus**
Pupils need to extend their knowledge of the existence of numbers between whole numbers to include the position of quarters. Ask pupils ‘We know where $\frac{1}{2}$ lives on the number line, where do you think $\frac{1}{4}$ would live on a number line?’ Invite a number of responses and ask the pupils to justify their answers. They might make reference back to folding into half and half again to find a quarter to justify a position half way between 0 and $\frac{1}{2}$. They may make reference to $\frac{2}{4}$ being the same as $\frac{1}{2}$, so $\frac{1}{4}$ is half way between 0 and $\frac{1}{2}$. Repeat finding the position of $\frac{2}{4}$, $\frac{3}{4}$, $\frac{4}{4}$, $\frac{5}{4}$, etc. Each time ask pupils to justify their reasoning.

**Assessment**
Listen to the pupils’ justifications for the position of the number of quarters on the number line. Pupils should be able to find the position of $\frac{1}{4}$ on a number line. Pupils should understand that numbers exist between whole numbers.

**Extension activity**
Pupils may try the same activity using a number line for 8.
Objectives
By the end of this unit, pupils will be able to:
• Identify and name objects that could be used for measuring capacity, for example, for example, cups, empty containers and buckets
• Order containers based on their capacity.

Suggested resources
• Spoons, cups, jugs and buckets
• Empty containers
• Tins, etc.
• Water, to fill containers

Key word definitions
litre: a metric unit of volume
total: the end result of either the sum, product, or difference

Frequently asked questions
Q What prior knowledge do the pupils need?
A Pupils need to understand that we can measure how much a container can hold. They will also need to be able to complete simple addition and subtraction problems.

Common errors pupils make
Some pupils may have difficulty in understanding how much a litre is. Fill a litre container and ask those pupils to physically pour the contents into a variety of containers. Allowing them to physically compare directly will help their understanding.

Evaluation guide
Assess whether pupils can:
1. Identify and name objects that could be used for measuring capacity, for example, cups, empty containers and buckets.
2. Order containers based on their capacity.

Lesson 1  Pupil’s Book page 92; Workbook 37

Preparation
You will need:
• Spoons, cups, jugs and buckets
• Litre bottles
• Variety of containers
• Water, soil or sand to fill containers
• Pupil’s Book
• Workbook

Starter activity
Remind pupils that when we talk about capacity we look at how much a container can hold. Put a jug, a cup, a bucket and a bottle on a table at the front. Hold up two of the containers. ‘Which do you think holds more?’ Place them on the table and repeat with two different containers.

Lesson focus
Ask pupils what we could use to measure capacity so that we know exactly how much, rather than just more or less than (spoons, cups, jugs, buckets and bottles). Hold up the jug. ‘What do you think would be best to use to measure the capacity of the jug?’ Hold up a spoon, a cup and a bucket. Listen to pupils’ reasons for their choices. A good response
would be – ‘The cup, as the bucket is too big and the spoon is small and so it would take a long time to fill the jug.’ When the cup has been chosen ask pupils to estimate how many cupfuls will fill the jug. Measure the capacity of the jug with cups and see whose estimate was closest. Repeat with other containers.

Pupils complete Exercise 1 (Pupil’s Book page 93).

**Answers**

**Exercise 1**
Give pupils a variety of different containers so that they can make decisions. For example, it would be illogical to fill a cup using a five-litre container to measure.

**Worksheet 25**
1. Measuring jug, teaspoon, bucket, litre water container, cup (any suitable answer).

**Assessment**
Listen to pupils’ responses throughout the class activities and find out how much they understand about capacity from Grade 1. Pupils should be able to measure, compare, order and estimate the capacity of containers using non-standard units (spoons, cups, buckets).

**Extension activity**
Suggest pupils play with different sized containers with sand, soil or water.

**Homework**
Worksheet 25, page 37, Question 1.
Lesson 3  Pupil’s Book page 94

Preparation
You will need:
• Litre bottles
• Variety of containers including a litre jug
• Medium sized bowl
• Large spoon
• Water, soil or sand to fill containers
• Labels: more than a litre, less than a litre, about a litre
• Pupil’s Book

Starter activity
Hold up a medium-sized bowl and a large spoon. ‘How many spoons full do you estimate will fill this bowl?’ Write down some of the pupils’ estimates. Find a small container at school and/or home and estimate how many spoons full will fill the container. Use a spoon to measure the capacity of the container. How close were their estimates?

Lesson focus
Hold up a full litre bottle. Explain that this bottle holds a litre. A litre is a standard measurement for capacity. (If you need to expand on standard measurements refer back to length and mass [kg] from previous units and explain that standard measurements are the same amount wherever you are.) Put a cup, a litre jug and a bucket on a table at the front of the class. Hold up the labels – ‘more than a litre’, ‘less than a litre’ and ‘about a litre’ – and read them together. Hold up the cup. ‘Do you think this cup holds more than a litre, less than a litre or about a litre?’ Listen to pupils’ responses. Pour the contents of the litre bottle into the cup until it is full. Ask if the cup holds more or less than one litre. Ask a pupil to choose the ‘less than 1 litre’ label and place it in front of the cup. Repeat the activity with both the jug and the bucket, placing the correct labels next to each container.

Ask pupils to complete Exercise 3 (Pupil’s Book page 94). Give pupils actual containers for this exercise and work through the exercise with them.
Lesson 4  Pupil’s Book page 95; Workbook page 38

Preparation
You will need:
• Litre bottles and two-litre bottles
• Variety of containers including a litre jug
• Medium-sized bowl
• Large spoon
• Water, soil or sand to fill containers
• Labels: more than a litre, less than a litre, about a litre
• Pupil’s Book
• Workbook

Starter activity
Hold up the two-litre bottle and the one-litre bottle. Ask pupils how many litres they estimate the large bottle to hold. Ask a pupil to use the litre bottle to measure the larger bottle. Were their estimates good?

Lesson focus
Ask pupils to work in small groups to complete Exercise 4 (Pupil’s Book page 95) as you visit each group.

Answers
Exercise 4
thimble, cup, tin, bowl, 1 litre, 2 litre, 5 litre, 10 litre

Extension
3. Answers will vary. Depends on the size of the cups.

Worksheet 25
6. Pupils should have four suitable drawings of measuring implements.
Lesson 5  
*Pupil’s Book page 95; Workbook page 38*

**Assessment**
Observe pupils and listen to their comments as they carry out Exercise 4. Are they able to measure accurately? Pupils should be able to compare estimates to actual measurements.

Pupils should be able to measure and record capacity in litres to the nearest litre. Pupils should be able to calculate totals and differences for capacities given in whole litres. Pupils should be able to solve simple problems involving capacity.

**Extension activity**
Worksheet 25, page 38, Question 3.

**Homework**
Worksheet 25, page 38, Question 6.

**Preparation**
You will need:
- Various containers of different shapes and sizes
- Measuring jug showing decilitres and millilitres
- Graduated cylinder
- Pupil’s Book
- Workbook

**Starter activity**
Show the measuring jug to pupils and explain how we may need to measure in smaller amounts than litres. Describe the smaller units of capacity – decilitres and millilitres.

**Lesson focus**
This lesson consolidates the work completed so far on capacity. Give pupils various containers and ask questions about which one holds most. Let them experiment and find out for themselves by filling the containers from a measuring jug and keeping a record of results. Give pupils various problems of capacity to think about, such as, why is it important to be able to measure petrol or kerosene? What would happen if we were making a cake and did not know exactly how much milk to add? Set up a station where pupils in groups can measure four litres of water with a graduated cylinder. Check on their progress to establish who has successfully completed the task.

Pupils complete Worksheet 25, page 38, Questions 4 and 5, giving the pupils containers to help them.

**Answers**

**Class activity**
Answers will depend on the size of containers the pupils are given.

**Worksheet 25**
4. Answers will vary according to size.
5. Answers will vary according to size.

**Extension**
The answer will depend on the size of the cup used (eight to ten).
Assessment
Pupils should be able to calculate totals and differences for capacities given in whole litres. Pupils should be able to solve simple problems involving capacity.

Extension activity
How many teaspoons of liquid are needed to fill a teacup?

Homework
Find out how many cups can be filled from your kettle at home.

Lesson 6  Revision: Term 1 – Adding and subtracting

Preparation
You will need:
- Blank number lines
- Pupil’s Book

Starter activity
Play ‘Target 80’ from Term 1.

Lesson focus
Being able to use and apply addition and subtraction to a problem is the whole reason why pupils need to be able to add and subtract. Use the word problems in Exercise 9 of ‘Solving story problems and number squares’ (Pupil’s Book page 47) to discuss how you could go about solving the problem. Comprehension of the written word is important. Pupils need to unpack the problem to find out what it is actually asking. The tendency is for pupils to read only the numbers and guess what they have to do with the numbers rather than understand the context in which the numbers are presented.

Problem solving will always involve words so poor reading will be a barrier, however supported reading allows pupils to learn how to problem solve rather than avoid it. Straightforward ‘find the totals’ are fairly obviously solved by addition, ‘How many left?’ type problems are fairly obviously solved by subtraction. However, problems that involve ‘How many more?’ can be solved by addition or subtraction. Discussion should allow for a variety of methods to be used. All methods are valid providing they are efficient. Counting should no longer be seen as an efficient method. Create some story problems for pupils to work through.

Answers

Class activity
The answers depend on the problems given.
Assessment
Listen to pupils’ questions and responses during class discussion. Can pupils identify the mathematics required to solve a problem and are they able to explain a mental method of solving addition and subtraction problems? Pupils should be able to use addition and subtraction to solve word problems.

Extension activity
Ask pupils to write a story problem that can be solved by addition and one that can be solved by subtraction. Ask them to write a story problem that could be solved by either addition or subtraction.

Homework
Create extra problems for pupils still needing more practice.
Objectives
By the end of this unit, pupils will be able to:
• Compare areas of surfaces
• Identify the use of standard measuring units.

Suggested resources
You will need:
• Plane shapes (squares and rectangles etc.)
• Cut outs of squares, rectangles and triangles
• Ruler
• Pencils
• Circular tins, coins, etc.

Key word definitions
symmetry: when things are the same or equal on all sides
plane shapes: two-dimensional shapes with breadth and width but no thickness
trapezium: a four-sided figure with no parallel sides
surface area: the total area of the surface of a three dimensional object
radius: the length of the line from the centre of a circle to any point on its edge
square: a regular quadrilateral, which means that it has four equal sides and four equal angles
rectangle: a four-sided flat shape with straight sides where all interior angles are right angles (90°) and opposite sides are parallel and of equal length

Frequently asked questions
Q What prior knowledge do the pupils need?
A Pupils will need to know the names of 2-D shapes (square, rectangle, triangle, circle) and some describing words, such as, edges, corners, curve and straight.

Common errors pupils make
• Rectangles and triangles can sometimes be confused. If you think this is the case, question pupils’ answers.
• Some pupils have difficulty recognising horizontal and diagonal lines of symmetry. Ask pupils to turn the shape round to help them. Pupils can look at pictures, objects and shapes from a different perspective. Question any incorrect answer to find the cause of the errors.

Evaluation guide
Assess whether pupils can:
1. Compare areas of surfaces.
2. Identify the use of standard measuring units.

Lesson 1 Pupil’s Book page 97
Preparation
You will need:
• Shapes: square, rectangle, triangle, circle
• Labels: square, rectangle, triangle, circle
• ‘Feely’ bag
• Pupil’s Book

Starter activity
Hold the shape name labels up one at a time for the class to read and then attach them to the board. Place a shape in the ‘feely’ bag. Ask one pupil to come to the front and put his or her hand into the bag and feel the shape.

Ask the pupil to describe the shape just by feeling it not looking at it. ‘Which shape do you think it is?’ Pull the shape out of the bag. Were they correct? Ask the pupil to place that shape by the correct label on the table. Repeat with different shapes and then objects, such as a ruler, coin and envelope. Can pupils find the shapes in a picture that you hold up?
Lesson focus
Hold up a circle. Ask a pupil to come and draw a circle on the board. Does a circle have straight sides? Does a circle have corners? Does a circle have a curved side? Hold up a square. Ask another pupil to come and draw a square on the board. Does a square have a curved side? How many straight sides does a square have? How many corners? Repeat with triangle and rectangle. Ask pupils to point out all the different shapes that they can see in the classroom and then complete Exercise 1 (Pupil’s Book page 97).

Answers
Exercise 1
Pupils will probably give various answers. Go through each set of pictures and explain the answers to them explaining your reasoning.

Assessment
Listen to pupils’ responses during the starter activity. What knowledge of 2-D shapes do they have? Pupils should be able to identify, name and draw a circle, square, rectangle and triangle. Pupils should be able to count and describe sides and count corners on 2-D shapes.

Extension activity
Give each pupil a paper or card square (approximately 10 cm × 10 cm). Ask pupils to cut the squares into three of four pieces and then pass to the person next to them. They must then put the pieces back together to form the square again. Make shape puzzles from different shapes.

Homework
Ask pupils to draw a square, a rectangle, a triangle and a circle in their exercise books.

Lesson 2  Pupil’s Book page 98; Workbook page 39

Preparation
You will need:
- Shapes: square, rectangle, triangle, circle
- Labels: square, rectangle, triangle, circle
- Rulers or tape measures
- Pupil’s Book
- Workbook

Starter activity
Play the ‘Feely bag’ game from the previous lesson. Recap the properties of 2-D shapes with quick-fire questions such as: ‘How many sides does a rectangle have?’ ‘How many sides does a circle have?’ ‘How many corners does a triangle have?’

Lesson focus
This lesson teaches pupils how to measure plane shapes and identify ‘bigger than’ and ‘smaller than’. Demonstrate how to use a ruler to measure the sides of a rectangle, and write down the measurements. Give pupils shapes to measure. They can work in pairs or groups. Pupils must draw the shapes and write the correct measurements along the sides measured.

Pupils can use their exercise books to draw out the different shapes and measure them. Some pupils may need help with drawing the shapes. Explain how to draw a circle when the radius is given. This may be difficult for some pupils. Make sure pupils can identify the length and width of a shape.

Answers
Worksheet 26
1. Answers will vary. Examples are sheet of paper, flag, mat, book and wheel of car.

Assessment
Pupils should be able to identify, name, draw and measure shapes of a circle, square, rectangle and triangle. Pupils should be able to count and describe sides and count corners on 2-D shapes.
Extension activity
Use a variety of 2-D shapes to make a picture. How many of each shape was used?

Homework
Worksheet 26, page 39, Question 1.

Lesson 3  Pupil's Book page 98; Wook Book page 39

Preparation
You will need:
• Shapes: square, rectangle, triangle, circle
• Labels: square, rectangle, triangle, circle
• Rulers or tape measures
• Pupil's Book
• Workbook

Starter activity
Make pictures using plane shapes. Divide the pupils into groups and give each group a variety of plane shapes. Let them put the plane shapes together in a variety of ways and see how many pictures they can make, for example, by using rectangles and a circle for a man.

Lesson focus
This lesson continues from the last one and gives pupils more practice in accurately measuring and drawing shapes. Pupils need time to consolidate the required skills.

Check on their work regularly so that you can make a note of any who struggle with this. Some pupils may not have acquired the necessary motors skills yet and may need help in learning how to hold a pencil properly and measure accurately.

Pupils complete Question 2 of Worksheet 26 (Workbook page 39).

Answers

Class activity
Pupils must draw the correct plane shape. Check their work whilst it is being completed and make sure they know how to measure correctly. The circle may cause problems and you could demonstrate how to measure the radius and use a drawing pin and length of string to draw the circle accurately.

Worksheet 26
2. Pupils must draw shapes using the correct measurements.
Lesson 4  

Preparation

You will need:
- Shapes: square, rectangle, triangle, circle
- Labels: square, rectangle, triangle, circle
- Rulers or tape measures
- Pupil’s Book
- Workbook

Starter activity

Review the worksheet that was completed in the previous lesson and check that all pupils finished it for homework. Ask pupils to look at rectangles number a) and b) that they drew and tell you which was biggest. Write the measurements of several other rectangles on the board and ask pupils if they can guess which is biggest just by reading the measurements.

Lesson focus

This lesson teaches pupils how to work out the surface area of simple plane shapes. Remind pupils of the earlier lessons on multiplication. Draw a rectangle on the board and write in the measurements of the sides alongside. Explain to pupils that if we multiply the two measurements together we can find out the surface area. Draw two similar rectangles on the board and ask pupils to guess which is larger/smaller. When they have finished guessing write some measurements alongside the two rectangles. Ask them to check by multiplying the two numbers for each rectangle and then comparing the surface areas. Pupils should be able to answer just by looking at the two sets of measurements.

Pupils complete Exercise 2 (Pupil’s Book page 98).

Answers

Exercise 2
a) 3 × 4 cm  
b) 2 × 2 cm  
c) 3 cm radius  
d) 3 cm, 4 cm, 5 cm.
Challenge (page 100)
16 unit squares, 9 unit squares, 4 unit squares.

Worksheet 26
3. a) A is largest and C is smallest.
   b) C is largest and B is smallest.

Assessment
Pupils should be able to look at two sets of measurements such as 4 × 5 and 4 × 3 and know instinctively that 4 × 5 will give a larger surface area. Pupils who have difficulty with this should be given extra shapes to measure and compare.

Extension activity
Pupils complete the Challenge on page 100 of the Pupil’s Book.

Homework activity
Worksheet 26, page 40, Questions 3a) and b).

Lesson 5  Pupil’s Book page 92; Workbook page 40

Preparation
You will need:
- Shapes: square, rectangle, triangle, circle
- Labels: square, rectangle, triangle, circle
- Rulers or tape measures
- Pupil’s Book
- Workbook

Starter activity
Ask pupils to line themselves up from smallest to biggest. When they have done this, choose pupils from either sides of the line and ask the class ‘Who is biggest and who is smallest.’ Extend the activity to comparing different objects such as books and ask pupils to say which is biggest or smallest.

Lesson focus
In this lesson pupils learn to compare size and describe which is biggest or smallest of different shaped objects. Pupils should be able to grade objects according to size.

Hold up three or four different sized rectangular shapes and ask pupils to put them in order from smallest to largest. You can also draw different sized triangles or circles on the board and ask pupils to order them. Explain to pupils that we often need to grade or size similar objects, for example, shoes have different sizes on them so that we can easily find the ones that will fit our feet.

Pupils complete Exercise 3 (Pupil’s Book page 98).

Answers

Exercise 3
1. a) hippo
   b) laptop
   c) dog on the right
   d) green circle
2. a) A, C, B
   b) B, C, A
   c) C, A, B
Worksheet 26

3. c) A is largest and B is smallest.
   d) B is largest and C is smallest.
   e) A is largest and C is smallest.

Assessment
Check for any pupils who do not have an understanding of size. Give practice in grading objects by size if needed and also in sorting different sets of numbers by size.

Extension activity
Ask pupils to find out how eggs are graded according to size.

Homework activity
Worksheet 26, page 40, Questions 3c) to e).

Lesson 6  Revision Term 2 – Addition and subtraction

Preparation
You will need:
• Number line
• Pupil’s Book

Starter activity
Play ‘Number squeeze’. Choose a mystery number on the number line. Pupils must ask questions such as ‘Is it more than or is it less than?’ Use a marker starting at each end of the line, which you move to show which numbers the question asked has eliminated. For example, if the mystery number was 65 and the pupil asked if the number was more than 70, then the answer is No and all numbers greater than 70 are eliminated by moving the marker from 100 down to 70. Pupils keep asking questions and the markers are moved to squeeze the mystery number.

Lesson focus
Pupils should be taught to check the reasonableness of their answers. They should ask if the answer to an equation is about what you should expect. Show the pupils how to round to the nearest decade, up or down, and add the decade numbers to get an approximate answer. For example: Write on the board 48 + 23 =. Ask ‘What is the closest decade number to 48?’ Pupils should be able to tell you 50. ‘What is the closest decade number to 23?’ Pupils should be able to tell you 20. Write 50 + 20 =, the pupils should be able to see straight away the answer is 70. So 70 is an approximate answer to the equation. Ask the pupils to find the actual answer, which is 71. An approximate answer should be the closest decade number to the actual answer.

Discuss which way you round when a number ends in 5. The convention is to round up to the next decade. Look at how number patterns can help you check the reasonableness of your answer. For example; Write on the board 68 + 24. Direct the pupils to look at just the ones digits. What do they total? They total 12, the ones digit is a 2 so the answer must end in a 2. Use estimation of rounding and number patterning to guess which
two numbers could total 41. Ask ‘What must the ones digits total to end up with the one in forty-one?’ The ones digits must total either 1 or 11. ‘Which pairs of single digits total either 1 or 11?’ It could be 8 and 3 or 4 and 7. ‘What is the decade number closest to 41?’ Answer 40. ‘Which two numbers when rounded and added together make the decade number closest to 40?’ Answer 18 and 23 because they would be 20 + 20 and 3 + 8 = 11.

Create some addition and subtraction questions with exchanging and remaining for pupils

🔍 Answers

Class activity
Check the answers that pupils give.

Assessment
Observe and listen to pupils’ responses during teaching. Are pupils able to round to the nearest decade? Can pupils recognise and use addition and subtraction patterns?

Extension activity
Give the pupils four two-digit numbers and ask them to find how many different totals they could find using just two numbers at a time.
Objectives
By the end of this unit, pupils will be able to:
• Identify and count the flat faces of a cube and a cuboid
• Identify and count the corners of a cube and cuboid
• Identify and count the edges of a cube and cuboid
• Identify objects at home that are cubes and cuboids.

Suggested resources
• Boxes, tins, balls, paper cuttings
• Drawings of cubes and cuboids, etc.
• Balls, milk tin, paper cuttings and drawings, etc.

Key word definitions
triangular prism: a triangular prism is a three-sided prism with a triangular base
cube: a three-dimensional figure which is box shaped and has six square faces which meet each other at right angles
cuboid: a box-shaped object. It has six flat sides and all angles are right-angles
rectangular prism: a solid (three-dimensional) object with six faces which are rectangles
solid: three-dimensional object with width, depth and height
three-dimensional (3-D): an object that has height, width and depth, like any object in the real world.
edge: a line segment that joins two faces or surfaces
face: an individual surface
corner: a point where two lines meet or intersect

Frequently asked questions
Q What prior knowledge do the pupils need?
A Pupils will need to know the 2-D shapes – circle, square, rectangle, and triangle. They will also need to know and understand corners, faces, curved and straight edges.

Q Are a cuboid and a rectangular prism the same?
A A cuboid is another name for a rectangular prism. A cube is a special rectangular prism, but this fact can confuse pupils at this stage – just highlight the similarities between the two.

Q Does a sphere have any faces?
A The term ‘face’ is used to describe only flat faces on 3-D shapes.

Common errors pupils make
• Pupils can miscount the number of faces on a solid shape, forgetting which faces they have already counted. Try using tape or a pencil to mark the faces.
• Pupils can sometimes have difficulty in saying which objects have the same shape. Allow pupils to compare with real objects.
• Pupils can sometimes confuse rectangle and triangle. If they give the incorrect shape, ask them how many sides on the shape they mean.
• Some pupils may think the point of a cone is a corner. Explain that a corner is where two or more edges meet and as there are no edges meeting it is a point rather than a corner.
• Recognising 3-D shapes and counting corners and faces from two-dimensional pictures can be difficult for many pupils. Wherever possible use models of three-dimensional shapes for pupils to count faces, edges and corners.

Evaluation guide
Assess whether pupils can:
• Identify and count the flat faces of a cube and a cuboid.
• Identify and count the corners of a cube and cuboid.
• Identify and count the edges of a cube and cuboid.
• Identify objects at home that are cubes and cuboids.

Lesson 1 Pupil’s Book page 102; Workbook page 43

Preparation

You will need:
• Collection of objects of different sizes of the following shapes – sphere, cube, cuboid (rectangular prism), cylinder, cone and triangular prism
• Labels: sphere, cube, cuboid, cylinder, cone and triangular prism
• Pupil’s Book
• Workbook

Starter activity

Review the solid shapes learnt in Grade 1. Hold up each of the shapes – cube, cuboid, sphere and cylinder. Ask pupils to name these shapes in turn and to find the appropriate labels. Ask pupils to sort the objects according to their shape.

Review the properties of the shapes asking ‘Which shapes have no corners?’ ‘Which shapes have straight edges?’ How many corners does a cube have?’ Check pupils’ answers by holding up the objects and counting corners, etc.

‘Can anyone remember the other name for a cuboid?’ – rectangular prism.

Gather the labels and mix them up. Hold up one label at a time and ask pupils to read the label and place it next to the correct shape.

Lesson focus

Hold up a cone shape. Ask pupils to describe the shape. Ask them if it has corners and/or straight edges. Ask them what the shape has. Encourage the vocabulary: curved, point, circle. Ask if anyone knows the name of this shape or if they had seen the shape before. Hold up the label ‘cone’ and ask pupils to read it together. Ask a pupil to come and hold a cone and its label at the front for everyone to see. Hold up a triangular prism. Again ask pupils to describe the shape. Encourage the vocabulary: straight edges, corners, rectangle and triangle. Ask pupils how the shape is similar or different to the cone. Hold up the label ‘triangular prism’. Ask pupils to read together the label. Ask pupils to look closely at the two new shapes and their labels.

Lay a collection of objects on a table in the front of the class and ask a pupil to come to the front and find a cone from the collection. Ask another to find a triangular prism. Repeat until all the cones and triangular prisms have been identified from the collection. Examine the pictures of shapes on pages 102 and 103 of the Pupil’s Book and hold up examples of the pictures. Point out the edges, faces and corners of each shape.

Pupils then complete Exercise 1 (Pupil’s Book page 104). They can work on the activity as a group or in pairs.

Answers

Exercise 1
1. 6
3. 8
4. 12

Worksheet 28
1. Sphere and cylinder. Pupils should give at least two examples each of items shaped as a sphere and cylinders at home.

Assessment

Listen to and record pupils’ responses from the lesson. How much knowledge have they remembered from Unit 27? Make sure that pupils can identify the edges, faces and corners of each shape. Pupils may confuse edges and corners. Make sure pupils can identify the differences between curved objects and straight-sided objects.
Extension activity
Provide a large collection of solid shapes, from packages to blocks. Allow pupils to build towers and walls with these shapes. Ask them which shapes are best for building, for example, walls, towers and roofs. Through being allowed to build with the shapes, pupils are physically able to see and experiment with the properties of each shape.

Ask pupils to look for sphere and cylinder shapes in and out of school and write where they found them.

Homework
Worksheet 28, page 43, Question 1.

Lesson 2  Pupil’s Book page 109; Workbook page 41

Preparation
You will need:
• Collection of objects shaped as cubes and cuboids
• Labels: cube, cuboid
• Paper and scissors
• Model of the net of a cuboid
• Templates of the net of a cuboid for pupils to copy or draw around
• Pupil’s Book
• Workbook

Starter activity
Recap the two shapes learnt in the last lesson – cube and cuboid. Ask pupils to name some objects in the classroom that have these shapes.

Lesson focus
Ask pupils if they have any idea how they could make a cube from a single piece of paper. Show them the picture of a net of a cube on page 106 of the Pupil’s Book and hold up your own model. Explain to pupils that a flat template that can be folded into a shape is called a net. Demonstrate what the net looks like flat and then demonstrate how it folds into a cube. Give pupils templates that they can make up for themselves and draw around to make more nets and cubes.

This will be a noisy lesson because pupils will get excited about making their own nets. Make sure pupils use the scissors in a safe and correct manner. Use the lesson as an opportunity to encourage proper cleaning up of the classroom when it is over.

At the end pupils complete Exercise 2 (Pupil’s Book page 106).

Answers
Exercise 2
Go through the answers with pupils. They should give answers such as books, microwaves, TV sets and wardrobes.
Lesson 3  Pupils Book page 106; Workbook page 42

Preparation
You will need:
- Labels: cube, cuboid,
- Labels: face, edge, corner;
- Collection of objects of different sizes of the following shapes – cube, cuboid
- Pupil’s Book
- Workbook

Starter activity
Hold up a cube and ask the pupils to describe the shape, using their own language. Hold up the flat net from the last lesson and remind pupils of how it folds into a cube.

Lesson focus
Use the language the pupils used to describe the cube and cuboid and translate into the correct mathematical language of faces, edges and corners.

Hold up a cube and ask pupils if they know what a face is. Hold up the label face (flat surface on a solid shape). Look together at the cube and count the faces together (6). Explain that when two surfaces join they create an edge. Hold up the label edge. How many edges does this shape have? Count together the edges on the cube (12). Explain that where the edges come together they create a corner. Hold up the label corner. How many corners does this shape have? Count together the corners on the cube (8).

Divide the class into small groups. Give cubes and cuboids to each group and ask them to describe their shape stating the number of faces, edges and corners their shape has.

Answers

Class activity
This is a practical lesson. Monitor pupil’s work by walking around the classroom and by listening. Give support where needed.
**Worksheet 27**

6. Check that the drawings show cuboid shapes.
7. Check that the drawings show cube shapes.

**Assessment**

Listen to pupils’ responses during class tasks and particular during the small group activity. Are pupils able to accurately count the number of faces, edges and corners? Pupils should be able to identify, count and describe faces, edges and corners of 3-D shapes.

**Extension activity**

Ask pupils to sort shapes into as many different groups as possible, for example, type of shape, straight or curved edge, with or without corners, six or more faces.

Ask pupils to work out how many faces, edges and corners a cuboid has. (6, 12, 8).

**Homework**

Worksheet 27, page 41, Questions 6 and 7.

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**Lesson 4**  
*Pupil’s Book page 106; Workbook page 42*

**Preparation**

You will need:
- Variety of boxes, cones and cylinders in net and solid form
- Tape or glue
- Card and scissors
- Pupil’s Book
- Workbook

**Starter activity**

Deliver a quick question and answer session on 3-D shapes with questions such as: ‘How many corners does a triangular prism have?’ ‘How many faces are on a cube?’ ‘Which shapes have curved edges?’ Hold up a sphere. ‘What is the name of this shape?’ etc.

**Lesson focus**

This lesson links Unit 27 with Unit 28. Hold up two boxes of the same size and shape, but have one unfolded so that it is in net form. Explain that a net is a flat shape, which can be folded into a three-dimensional solid. Point to the net. Then demonstrate how it can be folded into the box – use a little tape to secure the sides if necessary. It would be useful at this point to have enough nets to be folded for pupils to work in pairs. Give out the nets and some tape or glue and ask pupils to work in pairs to fold the net into a solid. Boxes are best for this section – cubes, cuboids and triangular prisms.

Talk about clues that pupils can look for in the nets to work out which shape it will make, such as a triangle, and all squares. Then hold up a cylinder net. Ask pupils which solid shape they think the net makes. Ask pupils how to make the curved edge (roll it). Show a cone net and again ask which shape it will make and demonstrate.

Pupils complete Exercise 3 (Pupil’s Book page 107).
Answers

Exercise 3
1. One cube
2. Three cuboids

Worksheet 27
Check the drawings to ensure that the nets drawn are correct. Also look at the end products (cardboard cubes).

Assessment
Observe pairs as they attempt to fold their nets. Have they recognised the shapes their net will make? Pupils should be able to identify and name: sphere, cube, cuboid (rectangular prism), cylinder, cone and triangular prism. Pupils should be able to:
• identify, count and describe faces, edges and corners of 3-D shapes;
• create own 3-D shapes; and
• solve simple problems and puzzles involving 3-D shapes.

Extension activity
Ask pupils to choose a 3-D shape from cube, cylinder, cuboid, triangular prism and cone. Ask them then to draw their own net for that shape, cut it out and fold, glue or tape to make the 3-D shape. Has it made the correct shape?

Homework activity
Worksheet 27, page 42, Question 8.

Lesson 5  Revision: Term 2 – Adding three-digit numbers and multiplying

Preparation
You will need:
• Small items to manipulate, for example, stones, buttons, beads, seeds and bottle tops
• Pupil’s Book

Starter activity
Make a bag of a multiple of five small items, for example 20 items and say: ‘I want to share these items between five pupils. How will I do it?’ Most pupils are familiar with sharing out by giving some to each person but the idea of equal sharing may be new. Demonstrate, one for you, one for you, etc. around the five pupils and then around again until all the items have been shared. How many did each pupil receive?

Lesson focus
Discuss the term ‘equal sharing’. Does it mean always give one to each person? Could you give two to each person if you know there are plenty and then one to each person as you have less to share? The idea of an equal share is that each receiver of the share must always have the same number as another receiver. Give pupils some word problems that involve sharing. Let pupils use counters if needed.

Answers

Class activity
Check that pupils have the correct answers to the word problems and that they have understood the concept of sharing out equally.

Assessment
Observe pupils as they use small items to share equally. Pupils should be able to share a set of objects using equal sharing.
Objectives
By the end of this unit, pupils will be able to:
• Identify the curved surfaces of a cylinder
• Mention three-dimensional objects at home that are cylinders and spheres.

Extension activity
Pupils can use the multiplication tables in the Resources to create some problems of their own.

Homework activity
Ask pupils to write out their 2× multiplication table.
Objectives
By the end of this unit, pupils will be able to:
• Identify and the curved surfaces of a cylinder
• Mention three-dimensional objects at home that are cylinders and spheres.

Suggested resources
• Boxes, tins, balls, paper cuttings
• Drawings of cubes and cuboids, etc.
• Balls, milk tin, paper cuttings, drawings, etc.

Key word definitions
triangular prism: a triangular prism is a three-sided prism with a triangular base
rectangular prism: a solid (three-dimensional) object which has six faces that are rectangles
sphere: a three-dimensional object shaped like a ball
cylinder: a closed solid that has two parallel straight sides and circular ends of equal size

Frequently asked questions
Q What prior knowledge do the pupils need?
A Pupils will need to know the 2-D shapes – circle, square, rectangle and triangle. They will also need to know and understand corners, faces, curved and straight edges.

Q Are a cuboid and a rectangular prism the same?
A A cuboid is another name for a rectangular prism. A cube is a special rectangular prism, but this fact can confuse pupils at this stage. Just highlight the similarities between the two.

Q Does a sphere have any faces?
A The term ‘face’ is used to describe only flat faces on 3-D shapes.

Evaluation guide
Assess whether pupils can:
1. Identify and the curved surfaces of a cylinder.
2. Mention three-dimensional objects at home that are cylinders and spheres.

Lesson 1 Pupil’s Book page 108; Workbook page 43

Preparation
You will need:
• Collection of objects of different sizes of the following shapes – sphere, cylinder, and cone and triangular prism
• Labels: sphere, cylinder, cone and triangular prism
• Pupil’s Book
• Workbook
Starter activity

Review the solid shapes learned in Unit 27. Hold up each of the shapes – cube, cuboid, sphere and cylinder. Ask pupils to name these shapes in turn and to find the appropriate label. Ask pupils to sort the objects according to their shapes.

Review the properties of the shapes asking ‘Which shapes have no corners?’ ‘Which shapes have straight edges?’ ‘How many corners does a cube have?’ Check pupils’ answers by holding up the objects and counting corners, etc.

Gather the labels and mix them up. Hold up one label at a time and ask pupils to read the label and place it next to the correct shape.

Lesson focus

Hold up a cone shape. Ask pupils to describe the shape. Ask whether the shape has corners or straight edges. Ask what the shape has. Encourage the vocabulary: curved, point, circle. Ask if anyone knows the name of the shape or if they had ever seen the shape before and where. Hold up the label ‘cone’ and ask pupils to read it together. Ask a pupil to come and hold a cone and its label at the front for everyone to see. Hold up a triangular prism. Again ask pupils to describe the shape. Encourage the vocabulary: curved, rectangle and triangle. Ask pupils how the shape is similar or different to the cone. Hold up the label sphere and cylinder. Ask pupils to read together the label. Ask pupils to look closely at the two new shapes and their labels.

Lay a collection of objects on a table in the front of the class and ask a pupil to come to the front and find a cone from the collection. Ask another to find a cylinder and a sphere. Repeat until all the cylinders and spheres have been identified from the collection. Examine the pictures of shapes on page 108 of the Pupil’s Book and hold up examples of the pictures. Get pupils to discuss if they can see any edges, faces and corners of each shape and then complete Exercise 1 (Pupil’s Book page 108). This can be completed as a group or pairs activity.

Answers

Exercise 1
1. 1
2. 3
3. none
4. none
5. 2
6. none
7. no
8. circular

Worksheet 28
1. Sphere and cylinder. Pupils should give at least two examples each of items shaped as a sphere and cylinders at home.

Assessment

Listen to and record pupils’ responses from the lesson. How much knowledge have they remembered from Grade 1? Make sure that pupils can identify the edges, faces and corners of each shape. Pupils may confuse edges and corners.

Extension activity

Provide a large collection of solid shapes from packages to blocks. Allow pupils to build towers and walls with these shapes. Ask them which shapes are best for building, for example, walls, towers and roofs. Through being allowed to build with the shapes, pupils are physically able to see and experiment with the properties of each shape. For example, a triangular prism cannot be used in the middle of a wall when it is horizontal, however, if it is stood on its end it can be built upon.

Ask pupils to look for cone and triangular prism shapes in school and out of school and write where they found them.

Homework

Worksheet 28, page 43, Question 1.
Lesson 2  Pupil’s Book page 109; Workbook page 43

Preparation
You will need:
• Labels: sphere and cylinder
• Collection of objects shaped as spheres and cylinders
• Paper and scissors
• Model of the net of a cylinder
• Templates of the net of a cylinder for pupils to copy or draw around
• Pupil’s Book
• Workbook

Starter activity
Recap the two shapes learnt last lesson – cube and cuboid. Ask pupils to name some objects in the classroom that have these shapes.

Lesson focus
Remind pupils that they already know how to make a cube from a single piece of paper. Show pupils that the flat template that can be folded into a shape is called a net (from Unit 27). Now hold up the net of a cylinder and demonstrate what the net looks like flat and then demonstrate how it folds into a cylinder. Give pupils templates that they can make up for themselves and draw around to make more nets of cylinders. This will again be a noisy lesson because pupils will get excited about making their own nets. Make sure pupils use the scissors in a safe and correct manner.

Pupils complete Exercise 2 (Pupil’s Book page 109).

Answers

Exercise 2
Go through the answers with pupils. Pupils should give answers such as footballs, toilet rolls, sausages and logs of wood.

Challenge (page 109)
Yes, you can use cardboard to make a cone.
Lesson 3  Pupil’s Book page 109; Workbook page 43

Preparation
You will need:
• Labels: sphere, cylinder
• Collection of objects of different sizes of the following shapes – sphere, n cylinder
• Pupil’s Book
• Workbook

Starter activity
Hold up a cylinder and ask the pupils to describe the shape, using their own language. Hold up the flat net from the last lesson and remind pupils of how it folds into a cylinder. Repeat the exercise with a sphere.

Lesson focus
Use the language the pupils used to describe the sphere and cylinder and translate into the correct mathematical language of faces, edges and corners.

Divide the class into small groups and give spheres and cylinders to each group. Ask them to describe their shape stating the number of faces, edges and corners their shape has. Get pupils to draw all the objects in the classroom that they can see in the shape of a sphere or cylinder.

Answers

Class activity
This is a practical lesson. Monitor pupil’s work by walking around the classroom and listening.

Challenge (page 109)
9 faces and 16 edges.

Worksheet 28
4. Pupils to draw examples of objects.
5. Pupils to draw examples of objects.

Assessment
Listen to pupils’ responses during class tasks, and particular during the small group activity. Are pupils able to accurately count the number of faces, edges and corners? Pupils should be able to identify, count and describe faces, edges and corners of 3-D shapes.

Extension activity
Pupils can do the second Challenge activity on page 109 of the Pupil’s Book.

Homework
Worksheet 28, page 44, Questions 4 to 6.
Lesson 4
Revision: Term2 – Open sentences and word problems

Preparation
You will need:
- String and coloured beads
- Collection of objects and pictures such as stones, leaves, books, pencils, crayons (ensure there are at least five of each object, preferably more)
- Pictures on cards of shapes, objects such as flowers and T-shirts
- Crayons – at least red, blue, yellow and green
- Pupil’s Book

Starter activity
Show a string of coloured beads of a simple alternating two-colour pattern. Ask pupils to describe this pattern. (Pupils should give responses such as red blue red blue red blue.) What would the next coloured bead be in this pattern? Repeat with a more complex pattern, such as red red blue red red blue red. Describe this pattern. Ask which colour bead would come next. Repeat with pictures or other objects in a pattern, such as stone leaf. Ask the type of pattern and what comes next. Ask a pupil to find the next picture or object in the pattern. Ask another pupil to create his or her own pattern and as a class decide how it should be continued.

Lesson focus
This lesson revises the lessons on word problems and open sentences. Give pupils examples of open sentences and repeat the exercises from Unit 17. Pupils should be confident at finding a missing value when given two out of three. The starter activity will remind pupils to look for patterns and repetition. Remind pupils that not all open sentences are true. Give examples of sentences that are both true and false and ask pupils to find the true ones and explain why the false ones are false. For example, 3 + 4 = 9 is false because 3 + 4 = 7.

Class activity
The answers will depend on your examples given.

Assessment
Monitor pupils’ ability to find values in a problem.

Extension activity
Ask pupils to make a quick true/false addition quiz to hold in the class.

Homework activity
Ask the pupils to find create simple open sentences of their own and write them in their books.
Lesson 5  Revision: Term 2 – Money

Preparation
You will need:
• Items to buy from a play shop
• Notes of each value
• Price tags
• Photos or pictures of each note
• Labels: Kobo, Naira, 5, 10, 20, 50, 100, 200, 500, 1,000
• Pupil’s Book

Starter activity
Show picture cards of each note and remind pupils of the names of the notes. Ask pupils to identify the notes shown. Repeat with all other picture cards until the pupils are familiar with all the notes. Ask pupils to add some of the notes together and also to work out change from some simple shopping sums.

Lesson focus
Set up two tables at the front of the class as a shop. Priced items in Naira (up to 500) are laid on top of the tables. Let a pupil be a shopkeeper while some other pupils are customers. Give each of them a certain amount of money to shop with. The shopkeeper sells and gives change to the customers. Ask the class to assist the shopkeeper where necessary. Repeat shopping with more pupils.

Pupils should remember this activity from Term 2. Give some simple addition and subtraction sums using money.

Answers
Make sure that pupils can correctly work out change from larger sums of money when shopping.

Assessment
Can pupils give and collect correct change?
Pupils should be able to:
• add and subtract amounts of money within the context of shopping
• find a number of notes to buy an article
• solve simple money problems using notes.

Extension activity
Pupils play the ‘Shopping’ game at home with a group. They should ensure they give and take correct change.

Homework activity
Ask pupils to find the prices of some shopping items and write down what they can buy with 100 Naira.
Objectives
By the end of this unit, pupils will be able to:
• Identify, a circle, square, rectangle and triangle
• Indicate which corner of a two-dimensional shape is a ‘square corner’.

Suggested resources
• Drawings of shapes: square, rectangle, triangle, circle
• Collection of objects: cubes, match boxes, tins, paper cuttings

Key word definitions
parallelogram: a simple quadrilateral with two pairs of parallel sides
trapezium: a quadrilateral having two parallel sides of unequal length
rhombus: a parallelogram with four equal sides
kite: a quadrilateral with two distinct pairs of adjacent sides that are congruent

Frequently asked questions
Q What prior knowledge do the pupils need?
A Pupils will need to know the names of 2-D shapes – square, rectangle, triangle, circle, and some describing words, such as edges, corners, curve and straight.

Common errors pupils make
• Rectangles and triangles can sometimes be confused. If you think this is the case, question pupils’ answers.
• Some pupils have difficulty recognising horizontal and diagonal lines of symmetry. Ask pupils to turn the shape round to help them. Pupils can look at pictures, objects and shapes from a different perspective. Question any incorrect answer to find the cause of the error.

Evaluation guide
Assess whether pupils can:
1. Identify, a circle, square, rectangle and triangle.
2. Indicate which corner of a two-dimensional shape is a ‘square corner’.

Lesson 1 Pupil’s Book page 110; Workbook page 45
Preparation
You will need:
• Shapes: square, rectangle, triangle, circle
• Labels: square, rectangle, triangle, circle
• ‘Feely’ bag
• Pupil’s Book
• Workbook

Starter activity
Hold the shape name labels up one at a time for the class to read and then attach them to the board. Place a shape in the ‘feely’ bag. Ask one pupil to come to the front and put his or her hand into the bag and feel the shape. Ask the pupil to describe the shape just by feeling it not looking at it. ‘Which shape do you think it is? Pull the shape out of the bag. Were they correct? Ask the pupil to place that shape by the correct label on the table.

Repeat with different shapes and then objects such as a ruler, coin and envelope. Can pupils find the shapes in the picture?
Lesson focus
Hold up a circle. Ask a pupil to draw a circle on the board. 'Does a circle have straight sides?' 'Does a circle have corners?' 'Does a circle have a curved side?' Hold up a square. Ask another pupil to come and draw a square on the board. 'Does a square have a curved side?' 'How many straight sides and how many corners does a square have?' Repeat with triangle and rectangle. Look at the shapes on page 110 of the Pupil's Book and identify them with pupils.

Ask pupils to complete Exercise 1 (Pupil’s Book page 111).

When they have finished, pupils can try and use different shapes to make patterns and colour them in.

Answers

Exercise 1
Pupils should be able to point out the different shapes and draw them correctly. Make sure they understand what makes a square the correct shape.

Worksheet 29
1. a) I have four corners.
   b) I have four edges.
   c) I have four angles.
   d) I have four sides.
   e) I am a square.
2. a) I have four corners.
   b) I have four edges.
   c) I have four angles.
   d) I have four sides.
   e) I am a rectangle.
3. a) I have no corners.
   b) I have one edge.
   c) I have no angles.
   d) I have no sides.
   e) I am a circle.

Assessment
Listen to pupils’ responses during the starter activity. What knowledge of 2-D shapes do pupils have? Pupils should be able to identify, name and draw a circle, square, rectangle and triangle. Pupils should be able to count and describe sides and count corners on 2-D shapes.

Extension activity
Give each pupil a paper or card square (approximately 10 cm × 10 cm). Ask them to cut the squares into three or four pieces and then pass to the person next to them. Ask pupils to put the pieces back together to form the square again. Make shape puzzles from different shapes.

Homework
Worksheet 29, page 45, Questions 1 to 3.
Lesson 2  Pupil’s Book page 110

Preparation
You will need:
• Shapes: square, rectangle, triangle, circle
• Labels: square, rectangle, triangle, circle
• Pupil’s Book

Starter activity
Play the ‘Feely bag’ game from the previous lesson. Recap the properties of 2-D shapes with quick-fire questions such as: How many sides does a rectangle have? How many sides does a circle have? How many corners does a triangle have?

Lesson focus
Remind pupils of the work completed in Unit 28 on 3-D shapes. Point out that they can look for 2-D shapes that are contained within 3-D shapes. Ask them to look around the classroom and find some.

Ask pupils to complete Exercise 2 (Pupil’s Book page 114).

Answers

Exercise 2
1. four
2. six
3. two
4. four

Assessment
Which pupils were able to answer the quick-fire questions in the starter activity? Pupils should be able to identify, name and draw a circle, square, rectangle and triangle. Pupils should be able to find and identify 2-D shapes within 3-D shapes.

Extension activity
Ask pupils to use a variety of 2-D shapes to make a picture. How many of each shape was used?

Homework
Pupils are to list 2-D shapes within 3-D shapes that they can find at home.
Lesson 3  Pupil's Book page 114

Preparation

You will need:
• Shapes: square, rectangle, triangle, circle
• Collection of flat objects – envelope, coin, ruler, greetings card, placemat, triangular neck tie, etc.
• Pupil’s Book

Starter activity

Look at the collection of flat objects. Ask pupils to say what shapes they are and explain how they can tell, for example, the properties of the shapes.

Lesson focus

Draw a variety of shapes on the board. Show pupils that some shapes have corners and edges. Ask pupils to draw lines in their exercise books in such to make corners. Can pupils put together various shapes to make new corners? Look around the classroom and identify objects and get pupils to point out the corners and edges.

Pupils complete Exercise 3 (Pupil’s Book page 115).

Answers

Exercise 3
1. 4
2. 4
3. 0
4. 3
5. 4
6. 4
7. 3

Assessment

Pupils should be able to understand the difference between a corner and an edge. Give extra practice to any pupil who has difficulty with this.

Extension activity

Ask pupils to draw their own new shapes using squares, triangles and rectangles.
Lesson 4 Workbook page 46: Workbook page 46

**Preparation**
You will need:
- Shapes: triangles, equilateral, right-angle and isosceles
- Collection of triangular objects
- Workbook

**Starter activity**
Pick up a triangle shape and ask pupils to tell you the name of the shape. They should all recognise a triangle. Ask them to draw some pictures using only triangles in their note books.

**Lesson focus**
This lesson introduces pupils to three different types of triangles: right-angled triangles, equilateral triangles and isosceles triangles. Draw the three types on the board or hold up shapes and ask pupils to spot the difference. Discuss the differences and then label and draw the triangles on the board.

Complete Worksheet 29, page 46, Questions 4 to 9 with the pupils.

**Answers**

**Worksheet 29**

4. 3
5. 3
6. 3
7. Pupils should draw the three types of triangles.
8. 2
9. 3

**Assessment**
Pupils should be able to spot the differences in the three types of triangles, and identify the triangles. Pupils should be able to write and spell the names.

**Extension activity**
Ask pupils to draw a pattern using right-angled triangles.

**Homework**
Pupils to complete any worksheet questions not completed in class.
Lesson 5  Revision: Term 2 – Length

Preparation
You will need:
• Two pencils of different lengths
• Centimetre ruler
• Metre stick
• Pupil’s Book

Starter activity
Remind pupils of measuring using non-standard units by giving them classroom objects to measure. Then ask them to measure the same objects using rulers to compare actual standard measurements against non-standard ones.

Lesson focus
Measure the two pencils using the centimetre ruler. Hold up the longest pencil. ‘How much longer is this pencil than the other one?’ Place both pencils next to each other and discuss which bit you need to measure to find out how much longer. Talk about the difference in length. Do this with several objects in the classroom. Ask questions to ensure that pupils have remembered the concept of ‘longer than’ and ‘shorter than’.

Draw three lines on the board – 30 cm, 20 cm and 10 cm. Ask a pupil to measure each line and write the measurement next to the line. Ask how long the line would be if we joined all three lines together. ‘How can we find out? (Add together the three measurements to find the total – 30 cm + 20 cm + 10 cm = 60 cm.)

Give pupils a series of lines to draw in their exercise books and measure. Let them measure their own height and also their desks. They can work in pairs and record their findings.

Answers

Class activity
Check answers to make sure they are realistic.
Objectives
By the end of this unit, pupils will be able to:
• Collect data and arrange them in arrays
• Collect data and arrange them in groups, such as groups of boys and groups of girls.

Suggested resources
• Cards with ages written on them
• Wall rule

Key word definitions
array: arrangement of objects, pictures, or numbers in columns and rows
tally: an account or record of information
data: information
group: information that has been put into groups of similar elements

Frequently asked questions
Q What prior knowledge do the pupils need?
A Pupils will need to be able to add totals, count in fives and count on in ones from a given number. They will also need to be able to order numbers to 50 and understand ‘more’ and ‘least’.

Common errors pupils make
• Pupils may have difficulty counting the tallies. Review counting in fives and also counting on in ones from 5. Remind pupils that four tally lines crossed through with another line give a total of five. Have them look at their fingers. They know they have five fingers. The four fingers represent the four lines and fold their thumb across their palm is the fifth line.

Evaluation guide
Assess if pupils can:
1. Collect data and arrange them in arrays.
2. Collect data and arrange them in groups, such as groups of boys and groups of girls.

Lesson 1 Pupil’s Book page 116
Preparation
You will need:
• Small bag with coloured beads or shapes inside
• Pupil’s Book

Starter activity
Count in fives from 0 to 100 as a class. Start again, but this time tell pupils that if you raise your hand, they are to count on in ones from where they stopped (for example – 5, 10, [raise hand] 11, 12, 13, 14, 15).

Lesson focus
Stand at the front of the class with the small bag of coloured beads (shapes could also be used). Ask a pupil to take a bead out of the bag and say which colour it is and then return the bead to the bag. Write the colour on the board and make a tally mark next to it. Ask another pupil to take a bead from the bag and say what colour it is. If it is a different colour then write it underneath the first one and make a tally mark next to it. Ask another pupil to take a bead from the bag and say what colour it is. If it is the same colour as the first make a second tally mark. Repeat, asking each pupil to take a bead from the bag. Either add another colour to the list with a tally mark or add a tally to an existing colour.

Explain to the pupils that you are making a tally to record how many times each colour appears. When you get to making a fifth tally on a colour, stop to explain that a fifth line is crossed through the four lines to clearly show it is five and then start another group of lines. Keep going until each member of the class has had a turn at taking out a bead. Look
at the tally list you have made and choose a colour for the pupils to find the total. Explain that to find a total we can count the tallies in fives and then count any extra by counting on in ones. As a class, find the totals for each colour and write them in figures at the end of each tally line.

Go through page 116 of the Pupil’s Book with the class and then complete Exercise 1 (page 117) together.

**Answers**

**Exercise 1**
1. a) 3  
   b) 4 (orange crayon tally)  
   c) 12  
   d) 10  
   e) 1

**Exercise 2**  
The totals are:  
Banana (5)  
Pineapple (3)  
Mango (10)  
Apple (7)  
Orange (4)  
Pawpaw (6)

**Assessment**  
Look at answers to Exercise 1. Have pupils understood and answered the questions correctly? Pupils should be able to collect data by counting.

**Extension activity**  
Early finishers can create a class tally on favourite sandwich fillings.

**Homework**  
Exercise 2 (Pupil’s Book page 117).
Assessment
Observe pupils as they carry out their survey. Are they recording answers correctly?

Look at the answers to Exercise 1. Have pupils totalled tallies correctly? Pupils should be able to collect data using tallies and counting.

Extension activity
Ask pupils to write their own question for a survey. ‘What is your favourite …?’ Ideas could include: food, game, song, animal, etc.

Homework
Pupils use the information in Question 2 to complete Question 3 of Exercise 2 (Pupil’s Book page 118).

Lesson 3 Pupil’s Book page 119; Workbook page 48

Preparation
You will need:
• Pupil’s Book
• Workbook

Starter activity
Recap counting totals of tallies with a quick survey of ‘What is your favourite shape?’ Write shapes circle, square, star, triangle and rectangle in a list and quickly go round the class and tally their favourite shape. Ask the class to total each group of tallies.

Lesson focus
Explain to pupils that a good way to display results is to put them in a table. Explain that a table is made up of columns and rows. Each column has a heading. Demonstrate with the favourite shapes information already collected. Quickly draw a table (or have one already drawn with 11 rows and three columns) Ask the pupils to suggest what the heading should be in each column (favourite shape, tally, total). Work with the pupils to transfer the favourite shapes information from the tally list to the table. Ask pupils some questions to be answered from the favourite shape table. For example: ‘How many people like triangles best? How many people like stars best?’

Ask pupils to complete Exercise 3 (Pupil’s Book page 119).

Answers

Exercise 3
Answers will vary. Pupils should be able to correctly record and interpret data.

Worksheet 30
2. a) Pupils should have drawn the correct tallies, two groups of five for the red shirt, three strokes for the blue shirt, one group of five for the yellow shirt and one group of five plus two strokes for the green shirt.
   b) 10
   c) 7
   d) 25

Assessment
Pupils should be able to record data in simple table.

Extension activity
In small groups play a game of skittles or other point scoring games, such as throwing dice or dominoes, and ask pupils to record in a table their points scored.

Homework
Pupils are to complete Worksheet 30, page 48, Question 2.
Objectives
By the end of this project, pupils will have shown that they are able to:
• Make a tally of different objects
• Correctly record the tally
• Correctly interpret a tally
• Find missing numbers.

Guidelines
This project needs to be begun on one day and completed in class on the next day or given as weekend homework.

Remind pupils of previous work completed on recording data. Talk about different models of cars as well as safety on the roads. Warn pupils that they must be careful not to stand in the road when recording models of cars.

Explain to pupils that they are going to complete the project for marks and that they will need to work in pairs and record their results. Allow pupils time to draw the record sheet on page 120 of the Pupil’s Book into their note books.

Pupils to use homework time to record the cars they see passing their house. If the school is on a busy road and pupils can observe the road safely, then they can record the types of cars passing in lesson time. If this happens then give pupils a time allocation to work within, say, 15 minutes. If pupils are recording types of cars at home then they can also be given a set time that they must stick to.

Pupils must then get together in their pairs and record their data. Pairs can report their findings to the rest of the class.

Pupils are to complete the secret number questions in their pairs and the challenge question (Pupil’s Book page 121).

Answers
Secret numbers
84, 12

Challenge (page 121)
532345515431
Objectives
This assessment is a summative assessment of work covered in Units 22 to 21. This final assessment for the year is designed to assess the pupils’ mathematical understanding and not their reading ability and is best completed individually or in small groups.

Guidelines
Use the assessment to check on pupils and their understanding. Some pupils may still experience difficulty with certain sections of the work.

Allow pupils time to complete the assessment. Give out scrap paper if needed, for pupils to work out their answers on.

Answers
Assessment
1. a) 5 o’clock  
   b) 11 o’clock  
   c) 6 o’clock  
   d) 3.30  
   e) 10.30  
   f) 3.30
2. Check that pupils draw in the correct times on the clocks.
3. 7
4. Tuesday
5. Sunday, Saturday
6. A scale in kilograms or grams
7. Rock
8. Lighter
9. A cup
10. Triangle, square, rectangle or circle
11. Answers will vary. Examples include a rolling pin, a saucepan, a petrol can, a cup.
12. Answers will vary according to the answers for Question 11. (Circle, square, rectangle, etc.)
13. Tally eight strokes for number 6, five strokes for number 7, four strokes for number 8 and three strokes for number 9, making 20 in all.
14. Two groups of five for cola, three strokes for apple juice, one group of five and two strokes for orange juice and one group of five and four strokes for water.
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