Unit 1: Numbers to 100

Counting objects to 100

→ pages 6–8

1. There are 60 birds.

2. a) There are 43 beads.
b) There are 77 straws.

3. There are 40 dots.

4. You need 60 cubes to make the tower.

5. Children should have completed the numbering of the number line and tracks as follows:
0, 10, 20, 30, 40, 50, 60, 70, 80
0, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100
100, 90, 80, 70, 60, 50, 40, 30, 20, 10, 0

Reflect

Children should have ticked the middle box to show there are 55 cubes.

Children could have explained their reasoning in different ways, e.g.

There are 5 tens, which is 50, and then 5 ones so that gives 55 cubes altogether.

The top count is wrong because it has missed out 40 when counting in tens and the bottom count is wrong because it has missed out 53 when counting in ones.

Representing numbers to 100

→ pages 9–11

1. a) There are 35 cakes.
b) There are 53 cups.
c) There are 55 cubes.

2. a) 29
b) 59
c) 79
d) 80

3. Children should have drawn lines and dots as follows:
43 4 lines and 3 dots
72 7 lines and 2 dots
63 6 lines and 3 dots
81 8 lines and 1 dot

4. a) 61
b) 40
c) 55

Reflect

Children could have represented 43 in various ways, e.g. using different objects such as tens frames, a bead string and cubes or by grouping in different ways such as 4 tens and 3 ones or 3 tens and 13 ones.

Tens and ones (1)

→ pages 12–14

1. 29 is 2 (tens) and 9 (ones).

2. Children should have matched:
35 to the third picture and to 3 tens and 5 ones.
53 to the fourth picture and to 5 tens and 3 ones.
33 to the second picture and to 3 tens and 3 ones.
30 to the first picture and to 3 tens.

3. a) 4 tens and 5 ones, 2 tens and 3 ones, 0 tens and 7 ones, 6 tens and 4 ones, 9 tens and 0 ones, 0 tens and 4 ones.
b) 4, 33, 0, 42, 2

4. Children should have chosen 'Yes'. For example, a child might have said 'Yes' because 2 tens and 20 ones are each worth 20 altogether.

5. Answers left to right along the number line: 8 tens and 4 ones, 8 tens and 7 ones, 9 tens and 0 ones, 9 tens and 1 one(s)

Reflect

Children could have chosen any number with a 9 in the ones column, e.g. 9, 19, 29, 79, 109.

Tens and ones (2)

→ pages 15–17

1. 20 and 4 (parts), 24 = 20 + 4

2. Children should have completed the part-whole diagrams and addition number sentences as follows:
a) 70 and 7 (parts), 77 (whole), 77 = 70 + 7
b) 10 and 9 (parts), 19 (whole), 19 = 10 + 9
c) 90 and 1 (parts), 91 (whole), 91 = 90 + 1

3. Answers from top to bottom: 1, 11, 21, 31

4. Answers from left to right: ✗, ✔, ✗, ✔

5. 64 = 60 + 4
74 = 14 + 60
46 = 26 + 20 or 46 = 20 + 26
46 = 40 + 6

Reflect

There are many possible answers. Children could have partitioned 39 in different ways where one part is a multiple of 10, e.g. 39 = 9 + 30 or 39 = 20 + 19. Children could have partitioned 39 into other pairs of numbers with a total of 39, e.g. 39 = 38 + 1, 39 = 35 + 4 or 39 = 25 + 14. Some children might have partitioned 39 into more than two parts, e.g. 39 = 10 + 10 + 10 + 9 or 39 = 20 + 15 + 4.

Representing numbers on a place value grid

➜ pages 18–20

1. a) 3 (Tens) 4 (Ones) There are 34 beads.
b) 4 (Tens) 3 (Ones) There are 43 cubes.
c) 1 (Tens) 0 (Ones) There are 10 straws.

2. Children should have matched the pictures to the place value grids as follows:
first picture ➜ 4 (Tens) 6 (Ones)
second picture ➜ 6 (Tens) 0 (Ones)
third picture ➜ 4 (Tens) 3 (Ones)
fourth picture ➜ 5 (Tens) 9 (Ones)

3. Answers from left to right along number line as follows: 7 (Tens) 1 (Ones), 8 (Tens) 0 (Ones), 8 (Tens) 5 (Ones), 9 (Tens) 3 (Ones)

4. a) There are two possible answers: 54 and 65.
b) 90

Reflect

85: 8 tens or 80

80: 8 tens or 80

88: 80 and 8, or 8 tens and 8 ones

8: 8 ones

82: 8 tens or 80

Children might have explained their reasoning in different ways, e.g.

In a 2-digit number, the digit on the left stands for tens and the digit on the right stands for ones.

85 can be partitioned into 80 and 5 and the 80 is 8 tens.

Comparing numbers (I)

➜ pages 21–23

1. 50 is greater than 43. 50 > 43

2. a) 30 < 45
b) 45 < 50
c) 70 = 70
d) 21 > 20

3. Answers from top to bottom as follows:
62 > 40
55 > 40
38 < 40
33 < 40
51 > 40

4. 8 tens and 7 ones < 9 tens and 5 ones.
4 tens and 6 ones < 48.
2 tens and 8 ones < 32.

Reflect

The number sentence is true. Children could have explained their reasoning in different ways, e.g.

47 can be partitioned into 40 and 7. This is less than 50 so it is also less than 54.

When you count up from 0 you get to 47 before you get to 54.

Comparing numbers (2)

➜ pages 24–26

1. Children should have circled the following answers:
a) 6 (Tens) 5 (Ones)
b) 5 (Tens) 4 (Ones)
c) 2 (Tens) 9 (Ones)
d) 93
e) 99
f) 44
g) 45

2. Answers from top to bottom:
a) greater than, greater than, less than, is equal to
b) <, <, >, >

3. Children should have written the following digits into the empty boxes:
a) 1, 2, 3 or 4. Alternatively, some children could have written 0 or left the box blank.
b) 6, 7, 8 or 9. Alternatively, some children could have written more than 1 digit into the box.
c) 9

4. 53

Reflect

Children could have explained their reasoning in different ways, e.g.

…87 is greater than 80 but 78 is less than 80.

…87 lies to the right of 78 on a number line.

Ordering numbers

➜ pages 27–29

1. Children should have circled:
a) 51
b) 2 (Tens) 9 (Ones)

2. Children should have circled:
a) the right-hand drawing (51)
b) the left-hand drawing (21)

3. Abbie, Anna, Maya

4. 65 < 67 < 76

5. a) 45 < 55 < 75
b) 54 < 55 < 57

6. 89, 90, 91 (in any order)

Reflect

28 < 58 < 98 Any 2-digit number with 9 tens is greater than any 2-digit number with 5 tens which, in turn, is greater than any 2-digit number with 2 tens. It is, therefore, only **necessary** to look at the tens to order these numbers. Children could, therefore, have just ticked the Tens box but might well have ticked the Ones box too to say that they looked at the ones.

41 < 47 < 48 Children should have ticked both the Tens and the Ones boxes for this example. Children could have started by looking at the tens and noticing that all of the numbers have 4 tens before using the ones to order them. Children could have used other methods such as placing the numbers on a number line but this would also have involved looking at both tens and ones.

Counting in 2s, 5s and 10s

➜ pages 30–32

1. a) 15, 20, 25, 30 Hanif has 30 marbles.
b) 8, 10, 12, 14, 16, 18 Cass has 18 cubes.

2. a) There are 38 cubes.
b) There are 80 straws.

3. Children should have filled in the gaps in the following counts:
a) 65, 70, 75, 80, 85, 90
b) 24, 26, 28, 30, 32, 34
c) 60, 62, 64, 66, 68, 70
d) 75, 70, 65, 60, 55, 50

4. Children should have crossed out: 15, 23, 52, 55, 65

5. a) <
b) =
c) <

Reflect

Leo will say the number 10.

Children could have explained their reasoning in different ways, e.g. 10 is an even number between 0 and 50 so when Leo counts down in 2s from 50 he will say 10. Eva will not say 10 because she is counting up from 20 but 10 is less than 20. Alternatively, children could have tried both counts.

Counting in 3s

➜ pages 33–35

1. Children should have added the following numbers to the number track: 3, 6, 9, 12, 15.

2. a) 3
b) 6
c) 9
d) 12
e) 15
f) 18

3. 12, 15, 18, 21, 24, 27, 30

4. The word 'yesterday' has 9 letters. The word 'kindergarten' has 12 letters.

5. Children should have shaded the following numbers on the grids: 3, 6, 9, 12, 15, 18, 21, 24, 27, 30.
In the first grid this makes a diagonal pattern, which goes up to the right.
In the second grid this makes two vertical lines.
In the third grid this makes a diagonal pattern, which goes down to the right.

6. a) 9, 12, 15
b) 24, 27, 30
c) 27, 30, 33
d) 18, 21, 24

Reflect

Jodie will have said the numbers: 3, 9, 12, 15 and 30.

Children could have explained their reasoning in different ways, e.g.

I counted up in 3s using a number line.

I looked at my work on page 34.

End of unit check

➜ pages 36–37

My journal

I can prove that c is a different number.

Children could have explained their reasoning in different ways, e.g. annotating the diagrams or explaining that diagram c shows 3 tens and 9 ones so represents the number 39. All the other diagrams represent 93.

Unit 2: Addition and subtraction (I)

Related facts – addition and subtraction

➜ pages 38–40

1. Children should have drawn 14 dots in the part-whole diagram and completed the number sentences:
9 + 5 = 14, 5 + 9 = 14, 14 – 9 = 5 and 14 – 5 = 9 (order may vary).

2. a) In any order: 15 = 7 + 8, 15 = 8 + 7, 8 = 15 – 7, 7 = 15 – 8
b) Children should have circled, and rewritten, the number sentences as follows:
12 + 20 = 8 ➜ 12 + 8 = 20 (or another correct number sentence, e.g. 20 = 8 + 12)
8 – 20 = 12 ➜ 20 – 8 = 12 (or another correct number sentence, e.g. 8 = 20 – 12)

3. Children should have completed the part-whole diagram and number sentences as follows:
5 and 6 (parts) 11 (whole)
11 – 6 = 5 and 11 – 5 = 6 (in either order)

4. Answers from left to right as follows:
11 12 4
4 6 5

5. a) Children should have placed numbers in the part-whole diagram as follows:
underneath the 16: 12 on the left and 4 on the right
bottom row: 3 and 9 (in either order)
b) There are many possible answers, e.g. 12 + 4 = 16, 12 = 9 + 3, 12 – 3 = 9 and 4 = 16 – 12.

Reflect

There are eight possible number sentences, as follows:
8 + 9 = 17, 9 + 8 = 17, 17 = 9 + 8, 17 = 8 + 9, 17 – 9 = 8, 17 – 8 = 9, 8 = 17 – 9, 9 = 17 – 8.

Using number facts to check calculations

➜ pages 41–43

1. a) 13 – 8 = 5 or 13 – 5 = 8
b) 13 – 5 = 8 or 13 – 8 = 5 (children must not give the same answer for parts a) and b))

2. a) 8 + 4 = 12 (or possibly 4 + 8 = 12)
b) 12 – 4 = 8 (or children might have written 12 – 8 = 4)
c) Koji took 4 sweets.

3. Children should have selected the calculations:
17 – 12, 5 + 12 and 12 + 5.

4. Children should have written a calculation to check each answer and corrected the top calculation, which contains a mistake:
For 15 + 4 = 20: Calculations to check 20 – 4 = 16, 20 – 15 = 5 or 4 + 15 = 19. Children should have noticed there is a mistake and corrected the calculation to 15 + 4 = 19, 16 + 4 = 20 or 15 + 5 = 20.

For 14 = 19 – 5: Calculations to check 14 + 5 = 19, 5 + 14 = 19, 19 – 14 = 5

For 8 + 8 = 16: Calculation to check 16 – 8 = 8

Reflect

There are many possible answers.

Children could have written an addition calculation, e.g. 18 + 2 = 20 and checked it using a related addition or subtraction calculation, e.g. 2 + 18 = 20 or 20 – 2 = 18.

Children could have written a subtraction calculation e.g. 15 – 10 = 5 and checked it using a related subtraction or addition calculation, e.g. 15 – 5 = 10 or 5 + 10 = 15.

Some children might have chosen to use multiplication, e.g. 5 x 2 = 10 and 5 + 5 = 10.

Comparing number sentences

➜ pages 44–46

1. a) 5 + 3 < 5 + 6. There are more bananas.
b) Children should have crossed out 5 counters in the top row and 8 in the bottom row and written 14 – 5 > 14 – 8 or 14 – 8 < 14 – 5. Tim has the most counters left.

2. There are several different ways of positioning the numbers to complete the number sentence, e.g.
8 + 7 > 7 + 6, 7 + 6 < 7 + 8 and 6 + 7 < 7 + 8.
The triangle has the greater value.

3. Children should have written symbols as follows:
< >
> >
> =

4. a)

any number less than 7	any number less than 5
any number less than 2	6
any number greater than 7	0

b) Children will have been unable to answer this question as it contains an error. The 'greater than' sign and the 'less than' sign in each number sentence should be swapped around, giving 8 and 9 as possible answers, as shown below:
7 + 6 < 6 + 8 (or 9)
14 – 8 (or 9) > 14 – 10

Reflect

There are several possible ways to complete the number sentences.

First number sentence, e.g. 4 + 5 < 6 + 7, 5 + 4 < 6 + 7 and 4 + 6 < 5 + 7

Second number sentence: 4 and 7 should be placed on one side of the = sign and 5 and 6 on the other, e.g. 4 + 7 = 5 + 6, 7 + 4 = 5 + 6 and 6 + 5 = 4 + 7.

Third number sentence: 7 – 6 = 5 – 4, 5 – 4 = 7 – 6, 7 – 5 = 6 – 4 or 6 – 4 = 7 – 5

Fourth number sentence: 7 – 4 > 6 – 5. Alternative answers are possible but these all involve negative numbers, e.g. 7 – 4 > 5 – 6 and 6 – 5 > 4 – 7

Finding related facts

➜ pages 47–49

1. Children should have completed diagrams and number sentences as follows:
Left-hand number family: 7, 2 (parts), 7, 7
Right-hand number family: drawing of 7 tens, 70 (part), 70, 70

2. Missing numbers in whole-part diagrams, from left to right: 80, 8
Missing numbers in number sentences, from left to write: 80, 80, 8

3. a) 4 + 6 = 10, 100 = 40 + 60, 100 – 40 = 60
b) 40 + 10 = 50, 50 – 40 = 10, 5 – 4 = 1
c) 9 = 4 + 5, 50 + 40 = 90, there are many possible answers, e.g. 40 + 10 = 90 – 40, 40 + 50 = 90 – 0

4. a) 10 + 60 = 70, 10 – 3 = 1 + 6, 90 – 70 = 10 + 10 (alternative answers are possible which are correct but do not use the number facts given)
b) Several answers are possible, e.g. 15 + 5 = 90 – 70, 6 + 1 = 10 – 3.

Reflect

There are many possible answers. Children might have written addition and subtraction facts using the same number family, e.g. 5 + 3 = 8, 8 – 5 = 3, 8 – 3 = 5. Alternatively, children may have written calculations that are related in another way, e.g. 30 + 50 = 80 or 3 + 6 = 9.

Making number bonds to 100

➜ pages 50–52

1. 25, 60

2. 20, 45

3. 60, 71

4. a) 30
b) 85
c) 79
d) 93
e) 23
f) 0

5. 50

6. Children should have filled in the missing digits so that the calculations say:
a) 36 + 64 = 100
b) 15 + 85 = 100

Reflect

The digits children have written in the boxes should total 10, e.g. using 6 and 4 to give 60 + 40 = 100.

Children might have chosen to write examples in a particular order to help them find all possibilities, e.g. 10 + 90 = 100, 20 + 80 = 100, 30 + 70 = 100… 90 + 10 = 100.

It is possible some children might have included 0 and written 0 + 100 = 100 and 100 + 0 = 100.

Adding and subtracting 1s

➜ pages 53–55

1. 22 + 7 = 29 There are 29 seeds in total.

2. Children should have completed the calculation 29 – 5 = 24 using the columnar method. There are 24 sheep in the field.

3. Children should have written the following missing numbers into the number sentences and written out each calculation using the columnar method.
a) 47
b) 59
c) 99
d) 42
e) 60

4. 18 4
47 40
31 37

5. Children could have written the correct number sentence as 48 – 20 = 28 and amended the columnar calculation by writing a zero in the ones column of the second row.
Alternatively, children could have written the correct number sentence as 48 – 2 = 46. If so, they should have amended the diagram, crossing out 2 ones instead of 2 tens, and amended the columnar calculation by writing 2 into the ones column instead of the tens column and changing the answer to 46.

Reflect

22 + 4 = 26, 59 – 7 = 52.

Children could have explained different methods, for example counting on or back methods or columnar methods.

Finding 10 more and 10 less

→ pages 56–58

1. a) There are 53 books. Now there are 63 books.
b) There are 29 cubes. 10 less is 19.

2. Answers from left to right:
a) 54, 84, 94
b) 27, 37, 47, 67, 77
c) 88, 78, 38, 28

3.

10 less	Number	10 more
20	30	40
62	72	82
23	33	43
34	44	54

4. 35 79
83 46
64 63
90 87

5. 48, 28

Reflect

There are many possible answers.

To complete the first number sequence, children should have chosen pairs of numbers with a difference of 10, placing the larger number on the right, e.g. 10 more than 48 is 58.

To complete the second number sequence, children should have chosen pairs of numbers with a difference of 10, placing the larger number on the left, e.g. 10 less than 53 is 43.

Adding and subtracting 10s

→ pages 59–61

1. a) 58. There are 58 cans in total.
b) 92
c) 81

2. a) 33. There are 33 pieces of cake left.
b) 14

3. a) 58
b) 58
c) 34

4. Digits from left to right: 3, 6, 0

5. Children should have filled in missing numbers as follows:
Left-hand number wall from top to bottom: 68, 30, 58
Right-hand number wall from top to bottom: 70, 54, 70

Reflect

There are several possible answers for each number sentence.

For the first number sentence, children should have completed the boxes with digits that total 7, e.g. 16 + 60 = 76 or 56 + 20 = 76.

For the second number sentence, children should have completed the boxes with digits that have a difference of 3, e.g. 96 – 60 = 36 or 46 – 10 = 36.

Adding a 2-digit number and a 1-digit number (1)

→ pages 62–64

1. Children should have completed the diagrams and number sentences as follows:
Tens frames: complete the addition of 7 doughnuts (3 completed ten frames and 3 ones counters)
Part-whole diagram: 3
Number line: Draw a jump of 3, from 30 to 33 (children might have jumped in ones).
26 + 7 = 26 + 4 + 3 = 33 There are 33 doughnuts in total.

2. Children might have partitioned 5 in a different way but the following method is efficient as it bridges onto 20:
Part-whole diagram: 2, 3
Number line: Draw a jump of 2, from 18 to 20, and a jump of 3, from 20 to 23.
18 + 5 = 18 + 2 + 3 = 23 There are 23 coins in the jar now.

3. a) Children might have partitioned 8 in a different way but the following method is efficient as it bridges onto 50:
Part-whole diagram: 8 (whole), 7 and 1 (parts)
Number line: Draw a jump of 7, from 43 to 50, and a jump of 1, from 50 to 51.
43 + 8 = 43 + 7 + 1 = 51
b) 57 + 7 = 57 + 3 + 4 = 64 (some children may have partitioned 7 in a different way)

4. a) 84 + 7 = 84 + 6 + 1 = 91
b) 8 + 46 = 46 + 4 + 4 = 54 (some children may have partitioned 8 in a different way)

5. If Mary had partitioned 8 into 5 and 3, she would have jumped onto 40, which would make the rest of the calculation more straight-forward. This would give the number sentence 35 + 8 = 35 + 5 + 3 = 43.

Reflect

Children could have explained their reasoning in different ways, e.g. I added 6 on first so that I landed on 60 (a multiple of 10). This makes it easy to do the rest of the addition.

Adding a 2-digit number and a 1-digit number (2)

→ pages 65–67

1. Children should have drawn a jump of 3, from 40 to 43, on the number line. There are 43 paper clips in total.

2. 51, 51

3. a) 23 + 8 = 31
b) 18 + 8 = 26 (in columnar layout), 26 = 18 + 8

4. Children should have filled in the gaps to complete calculations as follows:
a) 64 + 7 = 71 (in columnar layout)
b) 38 + 5 = 43 (in columnar layout)

5. a) 56 + 9 = 65 or 9 + 56 = 65
b) Children should have written two of the following calculations: 43 + 4 = 47, 4 + 43 = 47, 38 + 9 = 47, 9 + 38 = 47

Reflect

Children could have drawn different jumps along the number line but, to bridge on 70, they should have drawn a jump of 5, from 65 to 70, and a jump of 3, from 70 to 73.

65 + 8 = 65 + 5 + 3 = 73 (children could have partitioned the 8 in a different way)

65 + 8 = 73 (in columnar layout)

Subtracting a 1-digit number from a 2-digit number (1)

→ pages 68–70

1. Children should have completed the diagrams and number sentences as follows:
Number frames: crossed out 6 counters
Part-whole diagram: 4
Number line: label the left-hand jump as '- 4'
42 – 6 = 42 – 2 – 4 = 36 There are 36 leaves left on the tree.

2. Children could have partitioned numbers differently, but the following answers show efficient methods that bridge onto the multiple of 10:
a) 36 – 9 = 36 – 6 – 3 = 27
Part-whole diagram: 6, 3
Number line: Draw a jump of 6 backwards, from 36 to 30, and a jump of 3 backwards from 30 to 27
b) 63 – 9 = 63 – 3 – 6 = 54
Part-whole diagram: 3, 6
Number line: Draw a jump of 3 backwards, from 63 to 60, and a jump of 6 backwards from 60 to 54
c) 70 – 3 = 67
Part-whole diagram: 70 (whole), 3 and 0 (parts)
Number line: Draw a jump of 3 backwards, from 70 to 67 (alternatively, children could have jumped in ones)

3. a) 65 – 8 = 65 – 5 – 3 = 77
b) 33 – 8 = 33 – 3 – 5 = 25

4. Children could have explained each method using different language, e.g.
Tim started by subtracting 10 from 27 to give 17.
He had subtracted 10, which meant that he had subtracted one too many so he had to add one back, which gave an answer of 18.
The person on the right started at 27 and counted back 9 in ones to get to 18.

Reflect

Children could have made different suggestions but the most likely suggestion is that Hannah could have partitioned 9 into 7 and 2. Counting back 7 from 27 gives 20, which is a multiple of 10 so the Hannah could use number bonds to work out the remaining jump. This would give the calculation: 27 – 9 = 27 – 7 – 2 = 18

Subtracting a 1-digit number from a 2-digit number (2)

→ pages 71–73

1. Children should have crossed out 6 cubes from the bottom picture and completed the columnar subtraction to show 35 – 6 = 29. There are 29 blocks left.

2. Children should have completed the diagrams and columnar calculations as follows:
bottom place value grid: cross out 8 ones
columnar subtraction: record the exchange by crossing out the 5 (Tens) and replacing it with 4 and putting a 1 in front of the 5 (Ones) to show there are now 15 (Ones). Write in answer of 47.

3. a) Children should have completed the diagrams and columnar calculations as follows:
Bottom place value grid: draw 6 tens and 4 ones, show exchange by crossing out one of the tens and exchanging it for 10 ones, then cross out 7 of the ones.
Columnar subtraction: record the exchange by crossing out the 6 (Tens) and replacing it with 5 and putting a 1 in front of the 4 (Ones) to show there are now 14 (Ones). Write in answer of 57.
b) 81 – 8 = 73
c) 47 = 52 - 5

4. Children might have explained the mistakes in different ways, e.g.
The digit 7 has been written into the wrong place in the columnar calculation (Tens column, rather than Ones column).
The child on the right has made a mistake with the ones. He has written that 3 ones subtract 7 ones is 4 ones, which is not correct. Instead, he needs to exchange a ten for 10 ones so that he can then work out 13 (Ones) subtract 7 ones.

Reflect

Children will use different methods e.g. 65 – 8 = 65 – 5 – 3 = 57, counting back in ones from 93 or using a columnar method (with exchange).

They will explain their preferences in different ways:

The method I prefer is to partition the 8 into 5 and 3 and count back along a number line. I have chosen this because I can use my number bonds to help me.

I like to use the columnar method because it shows the tens and ones clearly.

End of unit check

→ pages 74–75

My journal

Children might have explained the mistakes in different ways, e.g.

Freya has added on 2 ones instead of 2 tens.

Jack has subtracted 20 instead of adding 20.

Mira has made a mistake working out 56 + 10, giving the answer 76 (which is adding 20) instead of 66.

Power puzzle

Children should have considered which number sentences they could use straight away to find the value of a shape (first and third number sentences). They should then have used these answers in the remaining number sentences to find the value of the other shapes.

star = 5 triangle = 67 square = 72 rhombus = 95

Unit 3: Addition and subtraction (2)

Adding two 2-digit numbers (I)

➜ pages 76–78

1. Children should have completed the diagrams and number sentences as follows:
a) 88, 88. There are 88 balloons in total.
b) 41 + 17 = 58
Part-whole diagram: 7
Number line: 51, + 7, 58,
41 + 10 = 51, 51 + 7 = 58
There are 58 animals altogether.

2. Children should have used tens and ones blocks to represent the numbers and complete the part-whole diagram and columnar addition:
a) 87, 87
b) 79, 79

3. a) 25
b) 26
c) 13
d) 49
e) 59
f) 58

4. Children should have used tens and ones blocks to represent the numbers and complete the columnar addition:
49. They have 49 sweets in total.

5. Children should have placed two digits with a total of 8 into the boxes, e.g. 17 + 72 = 89, 27 + 62 = 89 and 57 + 32 = 89.

Reflect

Children could have described different methods to work out that 25 + 62 = 87, e.g.

To work out 25 + 62, I would add 2 tens and 5 ones to 6 tens and 2 ones.

To work out 25 + 62, I would start at 62 and count 10, 10 and 5 along a number line.

Adding two 2-digit numbers (2)

➜ pages 79–81

1. Children should have completed the diagrams and number sentences as follows:
a) 94
Place value grid: 2 tens and 6 ones drawn in second row
Columnar addition: 26 in second row, answer 94 (with digits in appropriate columns)
68 + 26 = 94
There are 94 pencils altogether.
b) 63
Place value grid: 1 ten and 8 ones drawn in second row
Number line: jumps drawn, starting at 45, then jumping 10 and then jumping 8.
45 + 10 + 8 = 63
There are 63 sweets.

2. 63 (whole in part-whole diagram). Children could have shown their working using a range of methods, e.g. number line, columnar addition.

3. Jim has 99 balloons in total.

4. 17 + 15 = 32
18 + 15 = 33 28 + 30 = 58
19 + 15 = 34 38 + 30 = 68
15 + 17 = 32 48 + 30 = 78
15 + 16 = 31 48 + 29 = 77

5. 82 from (63 + 19)

6. Possible answers are: 4 and 38, 5 and 37, 6 and 36, 7 and 35, 8 and 34, 9 and 33.

Reflect

Children could have chosen different methods to complete the calculation and explained their methods in different ways, e.g.

I can add 35 and 18 by using tens and ones blocks because 35 is 3 tens and 5 ones and 18 is 1 ten and 8 ones.

I can add 35 and 18 by using a number line because adding 18 is the same as jumping 10 and then 8 along a number line.

Subtracting a 2-digit number from another 2-digit number (I)

➜ pages 82–84

1. 58 – 23 = 35

2. Children should have used the tens and ones blocks to help them answer the calculations:
a) 71, 71
b) 20, 20 (children should have drawn a place value grid for 36 in tens and ones)
c) 21, 21 (children should have drawn a place value grid for 62 in tens and ones)

3. She has 42 left.

4. a) 24
b) 34
c) 45
d) 44
e) 54
f) 22

5. 36 – 24 = 12

6. Children should have completed the calculation using pairs of numbers with a difference of 10, with the greater number on the right-hand side of the number sentence, e.g.
29 – 1 = 39 – 11
29 – 5 = 39 – 15
29 – 29 = 39 – 39

Reflect

The calculation is not correct. Children could have explained how they know this in different ways, e.g.

I took 6 tens and 5 ones blocks and subtracted 3 tens and 2 ones. This left 3 tens and 3 ones so the answer to 65 – 32 is 33, not 45.

I added 32 to 44 but the answer was not 65.

Subtracting a 2-digit number from another 2-digit number (2)

➜ pages 85–87

1. Children should have completed the number line and the number sentence as follows:
Number line jump: – 1
Missing numbers (by marks) on number line from left to right: 26, 36, 46
Penny has 31 more.

2. Children should have completed the number line and the number sentences as follows:
Number line jump: – 3
Missing number (by mark) on number line: 35
45 – 32 = 13 (alternatively, children could have written 45 – 13 = 32)
Class 1 needs 13 more.

3. Children should have completed the number line and the number sentences as follows:
Number line jumps from left to right:
– 5, – 10, – 10, – 10, – 10
Missing numbers (by marks) on number line from left to right: 47, 57, 67, 77, 87
97 – 42 = 55 (alternatively, children could have written 97 – 55 = 42)

4. Children should have completed the number lines to complete the number sentences:
a) 65 – 43 = 22 (alternatively, children could have written 65 – 22 = 43)
b) 48 – 11 = 37

5. The calculation is not correct. Children could have described how they know in different ways, e.g.
85 – 43 = 42 but 65 – 43 = 22.
The difference between 85 and 43 cannot be the same as the difference between 65 and 43 since 85 and 65 are in different places on the number line.

6. The difference between 86 and 32 is 54.
Children could have shown different methods, e.g.
Jumping backwards along a number line from 86 to 32.
Using 8 tens and 6 ones to represent 86 then subtracting 3 tens and 2 ones.

Reflect

48 – 16 = 32. Children could have used different methods, e.g.

I solved it by jumping backwards along a number line from 48 to 16.

I could also have solved it by using 4 tens and 8 ones to represent 48 then subtracting 1 ten and 6 ones to get the answer 32.

Subtracting a 2-digit number from another 2-digit number (3)

➜ pages 88–90

1. Children should have completed the number line and number sentences as follows:
Number line missing numbers from left to right:
29, 30, 38
48 – 10 = 38
38 – 8 = 30
30 – 1 = 29
29 are dogs.

2. Children should have completed the number line and number sentences as follows:
Number line missing numbers from left to right are 17, 20, 24, 34, 44, 54
64 – 47 = 17.
There are 17 cars left.

3. Children should have completed the number lines as follows:
Mary missing number from left to right: 28, 30, 34, 44
Sam missing number from left to right: 28, 30, 50
Mary and Sam do get the same answer, 28.
Children could have suggested different ways of doing the same problem, e.g. using a columnar method with exchange or using tens and ones blocks.

4. Children should have completed the number sentence and number line as follows:
27 – 13 = 14
Number line jumps from left to right: – 1, – 1, – 1, – 10
Number line missing numbers from left to right: 14, 15, 16, 17

5. a) 65
b) 66
c) 16
d) 48
e) 38
f) 74

6. a) 16
b) 19
c) 61

Reflect

Children could have described different methods to work out that the missing number in the calculation is 15, e.g.

Using a number line and counting back from 32 to 17

Taking 32 counters and splitting them into 17 and another group then counting how many counters are in the other group

Subtracting a 2-digit number from another 2-digit number (4)

→ pages 91–93

1. Children should have completed the diagrams and calculation as follows:
Picture: crossed out 15 buns
Bottom place value grid: crossed out 1 ten and 5 ones
34 – 15 = 19 (columnar subtraction)

2. Children should have used tens and ones blocks on place value grids and completed the columnar subtractions (including exchange) to answer the calculations:
a) 57 – 28 = 29
b) 83 – 55 = 28

3. 59 37
36 27
42 37

4. Missing numbers in part-whole diagram as follows:
28, 36

5. The statement is true.
Children might have started to understand why this is true if they have used tens and ones blocks to try out examples. To subtract a number with 7 ones from a number with 2 ones, it will be necessary to exchange 1 ten for 10 ones. This will give 12 ones. When you subtract 7 ones, this leaves you with 5 ones.
Children might also start to appreciate repeating patterns if they use a number line to try out examples.

Reflect

Children could have completed the statement in different ways, e.g.

I know I can use subtraction when I want to find how much greater one number is than another number.

I know I can use subtraction when I want to find the missing part in a part-whole diagram.

Adding three 1-digit numbers

→ pages 94–96

1. Children should have drawn counters into the ten frames to find the answer:
7 + 6 + 4 = 17. There are 17 flowers.

2. Children should have drawn counters into the ten frames to find the answers:
a) 16
b) 18
c) 23

3. There are many different ways to complete the part-whole diagram and number sentence, e.g.
9 + 2 + 1 = 12
6 + 6 + 0 = 12
3 + 4 + 5 = 12
2 + 2 + 8 = 12

4. a) 4
b) 6
c) 8

5. =
<
=

Reflect

There are four different totals that can be made by adding three of the cards:
15: by adding 3, 5 and 7 in any order
17: by adding 3, 5 and 9 in any order
19: by adding 3, 7 and 9 in any order
21: by adding 5, 7 and 9 in any order
21 is the greatest possible total that can be made.

Solving word problems – the bar model (I)

→ pages 97–99

1. Children should have completed the bar model, columnar addition and number sentence as follows:
Bar model: 88 (whole), 31 and 57 (parts)
Columnar addition: 31 + 57 = 88 (or 57 + 31 = 88)
Martha sells 88 cards in total.

2. Children should have completed the bar model, columnar subtraction and number sentence as follows:
Bar model: 46 (part)
Columnar subtraction: 72 – 26 = 46 (showing exchange)
There are 46 children.

3. Children should have ticked bar model A. They could have explained their reasoning in different ways, e.g. In the problem, the whole represents 42 and one part is 18. The answer to the problem is the missing part.

4. Eva rolls 2 on the third dice.

5. The other number is 29.

Reflect

There are many possible questions that fit the bar model, e.g.

There are 25 children in a class. 17 of them are boys. How many are girls?

Amy is saving her pocket money to buy a computer game which costs £25. She has saved £17 so far. How much more money does she need?

Solving word problems – the bar model (2)

➜ pages 100–102

1. Katie's mum has 23 flowers. (Children should complete a bar model and subtraction showing 35 – 12 = 23.)

2. There are 22 toy cars altogether.

3. Sam scored 27 more goals than Jorge.

4. The total of their ages is 66.
To work this out, children will have needed to work through the following steps:
Megan is 25 years old. Genji is 16 years older than Megan, so Genji is 25 + 16, i.e. 41 years old.
The total of their ages is 25 + 41, i.e. 66.

5. There are 44 people on the second bus.
There are 16 more people on the second bus than on the first bus.

Reflect

Children could make up many different problems, e.g.

I need to collect 30 stickers to complete my sticker chart. I have 16 so far. How many more do I need?

Rohan is 3 years older than Samir. Samir is 8. What is the total of their ages?

End of unit check

➜ pages 103–104

My journal

Children are most likely to have circled the part-whole diagram containing the numbers 23 and 52. Children could have justified their answer in different ways, e.g.

It is the odd one out because 23 + 52 = 75 whereas 46 + 19 and 37 + 28 both give answers of 65.

Children could have chosen a different image as the odd one out, e.g. 46 + 19 is the odd one out because not of the numbers involved include the digit 2.

Power puzzle

When using the cards 1 to 9 each pile must total 15.

There are several ways to make three unequal piles that total the same amount, e.g.

Pile 1: 9 and 6 Pile 2: 8, 4 and 3 Pile 3: 7, 5, 2 and 1

Pile 1: 8 and 7 Pile 2: 6, 5, 3 and 1 Pile 3: 9, 2 and 4

It is possible to solve the puzzle using equal piles. There are two different ways to organise the cards, although the piles can be labelled differently and the cards can be arranged in a different order in each pile:

Pile 1: 9, 5 and 1 Pile 2: 8, 4 and 3 Pile 3: 7, 6 and 2

Pile 1: 9, 4 and 2 Pile 2: 8, 6 and 1 Pile 3: 7, 5 and 3

When using the cards 2 to 10 each pile must total 18.

There are several ways to organise the cards into unequal piles, although the piles can be labelled differently and the cards can be arranged in a different order in each pile, e.g.

Pile 1: 10 and 8 Pile 2: 9, 4, 3 and 2 Pile 3: 5, 6 and 7

Pile 1: 10 and 8 Pile 2: 9, 6 and 3 Pile 3: 2, 4, 5 and 7

There are two ways to organise the cards into equal piles, although the piles can be labelled differently and the cards can be arranged in a different order in each pile:

Pile 1: 10, 6 and 2 Pile 2: 9, 5 and 4 Pile 3: 8, 7 and 3

Pile 1: 10, 5 and 3 Pile 2: 9, 7 and 2 Pile 3: 8, 6 and 4

Unit 4: Money

Counting money – coins

→ pages 105–107

1. Children should have completed the number line from left to right:
30p, 40p, 45p, 50p, 55p.
There is 55p.

2. There is 80p.
Children should have used the number line to find the total of the coins. They could have put the coins in any order, though it is generally more efficient to start with the coins of greatest value.

3. Children have been prompted to add coins along the number line using the coins of greatest value first, which would give:
0, 50p, 55p, 60p, 61p, 62p, 63p, 64p, 65p
There is 65p.

4. a) 40p
b) 82p

5. Alice will not say 19p. Children could have explained their reasoning in different ways, e.g.
Alice will count 2p, 4p, 6p, 8p, 10p, 12p, 14p, 16p, 18p and 20p so will not say 19p.
When you count in twos you say the even numbers but 19 is odd.

6. The four possible answers are:
10p, 5p, 2p, 1p gives a total of 18p
20p, 5p, 2p, 1p gives a total of 28p
20p, 10p, 2p, 1p gives a total of 33p
20p, 10p, 5p, 2p gives a total of 37p

Reflect

Children could have answered this question in different ways, e.g.

The easiest way to count the coins is to use a number line to add up the value of each coin in turn.

The easiest way to count the coins is to start with the coins of greatest value first.

Counting money - notes

→ pages 108–110

1. a) Children should have completed the number line as follows, from left to right:
£35, £40, £45, £50
There is £50.
b) There is £46.
£20, £30, £40, £46

2. Children should have circled one £20 note, two £10 notes, one £2 coin and one £1 coin.

3. a) £35
b) £24
c) £38
d) £29
e) £17
f) £35

4. £10, £8

5. It cannot be a £5 note. Children could have counted up in 2s and 10s to test which numbers they say. Alternatively, children could have explained their reasoning in words, e.g.
Jenny does not say £5 because 5 is not even so is not in the 2 times-table.

Reflect

There are many possible answers, e.g.

£10 and £10

£10, £5 and £5

£5, £5, £5 and £5

Twenty £1 coins

Ten £2 coins

£10, £2, £2, £2, £1, £1, £1, 50p and 50p

Counting money – coins and notes

→ pages 111–113

1. There is £27. There is 34p. Together there is £27 and 34p.

2. First purse has £25. Second purse has 58p. The total is £25 and 58p.

3. a) £30 and 10p
b) £32 and 21p
c) £5, 5p
d) £50, 10p

4. Children should have circled the £10 note, the £2 coin, the 20p coin and the two 5p coins.

5. Poppy and James are both incorrect. Children could have recorded their working in different ways, e.g.
The £2 coin and £1 coin together total £3. The 5p and 2p coins together total 7p. This gives £3 and 7p altogether.

Reflect

Children might explain their methods in different ways, e.g.

First, I would add together the coins with a value of £1 or more. Next, I would add together the coins with a value of less than £1. Finally, I would add the two amounts together.

Showing equal amount of money (I)

➜ pages 114–116

1. a) Children could have chosen different ways of making 75p, e.g.
50p, 20p and 5p
50p 10p, 10p, 2p, 2p and 1p
50p, 20p, 2p, 1p, 1p and 1p
b) Children could have chosen different ways of making £25, e.g.
£10, £10 and £5
£10, £5, £5, £2, £2 and £1
£10, £10, £2, £1, £1 and £1

2. Children could have completed the part-whole diagram in different ways, e.g.
10p (one part) and 10p (other part)
20p (one part) and 0 (other part)
10p (one part) and 5p, 2p, 2p and 1p (other part)

3. a) Children could have circled different coins, e.g.
10p + 1p + 1p + 1p or 5p, + 5p + 2p + 1p
b) 1p + 2p + 5p + 5p
c) There are two possible answers:
£2 + £2 + £2 + £2 + £10 + £20
£1 + £1 + £2 + £2 + £2 + £10 + £20
d) There are three possible answers:
£1 + £1 + £1 + £5 + £10 + £20
£1 + £1 + £1 + £5 + £5 + £5 + £20
£1 + £1 + £1 + £5 + £5 + £5 + £5 + £5 + £10

4. Marie uses a 20p coin and a 5p coins.
Max uses a 20p coin, a 5p coin and a 2p coin.

5. There are two possible ways to complete the problem:
Top purse: 20p, £2 and £1
Bottom purse: 5p, 5p, 5p, 5p, 5p, 10p, 20p, £1 and £1
Top purse: 20p, £1, £1 and £1
Bottom purse: 5p, 5p, 5p, 5p, 5p, 10p, 20p, £2

Reflect

The smallest number of coins needed to make 58 pence is 4 (50p + 5p + 2p + 1p). To prove this, some children might have tried out lots of different ways to make 58p. Others might have explained their reasoning in words, e.g.

To use the smallest number of coins, you need to use coins with the greatest possible value. So, to make 58p using the smallest number of coins, you will use 50p, 5p, 2p and 1p.

Showing equal amounts of money (2)

➜ pages 117–119

1. Children should have matched amounts as follows:
top left-hand set ➜ bottom right-hand set (55p)
middle left-hand set ➜ top right-hand set (£1 and 10p)
bottom left-hand set ➜ middle right-hand set (22p)

2. Children could have completed the part-whole diagrams in different ways, e.g.
2-part diagram: 20p, 20p or 10p, 20p + 5p + 5p
3-part diagram: 20p, 10p, 10p or 10p + 5p, 10p + 5p, 10p
4-part diagram: 10p, 10p, 10p, 10p or 20p, 10p, 5p, 5p

3. a) There are many possible ways, e.g. £10 + £5 or £5 + £5 + £1 +£1 +£1 + £1 + £1
b) There are many possible ways, e.g. £2 + 10p or £1 +£1 + 5p + 5p

4. I do not agree with Sarah. Children could have explained their reasoning in different ways, e.g.
The tin could have three coins in it (20p + 5p + 1p) but it could contain more than 3 coins, e.g. 4 coins (20p + 2p + 2p + 2p) or 5 coins (10p +10p + 2p + 2p + 2p)

5. Children could have written coins in any order:
20p = 10p + 10p
20p = 10p + 5p + 5p
20p = 5p + 5p + 5p + 5p
20p = 10p + 5p + 2p + 2p + 1p
20p = 10p + 2p + 2p + 2p + 2p + 2p (alternative answers are possible)
20p = 5p + 5p + 2p + 2p + 2p + 2p + 2p (alternative answers are possible)

Reflect

Children could have shown different ways of making 66p, e.g.
20p + 20p + 20p + 5p + 1p
50p + 5p + 5p + 5p + 1p
10p + 10p + 20p + 20p + 2p + 2p + 2p

Comparing amounts of money

➜ pages 120–122

1. a) Jerry has the most money.
b) Sandeep has the least money.
c) Children should have circled the left-hand wallet.

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

3. False, False, False

4. There are two possible answers that use single notes:
£20 – £10 = £5 + £5
£20 – £5 = £5 + £10
Children might give alternative answers, where the amounts could be made using notes and coins e.g.
£20 – £1 = £5 + £14

5. Children should have chosen an amount between £26 and £50 and shown how to make it using notes and coins, e.g.
£30 = £20 + £10
£35 = £20 + £10 + £5
£46 = £20 + £20 + £2 + £2 + £2

Reflect

Children could have explained their reasoning in different ways, e.g.

£10 + £2 + £2 + £1 gives a total of £15. £5 + £2 + £2 + £1 gives a total of £10. £15 is greater than £10.

Both bags contain an equal amount in coins. As well as the coins, bag 1 also includes a £10 but bag 2 includes a £5. £10 is greater than £5 so bag 1 has more money in it than bag 2.

Calculating the total amount

➜ pages 123–125

1. £58 (on bar model), £58. Ava has £58.

2. Children should have completed the bar model to show: £12 (whole) £6 (part). Peter spends £12.

3. Children should have completed the bar model, columnar addition and number sentences as follows:
Bar model: £72 (whole), £27 and £45 (parts)
Columnar addition: £27 + £45 = £72
£27 + £45 = £72
The total cost is £72.

4. Children should have drawn a bar model as follows:
£21 (whole), £7, £5 and £9 (parts)
Ali gives £21 to charity.

5. There are many different sets of objects Poppy could have bought, e.g.
One book, one notepad, one rubber, one pencil and one big sticker
Two pencil cases, two pens, three pencils and five small stickers

Reflect

Children could have written any word problem that could be represented by the calculation 27p + 14p, e.g.

I have 27p in my purse and find another 14p in my pockets. How much money do I have altogether?

Finding change

➜ pages 126–128

1. Children should have completed the bar model and number sentences as follows:
Bar model: £50 (whole), £18 (part)
£32 + £18 = £50
£50 – £32 = £18 (alternatively children could have written £50 – £18 = £32)
The change from £50 is £18.

2. Children should have completed the bar model and number sentences as follows:
Bar model: £28 (football), £37 (difference), £65 (kit)
The kit costs £37 more than the football.

3. There are 2 possible answers:
Amelia's coins were 10p, 2p, 1p, 1p (in any order)
Amelia's coins were 5p, 5p, 2p, 2p (in any order)

4. 65 + 35 = 100, 100 – 65 = 35. Li would have 35p change.

Reflect

Children could have used various methods to work out the change and explained their methods in different ways, e.g.

I would count along a number line to find the difference between 25p and 50p.

I would find the answer to 50 – 25 using a columnar subtraction.

Solving two-step word problems

➜ pages 129–131

1. Children should have completed the diagrams and number sentences as follows:
a) Bar model: £11 (whole)
£6 + £5 = £11
The total cost is £11.
b) Bar model: £11 and £9 (parts)
£20 - £11 = £9
Will gets £9 change.

2. Children should have completed the diagrams and number sentences as follows:
a) Bar model: £44 (top bar to represent cost of trainers), £14 (bottom bar on left to represent cost of football)
£14 + £30 = £44 (alternatively, children could have written £30 + £14 = £44)
The trainers cost £44.
b) The items cost £58 (£44 + £14)

3. 65p – 40p = 25p, so the drink costs 25p.
65p + 25p = 90p

4. Izzy has £12. Amin has £12 + £30 = £42. Izzy and Amin have £54 in total.

Reflect

Children could have written various second steps for this question, e.g.

Katie pays with a 50p coin. How much change will she get? Answer: 26p + 12p = 38p, 50p – 38p = 12p. Katie will get 12p change.

What coins could she use to pay exactly for the pen and pencil? Answer: 26p + 12p = 38p so Katie needs to pay 38p. One way Katie could pay is using one 20p coin, one 10p coin and four 2p coins.

End of unit check

➜ pages 132–133

My journal

It is false because 2 + 2 + 2 + 2 + 2 = 10 so the 2p coins have an equal value to the 10p coin.

Unit 5: Multiplication and division (I)

Making equal groups

➜ pages 134–136

1. There are 4 equal groups of 3 bananas.
There are 5 equal groups of 3 parcels.
There are 2 equal groups of 5 blocks.

2. Children should have matched descriptions to images as follows:
3 groups of 2 ➜ bottom image
5 groups of 5 ➜ top image
5 groups of 4 ➜ middle image

3. Children should have completed the images as follows:
a) ○○ ○○ ○○ ○○ ○○
b) ○○○○ ○○○○ ○○○○ ○○○○
c) ○○○○○ ○○○○○
d) ○ ○ ○ ○ ○ ○ ○

4. Children should have circled the following:
2nd pond from left (3 ducks instead of 2)
5th hoop from left (3 beanbags instead of 4)
right-most set of circles (4 circles instead of 1)

5. There are 3 groups of 2 children.
There are 3 groups of 4 clouds.
There are 2 groups of 3 birds.
Alternative answers are possible, e.g. There are 3 groups of 1 seesaw. There are 6 groups of 2 shoes.

Reflect

Children could have described a range of similarities and differences, e.g.

Same: Both pictures show groups of 4. Both pictures show dots.

Different: The first picture has 5 groups of 4 but the second picture has 3 groups of 4. The 4 dots are in lines in the first picture but in squares in the second picture. There are 20 dots in the first picture but 12 in the second picture.

Multiplication as equal groups

➜ pages 137–139

1. a) 4×2
$2 + 2 + 2 + 2$
b) 2×3
$3 + 3$
c) 5×1
$1 + 1 + 1 + 1 + 1$

2. a) 5×2
b) 4×3
c) 2×4

3. Children should have joined calculations to meanings as follows:
$3 + 3 + 3 + 3$ and 4×3 ➜ 4 groups of 3
$2 + 2$ and 2×2 ➜ 2 groups of 2
4×2 and $2 + 2 + 2 + 2$ ➜ 4 groups of 2

4. a) $3 + 3 + 3 + 3 = 4 \times 3$
b) $7 + 7 + 7 = 3 \times 7$
c) $5 + 5 + 5 + 5 + 5 = 5 \times 5$

5. a) $2 \times 3 = 3 + 3$
b) $2 \times 2 = 2 + 2$

Reflect

$3 + 3 + 3$ has the right multiplication partner, 3×3. Children may have described their reasoning in different ways, e.g.

$3 + 3 + 3$ is three groups of 3. Using multiplication this is written as 3×3.

$3 + 3 + 3 + 3 + 3$ shows 5 groups of 3 so does not match 6×3.

$3 + 3 + 3 + 3 + 3$ would match 5×3. Alternatively, $3 + 3 + 3 + 3 + 3 + 3$ would match 6×3.

Adding equal groups

➜ pages 140–142

1. a) $2 + 2 + 2 = 6$
$3 \times 2 = 6$
There are 6 cats in total.
b) Children should have completed four jumps of 5 along the number line and completed number sentences as follows:
$5 + 5 + 5 + 5 = 20$
$4 \times 5 = 20$
There are 20 balloons in total.

2. Children should have labelled the jumps along the number line and completed the number sentences:
a) $5 \times 5 = 25$
b) $4 \times 2 = 8$
c) $4 \times 1 = 4$

3. Children should have jumped in 10s along the number line and completed the number sentences:
$2 \times 10 = 20$ $8 \times 10 = 80$
$4 \times 10 = 40$ $7 \times 10 = 70$

4. Children should have labelled the jumps along the number line and completed the number sentences:
$6 \times 5 = 30$. There are 30 doughnuts in total.

5. $6 \times 2 > 5 \times 2$ $10 \times 2 = 5 \times 4$
$5 \times 4 = 4 \times 5$ $10 \times 3 < 10 + 10 + 10 + 10$

Reflect

The following are all possible multiplication facts for 20:

1 × 20 = 20 2 × 10 = 20 4 × 5 = 20

20 × 1 = 20 10 × 2 = 20 5 × 4 = 20

Children could jump to 20 along the number line by taking repeated jumps of 1, 2, 4, 5, 10 or 20.

Multiplication sentences

➜ pages 143–145

1. a) There are 5 groups of 2 people on tandems.
5 × 2 = 10
There are 10 people on tandems in total.
b) There are 2 groups of 4 people in balloons.
2 × 4 = 8
There are 8 people in balloons in total.
c) There are 9 people running (3 groups of 3).

2. Children should have matched multiplications to stories as follows:
5 × 3 ➜ Cost of 5 large loaves
2 × 5 ➜ Cost of 2 cakes
6 × 1 ➜ Cost of 6 rolls
5 + 5 + 5 ➜ Cost of 3 cakes
1 × 5 ➜ Cost of 1 cake

3. Children should have drawn a picture which shows 2 equal groups, each of which contains 4 objects, e.g. or 2 packets of apples, each containing 4 apples or a tray containing a 2 by 4 array of biscuits.

4. Children should have matched multiplications to pictures as follows:
6 × 3 ➜ set of 6 triangles
4 × 3 ➜ set f 4 triangles
2 × 4 ➜ set of 2 squares
3 × 6 ➜ set of 3 hexagons

5. 5 × 4 > 3 × 5. There are more cherries.

Reflect

Children could have made up different stories for the multiplications, e.g.

2 × 5: I hold up my 2 hands, showing all 5 fingers on each hand so I am showing 2 × 5 fingers. The 5 represents the number of fingers in each equal group.

5 × 2: 5 children each take off their 2 shoes and put them by the door as they go outside. There will be 5 × 2 shoes by the door. The 5 represents the number of equal groups (pairs) of shoes.

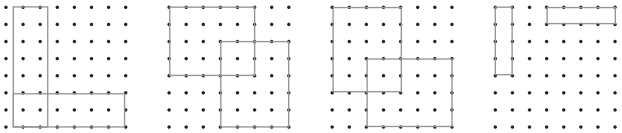
Using arrays

➜ pages 146– 148

1. a) 4 + 4 + 4 = 12
3 × 4 = 12
b) 4 + 4 + 4 + 4 + 4 + 4 = 24
6 × 4 = 24.
There are 24 tyres in the array.

2. a) 3 + 3 + 3 + 3 = 12
4 × 3 = 12
b) 10 × 2 = 20
2 × 10 = 20

3. Children will have drawn arrays as follows:
2 × 7: 2 rows and 7 columns, 2 columns and 7 rows
5 × 4: 5 rows and 4 columns, 4 columns and 5 rows
4 × 5: 4 rows and 5 columns, 5 columns and 4 rows
1 × 4: 1 row and 4 columns, 4 columns and 1 row



2 × 7 5 × 4 4 × 5 1 × 4

4. True, False

5. Children should have noticed that the 3 × 3, 4 × 4 and 5 × 5 arrays are squares. There will be 100 dots in a 10 × 10 array.

Reflect

Children should have appreciated that not all 2 × 7 arrays will look the same but that they will all share some common features.

Similarities: The arrays will all show 2 equal groups of objects in a line such that each group contains 7 objects.

Differences: Different arrays are likely to contain different objects. They are likely to have different dimensions and may be oriented in a different way.

2 times-table

➜ pages 149–151

1. a) 5 × 2 = 10
There are 10 gloves.
b) 7 × 2 = 14
There are 14 shoes.

2. a) 3 × 2 = 6
b) 4 × 2 = 8. Now there are 8 people.

3. Children should have matched the multiplications as follows:
<10: 3 × 2, 0 × 2
>10: 7 × 2, 10 × 2, 9 × 2
5 × 2 does not match to either circle because 5 × 2 is equal to 10.

4. 3 × 2 = 6
6 × 2 = 12

5. a) 8 × 3 = 12 × 2
b) 4 × 4 = 8 × 2

Reflect

Children could show 6 × 2 is 12 in many different ways, e.g.

by drawing a 6 × 2 array

by writing 2 + 2 + 2 + 2 + 2 + 2 = 12

by making 6 jumps of 2 along a number line

by drawing 6 groups of 2 objects such as 6 pairs of socks

5 times-table

➜ pages 152–154

1. 6 × 5 = 30

2. 7 × 5 = 35

3. 9 × 5 = 45

4. 5 × 5 = 25

5. a) 10
b) 25
c) 30
d) 35
e) 0
f) 55

6. 20 x 5 = 100. Children could have explained how they know in different ways, e.g.
I counted up 5 from 95 to add one more group of 5.
95 + 5 = 100

7. There are 9 possible answers:
eight 5p coins = 40p
seven 5p coins and one 10p coin = 45p
six 5p coins and two 10p coins = 50p
five 5p coins and three 10p coins = 55p
four 5p coins and four 10p coins = 60p
three 5p coins and five 10p coins = 65p
two 5p coins and six 10p coins = 70p
one 5p coin and seven 10p coins = 75p
eight 10p coins = 85p

Reflect

Children could have suggested several answers, e.g.

I can quickly work out that 5 × 6 = 30 because the answer will be the same.

I can quickly work out that 7 × 5 = 35 because the answer will be 5 more.

I can work out 12 × 5 = 60 because this is double the number of 5s.

10 times-table

➜ pages 155–157

1. a) 3 × 10 = 30. There are 30 stickers in total.
b) 6 × 10 = 60. There are 60 pencils in 6 boxes.

2. a) 5 × 10 = 50
b) 4 × 10 = 40

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

4. Children should have arranged the cards as follows:
1 × 10, 2 × 6, 3 × 5 and 5 × 3 (equal), 2 × 8, 10 × 2, 5 × 5, 4 × 10, 10 × 9

5. a) 5 × 4 = 2 × 10
b) 2 × 10 > 3 × 5 or 3 × 10 > 3 × 5 or 4 × 10 > 3 × 5
c) 2 × 3 > 0 × 10 or 3 × 3 > 0 × 10 or 4 × 3 > 0 × 10
d) The left-hand card must be 0. The right-hand cards can be any two cards from 2, 3 or 4.

Reflect

15, 75 and 99 are not in the 10 times-table. Children could have given different explanations for how they know, e.g.

I counted up in tens to 100. The other numbers were in the count but 15, 75 and 99 were not.

Numbers in the 10 times-table are made up of tens with 0 ones. This means they end in 0. 15, 75 and 99 do not end in 0 so are not in the 10 times-table.

Solving word problems – multiplication

➜ pages 158–160

1. a) 2 × 6 = 12. The tower is 12 cubes high.
b) 5 × 4 = 20. Jess has 20 balls.

2. a) There are 2 times as many light balls as dark balls.
b) 5 × 4 = 20
c) 6 × 10 = 60

3. 3 × 10 is 5 more than 5 × 5

4. Children could have drawn or written many different number stories that can be solved using the bar model, e.g.
How many wheels are there altogether on 3 cars?
There are 3 × 4 wheels, so there are 12 wheels altogether.
I have 4 stickers on my sticker chart. My sister has 3 times as many stickers as I do. How many stickers does she have?

Reflect

Children could have used different methods and explained their methods in different ways, e.g.

How many legs do 6 birds have? I drew the birds and counted the legs. I worked out 2 + 2 + 2 + 2 + 2 + 2, which gave me 12. I know that six groups of 2 is 12.

How many cubes high is Prisha's tower? I drew the towers and added 5 and 5. I worked out that 5 + 5 is 10. I knew that double 5 is 10.

End of unit check

→ pages 161–162

My journal

Children should recognise that Ajay's statement is false because both 50 and 30 are in both the 2 times-table and the 5 times-table. They could demonstrate this numerically as follows:

2 × 25 = 50
5 × 10 = 50

2 × 15 = 30
5 × 6 = 30