Unit 1 – Numbers to 10

Sorting objects

→ pages 6–8

1. a to c: Children should have sorted groups of rabbits, tortoises, bicycles, footballs, eggs and cars.

2. a and b: Children should have sorted groups of large strawberries, small strawberries, long ties and bow ties.

3. a and b: Children should have sorted groups of balloons, faces, full bottles and empty bottles.

4. Children should have circled one item in each set as follows:
a) bicycle
b) pen
c) rugby ball
d) chair – alternative answers could be justified, e.g. bicycle because the others all have 4 of something (wheels or legs).

5. Children should have sorted the objects so that every item in each set shares a common feature. There are many possible answers, e.g. animals and non-animals or objects with wings and objects without wings.

Reflect

Children should have drawn objects organised into sets so that every item in each set shares a common feature. There are many possible answers, e.g. books and furniture. If it is not clear how children have sorted objects, you may need to ask them what is the same about every object in a set.

Counting objects to 10

→ pages 9–11

1. Children should have matched 1 chalk, 4 cotton reels, 6 balloons, 8 ladybirds and 9 balls.

2. Children should have coloured counters and written the numeral as follows:
a) 8
b) 4

3. Children should have coloured apples as follows:
a) 7
b) 5

4. There are 9 keys.

5. Children could have drawn 10 in a ten frame, with cubes, with a bead string or on dice faces.

Reflect

Children could have drawn a range of representations for their chosen number, e.g. using the ten frame, a bead string, the number written as a word or a set containing that number of objects.

Counting and writing numbers to 10

→ pages 12–14

1. Children should have matched:
two bottles ➜ two counters on the ten frame
three bananas ➜ 3
five cupcakes ➜ five
seven oranges ➜ 7
eight pens ➜ eight

2. There are 6 footballs.
six
There are 3 tennis balls.
three
There are 2 rugby balls.
two

3. Children should have coloured 5 counters in the ten frame.
There are 5 pegs.
five

4. Children should have coloured:
a) 5 trees
b) 7 umbrellas
c) 0 apples

5. 4 cubes
four
4 cubes
four

6. Children should have completed the number track:

1 one	2 two	3 three	4 four	5 five	6 six	7 seven	8 eight	9 nine	10 ten

Reflect

Children should have written their chosen number in numerals and words and coloured in the corresponding number of triangles.

Counting backwards from 10 to 0

→ pages 15–17

1. Children should have completed the number tracks as follows:

a)

8	7	6	5	4	3	2	1

b)

5	4	3	2	1	0

2. Children should have completed the number tracks as follows:

a)

7	6	5	4	3	2	1	0

b)

10	9	8	7	6	5

c)

5	4	3	2	1

3. Six, five, four, three, two, one, zero

4. Children should have completed the sequences as follows:

a)

10	9	8	7	6

b)

4	3	2	1	0

c) 6 counters, 5 counters, 4 counters, 3 counters

d) 6 7 8 9 10

e)

1	2	3	4

5. Children should have completed the sequences as follows

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

Reflect

Children will have written different sequences depending on the dice roll, e.g.

Count on to 10 from your dice number: 4, 5, 6, 7, 8, 9, 10

Count back to 0 from your dice number: 4, 3, 2, 1, 0

Counting one more

➜ pages 18–20

1. a) 4 is one more than 3.
b) 9 is one more than 8.
c) One more than 7 is 8.

2. Lee has 7 flowers.

3. 8 one more ➜ 9
2 one more ➜ 3
6 one more ➜ 7

4. 8 one more ➜ 9 one more ➜ 10
7 one more ➜ 8 one more ➜ 9
6 one more ➜ 7 one more ➜ 8

5. Children are most likely to have coloured 8 counters on one ten frame and 7 on the other ten frame. However, some children might have chosen to colour 7 counters and then one more counter on the same frame in a different colour to make 8 altogether.

Children should have completed 'I can use _____ to help me work out one more' with the resources used, e.g. bead string.

Reflect

Children should have completed the top number sentence so that the number in the right-hand box is one more than the number in the left-hand box, e.g. I know that one more than 5 is 6.

Children should have completed the bottom number sentence so that the number in the left-hand box is one more than the number in the right-hand box, e.g. 10 is one more than 9.

For the last sentence a number of answers are possible, e.g. 'number beads'.

Counting one less

➜ pages 21–23

1. a) One less than 10 is 9.
One less than 1 is 0.
b) 3 is one less than 4.
8 is one less than 9.
c) 2 (counters) is one less than 3 (counters).

2. Lily has 4 sweets.

3. 10 one less ➜ 9
7 one less ➜ 6
8 one less ➜ 7

4. a) 5 is one less than 6.
b) 7 is one more than 6.

5.

one less	number	one more
7	8	9
1	2	3
3 counters	4 counters	5 counters

Reflect

Children should have held up one fewer finger than their friend, e.g. if their friend held up 4 fingers, they should have held up 3.

Children have been prompted towards understanding that if they are holding up one fewer finger than their friend, this means that their friend is holding up one more finger than they are.

Comparing groups

➜ pages 24–26

1. Children should have ticked the box next to the cup.

2. Children should have ticked the box next to the strawberry.

3. Children should have ticked the box next to the word 'No'.

4. There are more triangles than circles.
There are fewer triangles than stars.
There are 6 more stars than circles.

Reflect

There are several possible answers, e.g.

There are more circles than triangles.

There are 2 fewer triangles than circles.

Comparing numbers of objects

→ pages 27–29

1. a) 7 > 4
b) 4 < 6
c) 2 = 2
d) 10 > 8

2. a) 5 > 4
b) 2 < 5

3. a) 2 < 5
b) 6 = 6

4. a) Children should have drawn 4 or more squares and written the corresponding number into the number sentence.
b) Children should have drawn 5 squares and written 5 into the number sentence.

5. The following answers are possible: 6, 7, 8 or 9.

Reflect

Children should have ticked the box next to 'b) 4 > 3'. Children could have explained their reasoning in different ways, e.g. by drawing a line from each carrot to a different rabbit to show that there are more rabbits than carrots or by writing '4 is one more than 3.'

Comparing numbers

→ pages 30–32

1. a) 6 < 8
b) 5 = 5
c) 3 < 10

2. a) 7 = 7
b) 0 < 4
c) 6 > 5
d) 10 > 2
e) 5 < 6
f) 8 > 3

3. Children should have circled the following numbers:
a) 8
b) 2
c) 10

4. Children should have circled the following numbers:
a) 3
b) 4
c) 8

5. Children should have completed the number sentences by writing in:
any number less than 6, e.g. 2 or 5
any number less than 10, e.g. 4 or 9
any number greater than 5, e.g. 6 or 8
Children can find six different answers for the speech bubble by writing in numbers from 0–5.

Reflect

Children should have created a sequence where ongoing terms alternate between being greater than and smaller than the preceding term. There are many possible answers, e.g. 3, 5, 0, 10, 7, 8… or 0, 1, 0, 1, 0, 1…

Ordering objects and numbers

→ pages 33–35

1. Children should have circled the following:
a) box containing 8 eggs
b) dice showing 6 dots
c) ten frame containing 10 counters
d) bunch containing 7 flowers
e) 8
f) 10

2. Children should have circled the following:
a) box containing 5 oranges
b) cake with 2 candles
c) tower with 1 cube
d) 0
e) three
f) dice showing 1 dot

3. a) 5, 7, 8
b) 3, 1, 0
c) 1, 5, 9, 10
d) ten, six, five

4. Children should have written the following answers into the boxes:
a) 7
b) 2, 1 or 0
c) six or seven
d) 0, 1, 2, 3, 4, 5 or 6
c) 6 or 5 then 3, 2, 1 or 0

5. Children should have circled the tower on the right, which contains 6 small cubes.

Reflect

Children could have written 2, 7, 9 or 9, 7, 2 depending on whether they have chosen to start with the least or the greatest.

First, second, third

→ pages 36–38

1. 2nd 1st
4th 3rd

2. a) Children should have coloured the 4th counter.
b) Children should have circled the 9th (last) duck.
c) Children should have circled the first 4 books.

3. Children should have selected the square.
Children should have selected the rectangle.

4. 7 8 5 7

5. ○○△○○△○○

Reflect

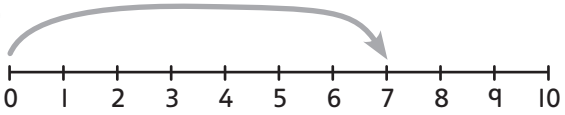
There are many possible answers. Children should have described which counters their friend coloured using ordinal numbers, e.g. second, third and fifth.

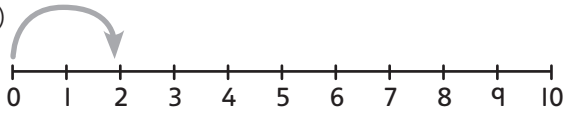
The number line

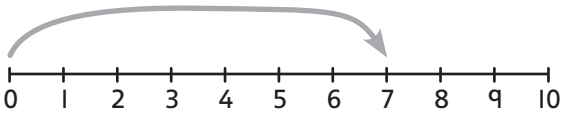
→ pages 39–41

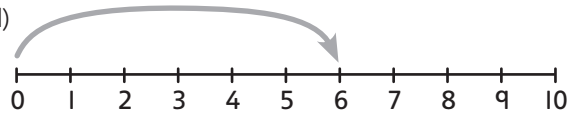
1. Answers from left to right as follows:
a) 5, 6, 7, 10
b) 0, 2, 5, 9
c) 3, 5, 8

2. Children should have drawn an arrow to the correct mark on the number line.

a)


b)


c)


d)


3. a) 7
b) 10
c) 2
d) 1

4. a) 6
b) 9
c) 0

5. a) 7
b) 4

6. 9, 8, 5, 1

Reflect

There are many possible answers, e.g.

I have learnt how to use a number line to put numbers in order.

I have learnt how to use a number line to find one less.

End of unit check

→ pages 42–43

My journal

Children should have coloured 5 balloons red and 1 balloon yellow.

Children should have coloured 3 balloons red and 3 balloons yellow.

There are many possible answers, e.g.

What is the same? Bea and Seth have the same number of balloons. Bea and Seth both have red and yellow balloons.

What is different? Bea has more red balloons than Seth. Seth has 3 yellow balloons but Bea has 1.

Unit 2 – Part-whole within 10

The part-whole model (1)

➜ pages 44–46

1. Children should have written in numbers to complete the part-whole models as follows:
a) 5, 4 (parts)
b) 8 (whole), 5 and 3 (parts)

2. Children should have drawn 1 triangle in one circle and 4 triangles in the other.

3. Children should have matched representations as follows:
top circle diagrams to the middle part-whole model
middle circle diagrams to the bottom part-whole model
bottom circle diagrams to the top part-whole model

4. Answers from left to right: 1, 4, 7

5. Children should have completed each diagram by writing in a pair of numbers that total 5. Possible pairs are: 0 and 5, 1 and 4, 2 and 3. Each pair can be presented in either order.

Reflect

The statement is false. In a part-whole model, the whole is not always the biggest number. If one of the parts is 0 then the whole will have the same value as the other part, so is not the biggest number, e.g. parts of 2 and 0 give a whole of 2.

Some children might have heard about negative numbers and might have discussed these during this activity.

The part-whole model (2)

➜ pages 47–49

1. Children should have drawn 3 pencils in one circle and 2 pencils in the other and written the numbers 3 and 2 into the part-whole model.

2. Children should have matched number sentences as follows:
3 + 3 = 6 to the third part-whole model
4 + 0 = 4 to the fourth part-whole model
6 = 2 + 4 to the first part-whole model
7 = 1 + 6 to the second part-whole model

3. a) 9 = 7 + 2 or 9 = 2 + 7
b) 6 = 2 + 4 or 6 = 4 + 2

4. Children should have completed the number sentences and part-whole models using number bonds to 5. There are many possible answers, e.g. 5 = 3 + 2, 5 = 0 + 5 or 5 = 5 + 0.

5. Children should have completed the number sentences and part-whole models using number bonds to 4. The possible answers are: 0 + 4 = 4, 1 + 3 = 4, 2 + 2 = 4, 3 + 1 = 4, 4 + 0 = 4.

Reflect

Alternatives are possible but the most likely answers are:

What is the same? 8 is the total (whole) in both number sentences.

What is different? (The parts) 5 and 3 are written different ways round.

Related facts – number bonds

➜ pages 50–52

1. Children should have written 5 and 3 (parts) and 8 (whole) into the part-whole model and completed the number sentences as follows:
a) 5 + 3 = 8 or 3 + 5 = 8
b) 8 = 5 + 3 or 8 = 3 + 5
c) 3 + 5 = 8
d) 8 = 3 + 5

2. Children should have written 7 (whole), 4 and 3 (parts) into the part-whole diagram and completed the number sentences as follows:
a) 4 + 3 = 7
b) 7 = 4 + 3
c) 3 + 4 = 7
d) 7 = 4 + 3 or 7 = 3 + 4

3. a) 4 + 2 = 6
b) 6 = 4 + 2 or 6 = 2 + 4
c) 4 + 2 = 6 or 2 + 4 = 6
d) 6 = 2 + 4 or 6 = 4 + 2

4. Children should have written 6 (whole), 3 and 3 (parts) into the part-whole model. There are only two possible addition number sentences: 6 = 3 + 3 and 3 + 3 = 6. It is possible that some children might have also written the subtraction number sentences: 6 – 3 = 3 and 3 = 6 – 3.

5. Children should have written 5 (whole), 5 and 0 (parts) into the part-whole model and written these number sentences: 5 = 0 + 5, 5 = 5 + 0, 0 + 5 = 5, 5 + 0 = 5, 5 – 0 = 5.

Reflect

There are many possible answers.

Where the parts have different values, children should have written four addition number sentences, e.g. 2 + 5 = 7, 5 + 2 = 7, 7 = 2 + 5, 7 = 5 + 2.

Where the parts have the same value, children should have written two addition number sentences, e.g. 5 + 5 = 10, 10 = 5 + 5.

It is possible that some children might include subtraction number sentences, e.g. 10 – 5 = 5 or 5 = 10 – 5.

Finding number bonds

➜ pages 53– 55

1. a) 4 = 1 + 3
b) Children should have drawn 2 white beads and completed the number sentence 4 = 2 + 2.
c) If children have continued the sequence they will have drawn 3 black beads and 1 white bead and written the number sentence 4 = 3 + 1. However, children may have chosen other number bonds to 4, i.e. 4 = 4 + 0 or 4 = 0 + 4.

2. Children should have drawn 2 black counters and 5 white counters and completed the number sentence 2 + 5 = 7.

3. The most obvious 'odd one out' is the 3rd bead string because there are 9 beads on this bead string but 8 on all the others. Alternative reasons and answers are possible, e.g. children could suggest that the 1st bead string is the odd one out because it has the same number of black and white beads whereas the others have more black beads than white beads.

4. Triangle = 0 Circle = 5

5. Aidan can write the most number sentences because there are more number facts for 5 than for 4.
Children could have explained their answer in different ways or they might have written out all possible number sentences.

Reflect

Children should have drawn beads to show different number bonds to 4. Possible number bonds are:
4 = 0 + 4, 4 = 1 + 3, 4 = 2 + 2, 4 = 3 + 1, 4 = 4 + 0.

Comparing number bonds

➜ pages 56–58

1. Children should have circled the second child and completed the part-whole models and number sentence as follows:
Top part-whole model: 4 (whole), 3 and 1 (parts)
Bottom part-whole model: 5(whole), 3 and 2 (parts)
Number sentence: 3 + 2 > 3 + 1 or 3 + 1 < 3 + 2.

2. Children should have circled the second child, drawn 4 and 5 cubes next to him, completed the part-whole models and number sentence as follows:
Top part-whole model: 8 (whole), 3 and 5 (parts)
Bottom part-whole model: 9 (whole), 4 and 5 (parts)
Number sentence: 4 + 5 > 3 + 5 or 3 + 5 < 4 + 5.

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

4. Any number greater than 5
0 or 1
3

5. The triangle can represent any number less than 5, the circle must be worth more than the triangle and the square is worth double the value of the circle.
There are many possible answers, e.g.
triangle = 2, circle = 3 and square = 6
triangle = 4, circle = 10 and square = 20.

Reflect

There are many possible answers, e.g. 2 + 0 < 3 + 5, 0 + 5 > 1 + 3 or 4 + 1 = 3 + 2.

Some children may have started to understand that number sentences that compare two non-equal amounts can be written in two ways. For example, if one child has made the expression 5 + 1 and their partner has made the expression 2 + 3, they could write 5 + 1 > 2 + 3 or 2 + 3 < 5 + 1.

End of unit check

➜ pages 59–60

My journal

There are many possible answers, e.g.

1st part-whole model
a) 10 (whole), 9 and 1 (parts)
b) 10 (whole), 6 and 4 (parts)

2nd part-whole model
a) 8 (whole), 6 and 2 (parts)
b) 9 (whole), 7 and 2 (parts)

3rd part-whole model
a) 7 (whole), 4 and 3 (parts)
b) 8 (whole), 5 and 3 (parts)

Unit 3 – Addition and subtraction within 10 (I)

Finding the whole – adding together

➜ pages 61–63

1. Children should have drawn and written answers as follows:
a) 7 dots, 7, 7
b) 7 dots, 7, 2 + 5 = 7 or 5 + 2 = 7

2. Children should have completed the part-whole models and number sentences as follows:
a) 2 and 5 (parts), 7 (whole) 2 + 5 = 7 or 5 + 2 = 7
b) 3 and 4 (parts), 7 (whole) 3 + 4 = 7 or 4 + 3 = 7
c) 6 and 1 (parts), 7 (whole) 6 + 1 = 7 or 1 + 6 = 7

3. a) 6 and 1 (parts), 7 (whole) 7 = 6 + 1 or 7 = 1 + 6
b) 6 and 2 (parts), 8 (whole) 8 = 6 + 2 or 8 = 2 + 6

4. a) Children could have written any number bonds to 9, e.g. 3 + 6, 1 + 8, 9 + 0 or 0 + 9.
b) Children could have written any number bonds to 6, e.g. 0 + 6 or 2 + 4.

Reflect

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

I can find the total by drawing a part-whole model.

I can find the total by counting the objects.

Finding the whole – adding more

➜ pages 64–66

1. a) 5 + 1 = 6
b) 5 + 3 = 8

2. a) 4 + 2 = 6
b) 1 + 6 = 7
c) 5 + 2 = 7
d) 2 + 4 = 6

3. a) 2 + 5 = 7 or 5 + 2 = 7
There are 7 balls in total.
b) 5 + 4 = 9 or 4 + 5 = 9
There are 9 counters in total.

4. When you count on from the number 5 you start with next number, which is 6. Tom started with the number 5. Children might have explained this mistake in different ways.

5. a) 9
b) 9
c) 8
d) 10

6. Children should have drawn arrows to the correct mark on the number line.
2 + 3 ➜ 5
1 + 0 ➜ 1
5 + 4 ➜ 9
4 + 6 ➜ 10
3 + 3 ➜ 6

Reflect

Children could have explained different methods, and in different ways, e.g. You can solve 2 + 8 by starting at 2 and counting on 8 or by jumping along a number line.

Finding a part

➜ pages 67–69

1. 5 (counters), 5, 2 + 5 = 7. There are 5 children in the tunnel.

2. 6 (counters), 6, 3 + 6 = 9. There are 6 people still on the minibus.

3. a) 1 dot
b) 2 dots
c) 3 dots

4. Children might have explained the mistake in different ways, e.g.
The numbers are in the wrong places in the number sentence.
The number sentence should be part + part = whole, so should say 3 + 5 = 8.

5. a) 3
b) 4
c) 1
d) 0

6. 5 = 2 + 3
5 = 3 + 2
7 + 2 = 9
7 + 1 = 8
3 + 6 = 9
5 + 4 = 9

Reflect

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

To work out 4 + ☐ = 7, I could count from 4 up to 7.

To work out 4 + ☐ = 7, I could draw a part-whole model and see how many counters I need in the second part to make 7 altogether.

Finding and making number bonds

→ pages 70–72

1. a) 6
b) 4
c) 3
d) 7

2. a) 7
b) 5
c) 4
d) 1

3. 0

4. square = 8, triangle = 2, star = 4, rhombus = 5

Reflect

There are 11 possible bonds to 10: 0 + 10 = 10, 1 + 9 = 10, 2 + 8 = 10, 3 + 7 = 10, 4 + 6 = 10, 5 + 5 = 10, 6 + 4 = 10, 7 + 3 = 10, 8 + 2 = 10, 9 + 1 = 10, 10 + 0 = 10.

Finding addition facts

→ pages 73–75

1. a) 8 + 2 = 10 and 2 + 8 = 10
b) 6 + 4 = 10 and 4 + 6 = 10

2. a) 3 + 7 = 10 or 7 + 3 = 10
b) 6 + 4 = 10 or 4 + 6 = 10
c) 8 + 2 = 10 or 2 + 8 = 10

3. Children should have joined 1 and 9, 2 and 8, 3 and 7, 4 and 6. Children might have suggested that the number 5 does not have a pair. Alternatively some children could have joined 5 to itself.

4. Children should have filled the same missing number into the part-whole model and number sentences:
a) 8
b) 7
c) 1

5. 2 + 8 = 10 or 8 + 2 = 10 or 3 + 7 = 10 or 7 + 3 = 10
3 + 2 = 5
10 = 4 + 6

6. Children could have answered in different ways but the most likely answers are:
What is the same? All pictures link to the number bond 5 + 5 = 10.
What is different? The objects are different in each picture.

Reflect

There are many possible answers, e.g.

I also know that 4 + 6 = 10.

I also know that 5 + 5 = 10.

Solving word problems – addition

→ pages 76–78

1. a) 6 hats, 4 scarves, 10 items in total. 6 + 4 = 10 or 4 + 6 = 10 with the associated part-whole model.
b) 3 children sitting, 5 children standing, 8 children in total. 3 + 5 = 8 or 5 + 3 = 8 with the associated part-whole model.

2. a) 8 + 2 = 10 There are 10 planes in total.
b) 2 + 6 = 8 There are 8 planes in total.

3. 3 + 4 = 7 or 4 + 3 = 7 2 + 7 = 9 or 7 + 2 = 9
9 is greater than 7.

Reflect

Children should have drawn 4 spiders and 5 ladybirds or 5 ladybirds and 4 spiders and used this to complete the number sentence 4 + 5 = 9.

End of unit check

→ pages 79–80

My journal

There are different possible answers, e.g.

Children might have chosen the number line because the other two images represent doubles.

Children might have chosen the part-whole model because it does not involve the number 5 as part of the associated number sentence.

Unit 4 – Addition and subtraction within 10 (2)

Subtraction – how many are left? (I)

➜ pages 81–83

1. There are 4 snowmen left.

2. Children should have crossed out 5 candles. There are 3 candles still lit.

3. a) Children should have crossed out 1 tree. There are 5 trees left.
b) Children should have crossed out 1 tree. There are 8 trees left.

4. a) 5 birds fly away. 5 birds are left.
b) 9 birds fly away. 1 bird is left.

5. 3 toy lorries are left.

6. Sparks starts with 5 balloons.

Reflect

In subtraction calculations, the answer is not **always** less. When you subtract 0 the answer is the same as the number you started with, not less, e.g. 8 – 0 = 8.

Similarly, when you subtract a negative number the answer is more than the number you started with. Some children might have heard about negative numbers and might have discussed these during this activity.

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

I can work out how many are left by crossing out objects and counting what is left.

I can work out how many are left by counting backwards along a number line.

Subtraction – how many are left (2)

➜ pages 84–86

1. Children should have crossed out 2 eggs and written: 6 – 2 = 4. There are 4 eggs left.

2. Children should have crossed out the appropriate number of counters and written answers as follows:
a) 9
b) 5
c) 3

3. Children should have written the following answers and crossed out 5 apples in the second picture:
a) 5
b) 1

4. a) 4 – 2 = 2
b) 8 – 4 = 4

5. Children should have completed images and written answers as follows:
a) 7 – 5 = 2
b) 9 – 6 = 3
c) 3
d) 4
e) 2
f) 0

Reflect

Children could have explained what the subtraction number sentence means in different ways, e.g.

5 – 2 = 3 can mean that you have to start at 5 and count back 2. The answer is 3.

5 – 2 = 3 can mean that you start with 5 objects and subtract 2, which leaves you with 3 objects.

Some children might know and use the term 'difference', e.g. 5 – 2 means that you find the difference between 5 and 2.

Subtraction – breaking apart (I)

➜ pages 87–89

1. 8 – 2 = 6. There are 6 stripy fish. Children should have written 2 and 6 (parts) into the part-whole diagram.

2. 7 are bananas. 10 – 7 = 3. There are 3 apples.

3. Children should have filled the missing numbers into the part-whole diagram and completed the subtractions as follows:
a) 1, 8 – 7 = 1
b) 5, 10 – 5 = 5

4. Children should have filled the missing numbers into the part-whole diagram and completed the subtraction as follows:

9 (whole), 3 (Tess part), 6 (Mia Part). 9 – 3 = 6

5. Children should have drawn the following numbers of dots into the part-whole diagram and completed the subtraction as follows:
a) 1, 6 – 5 = 1
b) 0, 5 – 5 = 0

Reflect

8 – 5 = 3. Children could have explained their reasoning in different ways, e.g.

8 – 5 = 3 because, when you split 8 objects into a group of 5 and another group, the other group contains 3 objects.

8 – 5 = 3 because 3 + 5 = 8.

Children should have written 3 as the missing part in all of the part-whole diagrams and have recognised that the numbers in a part-whole diagram do not change just because the orientation of the diagram has changed.

Subtraction – breaking apart (2)

➜ pages 90–92

1. a) 9 – 4 = 5. There are 5 smaller animals.
b) 9 – 6 = 3. There are 3 smaller animals.

2. 9 – 4 = 5. There are 5 white cubes.

3. 4 – 2 = 2, 10 – 5 = 5

4. Children should have completed the following:
8 (whole), 5 and 3 (parts) on the part-whole diagram
8 – 5 = 3. There are 3 bananas.

5. a) 1, 1, 1
b) 7, 7, 7

Reflect

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

The numbers have been put in the wrong places in the number sentence.

To find the missing part in a part-whole model, the number sentence is written (whole) – (one part) = (remaining part). These subtraction number sentences did not start with the whole.

Try to avoid language such as 'You cannot subtract a greater number from a smaller number' since it is possible to subtract a greater number from a smaller number (although the answer will be a negative number).

Related facts – addition and subtraction (I)

➜ pages 93–95

1. Children should have completed the number sentences and diagrams as follows:
There are 8 frogs in total. 2 are on lily pads. 6 are swimming.
Part-whole diagram: 2 and 6 (parts)
2 + 6 = 8, 6 + 2 = 8, 8 – 2 = 6, 8 – 6 = 2

2. Children should have completed the diagram and number sentences as follows:
Part-whole diagram: 10 (whole), 4 and 6 (parts)
4 + 6 = 10, 6 + 4 = 10, 10 – 6 = 4 and 10 – 4 = 6
The fact 10 – 4 shows how many paintbrushes there are.

3. 4 + 2 = 6 and 6 – 2 = 4. Children should have circled the two addition facts.

4. 3 + 3 = 6, 3 + 3 = 6, 6 – 3 = 3, 6 – 3 = 3

5. Children should have matched the calculations to the questions as follows:
2 + 5 = 7 ➜ How many horses are there in total?
7 – 5 = 2 ➜ How many galloping horses are there?
7 – 2 = 5 ➜ How many standing horses are there?

Reflect

Children should have circled the number sentence 5 – 9 = 4. The could have explained how they knew this was a mistake in different ways, e.g.

In a part-whole model, subtraction number sentences are written 'whole – part = other part' so this number sentence should start with the whole (9).

If you have a set of 5 objects, you cannot split it into a part containing 9 objects and another part.

Try to avoid language such as 'You cannot subtract a greater number from a smaller number' since it is possible to subtract a greater number from a smaller number (although the answer will be a negative number).

Related facts – addition and subtraction (2)

➜ pages 96–98

1. a) 9 (whole), 5 and 4 (parts)
b) 4 + 5 = 9
c) 9 = 5 + 4 or 9 = 4 + 5

2. 5 (whole), 4 and 1 (parts)
5 – 1 = 4 5 – 4 = 1
4 = 5 – 1 1 = 5 – 4

3. Children should have matched number sentences as follows:
How many skittles are knocked down? ➜ third pair of number sentences: 4 = 10 – 6 and 10 – 6 = 4
How many skittles are left up? ➜ second pair of number sentences: 10 – 4 = 6 and 6 = 10 – 4
How many skittles are there in total? ➜ first pair of number sentences: 4 + 6 = 10 and 10 = 4 + 6

4. There are many possible answers, e.g.
3 + 7 = 10, 7 + 3 = 10, 10 – 3 = 7, 10 – 7 = 3, 10 = 3 + 7, 10 = 7 + 3, 7 = 10 – 3, 3 = 10 – 7

5. 10 – 4 = 6 and 10 – 6 = 4, 6 = 10 – 4 and 4 = 10 – 6

Reflect

There are many possible answers.

Children could have written number facts from the same number family, e.g.

If I know 6 – 4 = 2, I also know that…6 – 2 = 4, 4 + 2 = 6 or 6 = 4 + 2.

Some children could have written facts that are related but use different numbers, e.g.

If I know 6 – 4 = 2, I also know 6 – 5 = 1.

Subtraction – counting back

➜ pages 99–101

1. 4

2. Children should have completed the number facts and matched them to number lines as follows:
10 – 6 = 4 ➜ middle number line
9 – 2 = 7 ➜ top number line
6 = 10 – 4 ➜ bottom number line

3. 7 – 5 = 2. Frog makes 5 jumps.

4. Answers from top to bottom: 5, 2, 9, 6

5. Children should have written subtraction pairs with a difference of 5, e.g. 10 – 5, 9 – 4, 8 – 3, 7 – 2, 6 – 1 and 5 – 0. Some children might have included numbers greater than 10, e.g. 15 – 10 or 16 – 1.

Reflect

Children could have identified different subtraction methods and explained them in different ways, e.g.

I could count back along a number line.

I could use an addition fact.

I could split break the whole number into parts.

Subtraction – finding the difference

➜ pages 102–104

1. 7 – 3 = 4. There are 4 more ducks than frogs.

2. a) 7 – 4 = 3. There are 3 fewer cupcakes.
b) Children should have drawn 6 cupcakes into one row of the grid and 9 biscuits into the other.
9 – 6 = 3. There are 3 fewer cupcakes.

3. There are two possible answers. Children should have drawn a tower made from 4 cubes, a tower made from 6 cubes or both.

4. Answers from top to bottom: 9, 8, 3, 0

Reflect

Answers from top to bottom: 5, 5, 5 – 5 = 0.

Children should have drawn 1 more bird on each branch so that the difference remains the same.

Solving word problems – subtraction

➜ pages 105–107

1. a) 8 – 2 = 6. 6 legs do not have socks.
b) There are 6 snails. There are 5 slugs. 6 – 5 = 1

2. Children should have matched the calculations with the questions as follows:
8 – 2 = 6 ➜ How many need hats?
8 – 3 = 5 ➜ How many need carrots?

3. a) There are 10 children in total.
5 have stripy hats. 10 – 5 = 5.
2 have plain hats. 10 – 2 = 8, 10 – 8 = 2, 7 – 5 = 2 or 5 – 2 = 3.
There are 10 children in total.
2 wear glasses. 10 – 8 = 2 or 10 – 2 = 8.
There are 2 children with glasses.
b) There are several possible answers, e.g.
There are 3 more stripy hats than plain hats.
There are 2 more children without scarves than children with scarves.

4. How many more stars without tails than stars with tails?
5 – 3 = 2
There are 2 more stars without tails than stars with tails.

Reflect

There are many different possible answers. Children could have set the problem in any context. Children could have interpreted subtraction in different ways, including counting back, breaking into parts or finding the difference, e.g.

The 10 means I am given £10 for my birthday. The –2 means that I spend £2 on toys. The 8 means that I have £8 left.

The 10 is how many goals I scored in a football match. The – 2 compares this to the 2 goals my friend scored. The 8 is how many more goals I scored than my friend.

Comparing additions and subtractions (I)

➜ pages 108–110

1. a) 5 + 2 = 7. There are 7 bikes in total.
b) 7 > 6 Yes

2. a) >
b) <
c) >

3. Answers from top to bottom:
a) >, >, <, =
b) <, =, <, >

4. Children should have matched calculations as follows:
Matched to '< 5': 9 – 5, 1 + 2, 2 + 2, 6 – 2, 6 – 3
Matched to '> 5': 2 + 5, 3 + 5, 9 – 3, 9 – 1

5. 4 + 3 > 6 is true. Children should have drawn three more cubes along the number line to prove it.

Reflect

2 + 4 < 7 4 + 4 > 7 7 > 9 – 4

Comparing additions and subtractions (2)

➜ pages 111–113

1. a) 3 + 6 = 7 + 2.
b) They are equal.

2. a) 4 + 4 < 2 + 7
b) 5 + 1 < 1 + 6

3. a) 4 + 2 > 3 + 2
b) 5 + 1 = 3 + 3
c) Children should have crossed out 3 cubes and 2 cubes and completed the number sentence 6 – 3 < 6 – 2

4. a) 7 + 5 = 5 + 7, 4 + 5 > 4 + 3, 3 + 1 < 3 + 3
b) 8 – 3 > 8 – 4, 5 – 3 > 4 – 3, 3 – 3 = 4 – 4

5. There are several possible answers:
First example: 5 – 2 > 1 + 1, 5 – 2 > 1 + 0, 5 – 2 > 0 + 1 or 5 – 2 > 0 + 0
Second example: 5 – 3 > 0 + 1, 5 – 3 > 1 + 0 or 5 – 3 > 0 + 0
Third example: any pair of numbers with a total that is greater than 9, e.g. 5 + 5 > 10 – 1 or 10 + 3 > 10 – 1
Fourth example: 1 + 0 < 10 – 8, 0 + 1 < 10 – 8 or 0 + 0 < 10 – 8

Reflect

Different answers are possible, e.g.

Number sentences involving addition: 3 + 4 = 2 + 5, 5 + 3 > 4 + 2 and 2 + 3 < 4 + 5

Number sentences involving subtraction: 5 – 3 = 4 – 2, 4 – 3 < 5 – 2 and 5 – 2 > 4 – 3

Solving word problems – addition and subtraction

➜ pages 114–116

1. Hamsa has 3 more sweets.

2. a) 3 + 5 = 8. There are 8 cubes in the cup.
b) 8 – 6 = 2. There are 2 cubes in the cup.

3. Children should have completed the calculations and matched each to a picture as follows:
3 + 2 = 5 ➜ bottom picture
8 – 3 = 5 ➜ third picture
8 = 5 + 3 ➜ second picture
4 = 7 – 3 ➜ top picture

4. square = 5, triangle = 3, circle = 2

Reflect

Children could have written questions that involve addition or subtraction, e.g.

There are 3 full glasses and 5 empty glasses. How many glasses are there altogether?

There are 3 full glasses and 5 empty glasses. How many more glasses are empty?

End of unit check

➜ pages 117–118

My journal

Marc has put some numbers in the wrong place in the calculation 3 – 6 = 3. Children could have explained the mistake in different ways, e.g.

In a part-whole model, subtraction number sentences are written 'whole – part = other part' so this number sentence should start with the whole (6).

If you have a set of 3 objects, you cannot split it into a part containing 6 objects and another part.

Try to avoid language such as 'You cannot subtract a greater number from a smaller number' since it is possible to subtract a greater number from a smaller number (although the answer will be a negative number).

Power puzzle

There are several possible answers, e.g.

2 – 0 < 4 and 5 > 1 + 3

2 – 1 < 3 and 5 > 0 + 4

5 – 4 < 3 and 2 > 1 + 0

Unit 5 – 2D and 3D shapes

Naming 3D shapes (I)

➜ pages 119–121

1. Children should have joined:
top shape on left (cube) ➜ third shape on right (cube)
second shape on left (cuboid) ➜ top shape on right (cuboid)
third shape on left (cylinder) ➜ second shape on right (cylinder)
fourth shape on left (pyramid) ➜ fourth shape on right (pyramid)
bottom shape on left (sphere) ➜ bottom shape on right (sphere)

2. Children should have circled:
a) cylinder
b) second shape from left (cuboid which is not a cube)
c) cube

3. a) There are 4 cubes.
b) There are 3 spheres.
c) There are 2 cylinders.

4. cube, cuboid, sphere, pyramid

Reflect

There are many possible answers, e.g.
cube: dice, some boxes of tissues
cuboid: most boxes of chocolates, most mirrors
sphere: balls, oranges
cylinder: tin cans, unsharpened pencils
pyramid: some chocolate boxes

Naming 3D shapes (2)

➜ pages 122–124

1. Children should have matched shapes to names as follows:
top shape ➜ pyramid
second shape from top ➜ cylinder
third shape from top ➜ cube
bottom shape ➜ cuboid
The cube (third shape from top) could also be matched to the name cuboid because all cubes are also cuboids. However, children in Y2 are unlikely to suggest this.

2. Children should have circled the second and third shapes.

3. Children should have ticked the first and third sentences.

4. Children should have matched the boxes and objects as follows:
left-hand box ➜ middle set of objects
middle box ➜ right-hand set of objects
right-hand box ➜ left-hand set of objects

5. Children should have written the letters into the hoops as follows:
pyramids: E, G
spheres and cylinders: C, D, H, I
cuboids: A, B, F, J

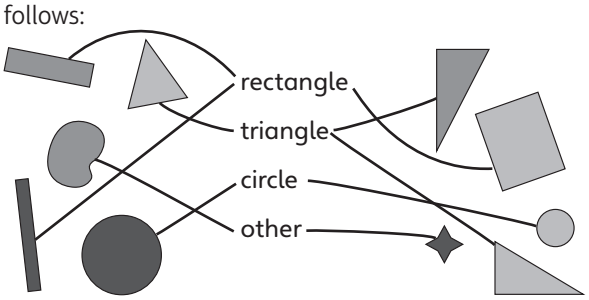
Reflect

Different answers are possible. The most likely shapes for children to name are: cube, cuboid, sphere, cylinder and pyramid.

Naming 2D shapes (I)

➜ pages 125–127

1. Children should have matched shapes to names as follows:



2. Children should have circled the following shapes:
a) 3rd shape (non-square rectangle)
b) 2nd shape (oval)
c) 3rd shape (square)
d) 4th shape (has curved side). However, other answers are possible (such as the first shape has an even number of sides) so justification should be asked for alternatives.

3. triangle circle
square triangle
rectangle

4. Children could have arranged 6 squares into a 3x2 grid, a 2x3 grid, a 1x6 grid or a 6x1 grid.

5. a) There are 7 circles.
b) The most likely answer is 5 but alternative answers are possible if the rectangles which represent the ground, sky and whole picture are included.
c) There are 10 triangles.

Reflect

circle triangle
rectangle square

Naming 2D shapes (2)

➜ pages 128–130

1. Children should have joined the 3D shape to the relevant 2D shape and completed sentences as follows:
a) The cube prints a square.
b) The cuboid prints a rectangle. Children might also say that the cuboid prints a square.
c) The pyramid prints a triangle.
d) The cone prints a circle.

2. Children should have crossed out the following 2D shapes:
Cube: non-square rectangle (right-hand shape)
Pyramid: right-angled triangle (second shape from left)

3. a) cube
b) square-based pyramid
c) circle or circular
d) circle or triangle
e) cone

4. The top shape is made from a rectangle and a triangle.
The middle shape is made from a rectangle and two circles.
The bottom shape is made from a circle and a triangle.
Children may also say a circle and three triangles.

5. The children should have matched the shape with when it was printed as follows:
rectangle ➜ first and sixth
square ➜ third
triangle ➜ fourth
circle ➜ second and fifth

Reflect

Children should have matched names and shapes as follows:
square ➜ fourth shape (2D)
cube ➜ second shape (3D)
cuboid ➜ fifth shape (3D)
rectangle ➜ third shape (2D)
triangle ➜ first shape (2D)
pyramid ➜ sixth shape (3D)

The above answers show the most likely matchings. However, the word cuboid could also be matched to the second shape since all cubes are also cuboids. Similarly, the word rectangle could also be matched to the fourth shape since all squares are also rectangles.

Making patterns with shapes

➜ pages 131–133

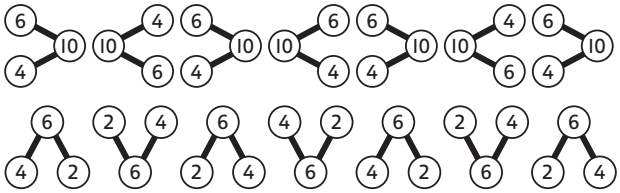
1. Children should have continued the patterns as follows:
a) large square, small square
b) square containing rectangle sloping downwards to the right, square containing rectangle sloping downwards to the left

2. Children should have circled the following:
a) middle pair of shapes
b) middle pair of shapes

3. a) The pattern has 3 repeating shapes. Children should have circled the shapes in groups of 3.
b) The pattern has 4 repeating shapes. Children should have circled the shapes in groups of 4.

4. Children should have circled the following shapes:
a) middle square
b) second triangle

5. a)



Reflect

Children could have made very different repeating patterns as they can choose the shapes they use and whether their repeating pattern involves 2 shapes, 3 shapes…

Examples might include:

square, triangle, square, triangle, square… (pattern has 2 repeating shapes)

square, square, triangle, square, square, triangle… (pattern has 3 repeating shapes)

End of unit check

➜ pages 134–135

My journal

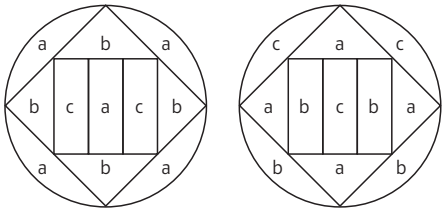
Children could have given alternative answers but should have been able to justify their choice by explaining what feature the cube shares with the rest of the group, e.g.

I put the shape in the group on the left because it is a 3D shape, not a 2D shape.

I put the shape in the group on the left because it is a dark shape, not a light shape.

Power puzzle

There are many different ways of colouring the shapes using 3 colours so that shapes with the same colour are only touching at the corner, e.g.



Unit 6 – Numbers to 20

Counting and writing numbers to 20

➜ pages 136–138

1. There are 16 eggs.

2. Children should have added counters to show 12 altogether, preferably showing this as 10 and 2.

3. thirteen, fourteen, fifteen

4. From left to right: 15, 16, 17

5. Missing numbers from left to right:
a) 12
b) 16
c) 14, 17
d) 9, 10

6. Children could have explained Anna's mistake in different ways, e.g.
The number between sixteen and fourteen is called 'fifteen'.
Anna wrote the number 'five' and then added 'teen' but this is not how you write or say 'fifteen'.

Reflect

Children could have completed their reflection in different ways, e.g.

Today I have learned to count backwards from 20 to 10.

Today I have learned how to write the word fifteen.

Tens and ones (I)

➜ pages 139–141

1. There is 1 ten and 4 ones. There are 14 sweets.

2. Children should have drawn 16 sweets into the ten frames (10 and 6). There is 1 ten and 6 ones.

3. Children should have matched:
1 ten and 2 ones ➜ middle set of ten frames
1 ten and 7 ones ➜ bottom set of ten frames
1 ten and 5 ones ➜ top set of ten frames

4. a) 16 = 1 ten and 6 ones
b) 19 = 1 ten and 9 ones
c) 10 = 1 ten and 0 ones
d) 20 = 2 tens
e) 0 tens and 7 ones = 7

5. 13 = 1 ten and 3 ones

6. There are 13 counters.

Reflect

The answer will depend on the number children have chosen, e.g.

My number (fifteen) = 1 ten and 5 ones.

My number (nine) = 0 tens and 9 ones.

Tens and ones (2)

➜ pages 142–144

1. 1 ten and 3 ones = 13. 10 + 3 = 13. There are 13 counters.

2. Children should have filled the first ten frame and drawn 2 faces into the second ten frame.
1 ten and 2 ones = 12. 10 + 2 = 12. I have 12 smiley faces.

3. a) Children should have circled 1 bundle of ten straws and 7 single straws.
b) Children should have circled 1 complete ten frame and 9 further counters.
c) Children should have drawn 11 counters into the ten frames (preferably 10 and 1).

4. Children should have matched number sentences as follows:
10 + 8 ➜ 1 ten and 8 ones
10 + 10 ➜ 2 tens
10 + 2 ➜ 1 ten and 2 ones
10 + 0 ➜ 1 ten

5. Children should have crossed off one counter in the one frame and drawn one into the other frame to show 10 + 8.

6. Children should have identified that the statement is false and corrected the number sentence to 16 = 10 + 6 or 16 = 1 ten + 6 ones.

Reflect

There are many possible answers, e.g.

15 = 10 + 5, 15 = 1 ten + 5 ones, 15 = 5 + 10, 15 = 7 + 8, 15 = 20 – 5, and fifteen.

Counting one more, one less

➜ pages 145–147

1. There are 13 cars now.

2. a) Children should have shown 18 on the number line.
b) Children should have shown 16 on the number line.

3. a) 14
b) ten
c) 20
d) 14

4. a) 13
b) Fifteen
c) 19
d) 11

5. a) less
b) more
c) more

6. There are many possible answers. The number in the right-hand box will be 2 greater than the number in the left-hand box, e.g.
One more than 7 is one less than 9.
One more than 15 is one less than 17.

Reflect

There are many possible answers. The numbers will go up by 1 from left to right, e.g.
3, 4, 5 or 19, 20, 21.

Comparing numbers of objects

➜ pages 148–150

1. Kai, 12 > 9

2. Dan, 12 > 11 or 11 < 12

3. more, less

4. There is more than one possible answer. Children should have chosen a number less than 18 and drawn that number of counters into the left-hand ten frames.

5. Children should have drawn at least 6 more sweets for Joe.

Reflect

Children could have explained how to compare numbers of objects in many different ways, e.g.

Match objects up in lines underneath each other and see which line is longer.

Count objects and check which number is greater using a number line.

Comparing numbers

➜ pages 151–153

1. a) greater than
b) less than
c) greater than
d) less than

2. 15 > 13, 17 < 19, 10 + 5 > 10 + 4

3. 18 > 16
16 < 20

4. Children could have written any number greater than 12 in the box.

5. Answers from top to bottom: 20, 12, 15

6. 12 < 13 or 13 > 12

Reflect

There are many possible answers, e.g.

1 < 5 and 10 > 8

0 < 6 and 9 > 6

Ordering objects and numbers

➜ pages 154–156

1. Children should have marked boxes from left to right as follows: ✔, blank, ✗

2. 18, 17, 16. Children should have drawn 17 counters into the middle set of ten frames.

3. 15, 12, 9

4. The smallest number is 4.
The largest number is 14.
14, 9, 4

5. 13 < 17 < 20
12 > 9 > 4

6. There are many possible answers such that Bilal has more than 14 sweets and Sam has more than Bilal, e.g.
Bilal 15, Sam 16
Bilal 20, Sam 25

Reflect

14, 16, 18 (smallest to largest) and 18, 16, 14 (largest to smallest)

End of unit check

➜ pages 157–158

My journal

The odd one out is thirteen because the other images all represent the number 15 in some way.

Power puzzle

There are many possible answers. The numbers in the left-hand column must be 9, 10 and 11 from top to bottom. The numbers in the right-hand column must be 19, 20 and 21 from top to bottom. Numbers in the middle column, from top to bottom are: any number between 9 and 19, any number between 10 and 20, any number between 11 and 21, e.g.

9 < 12 < 19
10 < 13 < 20
11 < 14 < 21
or
9 < 18 < 19
10 < 12 < 20
11 < 15 < 21