Unit 7: Addition within 20

Add by counting on

→ pages 6–8

1. Number track: 10, 11, 12, 13

8 + 5 = 13. There are 13 rabbits in the hole in total.

2. Speech bubbles: 9 pencils in the pot, 10 pencils in the pot, 11 pencils in the pot

8 + 3 = 11. There are 11 pencils in the pot now.

3. 6 + 11 = 17 or 11 + 6 = 17. There are 17 stickers altogether.

4. a) 10 + 3 = 13
b) 11 + 3 = 14
c) 4 + 8 = 12
d) 11 = 4 + 7

5. a) 19 = 3 + 16
b) 9 = 5 + 4
c) 14 + 4 = 18
d) 4 + 9 = 13

6. Number track: 9, 10, 11, 12, 13

8 + 5 = 13

Number track: 6, 7, 8, 9, 10, 11, 12, 13

5 + 8 = 13

Children should have noticed that the answers to 8 + 5 and 5 + 8 are the same. Children might have given different explanations, e.g.

I think it is because, when you add numbers, you can add them in any order and get the same answer.

Reflect

Children could have suggested different methods, e.g.

I would start at 5 and use the number line to count on 9.

I would start at 9 and add on 5 because I know that I can add numbers in any order and it will be quicker to count on 5.

I looked at the answer to 5 + 8 at the top of the page and added one more.

Adding ones

→ pages 9–11

1. 3 + 6 = 9, 13 + 6 = 19. There are 19 cards altogether.

2. 2 + 4 = 6, 12 + 4 = 16. There are 16 acorns in total.

3. a) 17
b) 16

4. a) 15
b) 17
c) 19
d) 19
e) 17
f) 15

5. a) 16, 16
b) 18, 18
c) 18, 8, 18, 8 + 11 = 19 (this number sentence follows the pattern of previous examples but children could have written an alternative addition fact for 19).

6. a) 13 + 3 = 16, 3 + 12 = 15
b) 15 = 13 + 2, 15 = 3 + 12
c) 19 = 2 + 17, 16 + 2 = 18
d) 10 + 6 = 16, 16 + 0 = 16

Reflect

Oliver: 14 + 5 = 19 and 4 + 15 = 19

Maria: Children could have written different number sentences. Following on from the lesson, children should have recognised that they can use the given fact to answer a related fact which involves a number 10 greater, giving 13 + 2 = 5 and 12 + 3 = 15. Alternatively, children may have chosen to write other closely related facts, e.g. 12 + 2 = 14 or 13 + 3 = 16.

Finding number bonds

→ pages 12–14

1. Children should have completed the diagram and number sentences as follows:

Part-whole diagram: 11, 9 (parts)

11 snails are pointy-shelled. 9 snails are round-shelled. 11 + 9 = 20

2. Children should have completed the diagram and number sentences as follows:

Part-whole diagram: 15, 5 (parts)

15 butterflies are stripy. 5 butterflies are dotty. 15 + 5 = 20

3. a) 12 + 8 = 20 or 8 + 12 = 20
b) 11 + 9 = 20 or 9 + 11 = 20
c) 3 + 14 = 17 or 14 + 3 = 17
d) 18 + 2 = 20 or 2 + 18 = 20

4. a) 6, 16
b) 2, 12
c) 4, 14

5. Children should have joined: 3 ➜ 17, 10 ➜ 10, 4 ➜ 16, 14 ➜ 6, 2 ➜ 18, 0 ➜ 20

6. Triangle = 11, star = 9, rhombus = 12, crescent = 8

Reflect

Children should have added 10 to one of the parts in the part-whole diagram to find related number facts for 20, e.g.

14 + 6 = 20, 6 + 14 = 20, 16 + 4 = 20, 4 + 16 = 20

In addition to adding 10 to one of the initial parts in the part-whole diagram, children may have chosen to adjust the numbers slightly, e.g.

15 + 5 = 20, 3 + 17 = 20

Add by making 10 (1)

→ pages 15–17

1. 8 + 2 = 10, 10 + 2 = 12, 8 + 4 = 12.

Freddie found 12 shells in total.

2. 8 + 2 = 10, 10 + 4 = 14, 8 + 6 = 14.

There are 14 beads altogether.

3. Children should have completed the diagram and number sentences as follows:

Part-whole diagram: 4 and 1 (parts)

6 + 4 = 10, 10 + 1 = 11, 6 + 5 = 11.

4. Greatest: 9 + 8 = 17 or 8 + 9 = 17. Smallest: 5 + 7 = 12 or 7 + 5 = 12

5. a) 13
   b) 11
   c) 12
   d) 15

Reflect

8 + 5 = 13.

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

First I added 2 to the 8 to make 10. This left me with 3 still to add. 10 + 3 is 13, so the answer is 13.

Some children might just have written calculations i.e. 8 + 2 = 10, 10 + 3 = 13, 8 + 5 = 13.

Some children might have used alternative methods, e.g. I counted on 5.

Add by making 10 (2)

→ pages 18–20

1. 8 + 3 = 11. There will be 11 chicks when all the eggs have hatched.

2. Children should have drawn the remaining jump of 3 onto the number line and written:

8 + 5 = 13. There are 13 slices of cake altogether.

3. Children should have completed the diagrams and number sentences as follows:
   a) Part-whole diagram: 2 and 4 (parts)
      Number line: jump on 4 from 10 to 14
      8 + 6 = 14
   b) Part-whole diagram: 3 and 4 (parts)
      Number line: jump on 4 from 10 to 14
      7 + 7 = 14

4. a) 14, 14
   b) 12, 12
   c) 18, 17
   d) 13, 14

5. 7 + 4 = 11 (Children may also have written 7 + 3 = 10 and 10 + 1 = 11.)

6. Children should have circled 6 + 6.

Reflect

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

5 + 5 = 10, 10 + 4 = 14, 5 + 9 = 14.

I started at 5 on the number line and drew a jump of 5 up to 10. 9 is 4 greater than 5 so I needed to jump 4 more, so my answer was 14.

I worked out 9 + 5 because the answer will be the same. I know 9 + 1 is 10 so 9 + 5 will be 4 more. 9 + 5 and 5 + 9 both have an answer of 14.

Some children may have used a different method, e.g.

I worked out 9 + 5 because the answer will be the same. I started at 9 and counted on 5.

Solving word problems – addition

→ pages 21–23

1. 5, 5, 5 + 5 = 10. Bella and Oscar balance 10 balls altogether.

2. 12, 5, 12 + 5 = 17. Now there are 17 children.

3. 7, 17. There are 17 counters still in the box.

4. 4 + 8 = 12 or 12 + 8 = 4. 12 > 10. There are 12 windows.
Children may also find other stories, e.g.
(window panes) 16 + 16 = 32
(legs on the roofs) 10 + 10 = 20

5. a) and b): 5 + 7 = 12 or 12 + 5 = 12. There are 12
counters. 6 + 6 = 12. There are 12 dots.

Reflect

Children could have made up a story in any context, e.g.

There are 8 cars in the school car park and then 7 more
arrive. How many cars are there in the car park now?

Amy has scored 8 goals this netball season. Ali has
scored 7 more goals than Amy. How many goals has Ali
scored?

End of unit check

→ **pages 24–25**

My journal

Star = 3
Triangle = 17
Square = 18.

Power puzzle

15 + 5 = 20

15 + 4 = 19

10 + 3 = 13

3 + 13 = 16

10 + 5 = 15

5 + 13 = 18

Unit 8: Subtraction within 20

Subtracting ones

→ pages 26–28

1. 15 − 4 = 11. There are 11 glasses of milk left.

2. 18 − 5 = 13. There are 13 bananas left.

3. a) 14
   b) 10
   c) 3

4. a) 4, 14
   b) 4, 4
   c) 5, 15
   d) 5, 18

5. triangle = 17, square = 7, circle = 10

Reflect

There are 4 possible answers:

9 − 3 = 6 and 19 − 3 = 16

8 − 2 = 6 and 18 − 2 = 16

7 − 1 = 6 and 17 − 1 = 16

6 − 0 = 6 and 16 − 0 = 16

Children could have explained how they used the first number sentence to work out the second one in different ways, e.g.

I added 10 to the first number so the answer is 10 greater.

16 is 10 + 6. The digit 1 has already been written into the box to show 1 ten, so the ones digits have to have a difference of 6. This means I can use the same digits that are in the first number sentence.

Subtracting tens and ones

→ pages 29–31

1. 16 − 10 = 6, 6 − 4 = 2 so 16 − 14 = 2. There are 2 sticks left.

2. Children should have completed the part-whole diagram and number sentences as follows:
   a) Part-whole diagram: 10, 2 (parts)
      17 − 10 = 7, 7 − 2 = 5 (alternatively, some children might have subtracted 2 then 10). So 17 − 12 = 5.
   b) Part-whole diagram: 10, 1 (parts)
      19 − 10 = 9, 9 − 1 = 8 (alternatively, some children might have subtracted 1 then 10). So 19 − 11 = 8.

3. a) 1, 11, 1
   b) 4, 4, 14

4. Children should have completed the number facts and matched them as follows:
   18 − 3   ➜ 15
   18 − 13 ➜ 5
   19 − 14 ➜ 5
   9 − 4   ➜ 5
   16 − 1   ➜ 15
   17 − 2   ➜ 15

5. There are two possible answers. The card could be 18 or 12.

Reflect

17 − 13 = 4

Children could have described different methods, e.g.

I subtracted 10 to give 7 and then another 4 to give 3.

17 − 3 = 14, 14 − 10 = 4 so 17 − 13 = 4.

I used a number line to find the difference.

Subtraction – crossing the 10 (1)

→ pages 32–34

1. 13 − 3 = 10, 10 − 2 = 8 so 13 − 5 = 8. There are 8 butterflies left.

2. Part-whole diagram: 2 and 6 (parts)

   12 − 2 = 10, 10 − 6 = 4 so 12 − 8 = 4. There are 4 eggs left.

3. Children should have completed the part-whole diagram and number sentences as follows to use the 'crossing the 10' method:
   a) Part-whole diagram: 9 (whole), 5 and 4 (parts)
      15 − 5 = 10, 10 − 4 = 6 so 15 − 9 = 6.
   b) Part-whole diagram: 6 (whole), 1 and 5 (parts)
      11 − 1 = 10, 10 − 5 = 5 so 11 − 6 = 5.
   c) Part-whole diagram: 8 (whole), 7 and 1 (parts)
      17 − 7 = 10, 10 − 1 = 9 so 17 − 8 = 9.

4. Part-whole diagram: 3 (whole), 2 and 1 (parts). Raz gave 9 balls away.

   Children could have used different methods for this problem, e.g.

   They could have completed the part-whole diagram with 12 (whole), 3 and 9 (parts) to give the answer 9.

   They could have completed the part-whole diagram with 10 (whole), 1 and 9 (parts), to give the answer 9.

5. a) 8
   b) 17

Reflect

Children might have given different advice to Harry, e.g.

It will be quicker if you start by subtracting 3 to get an answer of 10. You need to subtract 3 more so the answer will be 7.

Try to use number bonds you know. If you partition 6 into 3 and 3, this gives 13 − 3 = 10. You can then use bonds to 10 to work out the next step (10 − 3 = 7).

Use a number line to help.

Subtraction – crossing the 10 (2)

→ **pages 35–37**

1. 15 − 5 = 10, 10 − 2 = 8. So 15 − 7 = 8. Tim has 8 strawberries left.

2. Part-whole diagram: 4 and 1 (parts)

   14 − 4 = 10, 10 − 1 = 9. So 14 − 5 = 9. There are 9 girls.

3. a) Part-whole diagram: 9 (whole), 7 and 2 (parts)
   Number line: jump back 7, from 17 to 10, and then jump back 2, from 10 to 8.
   17 − 7 = 10, 10 − 2 = 8. So 17 − 9 = 8.
   b) Part-whole diagram: 8 (whole), 1 and 7 (parts)
   Number line: jump back 1, from 11 to 10, and then jump back 7, from 10 to 3.
   11 − 1 = 10, 10 − 7 = 3. So 11 − 8 = 3.
   c) 8
   d) 4

4. 13 − 8

5. a) 14
   b) 18
   c) 8
   d) 10
   e) 0
   f) 7

Reflect

Children should have worked out the answers to the four calculations and then matched calculations that give the same answer, i.e.

15 − 2 = 13 matched to 20 − 7 = 13

17 − 12 = 5 matched to 12 − 7 = 5

Children could have used different strategies to work out the subtractions, e.g.

For 15 − 2: counted back in ones or used known fact 5 − 2 = 3 to derive 15 − 2 is 13.

For 20 − 7: counted back in ones or used known fact 10 − 7 = 3 to derive 20 − 7 is 13.

For 17 − 12: subtracted 10 then 2 or subtracted 7 then 5.

For 12 − 7: subtracted 2 then 5 or counted back in ones.

Some children could have started to see relationships between matched calculations such as 15 − 2 and 20 − 7: 20 is 5 greater than 15 and 7 is 5 greater than 2, this means that the difference between 15 and 2 is the same as the difference between 20 and 7.

Solving word and picture problems – subtraction

→ **pages 38–40**

1. a) 17 − 4 = 13. Fred has 13 packets of crisps left.
   b) Children could have partitioned the 14 in different ways to subtract it, e.g.
   18 − 10 = 8, 8 − 4 = 4. So 18 − 14 = 4.
   18 − 8 = 10, 10 − 6 = 4. So 18 − 14 = 4.
   There are 4 red counters.

2. 12 − 5 = 7. Max has not read 7 books.

3. a) 19 − 12 = 7. Abe runs 7 more laps than Tom.
   b) 19 − 8 = 11. Lea runs 11 fewer laps than Abe.

4. 14 − 6 = 8. There are 8 more hearts than balloons.

5. 13

Reflect

Children could have made up different stories based on the picture, e.g.

There are 11 cats and 5 mice. How many more cats are there than mice? 11 − 5 = 6

Each cat catches a mouse. How many mice are left? 11 − 5 = 6

Addition and subtraction facts to 20

→ **pages 41–43**

1. a) 16 + 4 = 20, 4 + 16 = 20
   b) 8 + 12 = 20, 12 + 8 = 20

2. Children should have written the following facts:

   15 + 5 = 20, 5 + 15 = 20, 20 − 5 = 15, 20 − 15 = 5

3. Children should have written the following facts:

   20 = 11 + 9, 20 = 9 + 11, 11 = 20 − 9, 9 = 20 − 11

4. a) The rabbit has to jump 9.
   b) The frog was on 9.

5. a) 13
   b) 15
   c) 10
   d) 8
   e) 6

Reflect

Children could have chosen any number family for 20. They should have written at least 2 addition number facts and 2 subtraction number facts but may have included more if they used different formats, e.g.

3 + 17 = 20, 17 + 3 = 20, 20 − 3 = 17, 20 − 17 = 3

18 + 2 = 20, 2 + 18 = 20, 20 = 18 + 2, 20 = 2 + 18,

20 − 18 = 2, 20 − 2 = 18, 18 = 20 − 2, 2 = 20 − 18

If children chose to shade 10 squares, this gives fewer facts:

10 + 10 = 20 (and 20 = 10 + 10), 20 − 10 = 10 (and 10 = 20 − 10)

Comparing additions and subtractions

1. a) Children should have matched the diagrams and sentences as follows:
 1st diagram → 10 + 3
 2nd diagram → 11 + 1
 3rd diagram → 11 + 3
 4th diagram → 11 + 2
 b) 11 + 3 > 12   11 + 3 > 11 + 1
 11 + 1 < 11 + 2   11 + 2 = 10 + 3

2. a) 12 + 6 > 17   11 + 5 < 17
 13 + 4 = 17   12 + 4 < 17
 b) Children should have completed the number sentences as follows:
 12 + 5 < any number greater than 17,
 e.g. 12 + 5 < 18, 12 + 5 < 20
 12 + 5 > any number less than 17,
 e.g. 12 + 5 > 16, 12 + 5 > 2

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

4. a) any number greater than 11
 b) any number less than 13
 c) any number less than 5

5. 3, 2, 2

Reflect

Children could have given different explanations, either through showing the answer to each calculation or using other reasoning, e.g.

6 + 5 = 11, 6 + 8 = 14 and 11 < 14

8 is greater than 5, so if you add 8 to 6 your answer will be greater than if you add 5 to 6.

Solving word and picture problems – addition and subtraction

1. 12 + 6 = 18 or 6 + 12 = 18. Ellie has 18 pieces of fruit altogether.

2. 18 − 11 = 7. Brad has 7 more stars than Shelley.

3. a) 8 + 5 = 13. There are 13 bees.
 b) 14 − 6 = 8. There are 8 slices of cake.

4. 11 − 7 = 4. 4 seeds do not grow.

5. Gino has the most balloons.

 Children might have explained their reasoning differently, e.g.

 6 + 9 = 15 and 15 < 16

 Jane has 15 balloons but Gino has 16.

Reflect

7 + 8 = 15, 15 − 3 = 12.

Children could have written or drawn many different stories for the calculations, e.g.

Sam is 7. His sister Megan is 8 years older. How old is Megan?

My aunt gave me £15 for my birthday. I spent £3. How much do I have left?

I am doing a sponsored walk of 15 laps around the school field. I have completed 3 laps. How many laps do I still have to walk?

End of unit check

My journal

Sample answers include:

I notice that when there are ten more, the 1s do not change. This would be the case for any number from 0 to 10.

I notice that when I subtract the same number from 10 and 20, the 1s in the answers are the same. This is always the case for any number from 0 to 10.

Power puzzle

Yellow: 18 − 3 = 15, 19 − 7 = 12, 17 − 2 = 15, 15 − 6 = 9, 14 − 2 = 12, 16 − 7 = 9

Red: 12 − 6 = 6, 13 − 8 = 5, 14 − 8 = 6, 20 − 14 = 6, 11 − 10 = 1, 19 − 12 = 7, 20 − 13 = 7

Red makes a path from start to finish.

Unit 9: Numbers to 50
Counting to 50 (1)

1. There are 27 bricks.

2. Missing numbers from left to right as follows:
   a) 23, 24, 25
   b) 49, 46, 44
   c) 19, 20, 22, 23
   d) 37, 40, 41
   e) seventeen, twenty

3. Missing numbers from left to right as follows:

   17, 19, 20

   41, 42, 44

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

   The number after 39 should be 40.

   You cannot write 10 in the ones column, or 30 in the tens column. 10 ones should be regrouped into 1 ten and put with the 3 tens to make 4 tens. This is written as 40 or forty.

5. Children should have drawn in another 5 circles.

Reflect

Children should have chosen one of the numbers and counted up to fifty and back down to 0.

The most challenging sections of the count are likely to be counting from 10 to 20 and counting over tens boundaries.

Some children may demonstrate confusion between 'teen' and 'ty' numbers.

Children are likely to find counting backwards more challenging than counting forwards as they will probably have had less experience in doing so.

Counting to 50 (2)

1. a) 45, 44, 43 (in any order)
   b) The pond covers the number 35.

2. The missing numbers are: 33, 34, 35, 36. (children may also include 32 and 37 in their list, as these numbers are obscured by the frog and the lily pad.)

3. The missing numbers are: 12, 13, 14 and 34, 35, 36, 37, 38, 39.

4. a) The dark counter is covering 28 and the light counter is covering 37.
   b) The dark counter needs to move 9 spaces to catch the light counter.

5. Children should have drawn a route round the left hand side of the map. Children could have explained how they found the route in different ways, e.g.

   I saw the number at the start was 48 so I counted backwards from 48 to find the right way to go.

   I tried different routes and then checked the count each time to see if it was right.

Reflect

Children should have said the following counts out loud:

19, 20, 21, 22, 23, 24, 25, 26, 27, 28

43, 42, 41, 40, 39, 38, 37, 36, 35 34, 33, 32

Tens and ones

1. a) 24
   b) 29
   c) 40

2. a) 4 tens 7 ones. The number is 47.
   b) 3 tens 0 ones. The number is 30.

3. Children should have drawn counters into the ten frames as follows:
   a) 2 full ten frames and 9 counters in the third frame.
   b) 2 full ten frames and 4 counters in the third frame.

4. Children should have completed the table as follows:

   2nd row: 4 tens and 6 ones, 46

   3rd row: 3 tens and 2 ones (drawn), 32

   4th row: 4 tens (draw), 4 tens and 0 ones (written)

5. Children should have completed diagrams as follows:

   Tens frames: draw 7 counters

   Tens and ones blocks: draw 4 ten sticks

   They are both making the number 47.

Reflect

Children could have chosen any number and changed the number of tens in any way. They should have noticed that, when you change the number of tens, the tens digit changes but the ones digit remains the same.

Representing numbers to 50

1. Children should have matched pictures to diagrams as follows:

   Top picture (24 in ten frames) ➜ second part-whole diagram (24)

Second picture (42 in tens and ones blocks) ➜ bottom part-whole diagram (42)

Third picture (14 on a bead string) ➜ top part-whole diagram (14)

Bottom picture (43 in tens and ones blocks) ➜ third part-whole diagram (43)

2. Children should have completed the part-whole diagrams as follows:
   a) Left-hand diagram: 2 tens and 9 ones (parts)
      right-hand diagram: 29 (whole)
   b) Left-hand diagram: 3 tens and 3 ones (parts), 33 (whole)
      right-hand diagram: 33 (whole), 30 and 3 (parts)

3. Children should have drawn 10 counters in each of the first two ten frames and then 2 counters in the remaining ten frame.

4. a) 47 (whole)
   b) 30 (part)

5. Riley is not correct. Children could have explained how they knew in different ways, e.g.

   46 is made up of 4 tens and 6 ones. Riley has written 4, which is not the same as 4 tens. He needs to write 4 tens and 6 ones or 40 and 6.

   4 and 6 added together do not make 46.

Reflect

There are 12 possible answers: 12, 13, 14, 23, 24, 34, 21, 31, 41, 32, 42, 43. Children should have written their chosen number in a part-whole diagram, e.g.

12 (whole), 10 and 2 (parts) or 1 ten and 2 ones (parts)

34 (whole), 30 and 4 (parts) or 3 tens and 4 ones (parts)

42 (whole), 40 and 2 (parts) or 4 tens and 2 ones (parts)

Comparing numbers of objects

➜ pages 64–66

1. a) Children should have circled the top child.
   b) Children should have circled the top hen.

2. a) <
   b) >

3. Top row: < (Alternatively, children could have drawn 1 more counter in the left-hand diagram and written an = sign.)

   Bottom row: Children should have drawn at least 6 counters into the right-hand ten frame.

4. a) Children should have circled the right-hand child.
   b) Children should have circled the right-hand child.

5. Children should have drawn counters into the diagrams as follows:

   Top diagram: children should have added more counters on the left-hand diagram than on the right-hand diagram, e.g. 33 > 32, 40 > 32, 38 > 35, 40 > 39

   There are 8 + 7 + 6 + 5 + 4 + 3 + 2 + 1, i.e. 36 ways of completing the diagram.

   Bottom diagram: children should have added at least six more counters on the right-hand diagram than on the left-hand diagram, e.g. 45 < 46, 45 < 48, 47 < 49, 49 < 50

   There are 5 + 4 + 3 + 2 + 1, i.e. 15 ways of completing the diagram.

Reflect

Children's answers will vary depending on the number of counters or cubes picked. Children might have checked who took more in different ways, e.g.

They could have counted the number of counters in each set and compared these two numbers to see which is greater.

They could have organised the counters in each set into tens and ones to compare them.

They could have placed the objects in each set in a line, lining objects up underneath each other to compare them.

Comparing numbers

➜ pages 67–69

1. 24 > 19 (or 19 < 24). Erjot has more points.

2. Children should have circled:
   a) 39
   b) 21
   c) 20

3. a) <
   b) <
   c) =

4. There are 4 possible answers: 31, 34, 41 and 43.

5. Children should have circled the following numbers:
   a) 24, 16, 37, 18
   b) 4, 14, 23

6. Any number from 1 to 23, excluding 17, 18 and 20.

Reflect

The number could be 23, 24, 25, 26 and 27.

Children should have been able to recognise and explain whether their number is greater or smaller than another given number, using appropriate vocabulary. They should also be able to use clues to identify their partner's number.

Ordering objects and numbers

1. a) 25 > 22 or 22 < 25. Suki has more sweets.
   b) Suki has the most sweets. Shaan has the least sweets.

2. Children should have drawn an arrow to the correct number on the number line:
   a) 32, 28, 35
   b) 28, 32, 35

3. a) 23 < 25 < 32
   b) 27, 24, 19, 17

4. Children should have circled 39 or 40.

5. a) Star and triangle can be any pair of numbers between 20 and 26 such that star > triangle, e.g.

   star = 22 and triangle = 21, star = 25 and triangle = 21, star = 24 and triangle = 22.
   b) Children should have disagreed with Jo. The two numbers chosen satisfy the first two number sentences but not the third one. Children could have explained their reasoning in different ways, e.g.

   The star must be greater than the triangle but 19 is smaller than 30, so Jo is not correct.
   19 < 26 and 30 > 20 but 19 is not greater than 30.

Reflect

Children could have put any number between 29 and 36 into the number sentence as the number must be both greater than 29 and smaller than 36. Using whole numbers only, this gives 6 possible answers: 30, 31, 32, 33, 34 and 35.

Counting in 2s

1. There are 16 wheels.

2. Children should have drawn counters in the ten frames for the following numbers: 8 and 10.

3. a) There are 20 socks in total.
   b) There are 7 pairs of socks.

4. Missing numbers from left to right as follows:
   a) 6, 8
   b) 14, 12, 10, 8
   c) 26, 20, 18
   d) 24, 26, 28, 32, 34, 36, 38 or 36, 34, 32, 28, 26, 24, 22

5. a) What number did Sami start on? 12. What is the last number Sami says? 22.
   b) No

Reflect

Counting up in 2s from 20 to 50 and then down in 2s to 0 should have helped children notice the pattern in the ones digits, i.e. that the count ends in 0, 2, 4, 6, 8, 0, 2… when counting on and 0, 8, 6, 4, 2, 0, 8… when counting back.

This should have helped them to identify that, if they say a number that ends in 1, 3, 5, 7 or 9 (an odd number) then they have made a mistake.

Counting in 5s

1. a) There are 30 dots altogether.
   b) There are 25 apples altogether.

2. a) There are 40 bananas altogether.
   b) There are 45 bananas in 9 bunches.

3. Missing numbers from left to right as follows:

   Top row: 3, 6

   Bottom row: 10, 25

4. Missing numbers from left to right as follows:
   a) 0, 15, 20, 25
   b) 15, 10, 5
   c) 25, 30, 40, 45
   d) 15, 20, 30, 35, 40, 45 and 35, 30, 20, 15, 10, 5

5. No. Children could have explained their answer in different ways, e.g.

   When you count in 5s from 15, every answer ends in 5 or 0 so Alisha will not say 32.

   Alisha will count 20, 25, 30, 35… The count misses out the number 32.

Reflect

Children may practise counting in 5s to say how many fingers the others are holding up altogether. Where children guess how many fingers the others are holding up, their growing understanding of the pattern in the end digits when you count in 5s from 0 should be evident in their guess i.e. they should guess a number that ends in 5 or 0.

Some children may start to use what other children in the group have said to inform their guess, e.g. Tyler said 20 and I am showing the same number of fingers as Tyler, so I am going to guess 20 too.

Solving word problems – addition and subtraction (I)

→ **pages 79–81**

1. Children should have drawn 5 counters and 7 counters into the ten frames and written: 5 + 7 = 12 or 7 + 5 = 12.

2. a) 9
b) 8

3. a) 9 + 6 = 15 and 6 + 9 = 15
b) 7 + 8 = 15 and 8 + 7 = 15

4. a) 7 + 6 = 13 or 6 + 7 = 13
b) 19 − 13 = 6

5. 11 − 5 = 6. Astrid is correct. Children could have explained their reasoning in different ways, e.g.

11 − 5 = 6 and 5 + 6 = 11 are facts in the same number family and so you can use one fact to help you answer the other.

To find 11 − 5 you need to find the difference between 5 and 11. The number fact 5 + 6 = 11 tells you that the difference between 5 and 11 is 6 because this is the number you would have to add on to 5 to get 11. This means the answer to 11 − 5 is 6.

Reflect

Children could have made up different addition and subtraction sentences from this context, e.g.

Addition:

How many cookies do they have altogether?

Aman gives Ivy 2 of his cookies. How many cookies does Ivy have now?

Subtraction:

How many fewer cookies does Ivy have?

Aman gives Ivy 2 of his cookies. How many cookies does Aman have now?

Solving word problems – addition and subtraction (2)

→ **pages 82–84**

1. a) 11 − 4 = 7
b) 8 + 11 = 19 or 11 + 8 = 19

2. a) 8 − 4 = 4
b) 17 − 12 = 5
c) This shows the total number of sheep.

3. Children should have matched the problems to the number sentences as follows:

How many fewer birds are there than frogs?
➜ 21 − 11 = 10

How many more frogs are in the pond than on the ground? ➜ 14 − 7 = 7

How many animals are there in the barn?
➜ 8 + 11 = 19

4. Children could have drawn any picture that could represent the number sentence 7 + 7, e.g.

Two sets of objects, each containing 7 objects

A set of 7 objects with 7 more added

A diagram showing 7 + 7, such as the part-whole diagram with 7 and 7 (parts) and 14 (whole)

Reflect

Children could have written many different questions from this context, e.g.

How many fewer sheep are in the field than in the barn? 7

How many animals are in the picture altogether? 47

End of unit check

→ **pages 85–86**

My journal

32 shown clearly (e.g. using Base 10 equipment, place value counters, ten frames, part-whole model)

Some might draw 32 objects in no particular order.

Inequality completed using a number below and a number above 32, e.g.

29 < 32 < 35

3 tens, 2 ones

Power play

Any number from 21 to 49 shown in 10s and 1s, e.g. using Base 10 equipment, ten frames, bead strings. Some children may also make 20 or 50, though these are not strictly in the range.

Unit 10: Introducing length and height
Comparing lengths and heights

→ pages 87–89

1. Children should have ticked the following:
a) Left-hand tree
b) Stretch limo

2. a) shorter, longer
b) longer, shorter

3. There are many different possible answers.

4. a) taller
b) shorter
c) taller or longer

5. There are many different possible ways to draw answers.

Reflect

Children could have explained how they would compare who is taller in different ways, e.g.

I would get people to stand back to back so I could see who is taller.

I would ask people to stand against a wall and make a mark at the top of their head then see whose mark is higher up the wall.

Some children might suggest using a measuring instruments such as a tape measure.

Non-standard units of measure (1)

→ pages 90–92

1. a) 6
b) 7
c) 4, 6

2. a) About 5 (though children's estimates will vary)
b) About 7 (though children's estimates will vary)

3. Children should have:
a) extended the spring so that it is 8 cubes long.
b) drawn something on top of the bear, e.g. a hat, so that it makes the picture 5 cubes tall altogether.

4. Children should have drawn:
a) a person who is 3 cubes tall. Children are likely to have added 2 cubes to the picture to make a tower of 3.
b) a worm that is 5 cubes long. Children are likely to have added 4 cubes to the picture to make a horizontal line of 5.

5. 14

Reflect

Children will explain how they measure an object with cubes in different ways, e.g.

I stood the object on the ground and put a tower of cubes next to it. I counted how many cubes it took to reach the top of the object.

I made a long line of cubes that started and ended at the same level as the object and then counted how many cubes were in it.

Non-standard units of measure (2)

→ pages 93–95

1. a) 22
b) 5

2. a) 15
b) 5

3. a) About 2, about 3 (although children's estimates may vary)
b) Children could have given different answers as long as they were able to explain their reasoning, e.g. The footstep because you can be more accurate at measuring different distances using shorter units. The tape because you can cut other pieces of tape the same length and easily put them end to end which makes it easy to measure distances on any surface.

4. a) About 4, about 2 (though children's estimates may vary)
b) About 2, about 1 (though children's estimates may vary)
c) The baseball bat is longer.

Reflect

Children will have chosen different tools to measure their friend's height, e.g.

I chose my hand because it was easy to use. My friend is 12 hand-spans tall.

I chose a book because it was quite long. My friend is 7 books tall.

Measuring length using a ruler

→ pages 96–98

1. a) 11
b) 8
c) 15 (or 14 if they chose not to count the roots)

2. Children should have completed the drawing of the pencil so that it ended at the measurement:
a) 8 cm
b) 14 cm

3. Children should have matched drawings to lengths as follows:

giraffe ➜ 7 cm, monkey ➜ 3 cm, elephant ➜ 5cm

4. 6, 4

5. Children should have known how to use a ruler correctly to draw a house that is 8 cm long and 4 cm tall.

Reflect

Children could have explained how they used a ruler in different ways but they should ideally mention how they positioned the ruler next to the strip of paper so that one edge of the paper lined up with the 0 mark on the ruler, e.g.

I put the strip next to the ruler so that the start of the strip lined up with the 0 on the ruler. I looked along the ruler to see where the end of the strip was.

I put the ruler alongside the strip of paper so that the 0 on the ruler was at the start of the paper. I looked at the measurement where the paper ended to find its length.

Solving word problems - length

→ **pages 99–100**

1. a) 6
b) 12

2. 12 cm

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

Nat is wrong because the string is not straight.

Nat is wrong. You need to pull the string straight alongside the ruler to measure it.

4. Different answers are possible, e.g.
1 cm + 9 cm = 10 cm
3 cm + 7 cm = 10 cm

5. 0

Reflect

Children could have explained different methods to compare the lengths of the pencils, e.g.

I can see that the top pencil is shorter than the bottom pencil.

The top pencil reaches from 0 cm to 5 cm on the ruler so it is 5 cm long. The bottom pencil reaches from 3 cm to 9 cm on the ruler so it is 6 cm long. This means that the top pencil is shorter than the bottom one.

End of unit check

→ **pages 101–102**

My journal

Children should have explained their choice with reference to the fact that one of the strings is not taut, e.g.

I chose the top [grey/plain] string because it is not stretched out and it ends at the same place as the bottom [spotty/stripy] string. If I stretched it out like the bottom string it would be longer.

Power play

Check the children's measurements and counting.

Unit II: Introducing weight and volume
Comparing weight

→ **pages 104–106**

1. Children should have circled the following:
   a) The shoe
   b) The shoe
   c) The middle set of scales

2. Children should have circled the feather and the balloon. (Children could also have circled the car, lorry and tractor if they thought they represented toys rather than real vehicles.)

3. a) <
   b) <
   c) >

4. Children should have drawn lines joining the animals to the side of the seesaw as follows:
   a) As shown in the example
   b) zebra ➜ left-hand side (heavier), hedgehog ➜ right-hand side (lighter)
   c) camel ➜ right-hand side (heavier), mouse ➜ left-hand side (lighter)
   b) giraffe ➜ right-hand side (heavier), cat ➜ left-hand side (lighter)

5. Children should have labelled the sacks from left to right as follows:

   square, rhombus, circle, triangle

Reflect

The book is heavier than the pen. The pen is lighter than the book.

Children should have explained that, on balance scales, the side containing the heavier item(s) will be lower than the side containing the lighter item(s).

Measuring weight

→ **pages 107–109**

1. 8, 20, 6

2. Children should have completed the table as follows:

Teddy	6
Boot	20 (pictures show it is the only object which weighs more than 15 cubes)
Book	15
Ball	10

3. 5 + 8 = 13 or 8 + 5 = 13

   13 marbles are needed.

4. Alternative answers are possible where children have chosen to place cubes on both sides of the scales but the following answers assume children have only placed cubes on one side:

   8 cubes in right pan   5 cubes in right pan

   6 cubes in left pan   3 cubes in left pan (with the cube)

5. Children should have circled the right-hand drawing of scales.

Reflect

Children could have described the weight of the bread in different ways, e.g.

The loaf of bread weighs the same as 12 cubes.

The loaf of bread weighs the same as 4 big blocks and 3 small blocks.

The loaf of bread is 12 times as heavy as 1 cube.

Comparing weight using measuring

→ **pages 110–112**

1. a) heavier
   b) heavier
   c) lighter
   d) heavier
   e) small ball, tennis ball, rugby ball

2. a) >
   b) <
   c) >
   d) >, >

3. pineapple > orange > apple > banana

4. Children should have completed the table from top to bottom as follows: C, B, A, D

Reflect

The bun is heavier than the doughnut. Children should have identified that you cannot tell about the éclair, because it is shown balancing 3 cubes and 1 smaller cube and we do not know how the weight of this small cube compares with the others.

Comparing capacity

→ **pages 113–115**

1. a) full
   b) empty
   c) empty

2. E, A, C, D, B

3. Children should have matched the glasses as follows, clockwise from left-most glass: >, <, <, <, >, <, >

4. Children should have drawn liquid to a level between half-full and full in the two glasses on the left and liquid to a level between quarter and half-full in the two glasses on the right.

5. A

Reflect

More, full, empty

Measuring capacity

→ **pages 116–118**

1. a) 8
   b) 11

2. 4, 2, 5

3. a) 4 + 6 = 10 or 6 + 4 = 10
      10 glasses of water are poured into the pan.
   b) 1 + 6 = 7 or 6 + 1 = 7
      7 glasses of water are poured into the pan.

4. a) 15 spades fill 3 buckets.
   b) 25 spades fill 5 buckets.

Reflect

A pan holds 3 jugfuls. 15 glasses fill one pan.

Children need to multiply the number of glasses by the number of jugs in order to identify the capacity of the pan.

Comparing capacity using measuring

→ **pages 119–121**

1. Children should have matched pictures as follows:

   1st jug ➜ 4th set of glasses (4)

   2nd jug ➜ 1st set of glasses (8)

   3rd jug ➜ 2nd set of glasses (12)

   4th jug ➜ 3rd set of glasses (14)

2. a) =
   b) <
   c) >

3. C < A < B

4. Kat is correct. Children may explain their reasoning in different ways, e.g.

The water has been poured from the jug to fill 4 glasses. There is still some water left in the jug so the jug holds more than 4 glasses of water altogether.

The water which is left in the jug could be poured into another glass. There are already 4 glasses so the jug holds more than 4 glasses of water.

5. a) >
   b) =
   c) >

Reflect

Children could have suggested different methods for comparing the capacity of the containers, e.g.

I would get a small cup and count how many cups of water it took to fill each container. The container which took the smallest number of cups to fill it would have the smallest capacity. The container which took the greatest number of cups to fill it would have the greatest capacity.

I would fill up one container and then pour the water into the other containers, one at a time. If the water does not fill the second container, then the second container has a greater capacity than the original container. If the water fills the second container with some left over, then the second container has a smaller capacity than the original container.

Solving word problems – weight and capacity

→ **pages 122–124**

1. a) 8 − 7 = 1, 8 − 3 = 5
   b) There are 9 glasses left. There are 4 glasses left.

2. a) 6 + 4 = 10 or 4 + 6 = 10. The bag weighs 10 cubes.
   b) 18 − 4 = 14 (or 4 + 14 = 18). The bag weighs 14 cubes.
   c) 10 − 5 = 5 (or 5 + 5 = 10). The bag weighs 5 cubes.

3. a) 4 cylindrical weights balance 1 cuboid weight.
   b) 2 spherical weights balance 1 tall cylindrical weight.

Reflect

Children could have identified different problems as the most challenging.

End of unit check

→ **pages 125–126**

My journal

10 glasses of water would weigh 16 blocks.

Power play

N, A, J

Check children's individual answers based on their own names. They should all be multiples of the weight of a single cube.