Unit 5: Multiplication and division (2)

Lesson 1: Comparing multiplication and division statements (1)

→ pages 6–8

1. a) 5 × 10 < 6 × 10
Aki has the least number of biscuits.
b) 3 × 5 < 4 × 5 (or 4 × 5 > 3 × 5)
Amelia has the most cherries.

2. 4 × 4 < 8 × 4 (or 8 × 4 > 4 × 4)
The ladybirds have the most spots in total.

3. 20 ÷ 5 > 20 ÷ 10 (or 20 ÷ 10 < 20 ÷ 5)
Jamie makes the most towers.

4. a) <
b) >
c) =
d) >
e) <
f) <
g) >

5. a) 0, 1, 2, 3 or 4
b) 4
c) 1 or 2 or 3
d) The left-hand number must be smaller than the right-hand number.

6. Max is not correct. Mugs must hold more as you only fill 3, whereas the same size bottle can fill 5 glasses.

Reflect

If you divide 12 by the circle you get a smaller answer than if you divide 12 by the square, so the circle must be greater. Some children may notice that the first expression can provide further refinement. For example, if the circle is 8, the square must be less than 5. If the circle is 1, the square must be less than $\frac{5}{8}$.

Lesson 2: Related multiplication calculations

→ pages 9–11

1. a) 2 × 3 = 6
There are 6 pins.
b) 2 × 30 = 60
There are 60 pins.

2. a) 3 × 2 = 6
Player 1's score is 6.
b) 3 × 20 = 60
Player 2's score is 60.

3. a) 3 × 5 × 1 = 15 or 5 × 3 × 1 = 15 (multiplied in any sequence – commutative law)
Jamie has 15 pence.
b) 3 × 5 × 10 = 150 or 5 × 3 × 10 = 150 (multiplied in any sequence – commutative law)
Richard has 150 pence.

4. a) 6 × 4 = 24
b) 6 × 40 = 240

5. a) 24; 240
b) 45; 450
c) 360; 240; 270; 150
d) 80; 160; 0; 220

6. Answers will vary; for example: I know it will be 350, as 50 is 10 times bigger than 5 so my answer will be 10 times bigger.
Jottings may show 5 × 7 = 35
50 × 7 = 350

Reflect

Answers will vary; for example: I can work out 4 × 80 by multiplying the answer to 4 × 8 by 10, to get 320.

Lesson 3: Related multiplication and division calculations

→ pages 12–14

1. a) 3 There are 3 cherries on each plate.
b) 30 There are 30 cherries on each plate.

2. a) 8 b) 80

3. a) 6 × 4 = 24; 4 × 6 = 24; 24 ÷ 6 = 4; 24 ÷ 4 = 6
b) 60 × 4 = 240; 4 × 60 = 240; 40 × 6 = 240 or 6 × 40 = 240
240 ÷ 4 = 60; 240 ÷ 60 = 4; 240 ÷ 40 = 6 or 240 ÷ 6 = 40

4.

a)	b)	c)
8	70	20
80	70	8
9	70	11
90	90	200

5. Answers will vary; for example:
240 ÷ 20 = 12 12 pencils
240 ÷ 30 = 8 8 rubbers
240 ÷ 40 = 6 6 rulers
Allow correct combinations; for example: × 20 = 40 and 5 × 40 = 200 so Jess could buy 2 pencils and 5 rulers.

Reflect

Answers will vary; for example: 80 × 3 = 240; 8 × 30 = 240; 24 ÷ 3 = 8; 240 ÷ 30 = 8.

Lesson 4: Comparing multiplication and division statements (2)

➜ pages 15–17

1. 6 × 20 < 7 × 20
There are more mints in total in the bags.

2. a) 4 × 30 < 5 × 30
b) 1 × 80 = 2 × 40

3. a) 240 ÷ 3 > 240 ÷ 4 or 240 ÷ 4 < 240 ÷ 3
A box contains more sweets.
Answers will vary; for example: The same number of sweets is shared out in each case. There are fewer boxes than bags so more sweets must go in a box than go in a bag.
b) Each child receives 30 marbles. Each adult receives 30 marbles.
Both receive the same. Although there are more adults, there are also more marbles for them to share.

4. a) < d) >
b) > e) >
c) > f) >

5. Answers may vary but: ⬡ < ⬠; ♡ < ◯

Assuming divisions have whole number answers there are two possible solutions:
⬡ = 6, △ = 4, ◯ = 7, ⬠ = 8, ♡ = 5
⬡ = 4, △ = 8, ◯ = 7, ⬠ = 6, ♡ = 5

Reflect

Left-hand box must have a number greater than 3.
Right-hand box must have a number less than 4.

Reasons will vary; for example: Multiplying by a bigger number makes things bigger, and so does dividing by a smaller number.

Lesson 5: Multiplying a 2-digit number by a 1-digit number (1)

➜ pages 18–20

1. 2 × 3 ones = 6 ones
2 × 3 = 6
2 × 4 tens = 8 tens
2 × 40 = 80
6 + 80 = 86
2 × 43 = 86
There are 86 pencils in total.

2. 4 × 2 1s = 8 1s
4 × 2 = 8
4 × 2 10s = 8 10s
4 × 20 = 80
8 + 80 = 88
4 × 22 = 88
There are 88 in total.

3. a) 3 × 2 1s = 6 1s
3 × 2 = 6
3 × 3 10s = 9 10s
3 × 30 = 90
6 + 90 = 96
So, 32 × 3 = 96

b) 4 × 2 1s = 8 1s
4 × 2 = 8
4 × 2 10s = 8 10s
4 × 20 = 80
8 + 80 = 88
So, 22 × 4 = 88

4. a) 14 × 2 = 28 b) 3 × 33 = 99

5. a) 2 × 20 = 40
2 × 3 = 6
40 + 6 = 46
b) 23 × 2 = 46
32 × 3 = 96
2 × 43 = 86

Reflect

Children should explain how they do 3 × 13 step by step; for example:

First I would work out 3 × 10 = 30.
Then I would work out 3 × 3 = 9.
Finally I would add 30 + 9 = 39.
So 3 × 13 = 39.

Lesson 6: Multiplying a 2-digit number by a 1-digit number (2)

➜ pages 21–23

1. a) 3 × 4 = 12
3 × 20 = 60
60 + 12 = 72
3 × 24 = 72

b) 5 × 3 = 15
5 × 10 = 50
50 + 15 = 65
5 × 13 = 65

c) Children may draw 2 tens and 8 ones in two of the rows of the place value grid.
2 × 8 = 16
2 × 20 = 40
40 + 16 = 56
2 × 28 = 56

2. a) 3 × 5 = 15
3 × 30 = 90
90 + 15 = 105
35 × 3 = 105

b) 4 × 5 = 20
4 × 20 = 80
80 + 20 = 100
4 × 25 = 100
Allow variation; for example: 5 × 3 = 15.

3. a) 3 × 26 = 78 b) 6 × 14 = 84

4. There are 165 litres of paint in total.

5. a) 3 × 17 = 51 b) 2 × 49 = 98

6. a) 56 × 3 ➔ 168
26 × 8 ➔ 208
37 × 5 ➔ 185

Reflect

The numbers are different but the answers are the same.

Lesson 7: Multiplying a 2-digit number by a 1-digit number (3)

→ pages 24–26

1. a)
$$\begin{array}{rl} 15 & (5 \times 3) \\ +\underline{60} & (20 \times 3) \\ \underline{75} & \end{array}$$
b)
$$\begin{array}{rl} 28 & (7 \times 4) \\ +\underline{40} & (10 \times 4) \\ \underline{68} & \end{array}$$

2. a)
$$\begin{array}{rl} 18 & (6 \times 3) \\ +\underline{30} & (10 \times 3) \\ \underline{48} & \end{array}$$
b)
$$\begin{array}{rl} 16 & (8 \times 2) \\ +\underline{80} & (40 \times 2) \\ \underline{96} & \end{array}$$

3. a)
$$\begin{array}{rl} 14 & \\ \times\ \underline{5} & \\ 20 & (4 \times 5) \\ \underline{50} & (10 \times 5) \\ \underline{70} & \end{array}$$
b)
$$\begin{array}{rl} 19 & \\ \times\ \underline{4} & \\ 36 & (9 \times 4) \\ \underline{40} & (10 \times 4) \\ \underline{76} & \end{array}$$

4. a)
$$\begin{array}{rl} 12 & \\ \times\ \underline{4} & \\ 8 & (2 \times 4) \\ \underline{40} & (10 \times 4) \\ \underline{48} & \end{array}$$
b)
$$\begin{array}{rl} 21 & \\ \times\ \underline{4} & \\ 4 & (1 \times 4) \\ \underline{80} & (20 \times 4) \\ \underline{84} & \end{array}$$

5. Jamie should have remembered that when you multiply by 1 the number doesn't change, so 26 × 1 = 26.

6. a)
$$\begin{array}{rl} 35 & \\ \times\ \underline{3} & \\ 15 & 5 \times 3 \\ \underline{90} & 30 \times 3 \\ \underline{105} & \end{array}$$
b)
$$\begin{array}{rl} 18 & \\ \times\ \underline{6} & \\ 48 & 8 \times 6 \\ \underline{60} & 10 \times 6 \\ \underline{108} & \end{array}$$

7.
$$\begin{array}{r} 55 \\ \times\ \underline{3} \\ 15 \\ \underline{150} \\ \underline{165} \end{array}$$

♡ = 0
(Multiplying the 10s will give an answer that is a multiple of 10.)

● = 5
(This is the only digit which, when multiplied by 3, has an answer ending in the digit.)

3 × 5 = 15, so △ = 1

Reflect

Children should show correct method for 23 × 5.

$$\begin{array}{rl} 23 & \\ \times\ \underline{5} & \\ 15 & 3 \times 5 \\ \underline{100} & 20 \times 5 \\ \underline{115} & \end{array}$$

Lesson 8: Dividing a 2-digit number by a 1-digit number (1)

→ pages 27–29

1. 2 tens ÷ 2 = 1 ten
20 ÷ 2 = 10
8 ones ÷ 2 = 4 ones
8 ÷ 2 = 4
10 + 4 = 14
28 ÷ 2 = 14
Each basket has 14 apples.

2. a) 6 tens ÷ 3 = 2 tens
60 ÷ 3 = 20
9 ones ÷ 3 = 3
9 ÷ 3 = 3
20 + 3 = 23 So, 69 ÷ 3 = 23

b) 8 tens ÷ 4 = 2 tens
80 ÷ 4 = 20
8 ones ÷ 4 = 2 ones
8 ÷ 4 = 2
20 + 2 = 22 So, 84 ÷ 4 = 22

3. 85 can be partitioned into 50 and 35.
5 tens ÷ 5 = 1 ten
50 ÷ 5 = 10
35 ones ÷ 5 = 7 ones
35 ÷ 5 = 7
10 + 7 = 17
85 ÷ 5 = 17

4. a) 96 ÷ 3 = 32
96 (whole), 90 and 6 (parts) in part-whole model.
90 ÷ 3 = 30 6 ÷ 3 = 2

b) 86 ÷ 2 = 43
86 (whole), 80 and 6 (parts) in part-whole model.
80 ÷ 2 = 40 6 ÷ 2 = 3

5. 36 ÷ 3 = 12
63 ÷ 3 = 21
69 ÷ 3 = 23
96 ÷ 3 = 32

Reflect

To work out 84 ÷ 4, first I would work out 80 ÷ 4 = 20. Then I would work out 4 ÷ 4 = 1. Finally, I would work out 20 + 1 = 21.

Lesson 9: Dividing a 2-digit number by a 1-digit number (2)

→ pages 30–32

1. a) 30 ÷ 3 = 10
15 ÷ 3 = 5
10 + 5 = 15 (or 5 + 10)
45 ÷ 3 = 15

b) 20 ÷ 2 = 10
14 ÷ 2 = 7
10 + 7 = 17
34 ÷ 2 = 17

c) 50 ÷ 5 = 10
15 ÷ 5 = 3
10 + 3 = 13 (or 3 + 10)
65 ÷ 5 = 13

2. 60 ÷ 3 = 20
18 ÷ 3 = 6
20 + 6 = 26
78 ÷ 3 = 26

30 ÷ 3 = 10
30 ÷ 3 = 10
18 ÷ 3 = 6
10 + 10 + 6 = 26
78 ÷ 3 = 26

3. a) 72 ÷ 2 = 36
72 (whole), 60 and 12 (parts) in part-whole model (parts may vary).

b) 72 ÷ 3 = 24
72 (whole), 60 and 12 (parts) in part-whole model (parts may vary).

c) 85 ÷ 5 = 17
85 (whole), 50 and 35 (parts) in part-whole model (parts may vary).

d) 57 ÷ 3 = 19
57 (whole), 30 and 27 (parts) in part-whole model (parts may vary).

4. 84 ÷ 3 = 28
There are enough ice cubes.

5. a) 52 ÷ 4 = 13 or 72 ÷ 4 = 18
b) 90 ÷ 5 = 18 or 95 ÷ 5 = 19
c) 54 ÷ 3 = 18 or 84 ÷ 3 = 28

Reflect

Model d) does not help work out 92 ÷ 4 because 70 and 22 are not multiples of 4, whereas the parts in all the other part-whole models are.

Lesson 10: Dividing a 2-digit number by a 1-digit number (3)

➜ pages 33–35

1. a) 40 ÷ 2 = 20
5 ÷ 2 = 2 remainder 1
45 ÷ 2 = 22 remainder 1
22 tins can go on each shelf.

b) The remainder is 1, so 1 tin cannot be put on the shelf.

2. a) Answers will vary; for example: because 53 is an odd number and all multiples of four are even.

b) 40 ÷ 4 = 10
13 ÷ 4 = 3 r 1
53 ÷ 4 = 13 r 1

3. a) 83 ÷ 4 = 20 r 3
b) 83 ÷ 5 = 16 r 3
c) 83 ÷ 3 = 27 r 2
83 partitioned into 60 and 23.
d) 83 ÷ 8 = 10 r 3
83 partitioned into 80 and 3.

4. 77 ÷ 5 = 15 r 2 77 (whole), 50 and 27 (parts) in part-whole model.

5. Ambika's number must be 53.

Reflect

Answers will vary; for example:

67 ÷ 2 has a remainder, as 67 is odd.	33 r 1
67 ÷ 3 has a remainder, as 60 can be divided by 3 exactly but 7 ÷ 3 = 2 r 1.	22 r 1
67 ÷ 4 has a remainder, as all multiples of 4 are even.	16 r 3
67 ÷ 5 has a remainder, as all multiples of 5 have a 5 or 0 in the ones column.	13 r 2

Lesson 11: How many ways?

➜ pages 36–38

1. a) Answers should be in the format: letter, number. Ideally they should also be presented systematically. Answers are:
A1, A2, A3, B1, B2, B3, C1, C2, C3

b) 3 × 3 = 9
There are 9 ways.

2. a) 5 × 2 = 10 (accept 2 × 5 = 10)
There are 10 ways.

b) △, X; △, Y; ⬠, X; ⬠, Y; ○, X; ○, Y; ⏢, X; ⏢, Y; ◇, X; ◇, Y

c) There are 24 ways.

3. There are 20 ways.

4. Answers will vary and should show 6 ways; for example: for colours red (R), blue (B) and yellow (Y): RB, RY, BR, BY, YR, YB. Some children may choose to use white (W) as a further option, in which case they should find 12 ways (additional ways are WR, RW, WB, BW, WY, YW); in this case, accept any 8 correct answers in the spaces given.

Reflect

To work out the number of ways, I would multiply the number of choices in the first set by the number of choices in the second set.

Lesson 12: Problem solving – mixed problems (1)

→ pages 39–41

1. 15 × 3 = 45. There are 45 cakes in total.
2. 64 ÷ 4 = 16. There are 16 items of clothing in each drawer.
3. a) 8 × 12 = 96. There is 96 ml of honey in the jar.
   b) 96 ÷ 3 = 32. There is 32 ml of honey in each bowl.
4. 34 × 3 = 102. The tower is 102 m tall.
5. 26 × 3 = 39 × 2 = 78 78 in middle row of bar model, 39 in each part of bottom row.
6. 50 ÷ 5 = 10
   35 ÷ 5 = 7
   10 + 7 = 17
   85 ÷ 5 = 17, so each book costs £17.
   17 × 2 = 34
   2 books cost £34.

Reflect

Answers will vary. Children should have written a word problem that can be represented by either 18 × 4 = 72 or 72 ÷ 4 = 18.

Lesson 13: Problem solving – mixed problems (2)

→ pages 42–44

1. 4 × 3 = 12
   6 × 5 = 30
   30 + 12 = 42 (addition in either order)
   Kate buys 42 ice creams in total.
2. There are 21 more pears than apples.
3. a) There are 48 balloons in 6 bags.
   b) Reena needs to buy 10 packs.
4. 3 × 5 + 4 × 5 = 7 × 5
   They have 35 rulers altogether.
5. a) 4 × 3 + 5 × 3 = 9 × 3
   b) 8 × 5 + 4 × 5 = 12 × 5
   c) 3 × 8 + 8 = 4 × 8
   d) 7 × 4 – 2 × 4 = 5 × 4
   e) 5 × 2 + 8 = 9 × 2
6. 96 pence – 60 pence = 36 pence for 2 slices of toast.
   36 pence ÷ 2 = 18 pence for 1 slice of toast.
   60 pence – 18 pence = 42 pence for 2 eggs.
   42 ÷ 2 = 21
   The cost of an egg is 21 pence.

Reflect

Methods will vary; for example:

5 × 6 = 30
3 × 6 = 18
30 + 18 = 48
or 5 + 3 = 8
8 × 6 = 48

Lesson 14: Problem solving – mixed problems (3)

→ pages 45–47

1. a) 6 × 4 = 24
   24 ÷ 3 = 8 (or alternative method)
   Each person receives 8 beads.
   b) 24 ÷ 4 = 6
   Each person receives 6 beads.
2. Missing value is 23.
   63 – 17 = 46
   46 ÷ 2 = 23
   So, smaller bar is 23, larger bar is 23 + 17 = 40.
3. Children = 35
   Adults = 35 × 3 = 105
   105 + 35 = 140 (alternatively, some may just work out 35 × 4)
   There are 140 people in total at the play.
4. Box = (6 × 5 kg) + 500g = 30 kg and 500 g
   Giraffe = 4 × box
   4 × 30 kg = 120 kg
   4 × 500 g = 2,000 g = 2 kg
   120 kg + 2 kg = 122 kg
   So, the baby giraffe weighs 122 kg.
5. 10 × 2 kg = 20 kg 50 kg – 20 kg = 30 kg
   30 ÷ 5 = 6
   Max buys 6 5 kg sacks.
6. 150 – 74 = 76 76 ÷ 2 = 38
   38 + 74 = 112
   Danny's number is 112.
   Isla's number is 38.

Reflect

Children should state what they found easy and what they found challenging. Use this information to assess their understanding and provide same-day intervention as appropriate.

End of unit check

➜ pages 48–50

My journal

1. a) $8 \times 15 = 120$. Methods may vary.
b) $87 \div 3 = 29$. Methods may vary.

2. a) 8 6 5 5 7
b) 8 8 5 6 6

Power puzzle

a) $60 \times 3 = 180$ or $30 \times 60 = 180$

b) $6 \times 4 + 9 \times 4 = 15 \times 4$ or $9 \times 4 + 6 \times 4 = 15 \times 4$

c)
$$\begin{array}{r} 32 \\ \times \underline{4} \\ 8 \\ \underline{120} \\ \underline{128} \end{array}$$

Unit 6: Money

Lesson 1: Pounds and pence

→ pages 51–53

1. a) There is 9 pounds and 72 pence.
b) There is 27 pounds and 74p.
c) There is £0 and 56p.

2. a) Answers will vary; for example:
1 × £2, 2 × £1 and 1 × 20p
or 1 × £2, 1 × £1, 2 × 50p, 1 × 10p and 2 × 5p
b) £5 note, 2 × £1, 2 × 20p, 1 × 10p, 1 × 5p and 2 × 2p
or £5 note, 2 × £1, 2 × 20p, 1 × 10p, 1 × 5p, 1 × 2p and 2 × 1p

3. a) Answers will vary; for example:
1 × £2, 2 × 20p and 2 × 5p
or 2 × £1, 2 × 20p and 1 × 10p
or 1 × £2 and 1 × 50p
b) The greatest amount he can make is £5 and 50p.

4. 1 × £2, 2 × 20p, 1 × 5p, 1 × 2p and 1 × 1p
1 + 2 + 1 + 1 +1 = 6
6 coins

5. Kate: £14 and 35p Zac: £18 and 50p
Answers will vary, but Richard's three notes must all be £5 notes and his 8 coins must total less than £3 and 50p.

Reflect

Reena could have thought that the 1 on the 1p coin meant £1.

Lesson 2: Converting pounds and pence

→ pages 54–56

1. Children should have ticked a), b) and d).

2. There was 186p in the money box.
This is the same as £1 and 86p.

3. a) Ambika has £6 and 30p.
b) Max has £29 and 8p.

4. Missing amounts are:
a) 68p
b) £3 94p
c) £4 50p
d) 724p

5. Missing amounts are:
a) 50p
b) £4 29p
c) £5 4p
d) 185p
e) 308p
f) 448p £4
g) £18 70p

6. 50p = 6
20p = 15
10p = 30
5p = 60
2p = 150

Reflect

Explanations will vary; for example: I know that £2 and 72p equals 272p because there are 100 pence in £1, so 200 in £2, and 200 + 72 = 272.

Lesson 3: Adding money

→ pages 57–59

1. a) £1 + £2 = £3 and 60p + 13p = 73p
There is £3 and 73p in total.
b) £4 + £2 = £6
146p + 35p = 181p
There is £7 and 81p in total.

2. £1 + £2 = £3
35p + 42p = 77p
There is £3 and 77p in total.

3. a) £1 and 40p + £2 and 55p
= £3 and 95p
b) £1 and 60p + £2 and 55p
= £3 and 115p
= £4 and 15p

4. a) £5 and 55p
b) £6 and 81p
c) £7 and 15p
d) £7 and 22p
e) £16 and 86p

5. a) Bats and drink
b) £6 and 40p + £2 and 69p = £9 and 9p
c) Ball and pads
d) Ball and drink

Reflect

£5 and 23p

Methods may vary; for example:
I add £2 + £2 = £4
I add 36 + 87p = 123p = £1 and 23p
£4 + £1 and 23p = £5 and 23p

Lesson 4: Subtracting amounts of money

→ pages 60–62

1. Mia has £1 and 23p left.

2. Max has £2 and 46p left.

3. a) Number line shows jumps from £9 to £25.
£25 – £9 = £16
The helmet costs £16 more than the pump.
b) £148 – £25 = £123
The helmet costs £123 less than the bike.

4. Number line shows jumps from £5 and 85p to £6 and 30p.
The difference is 45p.

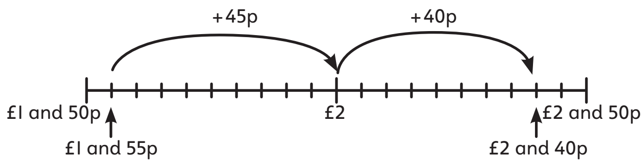
5. a) £1 and 85p – £1 and 42p = 43p
b) £4 and 12p – £3 and 80p = 32p
c) £7 – 84p = £6 and 16p
d) £3 and 92 – £2 and 97p = 95p

Reflect

£2 and 40p – £1 and 55p = 85p

Methods will vary; for example:

$$\begin{array}{cccc} & {}^{1}\cancel{2} & {}^{13}\cancel{4} & {}^{1}0 \\ - & 1 & 5 & 5 \\ \hline & & 8 & 5 \\ \hline \end{array}$$



45p + 40p = 85p

Lesson 5: Problem solving – money

→ pages 63–65

1. a) £8 + £5 = £13
The total cost is £13.
b) £20 – £13 = £7
Richard gets £7 change.

2. £5 – £2 and 70p = £2 and 30p
Marie gets £2 and 30p change.

3. Cost of 3 packs of pencils: £2 and 60p multiplied by 3
Cost of pencils and pack of cards: £2 and 60 + £1 and 95p
Cost of 1 ball of string: half of £3 and 80p
Difference between cost of pencils and pack of cards: £2 and 60p – £1 and 95p

4. a) £7 – £4 and 30p = £2 and 70p
The tin of biscuits cost £2 and 70p.
b) £4 and 30p – £2 and 10p = £2 and 20p = 2 cartons
1 carton = £1 and 10p
One carton of juice costs £1 and 10p.

Reflect

Answers will vary; children should make up their own problem using given items and amounts.

End of unit check

→ pages 66–67

Power puzzle

400 g butter costs £1 and 75p.
2 eggs cost 40p.
400 g sugar costs £1 and 40p.
400 g flour costs £1 and 4p.
50 g cocoa costs 90p.
One pack of sprinkles costs 87p.
The cake costs £6 and 36p and Max would get £3 and 64p change.

Unit 7: Statistics

Lesson 1: Pictograms (1)

→ pages 68–70

1. Each symbol represents 2 children.
$3 \times 2 = 6$
6 children said their favourite fruit was an orange.

2. a) $\frac{1}{2}$ a symbol represents 5 children.
15 children said popcorn was their favourite snack.
b) 5 children said cheese straws were their favourite snack.
c) More children like flapjack or shortbread (in either order) than like popcorn.

3. Pictogram completed with symbols:
orange juice = 3 whole glasses and 1 half glass
apple juice = 2 whole glasses
blackcurrant squash = 2 whole glasses and 1 half glass

4. Each cake symbol represents 5 children.
Table completed with numbers:
cake = 20
chewy sweets = 15
fruit = 5
Pictogram completed with symbols:
yogurt = 4 cake symbols

5. a) Fizz Bizz orangeade contains least sugar.
b) Isla could make sure the symbol represents the same amount of sugar in each pictogram to make the pictograms easier to compare.

Reflect

Children should draw two versions of 10 as a pictogram, each with a different scale; for example:

10 stick people	Key shows 1 stick person = 1 person
5 stick people	Key shows 1 stick person = 2 people
2 stick people	Key shows 1 stick person = 5 people

Lesson 2: Pictograms (2)

→ pages 71–73

1. a) There are 4 symbols for Greece and 2 for France.
$4 - 2 = 2$
1 symbol represents 10.
$2 \times 10 = 20$
20 more people said Greece was their favourite destination.
b) 65 people chose Greece or Portugal.
Greece = $4 \times 10 = 40$
Portugal = $2 \times 10 + 5 = 25$
$40 + 25 = 65$

2. 10
10
100

3. a) 34
b) 5
c) 9

4. Richard has used different symbols; suitcases are not all the same size; there is no key; symbols are not regularly spaced; Caribbean and USA do not match 1 suitcase = 10 people; pictogram has no title.

Reflect

Answers will vary; for example: Pictograms need a key, a title and consistently sized and spaced pictures.

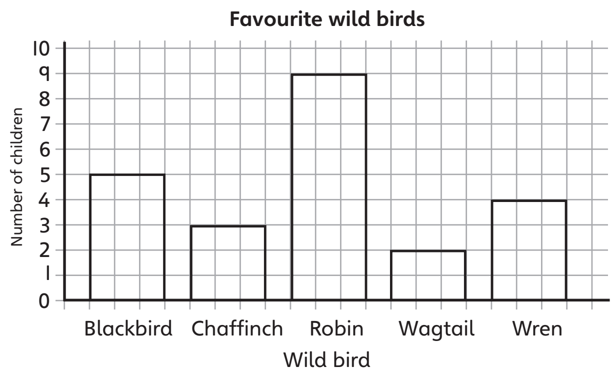
Lesson 3: Bar charts (1)

→ pages 74–76

1. a) 14
14
b) 12 14
13
c) 11

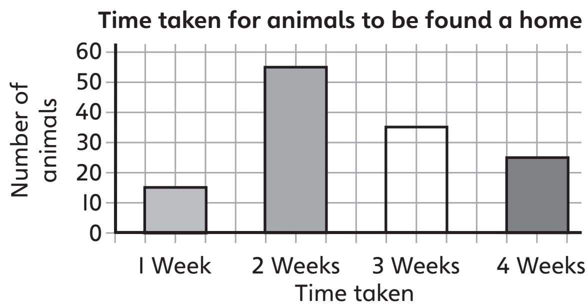
2. a) 30
b) Sunday
55
c) Friday
15

3. Bar chart completed using table data.



All bars should be separated by a least one square.
All bars should be the same width, ideally drawn with a ruler.

4. Table should be completed:
Week 1 = 15 animals
Week 4 = 25 animals
Bar chart should be completed:



Reflect

Max is incorrect. Baxter has 35 sponsors while Megan has 30. So Baxter has 5 more people sponsoring him than Megan.

Lesson 4: Bar charts (2)

➜ pages 77–79

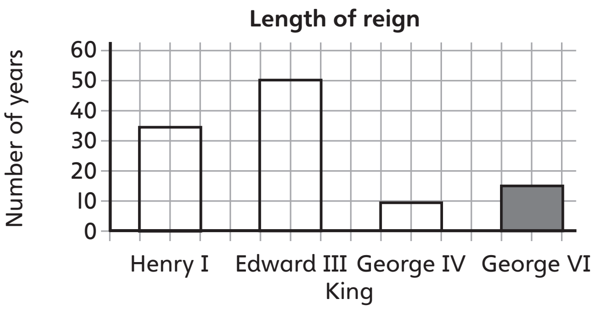
1. a) 8 – 4 = 4
4
b) 3
Edward and Henry (either order)

2. a) 8 + 3 = 11 (allow 3 + 8 = 11)
b) She is correct.
Henry was the name of 8 kings; the number of kings named William or Richard totalled 7, which is less.

3. a) From bottom to top: 0, 2, 4, 6, 8, 10
b) 7

4. a) 10
b) 35
c) 105

5. Bars should be drawn on to the chart to show the following reigns:
Henry I = 35 years
Edward III = 50 years
George IV = 10 years



Reflect

Answers will vary; for example: I agree because it is easy to count squares and multiply to work out the value of each bar.

Lesson 5: Tables

➜ pages 80–82

1. Tom, Louise, Kieron, Becky

2. a) Becky
b) 93
c) 5
d) 8

3. a) Adam
Noah
b) Adam
Alysia
c) 6
d) 8

4. Answers will vary. Assuming a ball always travels faster on wood than on sand, they should be in these ranges:
Squash ball on wood: a number *n*, where 90 < *n* < 120
Squash ball on sand: a number *m*, where 90 < *m* < *n*
Golf ball on wood: a number greater than 120
Golf ball on sand: a number less than 90

5. Table completed:

	Food	Non food	Total
Morgan	£65	£30	£95
Tan	£90	£30	£120
Agg	£95	£15	£110

Pictogram completed to show Morgan family with 6 circles.
Bar chart completed to show Tan family spend £30.

Reflect

Answers will vary; for example: I disagree because it is easy to compare information on bar charts by just looking at the heights of the bars.

End of unit check

➜ pages 83–85

My journal

1. Izzy is not correct. She sold 45 caramel ice creams and 35 vanilla ice creams, which is 10 more caramel ice creams.

2. Answers will vary; for example: 145 ice creams were sold altogether.
Izzy sold fewer raspberry ice creams than any other flavour.
The most popular flavour was caramel.

Power puzzle

Numbers missing from vertical axis: 6 and 10
Fruit, from left to right: apple, banana, kiwi, strawberry, raspberry.

Children should complete their own survey with pictogram and bar chart.

Unit 8: Length

Lesson 1: Measuring length (1)

→ pages 86–88

1. a) 2 m 20 cm
b) 1 m 85 cm
c) 3 m 5 cm
d) Mark made half-way between 9th and 10th (metre) marks.

2. Children should fill in three arm span measurements.

3. Each ruler has space before and after the 30 cm scale so the total length is longer than 60 cm.

4. a) 5th mark
b) 11th mark
c) 19th mark
d) Half-way between 27th and 28th marks.

5. Children should find objects that fit the criteria.

6. Answers will vary; for example: Ebo could place a tape along the wavy line to measure it, or place string along the line and then measure the string.

Reflect

Answers will vary; for example:
I could use a height-measuring piece of equipment.
I could get a friend to help. I could take off my shoes and stand against a wall with a hard-backed book on my head, flat and straight. My friend could then make a pencil mark on the wall, just under the book. Then I could step away, remove the book and measure from the floor to the mark (then rub out the pencil mark).

Lesson 2: Measuring length (2)

→ pages 89–91

1. a) 37 mm
b) 9 cm
c) 5 cm and 4 mm

2. Lines are drawn. Check accuracy to 2 mm.
a) 3 cm
b) 56 mm
c) 4 cm and 8 mm

3. 8 mm
9 cm and 6 mm
Line up each object with the 0 cm mark on the ruler.

4. Children's results should show plausible numbers of cm, and a mm value that is less than 10. Watch out for children who may give the same measurement twice, in two different units; for example: 3·1 cm and 31 mm, rather than '3 cm 1 mm'. Reassure these children that their results were not incorrect and that using just one unit is often a good idea.

5. a) Answers will vary; for example: Children could explain that an elephant would be measured in m and cm, and a mouse in cm and mm.
b) Children should list items that could be measured in metres and centimetres; for example: a house, a swimming pool, a football pitch (metres); a school book, a parcel, a smartphone (centimetres).

Reflect

Answers will vary: children should explain that objects should be lined up to start at the 0 mark.

Lesson 3: Equivalent lengths – metres and centimetres

→ pages 92–94

1. a) 1 m and 45 cm
b) 215 cm
c) 1 m 67 cm

2. 121 cm 2 m 31 cm
121 cm 602 cm

3. 530 cm
6 m 73 cm
303 cm
23 cm

4. 2 m 4 cm is 200 cm + 4 cm = 204 cm
240 cm is 200 cm + 40 cm = 2 m 40 cm

5. Children should say the correct conversion:

532 cm	10 cm	764 cm	0 cm
343 cm	574 cm	932 cm	75 cm
26 cm	312 cm	110 cm	846 cm
56 cm	407 cm	1 cm	300 cm
632 cm	45 cm	365 cm	64 cm

Reflect

3 m = 300 cm
243 cm = 2 m 43 cm
722 cm = 7 m 22 cm
Explanations will vary, but children should use the conversion fact 1 m = 100 cm.

Lesson 4: Equivalent lengths – centimetres and millimetres

→ pages 95–97

1. Children should identify:
a) 25 mm mark
b) 3 cm mark
c) 99 mm mark
d) 1 mm mark

2. 11 mm 8 mm 7 cm 5 mm

3. 92 mm
9 cm 2 mm
3 cm
101 mm

4. Children should measure three items in mm, and in cm and mm.

5. Yes. 1 cm is 10 mm, so 5 mm is not a complete cm.

6. Children should cut five strips of paper accurately and find that 67 mm = 6 cm 7 mm.

Reflect

Children should explain why cm and mm is better to use for longer lengths; for example: It is easier to understand a length in cm and mm because you can more easily compare it with the number of cm on a ruler or a metre stick.

Lesson 5: Comparing lengths

→ pages 98–100

1. a) Marks made as follows.
Plane 1: 5 m mark
Plane 2: just before the 5 m 90 cm mark
Plane 3: half-way between the 4 m 70 cm and 4 m 80 cm marks
Plane 4: 5 m mark
b) Plane 2
c) Plane 3
d) Plane 3

2. 970 mm 1 m 90 mm 190 cm
1 m 95 cm 200 cm

3. a) 5 m 87 cm > 495 cm
b) 8 m 240 mm < 8 m 25 cm
c) 402 cm = 4 m and 20 mm

4. a) 10 m and 30 cm
b) 500 cm (or 130 cm if children consider the pool as a 3D shape and use the depth)

5. The folder is longer – but not by much! The folder is 26 mm; the pencil case is 25·5 mm. This question was designed to test precision with reading a ruler. Allow answers such as 'neither' or 'they are both the same'.

6. Children should not agree with Astrid. It can be solved:
1 m 35 cm = 1 m 350 mm
1 m 370 mm = 1 m 37 cm
So one possible answer is 1 m 36 cm or 1 m 360 mm.

Reflect

3 m 8 cm = 308 cm
380 mm = 38 cm
So from shortest to longest: 380 mm 3 m 8 cm 380 cm

Lesson 6: Adding lengths

→ pages 101–103

1. a) 9 m
b) 60 cm

2. a) 185 cm

3. 170 cm (or 1 m 70 cm)

4. 70 cm
110 cm (or 1 m 10 cm)
1 m 80 cm (or 180 cm)
2 m (or 200 cm)

5. a) 1 m c) 13 cm
b) 3 mm d) 75 cm

6. Jamilla: 2 m 70 cm
Andy: 2 m 80 cm
Andy won.

7. 20 cm 3 mm (or 203 mm)

8. 1 m 70 cm + 60 cm = 1 m + 70 cm + 60 cm =
1 m + 130 cm = 1 m + 1 m and 30 cm = 2 m 30 cm.

Reflect

The scarf is now 2 m 10 cm long (or 210 cm).
Explanations will vary; for example:
1 m 80 cm + 30 cm
80 cm + 20 cm = 100 cm = 1 m
So, 1 m 80 cm + 20 cm = 2 m
2 m + 10 cm = 2 m 10 cm

Lesson 7: Subtracting lengths

→ pages 104–106

1. a) The pipe is now 2 m 50 cm (or 250 cm) long.
b) Emma's painting is 95 cm 5 mm (or 955 mm) long.
c) Toshi should cut 1 m 50 cm (or 150 cm) off the plank (to have 2 m left).
or Toshi should cut 2 m off the plank (to have 1 m 50 cm (or 150 cm) left).
d) The string is now 35 mm (or 3 cm 5 mm) long.

2. The flower sticks out 20 cm.

3. a) 60 cm
b) 1 m 60 cm (or 160 cm)
c) 1 m 60 cm (or 160 cm)
d) 1 m 40 cm (or 140 cm)
e) 65 mm (or 6 cm 5 mm)
f) 38 mm (or 3 cm 8 mm)
g) 17 mm (or 1 cm 7 mm)
h) 60 mm (or 6 cm)

4. 3 m 90 cm

Reflect

a) 3 m 30 cm – 165 cm = 165 cm (or 1 m 65 cm)
b) 2 m – 1 m 30 cm = 70 cm
Methods will vary.

Lesson 8: Measuring the perimeter (1)

→ pages 107–109

1. a) 2 cm, 4 cm and 2 cm (in any order)
The perimeter of the rectangle is 12 cm.
b) The perimeter of the triangle is 10 cm.
c) The square has a perimeter of 8 cm.

2. Rectangle: perimeter = 9 cm
Triangle: perimeter = 154 mm
Quadrilateral: perimeter = 158 mm
Accept small discrepancies in measurement.

3. Shape drawn with perimeter of 8 cm; for example:
1 cm × 3 cm rectangle; 2 cm × 2 cm square

4. C B A

5. Children should draw two polygons each with a perimeter of 10 cm.

Reflect

Andy is incorrect. There are lots of other shapes with a perimeter of 12 cm. For example, a 2 cm × 4 cm rectangle has a perimeter of 12 cm.

Lesson 9: Measuring the perimeter (2)

→ pages 110–112

1. a) 47 metres
Number line completed with jump of +12 (37 m) and +10 (47 m)
b) 42 metres
c) 46 metres

2. Field A: 12 m Field B: 5 m
Field C: two missing sides total 11 m

3. 140 metres
420 metres

4. A4 paper: 101 cm
Whiteboard: 526 cm
Football field: 320 m
£5 note: 410 mm

5. Children should draw three labelled shapes. One side is 12 m. Other sides total 20 m.

Reflect

Explanations will vary; for example: Add together the lengths of all of the sides.

Lesson 10: Problem solving – length (1)

→ pages 113–115

1. 75 m
25 × 3 = 75 Luis swims 75 metres.

2. 90 ÷ 5 = 18
Bar labelled with 18 five times
Each piece is 18 cm.

3. 72 ÷ 9 = 8
The baker pipes 8 pastries in one minute.

4. 4 × 40 = 160 or 40 × 4 = 160
or 40 + 40 + 40 + 40 = 160
160 metres of fence is needed.

5. Children may draw a bar model with three parts labelled 1 m 45 cm and a fourth part labelled 2 m 45 cm.
1 m × 3 = 3 m
45 cm × 3 = 135 cm = 1 m 35 cm
3 m + 1 m 35 cm = 4 m 35 cm,
so 3 × 1 m 45 cm = 4 m 35 cm
4 m 35 cm + 2 m 45 cm = 6 m 80 cm
Jamilla needs 6 m 80 cm (or 680 cm) of curtain pole.

6.

5 × 35	3 × 53
5 × 5 = 25	3 × 3 = 9
5 × 30 = 150	3 × 50 = 150
150 + 25 = 175	150 + 9 = 159

5 × 35 cm is longer.

7.

150 cm	150 cm
16 cm 5 mm	16 cm 5 mm
66 cm 5 mm	66 cm 5 mm

Reflect

The lower two calculations should be ticked.

Lesson 11: Problem solving – length (2)

➜ pages 116–118

1. 120 mm long, 40 mm wide
2. Empty bar filled with 9 cm 5 mm (or 95 mm)
   Bella has 265 mm of ribbon left.
3. 6 × 4 m = 24 m 6 × 50 cm = 300 cm = 3 m
   so, 6 × 4m 50 cm = 27 m
   27 m + 3 m 27 cm = 30 m 27 cm
   The tower is 30 m 27 cm high.
4. 275 – 240 = 35
   Amal and his dog walk 35 m further.
5. 2 × blue = 10 cm 4 × yellow = 32 cm
   10 cm + 32 cm = 42 cm
   60 cm – 42 cm = 18 cm
   5 cm + 5 cm + 8 cm = 18 cm, so a further 2 blue bricks and 1 yellow brick need to be added.
   4 blue bricks and 5 yellow bricks.
6. The perimeter is 36 cm and 0 mm.
   Children should sketch perimeters of shapes made with three rectangles.
   Perimeters will vary; for example:
   three rectangles with long edges touching giving a perimeter of 33 cm (shortest possible).
   three rectangles with short edges touching giving a perimeter of 51 cm (longest possible).

Reflect

Responses will vary; for example: I have learnt how to write lengths using different units. I know how to work out the perimeters of shapes.

End of unit check

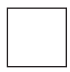
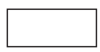
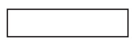
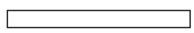
➜ pages 119–121

My journal

1. 1 m = 100 cm
   131 + 100 + 32 = 263
   Reena and Danny's combined height is 263 cm 5 mm.
   2 m = 200 cm
   2 m 64 cm = 264 cm
   129 cm 8 mm rounds up to 130 cm.
   264 – 130 = 134
   Add back on the extra 2 mm you subtracted:
   Ambika's height is 134 cm 2 mm.
   264 cm > 263 cm 5 mm
   The combined height of Richard and Ambika is greater than the combined height of Reena and Danny.
   Children did not need to know Ambika's height to work this out; they only worked out her height to complete the second bar model as requested.
2. Full perimeter of original piece of paper, in cm:
   (30 × 2) + (20 × 2) = 60 + 40 = 100
   Cutting the paper in half means you keep the same edges but also get two extra edges of 20 cm each.
   100 + (20 × 2) = 140.
   Half of 100 is 50 and half of 140 is 70, so Max is incorrect.
   Any or all of the keywords may appear in the child's answer. Check that they are used correctly.

Power puzzle

Children need to find the factors of the number. They might first notice it is a square number, 6 × 6: so the first rectangle is a square. Other factors pairs they should find are 9 × 4, 12 × 3, 18 × 2 and 36 × 1. Look for a table completed like this:

Length of rectangle	Width of rectangle	Draw what you think it might look like
6 cm	6 cm	
9 cm	4 cm	
12 cm	3 cm	
18 cm	2 cm	

Allow answers where 'length' and 'width' values are reversed. Also allow answers that include a 36 cm by 1 cm rectangle.

For a rectangle with a perimeter of 48 cm, the side lengths, given in cm, should reflect the following factor pairs (commutable – either way around):
8 × 6, 12 × 4, 16 × 3, 24 × 2, 48 × 1.

Unit 9: Fractions (1)

Lesson 1: Unit and non-unit fractions

→ pages 122–124

1. There are 5 birds altogether. The denominator is 5.
3 birds are flying to the right.
The numerator is 3.
$\frac{3}{5}$ of the birds are flying to the right.

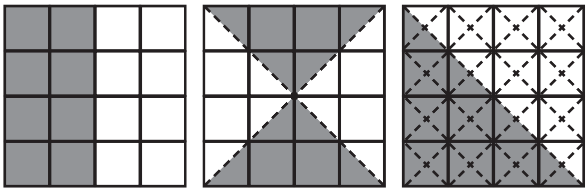
2. Top: $\frac{2}{3}$
Middle: $\frac{1}{2}$
Bottom: $\frac{1}{4}$

3. $\frac{1}{5}$ of the cards are light coloured.
$\frac{2}{5}$ have numbers on the roof.
$\frac{2}{5}$ are dark coloured.

4. a) b)

c) $\frac{1}{2} > \frac{1}{3}$ $\frac{1}{3} < \frac{1}{2}$

5. a), b) and c) Half of each square shaded (in three different ways). For example:



Reflect

Three sections coloured yellow, 1 section coloured red

Explanations will vary; for example:

$\frac{1}{2}$ is shaded yellow because there are 6 sections and half of 6 is 3, so I coloured 3 sections yellow.

$\frac{1}{6}$ means 1 out of 6, so I coloured 1 out of the 6 sections red.

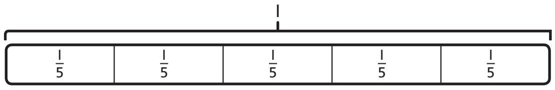
Lesson 2: Making the whole

→ pages 125–127

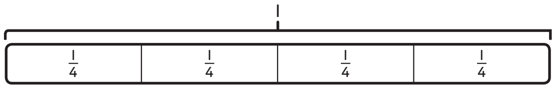
1. a) 4 out of the 6 eggs are in the box. This is $\frac{4}{6}$ of the whole.
2 out of the 6 eggs have been used. This is $\frac{2}{6}$ of the whole.
$\frac{4}{6} + \frac{2}{6} = 1$

b) 1 out of the 4 parts is shaded.
This is $\frac{1}{4}$ of the whole.
3 out of the 4 parts are not shaded.
This is $\frac{3}{4}$ of the whole.
$\frac{1}{4} + \frac{3}{4} = 1$

2. a)



b)



3. a) $\frac{3}{8}$ d) $\frac{4}{7}$
b) $\frac{5}{5}$ e) $\frac{5}{6}$
c) $\frac{8}{9}$ f) $\frac{5}{9}$

4. $\frac{3}{7}$

5. When you add these fractions the denominator does not change but you add the numerators.
The answer is $\frac{3}{3} = 1$ whole.

6. Answers will vary; for example:
1 whole $= \frac{1}{6} + \frac{5}{6}$
1 whole $= \frac{4}{6} + \frac{2}{6}$
1 whole $= \frac{1}{2} + \frac{1}{2}$

Reflect

Children's responses will vary; for example:
Today I learnt that a whole can be split into different fractions.
Today I learnt that $\frac{2}{2}$ is the same as 1 whole.

Lesson 3: Tenths (1)

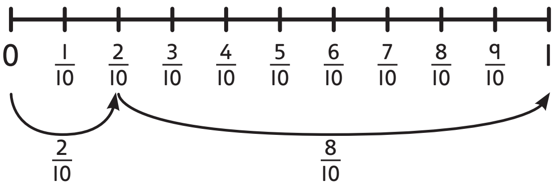
→ pages 128–130

1. a) $\frac{4}{10}$ b) $\frac{8}{10}$ c) $\frac{3}{10}$

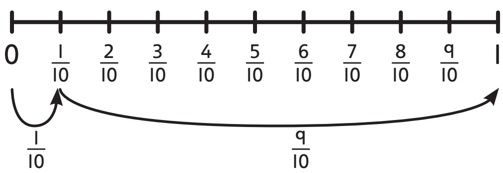
2. a) 4 triangles coloured
b) 7 small rectangles coloured
c) 8 circles coloured

3. a) $\frac{8}{10}$

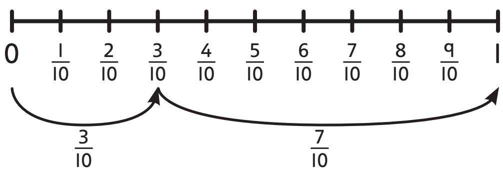
b)



4. a) $\frac{9}{10}$



b) $\frac{7}{10}$



5. They say $\frac{5}{10}$ at the same time. Children may show this using jumps on a number line.

6. Answers will vary. For example, the strip could have been long and thin (10 times as long and the same width) or a tall rectangle (same length and 10 times the width, which would now be the longer dimension).

7. Answers will vary; for example:
$\frac{1}{10} + \frac{9}{10} = 1$ whole
$\frac{2}{10} + \frac{8}{10} = 1$ whole

Reflect

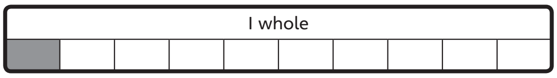
I know the next two numbers in the sequence will be $\frac{10}{10}$ (or 1) and $1\frac{1}{10}$.

Explanations will vary; for example: because $\frac{9}{10} + \frac{1}{10} = \frac{10}{10}$, which is 1 whole. 1 whole and 1 more tenth is written as $1\frac{1}{10}$.

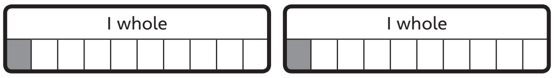
Lesson 4: Tenths (2)

→ pages 131–133

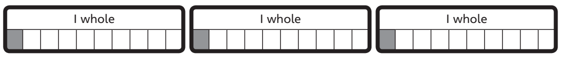
1. a) 1 part of the bar model should be shaded:
$1 \div 10 = \frac{1}{10}$



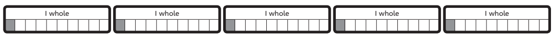
b) 1 part of each bar model should be shaded:
Altogether 2 tenths have been shaded. $2 \div 10 = \frac{2}{10}$



c) $3 \div 10 = \frac{3}{10}$
1 part of each bar model should be shaded:



d) $5 \div 10 = \frac{5}{10}$
1 part of each bar model should be shaded:



2. 3

3. a) 4 d) $\frac{7}{10}$
b) 5 e) $\frac{10}{10}$
c) $\frac{6}{10}$ f) $\frac{0}{10}$

4. a) 2 c) $\frac{3}{10}$
b) 10 d) Answers will vary: numerator should match first number; denominator is 10.

5. Each child eats $\frac{1}{2}$ of a pizza.
The pizzas could be cut in half.
The pizzas could be cut into tenths; each child eats $\frac{1}{10}$ from each pizza which makes $\frac{5}{10}$ of a pizza.

Reflect

Answers will vary; for example: because you can draw 2 bar models to show that 2 wholes are the same as 20 tenths. When you divide this by 10 you get 2 tenths. So, $2 \div 10 = \frac{2}{10}$.

Lesson 5: Fractions as numbers (1)

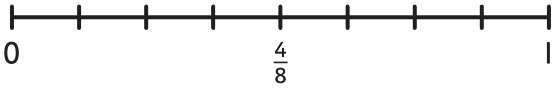
→ pages 134–136

1. a) 8
$\frac{1}{8}$ $\frac{3}{8}$
b) 5
$\frac{1}{5}$ $\frac{4}{5}$
c) 9
$\frac{1}{9}$ $\frac{5}{9}$

2. A = $\frac{2}{7}$
B = $\frac{2}{3}$ (or $\frac{6}{9}$)
C = $\frac{8}{9}$

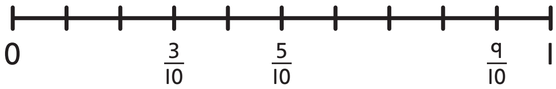
3. a)

b)



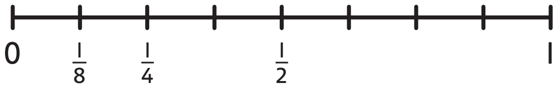
Some children may recognise that $\frac{4}{8}$ is equivalent to $\frac{1}{2}$ and position it at the midpoint of the line.

4.



5. $\frac{3}{9}$ and $\frac{4}{10}$ are not correct: they are at the positions for $\frac{3}{8}$ and $\frac{4}{8}$, as each fraction tile represents $\frac{1}{8}$.

6.



a) $\frac{1}{8}$
b) $\frac{3}{8}$

Reflect

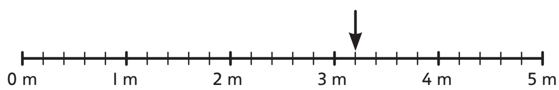
Divide the line into 5 equal parts and write $\frac{1}{5}$ at the first mark.

Divide the line into the number indicated by the denominator and then place the fraction at the mark shown by the numerator.

Lesson 6: Fractions as numbers (2)

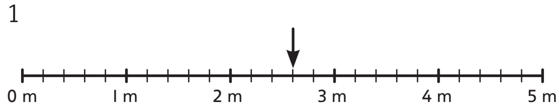
→ pages 137–139

1. a)

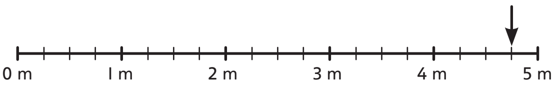


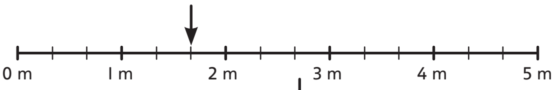
3
1

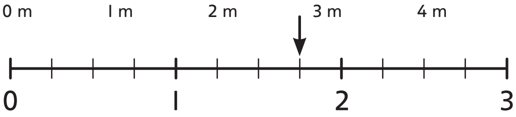
b)

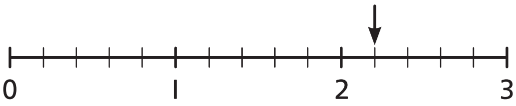


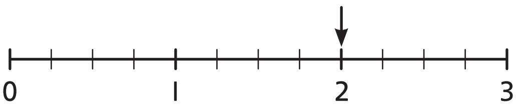
2
3

c) 

d) 

2. a) 

b) 

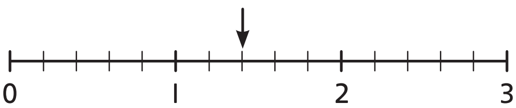
c) 

3. A = $1\frac{6}{8}$ (or $1\frac{3}{4}$) B = $2\frac{4}{8}$ (or $2\frac{1}{2}$) C = $3\frac{7}{8}$

4. $3\frac{9}{10}$ could be represented by X.
Explanations will vary; for example:
X is almost 4.
$3\frac{1}{4}$ and $2\frac{3}{6}$ are too small. $4\frac{7}{8}$ is too big.

5. Danny and Aki will never say the same number at the same time.
Explanations will vary; for example: children might draw jumps along the number line to show the next number Danny and Aki say in the count.

Reflect



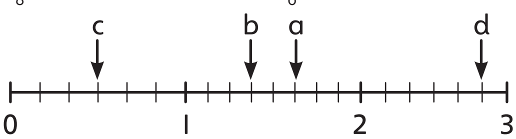
Answers will vary; for example:

I must first count how many sections between whole numbers and then find 1 whole and count on 2 small sections to mark $1\frac{2}{5}$.

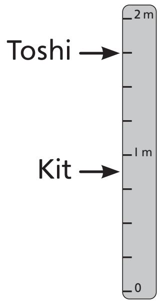
Lesson 7: Fractions as numbers (3)

→ pages 140–142

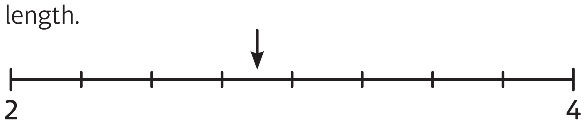
1. a) $1\frac{5}{8}$ c) $\frac{3}{6}$ (or $\frac{1}{2}$)
b) $1\frac{3}{8}$ d) $2\frac{5}{6}$

e) 

2. A = $2\frac{1}{2}$ because it is half-way between 2 and 3
B = $3\frac{1}{9}$ because the line from 3 to 4 is divided into 9 equal parts so B is $\frac{1}{9}$ more than 3
C = $4\frac{9}{10}$ because the line from 4 to 5 is divided into 10 equal parts and so C is $\frac{9}{10}$ more than 4.

3. 

4. Look for marks in sevenths from 0 to 1, from 1 to $1\frac{3}{7}$ and from $1\frac{6}{7}$ to 2, which may not be evenly spaced owing to length of line provided. Children may attempt to complete their marks up to 3 and may comment that the line is not long enough to do this properly. If markings are muddled, suggest that children redraw the line in their books at a suitable length.

5. 

Reflect

Answers will vary; for example: mark half-way between 1 and 2; label this $1\frac{4}{8}$.

Mark half-way between $1\frac{4}{8}$ and 2; label this $1\frac{6}{8}$.

Half-way between $1\frac{4}{8}$ and $1\frac{6}{8}$, make a mark. This is $1\frac{5}{8}$.

Lesson 8: Fractions of a set of objects (1)

→ pages 143–145

1. a) 36 ÷ 6 = 6
$\frac{1}{6}$ of 36 books = 6 books.
Each class gets 6 books.
b) 36 ÷ 9 = 4
$\frac{1}{9}$ of 36 books = 4 books
Each class gets 4 books.

2. $\frac{1}{3}$ of 21 = 7
7 in each part of the part-whole diagram.

3. Amelia should put 3 cherries on each slice of cake.

4. $\frac{1}{2}$ of 24 = 12
There are 24 sweets in a whole bag.

5. a) Luis had 24 balloons to start with.
b) Lee burst 4 balloons.

Reflect

Aki is not correct. He has divided them into 6 equal groups, so each group is $\frac{1}{6}$ and $\frac{1}{6}$ of 30 is 5.

Lesson 9: Fractions of a set of objects (2)

→ pages 146–148

1. a) $16 \div 4 = 4$ $\frac{1}{4}$ of 16 flowers = 4 flowers
b) $16 \div 4 = 4$
$4 \times 3 = 12$ $\frac{3}{4}$ of 16 flowers = 12 flowers
c) $18 \div 6 = 3$ $\frac{1}{6} \times 18$ glasses = 3 glasses
d) $18 \div 6 = 3$
$5 \times 3 = 15$
$\frac{5}{6} \times 18$ glasses = 15 glasses

2. $18 \div 3 = 6$
Children draw 6 in each part of the part-whole diagram.
$18 \div 3 = 6$
$6 \times 2 = 12$

3. The cake has 32 candles altogether.

4. $\frac{2}{3}$ of 12; 8 $\frac{3}{4}$ of 20; 15 $\frac{2}{5}$ of 25; 10 $\frac{7}{8}$ of 16; 14

5. Disagree. Explanations will vary; for example: I disagree because he has divided the 24 counters into 4 equal groups and there are 6 counters in each group. This means that $\frac{1}{4}$ of 24 is 6. He needs to multiply this by 3 to find $\frac{3}{4}$, so $\frac{3}{4}$ of 24 is 18.

6. $\frac{3}{4}$ of 16 = 12 $\frac{3}{5}$ of 20 =12
They are the same.

Reflect

Explanations will vary; for example: I can find a fraction of an amount by dividing it by the denominator and multiplying my answer by the numerator.

Lesson 10: Fractions of a set of objects (3)

→ pages 149–151

1. a) $100 \div 4 = 25$
$25 \times 3 = 75$
$\frac{3}{4}$ of 100 pencils is 75 pencils.
b) $180 \div 3 = 60$
$60 \times 2 = 120$
$\frac{2}{3}$ of 180 g of flour is 120 g.
c) $95 \div 5 = 19$
$19 \times 2 = 38$
$\frac{2}{5}$ of 95 dog biscuits is 38.
d) $32 \div 8 = 4$
$4 \times 3 = 12$
$\frac{3}{8}$ of 32 km is 12 km.

2. $32 \div 4 = 8$
$8 \times 3 = 24$
24 cm of ribbon was used.

3. $60 \div 6 = 10$
$10 \times 5 = 50$
$\frac{5}{6}$ of 60 m is 50 m.

4. a) 24 b) $\frac{4}{5}$ c) 60

5. a) $\frac{4}{6}$ b) 27

6. $\frac{3}{4}$ of a race will sometimes be a longer distance to run than $\frac{1}{2}$ of a race.
If the races are the same length, then it will be true. If the races are different lengths it may not be true; for example: $\frac{3}{4}$ of a 100-metre race is 75 metres but $\frac{1}{2}$ of a 1,000-metre race is 500 metres, which is longer.

Reflect

$\frac{3}{5}$ of 80 is 48. Explanations will vary; for example:
First find $\frac{1}{5}$ of 80 by working out $80 \div 5 = 16$, then work out $16 \times 3 = 48$ to find $\frac{3}{5}$ of 80.

Lesson 11: Problem solving – fractions

→ pages 152–154

1. There are 8 kg of rice left in the sack.

2. a) $\frac{1}{2}$ of 20 is 10.
There are 10 apples in the fruit bowl.
b) $\frac{2}{5}$ of 20 is 8.
$20 \div 5 = 4$ $4 \times 2 = 8$
c) 10 apples + 8 oranges = 18 pieces of fruit
$20 - 18 = 2$
There are 2 bananas. This is $\frac{1}{10}$ of the whole.

3. $\frac{1}{4}$ of 20 is 5. $\frac{1}{5}$ of 20 is 4. $5 + 4 = 9$
The counter finishes on number 9.

4. $\frac{1}{3}$ of the group are girls so $\frac{1}{3}$ of the group is 18.
There are 54 children in the group.

6. Holly baked 24 muffins.

Reflect

Answers will vary; for example: $\frac{2}{12}$ of 60 is 10, $\frac{3}{12}$ of 60 is 15.

End of unit check

→ pages 155–157

My journal

1. Example questions that could have been asked will vary, but should be based on the fact family $3 \times 6 = 18$ and the bracketing of the two 6s, for example:
Miss Hall brings in 18 eggs for her class to make cookies. Eggs come in boxes of 6. There is 1 full box left after the baking has been done. How many eggs did the children use? (Answer: 12)

Worked calculations should include some or all of the following:
$3 \times 6 = 18$ or $6 + 2 \times 6 = 18$
$6 + 6 + 6 = 18$ or $6 + 12 = 18$
$18 - (2 \times 6) = 6$ or $18 - 6 = 2 \times 6 = 12$
Allow any variant of each 'fact family'.

2. 500 + 500 = 1,000, so Toshi and Jen have 1,000 ml or 1 litre of orange juice. They also have: 3 apples, 8 slices of pizza, 4 baguettes and 9 strawberries. Ash's way of sharing the cartons is more sensible, though Astrid's might be useful if the juice cartons were different flavours.

It is not possible to share all the food equally without fractions or remainders, because 3 apples and 9 strawberries do not divide exactly by 2. All the other items can be shared between 2.

They will each get 1 juice carton (500 ml), $1\frac{1}{2}$ apples, 4 slices of pizza (or half a pizza), 2 baguettes and $4\frac{1}{2}$ strawberries.

If children give 1 r 1 for the apples and 4 r 1 for the large strawberries, this could lead to a 'Deepen' discussion about remainders. What if someone has to have the leftover apple and strawberry? The fairest answer would be: (child 1) 1 apple, 5 large strawberries and (child 2) 2 apples, 4 large strawberries; this now becomes a question about combinations, rather than division.

Number sentences should show:

$2 \div 2 = 1$ or $1{,}000 \div 2 = 500$

$3 \div 2 = \frac{3}{2}$ or $1\frac{1}{2}$ or 1 r 1

$8 \div 2 = 4$ or $\frac{8}{8} \div 2 = \frac{4}{8} = \frac{1}{2}$

$4 \div 2 = 2$

$9 \div 2 = \frac{9}{2} = 4\frac{1}{2}$ or 4 r 1