Unit 1: Place value within 1,000

Lesson 1: Counting in 100s

➜ pages 6–8

1. 300 three
600 six hundred
1,000 one thousand (Some children may write ten hundreds. Whilst true, teachers should discuss the special name for 10 hundreds is one thousand.)

2. a) 400 500
b) 900 800
c) 200 100 0
d) 600 700 1,000

3. a) 500 five hundred
b) 800 eight hundred

4. Children draw representation of 7 boxes each labelled with 100.

5. Andy has not realised that 10 hundred is called one thousand.

Reflect

When counting out loud, the children would say the numbers 200, 300, 400, 500, 600 and 700 twice.

Lesson 2: Representing numbers to 1,000

➜ pages 9–11

1. 315

2. a) 362
b) 529
c) 106

3. a) 160 c) 265
b) 284 d) 429

4. a) 500 20 8 c) 300 50
b) 200 60 6 d) 400 60 7

5. a) Olivia can make 6 different 3-digit numbers
872 827 782 728 287 278
b) Olivia can make 3 different 3-digit numbers
772 727 277

Reflect

Ebo is not correct. He has not understood place value.
The 2 digit means 200 and the 9 digit means 90.
The part-whole model should be 200, 90, 7.

Lesson 3: 100s, 10s and 1s (1)

➜ pages 12–14

1. a) 5 hundreds, 7 tens and 2 ones is equal to 572
b) 6 hundreds, 4 tens and 0 ones is equal to 640

2. a) 200 30 7
b) 100 0 6

3. Children should draw in more base 10 equipment as follows:
a) 2 tens (long rectangles or vertical lines), 2 ones (small squares)
b) 2 hundreds (large squares), 0 tens (nothing should be recorded here), 2 ones (small squares)

4. a) 5
b) 30 8
c) 3 9 5
d) 700 60
e) 905

5. a) Phil has not understood place value and position. The 6 digit should be in the 1s column and the 8 digit should be in the tens column.
b) 486

6. a) 267
b) 53
c) 382 = 300 + 80 + 2
d) 57
e) 12

Reflect

Children select a 3-digit number e.g. 354. They represent it in different ways e.g. 300 + 50 + 4; 100 + 254; 300 + 40 + 14 etc.

Lesson 4: 100s, 10s and 1s (2)

➜ pages 15–17

1. a) 342 c) 750
b) 256

2. Children draw counters in place value chart, correctly labelled as follows:
a) 4 circles in H column, labelled 100; 2 circles in T column, labelled 10; 6 circles in O column, labelled 1
b) 2 circles in H column, labelled 100; 0 circles in T column; 3 circles in O column, labelled 1

3. a) 1 circle in H column, labelled 100; 4 circles in T column, labelled 10; 1 circle in O column, labelled 1
b) 3 circles in H column, labelled 100; 5 circles in T column, labelled 10; 2 circles in O column, labelled 1

4. a) 332
b) 242

5. Both numbers have the same value, but appear different because Ally has 11, 10s counters. She needs to change 10 of these to a 100 counter and then the number would look the same.

Reflect

Children make a range of 3-digit, 2-digit and 1-digit numbers. All the digit sums should make 6. A range could be made: 600, 510, 42, 501, 60, 6. They know if they had found them all if they worked systematically.

Lesson 5: The number line to 1,000 (1)

➜ pages 18–20

1. Boat A 300
Boat B 850 (Answers may vary but should be close. Accept 840–860.)

2. a) 400 700 800 900
b) 820 830 850 860 870 880 890

3. a) 250 400 900
b) 285 289

4. Arrows drawn either from numbers to correct position on number line or re-written in correct position.
610 half-way between 600 and mark after 600
650 half-way between 2nd and 3rd mark after 600
735 three-quarters of the way between 1st and 2nd mark after 700
750 half-way between 2nd and 3rd mark after 700
780 on the 4th mark after 700

5. 101 is the next number after 100 but this number line does not go up in 1s. There are 10 sections between 100 and 200 so each section is worth 10 because 10 lots of 10 make 100. So the first mark will be 100 + 10 = 110. Isla is not correct.

6. Many answers possible depending on what steps the line goes up in. Accept anything sensible and correct: e.g.
Steps of 1: start 495, end 505
Steps of 10: start 450, end 550
Steps of 100: start 0, end 1,000

Reflect

Top line: 650 = half-way between 6th and 7th mark

Middle line: 650 = on 5th mark

Bottom line: 650 = on 8th mark

They are not in the same place because, although the number lines are the same length, the steps they go up in are all different. Top in steps of 100; middle in steps of 10 and bottom in steps of 1.

Lesson 6: The number line to 1,000 (2)

➜ pages 21–23

1. a) 550, 570 and 599 should be circled and placed on to the number line:
550 on the 5th mark after 500
570 on the 7th mark after 500
599 just before 600
b) 379, 372 and 365 should be circled and placed on to the number line:
379 half-way between 9th mark and 380
372 on 6th mark after 360
365 half-way between 2nd and 3rd mark after 360
c) 500, 695, 550 and 450 should be circled and placed on to the number line:
500 placed about a third along the number line
695 placed just before 700
550 half-way along the number line
450 about one-sixth along the number line half-way between 400 and where 500 has been placed.

2. a) Allow any numbers > 700 and < 800
b) Allow any numbers > 150 and < 160

3. a) A could be any number smaller than 105
B could be any number greater than 245
b) 104
c) 246

4. Children complete chart. Reading down:
True
False
True
Cannot tell

Reflect

The start and end numbers both have 0s in the tens and ones column, they are multiples of 100. Because the first number is 213, the nearest multiple of 100 would be 200. The number line has numbers greater than 300, so the end number is 400, which is the next multiple of 100 after 321.

Lesson 7: Finding 1, 10 and 100 more or less

➜ pages 24–26

1. a) 345
b) 445

2. a) 10 more than 482 is 492
b) 100 less than 390 is 290

3. a) 116
b) 803
c) 928
d) 855
e) 78
f) 389
g) 728
h) 114

4. a) 800, 600, 710, 690, 701, 699
b) 498

5. Children complete the maze from start by travelling: right, right, down, down, right, down, left

6. a) 435
b) 148

Reflect

Children generate a number using dice. Children swap with a partner so the chart will be checked. Explanations will vary: e.g. I know Louise's number is 452 as her chart said 100 more was 552. I took 100 away from 552 and got 452.

Lesson 8: Comparing numbers to 1,000 (1)

➜ pages 27–29

1. Mrs Dean has 361 books. Mr Lopez has 358 books.
361 is greater than 358.
So 361 > 358
Mrs Dean has more books.

2. a) <
b) <

3. a) False because (answers may vary). Answer should say that left-hand number is 300 and right-hand number is 249. 300 is the larger number.
b) True because (answers may vary) Both numbers have the same base 10 equipment, 2 hundreds and 3 tens. Both numbers are 230 although the RHS is placed differently, its value doesn't change.

4. Children add drawings of base 10 equipment so answers will vary. Minimum needed to be added is:
a) 2 tens and 6 ones (2 long rectangles and 6 small squares)
b) Answers will vary. Both sides should be represented by base 10 equipment to the value of 410
e.g. Right-hand side has 1 hundred and 4 ones added.
Allow children to add to both sides as long as each side equals the other in value.

5. B is greater than A

6. Both numbers are the same as they both show 120 in base 10 equipment.

Reflect

Answers may vary, but it should say that the digit in the H position is looked at first. If it is the same in both numbers, you look at the T column to compare or the O column if necessary.

Lesson 9: Comparing numbers to 1,000 (2)

➜ pages 30–32

1. a) 348 is greater than 251
348
b) 367 382
367

2. a) 53, 170, 340 should be circled
b) 290, 286, 300, 1,000 should be circled

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

4. a) Any digit less than 6
b) Any digit greater than 5
c) Answers will vary. Ensure right-hand number is greater e.g. 148 < 149
d) Answers will vary: Ensure that left-hand number is greater e.g. 388 > 387
e) Answers will vary: Both sides will be equal e.g. 436 = 436
f) Answers will vary. Ensure right-hand number is greater e.g. 941 < 951

5. a) Cannot tell circled
Because both Reena's and Zac's numbers have 4 hundreds but we don't know what is in the tens and ones column of Reena's. It could be greater than 418 or less.
b) Amelia because her number only has 3 hundreds which is less than Reena's or Zac's numbers.

Reflect

Answers will vary but will explain about comparing 100s first, then 10s and finally 1s to decide which number is greater.

Lesson 10: Ordering numbers to 1,000

➜ pages 33–35

1. 180, 225, 256

2. 74, 417, 471, 740

3. 310, 305, 285, 93
Allow reverse order as long as child has changed the labels on the page.

4. a) 115, 118, 126
b) 200, 207, 295, 529
c) 86, 608, 800, 806
d) 70, 80, 780, 870, 1,000

5. a) Allow various answers
First box can only have 1, 2 or 3
Second box allow any digit
Third box allow digits 4 and above
b) Answers will vary.
First box may have digits 3 and above
Second box if the first box had 3, then second box must be 4 or less. If the first box was greater than 3, allow any digit.
Third box allow 3 or less

Reflect

78, 718, 817, 871

Answers will vary. Children will explain that the 2 digit is smallest as it has 0 hundreds. They will then compare the 100s and that 718 has only 7 in the 100s. Children will then compare 10s and 7 tens is greater than 1 ten so 871 is the greatest.

Lesson II: Counting in 50s

➜ pages 36–38

1. a) 100
150
200
400
500
b) Children circle 11 packs

2. a) 50, 200, 300, 350
b) 600, 650, 700, 850, 900
c) 250, 350, 400, 450
d) 650, 500, 400, 350

3. a) 550
b) 700

4. a) 450
b) 550

5. 14 coins

Reflect

Answers will vary. Children should say that every other number is a hundred number and the numbers in between 'end' with a fifty, e.g. four hundred, four hundred and fifty, five hundred, five hundred and fifty.

End of unit check

➜ pages 39–41

My journal

Answers will vary.

1. Children will describe the number 415 in a variety of ways, describing its position on a number line. They may comment on its value compared to others e.g. it is less than 500.

2. Children explore using place value grid and seven counters to make numbers.

500 < number made < 700

Numbers made must have a digit total of 7 e.g. 502, 511.

If you had 8 counters, you could still make numbers in the range, but they could not all be in the 100s.

Power play

Answers will vary. Teacher to check number positioning on the number line.

Unit 2: Addition and subtraction

Lesson 1: Adding and subtracting 100s

➜ pages 42–44

1. a) 2 5 7 (Allow 5 2 7)
2 5 7 or 5 2 7
700
b) 7 3 4
7 3 4
400
c) 500 – 400 = 100 (Allow 400 + 100 = 500 or 100 + 400 = 500)
100
d) choc ices

2. a) 500
300 + 200 = 500
b) 500
400 + 500 = 900

3. a) 700 – 600 = 100
b) 500 – 300 = 200
3

4. a) 500 d) 900
b) 300 e) 200
c) 500 f) 700
a, c, e, f should be circled

5. The 800 and 500 are in the wrong circles. 800 is the total (300 + 500 = 800) and should be in the top circle, with 300 and 500 in the lower two circles.

6. star = 3 triangle = 5 square = 8

Reflect

Using fact families they should find 8 answers:
e.g. 900 = 400 + 500; 900 – 400 = 500; 500 = 900 – 400

Lesson 2: Adding and subtracting a 3-digit number and 1s

➜ pages 45–47

1. a) 8
258
258
b) 4, 2
4, 322
322

2. a) 165 b) 351
162 + 3 = 165 356 – 5 = 351

3. a) matches eight hundred and eight
b) arrow cards
c) match base 10 equipment
d) no match
e) arrow cards

4 a) 318 b) 0 c) 3

5. a) 128 c) 6
b) 0 d) 633

6. 153 + 6 = 159 or 156 + 3 = 159
549 – 0 = 549
432 + 1 < 434
847 – 5 = 846 – 4

Reflect

Answers may vary. Children represent 235 – 3 and 235 + 3 pictorially. This could be represented with base 10 equipment, place value grid or counters.

Lesson 3: Adding a 3-digit number and 1s

➜ pages 48–50

1. a) 154
b) 245
245 Children many complete number line by entering jumps (2 + 5) used and some or all of the numbers.

2. Number line shows jump of 3 then 1 ending at 351
a) 11
351

Number line shows jump of 2 then 1 ending at 531
b) 11
531

3. a) 355 d) 465 g) 565
b) 356 e) 464 h) 565
c) 357 f) 463 i) 565

Answers may vary.
e.g. In all of the additions it is only the tens and ones column that change.

Other explanations are acceptable.

4. 458 + 1 = 459
584 + 1 = 585
185 + 4 = 189
418 + 5 = 423 circled
154 + 8 = 162 circled
514 + 8 = 522 circled
841 + 5 = 846
158 + 4 = 162 circled

5. Possible answers:

583 + 4	853 + 4	584 + 3	854 + 3	385 + 4	384 + 5
835 + 4	834 + 5	843 + 5	483 + 5	485 + 3	845 + 3
535 + 8	438 + 5	348 + 5	345 + 8	534 + 8	538 + 4
354 + 8	358 + 4	458 + 3	453 + 8	548 + 3	543 + 8

Reflect

Children's explanations may vary. Explanation should notice the same 'starting' number but in one case the 10s stays the same, only 1s change. In the other, both 10s and 1s change as 5 + 8 > 10.

Lesson 4: Subtracting 1s from a 3-digit number

➜ pages 51–53

1. a) 251 – 7 = 244
244
b) 424 – 6 = 418
418

2. a) 295 Complete number line should show jump of 5, landing at 295
b) 4

3. 135 – 4 = 131 no exchange
235 – 6 = 229 exchange
336 – 9 = 327 exchange
446 – 4 = 442 no exchange
291 – 0 = 291 no exchange
290 – 1 = 289 exchange
299 – 1 = 298 no exchange
299 – 9 = 290 no exchange

4. a) 286 c) 276 e) 307
b) 386 d) 4 f) 307

5. Dexter has said 7 – 5, when it's 35 – 7 (we can pretend that the 200 isn't there to help mental calculation).
You need to know that 7 = 5 + 2, then 35 – 5 = 30;
30 – 2 = 28

So, 235 – 7 = 228

6. Children complete the sequence:

301 – 9 = 292	292 – 9 = 283	283 – 9 = 274
274 – 9 = 265	265 – 9 = 256	256 – 9 = 247
247 – 9 = 238	238 – 9 = 229	229 – 9 = 220
220 – 9 = 211	211 – 9 = 202	202 – 9 = 193

193

Reflect

Answers may vary. Children should say that an exchange is needed when the 1s subtracted is greater than the 1s digit in the 3-digit number.

Lesson 5: Adding and subtracting a 3-digit number and 10s

➜ pages 54–56

1. a) 197
197
b) 180 – 50 = 130
130
c) 525 417 310 201
555 447 340 231

2. a) 30 c) 10 more
b) 20 d) 893

3. 291 385
271 345
955 523
945 583

4. 320 290 275 249
Marked on number line as follows:
275: half-way between 2nd and 3rd mark after 250
290: on 4th mark after 250
249: just before 250 (do not allow if halfway between marks)
320: on 2nd mark after 300

5. a) 40 d) 285
b) 684 e) 604
c) 20 f) 0

6. 213 + 0 = 213
223 + 10 = 233
233 + 20 = 253
243 + 30 = 273

213 233 253 273

Reflect

Answer may vary.

e.g. 10s digit will be 9 in 432 + 60

I know that 3 + 6 = 9 so 30 + 60 = 90 so 432 + 60 = 492

The 10s digit will be 30 in 74 – 40. I know that 7 – 4 = 3, so 70 – 40 = 30, so 472 – 40 = 432

Lesson 6: Adding a 3-digit number and 10s

➜ pages 57–59

1. 50 525
525

2. a) 394 + 60 = 454
b) 480 + 12 = 492
c) 564 + 50 = 614
d) 624 + 90 = 714

3. a) 324
b) 361
c) 609
d) 299
e) 812
f) 60

4. Answer may vary. Isla had forgotten that 11 tens are 100 and 10, so that she should have increased her hundreds by 1 hundred too. So, 80 + 538 = 618.

5. a) 364
b) 416
c) 364
d) 416
e) 364
f) 416

Answers may vary.

e.g. The top row: I used bonds of 16 to help me. 9 + 7 = 16, 8 + 8 = 16; 7 + 9 = 16 so 9 tens + 7 tens = 16 tens.

The bottom row: I used bonds of 11 to help. 9 + 2 = 11; 7 + 4 = 11; 5 + 6 = 11 so 9 tens + 2 tens = 11 tens

6. Top left answer. Many possibilities: 1s digit in the 3-digit number will be 5 and the 10s digit in the 3-digit number and 2-digit number will be a bond of 11 e.g. 425 + 90 = 515

490 + 90 = 580

472 + 50 = 522 or 471 + 50 = 521

Bottom right answer. Various answers possible e.g. 462 + 90 = 552; 472 + 80 = 552

The 10s digits must be a bond of 15 (tens)

Reflect

When I add a 3-digit number and 10s, I know I will need to exchange 10 tens for 1 hundred if I have counted more than 9 tens in the tens column.

Lesson 7: Subtracting 10s from a 3-digit number

➜ pages 60–62

1. a) 7 5
155 155
b) 171 171
c) 315 – 80 = 235
235

2. a) 266
b) 500 2
552

3. 185
286 346
240 270

4. a) 280
b) 751
c) 290
d) 761

5. Top left answer: Various answers: 3-digit number must have a 5 digit in the 1s and the 10s digits must have a difference of 5 to make the calculation 655 e.g. 785 – 30 or 795 – 40 = 655

Top right answer: 690 + 20 = 710

Bottom left answer: Answer may vary: The 1s digit in the 3-digit number must be 0. The 10s digits in the 3-digit number must be one less than the number of 10s e.g. 780 – 90 = 690; 730 – 40 = 690

Bottom right answer 835 – 90 = 745 or 825 – 80 = 745 or 815 – 70 = 745

6. 81, 72

Reflect

Answers may vary. Children explain method e.g. using part-whole model.

Explain that 251 can be 100 + 150 + 1; if I have 150 – 80 = 70 then I'm left with 171.

Lesson 8: Adding and subtracting a 3-digit and a 2-digit number

➜ pages 63–65

1. a) 152 + 37 = 189
189
b) 152 – 41 = 111
111

2. 33 + 342 does not have a matching picture.

3. 122 134 976
133 145 22
144 33 33
166 55 987

Children then complete bottom three calculations by continuing the pattern.

4. 153 + 42 = 195 858 – 35 = 823
153 + 42 = 195 858 – 35 = 823

5. 272 + 24 = 296 678 – 32 = 646
272 + 24 = 296 678 – 32 = 646

Reflect

Children explain reasoning why 453 + 41 = 494 and 453 – 41 = 412.

e.g. I know that 453 + 41 will be 494 because 5 + 4 = 9 so 50 + 40 = 90

so 453 + 40 = 493; one more is 494.

453 – 41 = 412. I know that 50 – 40 =10. So, 453 – 40 = 413; subtract one more is 412.

Lesson 9: Adding a 3-digit and a 2-digit number

➜ pages 66–68

1. a) 168 + 23 = 191
191
191
b) 183 + 51 = 234
183 + 51 = 234
234

2. 823 + 92 = 915

3. 238 + 71 = 309 exchange 10 tens
318 + 72 = 390 exchange 10 ones
827 + 31 = 858 no exchange
731 + 28 = 759 no exchange
712 + 38 = 750 exchange 10 ones
73 + 182 = 255 exchange 10 tens
327 + 18 = 345 exchange 10 ones
28 + 137 = 165 exchange 10 ones

4. a) 258 + 47 = 305
b) 188 + 13 = 201
c) 303 + 17 = 320
d) 50 + 672 = 722
e) 525 + 76 = 601
f) 500 = 39 + 461

5. a) 355 + 61 = 416 b) 354 + 62 = 416

6.

267 + 34	239 + 64	189 + 12
802 + 99	565 + 37	251 + 49

Children explain how they chose their pairs. e.g. I looked at the 1s in both numbers and made sure they made 10 or more.

Reflect

Answer may vary.

Step one: Look at the 1s in both numbers and add together. Exchange 1s into a 10 if needed.

Step two: Look at 10s in both numbers and add together. Exchange 10 tens into 100 if needed.

Step three: Add together the hundreds.

Lesson 10: Subtracting a 2-digit number from a 3-digit number

➜ pages 69–71

1. a) 318
318
b) 291
291

2. a) 281 b) 390

3. a) 128 c) 184
b) 169 d) 889

4. Variety of answers:
e.g. 222 – 59 = 163
222 – 95 = 127
225 – 29 = 196
225 – 92 = 133
252 – 92 = 160
252 – 29 = 223
522 – 92 = 430
522 – 29 = 493
259 – 22 = 237
295 – 22 = 273
529 – 22 = 507
592 – 22 = 570
952 – 22 = 930
925 – 22 = 903
Check positions correctly placed on a number line.

5. 175 – 38 = 119

6. square = 8 triangle = 9

Reflect

Personal individual reflection.

End of unit check

➜ pages 72–73

My journal

Answers vary e.g. answers same, amount subtracted is the same

Power play

163 + 38 = 201

163 – 38 = 125

76 and 326

Unit 3: Addition and subtraction (2)

Lesson 1: Addition and subtraction patterns

➜ pages 74–76

1. Children complete compact addition.
a) 258
b) 254 + 40 = 294
c) 254 Children draw in 4 in H column
654

2. a) 256 Children complete compact subtraction
b) 30

3. 797

4. a) 545
365
347
b) 757
775
977
c) 30
300
3
d) – 200
– 300
+ 400

5. Dexter may have to change two digits if the answer crosses a 100s boundary.

e.g. 322 + 90 = 412 (100s and 10s change)

Reflect

Children show how 654 – 300 and 654 + 300 is worked out. Children may discuss that only the 100s would change in both cases and use of part-whole model 9 = 6 + 3; 6 = 3 + 3

Lesson 2: Adding two 3-digit numbers (1)

➜ pages 77–79

1. a) Compact addition completed to show:
224 + 543 = 767
b) 301 + 684 = 985
c) Place value chart completed:
527 + 221 = 748

2. a) 798 b) 972 c) 397
d) 894 e) 825

3. 547

4. a) 186 + 312 = 498
b) 300 + 245 = 545
c) 548 + 130 = 678

5. 436 + 231 = 667: triangle = 2; square = 3; star = 6

6. a) 540 + 321 = 861
b) 862 871
961 861
871 882

Reflect

Joe has said that 400 + 100 = 600 which is not correct.
He has tried to add 143 instead of 134.
Answer should be 454 + 134 = 588

Lesson 3: Adding two 3-digit numbers (2)

➜ pages 80–82

1. a) 154 + 168 = 322
322
322
b) Children complete the place-value chart and compact addition.
151 + 163 = 314

2. a) 236 + 155 = 391 exchange 1s
237 + 173 = 410 exchange 1s and 10s
347 + 270 = 617 exchange 10s
410 + 199 = 609 exchange 10s
109 + 190 = 299 no exchange
88 + 113 = 201 exchange 1s and 10s
b) yes: 237 + 173 and 88 + 113

3. a) 432 + 487 = 919 178 + 13 = 191 629 + 282 = 911
b) Answers may vary e.g. 759 + 152 = 911
10s can be 0 + 0 or a bond of 10 e.g. 5 + 5:
If 10s is a bond of 10, then H=7
If 10s is 0 + 0 the H = 8
1s = 2

4. 10s must include 5 + 5 or 5 + 8 or 8 + 5 to ensure the total is greater than 900. For example:

458 + 451 451 + 458 481 + 455 455 + 481

485 + 451 451 + 485 485 + 415 415 + 485

2 more than spaces.

Reflect

Bella is wrong as she will exchange 10 1s for a 10 because 5 + 7 = 12. Answer will be 712.

Lesson 4: Subtracting a 3-digit number from a 3-digit number (I)

➜ pages 83–85

1. Children complete compact subtraction and show 'crossings out' in PV chart or counters
a) 678 – 135 = 543
b) 876 – 351 = 525
c) 786 – 531 = 255

2. Children complete subtraction to show:
599 – 377 = 222
222

3. Children complete subtraction to show:
a) 888 – 434 = 454 868 – 443 = 425
688 – 340 = 348 688 – 34 = 654
b) 886 – 340 = 546 364 = 668 – 304

4. a) 894 – 690 = 204
b) Answers will vary. Teacher checks word problem is subtraction.

5. a) Possible numbers that give an answer between 200 and 220 are 120, 121, 122
b) Various numbers give an odd answer, e.g. 101, 111, 201, 211, 221.
c) Number must have a 1 in the ones column and be a multiple of both 5 and 10. Possible numbers are: 111, 121, 211, 201, 221.

Reflect

Children show their method for 372 – 251.

Lesson 5: Subtracting a 3-digit number from a 3-digit number (2)

➜ pages 86–88

1. a) 513 – 181 = 332
b) 385 – 169 = 216 Children cross off in place-value chart and complete subtraction.

2. 543 – 235 = 308 543 – 345 = 198 508 – 91 = 417

3. a) 340 – 187 = 153
b) 304 – 187 = 117
c) 400 – 178 = 222

4. a) 575 – 439 = 136
b) 930 – 539 = 391

5. Written as column subtraction: 405 – 138 = 267

6. Children test ideas that Even – Even = Even (Mo's idea) and Odd – Odd = Odd (Danny's idea)

They should conclude that Mo is correct but not Danny as Odd – Odd = Even

Reflect

Children record subtraction that needs only one exchange with an explanation that either the 10s or 1s digit in the lower line is greater than the corresponding digit in the top line.

Lesson 6: Estimating answers to additions and subtractions

➜ pages 89–91

1. Positioning numbers on a number line:
310 between 300 and 400, nearer 300
480 between 400 and 500, nearer 500
507 between 500 and 600, just past 500
990 between 900 and 1000, almost at 1000
99 between 0 and 100, almost at 100

2.
388	900	
688 or 721	97	100
600	298	300

3. a) 300 + 200 = 500 b) 600 – 400 = 200
500 200

4.
Approx. 200	Approx. 500	Approx. 800
548 – 351	195 + 304	901 – 99
	88 + 399	990 – 195
	949 – 452	

5. a) 200 b) 800 c) 400
redo c) 781 – 394 = 387

6. I agree with Jamie because 198 + 297 estimated is 200 + 300 = 500. I expect it to be less as 198 is less than 200 and 297 is less than 300.

Reflect

400 200 700 or 750.

Some children may see that 448 is close to 450 and will estimate to 750.

Lesson 7: Checking strategies

➜ pages 92–94

1. a) 220
220 + 215 = 435
553
211 364
364 + 211 = 575
b) 553 – 364 = 189 553 – 364 = 189

2. 517
310 207
310 + 207 = 517

I think the subtraction is correct because the subtraction matches the part-whole model.

3. a) 255 – 88 = 167
88 + 167 = 255

b) I agree with Olivia because the three numbers in the subtraction match the three in the addition.

4. 755 540 601

300 455 200 340 599 2

755 – 300 = 455	200 = 540 – 340	601 – 599 = 2
755 – 455 = 300	340 = 540 – 200	599 = 601 – 2
300 + 455 = 755	340 + 200 = 540	599 + 2 = 601
755 = 455 + 300	200 + 340 = 540	601 = 2 + 599

5. 201
201
201

6. a) I know that if 291 – 100 = 191 then 291 – 191 = 100 but 291 – 192 is subtracting one more so the answer is 99.

b) I know that 291 = 100 + 191 and that 99 + 192 = 291 is the same total; one has been taken from 100 to make 99 and added to 191 to make 192.

Reflect

Estimation gives you a rough answer while fact families gives you the exact answer.

Lesson 8: Problem solving – addition and subtraction (I)

➜ pages 95–97

1. a) 335 Complete compact addition 125 + 210 = 335
335

b) 231 94 231 + 94 = 325
94

2. Bottom left-hand drawing is circled
263

3. Top bar = 266
Bottom bars = 128 and 138
138

4. Top bar = 201
Bottom bars = 99 and 102

5. Top bar = 500
Bottom bars: 125; 125 + 55 = 180; 195
Bracket linking 125 and 180 may show total of 305

Reflect

Children write a question to match 99 + ? = 201

Lesson 9: Problem solving – addition and subtraction (2)

➜ pages 98–100

1. 314 – 282 = 32
32

2. a) Reena 205
Daniel 175 30
30

b) Bar model: Top Bar 380
Bottom bars: 205 and 175
380

3. Eiffel Tower bar with 324
Blackpool Tower Bar 158 Difference space 166
158

4. a) Girls Bar = 161
Boys Bar = 158 Difference space = 3

b) School A Bar = 158
Bar 161 Linked together to show total = 319
School B Bar = 173
Bar = 118 Linked together to show total = 291

School A Bar showing 319 (total from above)
School B Bar showing 291 (total from above)
Difference between two bars = 28

5. Bottom: Ebo's number split into two parts.
Left-hand side = Zac's number
Right-hand side = difference
Difference space labelled 699
Ebo's and Zac's bars linked together at the end showing they total 801
801 = 699 + Zac's number + Zac's number
Ebo's amount is $\frac{1}{2} \times 102 + 699 = 750$
Zac's amount = $\frac{1}{2} \times 102 = 51$

Reflect

I would draw one bar when I was adding or subtracting, and two when I was comparing two amounts or calculations.

End of unit check

➜ pages 101–102

My journal

Children order calculations according to their perception of difficulty.

Power play

Children construct pairs of 3-digit numbers, which they sum correctly. They use strategy to order their digits so as to get numbers that can be close together on the number line.

Unit 4: Multiplication and division (I)

Lesson 1: Multiplication – equal grouping

➜ pages 103–105

1. A, B

2. 3 4
4 + 4 + 4 = 12
3 × 4 = 12
12

3. 4 5
5 + 5 + 5 + 5 = 20
4 × 5 = 20
20

4. 3 × 10 with 10 + 10 + 10
5 + 5 + 5 + 5 + 5 + 5 with 6 × 5
2 × 4 with 4 + 4
3 + 3 + 3 + 3 with 4 × 3

5. 5 + 5
10 + 10

6. Children circle according to question, can be done in a variety of ways as long as circles contain equal totals.

Reflect

Children comment about seeing 2 lots of 10 or 10 lots of 2. Possibly they say they can see both, noting that they both equal 20. Some may say linked division facts e.g. 20 ÷ 2 = 10; 20 ÷ 10 = 2.

Lesson 2: Multiplying by 3

➜ pages 106–108

1. a) Number line completed to show 8 jumps of 3. Numbers 18, 21, 24 added to number line.
3 + 3 + 3 + 3 + 3 + 3 + 3 + 3 = 24
8 × 3 = 24
24
b) 11 × 3 = 33
33

2. 6 × 3 = 18
18

3. a) 3 × 12 = 36
36
b) 3 × 10 = 30
30

4. 11 × 3 = 33
33

5. 12 × 3 = 36; 15 × 3 is another 3 × 3 greater
I know that 3 × 3 = 9 and 12 × 3 = 36
9 + 36 = 45 so 15 × 3 = 45

6. Danny is correct because 1 × 3 = 3; 3 × 3 = 9; 5 × 3 = 15; 11 × 3 = 33. They are all odd.

Reflect

Children write a word problem for 9 × 3 = 27

Lesson 3: Dividing by 3

➜ pages 109–111

1. a) 18
3
18 ÷ 3 = 6
6
b) Number line shows 8 jumps of 3, starting at 24 and jumping back to 0.
24
24 ÷ 3 = 8
8
c) 9 ÷ 3 = 3
3

2. a) 9 Children may circle groups of 3 vertically on array.
b) 5 Children may circle groups of 3 horizontally on array.

3. Children may draw lines from cubes to bags to show sharing.
a) 4
b) You cannot share 13 between 3 bags as one bag would have 5. To share equally, you would need another 2.

4. Number line starts at 36, then jump forward 3 (39) and another 3 (42). This is another 2 × 3. 14 × 3 = 42 so, 42 ÷ 3 = 14

5. 6

Reflect

Children explain 15 ÷ 3 = 5 e.g. by drawing array, using a multiplication fact; drawing a picture.

Lesson 4: 3 times-table

➜ pages 112–114

1. a) 5 × 3 = 15
b) 10 × 3 = 30
c) 4 × 3 = 12

2. a) 0 × 3 = 0 c) 21
b) 9 × 3 = 27 d) 8

3. 7 × 3 = 21 3 × 3 < 21
3 × 0 < 21 3 × 7 = 21
8 × 3 > 21 Any number greater than 7
12 × 3 > 21 4 × 3 < 21
Any number less than 7

4 a) 12
b) 6
c) 7
d) 0
e) 12
f) 3
g) 3

5 a) > g) <
b) > h) >
c) < i) <
d) = j) >
e) >
f) <

6. Pattern coloured in shows diagonal pattern

Lesson 5: Multiplying by 4

➜ pages 115–117

1. a) Number line completed to show 5 jumps of 4, ending on 20
5 × 4 = 20
20
b) 9 × 4 = 36
36

2. 0 4 20 32 44 48

3. 6 × 4 = 24

4. a) 7 × 4 = 28
28
b) 4 × 5 = 20
20
c) 28 + 20 = 48 (Allow 20 + 28)
48

5. a) 21 42 84
b) 50 100 200
c) 27 54 108

6. Children may do in various ways.
7 × 4 = 28 5 × 4 = 20 20 + 28 = 48
or 7 + 5 = 12 12 × 4 = 48
or 12, 24, 48

Reflect

Children may say about knowing their 4 times-table or counting in 4s or × 4 is double then double again.

Lesson 6: Dividing by 4

➜ pages 118–120

1. a) 24 ÷ 4 = 6
6
b) Apples ringed into 4s
Number line shows 4 jumps of 4
16 ÷ 4 = 4
4

2. 20 ÷ 4 = 5
5

3. 8 Array circled in 8 vertical groups of 4.

4. 28 ÷ 4 = 7
7

5. 20 ÷ 4 = 5
5

6. Jamilla is not correct as 24 ÷ 4 = 6 and 24 ÷ 3 = 8.
The bigger the number you divide by, the smaller the answer if the starting number is the same.

7. 64 halved = 32 halved = 16

Reflect

Children explain why ÷ 4 is the same as ÷ 2 twice. Could be shown by cutting up an array or using a drawing e.g. pizza halved then halved again produces 4 pieces.

Lesson 7: 4 times-table

➜ pages 121–123

1. a) 6 × 4 = 24
b) 12 × 4 = 48
c) 2 × 4 = 8

2. a) 20 e) 7
b) 4 f) 11
c) 36 g) 0
d) 12 h) 4

3. a) All numbers expect 11 are circled.
b) All the numbers that are answers in 4 times-table are even; 11 is the only odd number.

4. a) 9 e) 5
b) 7 f) 8
c) 10 g) 12
d) 2 h) 44

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

6. Left-hand Target outer ring: 16 28
inner ring: 1 6
Right-hand Target outer ring: 18 15
inner ring: 10 8

Reflect

12, 24, 36, 48, etc are in both tables. They are groups of 12 (multiples of 12).

Lesson 8: Multiplying by 8

➜ pages 124–126

1. a) Number line jumps in 8s, 3 jumps of 8
3 × 8 = 24
24
b) 6 × 8 = 48
48

2. 5 × 8 = 40
40

3. 7 × 8 = 56
56

4. 4 × 8 = 32
32

5. a) 56
b) 32

6. a) 160 b) 296

Reflect

Children could do 6 × 4 = 24 add 6 × 4 = 24.

6 × 4 = 24 doubled is the same as 6 × 8 = 24

Lesson 9: Dividing by 8

➜ pages 127–129

1. a) 24 ÷ 8 = 3
3
b) 32 ÷ 8 = 4
4

2. 8 ÷ 8 = 1
1 ball

3. 48 ÷ 8 = 6
6

4. a) 4 2
b) 10 5

5. 4 × 8 = 32
32

6. Answers may vary
4 × 6 = 24
24 ÷ 8 = 3

Reflect

Children describe putting 16 into 2 groups of 8.

So, 16 ÷ 8 = 2

Lesson 10: 8 times-table

➜ pages 130–132

1. a) 2 × 8 = 16
b) 7 × 8 = 56
c) 4 × 8 = 32

2. a) 48 e) 80
b) 0 f) 8
c) 96 g) 1
d) 40 h) 7

3. a) 32, 40, 56
b) 80 64 56 40
c) 48 56 64 72
d) 32 24 16 8

4. a) 5 e) 9
b) 3 f) 80
c) 4 g) 8
d) 12 h) 0

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

6. 8 3
24

Reflect

First column: any calculations in the form

0 × 4 = 0, 5 × 0 = 0, 0 = 6 × 0, 0 = 0 × 7,

and so on, using numbers 0 to 12.

Second column: any multiplications of numbers 1 to 12 with answers 32, 33, 35, 36;

for example, 3 × 11 = 33, 7 × 5 = 35.

Some children may also correctly write

2 × 17 = 34, 2 × 19 = 38, 3 × 13 = 39.

Third column: further answers are

1 × 40, 4 × 10, 5 × 8

and other calculations in these fact families.

Fourth column: any multiplication fact using numbers 6 to 12 that have an answer greater than 70, e.g.

6 × 12 = 72, 7 × 11 = 77, 8 × 10 = 80.

In the first column, whatever numbers you choose, multiplying by 0 always gives an answer of 0.

Lesson I1: Problem solving – multiplication and division (I)

➜ pages 133–135

1. a) 20
5 4 20
20
b) 56
8 8 8 8 8 8
7 × 8 = 56
56

2. 4 4 4 4
16 ÷ 4 = 4
4

3. Children draw 2 more bars with 8
24 ÷ 8 = 3
3

4. Bar model with 5 horizontal bars each with £3
5 × 3 = 15
15

5. 12

Reflect

Children write a multiplication word problem with an answer of 24.

Lesson I2: Problem solving – multiplication and division (2)

➜ pages 136–138

1. a) 4 × 3 = 12 5 × 2 = 10
12 10
b) 12 + 10 = 22
22

2. 4 × 2 = 8
6 × 5 = 30
8 + 30 = 38
38

3. a) 2 × 8 = 16
6 × 4 = 24
24 > 16
Jamie
b) 24 – 16 = 8
8

4. a) 7 × 3 = 21
21
b) 40 ÷ 8 = 5
5

5. 15

Reflect

Example answers include:

How much do 3 cakes cost? (3 × 8 = 24, so £24)

What is the cost of 4 sandwiches? (4 × 4 = 16, so £16)

What do 2 coffees and 2 muffins cost?
(2 × 2 + 2 × 3 = 4 + 6 = 10, or (2 + 3) × 2 = 5 × 2 = 10, so £10

Lesson I3: Understanding divisibility (I)

➜ pages 139–141

1. a) Children draw 2 complete squares then separate 3 lines either in a line or as 3 sides of an incomplete square.
b) 2
c) 3
d) 3 2

2. Answers in table going across

12	2	2
13	2	3
14	2	4
15	3	0
16	3	1
23	4	3

b) The greatest number is 4 because if you had five, that would be another pentagon.

3. 23

Reflect

The greatest number is 4 because if you had five, that would be another group of 5.

Lesson I4: Understanding divisibility (2)

➜ pages 142–144

1. 6 1
6 1

2. 4 1
4 1

3. 9 5 1 4

4. a) 7 1
b) 5 0
c) 3 3
d) 3 0
e) 2 3

5. a) 13 ÷ 3, 19 ÷ 4, 28 ÷ 10 all circled
b) 13 3 4 1
19 4 4 3
28 10 2 8

6. a) Any answers as long as the number is one more than a multiple of 4.
e.g. 4 + 1 = 5; 8 + 1 = 9
b) The largest remainder is one less than the number you divide by. So when you divide by 5, the largest remainder is 4.

7. 24

Reflect

Children comment there will be no remainders as they are all numbers in the 3 times-table (multiples of 3). Numbers that give remainders of 1 will be numbers that are 1 more than multiples of 3 (numbers in the 3 times-table).

Lesson I5: Related facts – multiplication and division

➜ pages 145–147

1. 3 × 6 = 18 18 ÷ 3 = 6
6 × 3 = 18 18 ÷ 6 = 3

2. a) 2 × 5 = 10
5 × 2 = 10
10 ÷ 5 = 2
10 ÷ 2 = 5
b) 3 × 10 = 30
10 × 3 = 30
30 ÷ 3 = 10
30 ÷ 10 = 3

3. 5 × 7 = 35
7 × 5 = 35
35 = 5 × 7
35 = 7 × 5
35 ÷ 7 = 5
35 ÷ 5 = 7
5 = 35 ÷ 7
7 = 35 ÷ 5

4. 6 × 10 = 60 – total number of leaflets
60 ÷ 10 = 6 – number of packs
60 ÷ 6 = 10 – number of leaflets in each pack
10 × 6 = 60 – total number of leaflets

5. circle = 16
square = 4
triangle = 11

6. a) 160 ÷ 8 = 20
b) 39 × 5 = 195

Reflect

4 × 5 = 20
5 × 4 = 20
20 = 4 × 5
20 = 5 × 4
20 ÷ 4 = 5
20 ÷ 5 = 4
4 = 20 ÷ 5
5 = 20 ÷ 4

End of unit check

➜ pages 148–150

My journal

a) 30, 40, 50…

b) 24, 48, 72…

c) 40

d) 60

e) 120

Power play

a) Wheel top left (clockwise from 7): 21, 6, 15, 18, 30, 36, 3, 0, 12, 9

Wheel top right (clockwise from 4): 16, 24, 36, 48, 0, 4, 32, 12, 20, 44

Wheel bottom left (clockwise from 7): 35, 2, 40, 12, 25, 9, 15, 6, 55

Wheel bottom right, × 8 in centre (clockwise from 64): 8, 1, 2, 3, 4, 0, 10, 11, 7, 5

b) Wheel top left, multiplications (clockwise from 18): complete, complete, 60, 20, 32, 8, 8, 18, 80, 48

Wheel top right, multiplications (clockwise from 5): 20, 4, 11, 8, 7, 21, 12, 18, 4, 8

Wheel bottom left, multiplications (clockwise from 10):
2 × 5 or 1 × 10
5 × 4 or 2 × 10
2 × 4 or 1 × 8
3 × 8 or 12 × 2 or 6 × 4
6 × 8 or 12 × 4 or 16 × 3 or 24 × 2
8 × 4 or 16 × 2
9 × 3
3 × 3
10 × 3 or 6 × 5 or 15 × 2
10 × 4 or 5 × 8 or 20 × 2

Unit 5: Multiplication and division (2)

Lesson 1: Comparing multiplication and division statements (I)

→ pages 6–8

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

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

3. $20 \div 5 > 20 \div 10$ (or $20 \div 10 < 20 \div 5$)
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) $2 \times 3 = 6$
There are 6 pins.
b) $2 \times 30 = 60$
There are 60 pins.

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

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

4. a) $6 \times 4 = 24$
b) $6 \times 40 = 240$

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 $5 \times 7 = 35$
$50 \times 7 = 350$

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) $6 \times 4 = 24$; $4 \times 6 = 24$; $24 \div 6 = 4$; $24 \div 4 = 6$
b) $60 \times 4 = 240$; $4 \times 60 = 240$; $40 \times 6 = 240$ or $6 \times 40 = 240$
$240 \div 4 = 60$; $240 \div 60 = 4$; $240 \div 40 = 6$ or $240 \div 6 = 40$

4.

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

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

Reflect

Answers will vary; for example: $80 \times 3 = 240$; $8 \times 30 = 240$; $24 \div 3 = 8$; $240 \div 30 = 8$.

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) <
b) >
c) >
d) >
e) >
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) 15 (5 × 3)
+ 60 (20 × 3)
75

b) 28 (7 × 4)
+ 40 (10 × 4)
68

2. a) 18 (6 × 3)
+ 30 (10 × 3)
48

b) 16 (8 × 2)
+ 80 (40 × 2)
96

3. a) 14
× 5
20 (4 × 5)
50 (10 × 5)
70

b) 19
× 4
36 (9 × 4)
40 (10 × 4)
76

4. a) 12
× 4
8 (2 × 4)
40 (10 × 4)
48

b) 21
× 4
4 (1 × 4)
80 (20 × 4)
84

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

6. a) 35
× 3
15 5 × 3
90 30 × 3
105

b) 18
× 6
48 8 × 6
60 10 × 6
108

7. 55
× 3
15
150
165

♡ = 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.

23
× 5
15 3 × 5
100 20 × 5
115

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 I0: 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 I1: 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 I2: Problem solving – mixed problems (I)

→ 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 I3: 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 I4: 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 × 15 = 120. Methods may vary.
b) 87 ÷ 3 = 29. Methods may vary.

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

Power puzzle

a) 60 × 3 = 180 or 30 × 60 = 180

b) 6 × 4 + 9 × 4 = 15 × 4 or 9 × 4 + 6 × 4 = 15 × 4

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

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	c) £4	50p
b)	£3 94p	d)	724p

5. Missing amounts are:

a)	50p	e)	308p
b)	£4 29p	f)	448p £4
c)	£5 4p	g)	£18 70p
d)	185p		

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

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.

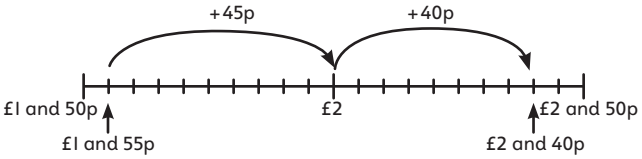
5. a) £1 and 85p – £1 and 42p = 43p
b) £4 and 12p – £3 and 80p = 32p
c) £7 – 84p = £6 and 16p
d) £3 and 92 – £2 and 97p = 95p

Reflect

£2 and 40p – £1 and 55p = 85p

Methods will vary; for example:

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



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.

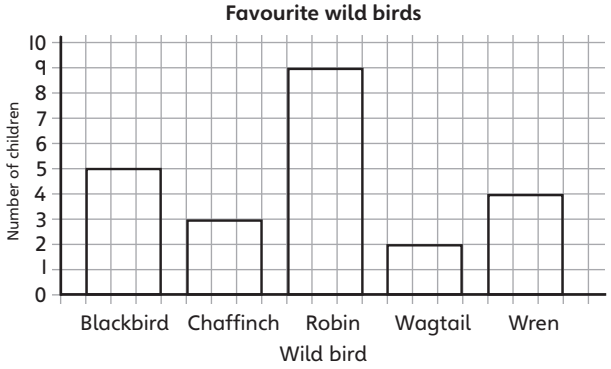
Lesson 3: Bar charts (1)

→ pages 74–76

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

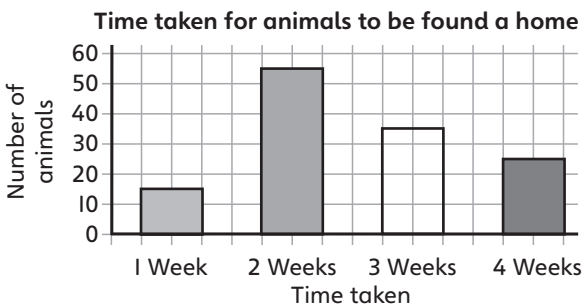
2. a) 30
b) Sunday
55
c) Friday
15

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

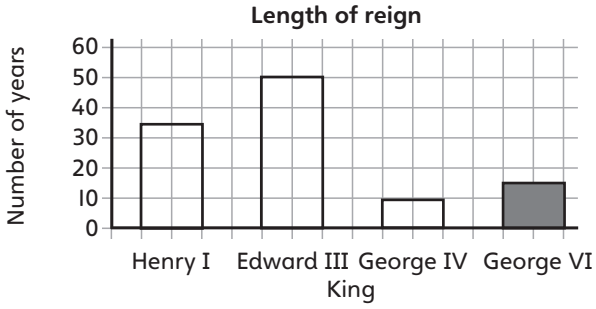
1. a) 8 – 4 = 4
4
b) 3
Edward and Henry (either order)

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 (I)

→ 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 (I)

→ 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 (I)

→ 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

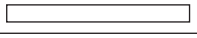
My journal

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 (I)

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: $\frac{1}{4}$

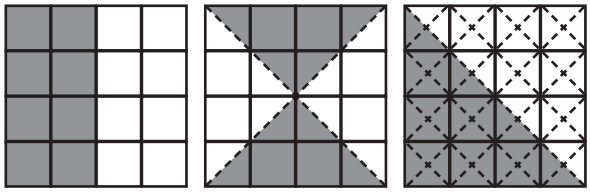
3. $\frac{1}{5}$ of the cards are light coloured.
$\frac{2}{5}$ have numbers on the roof.
$\frac{2}{5}$ are dark coloured.

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.

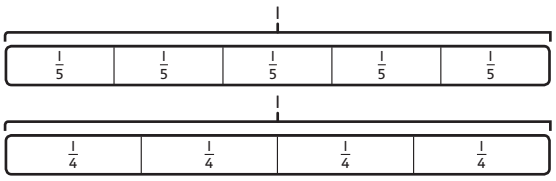
$\frac{1}{6}$ means 1 out of 6, so I coloured 1 out of the 6 sections red.

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 (I)

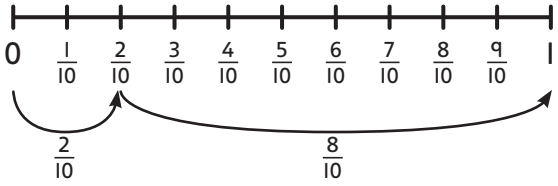
➜ pages 128–130

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

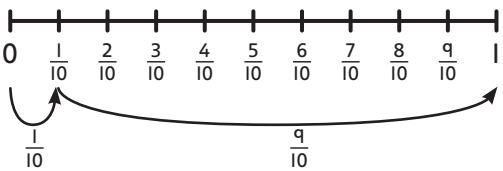
2. a) 4 triangles coloured
b) 7 small rectangles coloured
c) 8 circles coloured

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

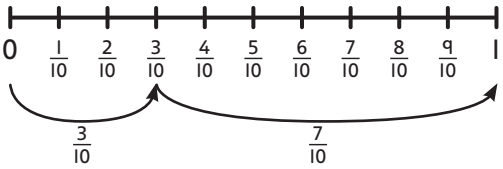
b)



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

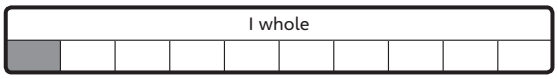
I know the next two numbers in the sequence will be $\frac{10}{10}$ (or 1) and $1\frac{1}{10}$.

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 $1\frac{1}{10}$.

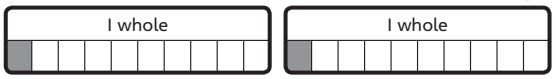
Lesson 4: Tenths (2)

→ 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
b) 5
c) $\frac{6}{10}$
d) $\frac{7}{10}$
e) $\frac{10}{10}$
f) $\frac{0}{10}$

4. a) 2
b) 10
c) $\frac{3}{10}$
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 (I)

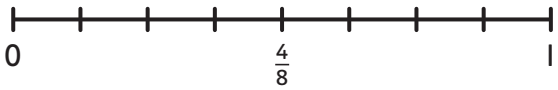
→ pages 134–136

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 = $\frac{8}{9}$

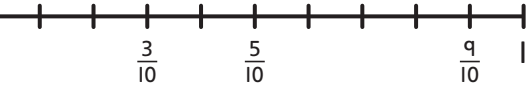
3. a)

b)



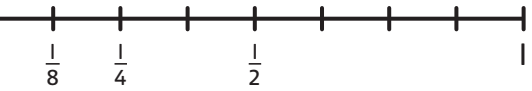
Some children may recognise that $\frac{4}{8}$ is equivalent to $\frac{1}{2}$ and position it at the midpoint of the line.

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

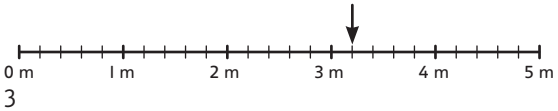
Divide the line into 5 equal parts and write $\frac{1}{5}$ at the first mark.

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)

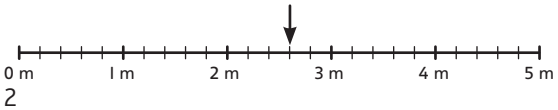
→ pages 137–139

1. a)

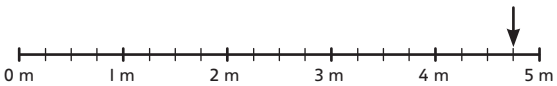


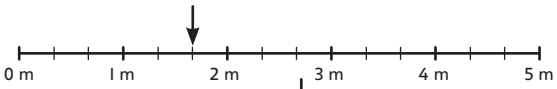
3
1

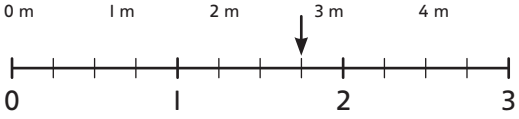
b)



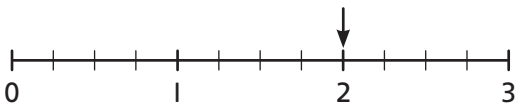
2
3

c)


d)


2. a)


b)

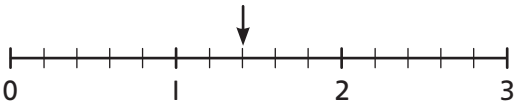

c)


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



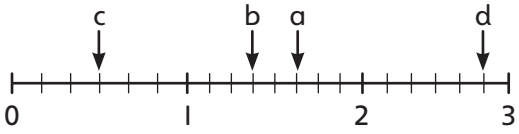
Answers will vary; for example:

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

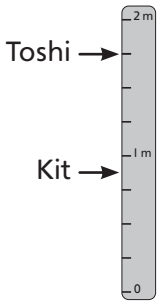
Lesson 7: Fractions as numbers (3)

→ pages 140–142

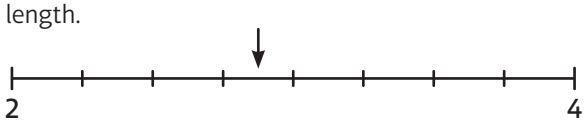
1. a) $1\frac{5}{8}$
b) $1\frac{3}{8}$
c) $\frac{3}{6}$ (or $\frac{1}{2}$)
d) $2\frac{5}{6}$

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 (I)

→ pages 143–145

1. a) $36 \div 6 = 6$
$\frac{1}{6}$ of 36 books = 6 books.
Each class gets 6 books.
b) $36 \div 9 = 4$
$\frac{1}{9}$ 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 ÷ 4 = 4 $\frac{1}{4}$ of 16 flowers = 4 flowers
b) 16 ÷ 4 = 4
4 × 3 = 12 $\frac{3}{4}$ of 16 flowers = 12 flowers
c) 18 ÷ 6 = 3 $\frac{1}{6}$ × 18 glasses = 3 glasses
d) 18 ÷ 6 = 3
5 × 3 = 15
$\frac{5}{6}$ × 18 glasses = 15 glasses

2. 18 ÷ 3 = 6
Children draw 6 in each part of the part-whole diagram.
18 ÷ 3 = 6
6 × 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 ÷ 4 = 25
25 × 3 = 75
$\frac{3}{4}$ of 100 pencils is 75 pencils.
b) 180 ÷ 3 = 60
60 × 2 = 120
$\frac{2}{3}$ of 180 g of flour is 120 g.
c) 95 ÷ 5 = 19
19 × 2 = 38
$\frac{2}{5}$ of 95 dog biscuits is 38.
d) 32 ÷ 8 = 4
4 × 3 = 12
$\frac{3}{8}$ of 32 km is 12 km.

2. 32 ÷ 4 = 8
8 × 3 = 24
24 cm of ribbon was used.

3. 60 ÷ 6 = 10
10 × 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 ÷ 5 = 16, then work out 16 × 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 ÷ 5 = 4 4 × 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 × 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 × 6 = 18 or 6 + 2 × 6 = 18
6 + 6 + 6 = 18 or 6 + 12 = 18
18 – (2 × 6) = 6 or 18 – 6 = 2 × 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

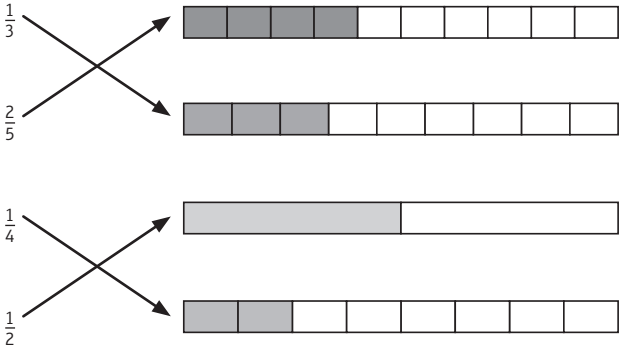
Unit 10: Fractions (2)

Lesson 1: Equivalent fractions (1)

➜ pages 6–8

1. a) $\frac{1}{4} = \frac{2}{8}$
b) $\frac{1}{6} = \frac{2}{12}$
c) $\frac{1}{3} = \frac{2}{6} = \frac{4}{12}$

2. Lines drawn as below:



3. a) $\frac{2}{3} = \frac{6}{9}$
(2 out of 3 parts shaded in the top bar; 6 out of 9 parts shaded in the bottom bar.)

b) $\frac{3}{15} = \frac{1}{5}$
(1 out of 5 parts shaded in the top bar; 3 out of 15 parts shaded in the bottom bar.)

c) $\frac{3}{12} = \frac{2}{8} = \frac{1}{4}$
(1 out of 4 parts shaded in the top bar; 2 out of 8 parts shaded in the middle bar; 3 out of 12 parts shaded in the bottom bar.)

4. $\frac{6}{8} = \frac{3}{4} = \frac{9}{12}$
(3 out of 4 parts shaded in the top bar; 6 out of 8 parts shaded in the middle bar; 9 out of 12 parts shaded in the bottom bar.)

5. Olivia is not correct, as she has not split the whole into 5 equal parts, so the parts are not fifths.
Children may draw bar models to compare and show that $\frac{2}{5} \neq \frac{1}{3}$. Alternatively, they may add a line to the top diagram to split the circle into sixths and label the fraction as $\frac{2}{6}$.

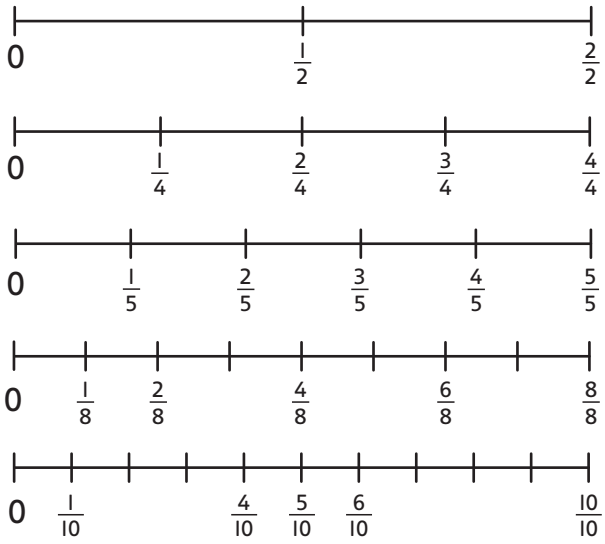
Reflect

An explanation should recognise that if you fold a sheet of paper into equal parts and shade one part, then the size of this shaded part stays the same even if the paper is folded again to make smaller equal parts; for example: I can fold my paper in half and shade in 1 half. If I then fold my paper in half again, I can now see $\frac{2}{4}$ shaded, which is the same as $\frac{1}{2}$.

Lesson 2: Equivalent fractions (2)

➜ pages 9–11

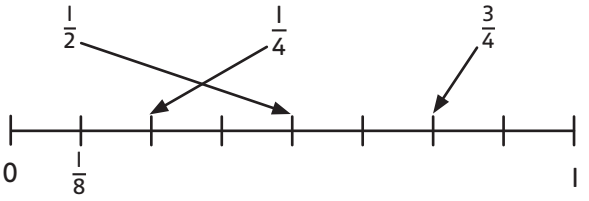
1.



2. a) $\frac{1}{2} = \frac{2}{4}$
b) $\frac{1}{2} = \frac{4}{8}$
c) $\frac{1}{2} = \frac{5}{10}$
d) $\frac{1}{4} = \frac{2}{8}$
e) $\frac{1}{5} = \frac{2}{10}$
f) $\frac{2}{5} = \frac{4}{10}$
g) $\frac{3}{4} = \frac{6}{8}$
h) $\frac{3}{5} = \frac{6}{10}$

3. a) $\frac{1}{3} = \frac{2}{6}$ b) $\frac{2}{3} = \frac{4}{6}$ c) $\frac{1}{2} = \frac{3}{6}$
d) Answers will vary: any three fractions that are not equivalent to $\frac{1}{3}$.

4.



5. $\frac{1}{3}$ written at first mark along the line.
These fractions circled on the bottom number line:
$\frac{1}{9}, \frac{2}{9}, \frac{4}{9}, \frac{5}{9}, \frac{6}{9}, \frac{7}{9}, \frac{8}{9}$.

6. $\frac{2}{2}$ and $\frac{7}{7}$ both equal 1 whole so they are equivalent fractions.
Any fractions equivalent to 1 whole (any fractions with a numerator the same as the denominator).

Reflect

Children need to explain that when they draw number lines to compare fractions, the number lines need to be the same length (the **whole** needs to be the same). They also need to explain that the whole needs to be divided into the number of **equal** parts determined by the denominator before they can compare.

Lesson 3: Equivalent fractions (3)

➜ pages 12–14

1. a) $\frac{1}{8} = \frac{2}{16}$
(1 out of 8 parts shaded in the top bar; 2 out of 16 parts shaded in the bottom bar.)

b) $\frac{4}{5} = \frac{8}{10}$
(4 out of 5 parts shaded in the top bar; 8 out of 10 parts shaded in the bottom bar.)

c) $\frac{3}{4} = \frac{9}{12}$
($\frac{3}{4}$ written at third mark along the top number line; $\frac{9}{12}$ written at ninth mark along bottom number line.)

d) $\frac{3}{4} = \frac{12}{16}$
($\frac{3}{4}$ written at third mark along top number line; $\frac{12}{16}$ written at twelfth mark along bottom number line.)

2. a) Answers will vary. Children could show and compare $\frac{2}{3}$ and $\frac{8}{12}$ pictorially, proving they are equal. Or they could write an explanation of how the numerator and denominator have both been multiplied by 4 to give $\frac{8}{12}$.

b) Answers will vary. Children could show and compare $\frac{2}{5}$ and $\frac{4}{15}$ pictorially, proving they are not equal. Or they could explain that the numerators and the denominators of the two fractions are not related by the same factor or multiple (the numerator of $\frac{2}{5}$ has been multiplied by 2, but the denominator has been multiplied by 3).

3. a) $\frac{6}{10} = \frac{12}{20}$ d) $\frac{4}{8} = \frac{1}{2}$ g) $\frac{4}{32} = \frac{1}{8}$

b) $\frac{3}{4} = \frac{12}{16}$ e) $\frac{5}{11} = \frac{30}{66}$ h) $\frac{12}{36} = \frac{3}{9}$

c) $\frac{8}{12} = \frac{4}{6}$ f) $\frac{5}{15} = \frac{1}{3}$ i) $\frac{5}{7} = \frac{20}{28}$

Children should have drawn a line between f) and h).

4. $\frac{27}{36}, \frac{30}{40}, \frac{33}{44}$

5. Emma is wrong. She has added 1 to the numerator and to the denominator – this does not show equivalence. In order to show equivalence, you need to either multiply both the numerator and the denominator by the same multiple or divide them both by a common factor.

Reflect

Teachers should look for an explanation that you can divide both the numerator and denominator in $\frac{4}{10}$ by the common factor 2 to make $\frac{2}{5}$.

Lesson 4: Comparing fractions

➜ pages 15–17

1. a) $\frac{1}{2} > \frac{1}{3}$ c) $\frac{1}{4} = \frac{4}{16}$

b) $\frac{1}{5} > \frac{1}{6}$ d) $\frac{10}{12} < \frac{9}{10}$

2. a) $\frac{1}{8} > \frac{1}{9}$ c) $\frac{2}{5} < \frac{5}{12}$

b) $\frac{5}{6} > \frac{2}{3}$ d) $\frac{3}{4} < \frac{9}{10}$

3. a) Answers will vary; the denominator must be less than 6.

b) Answers will vary; the denominator must be greater than 6.

c) Answers will vary; the denominator must be less than 8.

d) Answers will vary; the denominator must be greater than 8.

4. Answers will vary; the number of fifth parts must be greater than the number of quarter parts. Some possible solutions are: $\frac{2}{5} > \frac{1}{4}; \frac{3}{5} > \frac{2}{4}; \frac{4}{5} > \frac{3}{4}$.

5. Answers will vary. Some possible solutions are: $\frac{1}{2} = \frac{3}{6}; \frac{1}{3} = \frac{2}{6}; \frac{1}{6} < \frac{2}{3}$.

6. Smallest fraction = $\frac{6}{11}$
Greatest fraction = $\frac{8}{11}$

Reflect

Teachers should check for explanations that the denominator tells us how many equal parts the whole is split into. If the denominator is a smaller number, there are fewer equal parts, so each part is bigger. The larger the dominator, the more equal parts and the smaller each part.

Lesson 5: Comparing and ordering fractions

➜ pages 18–20

1. a) Possible answers: $\frac{7}{12}, \frac{8}{12}, \frac{9}{12}, \frac{10}{12}, \frac{11}{12}, \frac{12}{12}$

b) Possible answers: $\frac{1}{10}, \frac{2}{10}$

c) $\frac{3}{3}$

d) Possible answers: $\frac{6}{9}, \frac{6}{8}, \frac{6}{7}, \frac{6}{6}$

e) The denominator could be any number greater than 3.

f) The denominator could be any number smaller than 10.

g) Answers will vary; the fraction must be greater than $\frac{1}{2}$.

h) Answers will vary; the first fraction must be greater than the second fraction.

i) Answers will vary; the first fraction must be less than the second fraction.

2. a) $\frac{3}{12}, \frac{1}{2}, \frac{7}{12}$

b) $\frac{1}{8}, \frac{1}{5}, \frac{1}{3}$

c) $\frac{4}{10}, \frac{4}{8}, \frac{4}{6}$

3. a) $\frac{1}{5}$ circled

b) $\frac{1}{5}$ written at second mark along number line

4. $\frac{1}{3}, \frac{1}{4}, \frac{1}{5}$

5. $\frac{1}{9}, \frac{3}{7}$ (or possibly $\frac{2}{8}$), $\frac{5}{5}$

Reflect

Answers will vary. Children might find the fraction wall helps them to compare fractions. Some children may comment that it is easier to compare fractions that have the same denominator than those that have different denominators.

Lesson 6: Adding fractions

➜ pages 21–23

1. a) $\frac{6}{7}$ c) $\frac{8}{12}$
b) $\frac{5}{9}$ d) $\frac{10}{10}$

2. a) $\frac{4}{5}$ b) $\frac{3}{4}$

3. a) $\frac{5}{9}+\frac{3}{9}=\frac{8}{9}$ b) $\frac{1}{8}+\frac{2}{8}=\frac{3}{8}$

4. a) $\frac{2}{3}$ d) $\frac{4}{6}$ g) $\frac{8}{10}$
b) $\frac{4}{4}$ e) $\frac{4}{8}$ h) $\frac{12}{12}$
c) $\frac{5}{9}$ f) $\frac{4}{5}$ i) $\frac{3}{7}$

5. Possible answers: $\frac{1}{6}+\frac{4}{6}$; $\frac{2}{6}+\frac{3}{6}$; $\frac{3}{6}+\frac{2}{6}$; $\frac{4}{6}+\frac{1}{6}$

6. a) Lines drawn to join:
$\frac{5}{8}$ to $\frac{3}{8}$
$\frac{1}{2}$ to $\frac{1}{2}$
$\frac{3}{4}$ to $\frac{1}{4}$
b $\frac{1}{5}+\frac{4}{5}=1$
$\frac{3}{6}+\frac{3}{6}=1$
$\frac{3}{10}+\frac{7}{10}=1$

Reflect

Jamilla is correct. When you divide a whole into 5 equal parts, each part is 1 fifth. Adding one fifth and another fifth gives you two of these equal parts, but each part is still 1 fifth, so 1 fifth add 1 fifth equals 2 fifths: $\frac{1}{5}+\frac{1}{5}=\frac{2}{5}$.

Richard is wrong. $\frac{1}{5}$ is equivalent to $\frac{2}{10}$ so $\frac{1}{5}+\frac{1}{5}$ cannot be $\frac{2}{10}$.

Lesson 7: Subtracting fractions

➜ pages 24–26

1. a) $\frac{4}{9}$ c) $\frac{6}{12}$ (or $\frac{1}{12}$)
b) $\frac{2}{10}$ d) $\frac{7}{8}$

2. Max has $\frac{3}{8}$ of the cake left.

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

4. a) $\frac{3}{9}$ d) $\frac{2}{10}$ g) $\frac{4}{6}$
b) $\frac{1}{8}$ e) $\frac{7}{11}$ h) $\frac{8}{9}$
c) $\frac{1}{4}$ f) $\frac{2}{8}$ i) $\frac{1}{9}$

5. Possible pairs are: 0 and $\frac{3}{8}$; $\frac{1}{8}$ and $\frac{4}{8}$; $\frac{2}{8}$ and $\frac{5}{8}$; $\frac{4}{8}$ and $\frac{7}{8}$; $\frac{5}{8}$ and $\frac{8}{8}$

6. $\frac{9}{10}-\frac{7}{10}=\frac{2}{10}$

7. a) $\frac{1}{5}$ c) $\frac{6}{12}$
b) $\frac{1}{9}$ d) $\frac{6}{10}$

Reflect

Teachers should look for an explanation of why the subtraction only affects the numerator (because the subtraction involves taking ninths from ninths so the answer will also be ninths). Children could also show this method pictorially with a bar model or using a number line.

Lesson 8: Problem solving – adding and subtracting fractions

➜ pages 27–29

1. a) $\frac{4}{12}$ of Amy's cupcakes are chocolate or strawberry.
b) $\frac{8}{12}$ of the cupcakes are vanilla.
c) There were more vanilla cupcakes.
There were $\frac{7}{12}$ more vanilla cupcakes than chocolate cupcakes.

2. a) It is windy for $\frac{5}{9}$ of Emma's holiday.
b) It is windy for a greater amount of the holiday because $\frac{5}{9}$ is greater than $\frac{4}{9}$.

3. a) Possible answers: $\frac{0}{10}+\frac{3}{10}$; $\frac{1}{10}+\frac{2}{10}$; $\frac{2}{10}+\frac{1}{10}$; $\frac{3}{10}+\frac{0}{10}$.
b) Possible answers: $\frac{10}{10}-\frac{7}{10}$; $\frac{9}{10}-\frac{6}{10}$; $\frac{8}{10}-\frac{5}{10}$; $\frac{7}{10}-\frac{4}{10}$; $\frac{6}{10}-\frac{3}{10}$; $\frac{5}{10}-\frac{2}{10}$; $\frac{4}{10}-\frac{1}{10}$; $\frac{3}{10}-\frac{0}{10}$.
c) Answers will vary. Ensure the denominators are tenths and the numerators add and subtract to give 3.

4. Luis read $\frac{2}{10}$ of the book on Wednesday.

5. No, Ebo is not correct as Andy only ate $\frac{1}{7}$ of a pizza, so in total they ate $\frac{4}{7}$ of a pizza between them. Children could check their answer using a bar model or number line.

Reflect

Answers will vary. Ensure children are adding and subtracting fractions with the same denominator when creating their own word problems. Alternatively, some children may write problems around calculations using common fractions; for example: $\frac{3}{4}-\frac{1}{2}=\frac{1}{4}$.

Lesson 9: Problem solving – fractions of measures

➜ pages 30–32

1. a) $\frac{3}{4}$ of the bottles are apple juice.
b) There are 30 bottles of apple juice.

2. Children should have circled:
a) $\frac{1}{3}$ of 1 litre of water
b) $\frac{2}{5}$ of 20 kg
c) $\frac{1}{5}$ of 10 hours
d) $\frac{3}{8}$ of a 12 cm strip of paper.

3. a) Kate played more netball.
b) Kate went swimming on $\frac{6}{10}$ of the days in April. $\frac{6}{10}$ is greater than $\frac{1}{2}$ as this is equivalent to $\frac{5}{10}$, so Kate is correct.

4. Ambika used $\frac{3}{5}$ of the ribbon and Lee used $\frac{1}{5}$, so they used $\frac{4}{5}$ in total. Yes, there was $\frac{1}{5}$ of the ribbon left, which is 2 metres in length.

5. The plant was 18 cm tall at the end of the second week.

Reflect

Look for an explanation that you need to add the fractions that Olivia spent on bananas and cherries, then work out what fraction she has left: $\frac{1}{5} + \frac{2}{5} = \frac{3}{5}$; $\frac{5}{5} - \frac{3}{5} = \frac{2}{5}$.
Then work out $\frac{2}{5}$ of £10, which is £4, so Olivia has £4 left.

End of unit check

➜ pages 33–34

My journal

Children may record answers such as follows:

Comparing ◯ with □

- They are unit fractions and the first fraction is smaller than the second.
- The more parts a unit is divided into, the smaller the size of each part.
- Looking at a fraction wall, the bigger the denominator, the smaller the size of the bar.

(Some children may prove this using real examples and show that, for example $\frac{1}{3} < \frac{1}{2}$ or $\frac{1}{10} < \frac{1}{8}$.)

Comparing △ with ⬠

- The denominators are the same, so the greater the numerator the greater the fraction.
- If I look at a fraction strip split into 5 equal parts, the more parts I have, the bigger the fraction is.

(Some children may prove this by using real examples and show that, for example, $\frac{4}{5} > \frac{2}{5}$.)

Unit 11: Time

Lesson 1: Months and years

→ pages 35–37

1. a) 27th September
b) 21st April
c) 29th November
d) 7 days are 1 week, so counting forwards or backwards 7 days will take you to the same day in the following or previous week. You can add or subtract the number of days from the date unless the count goes over the end or start of a month.

2. There are 351 days left in the year.

3. Coloured red: Jan, Mar, May, July, Aug, Oct, Dec
Coloured yellow: Apr, Jun, Sept, Nov
Coloured blue: Feb

4. The time it takes for Earth to travel once around the Sun is 1 year.
Earth takes 365 $\frac{1}{4}$ days to travel once around the Sun.
Most years have 365 days.
Leap years have 366 days.
Every year has 12 months.

5. 29th November (or 30th November if you are counting this day as one of the days left).
333 days

6. Circled: 2036, 2044
'No' circled. 2045 will not be a leap year as it is not a multiple of 4. Leap years usually occur every 4 years, when the year is a multiple of 4.

Reflect

It is true that there were 91 days in January, February and March in 2016 as this was a leap year. 31 days in January, 29 days in February and 31 days in March make 91 days. In 2017, there would have been 90 days as it was not a leap year, so February only had 28 days.

Lesson 2: Hours in a day

→ pages 38–40

1. Children should have drawn hands on to clocks to show the appropriate times:
1 o'clock Wednesday → 1 o'clock Thursday
5 o'clock Friday → 5 o'clock Saturday
Third example completed to show any pair of times with a difference of 24 hours.

2. In top circle (24 hours): A, D, E
In bottom circle (12 hours): B, C

3. All intervals in bar diagrams labelled 24 hours.
2 days = 48 hours
3 days = 72 hours
1 week = 168 hours

4. 12 squares shaded; $\frac{1}{2}$ of a day = 12 hours
6 squares shaded; $\frac{1}{4}$ of a day = 6 hours
8 squares shaded; $\frac{1}{3}$ of a day = 8 hours

5. a) 22 hours
b) 2 hours

6. Answer will vary. Check whether the child is realistic about timings and durations.

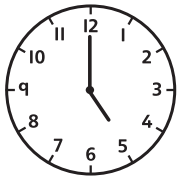
Reflect

Look for an explanation that each day starts at midnight and ends at midnight 24 hours later. The day does not start and end with bedtime.

Lesson 3: Estimating time

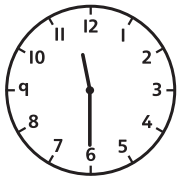
→ pages 41–43

1. a)



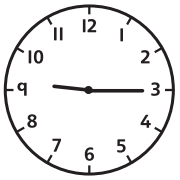
5 o'clock

b)



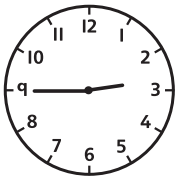
half past 11

c)



quarter past 9

d)



quarter to 3

2. Approximate times:
8 o'clock (minute hand drawn pointing to 12)
Half past 2 (minute hand drawn pointing to 6)
Quarter to 7 (minute hand drawn pointing to 9)

3. Ticked: quarter to 12; twenty-five to 12; five to 12

4. Emma is not right as the hour hand moves during the hour; so if it is half past the hour then the hour hand would point half-way between the two numbers. As the hour hand on the clock is more than half-way between 4 and 5, the time must be after half past 4 but before 5 o'clock.

5. 30 minutes, 15 minutes, 45 minutes, 12 minutes

6. It could be any time between 2 o'clock and quarter past 2 or between quarter to 3 and 3 o'clock.

Reflect

I know that it is half past the hour.
I know that it is between 5 o'clock and 6 o'clock.
I know that it is between 2 o'clock and half past 2.

Lesson 4: Telling time to 5 minutes

➜ pages 44–46

1. 20 minutes past 10
10 minutes past 5
5 minutes past 7
25 minutes past 3
10 minutes to 4
20 minutes to 7
5 minutes to 9
25 minutes to 12

2. a) Minute hand pointing to 9, hour hand between 10 and 11, but closer to 11.
b) Minute hand pointing to 5, hour hand between 10 and 11, but just before half-way.
c) Minute hand pointing to 8, hour hand between 2 and 3, but just after half-way.
d) Minute hand pointing to 2, hour hand between 6 and 7, but just after 6.

3. Lexi has mixed up the minute hand and hour hand of the clock. The time is five to 2.

4. Twenty minutes past 6

5. a) Possible times: twenty minutes to 4; quarter to 4; ten minutes to 4; five minutes to 4
Explanations will vary, but children should recognise that the hour hand must be pointing between 3 and 4, since 3 and 4 add up to 7, so the time is between 3 o'clock and 4 o'clock. The minute hand points to a number that is more than 7 so it must be later than 25 minutes to 4.
b) Answers will vary. Ensure that children's clues work.

Reflect

Explanations will vary. For example: the hour hand is between 3 and 4 so it must be between 3 o'clock and 4 o'clock. The minute hand is pointing to the 7. This means it is 25 minutes to 4 because there are 5 five-minute intervals until the minute hand would reach the 12 to say 4 o'clock.

Lesson 5: Telling time to the minute (I)

➜ pages 47–49

1. Minute hand pointing to 9th interval
Minute hand pointing to 42nd interval
Minute hand pointing to 24th interval
Minute hand pointing to 53rd interval

2. a) Minute hand pointing to the 13th interval, hour hand between 1 and 2 but closer to 1
b) Minute hand pointing to 8, hour hand over half-way between 8 and 9
c) Minute hand pointing to the 48th interval, hour hand between 7 and 8 but closer to 8
d) Minute hand pointing to 27th interval, hour hand almost half-way between 5 and 6

3. 2nd clock on the left (26 minutes past 3) matched to 3rd clock on the right (26 minutes to 3)
3rd clock on the left (9 minutes to 2) matched to 4th clock on the right (9 minutes past 2)
4th clock on the left (22 minutes to 12) matched to 1st clock on the right (22 minutes past 12)

4. Kate has correctly noticed that the long hand shows five minutes to the hour, but she has also seen that the short hand is after the 2, and thought that this meant it was five minutes to 2, not 3.

5. She checks 7 times (12 minutes past 9, 20 minutes past 9, 28 minutes past 9, 24 minutes to 10, 16 minutes to 10, 8 minutes to 10 and 10 o'clock).

Reflect

Answers will vary. Children might explain that each small interval stands for 1 minute, and each large interval between marked numbers stands for 5 minutes. You can count in 5s and then 1s to work out the number of minutes past or to the hour.

Lesson 6: Telling time to the minute (2)

➜ pages 50–52

1. a) Minute hand pointing to 6, hour hand half-way between 8 and 9
b) Minute hand pointing to 3, hour hand quarter-way past 1
c) Minute hand pointing to 9, hour hand three-quarters of the way between 4 and 5
d) Minute hand pointing to 7th interval, hour just past 10

2. a) 7:10
b) 3:25
c) 11:55
d) 5:08

3. a) 6:15 pm
b) 7:30 am
c) 4:09 pm
d) 9:40 am
e) 12:01 am

4. 7:32 am or 7:32 pm

5. a) On both clocks, the minute hand is drawn pointing to the 5 and the hour hand drawn pointing just under half-way between 4 and 5.
b) Both clocks look the same because analogue clocks do not show whether a time is am or pm.

6. 1:23 am and 1:23 pm; 2:34 am and 2:34 pm; 3:45 pm (am is given); 4:56 am and 4:56 pm

7. Possible times: 12:07, 12:16, 12:25, 12:34, 12:43, 12:52, 11:08, 11:17, 11:26, 11:35, 11:44, 11:53, 10:09, 10:18, 10:27, 10:36, 10:45, 10:54, 9:01, 9:10, 8:02, 8:11, 8:20, 7:03, 7:12, 7:21, 7:30, 6:04, 6:13, 6:22, 6:31, 6:40, 5:05, 5:14, 5:23, 5:32, 5:41, 5:50, 4:06, 4:15, 4:24, 4:33, 4:42, 4:51, 3:07, 3:16, 3:25, 3:34, 3:43, 3:52, 2:08, 2:17, 2:26, 2:35, 2:44, 2:53, 1:09, 1:18, 1:27, 1:36, 1:45, 1:54

Reflect

From 12 midnight till 12 noon it is am because it is before midday. So 1:35 am is very early in the morning and it is still dark at this time.

Lesson 7: Telling time to the minute (3)

→ pages 53–55

1. a) Hour hand half-way between 3 and 4
b) Hour hand between 6 and 7 but closer to 6
c) Hour hand just under half-way between 8 and 9
d) Hour hand three-quarters of the way between 1 and 2
e) Hour hand just over half-way between 9 and 10
f) Hour hand a quarter of the way between 1 and 2

2. a) 04:52, 03:52, 02:52, 01:52, 00:52
b) 17:09, 18:09, 19:09, 20:09, 21:09

3. 20:00 is the 24-hour clock equivalent of 8 pm or 8 o'clock in the evening.

4. a) Minute hand pointing to the 12th interval, hour hand pointing to just after 5
b) Minute hand pointing to 8, hour hand pointing just after half-way between 11 and 12

5. 19:05, 19:14, 19:23, 19:32, 19:41, 19:50, 19:46, 19:55

6. Answers will vary. Ensure that times and am/pm match the 24-hour time; for example, 03:40 and twenty minutes to 4 am (or 3:40 am).
Latest time is 23:44 (16 minutes to midnight or 11:44 pm)
Earliest time is 00:01 (1 minute after midnight or 12:01 am)

Reflect

An explanation that the hour is more than 12, so it is a 24-hour clock time. In the 24-hour clock, times after 12:00 are pm, so this time is in the evening: 6:58 pm.

Lesson 8: Finding the duration

→ pages 56–58

1. a) 38 minutes (clock shaded from 07:12 to 07:50; +38 minutes on number line)
b) 43 minutes (first clock shaded from 11:45 to 12:00 and second clock from 12:00 to 12:28; +15 minutes and +28 minutes on number line)
c) 46 minutes (first clock shaded from 13:38 to 14:00 and second clock from 14:00 to 14:24; +22 minutes and +24 minutes on number line)

2. a) Durations written into the table:
21 minutes
31 minutes
41 minutes
51 minutes
b) The answers get 10 minutes greater each time because the start time minutes are the same and the end time minutes are 10 minutes more each time.

3. The tanker takes 91 minutes to fill up with milk.

4. False. Max has not taken into account that the duration is over an hour, so he would need to add another 60 minutes to 35. This makes it 95 minutes.

5. 150 minutes

6. Possible answers: start 13:01, end 13:53; start 13:02, end 13:54; start 13:03, end 13:55; start 13:04, end 13:56; start 13:05, end 13:57; start 13:06, end 13:58; start 13:07, end 13:59

Reflect

Children's questions will vary. Ensure that the end time is after the start time, unless the question crosses over midnight.

Lesson 9: Comparing duration

→ pages 59–61

1. a) 26 minutes (clocks shaded from 18:09 to 18:35)
b) 25 minutes (clocks shaded from 18:52 to 19:17)
Alex practises for the longer time on Monday.

2. Lee's dad parks for 63 minutes. He should pay £1 as he did not park over 65 minutes.

3. a) Bus B is quicker. Bus A and B leave 10 minutes apart, but they do not arrive 10 minutes apart. If Bus B were to arrive 10 minutes later, it would arrive at 10:33. As it arrives 6 minutes before this time, I know it is 6 minutes faster than Bus A.
b) Bus C is quicker. Buses C and D leave 10 minutes apart, but they do not arrive 10 minutes apart. If Bus D were to arrive 10 minutes later, it would arrive at 11:22. As it arrives 3 minutes after this time, I know it is 3 minutes slower than Bus C.

4. 1 hour 9 minutes is longer. 1 hour = 60 minutes, so 1 hour 9 minutes = 69 minutes. 69 minutes is a longer time than 63 minutes.

5. Answers will vary: activities must total 110 minutes or less; for example, the science experiment and school library visit would take 60 + 35 minutes = 95 minutes so could be done before home time.
Exact time: science experiment, school library visit, spelling test (60 minutes + 35 minutes + 15 minutes = 110 minutes).

Reflect

Adventure film = 105 minutes; space film = 100 minutes. Adventure film is longer.

Children could also use the fact that they start 10 minutes apart, but do not finish 10 minutes apart. If the space film was the same length as the adventure film it would finish at 17:10; however, it finishes at 17:05 so it must be shorter.

Lesson I0: Finding start and end times

→ pages 62–64

1. I will get into the fair at 1:38 pm. (Clock to show 1:38.)

2. a) First clock to show 2:32; second clock to show 2:51
End time, 2:51 pm
b) First clock to show 3:03; second clock to show 3:52
Start time, 3:03 pm

3. 2:53 pm
Answers will vary. A possible explanation is: count back 2 minutes to 3:00 and then count back 7 minutes to 2:53.

4.

	Start time	Queue length (duration)	End time
Bouncy castle	1:16 pm	22 minutes	1:38 pm
Big dipper	2:12 pm	25 minutes	2:37 pm
Go karts	3:48 pm	26 minutes	4:14 pm
Runaway train	4:42 pm	24 minutes	5:06 pm

5. Mo has forgotten that there are only 60 minutes in an hour, so 65 minutes is the same as 1 hour and 5 minutes. Therefore, his poster will be ready an hour and 5 minutes later than 5 minutes past 4, which is 10 minutes past 5.

6. a) It could have started at 2:21, 2:22, 2:23 or 2:24.
b) It ends at 1:34 pm.
An efficient method is to add on 2 hours and adjust by taking off 1 minute.

Reflect

The lesson ends at 7:40 pm.

Explanations will vary. Some children will see that 55 minutes is just 5 minutes less than 1 hour and so will add 1 hour and adjust by subtracting 5 minutes. Some children will add on 15 minutes to make 7 pm and then add on 40 minutes to make 7:40 pm.

Lesson II: Measuring time in seconds

→ pages 65–67

1. a) Line drawn to 45 seconds
b) Line drawn to 40 seconds
c) Line drawn to 35 seconds
d) Line drawn to 55 seconds

2.

Activity	Time in minutes	Time in seconds
Bouncing a ball	$\frac{1}{2}$ a minute	30 seconds
Running on the spot	2 minutes	120 seconds
Skipping	$1\frac{1}{2}$ minutes	90 seconds
Star jumps	1 minute	60 seconds

3. It takes Ebo 40 seconds.

4. Jamie's stopwatch shows 17 seconds because 1 minute equals 60 seconds and 60 – 43 = 17 seconds. Max's stopwatch shows 36 seconds because 1 minute equals 60 seconds and 60 – 24 = 36 seconds.

5. Answers will vary. How accurate were the children at estimating 1 minute?

Reflect

Children should show an understanding that 1 second is a specific measurement of time (for example, the time it takes to say '1 elephant'.) Bella could count to 60 elephants to give her a better estimate of 1 minute.

End of unit check

→ pages 68–70

My journal

1. a) I know that the time is 25 minutes to 3 because …

Explanations will vary. Children should be able to explain that they know the time because the minute hand is pointing to 7 (or the 35th interval), which means 25 minutes to the hour, and the hour hand is just over half-way between 2 and 3.

b) I know that the time is 17 minutes past 8 because …

Explanations will vary. Children should be able to explain that they know the time because the minute hand is pointing to the 17th interval, which means 17 minutes past the hour, and the hour hand is pointing to 8.

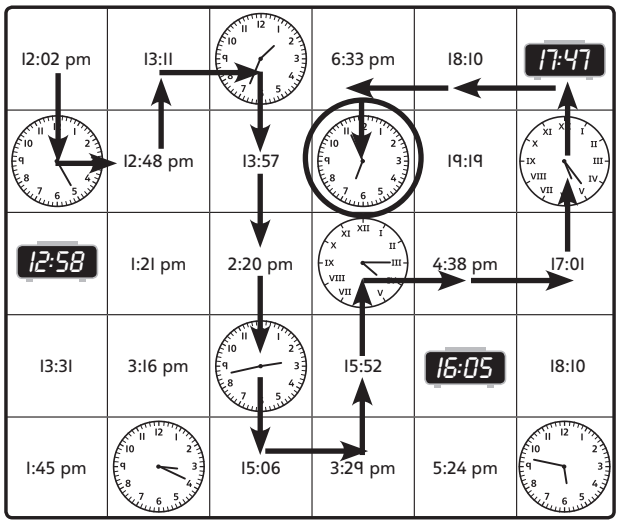
c) I know that the time is 9 minutes to 5 because …

Explanations will vary. Children should be able to explain that they know the time because the minute hand is pointing to the 51st interval, which means 9 minutes to the hour, and the hour hand is pointing to 5.

2. Answers will vary. Check that children have drawn the hands on their clocks correctly and have used a variety of ways to write their times, using the 24 hour clock and/or using am and pm. Ensure that they choose an appropriate time for the activity that they have chosen to record.

Power play

Children will end on the clock showing 4 minutes to 7.



Unit I2: Angles and properties of shapes

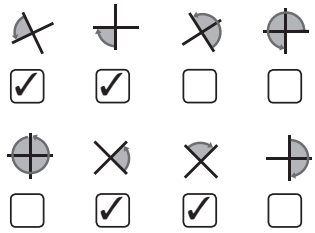
Lesson I: Turns and angles

→ pages 71–73

1. a) Now he faces the café.

b) Now he faces the pond.

2.



3. Answers will vary, but children should notice that they end up facing in the same direction.

4. a) She is facing west.

b) She could be facing west or east.

c) Southwest

d) One right angle anticlockwise or three right angles clockwise

5.

Starting position	Quarter turn clockwise	Two right-angle turns anticlockwise	Quarter turn anticlockwise	Three-quarter turn anticlockwise then a quarter turn clockwise

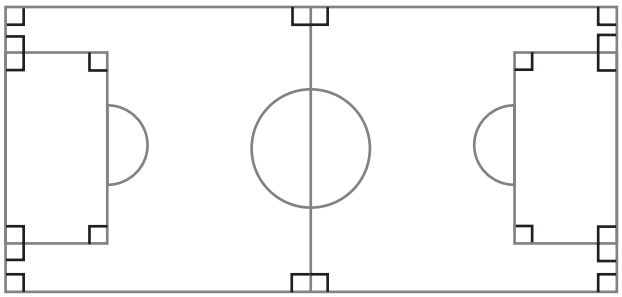
Reflect

When I turn by two right angles, I will face the opposite direction.
When I turn by four right angles, I will face the same direction.

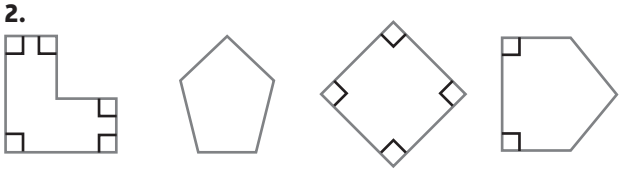
Lesson 2: Right angles in shapes

→ pages 74–76

1.

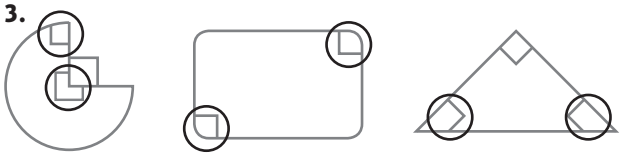


2.



A B C D

3.



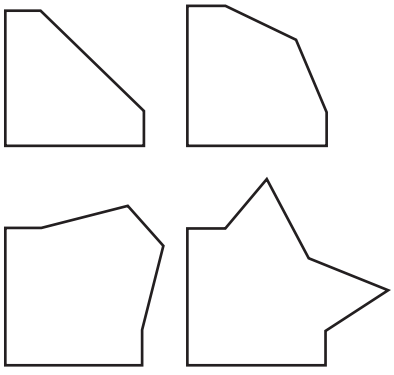
4. Answers will vary. Children should have drawn a line that is perpendicular to the existing line, to create at least one right angle. Children can draw their own pair of perpendicular lines in the final two diagrams.

5. Answers will vary. Typical items that show right angles include books, doors, tables or the whiteboard.

6. Children should have coloured the cross.

Reflect

Answers will vary. Ensure that children are drawing accurately with a ruler and that the shape has at least three internal right angles. Possible answers include a square, a rectangle, an irregular pentagon with three right angles, and an L shape. Children who interpret the question as specifying 'exactly three right angles' will discover that they need to draw an irregular polygon with five or more sides, either convex or concave, that looks like three corners of a square or rectangle with extra sides added. Some possibilities are shown.



Lesson 3: Comparing angles

➜ pages 77–79

1. First angle joined to 'less than a right angle'
Second angle joined to 'greater than a right angle'
Third angle joined to 'a right angle'

2. Drawings will vary. Children should show three angles of between 0 and 90 degrees in the top row and three angles of between 90 and 180 degrees in the bottom row.

3. obtuse acute obtuse

4. Answers will vary. Using the points of the peg board, children should show three angles of between 0 and 90 degrees in the top row, three angles of between 90 and 180 degrees in the second row, and three angles of 90 degrees in the final row.

5. Answers may vary, but the following is the correct prediction:
12 acute angles (2 × 2 complementary; 8 supplementary with the obtuse angles)
6 right angles (2 × 2 supplementary, + 2)
8 obtuse angles (8 supplementary with the acute angles)
(Children will not know the vocabulary 'supplementary' and 'complementary' but they may be able to spot and use the principles in their predictions.)

Reflect

Answers will vary. Typical obtuse and acute angles can be formed in open books, open doors, two pencils or rulers. Children may discover shapes around the room that have acute or obtuse angles. Children can use an angle measurer (or a right angle) to decide whether an angle is acute or obtuse.

Lesson 4: Drawing accurately

➜ pages 80–82

1. Lines drawn of the following lengths:
A: 3 cm
B: 4 cm
C: 5 cm

2. Ensure the child measures accurately, marking both the top and bottom lines to find 5 cm before drawing a line to connect the marks.

3. a) Shapes measured, sides labelled and then shapes copied:
A: horizontal line = 29 mm; diagonal line = 39 mm
B: vertical line = 23 mm; horizontal line = 35 mm
C: vertical line = 23 mm; horizontal line = 38 mm
b) Answers will vary. Ensure the child has justified their reasons.

4. a) Rectangle will be 11 cm × 55 mm.
b) Square will be 55 mm × 55 mm.
c) Each right-angled triangle will have perpendicular sides of length 55 mm and hypotenuse approximately 78 mm long.

Reflect

Step 1: Place your ruler flat on your paper and find 0.
Step 2: Place your pencil on 0 and draw a line to 5 cm.
Step 3: Extend your line for 5 smaller intervals (mm).
You will have drawn a line 5 cm and 5 mm long.

Lesson 5: Types of line (I)

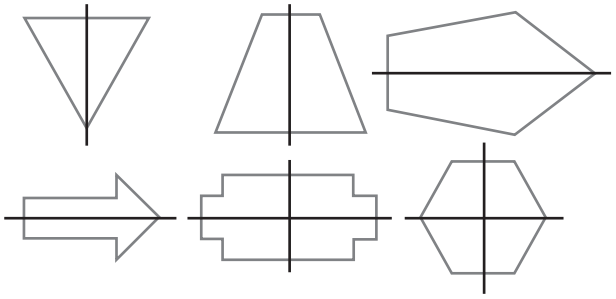
➜ pages 83–85

1. neither horizontal neither vertical

2. There are 2 horizontal lines and 8 vertical lines.

3. Answers will vary. Child should show 3 horizontal, 3 vertical and 3 neither horizontal nor vertical lines.

4.



5. Turn all shapes by a quarter-turn (right-angle turn) to change the symmetry lines from vertical to horizontal or vice versa.

6. Lines ticked:
From top to bottom: middle line (horizontal)
From left to right: the first, third and fourth lines (vertical)

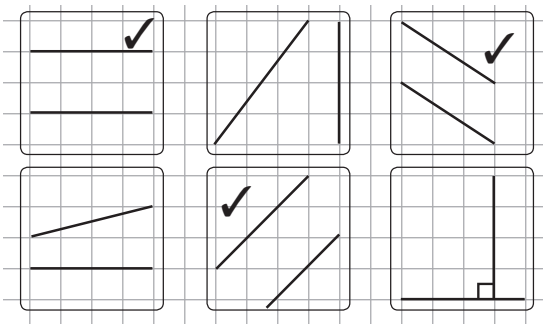
Reflect

Answers will vary. Typical answers might include:
horizontal – the playground, tables
vertical – trees, lampposts, wall of the school

Lesson 6: Types of line (2)

➜ pages 86–88

1. a)



b) Answers will vary. Children should draw lines with lengths that differ from the original lines but that are demonstrably parallel to them using the grid.

2. Answers will vary. Check that children demonstrate understanding of the difference between parallel and perpendicular lines, labelling accurately.

3. Answers will vary.
Examples of parallel lines include: train tracks, lanes in an athletics track, road markings, edges of buildings, edges of a slide.
Examples of perpendicular lines include: adjacent edges of window and door frames, line where the road meets a lamppost or building, chair and table legs to the floor.

4. Dexter is wrong: the lines are parallel. When you measure a distance from a line, you should place the ruler so that it is perpendicular to the line. Dexter needs to move the right-hand ruler so that it is vertical. This will show that the lines are the same (perpendicular) distance apart.

5. a) Answers will vary. Ensure each pair of lines drawn are parallel using opposing pairs of dots.
b) Answers will vary. Ensure each pair of lines drawn are perpendicular. In the first two diagrams the only solutions use the vertices of a kite shape. There are more possibilities for the third and fourth diagrams.

Reflect

1. Parallel lines always stay the same distance apart so they will never touch.

2. Parallel lines do not have to be the same length.

3. Perpendicular lines will meet at right angles.

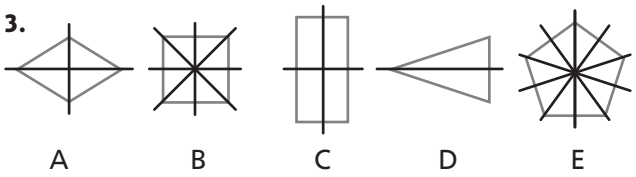
Lesson 7: Recognising and describing 2D shapes

➜ pages 89–91

1. triangle pentagon rectangle hexagon

2. Shape E is not a quadrilateral. A quadrilateral is a shape with 4 sides; this shape has 6 sides so it is a hexagon.

3.



A B C D E

4. a) Children should draw and label two rectangles (possibly including squares).
b) Answers will vary. The shapes that show one pair of perpendicular sides and no parallel sides include a right-angled triangle, a kite with just one right angle or an irregular quadrilateral with just one right angle.
c) Answers will vary. Shapes that show no perpendicular or parallel sides but have one line of horizontal symmetry include kites or semicircles.

5. A3 B1 F6 E2 C4

Reflect

A rectangle is a quadrilateral that has 2 pairs of parallel sides, 4 right angles and 4 pairs of perpendicular lines.

Lesson 8: Recognising and describing 3D shapes

➜ pages 92–94

1. cube cuboid triangular prism
square-based pyramid sphere cylinder

2. Numbers written into table as follows:

Vertices:	8	4	5	8
Faces:	6	4	5	6
Edges:	12	6	8	12

3. a) matched to ii)
b) matched to i)
c) matched to iii)

4. Answers written into the table as follows:

Prism	B, D	
Not a prism	C	A

5. Answers will vary. A possible response could be:
Both shapes have at least one square face, have some parallel and perpendicular edges and have lines of symmetry.
The cuboid has 6 faces, 8 vertices and 12 edges, but the pyramid has 5 faces, 5 vertices and 8 edges.

Reflect

A cube has 6 square faces, 8 vertices and 12 edges. The cube has parallel and perpendicular edges and faces.

Lesson 9: Constructing 3D shapes

➜ pages 95–97

1. 6 cubes; 6 cubes; 5 cubes
8 cubes; 6 cubes; 6 cubes

2. Reena has made 4 different cuboids.

3. A: 12 sticks; 8 marshmallows
B: 8 sticks; 5 marshmallows
C: 6 sticks; 4 marshmallows

4. Children should have circled 2 shapes from: triangular prism, square-based pyramid, cuboid

5. Answers will vary. An example answer could be: First make two triangles of the same size with 6 sticks and 6 marshmallows. Then attach the two triangle faces parallel to each other using 3 sticks to join the vertices.

6. Table completed:

Sticks:	9	12	15	18
Marshmallows:	6	8	10	12

Answers may vary. One possible pattern is that the number of sticks is always 3 times the number of sides of the non-rectangular face in the prism. The number of marshmallows is always 2 times this number.

Reflect

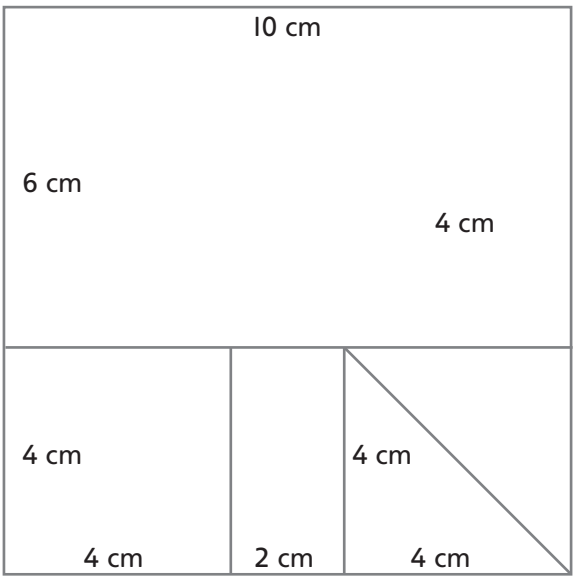
Answers will vary. Children might mention: learning that angles (acute, obtuse and right) are part of a turn; drawing and measuring lines accurately; learning about parallel and perpendicular lines; learning how to describe 2D and 3D shapes; learning how to make 3D shapes.

End of unit check

➜ pages 98–100

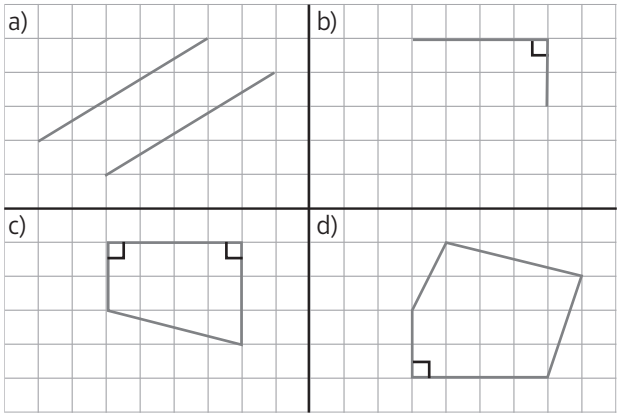
My journal

1 a. How the child splits up the square will vary. This is a possible solution



1 b. Answers will vary. Children should provide an explanation of how they used a ruler to measure and draw horizontal and vertical lines, making sure lines were perpendicular or parallel when necessary.

2. Answers will vary. This is a possible solution.



Unit I3: Mass

Lesson I: Measuring mass (I)

→ pages 101–103

1. a) Arrow pointing to the first mark after 200 g.
b) Arrow pointing half-way between the first and second marks after 100 g.
c) Arrow pointing to the third mark after 0 kg.
d) Arrow pointing half-way between the third and fourth mark after 0 kg.

2. The second pair of scales could measure kg whilst the first pair of scales could measure g.

3. No, the arrow is pointing half-way between 200 g and 400 g, which means the scale shows a mass of 300 g.

4. a) Answers will vary. Possible answers include:
8 kg – a medium-sized bike, a school bag full of books, 8 bags of sugar
180 g – a fork, a small box of raspberries, a small tub of cheese
28 g – 1 small piece of cheese, an AA battery, 3 one-pound coins
b) Answers will vary – ensure children have written objects that are plausible estimates for the mass.

Reflect

Answers will vary, but encourage children to draw a number line with intervals of 100 g and then mark out 200 g, 500 g and 600 g.

Lesson 2: Measuring mass (2)

→ pages 104–106

1. a) Pointer pointing half-way between 2 and 3 kg.
b) Pointer pointing half-way between 8 and 9 kg.
c) Pointer pointing at the first mark after 3 kg

2. 2 kg 50 g 2 kg 100 g 2 kg 125 g

3. a) approximately 3 kg 400 g and 3 kg 700 g
b) approximately 11 kg and 11 kg 500 g
c) approximately 2 kg 90 g

4. If the mass of the spade is just under 8 kg 500 g, this would be closer to 8 kg than 9 kg. If the mass of the spade is just over 9 kg 500 g then it would be closer to 10 kg than 9 kg (9 kg 500 g also rounds up to 10 kg). Since the mass of the spade to the nearest kg is 9 kg, it must be in the range 8 kg 500 g to 9 kg 499 g.

Reflect

Find the difference between the two marked amounts.
Count the number of intervals between the two marked amounts.
Divide the difference by this number to find the value of each interval.
Use this to read the scale.

Lesson 3: Measuring mass (3)

→ pages 107–109

1. Masses written into part-whole models:
a) 1 kg; 376 g
b) 1,020 g
c) 3,246 g
d) 2 kg; 2 g

2. Masses written into table:
1,456 g
2 kg 132 g
1,088 g
0 kg 654 g

3. a) 1,400 g 1 kg 400 g
b) 2,500 g 2kg 500 g
c) 1,050 g 1 kg 50 g

4. Lee is incorrect. The difference between each labelled amount is 1 kg or 1,000 g. There are 10 intervals between 1 kg and 2 kg, and 1,000 ÷ 10 = 100. This means that each interval is worth 100 g. The arrow is pointing at the ninth mark after 1 kg, so the mass of the sugar is 1 kg 900 g. Lee thought the intervals were going up in 10 g, not 100 g.

5. Answers will vary. Some possible solutions are:
2 kg + 500 g + 100 g + 100 g + 10 g + 10 g + 10 g + 10 g + 10 g
1 kg + 1 kg + 500 g + 100 g + 100 g + 10 g + 10 g + 10 g + 10 g + 10 g

Reflect

Answers will vary. Ideas could include:
Just grams – cooking ingredients, precious metals like gold
Kilograms and grams – weight of a person, weight of luggage at the airport

Lesson 4: Comparing masses

→ pages 110–112

1. a) 1,321 g > 1 kg 300 g
b) 1 kg 8 g < 1,080 g
c) 2 kg 10 g = 2,010 g
d) 983 g > 0 kg 899 g

2. Top right scales circled

3. a) ≈ 1,750 g
b) ≈ 1,422 g
c) ≈ 1,250 g

4. Answers will vary.
B – any mass less than 1 kg 20 g
C – any mass greater than 1 kg 20 g
D – any mass less than that given for B

5. a) 1 kg 500 g 1,540 g 1,999 g 2 kg
b) 1,001 g 1,010 g 1 kg 100 g 1,110 g
c) 1,070 g 1 kg 700 g 1 kg 707 g 1,777 g

Reflect

An explanation that when comparing numbers children know they need to compare the largest value columns first, and then, if these values are the same, look at the next largest value column. Max is incorrect because he did not compare the hundred gram column before comparing the ten gram column. You can see that 1 kg 265 g is bigger than 1 kg 157 g as 2 hundred is bigger than 1 hundred.

Lesson 5: Adding and subtracting masses

→ pages 113–115

1. + 850 g
15 kg
6 kg 950g

2.

1 kg 800 g	
1 kg 200 g	600 g

1 kg 100 g	
550 g	550 g

1 kg 300 g	
900 g	400 g

1 kg 750 g	
1 kg 440 g	310 g

3. a) Alex has 150 g left.
b) Zac needs 950 g more.
c) Alex buys 1 kg 200 g (or 1,200 g) of flour.

4. Answers will vary. Ensure that children's questions involve subtraction.

5. a) 900 g
b) 550 g
c) 1 kg 100 g (or 1,100 g)
d) 1 kg 80 g (or 1,080 g)
e) 2 kg 710 g (or 2,710 g)

Reflect

Answers will vary.

Lesson 6: Problem solving – mass

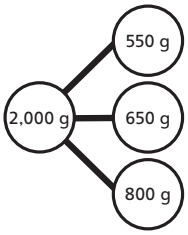
→ pages 116–118

1. Masses in number lines from left to right:
a) 470 g 620 g 770 g 920 g 1070 g (or 1 kg 70 g)
b) 250 g 500g 750 g 1 kg (or 1,000 g)
1 kg 250 g (or 1,250 g)

2. 450 g of nuts

3. Amal had 550 g of clay left.

4.



The middle guinea pig weighs 650 g.

5. The mass of the heart is 1,225 g.
□ = 1,110 g ÷ 2 = 555 g
⌓ = 2,000 g – (3 × 555 g) = 335 g
♡ = 2 × 335 g + 555 g = 1,225 g

Reflect

Answers will vary. Ensure children's questions make sense and give an answer of 2 kg and 550 g.

End of unit check

→ pages 119–120

My journal

1. First you calculate the mass of the pineapple:
500 + 200 + 50 + 5 = 755 g.

Then you work out the total mass of the pineapple and melon by reading the scale: 1 kg 300 g.

Now you can work out the mass of the melon by subtracting the mass of the pineapple from the total mass: 1,300 – 755 = 545 g.

The mass of the melon is 545 g.

Unit 14: Capacity

Lesson 1: Measuring capacity (1)

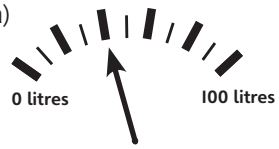
→ pages 121–123

1. a) 375 ml b) 65 ml c) 550 ml

2. a) litres
b) millilitres
c) litres
d) litres or millilitres
e) millilitres

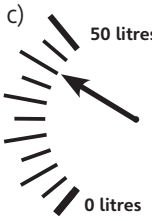
3. A C B

4. a)

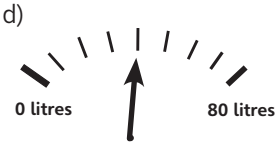


b)

c)



d)



5. First scale: Divide line into two equal parts; mark this interval 100 ml.
Second scale: Divide line into 10 equal parts; mark first interval from bottom as 100 ml.
Third scale: Divide line into 5 equal parts; mark first interval from bottom as 100 ml (or divide line into 10 equal parts and mark second interval from bottom as 100 ml).

Reflect

Look for an explanation of the need to work out what each interval is worth by finding the difference between marked amounts and dividing this by the number of intervals between them.

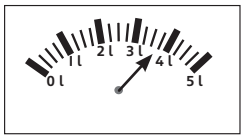
Lesson 2: Measuring capacity (2)

→ pages 124–126

1. a) Capacities completed as:
1 l 700 ml 1 l 500 ml
0 l 500 ml 1 l 0 ml
b) First jug: 1,000 ml 900 ml = 1,900 ml
Second jug: 1,000 ml 200 ml = 1,200 ml
Third jug: 1,000 ml 700 ml = 1,700 ml

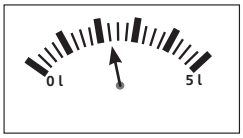
2. A Shaded to the third mark above 1 litre
B Shaded to the second mark above 1 litre
C Shaded to half-way between 3 and 4 litres

3. A



3 l 750 ml

B



2 l 250 ml

4. Jug B was used.

5. Answers will vary but should be in the range of 1 l 100 ml to 1 l 300 ml.

Reflect

Scale showing a litre split into 4 intervals to be labelled: 0 ml, 250 ml, 500 ml, 750 ml and 1,000 ml (or 1 l).

Scale showing a litre split into 5 intervals to be labelled: 0 ml, 200 ml, 400 ml, 600 ml, 800 ml and 1,000 ml (or 1 l).

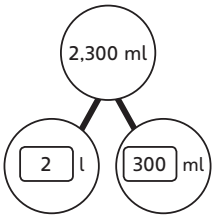
Lesson 3: Measuring capacity (3)

→ pages 127–129

1. a) 1,100 ml = 1 l and 100 ml

b)

2,300 ml		
1,000 ml	1,000 ml	300 ml
1 l	1 l	300 ml
2 l 300 ml		



2,300 ml = 2 l 300 ml

2. Answers may vary. Children may choose to use a bar model or a part-whole model.
3 l 700 ml = 3,700 ml

3. a) 2,270 ml
b) 3,450 ml

4. a) 400 ml = 0 l 400 ml
b) 300 ml = 0 l 300 ml

5. Shaded up to half-way between the second and third mark above 1,000 ml.
1,250 ml = 1 l 250 ml

6. 1 litre and 2 litres written by bold marks on jug.
2,250 ml between second and third mark above 2 litres.

Reflect

Answers will vary. The explanation should include that you need to use the fact that 1 l = 1,000 ml to help you. Children may suggest checking how many thousands of ml there are in the amount; this will give how many litres there are. The rest can be left as ml.

Lesson 4: Comparing capacities

➜ pages 130–132

1. a) 1 l 200 ml < 2 l 100 ml
b) 1 l > 900 ml
c) 500 ml = $\frac{1}{2}$ l
d) 2 l 100 ml > 1 l 999 ml

2. 25 l | 2 l 250 ml | 2,100 ml | 300 ml

3. B | D | A | C

4. D | B | A | C

5. A = 1,000 ml | C = 1,250 ml | D = 1,400 ml | B = 1,500 ml

6. Jessica should choose bowl C.

7. Reasoning will vary, for example: Container A has a capacity of 2 l and is about $\frac{3}{4}$ full. This means it contains about 1,500 ml or 1·5 l. Container B holds 1·5 l when full, but it is not full, so it contains less than 1·5 litres. Therefore container A has more liquid in it.

Reflect

Answers will vary. Encourage an explanation of converting all the amounts to the same units before comparing, starting from the column with the greatest value first.

Lesson 5: Adding and subtracting capacities

➜ pages 133–135

1. a) 450 + 300 = 750 ml
The total of the two amounts is 750 ml.
b) The total of the two amounts is 2 l.
c) 5 l 675 ml

2. There is 1 l 750 ml left in the bottle.

3. 4 l = 1 l = 3 l
500 ml – 150 ml = 350 ml
There will be 3 l 350 ml left in the large container.

4. James needs 1 l 500 ml more water.

5. There are 550 ml in cylinder C.

Reflect

Answers may vary. Some children may convert 2 l 800 ml to 2,800 ml before adding this to 1,250 ml to get 4,050 ml. Others may convert 1,250 ml to 1 l 250 ml and then add the litres and millilitres separately. This gives 3 l 1,050 ml, which is the same as 4 l 50 ml.

Lesson 6: Problem solving – capacity

➜ pages 136–138

1. 800 ml (in the bar model)
Paolo bought 800 ml of water altogether.

2. 500 ml in each of the 4 parts in the bar model
Each glass holds 500 ml of water.

3.

40 l			
10 l	10 l	10 l	10 l
30 l			10 l

Frederica has 30 l of fuel left.

4.

250 ml	250 ml	250 ml	$\frac{1}{2}$ litre
750 ml			500 ml
1,250 ml			

The total is 1,250 ml. This is 1 l and 250 ml of milk in total.

5. Alfredo needs to drink 7 more glasses.
Jen needs to drink 9 more glasses.

6. He needs 2 l and 500 ml more cream.

7. You will need 7 l 500 ml.

Reflect

Answers will vary. Encourage children to explain their different steps and the reasons for these steps. Children should consider the need to convert between litres and millilitres.

End of unit check

➜ pages 139–140

My journal

4 l				250 ml
1,000 ml	1,000 ml	1,000 ml	1,000 ml	250 ml
4,250 ml				

$2\frac{1}{2}$ l		
1,000 ml	1,000 ml	500 ml
2,500 ml		

3,750 ml			
1,000 ml	1,000 ml	1,000 ml	750 ml
3,000 ml			750 ml