Unit 1 – Place value – 4-digit numbers (1)

1 Represent and partition numbers to 1,000

→ pages 6–8

1. a) 121
b) 203
c) 144
d) 230

2. Children should show or draw base ten equipment as follows:
a) 1 × 100, 3 × 10, 5 × 1
b) 3 × 100, 1 × 10, 5 × 1
c) 3 × 100, 5 × 10, 1 × 1

3. a) 2 tens
b) 2 hundreds
c) 2 ones

4. a) **8** hundreds, **9** tens, **2** ones
b) **7** hundreds, **0** tens, **5** ones

5. a) **462** = 400 + 60 + 2
b) 555 = **500** + **50** + **5**

6. a) 452
b) 973
c) 320
d) 807
e) 603
f) 790
g) 60
h) 900
i) 70
j) 700

7. a) 500, 410, 401, 320, 302, 311, 230, 203, 221, 212, 203, 140, 131, 122, 113, 104
b) Have a system, starting with 5 in the hundreds, then four and so on.

Reflect

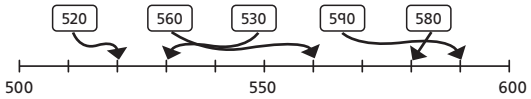
206, 216, 226, 236, 246, 256, 266, 276, 286, 296

2 Number line to 1,000

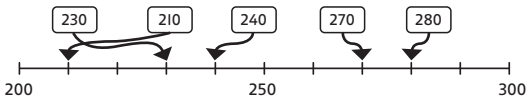
→ pages 9–11

1. a) 0 **100 200 300 400 500 600 700 800 900** 1,000
b) 600 **610 620 630 640 650 660 670 680 690** 700
c) 650 **651 652 653 654 655 656 657 658 659** 660

2. a)



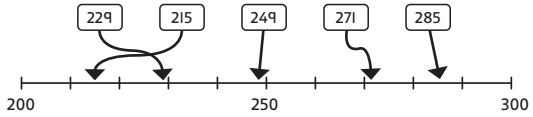
b)



3. a) 150, 450, 650
b) 525, 550, 575

4. a) 200ml
b) 950ml
c) 520ml
d) 750ml

5.



6. Children should have drawn a number line in tenths with most or all intervals labelled in hundreds, with some way of marking the relevant numbers in approximately the correct places between the intervals. 24 should be a quarter of the way between first and second intervals, 475 three quarters of the way between 500 and 600, 725 a quarter of the way between 700 and 800 and 999 immediately before the 1,000 marker.

Reflect

Expect to see some of the following: the number in the middle is half-way between the two end numbers; the middle number depends on the first and last numbers; these numbers can often end in 5, 50 or 500.

3 Multiples of 1,000

→ pages 12–14

1. a) 4,000 cups
b) 5,000 cups

2. a) 2,000
b) 10,000
c) 8,000
d) 6,000
e) 9,000

3. a) 2,000 3,000 **4,000** **5,000** 6,000 **7,000** 8,000
b) 10,000 9,000 **8,000** **7,000** 6,000 **5,000** 4,000

4.

6	0	1	7	0	4	0	6	0	0	5	7	0	0	0	5
4	0	0	7	0	0	4	0	0	1	5	6	0	8	0	0
0	2	0	7	3	0	4	0	3	0	0	7	4	0	6	4
0	5	8	2	2	8	9	0	0	5	4	0	0	1	4	0
8	0	1	0	0	3	4	5	0	8	3	8	2	7	0	6
0	0	4	0	6	0	8	5	4	5	0	1	0	3	0	0
1	9	7	8	9	3	0	1	5	0	0	2	4	0	0	5
1	0	3	0	0	9	0	5	0	0	0	4	2	3	6	0
0	3	0	5	4	1	0	2	8	4	7	9	0	0	8	6
0	9	5	0	0	5	6	0	0	7	0	1	0	0	0	0

5. 3,000 are green

Children could draw two rows of 5 boxes, colouring in two red, and five blue, leaving three boxes to colour green. 3 × 1,000 = 3,000 green pencils. Some children may show that there are 10 × 1,000 = 10,000 pencils altogether. 10,000 – 2,000 – 5,000 = 3,000.

6. a) 10 hundreds
b) 30 hundreds
c) 5 thousands
d) 7 thousands

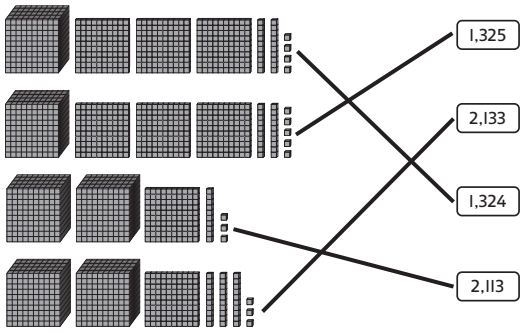
Reflect

Children may notice that the child who starts the count only says the odd multiples of 1,000 and their partner only says the even multiples. They may like to reflect on what happens with 3 people or 4 people.

4 4-digit numbers

→ pages 15–17

1.



2. a) 2,231
b) 2,322
c) 4,340
d) 2,104

3. a) 2 × 1,000 2 × 100 2 × 10 3 × 1
b) 2 × 1,000 1 × 100 2 × 10 1 × 1
c) 2 × 1,000 2 × 10 1 × 1
d) 2 × 1,000 2 × 10

4. a) 9,988 9,898 9,889
8,899 8,989 8,998

5 5,601.
5 and 6 is the only one-digit factor pair for 30;
6 – 5 = 1, so diamond is 6 and triangle is 5.
6 – 0 = 6 so heart = 0. 6 – circle – 0 = 5 so circle = 1.

Reflect

Children should reflect that only the tens digit is hidden and could be any digit from 0 to 9, so 5,605 through to 5,695.

5 Partition 4-digit numbers

→ pages 18–20

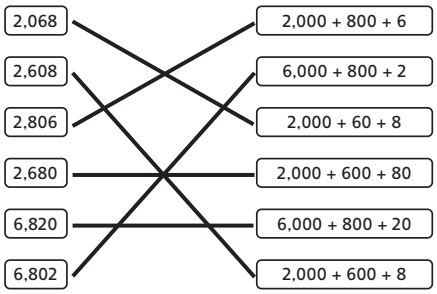
1. a) **2** thousands **3** hundreds **2** tens **4** ones
6 thousands **2** hundreds **8** tens **1** ones
4 thousands **4** hundreds **2** tens **7** ones
9 thousands **9** hundreds **8** tens **8** ones
b) 5,237
2,894
9,136
7,654

2. a) 3,511
b) 5,393
c) 7,935
d) 9,357
e) 4,517 = **4,000** + 500 + 10 + 7
f) 5,417 = 5,000 + 400 + **10** + 7
g) 1,574 = 4 + 70 + **500** + 1,000
h) 4,141 = 1 + 40 + 100 + **4,000**

3.

	5	50	500	5,000
2,552			✓	
5,235	✓			
1,555		✓		
5,055				✓

4.



5. a) 4,000 + 400
b) 4,000 + 40
c) 4,000 + 4
d) 3,000 + 30
e) 1,000 + 10
f) 6,000 + 60

6. 6,368, 4,246 and 2,124 are the possible solutions which children should show using place value counters

Reflect

Children should use the ideas in Question 5 Challenge as a model to write their own puzzle. They should be using the terminology relating to the value of the thousands, hundreds, tens, ones digits.

6 Partition 4-digit numbers flexibly

→ pages 21–23

1. Various options are possible, depending on which place values children choose to partition, such as
1,000 + 1,300 + 20 + 1
2,000 + 200 + 120 + 1
1,000 + 1,200 + 121

2. a) 8,535
b) 5,724
c) 3,044
d) 2,621
e) 7,399
f) 4,286 = 4,000 + 200 + **86**
g) 9,147 = 9,000 + **147**
h) 7,565 = 7,500 + **65**
i) 5,535 = 5,000 + 500 + 20 + **15**
j) 6,177 = 6,000 + 170 + **7**

3. £750

4. 4,000 + 800 + 10 + 6
4,816 – 10 = **4,806**
4,816 – 4,000 = **816**
4,816 – **800** = 4,016
4,816 – **6** = 4,810

5. a) 6,177 – 100 = **6,077**
b) 4,800 + **150** = 4,950
c) 5,834 – 30 = **5,804**
d) 2,440 + **11** = 2,451
e) 3,054 – **54** = 3,000
f) **1,100** + 725 = 1,825
g) 4,275 – **270** = 4,005
h) **1,500** + 6,005 = 7,505

6. a) 3,000 + 600 + **152**
b) Various answers possible, depending on how children partition each place value.

Reflect

Various answers are possible, ranging from the simple 3,000 + 700 + 50 to more complex such as 2,000 + 1,500 + 150 + 100.

7 1, 10, 100, 1,000 more or less

→ pages 24–26

1. a) 1,000 more than 3,767 is **4,767**.
b) 100 more than 5,870 is **5,970**.
c) 10 less than 2,950 is **2,940**.
d) 1,000 less than 10,000 is **9,000**.

2.

Number in digits	1000 more	100 less	10 more
4,407	5,407	4,307	4,417
3,241	4,241	3,141	3,251
2,225	3,225	2,125	2,235
758	1,758	658	768

3. a) 1,000 more than 4,879 is **5,879**.
b) 100 less than 4,879 is **4,779**.
c) 10 more than **4,869** is 4,879.
d) 1 more than 4,879 is **4,880**.
e) 3,921 is 1,000 more than **2,921**.
f) 100 less than 752 is **652**.

4. a) **1** more than 2,875 is 2,876.
b) 5,783 + **1,000** = 6,783
c) **100** less than 3,580 is 3,480.
d) **4,000** – 10 = 3,990
e) 5,999 + 1,000 – 10 = **6,989**
f) **7,950** + 10 – 100 = 7,860
g) 7,500 is **1,000** less than 8,500.

5. 7,775. Reverse the operations:
6,865 + 10 – 100 + 1,000 = 7,775

Reflect

Children should explain that only the 1,000s digit will change unless, when adding 1,000, that digit is 9.

8 1,000s, 100s, 10s and 1s

→ pages 27–29

1. a) 1,400
b) 1,600
c) 2,500
d) 3,500
e) 4,100

2. a) 37 hundreds **3,700**.
b) 38 hundreds **3,800**.
c) 39 hundreds **3,900**.
d) **40** hundreds 4,000.

3. The total mass is 1,300 g.

4. a) **10** lengths measure 100 m.
b) **50** lengths measure 500 m.
c) **100** lengths measure 1,000 m.
d) **110** lengths measure 1,100 m.
e) **150** lengths measure 1,500 m.
f) **160** lengths measure 1,600 m.
g) **200** lengths measure 2,000 m.
h) **175** lengths measure 1,750 m.

5. 2,150.
20 × 100 + 14 × 10 + 10 × 1 =
2,000 + 140 + 10 = 2,150

Reflect

Children should explain that ten hundreds equal one thousand, so twenty hundreds will equal two thousand.

My journal

➜ page 30

The number shown is 4,563. Children could represent this using place value counters or a variety of number lines. They may explain that the number has four thousands, five hundreds, six ten and three ones. They could describe it using 1,000 / 100 / 10 / 1 more or less than a given number.

Power play

➜ page 31

In order to use all six counters and have at least one counter in each column, there are only two combinations: 1, 1, 1 and 3 or 1, 1, 2 and 2. This gives these ten possible 4 digit numbers: 3,111, 1,311, 1,131, 1,113, 2,211, 2,121, 2,112, 1,221, 1,212, 1,122.

Unit 2 – Place value – 4-digit numbers (2)

1 Number line to 10,000

➜ pages 32–34

1. a) 6,000
b) 4,700
c) 3,250

2. a) 940 950 960 **970 980 990 1,000 1,010**
b) 1,996 1,997 1,998 **1,999 2,000 2001 2,002 2,003**
c) 1,560 1,570 1,580 **1,590 1,600 1,610 1,620 1,630**
d) 2,500 2,600 2,700 **2,800 2,900 3,000 3,100 3,200**

3. a) 5,000 **5,100 5,200 5,300 5,400 5,500 5,600 5,700 5,800 5,900** 6,000
b) 1,100 **1,110 1,120 1,130 1,140 1,150 1,160 1,170 1,180 1,190** 1,200
c) 8,990 **8,991 8,992 8,993 8,994 8,995 8,996 8,997 8,998 8,999** 9,000

4. a) 8,000 mm
b) 6,000 mm
c) 9,000 mm

5. a) **4,800** 5,000 **5,200** **5,700** 6,000
b) **7,020** **7,050** **7,090** 8,010 8,030

6. 700 ml is added (1,900 – 1,200)

Reflect

Children should explain that Max has counted in 1s so the final interval is incorrect. The count is in 10s.

2 Between two multiples

➜ pages 35–37

1. A: 3 numbers between 1 and 999
B: 3 numbers between 2,001 and 2,999
C: 3 numbers between 9,001 and 9,999

2. A: 3 numbers between 1,101 and 1,199
B: 3 numbers between 1,501 and 1.599
C: 3 numbers between 1,901 and 1,999

3. A: 3 numbers between 4,601 and 4,609
B: 3 numbers between 4,661 and 4,669
C: 3 numbers between 4,681 and 4,689

4. a) **4,000** 4,916 **5,000** d) **0** 820 **1,000**
2,000 2,837 **3,000** **5,000** 5,630 **6,000**
9,000 9,201 **10,000** **0** 16 **1,000**
b) **4,900** 4,916 **5,000** e) **900** 990 **1,000**
2,800 2,837 **2,900** **1,000** 1,040 **1,100**
9,200 9,201 **9,300** **0** 99 **100**
c) **4,910** 4,916 **4,920** f) **890** 894 **900**
2,830 2,837 **2,840** **9,990** 9,999 **10,000**
9,200 9,201 **9,210** **0** 1 **10**

5. **4**,50**1**
3,0**9**1
4,**99**7

Reflect

The previous multiple of a thousand has the same 1,000s digit as the number itself and the next multiple of a thousand has one more thousand than the number.

3 Estimate on a number line to 10,000

➜ pages 38–40

1. Children's answers may vary but should be close to these approximations:
a) approximately: 400 3,800 7,100 9,900
b) approximately: 2,160 2,420 2,690 2,920

2. a) 3,500 half-way between 3,000 and 4,000
4,100 just after 4,000
4,900 just before 5,000
7,500 half-way between 7,000 and 8,000
7,600 just after half-way between 7,000 and 8,000
b) 1,050 half-way between 1,000 and 1,100
1,190 just before 1,200
1,500 on 1,500
1,550 half-way between 1,500 and 1,600
1,750 between 1,700 and 1,800
1,790 just before 1,800
c) 6,201 just after 6,200
6,210 on 6,210
6,245 half-way between 6,240 and 6,250
6,272 just after 6,270
6,289 just before 6,290

3. a) Half-way between 1,000 ml and next marker up
b) Just under 2,000 ml
c) Just over half-way between 1,000 ml and the marker **below** it
d) Just above the half-way marker between 1,000 ml and 2,000 ml

4. a) Approximately 6,500 g
b) Approximately 2,500 g

5. a) 1,500 g is half-way between 1,000 g and 2,000 g. As each interval is 200g, this will be half-way between the 1,400 g and 1,600 g markers.
b) This should be left of centre.

6. Children's answers may vary but should be close to these approximations:
a) approximately 7,500 mm
b) approximately 5,900 mm
c) approximately 6,400 mm

Reflect

Children should realise that once they have said their first number, keeping the 1,000s digit the same will make it harder for their partner to get three in a row. The first player has the advantage.

4 Compare and order numbers to 10,000

➜ pages 41–43

1. a) 5,015
b) 6,751
c) 4,781
d) 1,003
e) 9,248
f) 3,162

2. a) 3,560 < 3,650
b) 2,886 < 2,888
c) 2,846 < 2,848
d) 3,560 < 3,660
e) 2,686 < 2,886
f) 2,848 < 2,851

3. Various answers are possible, such as:
a) 4,**5**78 < 4,592, 100s digit is 5 or less.
b) 7,8**1**9 < 7,8**2**4, 10s digit in the first number is less than the 10s digit in the second number.
c) 5,04**1** < **5**,042, 1,000s digit is 5 or more.

4. 6,421 6,536 6,541

5. a) 4,502 kg 4,314 kg 4,099 kg 3,821 kg
b) 8,120 m 8,032 m 7,909 m 7,830 m 812 m

6. a) Max swam the furthest.
b) Richard ran the second shortest distance.
c) 7,850 m 7,855 m 7,995 m

7. 4,326 4,335 4,344

Reflect

Children should generate at least four numbers and order then greatest to smallest.

5 Round to the nearest 1,000

➜ pages 44–46

1. a) 2,345 rounded to the nearest 1,000 is **2,000**.
b) 7,480 rounded to the nearest 1,000 is **7,000**.
c) **2,800** rounded to the nearest 1,000 is **3,000**.

2. a) next
b) previous
c) next

3. Paris: 9,000
Sydney: 9,000
Pisa: 5,000
New York: 4,000

4. a) Marks should be either side of the 1,000 marker representing between 500 and 1,499.
b) Marks should be either side of the 5,000 marker representing between 4,500 and 5,499.

5. Isla: any of the digits 0–9
Zac: any of the digits 5–9
Aki: 5

Reflect

Children should refer to the 100s digit and to the previous and next multiple of a thousand.

A 100s digit of 4 or less rounds down to the previous multiple of a thousand. A 100s digit of 5 or more rounds up. 500 rounds up to the next thousand.

6 Round to the nearest 100

➜ pages 47–49

1. a) 515 rounded to the nearest 100 is **500**.
b) 538 rounded to the nearest 100 is **500**.
c) 560 rounded to the nearest 100 is **600**.
d) 581 rounded to the nearest 100 is **600**.
e) 1,725 rounded to the nearest 100 is **1,700**.
f) 1,746 rounded to the nearest 100 is **1,700**.
g) 1,754 rounded to the nearest 100 is **1,800**.
h) 1,798 rounded to the nearest 100 is **1,800**.

2.

a)	**300**	320	**400**
b)	**300**	350	**400**
c)	**1,200**	1,290	**1,300**
d)	**2,400**	2,447	**2,500**
e)	**4,000**	4,005	**4,100**

3. a) 768 rounds up to 800
b) 402 rounds down to 400
c) 199 rounds up to 200
d) 84 rounds up to 100
e) 951 rounds up to 1,000
f) 12 rounds down to 0
g) 420 rounds down to 400
h) 1,001 rounds down to 1,000

4. Children should explain that, according to the rules of rounding, for the nearest 100, 50 and above rounds up so neither Richard nor Bella is correct.

5. 453 (rounds up) or 534, 543 (rounds down)

6. 4,453

Reflect

Children should explain that when rounding to the nearest 100, the 10s digit is the important digit. A 10s digit of 4 or less rounds down to the previous hundred and a 10s digit of 5 or more rounds up to the next hundred. Children may also refer to the 2-digit number made by the 10s and 1s digits, saying that 49 or less rounds down and 50 and above rounds up.

7 Round to the nearest 10

➜ pages 50–52

1. 132 rounds to 130 to the nearest 10.
137 rounds to 140 to the nearest 10.

2.

a)	**50**	57	**60**
b)	**10**	12	**20**
c)	**130**	136	**140**
d)	**500**	502	**510**

3. a) 18 to the nearest 10 is 20.
b) 28 to the nearest 10 is 30.
c) 81 to the nearest 10 is 80.
d) 82 to the nearest 10 is 80.
e) 124 to the nearest 10 is 120.
f) 126 to the nearest 10 is 130.
g) 368 to the nearest 10 is 370.
h) 995 to the nearest 10 is 1,000.

4. a) 41, 102, 333, 902, 981 round down to the nearest 10.
15, 78, 209, 457, 765 round up to the nearest 10.
b) Any two 4-digit numbers that round down to the nearest 10 and any two 4-digit numbers that round up to the nearest 10.

5.

a)	76	**80**	176	**180**	376	**380**
b)	1,024	**1,020**	1,124	**1,120**	1,324	**1,320**
c)	1,715	**1,720**	2,715	**2,720**	3,715	**3,720**
d)	1,704	**1,700**	5,704	**5,700**	8,704	**8,700**

6. a) 78 or 81.
b) 78 or 81.

7. **4** rounds to 0 to the nearest 10.
5 rounds to 10 to the nearest 10.
45 or **54** rounds to 50 to the nearest 10.
543 rounds to 540 to the nearest 10.
5,445 or **5,454** rounds to 5,450 to the nearest 10.

Reflect

Children should explain that if the 10s digit is 9 and the 1s digit is 5 or above, then the 100s digit could change too. In extreme examples such as 9,996, then rounding to the nearest 10 results in 10,000 so all the digits change.

8 Round to the nearest 1,000, 100 or 10

➜ pages 53–55

1.

Potatoes:	9,451	**9,000**
Carrots:	9,050	**9,000**
Parsnips:	5,500	**6,000**
Turnips:	3,900	**4,000**

2.

Manchester:	8,498	**8,500**
Leeds:	7,849	**7,800**
Birmingham:	8,805	**8,800**

3. 32 rounds to **30**
198 rounds to **200**
2,425 rounds to **2,430**

4.

8	**10**	**0**	**0**
988	**990**	**1,000**	**1,000**
1,899	**1,900**	**1,900**	**2,000**
9,999	**10,000**	**10,000**	**10,000**

5.

a)	smallest 8,500	greatest 9,499
b)	smallest 1,350	greatest 1,449
c)	smallest 815	greatest 824
d)	smallest 5,450	greatest 5,454

6. Any number from 1,995 to 2,004 inclusive.

7.

8,341:	**8,000**	**8,300**	**8,340**
6,**89**2:	**7,000**	**6,900**	6,890

Any number between **8,570 and 8,979** which has 7 tens: the nearest 100 and 10 will depend on the chosen number.

Any number between **5,451 and 5,459**: the nearest 1,000 and 10 will depend on the chosen number.

6,097 or 6,107: 6,**000**	6,100	6,100

Reflect

Children should refer to the relevant digits for each rounding, explaining that 5 or above rounds up, 4 and below rounds down.

To round to the nearest 10, look at the 1s digit (9).
So 3,539 rounds up to 3,540.

To round to the nearest 100, look at the 10s digit (3).
So 3,539 rounds down to 3,500.

To round to the nearest 1,000, look at the 100s digit (5).
So 3,539 rounds up to 4,000.

My journal

➜ page 56

1. When rounding to the nearest 1,000, you need to focus on the 100s column.

2. When rounding to the nearest thousand, the 1,000s column either stays the same or goes up or down by 1. All other digits after the 1,000s are replaced by zeros. For example, 6,435 rounded to the nearest 1,000 is 6,000.

Power puzzle

➜ page 57

This game can produce a wide variety of answers, depending on the roll of the dice. Some children may need their answers checking in order to score points.

Unit 3 – Addition and subtraction

I Add and subtract Is, I0s, I00s, I,000s

➜ pages 58–60

1. a) 4,137 + 2 = **4,139**
b) 4,137 + 20 = **4,157**

2. a) 6,666 + 2 = **6,668**
6,666 + 20 = **6,686**
2,000 + 6,666 = **8,666**
b) 6,666 – 200 = **6,466**
6,666 = 6,866 – 200
6,666 – **2** = 6,664

3. a) 3,154 + 500 = **3,654**
b) 500 + 4,351 = **4,851**
c) 9,786 – 4,000 = **5,786**
d) **7,568** = 7,968 – 400
e) **1,134** + 1,000 = 2,134
f) **521** + 4,000 = 4,521
g) 4,014 – 10 = **4,004**
h) 5,001 – **5,000** = 1

4. a) £6,999
b) £500

5. 7,333 – 3,333 is a related inverse fact to 3,333 + **4,000** = 7,333, so 7,333 – 3,333 = **4,000**.

6. One solution is:
3,334 + **700** – **600** = 3,434
3,334 – **800** + **900** = 3,434
3,934 – **100** – **400** = 3,434
3,434 – **200** – **300** + **500** = 3,434
Another solution:
3,334 + **700** – **600** = 3,434
3,334 – **800** + **900** = 3,434
3,934 – **200** – **300** = 3,434
3,434 – **100** – **400** + **500** = 3,434

Reflect

Children could show the subtraction 9,167 – 5,167, explaining that only the thousands digit has changed so the answer is **4,000**. They could show it in counters on a place value grid.

2 Add two 4-digit numbers

➜ pages 61–63

1. They have saved **£2,846** altogether.

2. a) 3,105 + 3,511 = **6,616**
b) 5,131 + 3,051 = **8,182**

3. a) Max has lined the digits up incorrectly.
b) 3,452 + 42 = 3,494

4. 6,498

5. a) 1,143
b) 3,**0**7**1** + **4**,8**1**6
c) 2,741
d) **2**,5**4**2 + 6,**4**3**0**

6. Children should show column addition lined up correctly or explain that they added each place value digit separately.
a) 1,045 + 2,331 = **3,376**
b) 4,521 + 432 = **4,953**

7. There are many possible answers. Children may randomly produce solutions or use a systematic approach. For example, 1,111 + 8,888, 1,118 + 8,881, 1,181 + 8,818, 1,818 + 8,181.

Reflect

Children should show 2,512 + 5,105 = 7,617 set out and calculated correctly.

3 Add two 4-digit numbers – one exchange

➜ pages 64–66

1. a) They ran **2,925** m in total.
b) Bella ran **3,375** m.
c) They ran **2,490** m in total.

2. a) 1,475 + 3,711 = **5,186**
b) **5,992** = 3,029 + 2,963
c) **6,148** = 1,054 + 5,094
d) 179 + 2,608 = **2,787**

3. a) 1,575 + 5,520 = **7,095**
b) 1,630 + 3,197 = **4,827**
c) Both use the answer to a). 4,520 + 1,575 is 1,000 less and 1,565 + 5,510 is 20 less than 7,095.

4. a) 1,139
b) 1,633

5. Various answers are possible. The ones digit needs to be 1 or more for an exchange, so the tens digit then needs to be 0, 1, 2 or 3 to avoid another exchange, The hundreds can be 7 or less including 0 and the thousands digit 8 or less including 0. 8,739 is the largest number that would work to involve only one exchange of 1 ten for 10 ones. 1,001 is the smallest 4-digit number, 101 the smallest 3-digit number and 11 the smallest 2-digit number.

Reflect

Various answers are possible, ensuring that:

a) 1s digits add to 10 or more, with 10s digits adding to 8 or less (taking into account the carried 10), and 100s and 1,000s digits adding to 9 or less.

b) 1s digits add to 9 or less, 10s to 10 or more, 100s to 8 or less (taking into account the carried 10) and 1,000s to 9 or less.
c) 1s and 10s digits add to 9 or less, 100s to 10 or more and 1,000s to 8 or less (taking into account the carried 10).

4 Add with more than one exchange

➜ pages 67–69

1. a) 3,821
b) 4,127

2. a) 1,257 + 189 = **1,446**
b) **2,000** = 1,011 + 989

3. a) 654 + 2,999 = **3,653**
b) 4,999 + 2,999 = **7,998**

4. a) 3,405 + 1,726 = 5,131
3,405 + 199 = 3,604
1,726 + 1,283 = 3,009
1,726 + 199 = 1,925
1,283 + 199 = 1,482
b) Various numbers and answers are possible. Children should think carefully about the sum of the digits in each column.

5. 1,234 + **766** = 2,000
4,3**7**1 + 4,**6**2**9** = 9,000
7,**0**01 + 1,9**99** = 9,000

6. a) 1,766
b) 8,001
c) 5,679

Reflect

Answers will vary. Children should think carefully about the sum of the digits in each column.

5 Subtract two 4-digit numbers

➜ pages 70–72

1. a) 4,325 – 2,114 = **2,211**

2. a) 3,110
b) 2,411
c) 2,241
d) 2,401

3. £1,408

4. a) 8,855 – 4,545 = **4,310**
b) 4,999 – 2,550 = **2,449**
c) 9,099 – 2,066 = **7,033**

5. The digits are not lined up correctly in the place value grid. The correct answer is 9,321.

6. Odd:
9,999 – 6,655 = 3,344
9,999 – 6,565 = 3,434
9,999 – 5,665 = 4,334
Answers are all even: odd – odd = even.

Even:
9,999 – 5,566 = 4433
9,999 – 5,656 = 4343
9,999 – 6,556 = 3443
Answers are all odd: odd – even = odd.

I noticed that when you subtract an odd number from another odd number, you always get an even number, and when you subtract an even number from an odd number, you always get an odd number.

Reflect

Children should write a story involving a single step subtraction. 5,455 – 2,123 = 3,332. An example: Over a weekend there were 5,455 visitors to a museum. 2,123 went on Saturday. How many people went on Sunday?

6 Subtract two 4-digit numbers – one exchange

➜ pages 73–75

1. a) 4,362 – 247 = **4,115**
b) 1,454 – 1,270 = **184**
c) 2,350 – 1,530 = **820**

2. 1,356 – 349 = **1,007**
Bella lives 1,007 m further away.

3. a) 9,375 – 8,293 = **1,082**
b) **82** = 8,375 – 8,239
c) 9,375 – 8,239 = **1,136**
d) 7,375 – 239 = **7,136**

4. a) 2,139
b) 1,620

5. a) 1,872 – 1,**14**4 = 7**2**8
b) 2,891 – **1,941** = 950
c) 3,**71**6 – **1**,262 = 2,45**4**
d) **7,789** – 3,661 = 4,128

Reflect

Children should write a subtraction where the 10s digit in the number being subtracted is more than the 10s digit in the number it is being subtracted from, e.g. 3,4**5**6 – 1,1**7**3.

7 Subtract two 4-digit numbers – more than one exchange

➜ pages 76–78

1. 2,335 – 418 = 1,917
Isla scored **1,917** points.

2. a) 2,292 – 1,199 = **1,093**
b) **1,990** = 3,150 – 1,160
c) 1,251 – 182 = **1,069**
d) 3,150 – 225 = **2,925**

3. The smallest digit has been subtracted from the largest digit in each case, rather than the bottom digit from the top.
3,412 – 1,651 = 1,761.

4. a) 1,258 litres – 163 litres = **1,095 litres**
b) 5,392 kg – 1,628 kg = **3,764 kg**
c) £3,215 – £329 = **£2,886**
d) 6,500 km – 2,970 km = **3,530 km**

5. Various answers are possible. **Either** the 1s **or** the 100s, not both, need to have an exchange, as the 10s already involve one of the two exchanges required. For example, 1,**4**58 – 28**9** or 1,**1**58 – 28**7**.

6. Children should work out the difference between the weights of the cat and the rabbit (2,455 g – 1,689 g = 766 g) and the rabbit and the guinea pig (1,689 g – 949 g = 740 g) to show that the rabbit is closer to the guinea pig's mass because 740 g < 766 g.

Reflect

Answers will vary. Children should pay close attention to the value of the digits in each place.

8 Exchange across two columns

➜ pages 79–81

1. a) 2,502 – 1,359 = **1,143**
b) 4,506 – 1,482 = **3,024**
c) 3,026 – 573 = **2,453**
d) 8,017 – 1,928 = **6,089**

2. 1,401 – 225 = **1,176 words**

3. 5,048 – 2,362 = **£2,686**

4. The hundreds digit 5 needs to be crossed out and replaced with a small 4. The tens digit 0 also needs to be crossed out and replaced with a small 9.

	Th	H	T	O
	3	$^{4}\not{5}$	$^{9}\not{0}$	$^{1}7$
–		4	1	9
	3	**0**	**8**	8

This is correct except for the 10s digit in the answer line should be 8 not 9.

	Th	H	T	O
	$^{2}\not{3}$	$^{9}\not{1}0$	$^{9}\not{1}0$	$^{1}8$
–	1	4	1	9
	1	5	**8**	9

All correct.

	Th	H	T	O
	$^{1}\not{2}$	$^{1}0$	$^{1}\not{2}$	$^{1}3$
–		4	1	9
	1	6	0	4

5. a) 7,002 – 1,359 = **5,643**
b) 3,006 – 2,478 = **528**
c) 5,011 – 827 = **4,184**
d) 9,023 – 3,624 = **5,399**

6. a) 1,771
b) 2,728

Reflect

Children should refer to exchanging 1 hundred for 10 tens, then exchanging 1 of those tens for 10 ones, leaving 9 tens in the tens column.

9 Efficient methods

➜ pages 82–84

1. a) 1,957 + 1,000 = **2,957**
1,957 + 999 = **2,956**
b) 3,175 + 1,000 = **4,175**
3,175 + 999 = **4,174**
c) 1,957 – 1,000 = **957**
1,957 – 999 = **958**
d) 3,175 – 1,000 = **2,175**
3,175 – 999 = **2,176**
e) 2,048 + 1,000 = **3,048**
2,048 + 999 = **3,047**
f) 8,858 + 1,000 = **9,858**
8,858 + 999 = **9,857**
g) 2,048 – 1,000 = **1,048**
2,048 – 999 = **1,049**
h) 8,858 – 1,000 = **7,858**
8,858 – 999 = **7,859**

2. a) 1,582 + 1,999 = **3,581**
b) 3,999 + 1,672 = **5,671**
c) 4,316 – 2,999 = **1,317**
d) 7,072 – 5,999 = **1,073**

3. 8,124 + 9 = **8,133**
8,124 + 99 = **8,223**
8,124 + 999 = **9,123**
8,124 – 9 = **8,115**
8,124 – 99 = **8,025**
8,124 – 999 = **7,125**

4. a) 3,251 – 6 = **3,245** Counting back 6
b) 5,051 – **5,047** = 4 Counting back 4
c) 3,251 – 3,246 = **5** Counting on 5
d) 4,982 = 4,982 – **0** Counting on 0

5. a) 8,708
b) 1,197
c) 108
d) 2,082

Reflect

Children should consider what they are comfortable with and what they have been practising in this lesson. Children could choose near multiples of 10, 100 or 1,000 or using single digits for the mental method.

I0 Equivalent difference

➜ pages 85–87

1. a) 95 – 7 = 88
b) 96 – 8 = 88
c) 97 – 9 = 88
d) 98 – 10 = 88
e) They all have the same answer.
98 – 10 is probably the easiest.

2. 299 – 140 = 159

3. Children should continue the pattern:
236 – 99, 237 – 100, 238 – 101, 239 – 102.
Jan's tower is **137 cm** taller.

4. 1,434

5. Children may choose to make a column subtraction with no exchanges or use a number line.
a) 2,950 – 850 = **2,100**
b) 2,875 – 1,989 = **886**
c) 3,011 – 2,997 = **14**
d) 8,001 – 4,567 = **3,434**
e) 6,626 – 6,618 = **8**
f) 9,009 – 10 = **8,999**

Reflect

Children should show a different method such as 999 – 954 (column method, no exchanges) or a number line counting on from 955 to 1,000. 1,000 – 955 = 45.

I1 Estimate answers

➜ pages 88–90

1. a) 3,987 rounds to **4**,000
5,123 rounds to **5**,000
Estimate: **4,000** + **5,000** = **9,000**
Lexi's score is roughly **9**,000 points.
b) Estimate: **4,000** – **3,000** = **1,000**
Max has roughly **1,000** points now.
c) Lexi's exact score: **9,110** points.
Max's exact score: **883** points.

2.

2,101 – 998	2,100 – 1,000
1,975 + 2,010	2,000 + 2,000
1,998 + 3,101	2,000 + 3,000
2,925 – 975	3,000 – 1,000
2,998 – 1,998	3,000 – 2,000

3. a) 6,152 + 3,025 = **9,177**
Estimate: 6,000 + 3,000 = 9,000
6,452 – 2,005 = **4,447**
Estimate: 6,500 – 2,000 = 4,500
b) Children should explain their rounding based on the proximity of each number to the closest 100 or 1,000.

4. 6,491 – 2,725 = **3,766**
Nearest 1,000 = 6,000 – 3,000 = 3,000
Nearest 100 = 6,500 – 2,700 = 3,800
Nearest 10 = 6,490 – 2,730 = 3,760
Estimating to the nearest 10 is the most accurate.

Reflect

Children could show 2,000 – 1,000 = 1,000 or 1,900 – 1,000 = 900 or 1,920 – 1,020 = 900.
The nearest 10 is no more accurate than the nearest 100.
1,915 – 1,019 = 896.

I2 Check strategies

➜ pages 91–93

1. a) 2,341 + 1,151 = 3,492 Incorrect
b) 550 + 451 = 1,001 Correct
c) 6,789 + 2,189 = 8,978 Incorrect

Part-whole models should have the number being subtracted and the answer as the parts and the first number in the subtraction as the whole.

2. £1,899 + £995 = £2,894 with £2,894 as the whole in the part-whole model.
£2,894 – £1,899 = £995 or £2,894 – £995 = £1,899

3. Children should show working for:
a) 5,555 – 995 = **4,560**
b) 5,555 + 995 = **6,550**
c) 5,555 – **4,560** = 995
d) Answers will vary, e.g. **5,555** – 995 = **4,560**.

4. Dexter's estimate to the nearest 1,000 is correct but it is not accurate. He should estimate to the nearest 100 for a more accurate answer: 4,500 + 3,500 = 8,000.

Reflect

Children should suggest rounding to the nearest 100: 600 + 1,600 = 2,200, Rounding to the nearest 10 gives the same estimation.

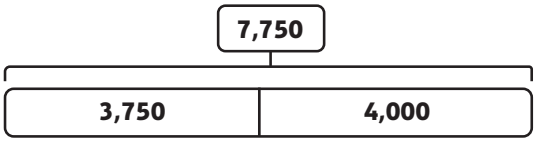
I3 Problem solving – one step

➜ pages 94–96

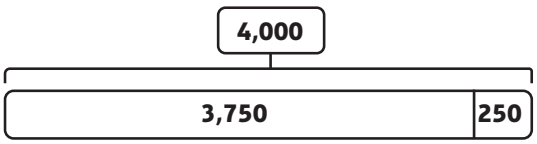
1. a) 5,600 ml
b) 2,500 ml

2. a) She has 1,100 m left to cycle.
b) He travels 4,150 m altogether.

3. a)



b)



4. Cloud = 2,500
Triangle = 2,000
Heart = 1,500
Star = 500

Reflect

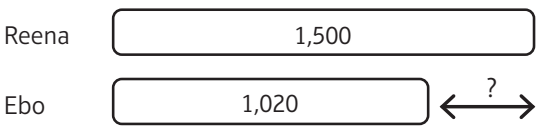
Children complete the bar model and write a story problem for 1,050 + 950 = 2,000 or 2,000 – 950 = 1,050.

I4 Problem solving – comparison

➜ pages 97–99

1. a) 1,020 – 820 = 200
Ebo has **200** more stickers.

b)



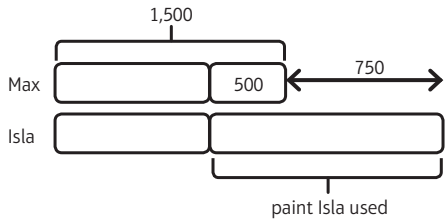
1,500 – 1,020 = 480
Ebo has **480** fewer stickers than Reena.

c) Column addition: 1,500 + 250 = 1,750
Luis has **1,750** stickers in total.

2. Lee collects **151** more shells that Mo.

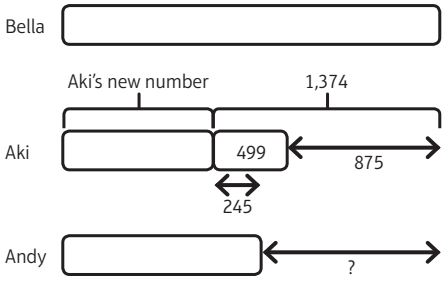
B suits this problem as it involves comparing two amounts, not combining them.

3.



500 + 750 = 1,250
Isla used **1,250** ml of paint.

4. Bar models may vary.



499 + 875 = 1,374
1,374 – 245 = 1,129
The difference between Bella's number and Andy's number is **1,129**.

Reflect

Explanations will vary. Children may say that they draw a comparison bar model when the problem involves comparing amounts. They draw a single bar model when finding a part or the whole of an amount.

I5 Problem solving – two steps

➜ pages 100–102

1. a) 4,000 m
Children may work out 2,250 + 500 first or 2,250 + 1,250 first.

b) Write 2,500, 4,750 and ? as the parts:
8,000 – 2,500 = 5,500
5,500 – 4,750 = 750

Or:
2,500 + 4,750 = 7,250
8,000 – 7,250 = 750

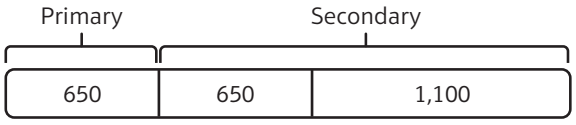
She swam 750 m.

2. 435 cm
1,200 – 450 = 750
750 – 325 = 425

Or:
450 + 325 = 775
1,200 – 775 = 425

The middle section is 425 m.

3.



The total number of children is 2,400.

4. a) **Amy** has more money now.
1,275 – 550 = 725
750 – 725 = 25
Or:
550 + 750 = 1,300
1,300 – 1,275 = 255
The new difference is **£25**.

b) Evelyn has **£1,800** and Noah has **£1,000**.

Reflect

Children should draw a single bar model where the parts add to 2,050.

I6 Problem solving – multi-step

➜ pages 103–105

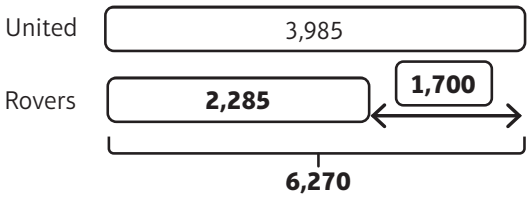
1. a) Write in parts of 1,228, 1,517 and 483 into both diagrams.

b) 1,228 + 1,517 = 2,745
2,745 + 483 = 3,228
5,000 – 3,228 = 1,772

Class 2 collected **1,772** bottles.
483 < 1,228 < 1,517 < 1,772

Class 2 collected the most bottles.

2.



3,985 – 1,700 = 2,285
There are 2,285 Rovers fans.

3,985 + 2,285 = 6,270
There are **6,270** fans in total.

3. 1,502 + 3,116 = 4,618, so a small dog weighs 4,618 g.
4,618 – 4,586 = 32, so a hamster weighs 32 g.
The hamster weighs **32 g**.

4. Answers will vary.

For example: A school is comparing class points earned this year. The total points earned is 4,000. Class 1 earned 950 fewer points than Class 3. Class 3 earned 1,900 points. How many did Class 2 earn?

Reflect

Answers will vary, but children could discuss the number of elements in a problem and how many values they need to work out.

My journal

➜ page 106–107

1. Children estimate 2,000 + 6,500 = 8,500 or 1,900 + 6,700 = 8,600; and 2,000 = 9,000 – 7,000.

Based on these estimations, they should expect that the second calculation has a missing number greater than 6,800.

8,634 – 1,889 = **6,785** so 1,849 + **6,785** = 8,634 (which is not greater than 6,800).

9,000 – 2,026 = **6,974** so 2,026 = 9,000 – **6,974** (which is greater than 6,800).

2. 8,699 – 4,875 = 3,824. The difference between Aki's score and Lee's score is 3,824.

The difference between Aki's score and Jamilla's score is 3,823.

So Aki is wrong. His score is 1 point closer to Jamilla's score than it is to Lee's score.

Power puzzle

➜ page 108

Puzzle A
Cloud = 1,750
Star = 1,250

Puzzle B
Heart = 1,050
Star = 150
Cloud = 1,800
Triangle = 600

Unit 4 – Measure – area

I What is area?

➜ pages 109–111

1. The answer will depend on the size of the counters and whether the children place them correctly as an array with no spaces between counters

2. a) The area of this quadrilateral is about **9** dominoes.
b) The area of this triangle is about **15** buttons.

3. The space inside a shape

4. a) to c) The answer will depend on the size of the counters the children are using.

5. Tick
Tick
No tick
Tick

6. a) Mo has used two different sizes of sticky notes.
b) The area in smaller sticky notes is 42 notes.
The area in larger sticky notes is approximately 10 notes.

Reflect

Children should use shapes of the same size, placing them close together.

2 Measure area using squares

➜ pages 112–114

1. 8 3 6 5 7

2. a) A: 5 B: 4 C: 9 D: 6 E: 9
b) Shapes **C** and **E** have the same area.

3. The area of the piece of paper is **8** squares.

4. Ebo has not placed the squares right next to each other. He has spaces between the squares.

5. T A B L E T O P (8, 1, 2, 5, 3, 8, 6, 7)

6. a) 1 4 9 16
b) The areas of the next 3 shapes will be 25, 36 and 49.
c) Use multiplication: The first 4 shapes are 1×1, 2×2, 3×3 and 4×4, so the next 3 will be 5×5, 6×6, 7×7.

Reflect

Children should mention some of the following. Squares are good for measuring area because they have straight edges and each edge is the same length. They fit closely together, with no gaps.

3 Count squares

➜ pages 115–117

1. a) Desk: 10
Chair: 5
Wardrobe: 18
Mat: 6
Bookshelf: 7
Bed: 21
b) Answers will vary based on the size of the object the children have drawn.

2. Rectangle A has an area of **18** squares.
Rectangle B has an area of **10** squares.
Area of A + B = **18** squares + **10** squares = **28** squares
The whole shape has an area of **28** squares.

3. Answers will vary but should include the two areas added together.

4. 32 squares

5. There should be 5 shapes, each with an area of 3 squares. 15 squares divided into 5 = 3 squares.

Reflect

Children should explain that they could count the squares, including the ones hidden by the ink splash or use multiplication: $3 \times 5 = 15$ or $= 5 \times 3 = 15$.

4 Make shapes

➜ pages 118–120

1. Answers will vary.

2. Various shapes are possible but should be rectilinear so 2×10, 4×5 or a combination of two rectangles together.

3. a) 16
b) 4
c) 9
d) 6

4. Answers will vary based on the letters the children have used and how they are drawn.

5. Answer will vary based on the children's designs.

Reflect

Children should refer to multiplication and division facts to make rectangles. For example: 4 x 5 and 3 x 6. Moving one square at a time can be helpful to make different shapes.
Check that a shape is not the same as another shape by turning it around to see if it matches any other of their shapes. Children should remember that two rectangles can be placed together to make a rectilinear shape.

5 Compare area

➜ pages 121–123

1. a) Children could guess any of the three children as the shapes look similar in size.
b) Abdul: 52 squares
Bryony: 38 squares
Chloe: 50 squares
c) Abdul has won as his shape has the largest area.

2. a) The shape with the smallest area marked A is the T shape at the bottom left (7 squares).
b) The shape with the greatest area marked B is the shape which covers the top and the right side of the board (11 squares).
c) The area of the whole board is 9 × 5 = 45 squares.

3. a) 5 squares and 4 squares, left shape shaded.
b) 3 squares and 1 square, left shape shaded.
c) 9 squares and 10 squares, right shape shaded.
d) 7 squares and 7 squares, neither shape shaded. Children may shade both shapes.

4. This shape has an area of 15 shapes.
2 × 15 = 30, so the rectangle should have an area of 30 squares. For example, 3 × 10 or 5 × 6.

Reflect

Children should give examples. It is **sometimes true** because a 1 × 1 square has a smaller area than a 1 × 2 rectangle, but a 3 × 3 square has a larger area than a 3 × 2 rectangle. A 6 × 6 square has the same area as a 9 × 4 rectangle

My journal

➜ page 124

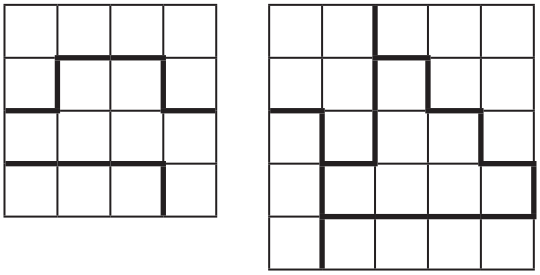
1. Answers will vary.

2. Answers will vary but children should mention multiplication or division facts.

Power puzzle

➜ page 125

a)



b) The areas of the chocolate bars are **16** squares and **25** squares.

c) Answers will depend on whether a child likes chocolate. For example: *I would choose the bar with 25 squares as it has a larger area so more chocolate.*

Unit 5 – Multiplication and division (I)

I Multiples of 3

➜ pages 126–128

1. a) Various diagrams are possible but should show clearly 3 groups of 5.
b) Various diagrams are possible but should show clearly 5 groups of 3.
c) 3 × 5 = **15** **15** ÷ 3 = 5
5 × 3 = **15** **15** ÷ 5 = 3

2. a) 2 × 3 = 6 6 ÷ 3 = 2
3 × 2 = 6 6 ÷ 2 = 3
b) 6 × 3 = 18 18 ÷ 3 = 6
3 × 6 = 18 18 ÷ 6 = 3

3. The number at the top of the triangle is 27.
9 × 3 = 27
3 × 9 = 27
27 ÷ 9 = 3
27 ÷ 3 = 9

4. a) 9 ÷ 3 = **3**
b) 24 ÷ 3 = **8**

5. a) 9, 12, 15, 18, 21, 24, 27
b) Children should notice the multiples are on a diagonal and that there are two unshaded squares in between each multiple of 3.

Reflect

27 is the only multiple of 3 because 9 × 3 = 27. A number with a 1s digit of 3 is not often a multiple of 3 (although there are some, e.g. 33 and 63).

2 Multiply and divide by 6

➜ pages 129–131

1. a) 3 × 6 = **18**
b) 5 × 6 = **30**
c) 10 × 6 = **60**

2. 24 ÷ 6 = **4**

3. a) 4 × 6 = 24
b) 7 × 6 = 42

4. 48 ÷ 6 = 8
He can make 8 hexagons.

5. 12 × 6 = 72
The length of the new shape is **72** cm.

Reflect

Children should write and solve a story problem using × or ÷ by 6.

3 6 times-table and division facts

➜ pages 132–134

1. a) 12, 18, 24, 30

2. a) 3 × 6 = 18
b) 4 × 6 = 24
c) 6 × 3 = 18

3. a) 18 f) 0 k) 2
b) 6 g) 4 l) 5
c) 36 h) 54 m) 7
d) 72 i) 1 n) 10
e) 60 j) 4 o) 66

4. a) 24, 30, 36, 48
b) 54, 48, 42, 30, 24, 18

5. 13 × 6 = 72 + 6 = 78
13 × 6 = **78**

6. a) 2 × 6 > 10 d) 18 ÷ 6 < 24 ÷ 6
b) 36 ÷ 6 < 30 e) 9 × 6 = 6 × 9
c) 5 × 6 < 7 × 6 f) 15 × 6 > 6 × 12

7. 8 × 6 = 8 x 5 + 8 = 40 + 8 = 48

Reflect

Children should complete the 6 times-table, circling the facts they are not sure of.

0	6	12	18
24	30	36	42
48	54	60	66
72			

4 Multiply and divide by 9

➜ pages 135–137

1. 36, 45, 54, 63, 72, 81, 90

2. a) 5 × 9 = 45 There are **45** hearts.
b) 7 × 9 = 63 There are **63** spades.

3. 18 ÷ 9 = **2**

4. 27 ÷ 9 = **3**

5. £72 ÷ £9 = 8
8 children handed in money.

6. a) 2 × 10 = **20** 2 × 9 = **18**
b) 6 × 10 = **60** 6 × 9 = **54**
c) 4 × 10 = **40** 4 × 9 = **36**
d) 8 × 10 = **80** 8 × 9 = **72**

7. 12 × 3 = 36 36 ÷ 9 = 4
Rowan can make **4** towers of 9 cubes.

Reflect

Children should write a story problem using the division fact £45 ÷ 9 = £5.

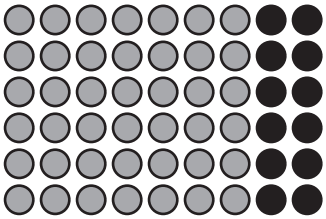
5 9 times-table and division facts

→ pages 138–140

1. a) $4 \times 9 = 36$ $36 \div 9 = 4$
b) $2 \times 9 = 18$ $18 \div 9 = 2$
c) $8 \times 9 = 72$ $72 \div 9 = 8$

2. 36, 45, 63, 72, 81, 99, 108

3. a)



b) $6 \times 9 = 54$ $54 \div 9 = 6$
$9 \times 6 = 54$ $54 \div 6 = 9$

4. a) 63
b) 0
c) 81
d) 45
e) 108
f) 9
g) 3
h) 1
i) 6
j) 4
k) 99
l) 90

5. Children should play the game in pairs to practise their 9 times-table facts.

Reflect

$9 \times 9 = 81$ $6 \times 9 = 54$ $8 \times 9 = 72$ $7 \times 9 = 63$
$9 \times 9 = 81$ $9 \times 6 = 54$ $9 \times 8 = 72$ $9 \times 7 = 63$
$81 \div 9 = 9$ $54 \div 9 = 6$ $72 \div 9 = 8$ $63 \div 9 = 7$
$81 \div 9 = 9$ $54 \div 6 = 9$ $72 \div 8 = 9$ $63 \div 7 = 9$

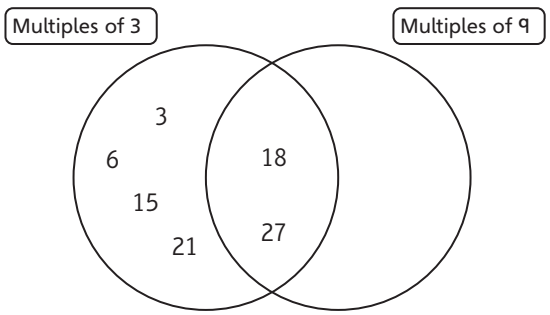
Note that there are only 2 distinct facts for a square number (e.g. 81).

6 The 3, 6 and 9 times-tables

→ pages 141–143

1. a) 12, 15, 18, 21, 24, 27, 30
b) 24, 30, 36, 42, 48, 54, 60
c) 36, 45, 54, 63, 72, 81, 90

2.



3. Children should choose which numbers to write in the diagram. All multiples of 9 are also multiples of 3 so should be written in the overlap and the right-hand circle will remain empty.

4.

All multiples of 9 are multiples of 3	True
All multiples of 3 are multiples of 9	False
All multiples of 3 are even	False
Some multiples of 6 are odd	False

5. a) $4 \times 3 = \mathbf{2} \times 6$
$8 \times 3 = \mathbf{4} \times 6$
$10 \times 3 = \mathbf{5} \times 6$
b) $3 \times 3 = \mathbf{1} \times 9$
$6 \times 3 = \mathbf{2} \times 9$
$9 \times 3 = \mathbf{3} \times 9$
c) $15 \div 3 = \mathbf{30} \div 6$
$21 \div 3 = \mathbf{42} \div 6$
$30 \div 3 = \mathbf{60} \div 6$
d) $36 \div 9 = \mathbf{24} \div 6$
$45 \div 9 = \mathbf{30} \div 6$
$63 \div 9 = \mathbf{42} \div 6$

Reflect

Children should choose facts that they find difficult to remember.

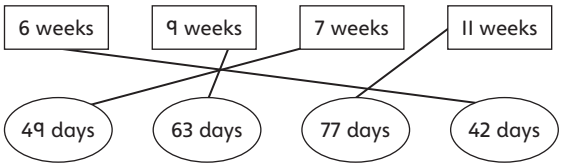
7 Multiply and divide by 7

→ pages 144–146

1. a) $4 \times 7 = 28$
There are **28** cars.
b) $2 \times 7 = 14$
There are **14** cubes.
c) 7 packs circled

2. 21, 35, 42, 49, 56, 63, 70

3.



4. $7 \times 8 = 56$

5. a) 11
b) 2
$79 \div 11 = 7$ r 2

6. $3 \times 7 = 21$
$35 - 21 = 14$
$14 \div 7 = 2$
A bag of popcorn costs **£2**.

Reflect

Children should write and solve a story problem using 5×7.

8 7 times-table and division facts

➜ pages 147–149

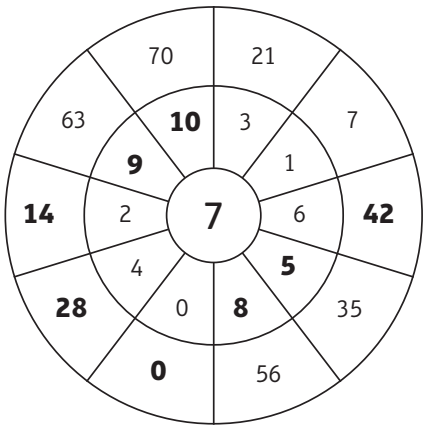
1. 21, 28, 35, 42, 49, 56, 63, 77

2. a) $4 \times 7 = 28$
$7 \times 4 = 28$
$28 \div 7 = 4$
$28 \div 4 = 7$
b) $3 \times 7 = 21$
$7 \times 3 = 21$
$21 \div 7 = 3$
$21 \div 3 = 7$

3. a) 28
b) 14
c) 35
d) 70
e) 0
f) 77
g) 6
h) 8
i) 11
j) 1
k) 4
l) 9
m) 21
n) 84

4. a) $8 \times 5 = 40$
$8 \times 2 = 16$
$40 + 16 = 56$
$8 \times 7 = 56$
b) $9 \times 7 = 8 \times 7 + 7 = 56 + 7 = 63$

5.



6. Any odd number multiplied by 7.
For example: $1 \times 7 = 7$, $3 \times 7 = 21$, $5 \times 7 = 35$.

Reflect

Children should notice that whoever starts the count says the odd multiples of 7 and their partner says the even multiples.

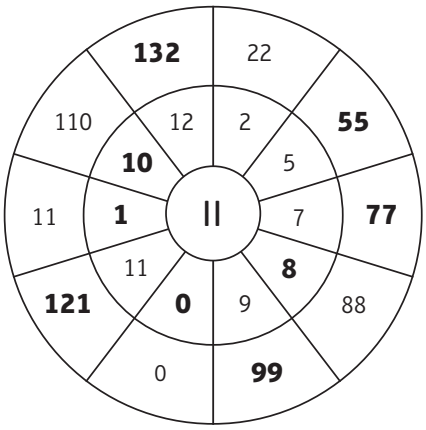
9 11 and 12 times-tables and division facts

➜ pages 150–152

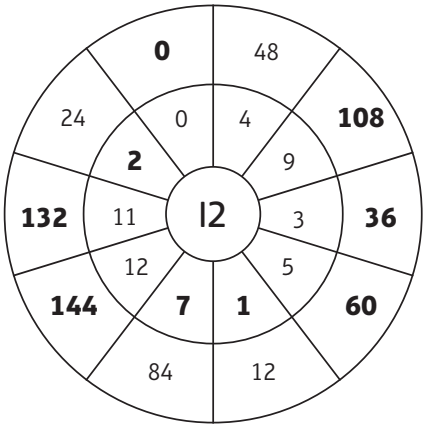
1. a) 33, 44, 55, 66, 77, 88, 99
b) 36, 48, 60, 72, 84, 96, 108

2. a) $12 \times 6 = 72$ dots
b) $6 \times 12 = 72$ eggs
c) $11 \times 4 = 44$ dots

3. a)



b)



4. a) 44, 55, 66, 88, 99, 110
b) 24, 48, 72, 96, 108
c) 120, 108, 96, 84, 72
d) 121, 110, 99, 88, 77

5. a) $6 \times 12 = \mathbf{72}$
$\mathbf{72} \div 12 = 6$
b) $88 \div 11 = \mathbf{8}$
$88 \div \mathbf{8} = 11$
c) $\mathbf{3} = 36 \div 12$
$36 = 12 \times \mathbf{3}$
d) $132 \div 12 = \mathbf{11}$
$11 \times \mathbf{12} = 132$

Reflect

×	7	3	2	5	10	11	9	6	8	1	12	4
10	**70**	**30**	**20**	**50**	**100**	**110**	**90**	**60**	**80**	**10**	**120**	**40**
11	**77**	**33**	**22**	**55**	110	**121**	**99**	**66**	88	**11**	**132**	**44**
1	**7**	**3**	**2**	**5**	**10**	11	**9**	**6**	**8**	**1**	**12**	**4**
4	**28**	**12**	**8**	**20**	**40**	**44**	**36**	**24**	**32**	**4**	48	**16**
5	**35**	**15**	**10**	25	**50**	**55**	**45**	**30**	**40**	**5**	**60**	**20**
6	42	18	12	**30**	60	**66**	**54**	**36**	**48**	**6**	**72**	**24**
2	**14**	**6**	**4**	**10**	**20**	**22**	**18**	**12**	16	**2**	**24**	**8**
12	**84**	**38**	**24**	**60**	**120**	**132**	**108**	**72**	**96**	12	**144**	**48**
7	**49**	**21**	**14**	**35**	**70**	**77**	63	**42**	**56**	**7**	**84**	**28**
3	**21**	**9**	**6**	**15**	**30**	**33**	**27**	**18**	24	**3**	**36**	**12**
9	**63**	**27**	**18**	**45**	**90**	**99**	**81**	**54**	**72**	**9**	**108**	36
8	**56**	**24**	**16**	**40**	**80**	**88**	**72**	**48**	**64**	8	**96**	**32**

I0 Multiply by I and 0

→ pages 153–155

1. Children should draw lines to match the pictures with the following multiplications:
a) 4 × 0 = **0**
b) 2 × 3 = **6**
c) 1 × 4 = **4**
d) 5 × 1 = **5**
e) 2 × 0 = **0**

2. a) 4 × 1 = 4 There are **4** counters in total.
b) 4 × 3 = 12 There are **12** pencils in total.
c) 4 × 0 = 0 There are **0** cubes in total.

3. Children should circle: 3 × 0, 0 × 10, 15 × 0, 0 × 5, 1 × 0.
All of the multiplications include a 0.

4. a) 0
b) 9
c) 15
d) 0

5. 0

Reflect

With × 0, any number can be put in the first box but the answer will always be 0.

With × 1, whatever goes into the first box is also the answer in the second box. When you multiply a number by 1, the number does not change.

I1 Divide by I and itself

→ pages 156–158

1. a) 6 ÷ 1 = 6
The person receives 6 sweets.
b) 6 ÷ 6 = 1
Each person receives 1 sweet.

2. Amelia has confused division with subtraction (4 – 4 = 0).
However, 4 ÷ 4 = 1 because 4 things shared among 4 people means one each.

3. Children should circle: 8 ÷ 8, 5 ÷ 5, 16 ÷ 16, 7 ÷ 7, 150 ÷ 150.

4. a) 3 4 5
10 14 20
When you divide a number by 1, the number does not change.
b) The answers are all 1. When you divide a number by itself, the answer is always 1.

5. a) 11 d) 1 g) 0
b) 1 e) 12 f) 8
c) 1 f) 70

6. Children should tick:
- The square is greater than the pentagon.
- When you divide a number by 1, the number does not change. So, if square ÷ 1 > pentagon ÷ 1, then square > pentagon.

Reflect

In each calculation both numbers are the same, e.g. **12** ÷ **12** = 1, **6** ÷ 1 = **6**.

I2 Multiply three numbers

→ pages 159–161

1. a) 4 × 2 × 4 = 8 × 4 = 32
b) 5 × 3 × 3 = 15 × 3 = 45

2. Children should draw two boxes with 24 shapes arranged in an array of 4 by 6 or 8 by 3.

3. 7 x 9 = 63.
Multiplying 63 by 2 is easier than multiplying 14 (the total of 2 × 7) by 9 or 18 (the total of 2 × 9) by 7.

4. 5 × 11 × 2 = 5 × 2 × 11 = 10 × 11 = 110.
There are **110** candles in total.

5. a) 48
b) 80
c) 100
d) 105
e) 72
f) 144

6. a) 4
b) 5
c) 2
d) 3
e) 7 × 0 × [**any digit**] = **0**
f) 1

7. Some children will spot that there is a zero as a multiplier, so the answer will be zero without any need to work anything out.
4 × 5 × 7 × 6 × 0 × 3 × 2 × 1 = 0

8. 2 × 5 × 6 or 3 × 4 × 5 (digits can be in any order).

Reflect

2 × 8 × 5 = 16 × 5 = 80
2 × 8 × 5 = 2 × 40 = 80
2 × 8 × 5 = 10 × 8 = 80
Children will probably choose 40 × 2 or 10 × 8 as the most efficient method.

My journal

→ pages 162–163

1. There are 27 possible combinations:

Large	Med.	Small
5	0	0
4	1	1
4	0	3
3	3	0
3	2	2
3	1	4
3	0	6
2	4	1
2	3	3

Large	Med.	Small
1	0	12
0	7	1
0	6	3
0	5	5
0	4	7
0	3	9
0	2	11
0	1	13
0	0	15

Large	Med.	Small
2	2	5
2	1	7
2	0	9
1	6	0
1	5	2
1	4	4
1	3	6
1	2	8
1	1	10

2. Problems that involve **multiplication**: A, D.
Problems that involve **division**: B, C.
Children should explain that A and D require a multiplication and that B and C require a division.
A: 6 × 7 = 42
7 books cost £42.
B: 48 ÷ 6 = 8
Each child receives 8 sweets.
C: 90 ÷ 9 = 10
I can buy 10 board games.
D: 2 × 9 × 9 = 18 x 9 = 162
9 bags weigh 162 kg.

Power puzzle

→ page 164

1. Children should note how long it took them.
Teacher to check answers.

2. Children should note how long it took them.
Teacher to check answers.
Order of numbers along the top of the grid:
2, 7, 9, 4, 8, 1, 11, 6, 5, 10, 12, 3.
Order of numbers down the side of the grid:
4, 10, 2, 1, 8, 6, 12, 3, 7, 11, 9, 5.
Teacher to supervise checking of answers in grids designed by children.