Caribbean Primary Mathematics

Level 6

Mathematics

Workbook

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Contents

The number system

1   Complete the table.

Number in figures	Number in words
4 214	Four thousand two hundred and fourteen
8 009	Eight thousand and nine
7 312	Seven thousand three hundred and twelve
99 451	Ninety-nine thousand four hundred and fifty-one

2   Work out the counting patterns. Fill in all the missing numbers.

a   35 000   36 000   37 000   38000   39 000   40 000

b   27 500   26 500   25 500   24 500   23 500   22 500

c   24500   24 550   24600   24 650   24700   24750   24800

d   12 500   12 300   12 100   11 900   11 700   11 500   11 300   11 100

3   List the factors of each number.

a   19 ___1 , 19___

b   24 1, 2, 3, 4, 6, 8, 12, 24

c   60 1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30, 60

d   100 1, 2, 4, 5, 10, 20, 25, 50, 100

e   Complete the table. Tick the columns that apply to each number.

Number	Odd	Even	Prime	Square	Composite
19	✔		✔		
24		✔			✔
60		✔			✔
100		✔		✔	✔

4   Use the numbers in the box.

⑧   9   ⑩   15   ⑳   24   30   42   45   80   144

a   Circle all the multiples of 2.
b   Put a block around all the multiples of 3.
c   Underline all the multiples of 10.
d   Cross out all the multiples of 5.

Calculations

1. What must be added or subtracted to get the result shown? Fill in the operation sign and the amount.

   a. $6.56 \underline{+0.01} = 6.57$

   b. $6.56 \underline{-0.10} = 6.46$

   c. $6.56 \underline{-1.00} = 5.56$

   d. $6.56 \underline{-0.55} = 6.01$

   e. $6.56 \underline{-0.98} = 5.58$

   f. $6.56 \underline{-0.537} = 6.023$

2. Use place value and the fact that $7 \times 5 = 35$ to work out the missing numbers in each number sentence.

   a. $35 \div 7 = \underline{5}$

   b. $35 \div 5 = \underline{7}$

   c. $7 \times 50 = \underline{350}$

   d. $700 \times 5 = \underline{3\,500}$

   e. $5\,000 \times 7 = \underline{35\,000}$

   f. $350 \div 7 = \underline{50}$

   g. $35\,000 \div 5 = \underline{7\,000}$

   h. $3\,500 \div 7 = \underline{500}$

   i. $3\,500 \div 70 = \underline{50}$

3. Complete this addition pyramid. The number in each brick is found by adding the two numbers below it.
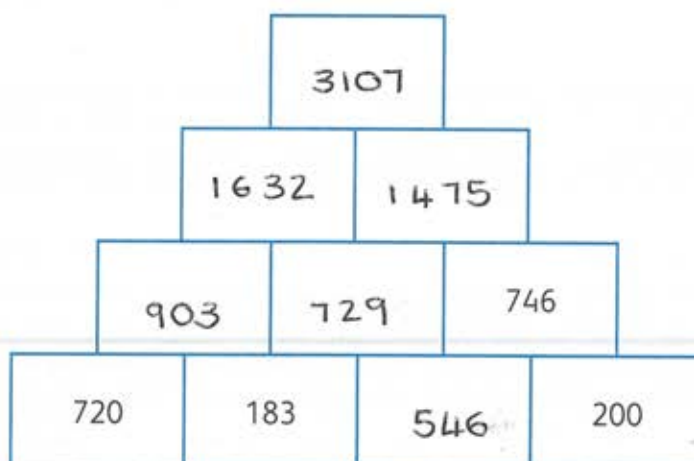
Space and shape

1   Use the grid that is shown here to answer the questions.
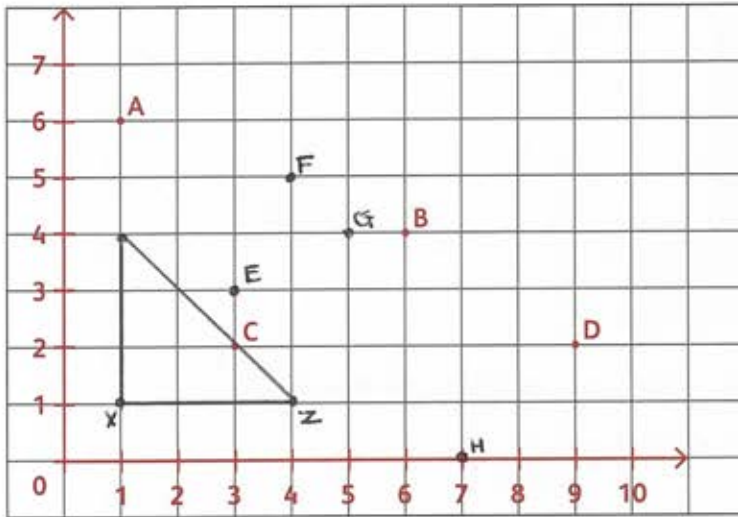
a   Write the coordinates of points A to D.

A (_1_, _6_)   B (_6_, _4_)   C (_3_, _2_)   D (_9_, _2_)

b   Plot and label these points on the grid.

E (3, 3)   F (4, 5)   G (5, 4)   H (7, 0)

c   Draw a right-angled isosceles triangle XYZ on the grid. Write the coordinates of its vertices.

X (_1_, _1_)   Y (_1_, _4_)   Z (_4_, _1_)

2   a   Write the correct mathematical names for the parts of the circle.

centre /origin

circumference

diameter

radius
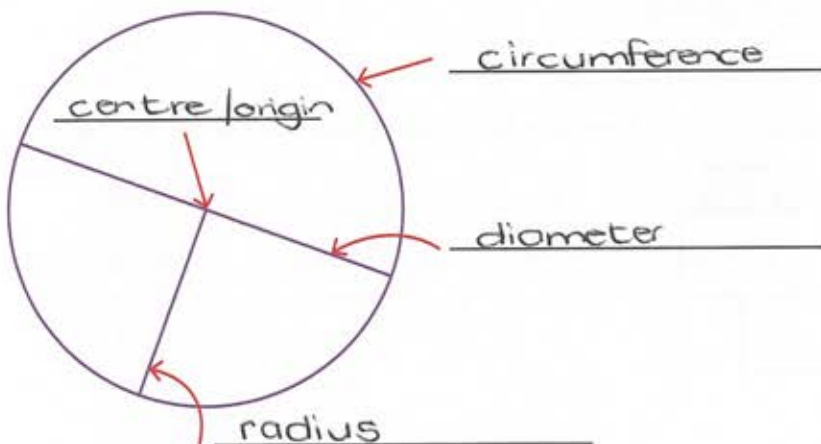
b   Is a circle a plane shape? Give a reason.

Yes   as   it   is   a   2-D shape

c   Is a circle a polygon? Give a reason.

Yes   as   it   has   on infinite number of sides.

Space, shape and measures

1   Each block on the grid is 1 cm long and 1 cm wide. On the grid, draw two different shapes, both with an area of 9 square centimetres.
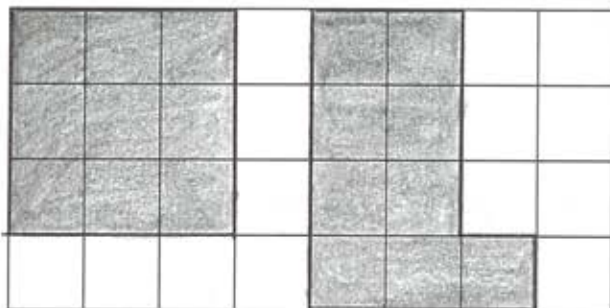
2   Measure each angle. Write the size on it in degrees. Complete the sentences.

Angle A: __60__ °   __90__ °   Angle C: __125__ °
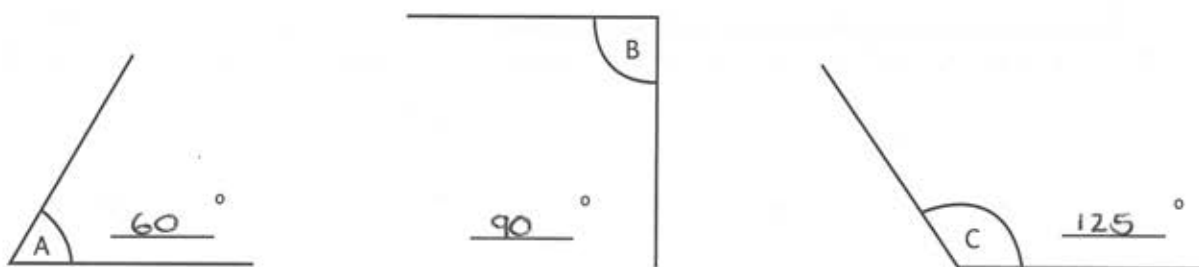
a   Angle ___C___ is an obtuse angle.

b   Angles that measure 90° are called __right__ angles.

c   Angle A is __acute__ because it measures __less__ than 90°.

d   Four right angles make __360°__.

e   A straight angle measures __180°__.

3   These scales are balanced. Work out the mass of the unmarked object on each scale.

a

| $\frac{1}{2}$ kg | 100 g |
| | 400g |

b

| 50 g | 120 g |
| 1.2 kg | 1130g |

c

| | 130 g |
| $\frac{3}{4}$ kg | 620g |

d

| 520g | 20 g |
| 1 kg | $1\frac{1}{2}$ kg |
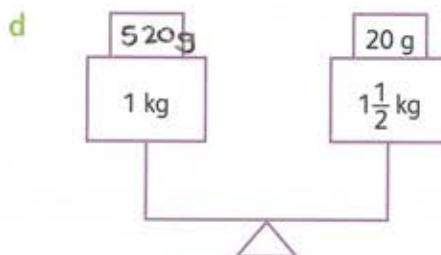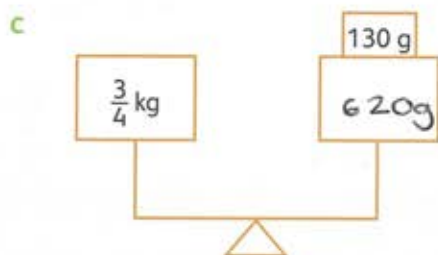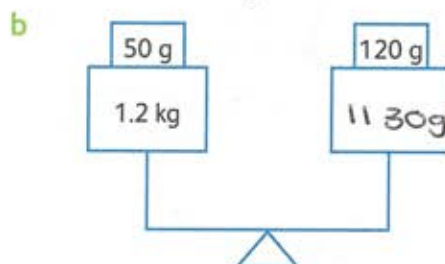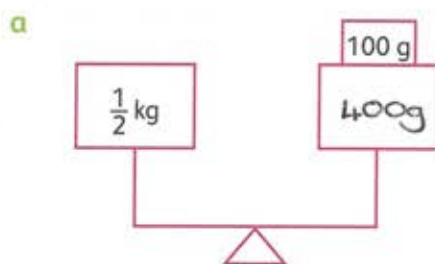
Measurement and data

1 Convert each measurement to the given units.

a 200 centimetres = ___2___ metres   b 3 litres = ___3000___ millilitres

c 2 750 grams = ___2.75___ kilograms   d 210 minutes = ___$3\frac{1}{2}$___ hours

e 30 months = ___$2\frac{1}{2}$___ years

2 Draw a labelled diagram to teach someone the difference between area and perimeter.
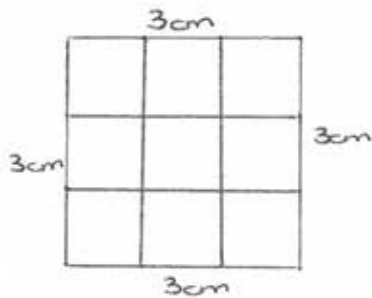
Perimeter = 3 + 3 + 3 + 3
= 12 cm

Area = 3 × 3
= 9 cm²
(count all the inside blocks)

3 Use a ruler to measure the perimeter of each shape. Give your answer in millimetres.

a   P = 150 mm

b   P = 206 mm

c   P = 158 mm
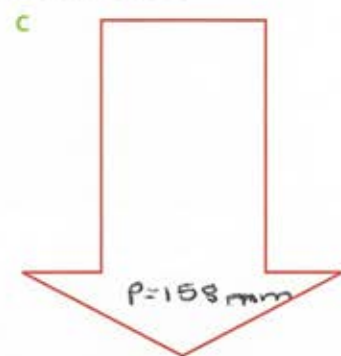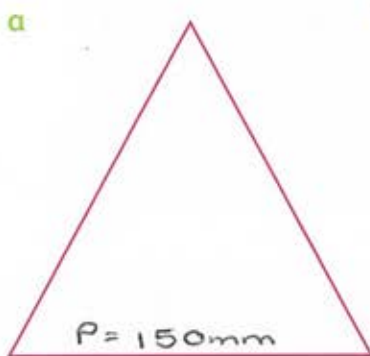
4 Toniqua did a survey of the favourite colours among her friends.

Her results were: red – 8, blue – 2, yellow – 5, green – 6, black – 7 and purple – 3.

Complete and label the graph to show the information.

Friends' favourite colours

Number of friends | Colours

Number sense (1)
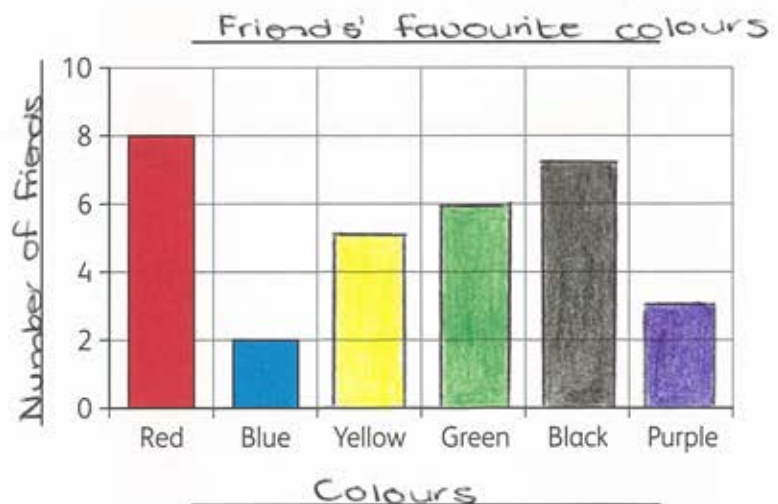
Counting and place value

1   Fill in the missing numbers.

  a   __315 309__ = 300 000 + 10 000 + 5 000 + 300 + 9

  b   144 434 = 100 000 + __40 000__ + 4 000 + 400 + 30 + 4

  c   __320 509__ = 300 000 + 20 000 + 500 + 9

2   Draw lines to match the number names to the numerals.

One hundred and nineteen thousand three hundred and twenty-nine	134 927
Three hundred and forty-nine thousand two hundred and seven	349 207
One hundred and ninety-three thousand two hundred and ninety	119 329
One hundred and thirty-four thousand nine hundred and twenty-seven	193 290

3   Sort the numbers in the box into two groups. Write each number in the correct column in the table.

4 967 204	5 984 309	66 986	890	54 002
78 008	898 765	4 321 000	999	876 987
999 999	9 999 999	4 210 342	654 329	1 000 001

> 1 million		< 1 million	
66 986 898 765		4 967 204	4 210 342
890 999		5 984 309	1 000 001
54 002 876 987		4 321 000	
78 008 999 999 654 329		9 999 999	

4   Write the missing numbers on each number line.

  a   4 000 000 ─── 5 000 000 ─ 6 000 000 ─── 7 000 000 ─── 8 000 000 ─ 9 000 000

  b   2 500 000 ─── 2 550 000 ─── 3 500 000 ─── 3 550 000

  c   9 700 000 ─── 9 750 000 ─── 9 800 000 ─── 9 850 000 ─── 990 000
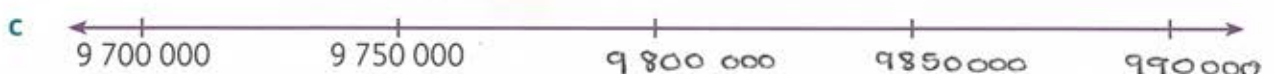
Millions

1 Fill in the missing numbers on each number line.

a
10 000   20 000   30 000   40 000   50 000   60 000

b
380 000   400 000   420 000   440 000   460 000   480 000   500 000

c
580 000   582 000   584 000   586 000   588 000   590 000   592 000

d
1 200 000   1 300 000   1 400 000   1 500 000   1 600 000

e
4 500 000   4 550 000   5 500 000   5 550 000   6 500 000   6 550 000
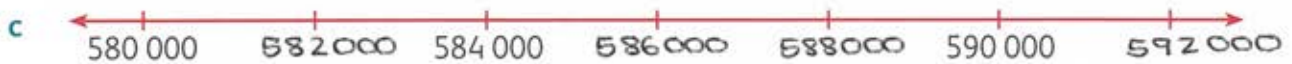
2 Estimate where each number will go on this number line. Show the position of each number with an arrow and a letter. The first one has been done as an example.

f   a   d   b   g   e c

0   1 000 000   2 000 000
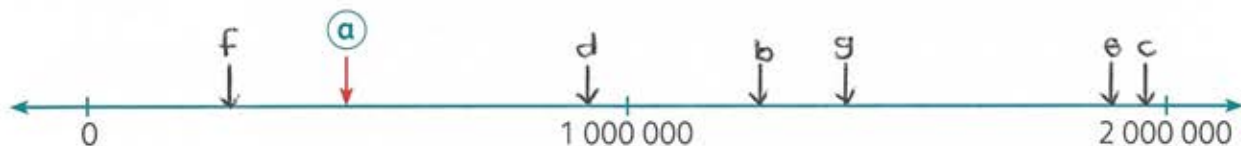
a 500 000   **b** 1 275 164   **c** 1 999 999   **d** 900 000

e 1 900 000   **f** 250 000   **g** 1 400 000

3 Fill in < or > to make each statement true.
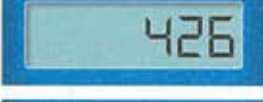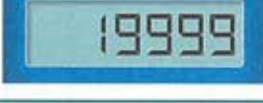
a 4 909 123 < 4 912 345   **b** 2 341 256 < 2 789 966

c 9 459 093 > 9 098 432   **d** 5 090 450 < 5 090 540

(Student's Book pages 10–11)

Rounding and estimating

1 Round the numbers to the place given in each column.

Number	To the nearest 10	To the nearest 100	To the nearest 1 000
3 209 876	3 209 880	3 209 900	3 210 000
2 987 452	2 987 450	2 987 500	2 987 000
9 099 100	9 099 100	9 099 100	9 099 000
2 987 345	2 987 350	2 987 300	2 987 000
4 919 326	4 919 330	4 919 300	4 919 000
5 245 765	5 245 770	5 245 800	5 246 000
1 919 987	1 919 990	1 920 000	1 920 000

2 Tamika used a calculator to do these calculations. Write an estimate below each one and tick the answers that you think are reasonable.

a $345 + 450 + 399 + 289$

Estimate: $300 + 500 + 400 + 300 = 1500$

1843

b $312 + 689 + 5\ 234 + 459$

Estimate: $300 + 700 + 5\ 200 + 500 = 6700$

6694 ✓

c $23\ 897 - 12\ 988$

Estimate: $24\ 000 - 13\ 000 = 11\ 000$

22609

d $43\ 126 - 24\ 999$

Estimate: $43\ 000 - 25\ 000 = 18\ 000$

18127 ✓

e $4\ 532 \times 9$

Estimate: $4500 \times 9 = 40\ 500$

47880

f $1\ 278 \div 3$

Estimate: $1300 \div 3 = 433\ r\ 1$

426 ✓

g 199×9

Estimate: $200 \times 9 = 1800$

19999

(Student's Book pages 12–13)

Large numbers in real life

1   This table contains a list of the world's busiest airports in order. The number of passengers passing through each airport per month (for the year 2016) is given too.

Airport	Country	Number of passengers per month	Passengers to the nearest 1 000
1 Atlanta	USA	8 457 490	8 457 000
2 Beijing	China	7 494 886	7 495 000
3 Dubai	UAE	6 500 855	6 501 000
4 Chicago	USA	6 411 874	6 412 000
5 Tokyo	Japan	6 276 393	6 276 000
6 London Heathrow	UK	6 249 160	6 249 000

a   Fill in the missing information in the table.

b   Which airports have fewer than six and a half million passengers per month?

___Chicago___   ___Tokyo___   ___London___

c   Approximately how many more passengers travelled through Atlanta per month than through:

i   Dubai? __1 956 000__   ii   Heathrow? __2 208 000__

2   The land area of some large islands is given here in square kilometres.

GREENLAND 2 130 800

NEW GUINEA 800 311

UNITED KINGDOM 216 777

CUBA 110 860

a   Write the areas in order from the smallest to the greatest.

__110 860 km² ; 216 777 km² ; 800 311 km² ; 2 130 800 km²__

b   Which island is larger: the United Kingdom or Greenland, and by how much?

__Greenland by 1 914 023 km²__

c   Which two islands have a combined area of approximately three million square kilometres?

__Greenland and New Guinea__

d   Which island is more than two million square kilometres larger than Cuba?

__Greenland__

Mental calculations

1   Do these calculations mentally. Complete each grid as quickly as you can.

a   Add or subtract the number in the top row to or from the number in the first column.

	11	28	45	90	99	12	88	100	55
100 −	89	72	55	10	1	88	12	0	45
150 −	139	122	105	60	51	138	62	50	95
200 +	211	228	245	290	299	212	288	300	255
55 +	66	83	100	145	154	67	143	155	110
120 +	131	148	165	210	219	132	208	220	175

b   Divide the number in the top row by the number in the first column.

÷	30	300	60	600	90	120	450	4 500	1 800
2	15	150	30	300	45	60	225	2250	900
10	3	30	6	60	9	12	45	450	180
5	6	60	12	120	18	24	90	900	360
3	10	100	20	200	30	40	150	1500	600

2   Work out and fill in all the missing numbers in these multiplication grids.

a

×	5	7	9
4	20	28	36
5	25	35	45
9	45	63	81

b

×	3	6	8
6	18	36	48
7	21	42	56
9	27	54	72

c

×	8	6	10
4	32	24	40
3	24	18	30
8	64	48	80

d

×	7	8	9
2	14	16	18
6	42	48	54
10	70	80	90

(Student's Book pages 18–19)

More mental methods

1 In each number pyramid, a block is the sum of the two blocks below it. Work out the missing values to complete each pyramid. Use the space for jottings, if needed.

a

	3855			
1762		2093		
618		1144		949
276	342		802	147

b

	2864		
1614		1250	
1214		400	850
914	300	100	750

c

	1290		
570		720	
390		180	540
300	90	90	450
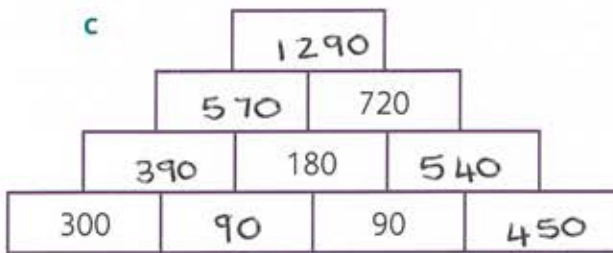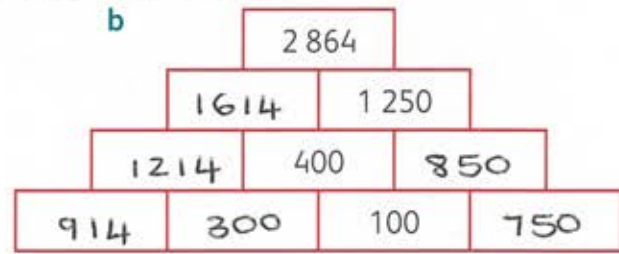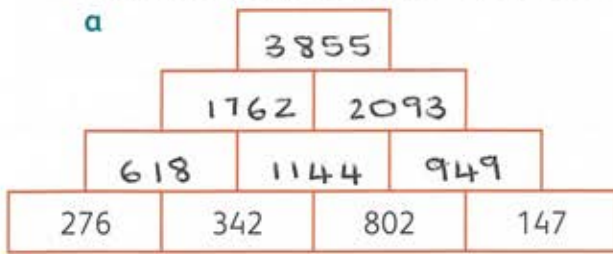
2 In these triangles, the top number is the product of the bottom two. Work out the missing numbers.

a 320 / 20, 16

b 210 / 7, 30

c 300 / 50, 6

d 240 / 3, 80

e 350 / 35, 10

f 100 / 2, 50

g 175 / 7, 25

h 225 / 25, 9

i 120 / 12, 10
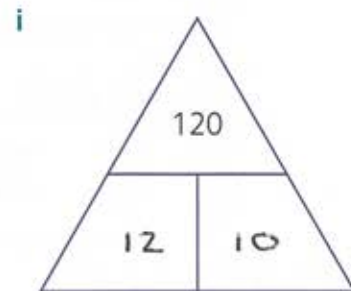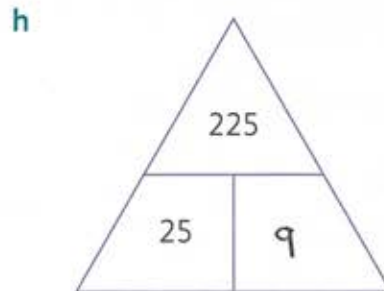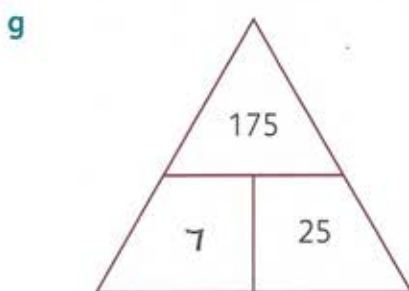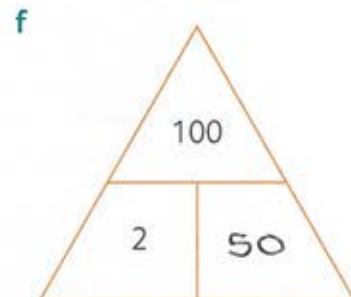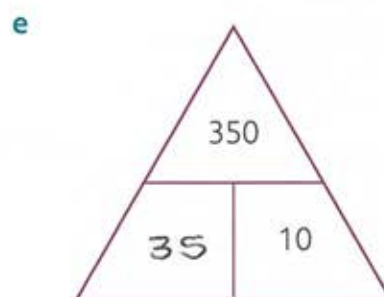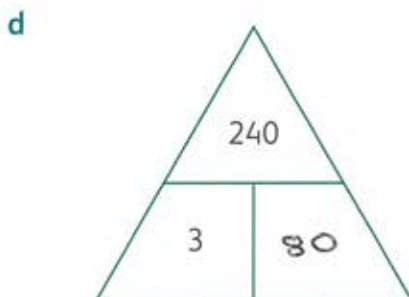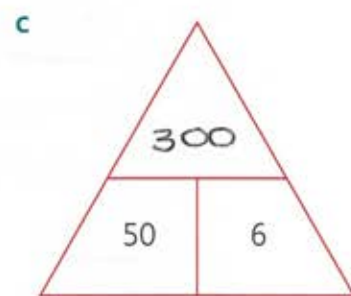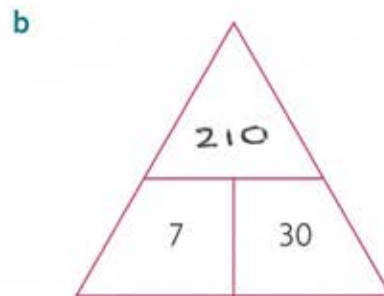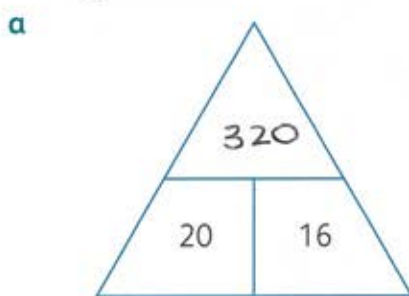
Adding and subtracting

1 Calculate.

a
```
   1 204
 +   987
 ―――――
   2 191
```

b
```
  19 246
 + 11 432
 ―――――
  30 678
```

c
```
  14 089
 + 9 264
 ―――――
  23 353
```

d
```
   2 074
 − 1 042
 ―――――
   1 032
```

e
```
   2 000
 − 1 486
 ―――――
    514
```

f
```
  12 072
 − 9 387
 ―――――
   2 685
```

2 The total length of each boat's journey is shown, as well as the distance already travelled. Work out how much further each boat must travel to reach the halfway point on its journey. Use the space next to each diagram for working.

a
0 ――――――――――――⊣ 2 160 km
980 km + 100 km

Answer: 100 km

b
0 ――――――――――――⊣ 4 480 km
1 882 km + 358 km

Answer: 358 km

c
0 ――――――――――――⊣ 1 445 km
487 km + 235.5 km

Answer: 235.5 km

d
0 ――――――――――――⊣ 2 812 km
742 km + 664 km

Answer: 664 km

e
0 ――――――――――――⊣ 4 875 km
1 799 km + 638.5 km
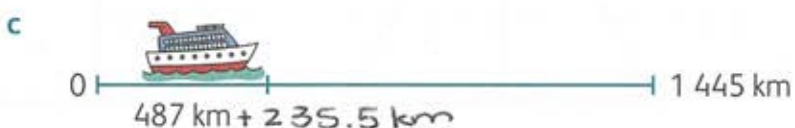
Answer: 638.5 km

f
0 ――――――――――――⊣ 3 638 km
1 689 km + 130 km

Answer: 130 km

Multiplication

Work out the area of each rectangle. Show your working out inside each rectangle.

1   28 cm

```
  137
  ×28
 2740
+1096
 3836cm²
```
137 cm

2   35 cm

```
  282
  ×35
 8460
+1410
 9870cm²
```
282 cm

3   47 cm

```
  216
  ×47
 8640
+1512
10152cm²
```
216 cm

4   49 cm

```
   312
 ×  49
 12480
+ 2808
 15288cm²
```
312 cm

5   63 cm

```
   487
  ×63
 29220
+ 1461
 30681cm²
```
487 cm

6   72 cm

```
   619
  ×72
 43330
+1238
 44568cm²
```
619 cm

13

Division

Complete each division.

1 15) 743 = 49 r 8
- 60
143
- 135
8

2 16) 648 = 41 r 2
- 64
. 8
- 6
2

3 28) 861 = 30 r 21
- 84
21

4 13) 333 = 25 r 8
- 26
73
- 65
8

5 12) 416 = 34 r 8
- 36
56
- 48
8

6 24) 687 = 28 r 15
- 48
207
- 192
15

7 42) 431 = 10 r 11
- 42
11

8 22) 732 = 33 r 6
- 66
72
- 66
6

9 35) 517 = 14 r 27
- 35
167
- 140
27

10 31) 634 = 20 r 14
- 62
14

11 45) 999 = 22 r 9
- 90
99
- 90
9

12 24) 1087 = 45 r 7
- 96
127
- 120
7

(Student's Book pages 24–25)

Number puzzles

1   In this number puzzle, the number in each oval is the sum of the two numbers in the circles on either side of it. Can you find six different solutions that work?

a

| 85 — 170 — 85 |
| 190   190 |
| 105 — 210 — 105 |

b

| 95 — 170 — 75 |
| 190   190 |
| 95 — 210 — 115 |

c

| 70 — 170 — 100 |
| 190   190 |
| 120 — 210 — 90 |

d

| 90 — 170 — 80 |
| 190   190 |
| 100 — 210 — 110 |

e

| 65 — 170 — 105 |
| 190   190 |
| 125 — 210 — 85 |

f

| 45 — 170 — 125 |
| 190   190 |
| 145 — 210 — 65 |
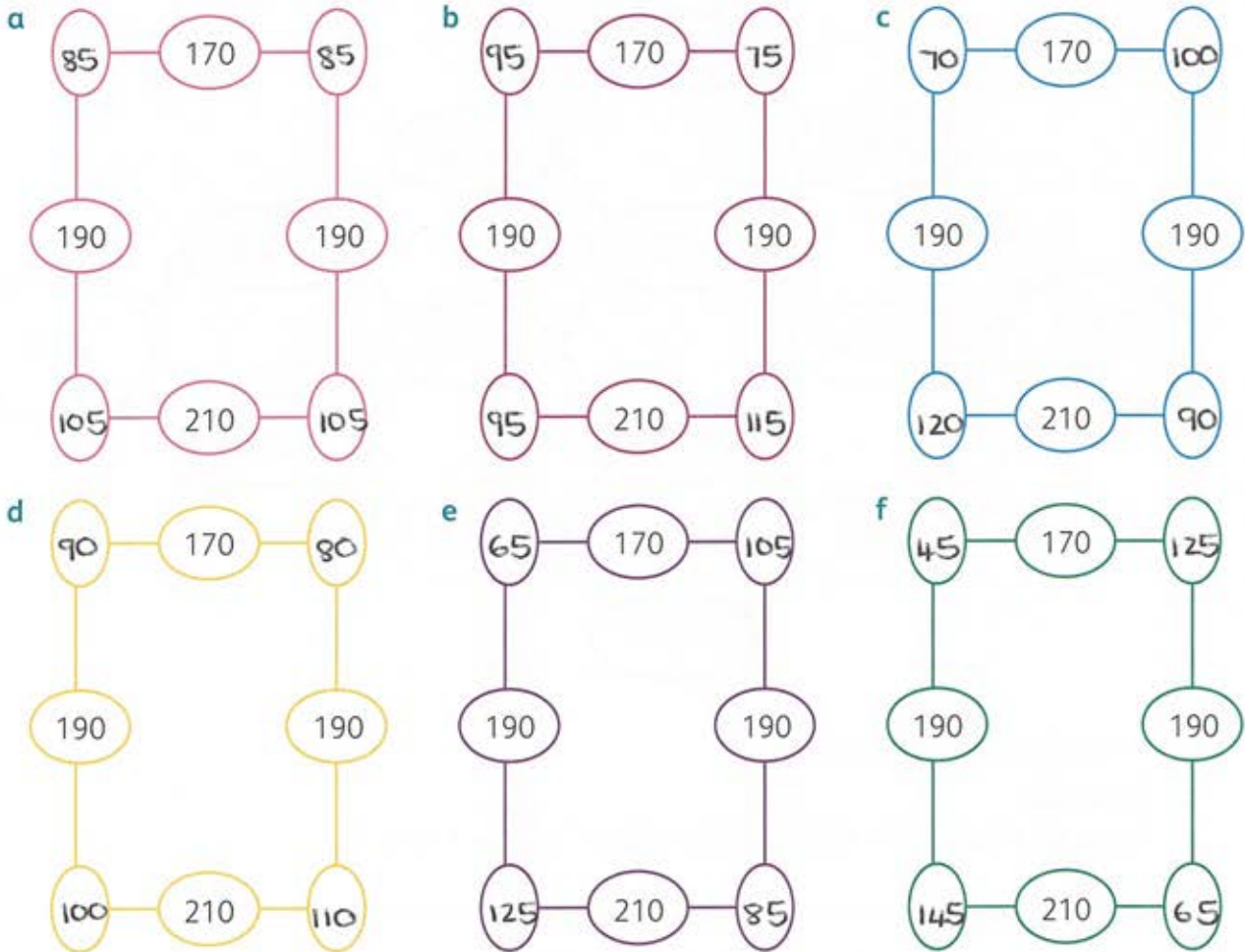
2   Fill in the digits from 1 to 9 in this triangle so each side has a sum of 20. You may use each digit once only.

Triangle:
- Top: 5
- Left side downward: 3, 8, 4
- Right side downward: 2, 7, 6
- Bottom: 4, 1, 9, 6

(Student's Book pages 26–28)
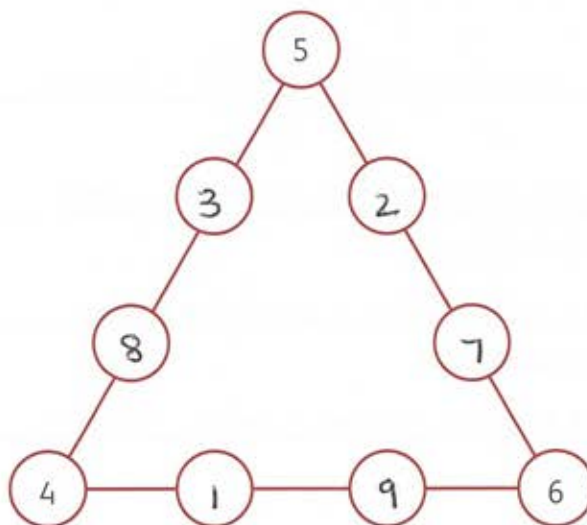
Find the route

In this number puzzle, you may move along any arrow and add or subtract the number in the bubble as you go.
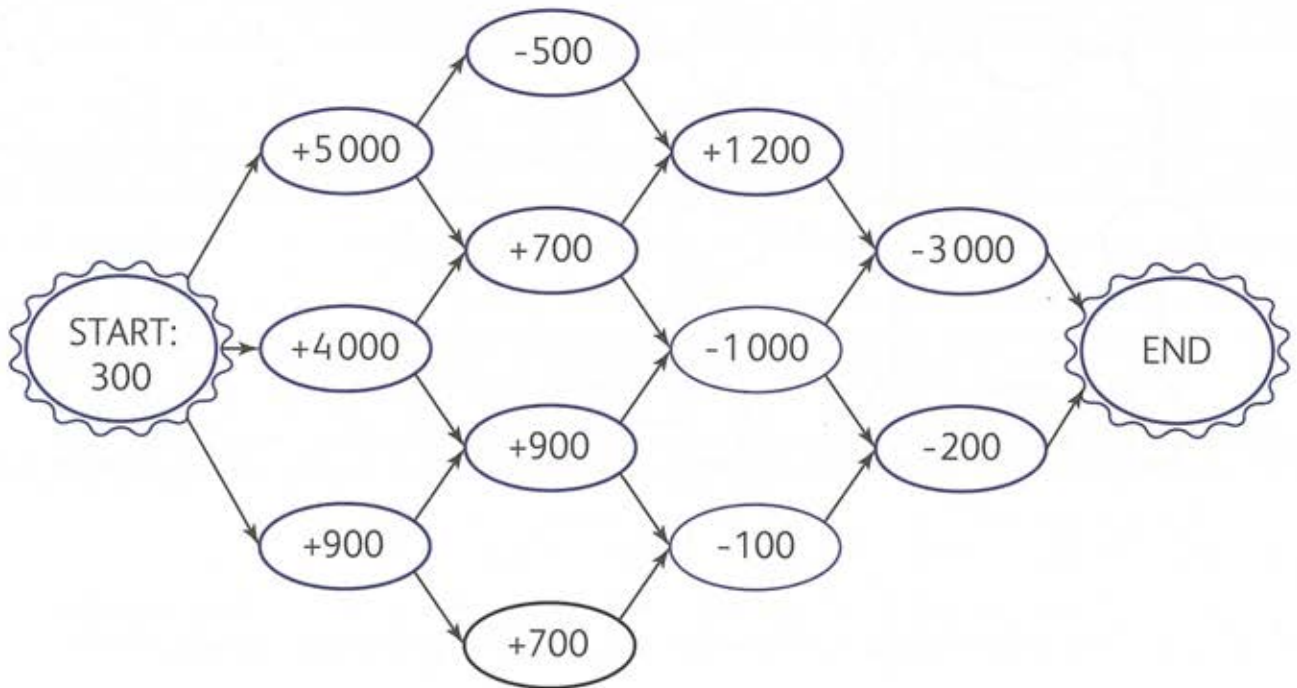
1 Write the route you followed.

Example:

Route for 1 000: 300 + 4 000 + 700 − 1 000 − 3 000 = 1 000

_____

2 Now find routes through the puzzle that give the totals shown.

 a Route for 2 000

   300 + 5000 + 700 − 1000 − 3000 = 2000

 b Route for 3 000

   300 + 5000 − 500 + 1200 − 3000 = 3000

 c Route for 4 000

   300 + 4000 + 900 − 1000 − 200 = 4000

 d Route with highest possible total

   300 + 4000 + 900 − 100 − 200 = 4900

 e Route with lowest possible total

   300 + 900 + 900 − 1000 − 200 = 900

(Student's Book pages 26–28)

More problems

1   Follow the flow diagram instructions.

| Think of a number | Double it | Add 30 | Halve the result | Subtract 10 |

Try this with 5 different starting numbers.

Numbers used: __3__   __12__   __27__   __6__   __1__

What did you notice?

The answer is 5 more than the number I thought of.

Try to explain the results.

When you double the number & add 30 & then halve it, you are effectively adding 15 to your original number. You then subtract 10 from that, effectively getting a number that is 5 more than your original number.

2   Follow the flow diagram instructions.

| Think of a number | Add your age in years | ×4 | Halve the result | Subtract twice the starting number | Divide by 2 |
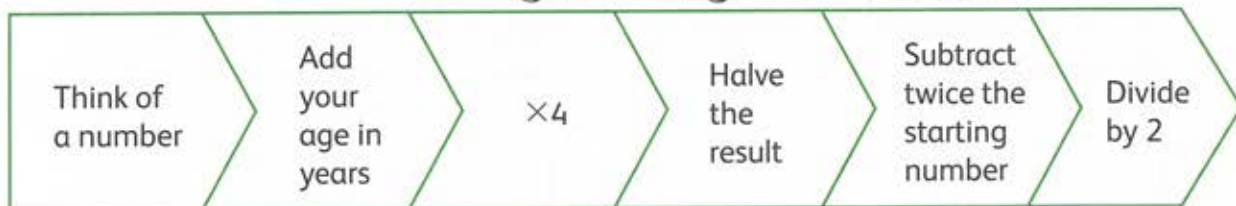
Try this with 5 different starting numbers.

Numbers used: __4__   __13__   __26__   __5__   __2__

What did you notice?

You end up with the same number.

Try to explain the results.

Number + age multiplied by 4 & halved is equal to twice your number & age. You then subtract twice your age, leaving you double the number. You then divide that by 2, bringing you back to your original number.

Angles

1 Use a protractor. Measure each angle in degrees. Fill in the measurements.

a

DÊF = _95°_

b

PQ̂R = _60°_

c

KL̂M = _165°_

d
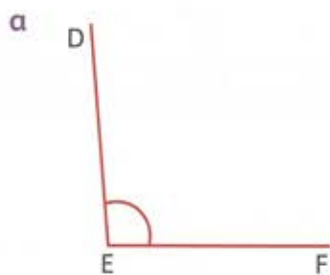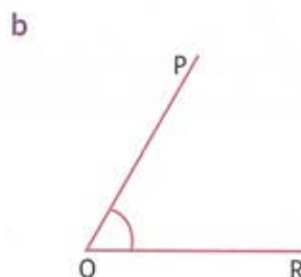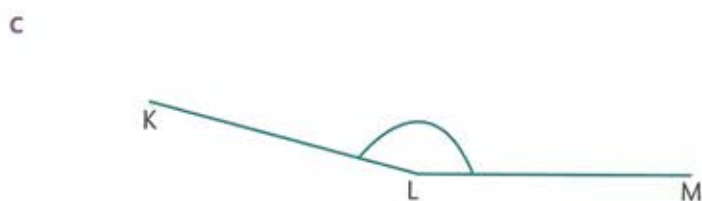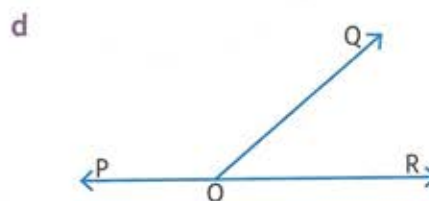
PÔQ = _140°_   QÔR = _40°_

2 Draw accurate sketches to show what type of angle you would get if you combined:

a Two right angles 90° +90° =180° Straight line	**b** Two acute angles, both smaller than 45° 20° 20° 40° Acute angle
c Two acute angles, both greater than 45° 56° 50° 100° Obtuse angle	**d** Three acute angles, all smaller than 60° 5° 20° 30° 55° Acute angle

(Student's Book pages 32–35)

Different types of lines

1 Use the right angle symbol (⌐) or the parallel lines arrows to mark all the parallel and perpendicular lines on this set of letters.

E F H K L

M N T W X

2 Use the same colour to draw a line that is parallel to each coloured line.
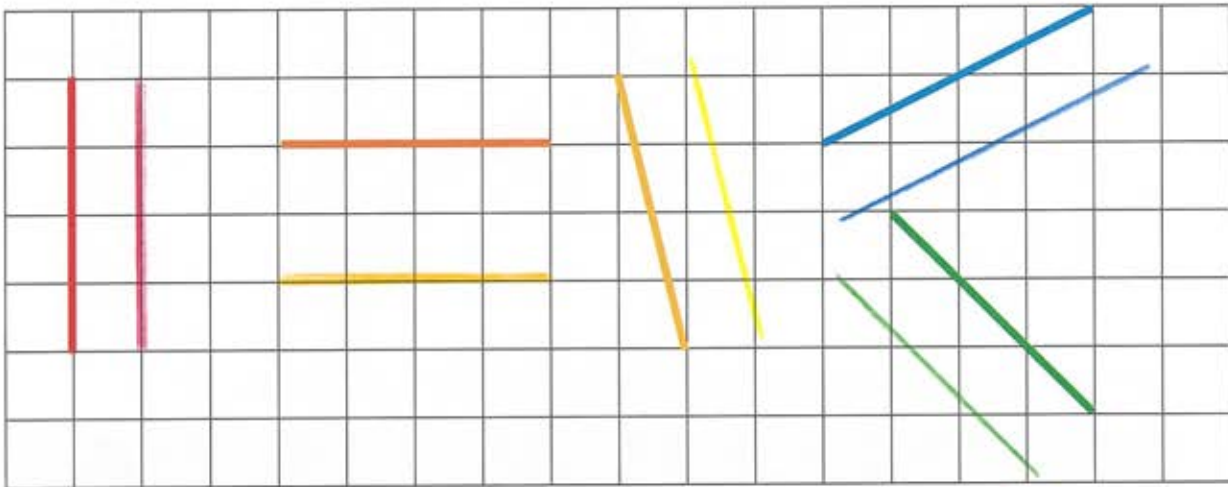
3 Draw a line that is perpendicular to each blue line at the point marked on the line.
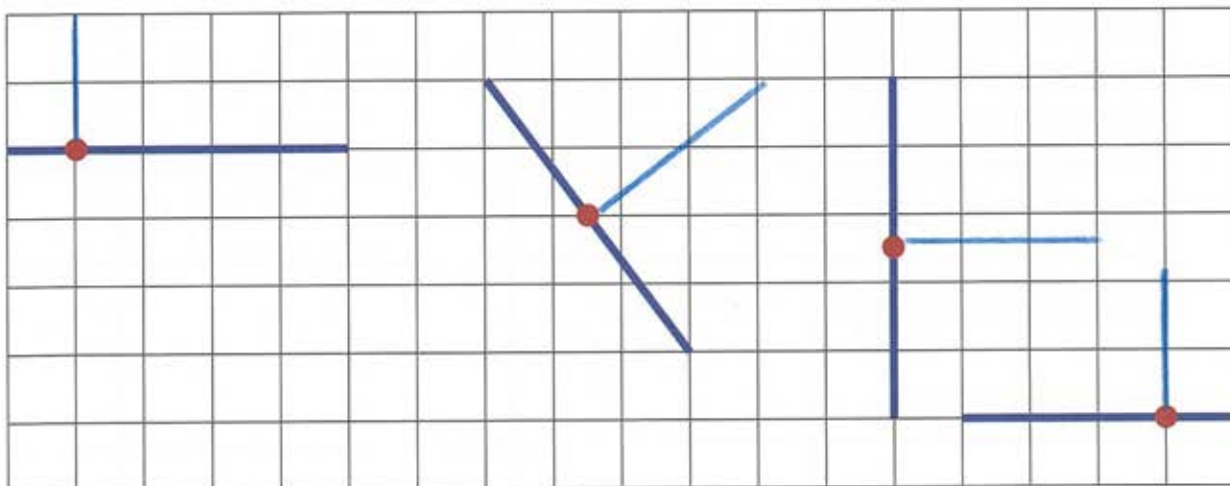
Shapes and their properties

1   Tick the shapes that are quadrilaterals.

Shade the squares green.

Shade the parallelograms blue.

Shade all other quadrilaterals red.

Write the name of each unshaded shape inside it.

a   ✓   b   c   ✓   d   ✓

e   f   g   h   ✓

i   j   k   ✓   l
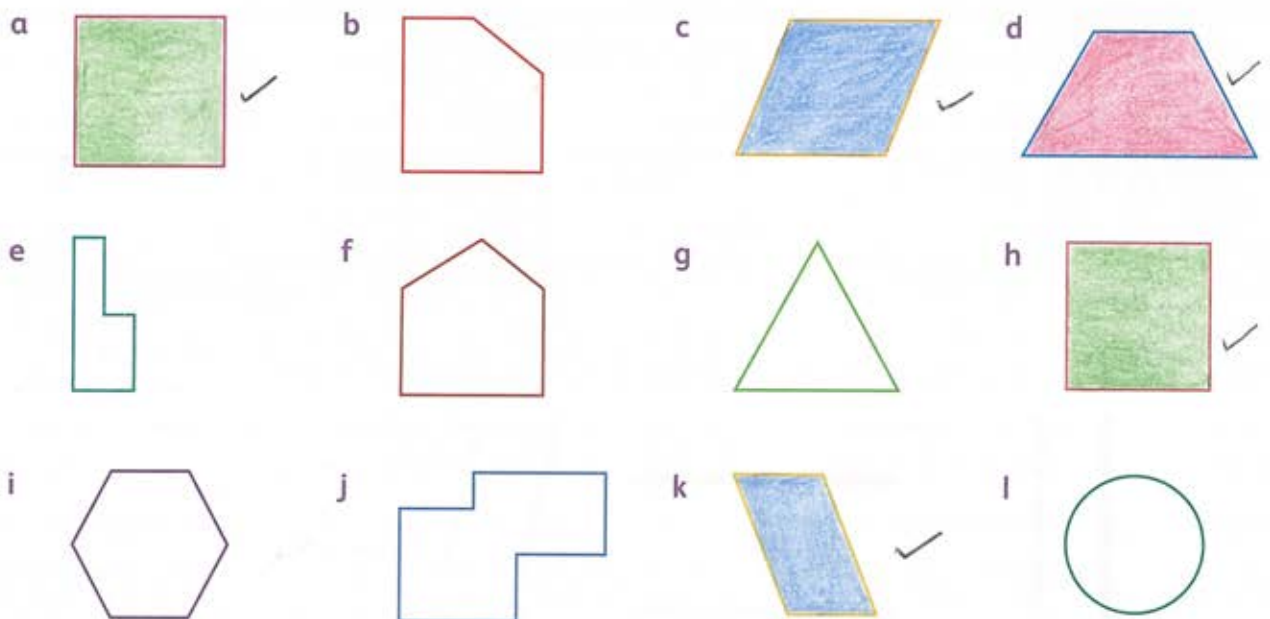
2   Complete this table by ticking all the properties that apply to each shape.

Property	Square	Rectangle	Parallelogram	Rhombus	Trapezium
All sides are equal	✓			✓	
Opposite sides are equal		✓	✓		
No sides are parallel					
Opposite sides are parallel	✓	✓	✓	✓	
One pair of sides is parallel					✓
All angles are equal	✓	✓			
Opposite angles are equal			✓	✓	

(Student's Book pages 36–39)

Classifying shapes

Decide how you could group these shapes using different properties of the shapes.
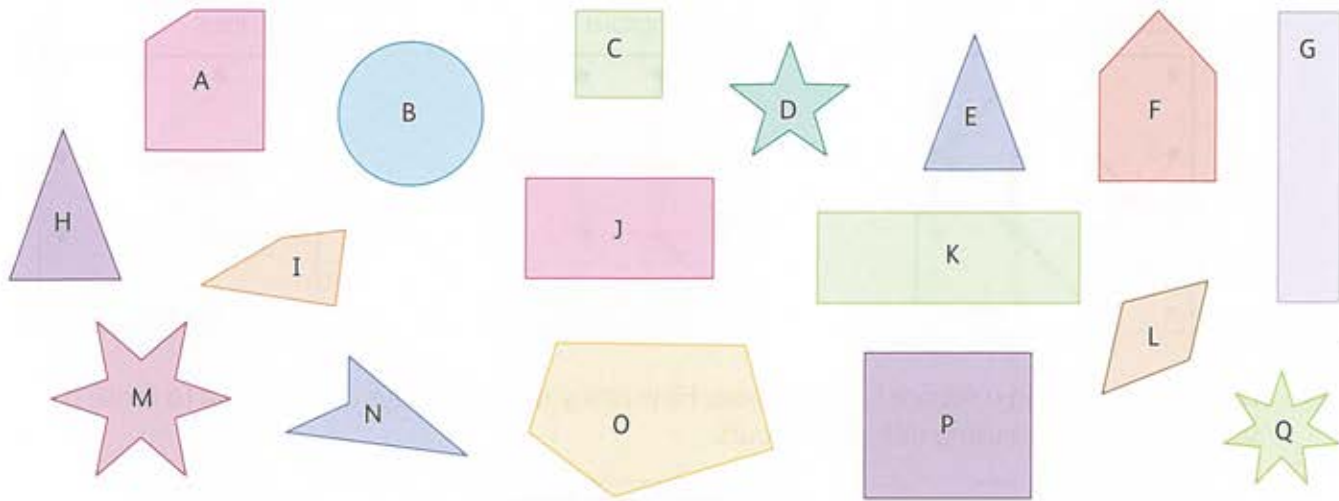
Use the table to show what groups you've made. Write the letters in the first column and write the properties shared by the shapes in the second column. You don't need to use all the rows and you can add more groups if you need to.

Shapes in the group	Properties shared by all shapes in the group
A , F, O	5 - sided shapes
B	No sides
C , G, I, J, K, L, N, P	4 - sided shapes
D	10 - sided shapes
E, H	3 - sided shapes
M	12 - sided shapes
Q	14 - sided shapes

Compare your groups with a partner's.

Drawing shapes

1   You can make shapes on a pegboard using elastic bands. Use different colours to show three different ways of making each shape on a pegboard. One shape has been drawn for you.
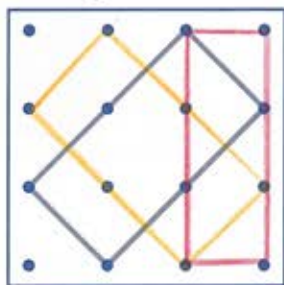
   a   Rectangle   **b**   Parallelogram   **c**   Rhombus
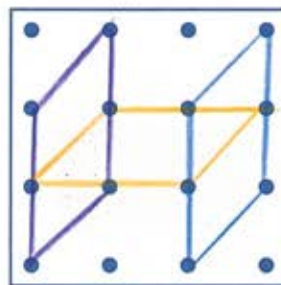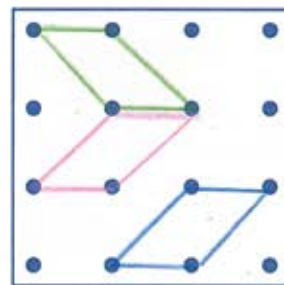
2   One way of making a square is shown here. How many different ways can you find to make a square? Draw them using different colours.
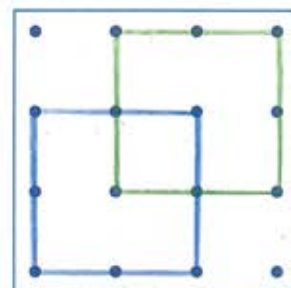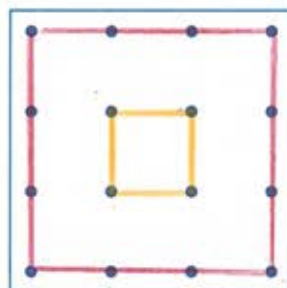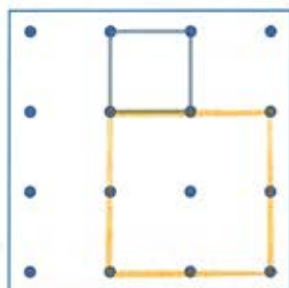
3   Draw six different polygons, each with at least two pairs of parallel sides. Write the name of each shape below it.

   a   **b**   **c**

   ___Square___   ___Rectangle___   ___Hexagon___

   d   **e**   **f**
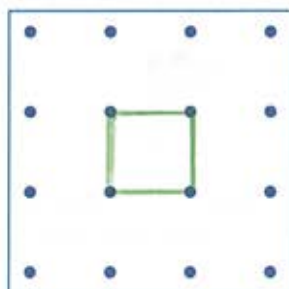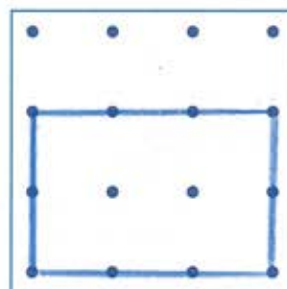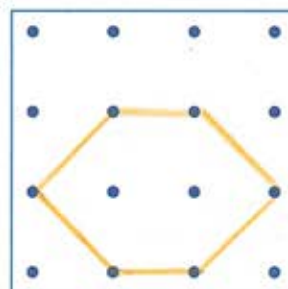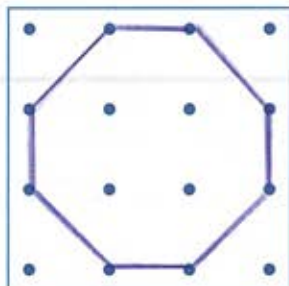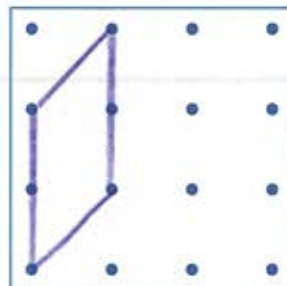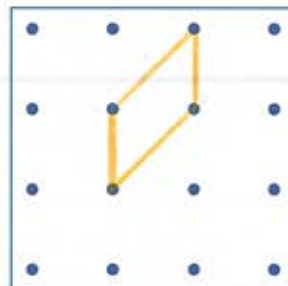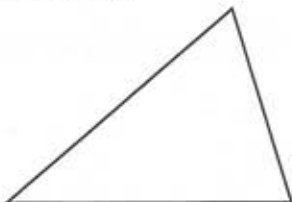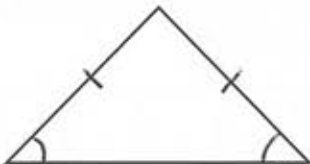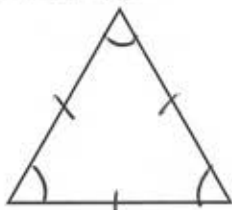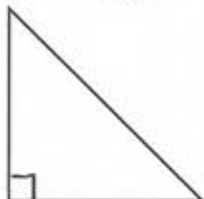
   ___Octagon___   ___Parallelogram___   ___Rhombus___

Triangles

1   Draw the correct markings on each triangle to show its properties.

a Scalene triangle	**b** Isosceles triangle
c Equilateral triangle	**d** Right-angled triangle

2   Use three different colours to show equilateral, isosceles and scalene triangles. Complete the key to show what colour you used for each type.
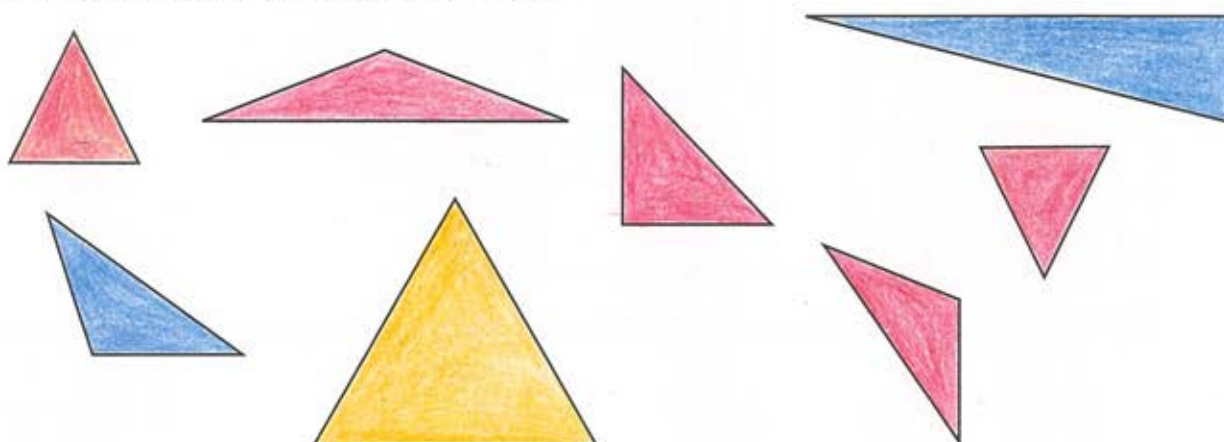
Key

☐ Equilateral   ☐ Isosceles   ☐ Scalene

3   Colour parts of each square to match the named triangle. You may need to colour more than one part.
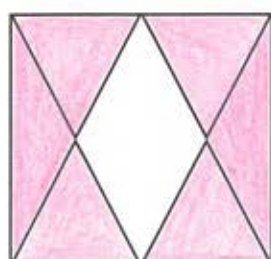
Right-angled triangle
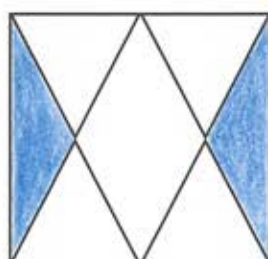
Obtuse-angled isosceles triangle

Acute-angled isosceles triangle

(Student's Book pages 40–41)

5 Number sense (2)
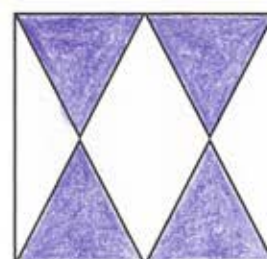
Equivalent fractions

1 This grid shows a fraction wall, but the labels have fallen off. Label each part to show what fraction it represents.
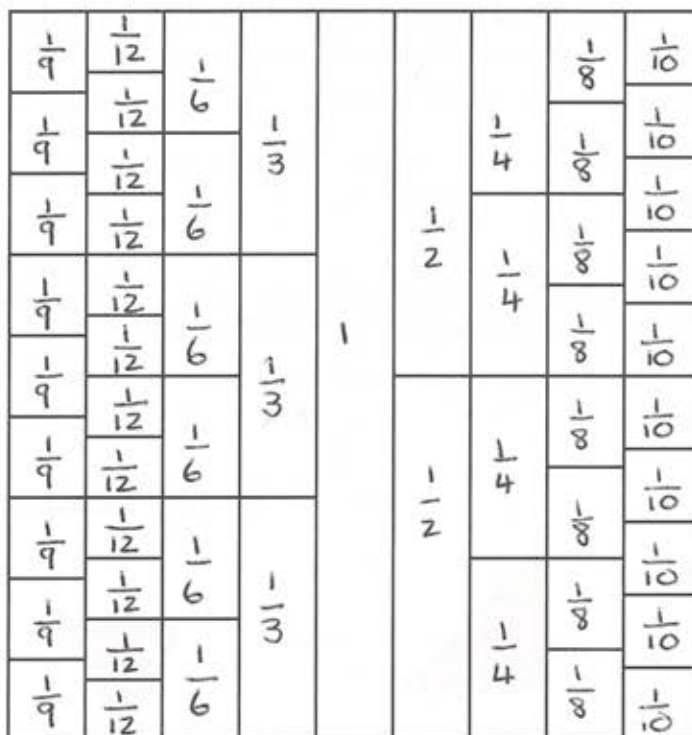
2 Use the fraction wall to find an equivalent fraction in simplest terms for each of these fractions.

a $\frac{2}{6} = \dfrac{1}{3}$

b $\frac{4}{6} = \dfrac{2}{3}$

c $\frac{6}{9} = \dfrac{2}{3}$

d $\frac{8}{12} = \dfrac{2}{3}$

e $\frac{9}{12} = \dfrac{3}{4}$

f $\frac{6}{8} = \dfrac{3}{4}$

g $\frac{5}{10} = \dfrac{1}{2}$

h $\frac{3}{12} = \dfrac{1}{4}$

3 Use the fraction wall to compare these fractions by filling in $<$ or $>$.

a $\frac{1}{2} \boxed{>} \frac{1}{3}$

b $\frac{2}{3} \boxed{>} \frac{6}{10}$

c $\frac{5}{12} \boxed{>} \frac{4}{10}$

d $\frac{3}{4} \boxed{<} \frac{8}{10}$

e $\frac{1}{5} \boxed{>} \frac{2}{12}$

f $\frac{7}{10} \boxed{>} \frac{2}{3}$

g $\frac{1}{4} \boxed{<} \frac{5}{12}$

h $\frac{4}{3} \boxed{>} \frac{2}{3}$

i $\frac{9}{12} \boxed{<} \frac{4}{5}$

j $\frac{3}{5} \boxed{<} \frac{2}{3}$

More equivalent fractions

1   Colour in a section of each grid. All your grids must be different.

    ✳   Write the fraction of the grid that is shaded with a denominator of 24.

    ✳   Write any simpler, equivalent fractions that you can.

    ✳   The first one has been done as an example.

a
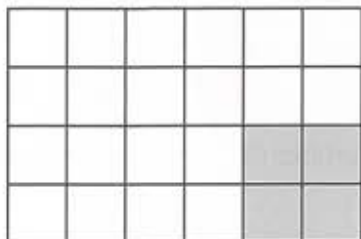
$$\frac{4}{24} = \frac{2}{12} = \frac{1}{6}$$

b
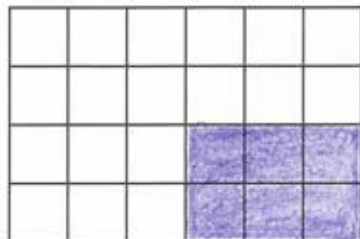
$$\frac{6}{24} = \frac{1}{4}$$

c

$$\frac{8}{24} = \frac{1}{3}$$

d

$$\frac{12}{24} = \frac{1}{2}$$

e

$$\frac{2}{24} = \frac{1}{12}$$

f

$$\frac{10}{24} = \frac{5}{12}$$

g

$$\frac{3}{24} = \frac{1}{8}$$

h

$$\frac{9}{24} = \frac{3}{8}$$

i

$$\frac{15}{24} = \frac{5}{8}$$
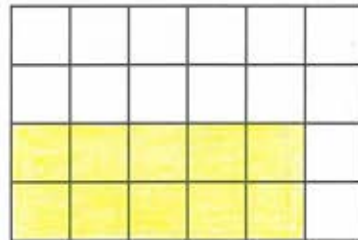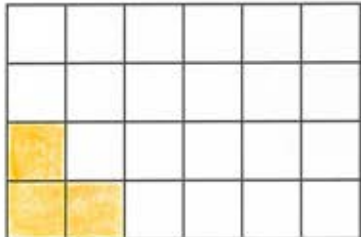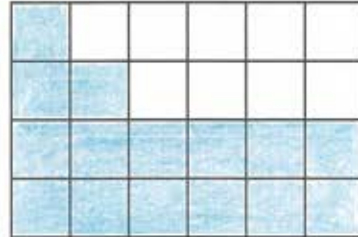
2   Circle the correct fraction (or fractions, if there is more than one match) in each set.

a $\frac{1}{8}$ is equivalent to:	$\boxed{\frac{2}{16}}$	$\frac{4}{36}$	$\frac{10}{8}$	$\frac{2}{24}$
b $\frac{2}{3}$ is equivalent to:	$\frac{1}{6}$	$\frac{2}{6}$	$\frac{9}{12}$	$\boxed{\frac{16}{24}}$
c $\frac{1}{10}$ is equivalent to:	$\boxed{\frac{10}{100}}$	$\frac{50}{100}$	$\frac{100}{100}$	$\frac{10}{1\,000}$
d $\frac{1}{5}$ is equivalent to:	$\frac{3}{25}$	$\boxed{\frac{6}{30}}$	$\boxed{\frac{10}{50}}$	$\frac{10}{15}$
e $\frac{4}{7}$ is equivalent to:	$\frac{7}{14}$	$\frac{3}{25}$	$\boxed{\frac{12}{21}}$	$\boxed{\frac{40}{70}}$

Revisit decimals

1 Use the key to colour the digit in each place value for these numbers.

thousands → **red**   hundreds → **orange**

tens → **yellow**   units → **green**

tenths → **blue**   hundredths → **purple**

a 7241.02   **b** 15.05   **c** 2020.8

d 237.70   **e** 6.2   **f** 2009.18

2 Use the grids to represent each number by shading the correct number of blocks. Then write the decimal equivalent below each diagram.

a $\frac{5}{10}$

_____0.5_____

b $\frac{10}{10}$

_____1.0_____

c $\frac{9}{100}$

_____0.09_____

d $\frac{47}{100}$
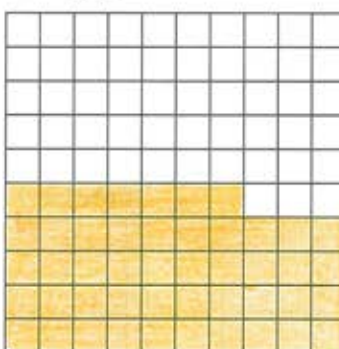
_____0.47_____

3 Round each decimal to the nearest whole number.

a 25.4 _____25_____   **b** 11.2 _____11_____   **c** 109.8 _____110_____

d 199.9 _____200_____   **e** 1 005.1 _____1005_____   **f** 45 400.5 _____45401_____

g 7.48 _____7_____   **h** 0.59 _____1_____   **i** 11.89 _____12_____

4 Round each decimal to one decimal place.

a 12.11 _____12.1_____   **b** 15.48 _____15.5_____   **c** 50.59 _____50.6_____

d 175.28 _____175.3_____   **e** 1 000.09 _____1000.1_____   **f** 23.91 _____24.0_____

g 95.01 _____95.0_____   **h** 79.28 _____79.3_____   **i** 31.62 _____31.6_____

(Student's Book pages 50–51)

Percentages

1 Shade the correct number of squares to show each percentage.

a 55%
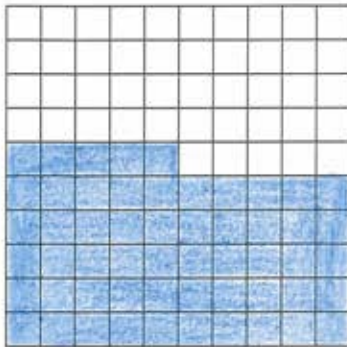
b 1%
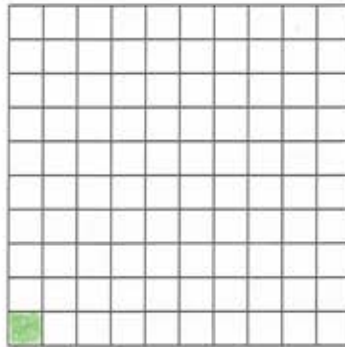
c 92%
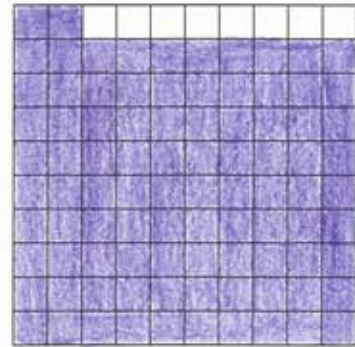
d 18.5%
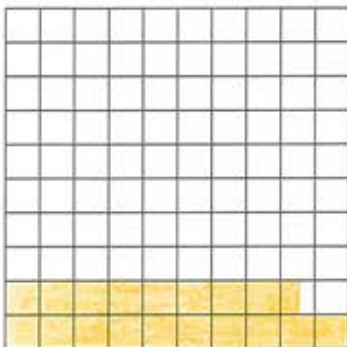
e 99.5%

f $12\frac{1}{4}$%
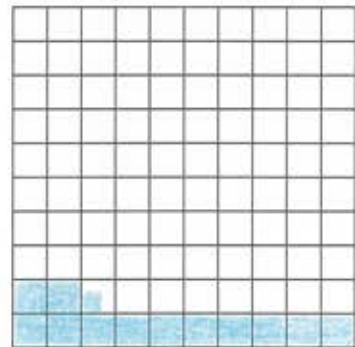
2 Complete the table by inserting equivalent values.

Percentage	Fraction	Decimal
6%	$\frac{6}{100}$	0.06
44%	$\frac{44}{100}$	0.44
95%	$\frac{19}{20}$	0.95
13%	$\frac{13}{100}$	0.13
155%	$1\frac{55}{100}$	1.55
8%	$\frac{8}{100}$	0.08
150%	$1\frac{5}{10}$	1.5
114%	$1\frac{14}{100}$	1.14

Fractions, decimals and percentages

1   Write each fraction as a percentage.

a $\frac{1}{4}$ _25%_   b $\frac{1}{10}$ _10%_   c $\frac{3}{10}$ _30%_

d $\frac{7}{20}$ _35%_   e $\frac{19}{25}$ _76%_   f $\frac{11}{20}$ _55%_

g $\frac{4}{5}$ _80%_   h $\frac{420}{1\,000}$ _42%_

2   Write each percentage as a fraction in its simplest form.

a   25%   _$\frac{1}{4}$_   b   10%   _$\frac{1}{10}$_   c   5%   _$\frac{1}{20}$_

d   12%   _$\frac{3}{25}$_   e   24%   _$\frac{6}{25}$_   f   60%   _$\frac{3}{5}$_

g   150%   _$1\frac{1}{2}$_   h   195%   _$1\frac{19}{20}$_   I   480%   _$4\frac{4}{5}$_

3   Convert these percentages to decimals.

a   10%   _0.1_   b   15%   _0.15_   c   119%   _1.19_

d   134%   _1.34_   e   4.5%   _0.045_   f   0.1%   _0.001_

4   Write each decimal as an equivalent percentage.

a   0.12   _12%_   b   1.42   _142%_   c   7.9   _790%_

d   0.05   _5%_   e   0.78   _78%_   f   112.2   _11 220%_

5   Jasmin has 40 fish. The table shows how many of each type of fish she has in her collection.

a   Work out what percentage of her collection each type of fish makes up.

Type of fish	Zebra danio	Goldies	Clownfish	Butterfly fish	Angelfish
Number	4	18	6	4	8
Percentage of whole collection	10%	45%	15%	10%	20%

b   Her cousin gives her 5 guppies and 5 more clownfish. Complete these sentences about her collection after the new fish are added.

i   She now has _50_ fish.

ii   Clownfish now make up _22_ % of her collection.

iii   _22.5_ % of the fish are either guppies or butterfly fish.

Ratios

1   Cross out the incorrect ratios in each set.

    a   1 : 5 is equivalent to: ~~5 : 1~~   ~~2 : 6~~   2 : 10

    b   3 : 8 is equivalent to: ~~5 : 16~~   9 : 24   ~~1 : 4~~

    c   9 : 10 is equivalent to: ~~9 : 1~~   ~~10 : 1~~   90 : 100

    d   1 : 4 is equivalent to: ~~4 : 1~~   ~~5 : 5~~   5 : 20

    e   11 : 12 is equivalent to: ~~1 : 2~~   33 : 36   ~~1 : 24~~

    f   3 : 7 is equivalent to: 12 : 28   ~~6 : 15~~   ~~1 : 21~~

2   Complete the table by writing each ratio in simplest (equivalent) form.

Ratio	Equivalent form
3 : 9	1 : 3
30 : 90	1 : 3
15 mm : 45 mm	1 mm : 3 mm
0.25 : 0.50	0.1 : 0.2
72 : 36	2 : 1
66 : 121	6 : 11
40% : 60%	2% : 3%
0.10 : 0.100	0.1 : 0.10

3   Complete these sentences.

    a   The ratio of concentrated juice to water in a jug is 1 : 8. For every one glass of concentrated juice, I added ___8___ glasses of water. Now I have enough juice to fill ___9___ glasses.

    b   Seymour spent five hours running and walking yesterday. The ratio of his running and walking was 4 : 1, so he spent ___4___ hours running and ___1___ hours walking.
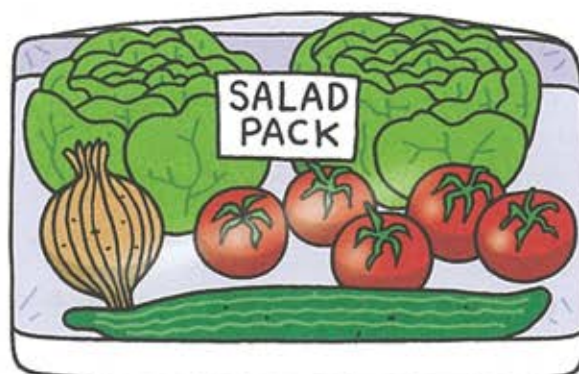
A supermarket is selling these value packs of vegetables.

1   Write these ratios for the soup pack.

    a   onion : potato   _1 : 3_

    b   potato : carrot   _3 : 2_

    c   carrot : celery   _2 : 1_

    d   onion : potato : carrot : celery   _1 : 3 : 2 : 1_

2   Kim buys a number of soup packs so that she gets 27 potatoes. How many does she have of the other vegetables?

    a   onions   _9_

    b   carrots   _18_

    c   sticks of celery   _9_

3   Write these ratios for the salad pack.

    a   lettuce : cucumber   _2 : 1_

    b   onion : lettuce   _1 : 2_

    c   cucumber : tomato   _1 : 5_

4   Dan buys a number of salad packs so that he has 40 tomatoes. How many does he have of the

    other vegetables? _8 cucumbers_   _8 onions_   _16 lettuces_

5   Calculate the amounts.

    a $100 shared in the ratio 3 : 7   _$30 : $70_

    b $180 shared in the ratio 7 : 2   _$140 : $40_

    c $150 shared in the ratio 2 : 1   _$100 : $50_

    d $144 shared in the ratio 11 : 1   _$132 : $12_

(Student's Book pages 54–56)

6 Read this recipe for pancakes and answer the questions that follow.

Ingredients

1 cup flour	2 eggs
1 cup milk	3 teaspoons of sugar
2 teaspoons of oil	

Method

Sift the flour into a bowl. Add the sugar. Then add the rest of the ingredients.

Use a whisk to beat the mixture until it is smooth with no lumps.

Grease a pan and heat it on the stove.

Pour a spoonful of mixture into the pan, and fry it for 2 minutes on each side.

Serve with lemon and sugar.

Makes 8 pancakes.

a Complete the table.

Number of pancakes	Cups of flour	Eggs	Milk	Teaspoons of sugar	Teaspoons of oil
16 pancakes	2	4	2 cups	6	4
32 pancakes	4	8	4 cups	12	8
80 pancakes	10	20	10 cups	30	20
400 pancakes	50	100	50 cups	150	100

b In the pancake recipe, what is the ratio of:

 i cups of flour : cups of milk?   _1 : 1_

 ii teaspoons of sugar : teaspoons of oil?   _3 : 2_

 iii eggs : cups of milk?   _2 : 1_

c Find a recipe of your own. Write down the ingredients. Then write down the ratios that you notice in your recipe.

Name of recipe: _____

Ingredients: _____

_____

Ratios in my recipe: _____

_____

_____

Computation (2)

Adding and subtracting fractions

1 These diagrams show the distances four cyclists have cycled. Write a calculation and work out the total distance each cyclist cycled.

a

$\frac{7}{8}$ km

$\frac{9}{10}$ km

$1\frac{1}{2}$ km

$\frac{7}{8} + \frac{9}{10} + 1\frac{1}{2} = 3\frac{11}{40}$ km

b

$\frac{9}{10}$ km

$\frac{7}{8}$ km

$1\frac{1}{2}$ km $\frac{4}{5}$ km

$3\frac{11}{40} + \frac{4}{5} = 4\frac{3}{40}$ km

c

$\frac{1}{2}$ km $2\frac{1}{4}$ km

$\frac{4}{5}$ km

$\frac{2}{5}$ km $\frac{9}{10}$ km
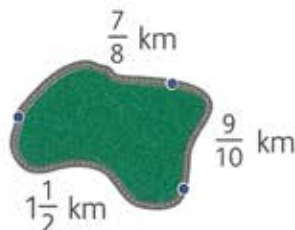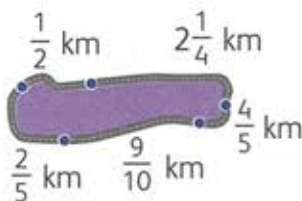
$\frac{1}{2} + 2\frac{1}{4} + \frac{4}{5} + \frac{9}{10} + \frac{2}{5} = 4\frac{17}{20}$ km

d

$1\frac{1}{4}$ km $\frac{9}{10}$ km

$1\frac{2}{5}$ km $\frac{3}{8}$ km
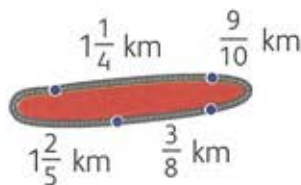
$1\frac{1}{4} + \frac{9}{10} + 1\frac{2}{5} + \frac{3}{8} = 3\frac{37}{40}$ km

2 The total distance and the distance four cyclists have already cycled on four different routes are shown. Work out how much further each cyclist has to go to complete their route.

a

$\frac{9}{10}$ km

Total distance: $1\frac{1}{2}$ km   ?

$1\frac{1}{2} - \frac{9}{10} = \frac{3}{5}$ km

b

?   Total distance: $2\frac{1}{4}$ km

$\frac{3}{8}$ km $\frac{7}{8}$ km

$2\frac{1}{4} - \left(\frac{3}{8} + \frac{7}{8} \right) = \frac{8}{8} = 1$ km

c

$\frac{1}{6}$ km $\frac{5}{8}$ km $\frac{1}{3}$ km

Total distance: $1\frac{7}{24}$ km

?

$1\frac{7}{24} - \left(\frac{1}{6} + \frac{5}{8} + \frac{1}{3} \right) = \frac{1}{6}$ km

d

?   Total distance: 3 km $\frac{1}{2}$ km

$\frac{5}{6}$ km $\frac{3}{8}$ km
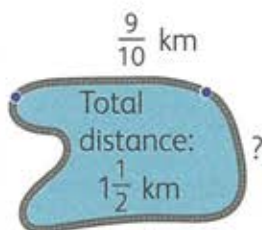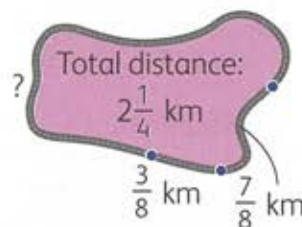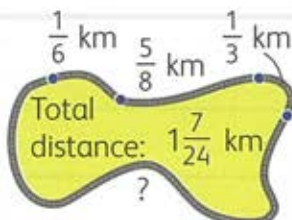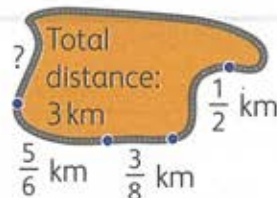
$3 - \left(\frac{1}{2} + \frac{3}{8} + \frac{5}{6} \right) = 1\frac{7}{24}$ km

Multiply fractions

1 Complete the grid.

×	$\frac{2}{3}$	$\frac{1}{2}$	$\frac{5}{6}$	$\frac{7}{3}$	$1\frac{1}{2}$	$\frac{9}{8}$	$\frac{4}{9}$
$\frac{1}{4}$	$\frac{1}{6}$	$\frac{1}{8}$	$\frac{5}{24}$	$\frac{7}{12}$	$\frac{3}{8}$	$\frac{9}{32}$	$\frac{1}{9}$
$\frac{3}{7}$	$\frac{2}{7}$	$\frac{3}{14}$	$\frac{5}{14}$	1	$\frac{9}{14}$	$\frac{36}{56}$	$\frac{4}{21}$
$\frac{2}{9}$	$\frac{4}{27}$	$\frac{1}{9}$	$\frac{5}{27}$	$\frac{14}{27}$	$\frac{1}{3}$	$\frac{1}{4}$	$\frac{8}{81}$
$1\frac{1}{3}$	$\frac{8}{9}$	$\frac{2}{3}$	$\frac{10}{9}$	$\frac{28}{9}$	2	$\frac{3}{4}$	$\frac{16}{27}$
$\frac{3}{11}$	$\frac{2}{11}$	$\frac{3}{22}$	$\frac{5}{22}$	$\frac{7}{11}$	$\frac{9}{22}$	$\frac{27}{88}$	$\frac{4}{33}$
$\frac{9}{11}$	$\frac{6}{11}$	$\frac{9}{22}$	$\frac{15}{22}$	$\frac{21}{11}$	$\frac{27}{22}$	$\frac{81}{88}$	$\frac{4}{11}$
$\frac{7}{12}$	$\frac{14}{36}$	$\frac{7}{14}$	$\frac{35}{72}$	$\frac{49}{36}$	$\frac{7}{8}$	$\frac{21}{32}$	$\frac{7}{27}$
$\frac{3}{20}$	$\frac{1}{10}$	$\frac{3}{40}$	$\frac{1}{8}$	$\frac{7}{20}$	$\frac{9}{40}$	$\frac{27}{160}$	$\frac{1}{15}$

2 Work out these amounts.

a $\frac{1}{2}$ of 20 minutes ___10 minutes___

b $\frac{1}{10}$ of 4 metres ___0.4 metres___

c $\frac{1}{4}$ of 2 litres ___0.5 litres___

d $\frac{9}{10}$ of $30.00 ___$ 27.00___

e $\frac{3}{8}$ of $40.00 ___$ 15.00___

f $\frac{1}{2}$ of 28 kg ___14 kg___

g $\frac{1}{20}$ of 4 000 m ___200 m___

h $\frac{2}{3}$ of $90.00 ___$ 60.00___

(Student's Book pages 62–63)

Divide with fractions

1 Explain how you find the reciprocal of

a a whole number:

You write the whole number as a fraction over one & then invert it.

b a proper fraction:

Swap the numerator & denominator around.

2 Find the reciprocal of each number.

a 20 $\frac{1}{20}$ b 100 $\frac{1}{100}$

c 4 $\frac{1}{4}$ d 9 $\frac{1}{9}$

e $\frac{3}{4}$ $\frac{4}{3}$ f $\frac{1}{2}$ $\frac{2}{1}$

g $\frac{6}{7}$ $\frac{7}{6}$ h $\frac{3}{5}$ $\frac{5}{3}$

i $\frac{11}{12}$ $\frac{12}{11}$ j $\frac{12}{13}$ $\frac{13}{12}$

3 Calculate.

a $\frac{3}{4} \div 4 =$ $\frac{3}{8}$ b $\frac{5}{6} \div 10 =$ $\frac{1}{12}$

c $\frac{3}{7} \div 6 =$ $\frac{1}{14}$ d $\frac{1}{5} \div \frac{2}{7} =$ $\frac{7}{10}$

e $\frac{2}{9} \div \frac{1}{4} =$ $\frac{8}{9}$ f $\frac{2}{3} \div \frac{2}{9} =$ 3

g $1\frac{1}{4} \div 3 =$ $\frac{5}{12}$ h $2\frac{1}{3} \div 6 =$ $\frac{7}{18}$

i $9\frac{1}{2} \div \frac{1}{4} =$ 38 j $2\frac{1}{2} \div 5 =$ $\frac{1}{2}$

4 Use division to help you solve these word problems.

a It cost $25.50 to buy 6 metres of fabric. What is the cost per metre? $4.25

b James buys 21 metres of fabric. He uses $\frac{3}{4}$ of the fabric to sew a shirt. How many shirts can he make? 1.33

c Celia buys $12\frac{1}{2}$ litres of soda. She shares it among 8 children. How much soda does each one get? Express your answer as a mixed number, in litres. $1\frac{9}{16}$ ℓ

Timed practice

Try to do each set of calculations mentally. Write the answers only. Record your time and your score.

Set A	Set B	Set C
0.2 + 0.6 = _0.8_	1 − 0.2 = _0.8_	0.8 + 0.8 = _1.6_
0.8 + 0.1 = _0.9_	1 − 0.8 = _0.2_	0.9 − 0.3 = _0.6_
0.3 + 0.6 = _0.9_	2 − 1.5 = _0.5_	1.2 − 0.4 = _0.8_
0.9 + 0.1 = _1.0_	0.9 − 0.2 = _0.7_	1.4 + 2.4 = _3.8_
0.5 + 0.6 = _1.1_	0.8 − 0.7 = _0.1_	2 − 0.5 = _1.5_
1.2 + 1.2 = _2.4_	4.5 − 2.3 = _2.2_	3.5 − 2.7 = _0.8_
2.4 + 4.5 = _6.9_	1.2 − 0.8 = _0.4_	2.3 + 4.8 = _7.1_
0.8 + 1.2 = _2.0_	1.9 − 0.6 = _1.3_	5 − 3.7 = _1.3_
1.3 + 1.5 = _2.8_	2.3 − 2.1 = _0.2_	1 − 0.8 = _0.2_
1.2 + 1.1 = _2.3_	1.8 − 0.9 = _0.9_	7.2 + 6.2 = _13.4_
4 + 0.9 = _4.9_	2.3 − 1.9 = _0.4_	2.4 − 0.6 = _1.8_
2.3 + 0.1 = _2.4_	0.9 − 0.9 = _0_	3.9 − 0.8 = _3.1_
2.8 + 0.5 = _3.3_	1.2 − 0.5 = _0.7_	4 + 2.7 = _6.7_
3.1 + 2.5 = _5.6_	4.5 − 0.8 = _3.7_	3 − 2.7 = _1.7_
8 + 0.8 = _8.8_	3.1 − 0.5 = _2.6_	1.25 + 1.5 = _2.75_
0.9 + 0.7 = _1.6_	2 − 1.2 = _0.8_	2.55 − 1.2 = _1.35_
2.9 + 2.8 = _5.7_	3 − 1.5 = _1.5_	0.99 − 0.55 = _0.44_
3.1 + 4.5 = _7.6_	9.2 − 0.7 = _8.5_	1.25 + 0.5 = _1.3_
1.1 + 3.9 = _5.0_	7.8 − 3.4 = _4.4_	2.45 − 0.4 = _2.05_
2.7 + 3.3 = _6.0_	3.9 − 0.6 = _3.3_	3.2 − 0.8 = _2.4_
Time:	Time:	Time:
Score: [/20]	Score: [/20]	Score: [/20]

(Student's Book pages 66–67)

More addition

For each shape, write a calculation and work out the perimeter. All distances are in metres.

1
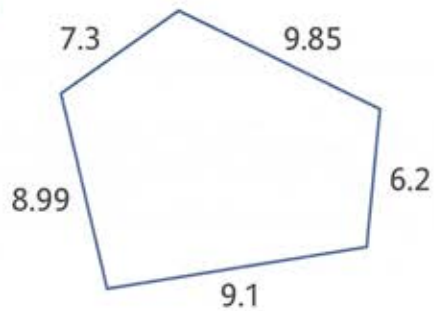
7.3 + 9.85 + 6.2 + 9.1 + 8.99

= 41.44 m

2
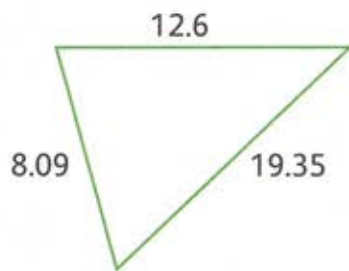
12.6 + 19.35 + 8.09

= 40.04 m

3
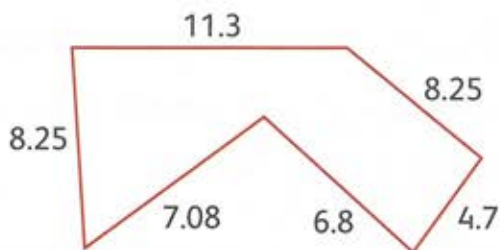
11.3 + 8.25 + 4.7 + 6.8 + 7.08 + 8.25

= 46.38 m

4
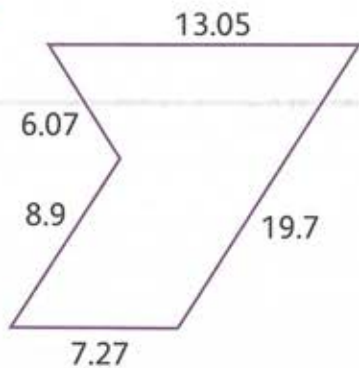
13.05 + 19.7 + 7.27 + 8.9 + 6.07

= 54.99 m

36

Powers of 10

1 Fill in the operation symbol × or ÷ and the power of 10 used to get from one number to the next in each chain.

a

| 0.4 | ×10 | 4 | ×10 | 40 | ÷1000 | 0.04 | ×10 | 0.4 | ×1000 | 400 |

b

| 1.7 | ×1000 | 1 700 | ÷10 000 | 0.17 | ÷10 | 0.017 | ×1000 | 17 | ÷10 | 1.7 |

c

| 67 | ÷10 | 6.7 | ÷10 | 0.67 | ×1000 | 670 | ÷10 000 | 0.067 | ×100 | 6.7 |

2 Fill in the missing numbers in each chain.

a

| 0.8 | ×10 | 8 | ×10 | 80 | ÷1 000 | 0.08 | ×10 | 0.8 | ÷100 | 0.008 |

b

| 120 | ÷1 000 | 0.12 | ×10 | 1.2 | ×100 | 120 | ÷10 | 12 | ×100 | 1200 |

c

| 0.002 | ×10 | 0.02 | ×100 | 2 | ÷10 | 0.2 | ×100 | 20 |

d

| 6.5 | ×100 | 650 | ÷10 | 65 | ×10 | 650 | ÷100 | 6.5 |
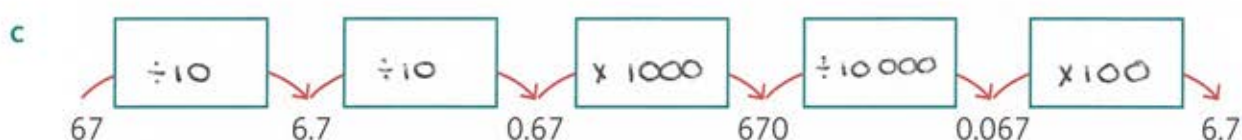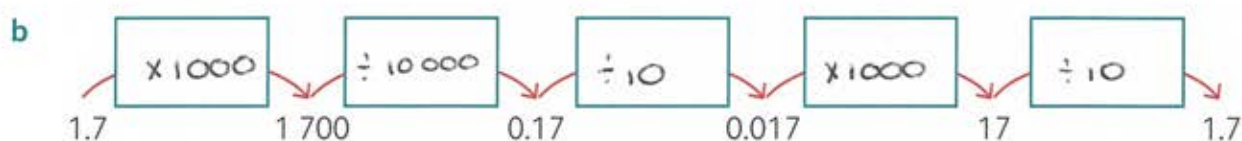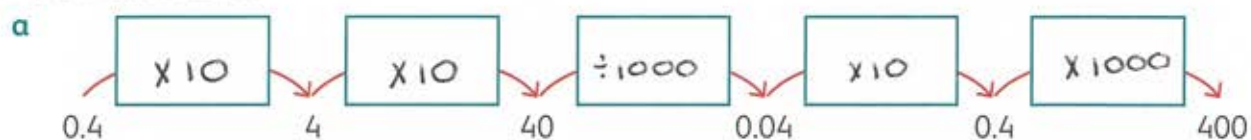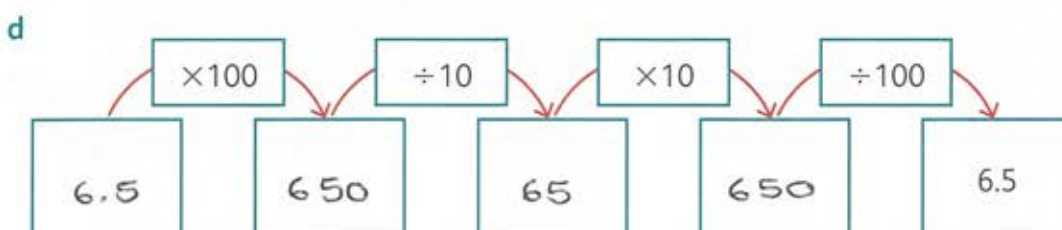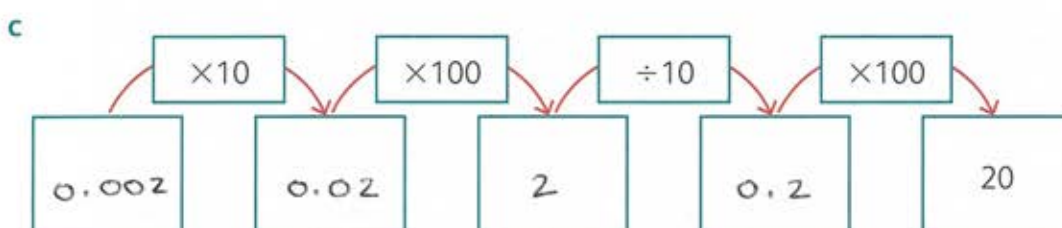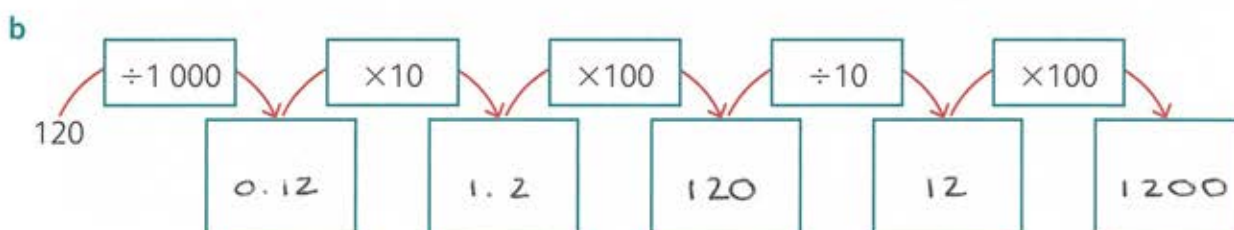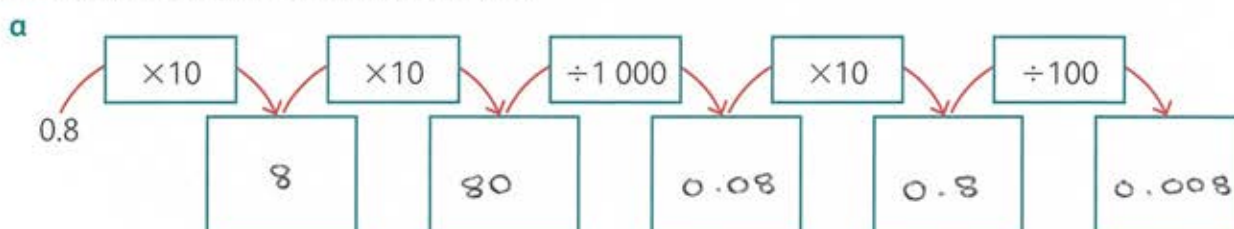
More multiplication

1   Two digits have been accidentally erased in each calculation. Work out what they are and write
    them in the correct place.

   a   2. **5** × 8 = **2** 0   b   12. **0** × 10 = 12 **0**

   c   7. **6** × 3 = 2 **2** .8   d   4. **2** × 9 = 3 **7** .8

   e   3. **6** × 9 = 32. **4**   f   9.2 × **5** = 4 **6**

   g   **9** .6 × 6 = 5 **7** .6   h   0. **6** × 8 = 4. **8**

   i   4.5 × **7** = 31. **5**   j   7. **6** × 6 = 4 **5** .6

   k   5.7 × **6** = 3 **4** .2   l   9. **6** × 3 = 28. **8**

2   Which set of bags is heavier? Circle it.

   (Set A) = 14 kg

   3.5 kg   3.5 kg

   3.5 kg   3.5 kg
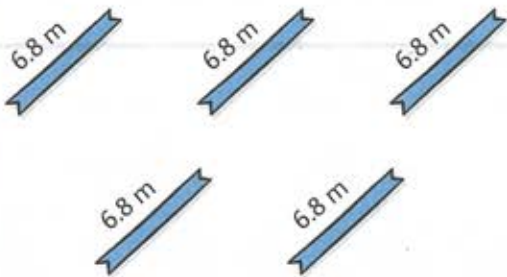
   Set B = 12.3 kg

   4.1 kg

   4.1 kg   4.1 kg
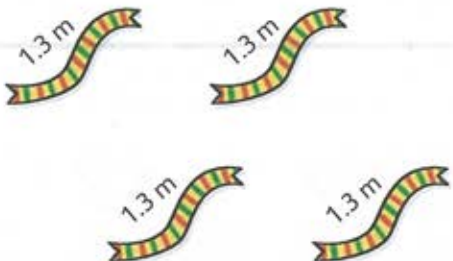
3   Which set of ribbons will make the longer total length? Circle it.

   (Set A) = 34 m

   6.8 m   6.8 m   6.8 m

   6.8 m   6.8 m

   Set B = 5.2 m

   1.3 m   1.3 m

   1.3 m   1.3 m

Divide decimals

1 Divide. Show your working on the grid.

a
```
        1  0  .  3
  6 ) 6  1  .  8
    - 6
        1  8
      - 1  8
           0
```

b
```
        1  7  .  4
  3 ) 5  2  .  2
    - 3
       2  2
     - 2  1
          1  2
```

c
```
        1  2  .  3
  4 ) 4  9  .  2
    - 4
        . 9
      -  8
         1  2
```

d
```
        1  5  .  6
  6 ) 9  3  .  6
    - 6
       3  3
     - 3  0
          3  6
```

e
```
         7  .  9
  8 ) 6  3  .  2
    - 5  6
        7  2
```

f
```
        3  .  0  6
  6 ) 1  8  .  3  6
    - 1  8
         .     3  6
```

2 Each roll of rope needs to be divided equally into a number of equal pieces as shown. Work out the length of the pieces.
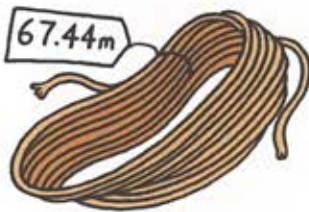
67.44m

7.74m

60.2m

a 6 pieces

$$67.44 \div 6$$
$$= 11.24\,m$$
each

b 9 pieces

$$7.74 \div 9 =$$
$$0.86\,m \text{ each}$$
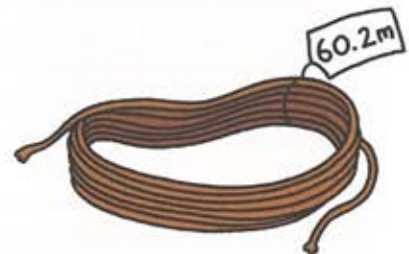
c 7 pieces

$$60.2 \div 7 =$$
$$8.6\,m \text{ each}$$

Measuring systems

1   Complete the table.

Unit of measurement	Abbreviation	Used to measure ... (give an example)
Millimetre	mm	Length of a small insect
Metre	m	Height of a door
Kilometre	km	Distance from home to shop
Milligram	mg	Salt for cake
Gram	g	Sugar for cake
Kilogram	kg	Flour for bread
Millilitre	ml	Milk to make sauce
Litre	l	Juice in jug
Kilolitre	kl	Petrol in container

2   Work in pairs to complete this table. You will need to do some measuring as part of the task.

Quantity	Instrument I would use	Units	Estimate	Accurate measurement
The width of the classroom		m		
The height of my teacher		m		
The length of my pen		cm		
The distance from the door to the gate		m		
The mass of a book		g		
The mass of a calculator		mg		
The mass of a litre of water		g		
The amount of water a bucket can hold		l		
The amount of coffee in a mug		ml		

(Student's Book pages 76–80)

3 Convert these measurements to the units shown.

a 3.5 kg = <u>3500</u> g   b 250 g = <u>0.25</u> kg   c <u>300</u> g = 0.3 kg

d 0.05 g = <u>0.00005</u> kg   e <u>12000</u> ml = 12 l   f 5 600 ml = <u>5.6</u> l

g 0.125 l = <u>125</u> ml   h 2.5 l = <u>2500</u> ml   i 0.5 km = <u>500</u> m

j 7 500 m = <u>7.5</u> km   k 65 mm = <u>6.5</u> cm   l <u>470</u> cm = 4.7 m

4 Look at the quantities in this recipe. Use the conversion table to answer the questions. You can use a calculator to help you.

Ingredients for pancakes
4 oz flour
10 fl oz milk
2 oz butter
a pinch of salt

Customary units	Metric units
1 ounce (oz)	28.35 grams
1 fluid ounce (fl oz)	29.57 millilitres

Underline the best answer.

a How much flour will you need? Approximately:

   i <u>113 grams</u>   ii 400 grams   iii 313 grams

b How much milk will you need? Approximately:

   i <u>300 ml</u>   ii 30 l   iii 30 ml

c Will you need:

   i more than 100 g of butter?   ii <u>less than 100 g of butter?</u>

d How much is a 'pinch of salt'?

   i <u>less than one gram</u>   ii more than one gram   iii about one kg

5 Rewrite the recipe using metric measurements. Be sensible and round the numbers where necessary.

Ingredients for pancakes

<u> 113 g </u> flour

<u> 296 ml </u> milk

<u> 57 g </u> butter

<u> 1 pinch </u> salt
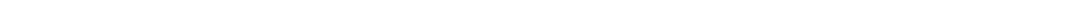
Scale and distance

1 Complete the statements.

   a If the scale is 1 : 100, then 1 cm on the map = __1m__ in reality.

   b If the scale is 1 : 1 000, then 1 cm on the map = __10m__ in reality.

   c If the scale is 1 : 1 000, then 1 mm on the map = __1m__ in reality.

   d If the scale is 1 : 10 000, then 1 cm on the map = __100m__ in reality.

2 Mario is doing a scale drawing with a scale of 1 : 100.

   Draw a line next to each measurement to show accurately what length each of these real distances have to be on his diagram.

   a 100 cm ⊢——⌐

   b 750 cm ⊢————————————————⌐

   c 4.5 m ⌐——————————⌐

   d 15 m ⌐———————————————————————⌐

   e 10.2 m ⌐———————————————⌐

3 Measure the length of each line segment. Complete the table.

Scale 1 : 500
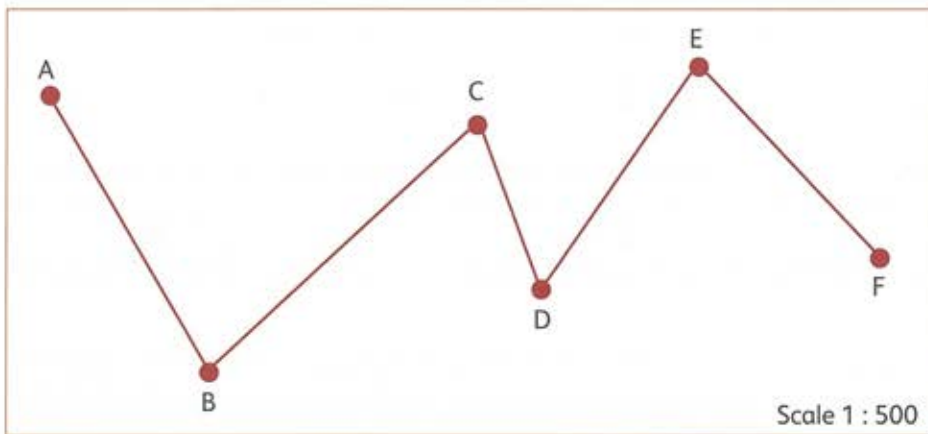
	A to B	B to C	C to D	D to E	E to F
Distance on diagram	4 cm	4.5 cm	2 cm	3.4 cm	3.3 cm
Distance in reality	20 m	22.5 m	10 m	17 m	16.5 m

(Student's Book pages 81–84)

Working with scale

1   This simple map shows the route a bus driver travelled.
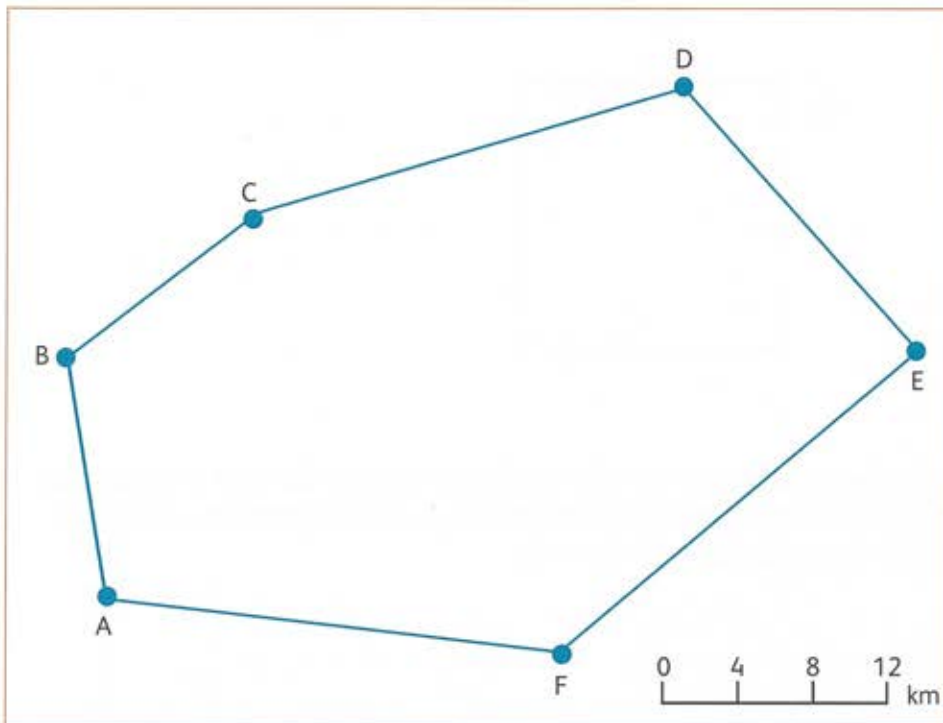
Measure the distances on the map and complete this table for his route.

Route	Distance on map	Distance in real life
A to B	3 cm	12 km
B to C	2.8 cm	11.2 km
C to D	5.8 cm	23.2 km
D to E	4.5 cm	18 km
E to F	5.9 cm	23.6 km
F to A	5.8 cm	23.2 km
Whole route	27.8 cm	111.2 km

2   If the driver does this route eight times a day, what distance (in kilometres) does he cover in real life? Show how you work out your answer.

111.2 km × 8 = 889.6 km

Scale drawings

1   Use a scale of 1 cm = 10 m. Draw these shapes to scale on the grid.

    a   A rectangle with length = 25 m and width = 15 m   **b**   A square with sides = 35 m

a)

b)
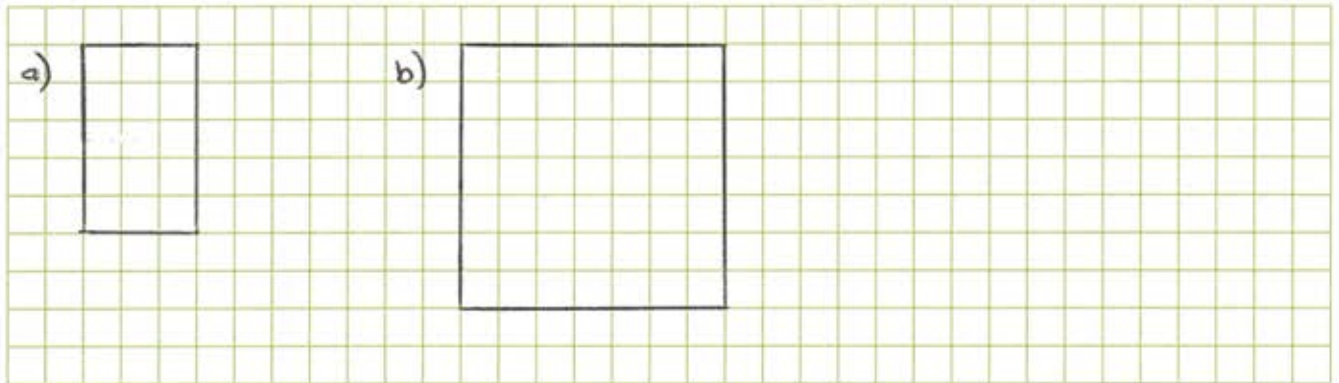
2   Pick one room in your home. Draw a map of the room to scale on the grid. Measure the room and the larger items in the room. Once you have made your measurements, decide on a suitable scale. Remember to include your scale on the map.

(Student's Book pages 81–84)

Data handling (1)
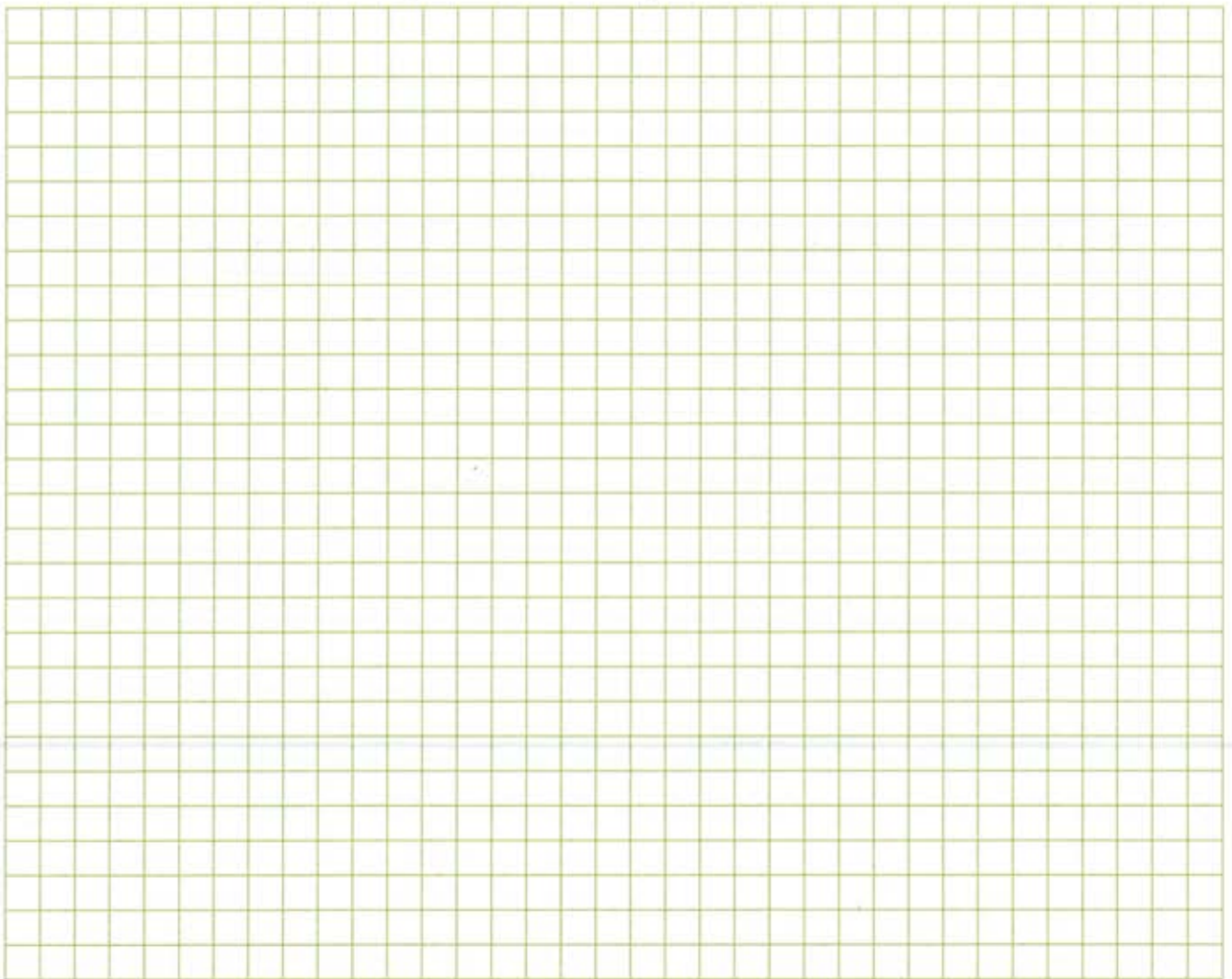
Collect and organise data

1 Look at the tables and write down what data you would need to enable you to complete each table for the students in your class.

Table A

Right-handed	
Left-handed	

Ask who is right- or left-handed.

Table B

	Girls	Boys
Right-handed		
Left-handed		

Ask girls & boys seperately who is right- or left-handed.

Table C

	Girls	Boys
Right-handed		
Left-handed		
Mixed (uses right for some things, left for others)		

Ask girls & boys separately who is right- or left-handed or who uses both hands.

2 How could you collect the data for all three tables at the same time? Write down the steps you would follow.

Complete table C & use that information to complete tables A & B by adding the amounts together to fit the columns & rows.

3 Collect the data in your class and complete the tables. You can use tallies or numbers to complete them.

Averages

1   These are the ages of the patients a doctor sees in the morning over the course of a week.

Day	Ages of patients seen
Monday	78, 87, 63, 27, 89, 68
Tuesday	72, 12, 61, 67, 37, 72
Wednesday	80, 79, 78, 65, 50, 47
Thursday	65, 62, 72, 19, 69, 71
Friday	72, 88, 53, 59, 71, 80

Complete these sentences.

a   The youngest patient was __12__ years old.

b   The oldest patient was __89__ years old.

c   That means the range was __89__ to __12__.

d   Calculate the mean age for each day's patients. Show your working. Round off your answer to the nearest whole number.

Monday	Tuesday	Wednesday	Thursday	Friday
78 87 63 27 89 + 68 ――――― 412 ÷ 6= 68 r 4 = 68	72 12 61 67 37 + 72 ――――― 321 ÷ 6= 53 r 3 = 53	80 79 78 65 50 + 47 ――――― 399 ÷ 6 = 66 r 3 = 66	65 62 72 19 69 + 71 ――――― 358 ÷ 6 = 59 r 4 = 59	72 88 53 59 71 + 80 ――――― 423 ÷ 6 70 r 3 = 70

e   Do you think the average age would be similar in the afternoons?
Give a reason for your answer.

Yes, as the ages range between 50 & 70 mainly.

(Student's Book pages 95–96)

More averages

1 Work out the mean of each set of numbers.

a 2, 4, 6, 8, 10   6

b 12.5, 15.2, 16.4, 18.1, 19.4   16.32

c 120, 125, 320, 300, 400   253

d 1.2, 1.3, 1.5, 1.8, 2   1.56

2 Here are some report cards that show four students' test scores out of 25 for their mathematics tests during two terms. Find the mode and the average for each student.

Amanda

Test 1:   21

Test 2:   24

Test 3:   19

Test 4:   21

Mode: 21

Average: 21.25

Khenan

Test 1:   18

Test 2:   19

Test 3:   19

Test 4:   17

Mode: 19

Average: 18.25

Nicholas

Test 1:   16

Test 2:   15

Test 3:   19

Test 4:   16

Mode: 16

Average: 16.5

Avril

Test 1:   19

Test 2:   19

Test 3:   23

Test 4:   21

Mode: 19

Average: 20.5

Mean and mode

1   Calculate the mean and find the mode for each set of prices.

a

$15.99 $14.75 $15.99 $16.99 $18.99 $12.99 $15.99 $25.99

Mean: $17.21

Mode: $ 15.99

b

$26.99 $39.99 $49.99 $25.99 $29.99 $39.99 $25.79 $22.99

$ 32.72

Mode: $ 39.99

c

$185 $120 $150 $145 $185 $130 $200 $150

Mean: $ 158.13

Mode: $185 ; $150

2   Calculate the mean and find the mode for each set of masses.

a

865 g   850 g   855 g   849 g   850 g   862 g

Mean: 855.2 g

Mode: 850 g

b

925 g   940 g   920 g   935 g   925 g   939 g

Mean: 930.7 g

Mode: 925 g

Number sense (3)

Classifying numbers

1 Complete the table. Tick all the columns that apply to each number.

	Odd	Even	Square	Prime	Composite
112		✓			✓
97	✓			✓	
51	✓				✓
121	✓		✓		✓
99	✓				✓
144		✓	✓		✓

2 Find the mystery number.

Read the clues and eliminate numbers by crossing them out.

5	19	18	12	1
26	23	24	38	10
9	22	40	35	4
31	30	2	15	20
16	32	25	29	64

* I am not a square number.
* I am not the square root of 81 or 100.
* I am not an even prime number.
* I am not an odd number between 20 and 30.
* I am not a multiple of 4.
* I am not a factor of 25.
* I am not divisible by 3.
* I am smaller than 20.
* I am the number that is left.

What am I? __19__

Factors and multiples

1 Write your own definition for each word.

   a Factor _Numbers we can multiply together to get another number_

   b Multiple _Are what we get after multiplying the number by a whole number._

   c Prime factor _Any prime numbers that can be multiplied to give the original number._

   d Highest common factor _The largest common factor of two or more numbers_

   e Lowest common multiple _of two numbers is the smallest number that is a multiple of both._

2 Write all the factors of each number.

   a 15 _1, 3, 5, 15_

   b 24 _1, 2, 3, 4, 6, 8, 12, 24_

   c 30 _1, 2, 3, 5, 6, 10, 15, 30_

   d 44 _1, 2, 4, 11, 22, 44_

3 Write all the elements of each set.

   a Multiples of 4 between 0 and 55

      _M4: 4, 8, 12, 16, 20, 24, 28, 32, 36, 40, 44, 48, 52._

   b Multiples of 5 between 1 and 60

      _M5: 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55_

   c Multiples of 7 between 1 and 65

      _M7: 7, 14, 21, 28, 35, 42, 49, 56, 63_

4 Draw a factor tree for each number and express it as a product of its prime factors.

   a 14 → 2, 7

      _2 × 7 = 14_

   b 25 → 5, 5

      _5 × 5 = 25_

   c 30 → 5, 6 → 2, 3

      _5 × 2 × 3 = 30_

HCF and LCM

1 Complete each factor tree and write the number as a product of its prime factors.

a
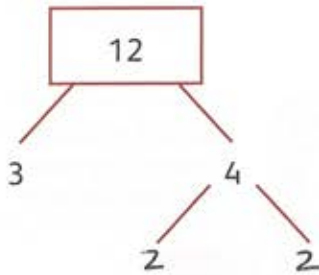
12 = __2 × 2 × 3__

b
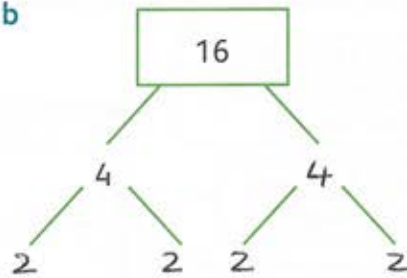
16 = __2 × 2 × 2 × 2__

c
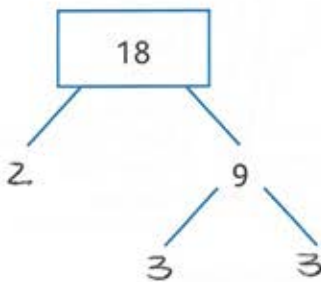
18 = __2 × 3 × 3__

d
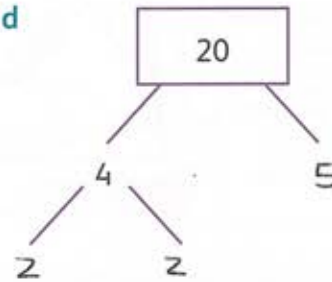
20 = __2 × 2 × 5__

e
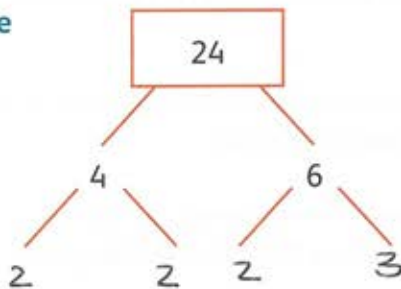
24 = __2 × 2 × 2 × 3__

f
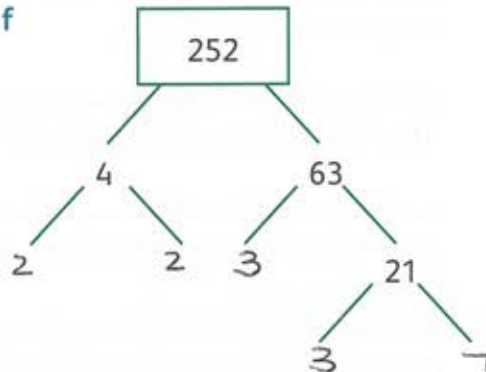
252 = __2 × 2 × 3 × 3 × 7__

2 Use the information in Question 1 to find the HCF of:

a	12 and 20	__4__	**b**	16 and 20	__4__
c	24 and 252	__4__	**d**	252 and 18	__3__

3 Find the LCM of:

a	12 and 20	__60__	**b**	12 and 24	__24__
c	16 and 24	__48__	**d**	24 and 252	__504__

Solving problems with HCF and LCM

1   A scientist builds a machine with screens, lights, bells and flags. Use prime factorisation to work out the solutions to the problems below.

Every 9 seconds, the number on the top screen changes.

Every 7 seconds, a bell clangs.

Every 3 seconds, a green light flashes.

Every 4 seconds, a purple flag pops up and down.

Every 10 seconds, the picture on the lower screen changes.

Every 8 seconds, an orange flag pops out from the side.

Every 6 seconds, a blue light flashes.

Every 5 seconds, a red light flashes.
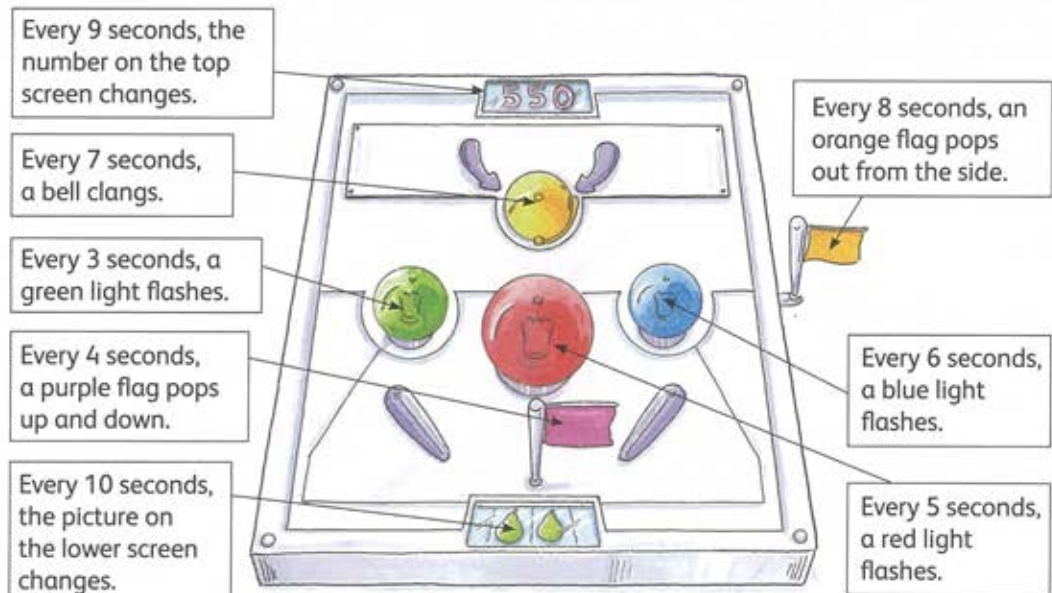
a   After how many seconds will all three lights flash at the same time?

   _30_   seconds

b   After how many seconds will the number screen and the picture screen change at the same time?

   _90_   seconds

c   After how many seconds will both the flags pop up at the same time?

   _8_   seconds

d   After how many seconds will the green light flash at the same time as the bell goes?

   _21_   seconds

e   After how many seconds will the number on the top screen change at the same time as the orange flag pops out?

   _72_   seconds

2   Make up two more questions about the machine's timing, and get your partner to answer them.

   Question 1:

   _____

   _____

   Question 2:

   _____

   _____

(Student's Book pages 101–103)

More numbers

1   Complete the crossword using the clues in the box below. Write all the answers in words, not numerals.

				¹T	²E	N			
					L		³O		
⁴F	O	U	R	T	E	E	N		
					V		E		
		⁵S	⁶E	V	E	N			
			V		N		⁷T		⁸O
	⁹P	I	E				H		N
			¹⁰N	O		¹¹N	I	N	E
							R		
							D		

Across	Down
1 The square root of 100	2 The HCF of 22 and 55
4 The LCM of 2 and 7	3 1 squared
5 The HCF of 49 and 35	6 Multiples of two are also called _____ numbers
9 A circular graph divided into sectors is called a _____ chart.	7 51 is the (first, third or fifth) multiple of 17
10 Can a prime number have more than two factors?	8 The common factor of all prime numbers
11 The square root of 81	

2   Write *true* or *false*. Give a reason for each answer.

a   Square numbers are always even.

   False, 9 is a square number.

b   Square numbers are always odd.

   False, 4 is a square number.

c   Square numbers are never prime.

   True, the smallest number of factors will be 3.

d   Square numbers are always divisible by 4.

   False, 9 is not divisible by 4.

Roman numerals

1   Complete the tables.

Roman numeral	Number
I	1
IV	4
V	5
VI	6
X	10
XX	20

Roman numeral	Number
L	50
LX	60
XC	90
C	100
D	500
M	1 000

2   Complete the table by writing the numbers in Hindu-Arabic and Roman numerals.

Number	Hindu-Arabic (0, 1, 2, 3 …)	Roman numerals (I, II, III …)
My age		
The number of students in our class		
The number of hours I spend on maths homework each week		
The year we are in now		
The year in which I was born		

3   The route numbers on this map are given in Roman numerals. Write the equivalent number using Hindu-Arabic numerals.

(Student's Book page 104)

Topic 10 Algebraic thinking
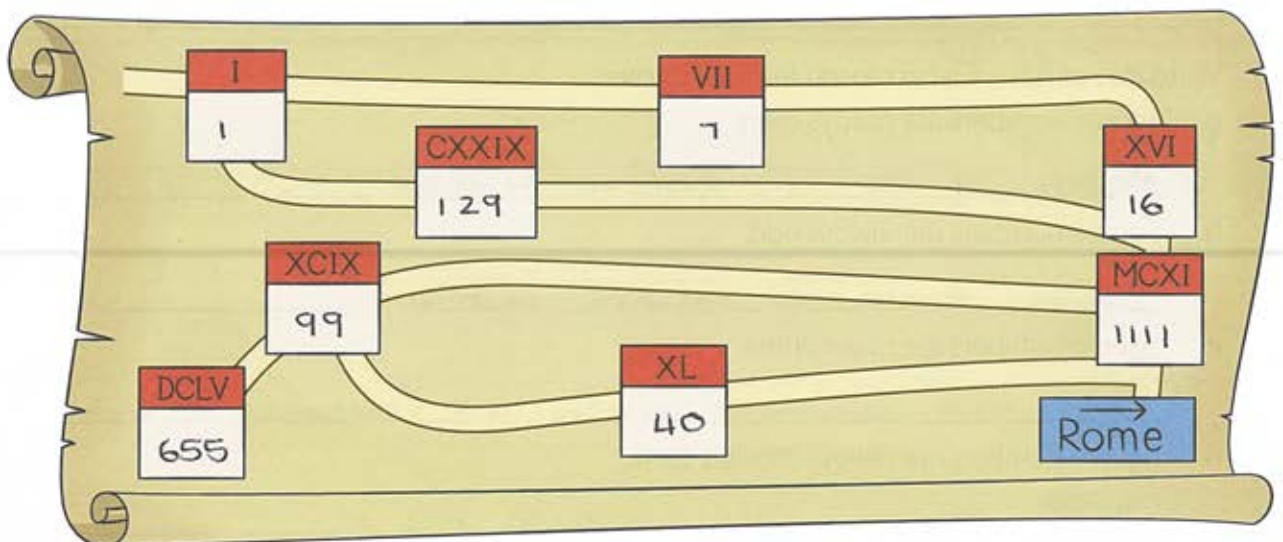
Investigate number sequences

1 Look at the dot pattern.
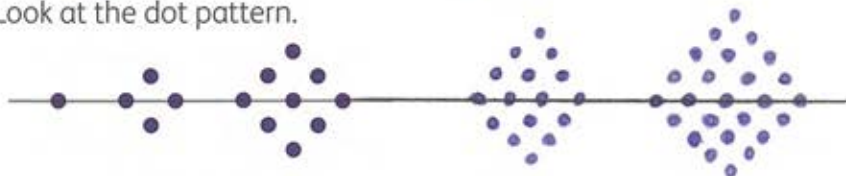
a Draw the next two shapes in the dot pattern.

b Complete the table for the first five dot patterns.

Shape number	1	2	3	4	5	n
Number of dots	1	4	9	16	25	n×n

c Look at the numbers in the bottom row of the table. Describe the pattern you see.

+3 ; +5 ; +7 ... adding consecutive odd numbers.

d Write a rule in words for finding the number of dots in any shape (n).

Take the shape number & multiply it by itself.

e How many dots would you need to draw the 10th shape? Write a number sentence with the answer.

10×10 = 100 dots

f What would you call this sequence of numbers? Why?

Square numbers - they make square shapes

2 Look at this dot pattern.
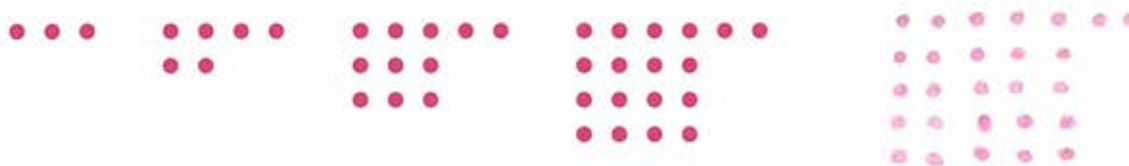
a Draw the next dot pattern. Write the number of dots for the first five patterns in the table below.

b How many dots would you need to draw the 10th shape? Write the answer in the table.

c Can you work out how many dots are in the nth shape? Write the answer in the table too.

Pattern number	1	2	3	4	5	10	n
Number of dots	3	6	11	18	27	102	(n×n)+2

(Student's Book pages 108–110)

55

Working with unknown values

1   Find the value of *x* and *y* in each flow diagram.

Write an equation for each calculation. The first one has been done for you.

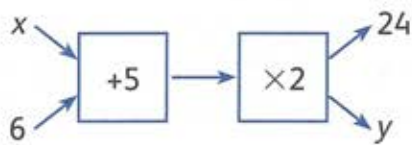**Example**

a

$(24 \div 2) - 5 = 7$, so $x = 7$

$(6 + 5) \times 2 = 22$, so $y = 22$

b
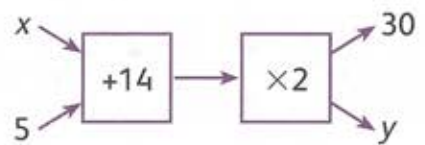
$(30 \div 2) - 14 = 1$, so $x = 1$

$(5 + 14) \times 2 = 38$, so $y = 38$

c
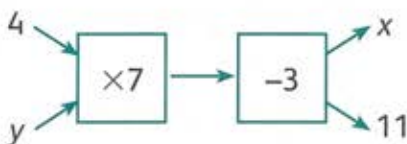
$4 \times 7 - 3 = 25$, so $x = 25$

$(11 + 3) \div 7 = 2$, so $y = 2$

d
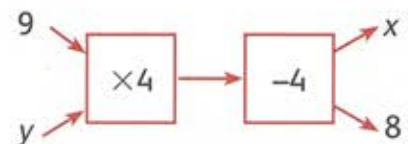
$9 \times 4 - 4 = 32$, so $x = 32$

$(8 + 4) \div 4 = 3$, so $y = 3$

e
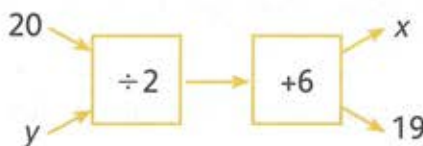
$(20 \div 2) + 6 = 16$, so $x = 16$

$(19 - 6) \times 2 = 26$, so $y = 26$

f
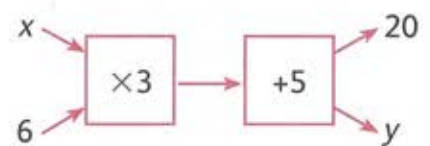
$(20 - 5) \div 3 = 5$, so $x = 5$

$6 \times 3 + 5 = 23$, so $y = 23$

2   Write all the pairs of values of *x* and *y* that make these equations true.

a $9 + 9 = x \times y$

$x = 1 \; ; \; y = 18$

$x = 2 \; ; \; y = 9$

$x = 3 \; ; \; y = 6$

$x = 6 \; ; \; y = 3$

$x = 9 \; ; \; y = 2$

$x = 18 \; ; \; y = 1$

b $7 \times 7 = x + y$

$x = 48 \; ; \; y = 1$

$x = 47 \; ; \; y = 2$

$x = 30 \; ; \; y = 19$

$x = 20 \; ; \; y = 29$

(Student's Book pages 111–112)

Equation problems

1   Follow the instructions in the flow diagram.

| Think of a number | → | Double it | → | Add 30 | → | Halve the result | → | Subtract 10 |

Try this with 5 different starting numbers.

What do you notice?

The answer is 5 more than the number I thought of.

Try to explain the results.

When you double the number & add 30 & then halve it, you are effectively adding 15 to your original number. You then subtract 10 from that, effectively getting a number that is 5 more than your original number.

2   Follow these flow diagram instructions.

| Think of a number | → | Add your age in years | → | ×4 | → | Halve the result | → | Subtract twice the starting number | → | Divide by 2 |
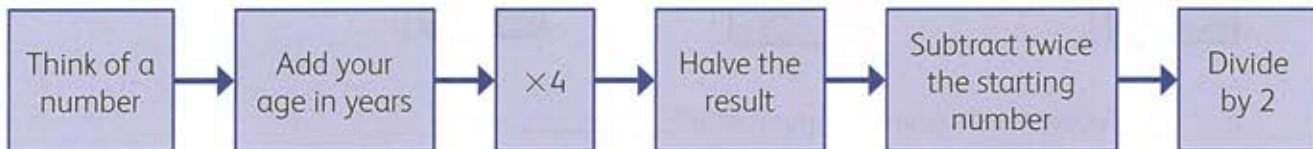
Try this with 5 different starting numbers.

What do you notice?

You end up with the same number.

Try to explain the results.

Number + age multiplied by 4 & halved is equal to twice your number + age. You then subtract twice your age, leaving you double your number. You then divide that by 2, bringing you back to your original number.

3   Make up your own five-step flow diagram.

Your final answer should be the same as the starting number.

Measurement (2)

Measuring perimeter

1   Which units (mm, cm, m or km) would you use to measure the perimeter of each of these?

   a   The coastline of South America __km__

   b   A small triangle __mm__

   c   A desk in your classroom __cm__

   d   A fish pond in the garden __m__

2   Look at these mobile phone cover designs.

   75 mm   145 mm   A

   8 cm   15 cm   B

   6.7 cm   12.4 cm   C

   a   Which cover has the longest perimeter? __B__

   b   Which cover has the shortest perimeter? __C__

   c   Calculate the perimeter of each cover. Then write the perimeters in order from shortest to longest using the same unit of measurement.

   7.5 + 7.5 + 14.5 + 14.5 = 44 cm

   8 + 8 + 15 + 15 = 46 cm

   6.7 + 12.4 + 6.7 + 12.4 = 38.2 cm

   38.2 cm, 44 cm, 46 cm

3   Calculate the missing dimensions to complete the table.

| Shape	Length	Width	Perimeter
Square	150 m	150 m	600 m
Rectangle	63 m	9 m	144 m
Rectangle	26 m	598 m	1 248 m
Square	3600 cm	3600 cm	14 400 cm

Investigating perimeter

Work with a partner.

Mr Johnson has a few goats that he wants to keep in a small fenced-off enclosure.

He has 144 metres of fencing for making the enclosure. He would like it to have four sides and cover as large an area as possible, so that the goats can move around and graze.

1   Draw sketches and experiment with different shapes and sizes for the enclosure. The enclosure must have four sides and a perimeter of 144 m, because that is the length of the fencing that Mr Johnson has.
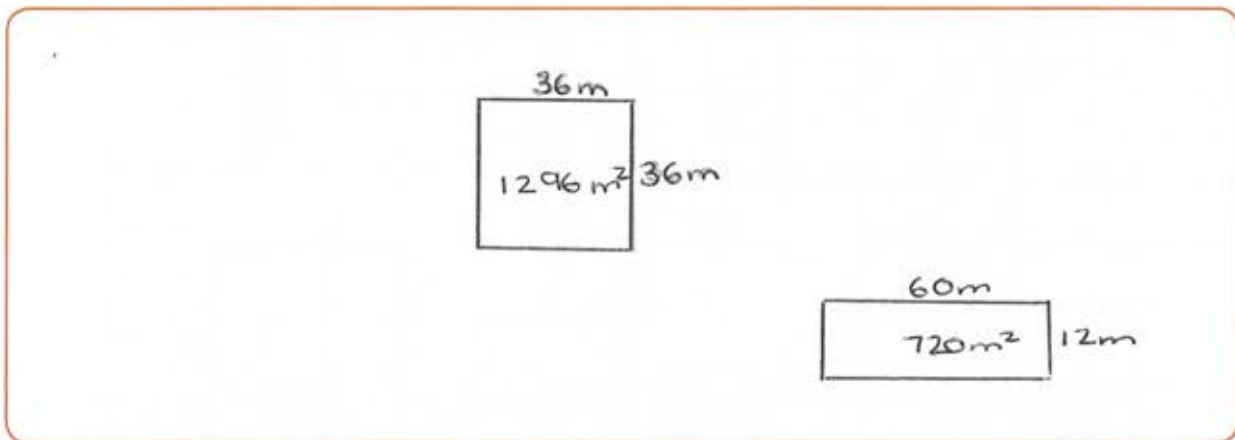
2   Use this table to keep a record of each enclosure you draw.

Shape	Dimensions	Perimeter	Area	Comment
Rectangle 1	1 m wide, 71 m long	144 m	71 m²	Not practical. Too long and thin; the goats will not have much space.
Rectangle	12 wide, 60 long	144m	720m²	Long & thin
Square	36m	144m	1296m²	Nice & big

3   Decide which shape and size is best. Write down the dimensions here and why you think it is the best shape. Share your result with the class and explain to the class why you chose this shape.
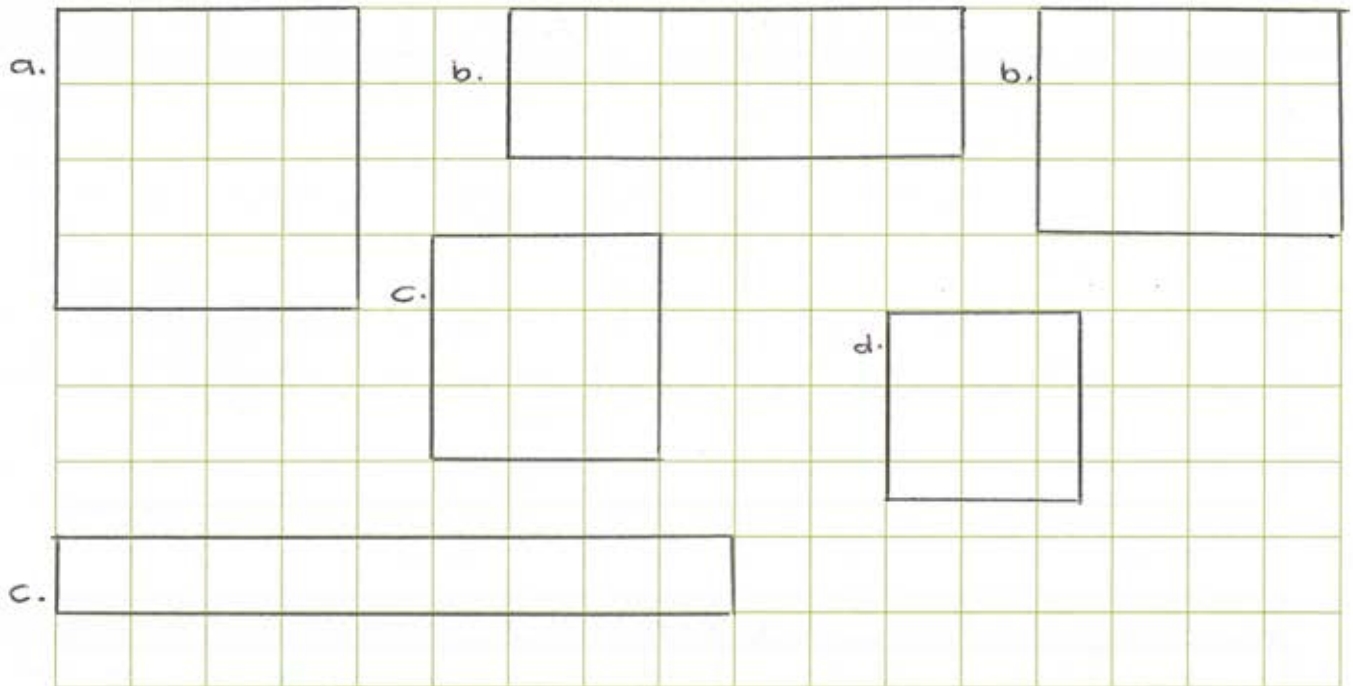
Square is the best. 36m per side

Will be the shape with the largest area.

Area

1 Each square on the grid is 1 cm². Draw these shapes on the grid.
   a A square with an area of 16 cm²
   b Two different rectangles, each with an area of 12 cm²
   c Any two different shapes with an area of 9 cm²
   d A square with an area of 6.25 cm²

2 This table gives information about different rectangles. Fill in all the missing information to complete the table.

Length (cm)	Width (cm)	Perimeter (cm)	Area (cm²)
6	10	32 cm	60 cm²
2	5	14 cm	10 cm²
7	4	22 cm	28 cm²
3	8	22 cm	24 cm²
11	6	34 cm	66 cm²
2	7	18 cm	14 cm²
10	11	42 cm	110 cm²
15	10	50 cm	150
19	8	54 cm	152
770	14	1 568	10 780 cm²

Volume

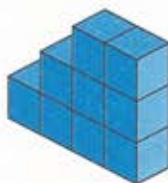1   Work out the volume of each shape in cubic centimetres. Each block in the picture represents 1 cm³. You may build the shapes out of blocks if you wish.

a

_____54 cm²_____
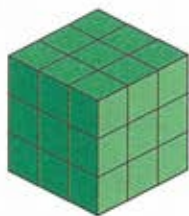
b

_____9 cm³_____

c
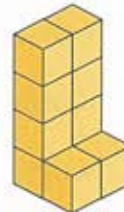
_____10 cm³_____

d

_____10 cm³_____

e
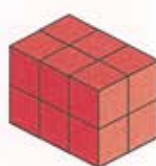
_____12 cm³_____

f

_____12 cm³_____

g
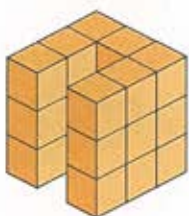
_____21 cm³_____

h
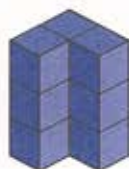
_____9 cm³_____

i

_____24 cm³_____

2   Solve these problems.

a   A crate of jam jars can hold 8 jars along its length and 5 jars along its width, and it can fit 4 layers. How many jars fit into the crate?

Number of jars = 8 × 5 × 4
= 160

b   A pack of washing sponges holds 3 rows of 3 sponges in 2 layers. How many sponges are in the pack?

Number of sponges in a pack = 3 × 3 × 2
= 18

More volume

1   Write down the formula for calculating the volume of a cube or cuboid.

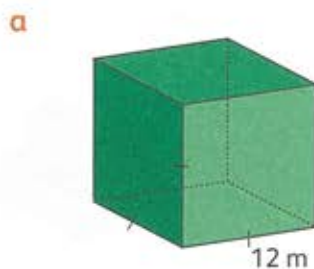$V = \text{length} \times \text{width} \times \text{height}$

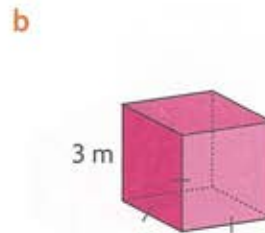2   Write the abbreviation for these units.

   a   Cubic centimetres cm^3 b   Cubic metres m^3

   c   Cubic decametres dam^3

3   Use a formula to calculate the volume of these solids.

   a   b   c

12 m   3 m   55 cm

$V = 12 \times 12 \times 12 = 1728 m^3$ $V = 3 \times 3 \times 3 = 27 m^3$ $V = 55 \times 55 \times 55 = 166375 \\ cm^3$

   d   e   f

30 cm   18 cm   2 cm   4 m   8 m
12 cm   1 cm   1.5 m
10 cm
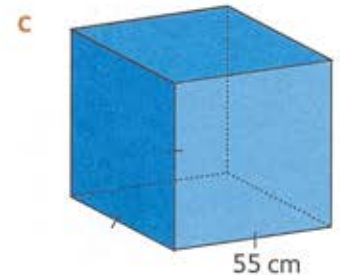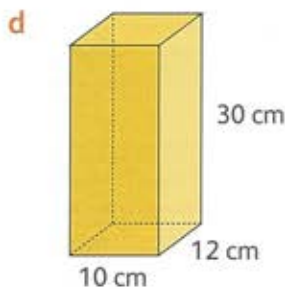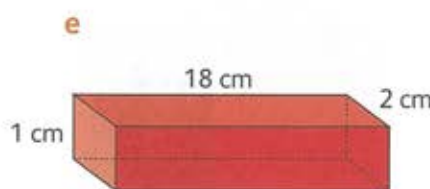
$V = 30 \times 10 \times 12 = 3600 cm^3$ $V = 18 \times 2 \times 1 = 36 cm^3$ $V = 1.5 \times 4 \times 8 = 48 m^3$
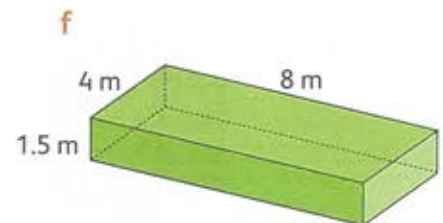
4   I have a box that has these dimensions: height 10 cm, width 15 cm and length 20 cm.

   a   Calculate the volume of the box.

$V = 20 \times 15 \times 10$

$= 3\,000\ cm^3$

   b   I have four small cubes, each with side dimensions of 5 cm. I put them into the bigger box.
       Calculate the volume of the remaining space in the box.

Remaining space $= 3000 - (5 \times 5 \times 5) \times 4$

$= 3000 - 500$

$= 2500\ cm^3$

Name the shapes

1   Write the mathematical name of each 3-D object below it.

a

_____Cylinder_____

b

_____Cube_____

c

_____Cuboid_____

d

_____Cone_____

e

_____Cone_____

f

_____Cylinder_____

g

_____Cuboid_____

h

Trapezoidal prism

i

_____Pyramid_____

j

__Triangular__
__prism__

k

__Tetrahedron__

l

Pentagonal prism

(Student's Book pages 126–128)
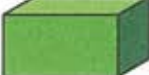
Solids and their properties

1   Complete the table.

Solid	Name	Number of faces	Number of edges	Number of vertices	Shape of faces
a	Cube	6	12	8	Square
b	Tetrahedron	4	6	4	Triangle
c	Square-based pyramid	5	8	5	Triangle Square
d	Triangular prism	5	9	6	Triangle Rectangle
e	Cuboid	6	12	8	Square Rectangle
f	Cylinder	3	2	0	Circle Rectangle
g	Cone	2	1	1	Circle Curved-triangle
h	Sphere	1	0	0	Globe

2   Find two examples of each type of solid at school or at home. Complete the table by writing down the names of the objects you find.

Shape	Object 1	Object 2
Cone		
Cuboid		
Cylinder		
Sphere		

(Student's Book pages 126–128)

Shapes and nets

For each 3-D object, colour in the net that could be used to make it.

1
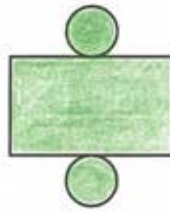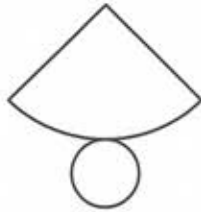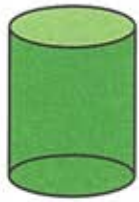
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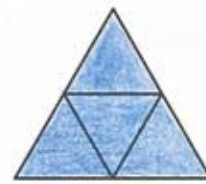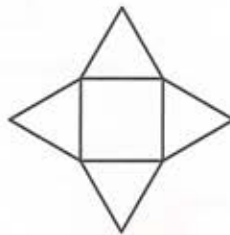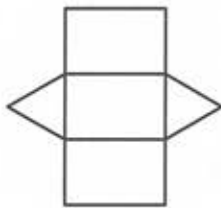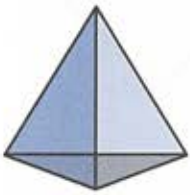
3
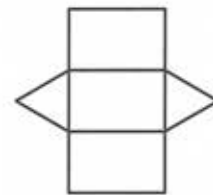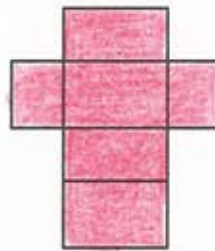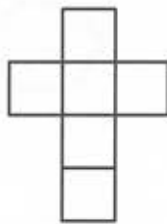
4
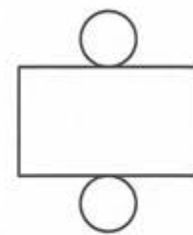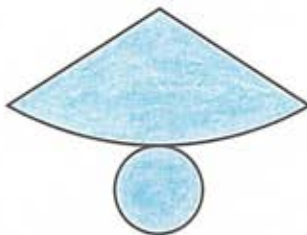
5
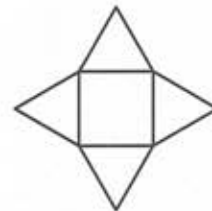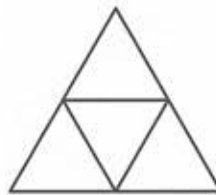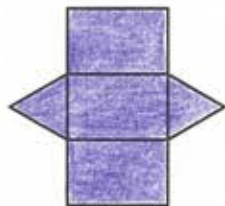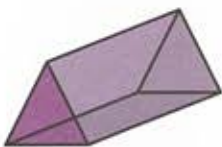
6
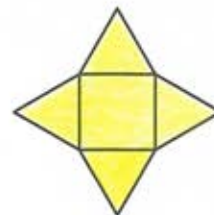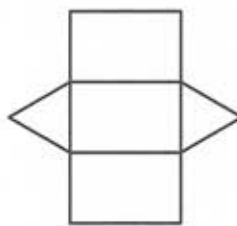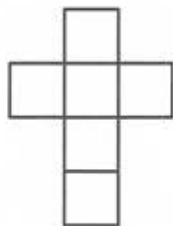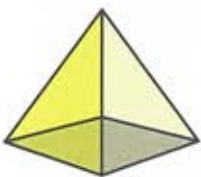
Drawing 3-D objects

1   One of two parallel faces of each prism is given. Use the method of duplicating the face and then shading and connecting the faces to draw each prism. Plan your drawings so that they don't overlap.

a   b   c

d   e
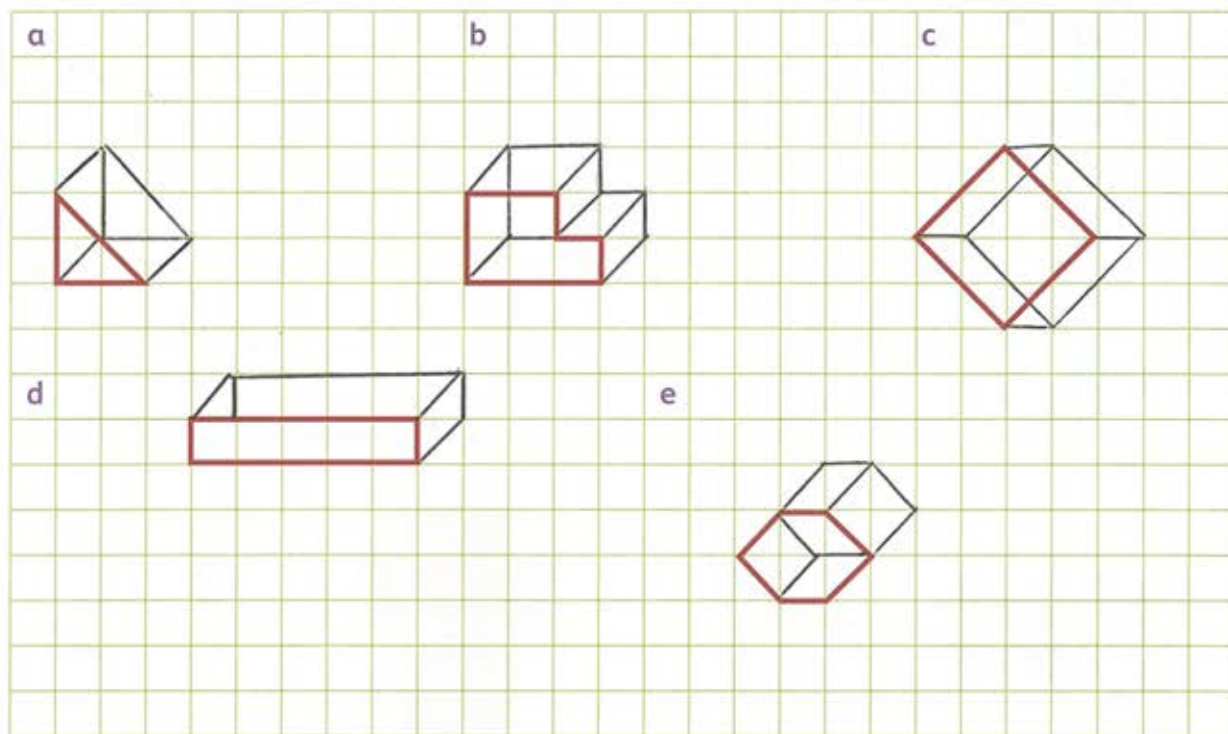
2   Copy this shape as neatly as you can. Use the lines on the grid to help you.

(Student's Book pages 129–130)
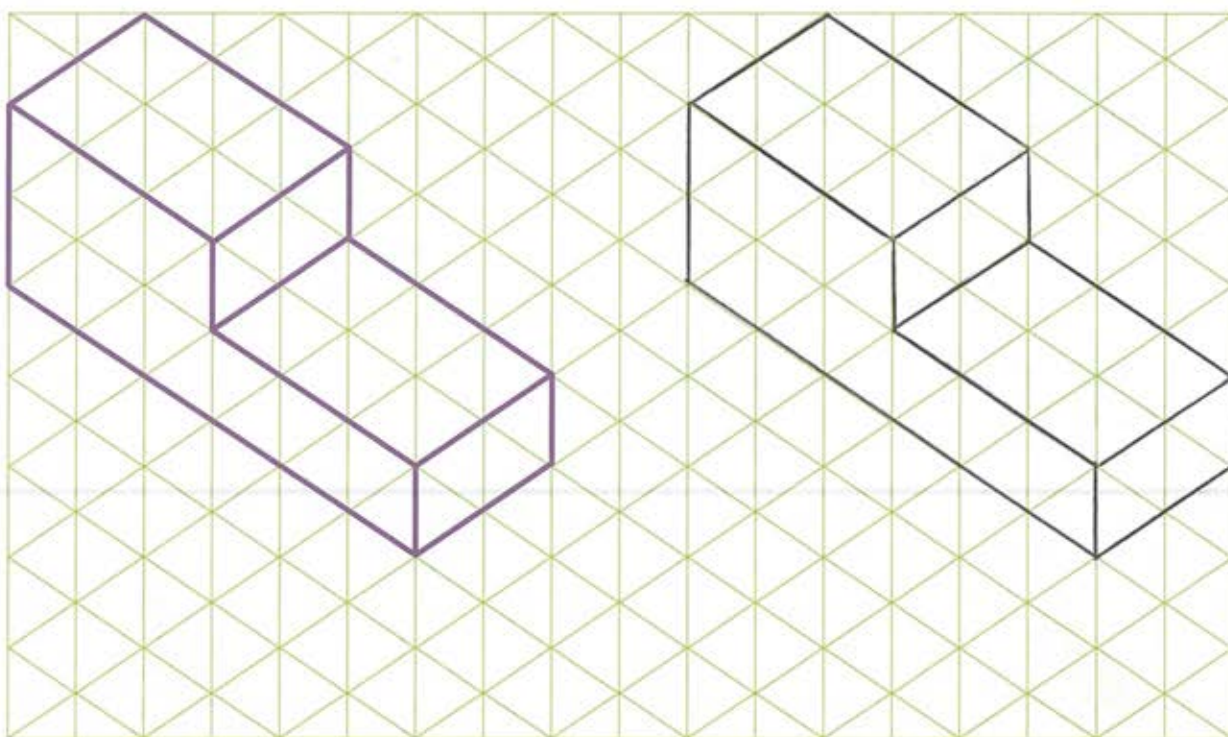
Coordinate systems

Plot these points on the grid.
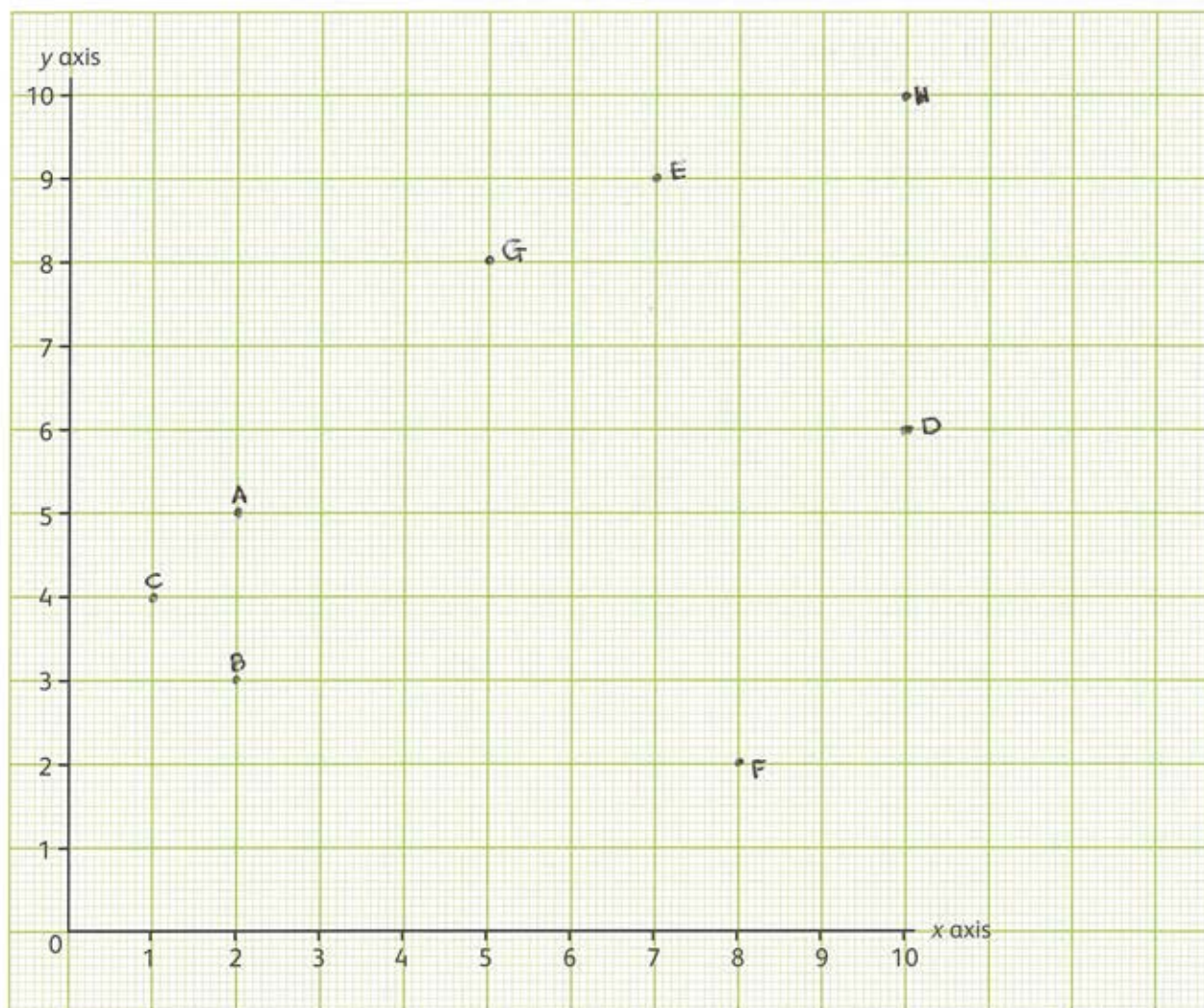
A (2, 5)

B (2, 3)

C (1, 4)

D (10, 6)

E (7, 9)

F (8, 2)

G (5, 8)

H (10, 10)

(Student's Book pages 131–133)

Plotting and joining points

1   Use the grid to draw a graph. First draw the *x* axis and label it from 0 to 10. Then draw the *y* axis and label it from 0 to 10. Then plot these points on the graph.

   A (5, 9)   B (2, 6)   C (8, 6)   D (2, 3)   E (8, 3)
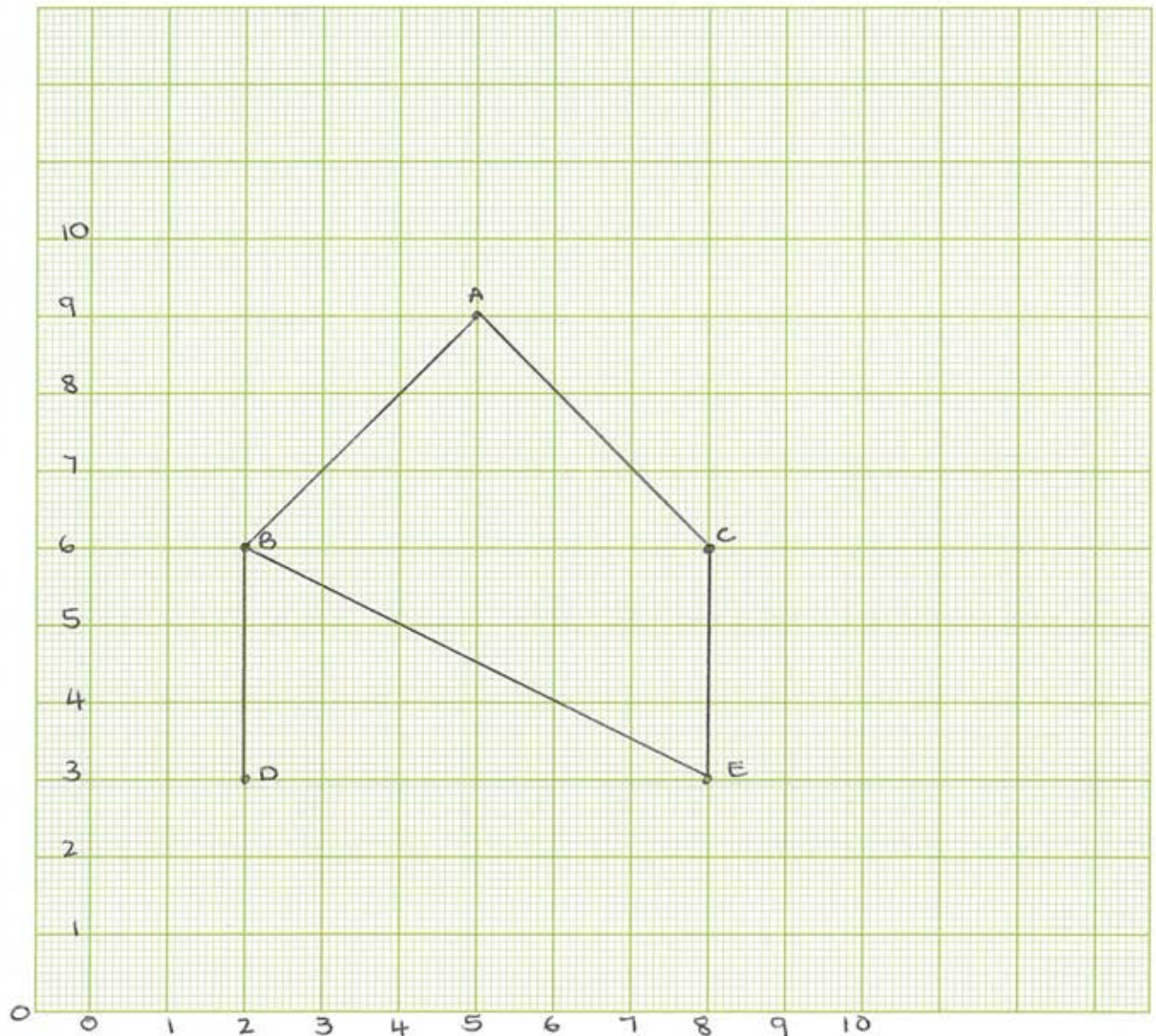
2   **a**   Join the points you drew on the graph in Question 1 to form these lines: AB, BD, BE, EC, CA, BC, DC and DE.

   b   Tick the shapes and angles that are formed in your sketch.

Square	☐	Circle	☐	Rectangle	☐
Irregular pentagon	☐	Rhombus	☐	Trapezoid	✓
Isosceles triangle	☐	Scalene triangle	☐	Equilateral triangle	☐
Right angle	☐	Acute angle	✓	Obtuse angle	✓

(Student's Book pages 131–133)

Topic

13 Computation (3)

Percentages

1   Write each amount as a percentage.

    a   3 out of 12   _25 %_

    b   12 out of 40   _30 %_

    c   9 out of 25   _36 %_

    d   7 out of 8   _88 %_

    e   32 out of 60   _53%_

2   Fill in the missing numbers or percentages.

    a   _90_ % of 50 = 45

    b   50 % of _46_ = 23

    c   _150_ % of 300 = 450

    d $49\frac{1}{2}$ % of 200 = 99

    e $\frac{1}{2}$ % of _1800_ = 9

3   A cake is cut into 20 equal pieces. How many pieces of cake are left if the following amounts are eaten?

    a   50 % of the cake   _10_

    b   25 % of the cake   _15_

    c   70 % of the cake   _6_

    d   5 % of the cake   _19_

    e   35 % of the cake   _13_

4   Fill in $<$ or $>$ to make these statements true.

    a   50 % of 100 $>$ 30 % of 120

    b   75 % of 80 $=$ 50 % of 120

    c   40 % of 320 $<$ 72 % of 200

    d   55 % of 420 $<$ 65 % of 500

(Student's Book pages 142–145)

More percentages

1   Work out the percentages and fill in the missing numbers in each diagram.

a

180 — 100% — (180)
18 — 10%
135 — 75%
90 — 50%
45 — 25%

b

1.3 — ½%
312 — 120% — (260)
2.6 — 1%
70.2 — 27%
117 — 45%
23.4 — 9%

c

2350 — 250%
874.2 — 93% — (940)
84.6 — 9%
846 — 90%
32.9 — 3½%
159.8 — 17%
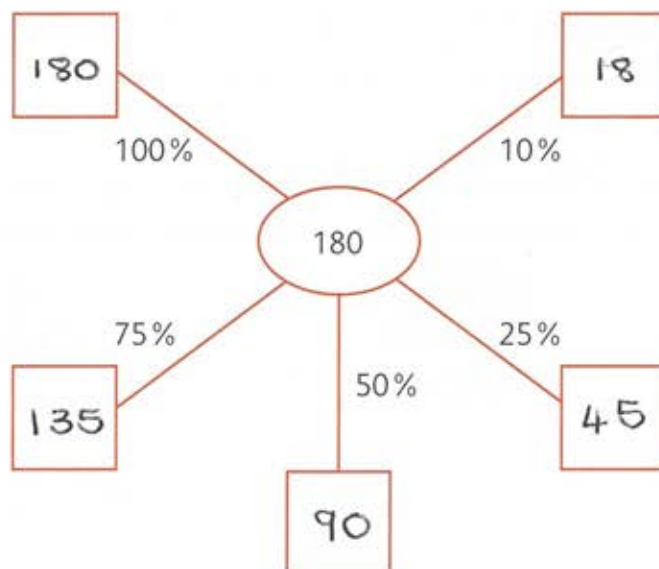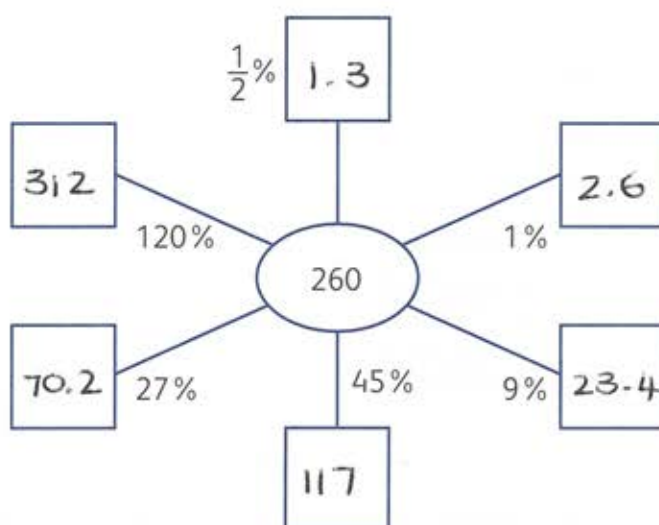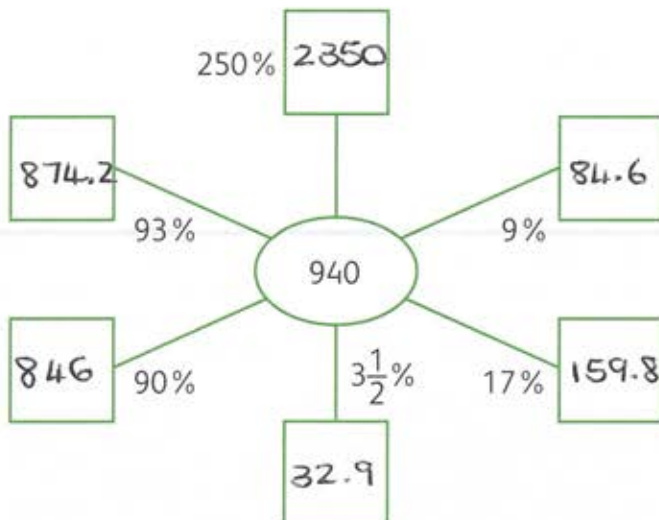
Discount, profit and loss

1   Fill in the sale price of each item.

SAVE 49%
Was $50 – Now $25.50

SAVE 63%
Was $315 – Now $116.55

SAVE 46%
Was $8 500 – Now $4590

SAVE 75%
Was $65 – Now $16.20

SAVE 20%
Was $115 – Now $92

SAVE 35%
Was $75 – Now $48.75

2   Complete the table.

Cost price	Selling price	Amount of profit or loss (underline losses)	Percentage profit or loss
$1 285	$2 299	$ 1014	78.9%
$2 387	$ 3637	$1 250	52.37 %
$ 3950	$3 500	$450	11.4 %
$3 125	$2 999	$126	4 %
$ 2666.67	$ 3066.67	$400	15%

Plan your project

Use these pages to plan your project for making and selling an item. Record your ideas and decisions.

1   Brainstorm some ideas on your own here. Then share them with your group.

What could we
make and sell?

2   Record the five best ideas from your group's brainstorm.

a   The five best ideas are:

*   _____

*   _____

*   _____

*   _____

*   _____

b   Which idea do you think is the best one? _____

c   Why? _____

(Student's Book page 146)

What we are going to make

Use this page to describe what you are going to make and sketch the item or stick a picture of it in the space provided.

Project: Making and selling an object

We will make: _____

Description:

_____

_____

_____

Sketch or picture:

We will need:

_____

_____

How we will make it:

_____

_____

_____

What each person will do:

_____

_____

_____

Costing sheet

Use this sheet to work out the cost of making the item.

You might need to do some research to find the information you need.

Cost of making our item

Material costs:

_____

_____

_____

_____

_____

Packaging costs:

_____

_____

_____

_____

_____

Transport costs:

_____

_____

_____

_____

_____

Any other costs:

_____

_____

_____

_____

_____

Cost of 1 item: _____

Cost of 25 items: _____

We think a selling price of _____ is reasonable because _____

_____

_____

This includes the cost price of _____ and a profit of $_____.

This is a profit of _____%.

Ratio

1   $240 can be shared in different ratios.
Draw lines to match each ratio on the left to the correct amounts on the right.

Ratio		Amounts
1 : 5		$140 and $100
2 : 3		$40 and $200
7 : 5		$96 and $144
3 : 5		$112 and $128
7 : 8		$90 and $150

2   Divide $200 in different ratios.

a   1 : 4 $40 : $160

b   1 : 3 $50 : $150

c   22 : 28 $88 : $112

c   3 : 7 $60 : $140

3   Divide $720 in the following ratios.

a   1 : 2 $240 : $480

b   3 : 1 $540 : $180

c   9 : 1 $648 : $72

d   5 : 3 $450 : $270

4   Maria has a recipe that requires 3 eggs for every 1.5 cups of flour. How many eggs will she need if she uses:

a   3 cups of flour?   6 eggs

b   12 cups of flour?   24 eggs

c $\frac{1}{2}$ cup of flour?   1 egg

d   9 cups of flour?   18 eggs

Solve problems involving ratios

1   The ratio of colours that are mixed to make each colour of paint is given below each tin.
Work out how many litres of each colour are in each tin.

_1.5_ red

_3.5_ yellow

_4_ white

r : y : w
3 : 7 : 8

_1.5_ blue

_3_ grey

_7.5_ white

b : g : w
1 : 2 : 5

2   This table shows the ratio of cement, sand and gravel in different types of concrete.

Grade of concrete	Ratio of mix (cement : sand : gravel)	
M5	1 : 5 : 10	
M8	1 : 4 : 8	
M20	1 : 1.5 : 3	

Work out the mass of each component for the type and amount of concrete shown below.

a 320 kilograms of M5	b 780 kg of M8	c 1 100 kg of M20
_20 kg_ cement	_60 kg_ cement	_200 kg_ cement
_100 kg_ sand	_240 kg_ sand	_300 kg_ sand
_200 kg_ gravel	_480 kg_ gravel	_600 kg_ gravel

(Student's Book pages 147–148)

Time

1   Complete the tables.

a

Time in words	This is the same as	Time in symbols
Quarter to 9	15 minutes before 9	8:45
Twenty-five to 7	35 minutes after 6	6:35
Twenty past 7	20 minutes after seven	7:20
Ten to 7	50 minutes after 6	6:50
Ten to 10	10 minutes before 10	9:50

b

12-hour system	24-hour system
4 a.m.	04:00
7:15 a.m.	07:15
11:45 a.m.	11:45
12 noon	12:00
12:45 p.m.	12:45
7:30 p.m.	19:30
9:30 p.m.	21:30
11:45 p.m.	23:45
12 am.	00:00

Challenge

2   Choose a word from the box to match each time period.

daily   week   monthly   fortnight   century   decade   annually   millennium

a   100 years   century   b   1 000 years   millennium
c   Every 24 hours   daily   d   Ten years   decade
e   Every 12 months annually   f   Two weeks   fortnight
g   Seven days   week   h   12 times a year monthly

(Student's Book pages 152–153)

Working with time

When you take public transport, you need to be able to work with timetables, departure times and arrival times. This notice gives information about a ferry between different places. Read the information and then answer the questions that follow.

DAILY DEPARTURES

Belize City to Caye Caulker and San Pedro	San Pedro to Caye Caulker and Belize City	Caye Caulker to Belize City	Caye Caulker to San Pedro
8:00 a.m.	7:00 a.m.	6:30 a.m.	7:00 a.m.
9:00 a.m.	8:00 a.m.	7:30 a.m.	8:45 a.m.
10:30 a.m.	9:30 a.m.	8:30 a.m.	10:00 a.m.
12:00 noon	11:30 a.m.	10:00 a.m.	11:30 a.m.
1:30 p.m.	1:00 p.m.	12:00 noon	1:00 p.m.
3:00 p.m.	2:30 p.m.	1:30 p.m.	2:30 p.m.
4:00 p.m.	3:30 p.m.	3:00 p.m.	4:00 p.m.
To Caye Caulker only	**To Caye Caulker only**	4:00 p.m.	5:30 p.m.
5:30 p.m.	Mon to Fri 4:30 p.m.	**On Weekends and Public Holidays** 5:00 p.m.	

1   Which route has the earliest departure time? _Caye Caulker to Belize City._

2   Which routes depart at noon each day? _Belize City to Caye Caulker & San Pedro + Caye Caulker to Belize City._

3   a   Which route departs at quarter to nine in the morning? _Caye Caulker to San Pedro._

     b   Which route departs exactly 45 minutes after the route you identified in part **a**? _San Pedro to Caye Caulker & Belize City._

4   Lucy was supposed to travel on the 8 a.m. ferry from San Pedro to Belize City. However, she arrived $2\frac{1}{2}$ hours late for her departure. How long will she have to wait for the next departure on this route?

     I hour, for the 11:30 ferry.

5   James wanted to catch the lunchtime ferry from Caye Caulker to San Pedro. However, he arrived 45 minutes late for his departure. How long will he have to wait for the next departure on the same route?

     45 minutes for the 2:30 ferry.

6   Oscar wanted to take the 15:00 ferry from Caye Caulker to Belize City. He arrived at the ferry terminal just after 2 p.m. Is there an earlier ferry or any other ferry he could take to get to Belize City? Explain your answer.

     The 2:30 ferry from San Pedro to Caye Caulker & Belize City. as it is a ferry enroute to B.C.

The 24-hour system

Look at this extract from Patricia's phone bill and use it to answer the questions.

International calls				
Date	Time	Duration	Number dialled	Call destination
27/08	10:23	00:00:32	+4412147989	UK landline
27/08	10:25	00:02:42	+4487019282	UK landline
27/08	13:33	00:01:26	+4412147989	UK landline
27/08	02:15	00:00:05	+1450282391	Canada
27/08	02:26	00:01:58	+1450982614	Canada
30/08	17:51	00:34:21	+4412147989	UK landline
30/08	19:48	00:22:05	+4477629380	UK mobile
31/08	20:55	00:07:15	+4477629380	UK mobile
05/09	20:42	00:00:07	+12429803829	Bahamas
07/09	21:15	00:10:00	+1450282391	Canada

1   What was the total time that Patricia spent on the phone to:

   a   UK mobile phones? _00:29:20_   b   Canada? _00:12:03_

   c   UK landline phones? _00:38:21_

2   At what time did Patricia finish these calls?

   a   Her call to a UK mobile on 30/08 _20:10_   b   Her call to a UK mobile on 31/08 _21:02_

   c   Her call to Canada on 07/09 _21:25_

3   Round off the duration of each call to the nearest minute. Then work out the mean duration of Patricia's international calls in minutes.

International calls		
Date	Duration	Rounded off to nearest minute
27/08	00:00:32	1
27/08	00:02:42	3
27/08	00:01:26	1
27/08	00:00:05	0.1
27/08	00:01:58	2

International calls		
Date	Duration	Rounded off to nearest minute
30/08	00:34:21	34
30/08	00:22:05	22
31/08	00:07:15	7
05/09	00:00:07	0.1
03/09	00:10:00	10

Mean length of calls:

8 minutes

Distance, time and speed

Remember: Average speed = Distance ÷ Time

1   Complete the table.

Distance	Time taken to cover this distance	Average speed
10 km	0.15 hours ≈ 9 minutes	65 km/h
15 km	15 minutes	60 km/h
155 km	1 hour 33 minutes	100 km/h
330 km	2 hours 45 minutes	120 km/h
18 km	24 minutes	45 km/h
28.75 km	15 minutes	115 km/h
175 km	$1\frac{1}{2}$ hours	116.6 km/h

2   A group of hikers sets off at 08:15 to do a 27-km walk. The table gives some of their average speeds. Work out at what time each hiker arrives at the end of the trail.

Name	Average speed for hike	Time of arrival at end of trail
Jenny	4.5 km/h	14:15
David	2.5 km/h	19:03
Marcus	3 km/h	17:15
Amy	5 km/h	12:39

3   Look at the cartoon.

Who do you think is correct in this cartoon? Explain your answer.

The lady as it does not equal out eventually, you need to follow road rules

(Student's Book pages 154–155)

4 Convert each of these times from minutes to hours. Show your working out. Use decimals in your answers.

a 30 minutes

$30 \div 60 = 0.5$ hours $= \frac{1}{2}$ an hour

b 45 minutes

$45 \div 60 = 0.75$ hours $= \frac{3}{4}$ of an hour

c 90 minutes

$90 \div 60 = 1.5$ hours $= 1$ and a $\frac{1}{2}$ hours

d 15 minutes

$15 \div 60 = 0.25$ hours $= \frac{1}{4}$ of an hour

e 120 minutes

$120 \div 60 = 2.0$ hours

f 40 minutes

$40 \div 60 = 0.66$ hours

g 36 minutes

$36 \div 60 = 0.6$ hours

5 Complete the table below, which shows three journeys: A, B and C. You can use a calculator if you need to.

Trip	Distance (in kilometres)	Time (in hours)	Speed (in km/h)
A	325	3.25	100
B	13.5	0.15	90
C	200	2.5	80

Investigate speed

In this activity, each group will need two stopwatches and a tape measure. Decide on a distance and mark it off. Students then take turns to run and keep time. Each run is timed by two timekeepers.

1   Work outside in an open space in groups of five.

Student	Timekeeper A	Timekeeper B	Mean time taken	Speed in metres per second (Distance ÷ Time)

2   Now work out the mean time for each student. Record this in the table.

3   Then divide the distance in metres by the time in seconds to work out the speed in metres per second of each student. Record this in the last column of the table.

4   Rank the speeds in order from slowest to fastest.

   _____   _____   _____   _____   _____

5   How could you improve the accuracy of the results in a race timed like this one?

   _____

   _____

6   Linda walked for four hours at a mean speed of 5 km/h. How far did she walk?

   $d = 5 \times 4$

   $= 20 \text{ km}$

7   Ramon took four hours to cycle 58 km on Sunday. Work out his mean speed.

   Average speed $= 58 \div 4$

   $= 14.5 \text{ km/h}$

Temperature

1 Number these items from 1 to 6 (1 being the coldest and 6 the warmest).

a Water in pool _____3_____

b A block of ice _____1_____

c Melting ice-cream _____2_____

d A fire _____6_____

e A cup of freshly brewed tea _____5_____

f The palm of your hand _____4_____

2 Look at the temperature on each thermometer. Pay attention to the scale used.

50 °C   220 °F   93 °F   63 °C   17 °C   25 °F
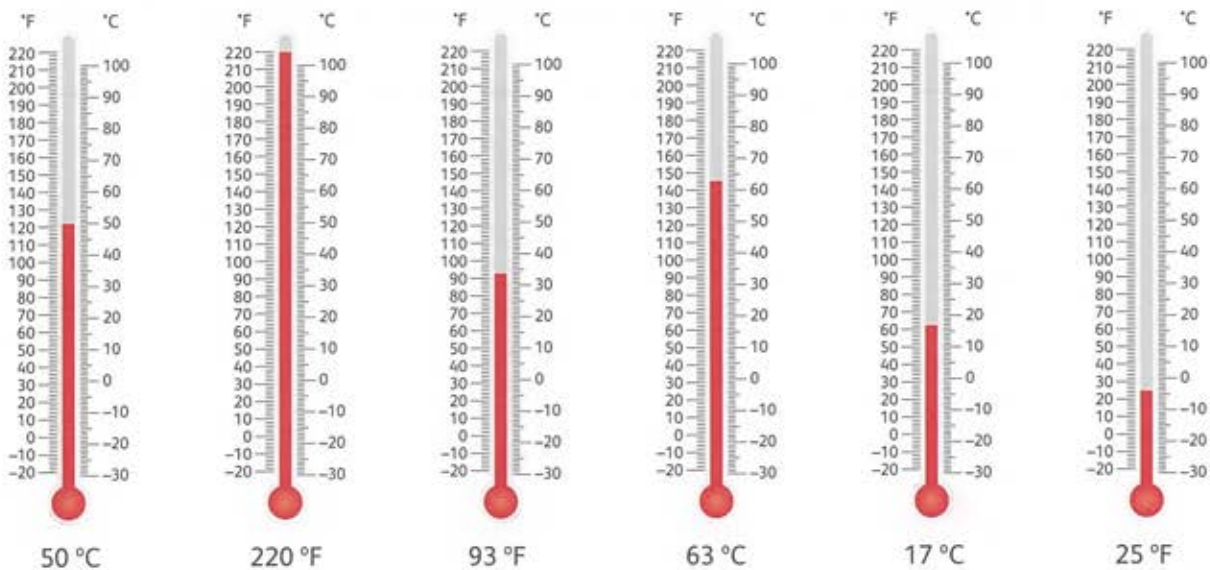
Write the temperatures in order from the coldest to the hottest.

__25°F__   __17°C__   __93°F__   __50°C__   __63°C__   __220°F__

3 Choose the most suitable temperature from the options given in brackets.

a The temperature of a healthy human body (37 °C/42 °C/35 °F) __37°C__

b The boiling point of water (100 °F/0 °C/100 °C) __100°C__

c The temperature inside your freezer (25 °F/–20 °C/10 °C) __25°F__

d The temperature at which we wash clothing (60 °F/60 °C/90 °C) __60°F__

e The temperature inside our classroom on a sunny day (68 °C/80 °F/52 °C) __80°F__

More temperature

1   Write the temperature shown on each thermometer. Then, for each thermometer, suggest something that might give that temperature reading.

a

<u>2 1°C</u>

_____

b

<u>9°C</u>

_____

c

<u>37°C</u>

_____

d

<u>−40°C</u>

_____

e

<u>0°C</u>

_____

f
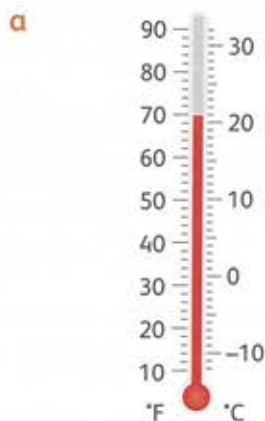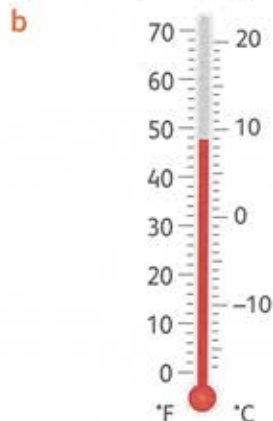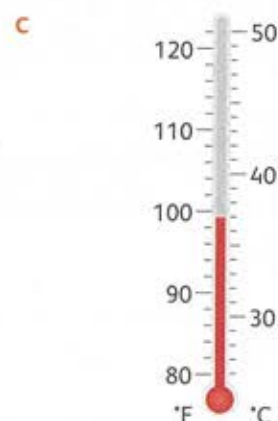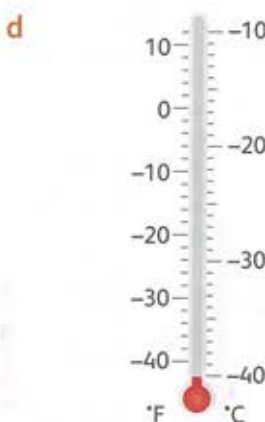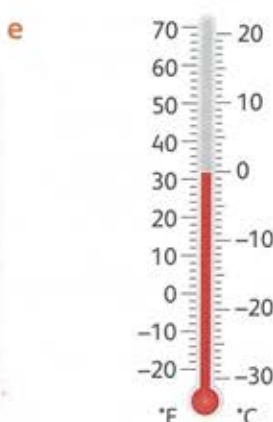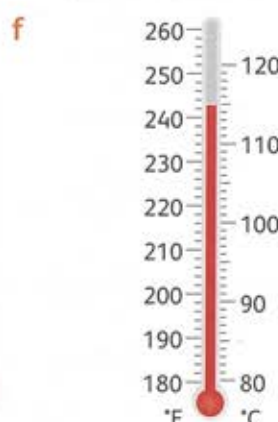
<u>115°C</u>

_____

2   Show each temperature on the thermometer.

a

0 °F

b

28 °C

c

55 °F

d

42 °C

(Student's Book page 158)
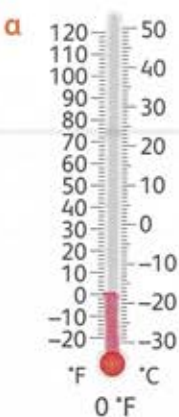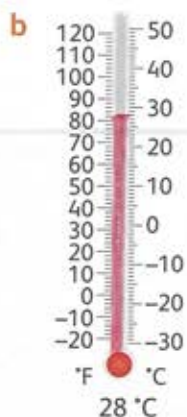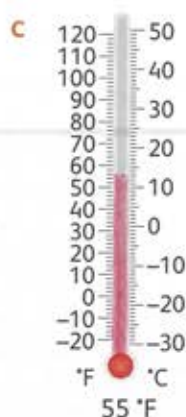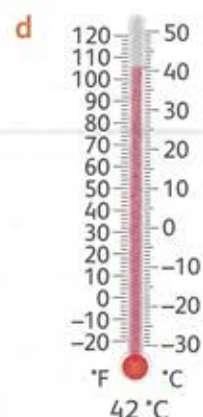
Tables and graphs

1 Complete this frequency table.

Games	Tallies	Frequency
Cricket	### ### ////	14
Tennis	### ////	9
Basketball	### ////	9
Football	### ### //	12

2 **a** Complete this frequency table.

Favourite ice-cream	Tallies	Frequency
Vanilla	### ###	10
Chocolate	////	4
Strawberry	### ### /	11
Pineapple	### ///	8

Favourite ice-cream

Vanilla	🧍🧍🧍🧍🧍
Chocolate	🧍🧍
Strawberry	🧍🧍🧍🧍🧍🧍
Pineapple	🧍🧍🧍
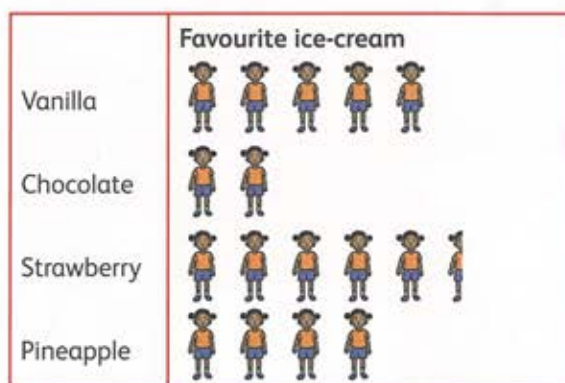
b Use the information from the frequency table in part **a** to complete the key for this pictograph.

Key

🧍 = 2 children 🧍 = 1 child

3 Yasmin did a survey of the students in her class to see how many have had various illnesses. She recorded the results in this frequency table.

a Complete the table.
b Write down what you can conclude from the data.

Most common illness is flu & the least common is whooping cough

Illness	Tallies	Frequency
Rubella	### ### ###	15
Chicken pox	### ### ////	14
Flu	### ### ### ### /	21
Measles	### ### ///	13
Whooping cough	###	5
Mumps	### /	6

Making sense of graphs

Books read		
Aliya	🎲🎲	
Anna	🎲🎲🎲	
Greg	🎲🎲🎲🎲	
Marcus	🎲🎲🎲🎲🎲	
Robert	🎲🎲🎲🎲	🎲 = 2 books

1   This pictograph shows how many books five children read in one month.

a   Who read the fewest books, and how many books did they read?

   Aliya read 4 books

b   Who read the most books, and how many books did this student read?

   Marcus read 9 books

c   Which students read an even number of books?

   Aliya, Anna & Robert.

d   Which students read an odd number of books?

   Greg & Marcus

e   Explain an easy way to tell whether the total was even or odd.

   Those ending with a half cube are odd. Full cube is even.

2   This graph shows the average daily temperature for each month of the year in Barbados.

Mean monthly temperature in Barbados

a   Which month has the lowest average temperature? *January*

b   Which month has the highest average temperature? *September*

c   Between which two months was there the greatest difference in temperature?

   September & October

d   Between which two months was there the smallest difference in temperature?

   January & February

e   The bar for June shows a temperature of 30 °C. Does that mean that every day in June had the same temperature? Explain your answer.

   No, that is the average temperature for the whole of June.

3 Look at this line graph and use the information to answer the questions.

Exchange rate: Jamaican $ to US$

Jamaican dollars needed to buy US$1
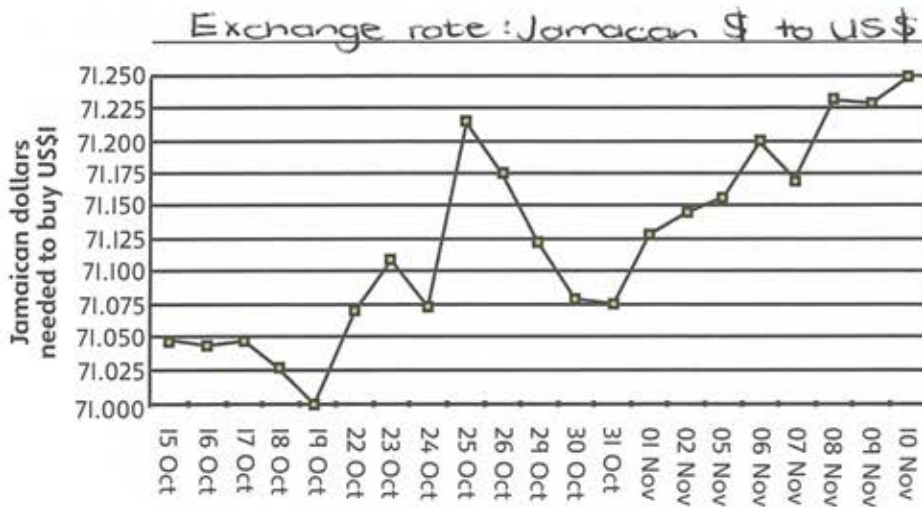
a Give the graph a suitable title.

b What do you call the value of one currency compared to another?

Exchange rate

c From 15 October to 10 November, US$1 could be exchanged for an amount between

_71.049_ and _71.250_ Jamaican dollars.

d Write the exact amount of Jamaican dollars, to the nearest cent, that you could buy for US$1 on:

i 15 October _$ 71.05_

ii 19 October _$ 71.00_

iii 26 October _$ 71.18_

e During which week did the value of the Jamaican dollar suddenly rise and then drop back

to its previous value? _24-31 Oct._

4 Look at the pie chart and answer the questions that follow.

a From which country do most visitors come?

United States

b Where do the second largest group of visitors come from?

Caricom

c What information would you need if you want to work out the actual number of visitors from each place?

Total number of visitors

Nationalities of visitors to Trinidad and Tobago

Rest of world 11%

Caricom 28%

United States 34%

Germany 2%

United Kingdom 14%

Canada 11%

Presenting results

A class of students in Anguilla did a science project to look at the way beaches changed from month to month as a result of waves, currents and tides. They took regular measurements of the beaches.

These graphs show their findings over a year. Use the graphs to help you answer the questions.

Graph showing erosion and accretion of sand at three beach sites over one year

1 a Between which months of the year did the students take their measurements?

March   to

December

b Describe what happened to the sand at each site – whether each beach accreted (gained sand), eroded (lost sand) or stayed the same.
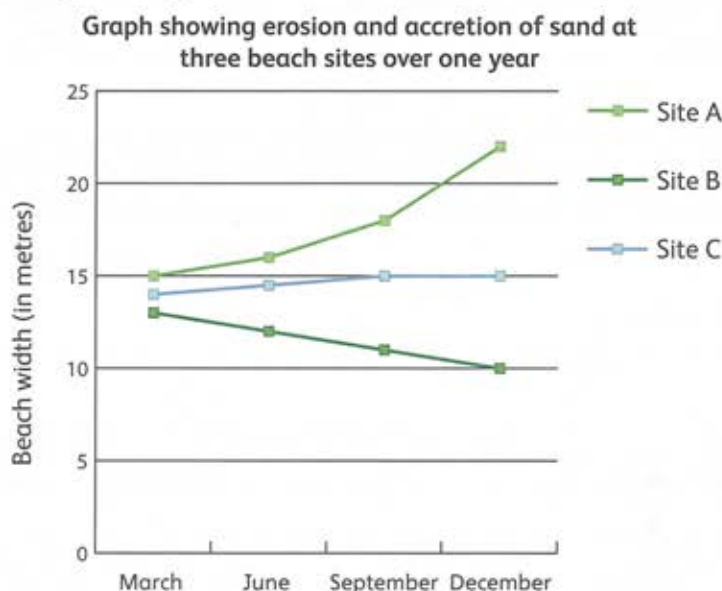
Site A _Width   of   the   beach   increased   (accreted)_

Site B _Width   of   the   beach   decreased   (eroded)_

Site C _Width   of   the   beach   stayed   the   same._

2 a Over what period did the students take measurements?

January   to

December

Graph showing changes in beach width over one year

b Explain how you think the width of the beach changes with the seasons, as the data in the graph shows.
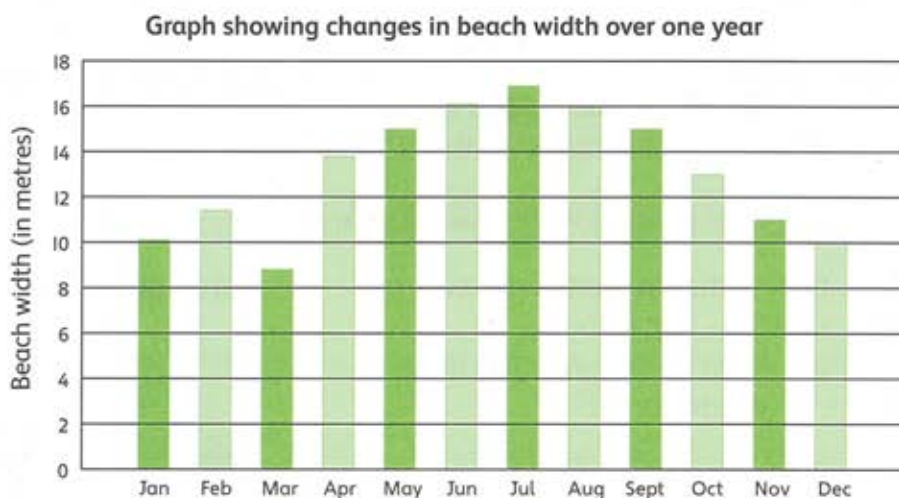
Beach   gains   more   sand   over   June-August   ✓

decreases   November – March.

3 Why did the students choose two different types of graphs to show the data sets?

One   graph   shows   different   sites   so   needs   to

be   a   line   graph. Bar   graph   was   used   for   only

one   site.

(Student's Book pages 165–166)

Analyse data

This table and graph give you some information about the number of medals that five countries won at the Summer Olympics from 2000 to 2016. Use the information to answer the questions.

Country	Total medals won				
	2000	2004	2008	2012	2016
USA	93	101	110	103	121
China	58	63	101	88	70
Great Britain	28	30	47	65	67
Russia	89	90	62	72	55
Germany	56	49	41	44	42

Total medals won
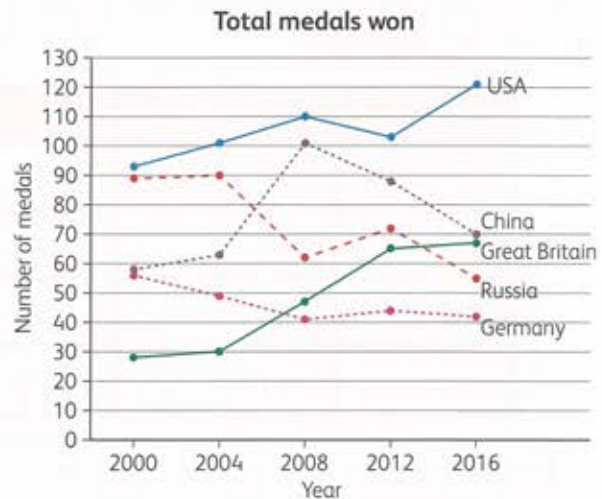
1   What is the difference between the highest and lowers number of medals the top 5 countries collected in 2016?

   $121 - 42 = 79$

2   What is the mean number of medals each country collected at the five different Olympic Games competitions?

   USA: 105.6

   China: 76

   Great Britain: 47.4

   Russia: 73.6

   Germany: 46.4

3   What trends does the graph show?

   There was an increase in medals for USA & Great Britain. The number of medals for China & Russia decreased a lot. Germany's medal count was fairly constant.

Use tables to draw graphs

Complete each table.

Draw a bar graph to show the data.

Remember to give each graph a clear title and label it correctly.

1   Favourite fruits

Fruits	Tallies	Number of children
Mangoes	### ### ### /	16
Bananas	### ///	8
Guavas	////	4
Pineapples	### ////	9

Fruit liked by children

2   Vehicles Tom saw in one day

Vehicles	Tallies	Number of vehicles
Cars	### ### ### ////	19
Buses	### ### ////	14
Bicycles	### ### ### /	16

Vehicles Tom saw in a day

(Student's Book pages 165–166)
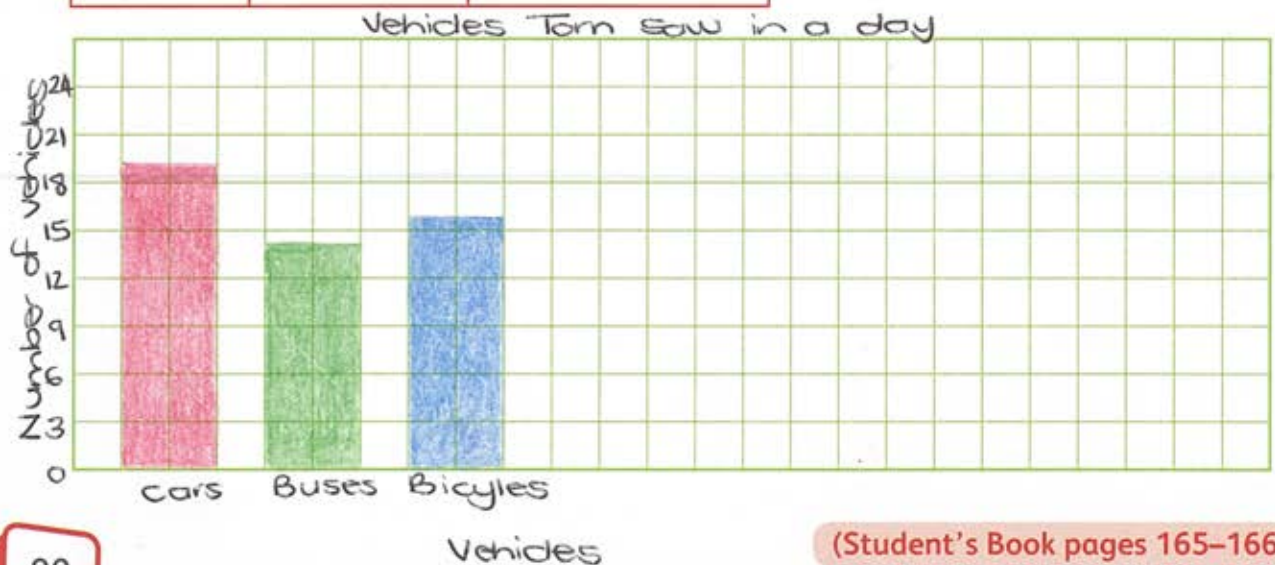
3 Favourite colours

Colours	Tallies	Number of children
Red	### ### /	11
Blue	### ### ###	15
Green	### ### ### /	16
Yellow	### ///	8

Favourite colours
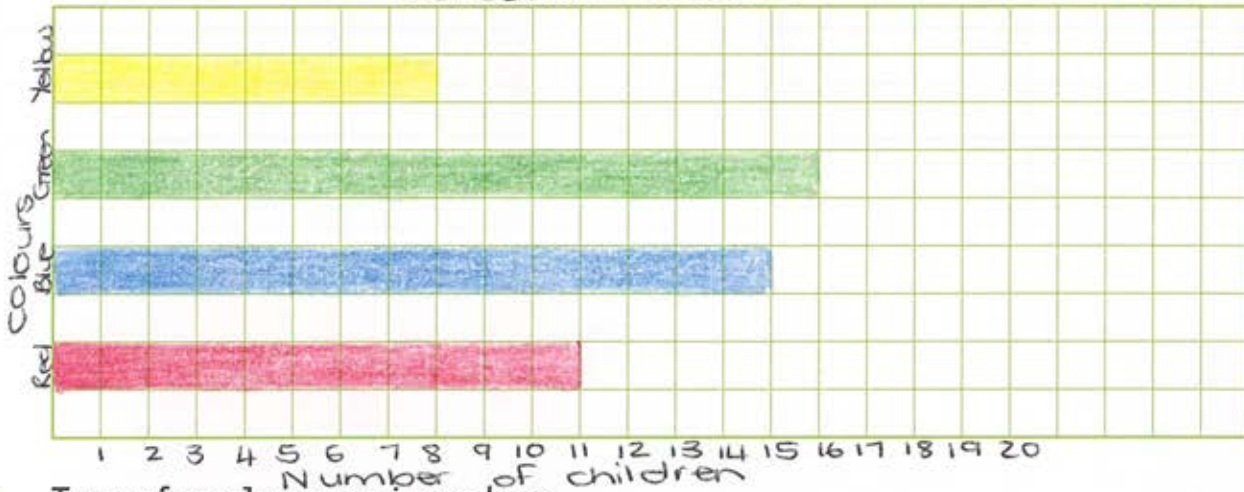
4 Types of cars Jenny saw in one hour

Type of car	Tallies	Number of cars
Honda	///	3
Ford	### /	6
Mazda		0
Nissan	### ### ### /	16

Types of cars Jenny saw in an hour
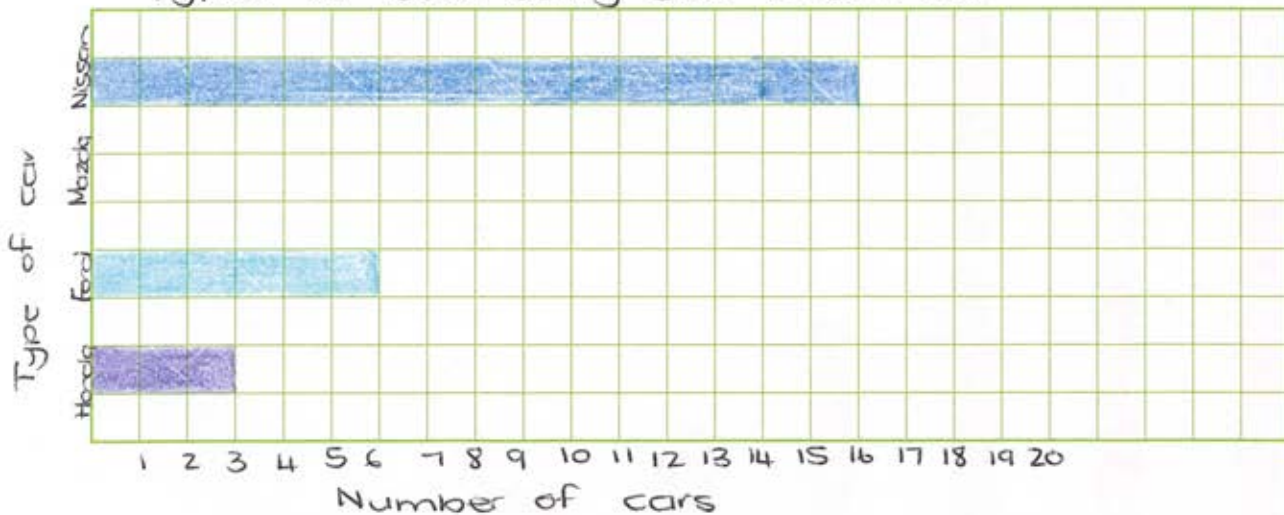
Double bar graphs

Draw a double bar graph to represent the Olympic medal data given.

2012 Olympic Games

Country	Gold medals
USA	46
China	38
Great Britain	29
Germany	11
Australia	7
Jamaica	4

2016 Olympic Games

Country	Gold medals
USA	46
Great Britain	27
China	26
Germany	17
Australia	8
Jamaica	6

Olympic Medals

KEY
— 2012
— 2016

Number of Gold Medals

USA China Great Britain Gemony Australia Jamaica

Countries

(Student's Book pages 165–166)
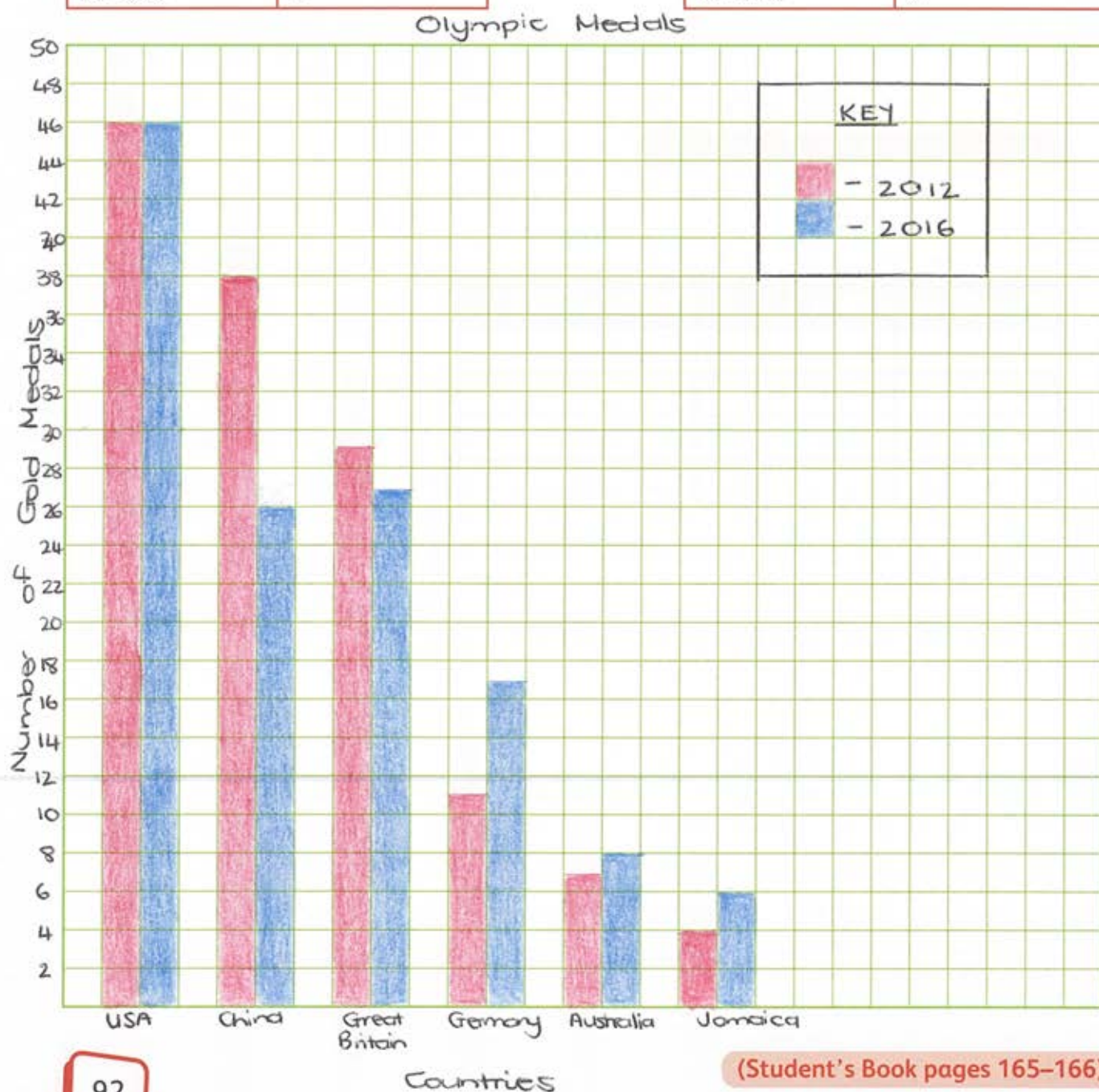
Line graphs

1 Draw a line graph to represent this set of data.

Height of a plant over one year

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Measurement in cm	0	2	5	12	15	22	30	31	32	35	35	36

First mark the units on the axes of your graph. Then plot the points.
Join the points using a pencil and a ruler.
Don't forget to label the axes and the graph.

Height of a plant over a year

2 This table shows the mean monthly wave height in metres on a beach in Anguilla for one year.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Wave height in m	1.2	1.2	1.0	1.1	0.5	0.5	0.4	0.4	0.3	0.7	0.9	1.0

Use a scale of 1 cm = 0.2 m on the vertical scale and draw a line graph to show this data set.

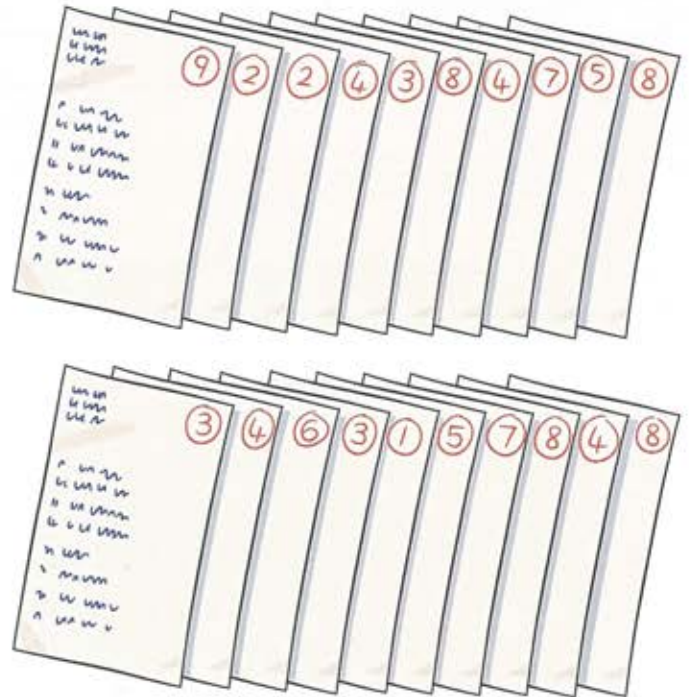Mean monthly wave height (beach in Anguilla)
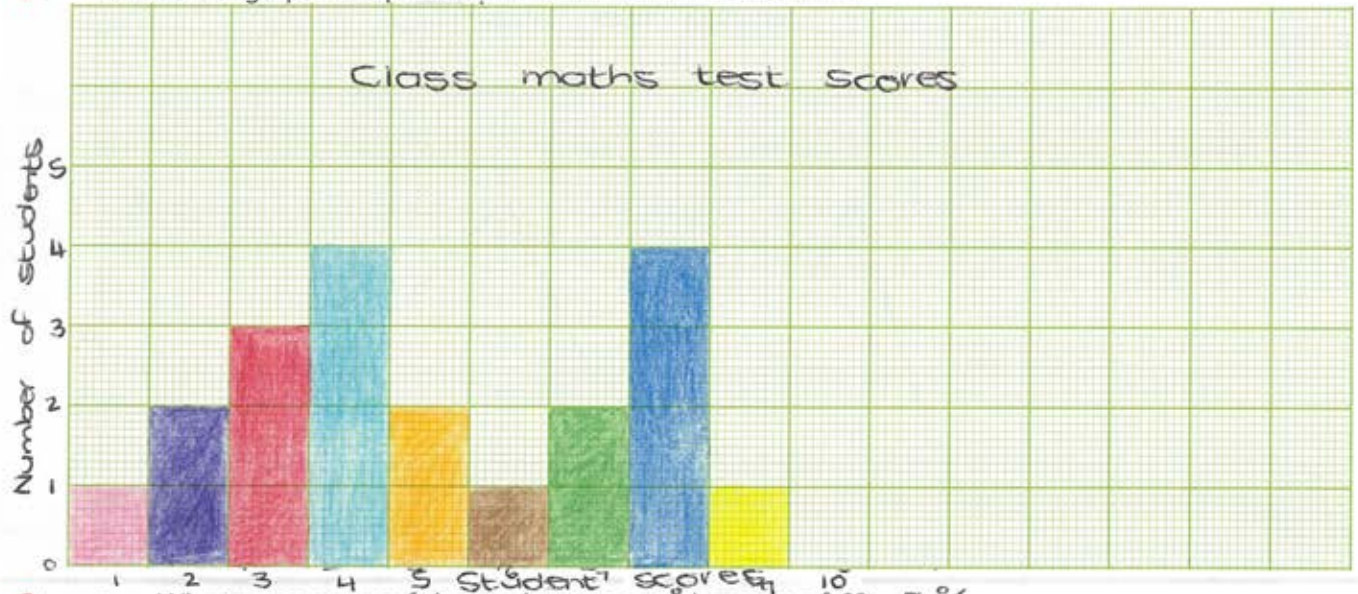
93

Solve problems with graphs

There were 20 students in a class. They received these scores in a mathematics test.

1 Complete this table to organise the data.

Score	Tallies	Frequency
1	l	1
2	ll	2
3	lll	3
4	llll	4
5	ll	2
6	l	1
7	ll	2
8	llll	4
9	l	1
10		0

2 Draw a bar graph to represent the information in the table.

Class maths test scores

3 **a** What percentage of the students received a score of 6? __5 %__

b What percentage of the class received a score above 6? __35%__

c What was the average score? __5__

d Find the sum of the percentages in parts **a** and **b**. __40%__

Probability

1   I have 100 counters in a bag. 10 are blue, 10 are green and 80 are red. Say whether each outcome is likely, unlikely, certain or impossible.

    a   I take 1 counter from the bag, and it is red. __Likely__

    b   I take 30 counters from the bag, and some are green, some are red, and some are blue.

       __Certain__

    c   I take 20 counters from the bag, and they are all the same colour. __Likely__

    d   I take 90 counters from the bag and they are all the same colour. __Impossible__

    e   I take 20 counters from the bag, and some of them are red. __Likely__

    f   I take 10 counters from the bag and all of them are blue. __Likely__

    g   I take 10 counters from the bag and most of them are red. __Likely__

    h   I take 5 counters from the bag and one of them is gold. __Impossible__

2   I put five counters in a bag: one red, two yellow and two blue. Without looking, I pull out one counter. What is the probability that the counter is:

    a   red?   __1 in 5__ / $\frac{1}{5}$ / 20%

    b   yellow? __2 in 5__ / $\frac{2}{5}$ / 40%

    c   blue?   __2 in 5__ / $\frac{2}{5}$ / 20%

   (You can write your answers as fractions or percentages.)

3   For each event, write how many possible outcomes there are, and list them.

| Event	Number of possible outcomes	List of possible outcomes
Tossing a coin	2	Heads Tails
Throwing a dice	6	1 3 5 2 4 6
Drawing a counter from a bag containing 5 red counters and 5 blue counters	2	Red Blue
Drawing 2 counters from a bag containing 5 red and 5 blue counters	2	Red Blue

More probability

1 Colour in each spinner to create the probabilities given.

  a 3 in 4 probability of landing on red
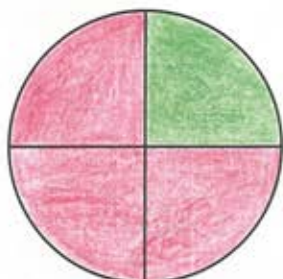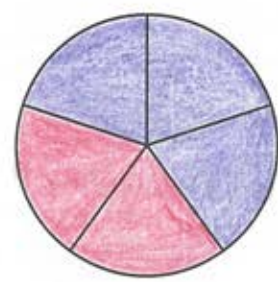
  b $\frac{1}{3}$ probability of landing on red
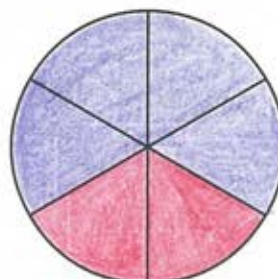
  c 3 in 8 probability of landing on green

  d 40% probability of landing on red

2 Match each description to the probability.

Fairly likely	Zero
Impossible	$\frac{1}{2}$
Highly likely	1
Even chance	$\frac{9}{10}$
Possible but unlikely	$\frac{7}{10}$
Certain	$\frac{1}{100}$

3 Write an everyday event to match each of these probabilities.

  a 50% _____

  b $\frac{1}{20}$ _____

  c $\frac{3}{4}$ _____

  d 100% _____

  e 0% _____

(Student's Book page 167)

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