Unit 11: Decimals (2)

Lesson 1: Making a whole

→ pages 6–8

1. a) 0·2 + 0·8 = 1 c) 0·48 + 0·52 = 1
b) 0·9 + 0·1 = 1 d) 0·07 + 0·93 = 1

2. a) 0·61 b) 0·87

3. a) 0·3 + 0·7 = 1; missing part is seven 0·1 counters
b) 0·1 + 0·5 + 0·4 = 1; missing part is five 0·1 counters
c) Different answers possible but two missing numbers must total 0·8; for example: 0·1 + 0·2 + 0·7; missing parts to show numbers chosen (using 0·1 counters)

4. a) 0·4 c) 0·68
b) 0·16 d) 0·91

5. a) 0·23 + 0·77 = 1
b) 1 = 0·11 + 0·89
c) Different answers possible but two missing digits must total 10; for example:
1 – 0·61 = 0·39
d) Different answers possible but two missing digits must total 9; for example:
0·86 = 1 – 0·14

6. a) Different arrangements are possible but 0·3 must be in the centre; 0·5 and 0·2 complete a row/column; 0·6 and 0·1 complete a column/row; for example:

	0·6	
0·5	0·3	0·2
	0·1	

b) Different arrangements are possible but 0·48 must be centre number; 0·2 and 0·32 complete a row/column; 0·23 and 0·29 complete a column/row; for example:

	0·23	
0·32	0·48	0·2
	0·29	

Reflect

Possible calculations: 0·1 + 0·9 = 1, 0·2 + 0·8 = 1, 0·3 + 0·7 = 1 … 0·9 + 0·1 = 1 (some children may include 0 + 1 = 1 and 1 + 0 = 1)

Using number bonds to 10 and dividing each number by 10 would give these calculations.

Lesson 2: Writing decimals

→ pages 9–11

1. a) 6·8 c) 10·5
b) 7·09 d) 0·04

2. Missing section in model: 0·4
3·49 = 3 ones + 4 tenths + 9 hundredths

3. Image A does not represent 0·12.

4. Missing elements in table completed:
a) 7·21
b) 2 tens + 9 ones + 3 tenths + 4 hundredths 29·34
c) 1 hundred + 5 ones + 6 tenths 105·6
d) 17·01
e) 0·53
f) 0·53
Children should notice that e) and f) are both 0·53; this is because 1 tenth equals 10 hundredths and so 5 tenths are equal to 50 hundredths, i.e. 0·53 = 5 tenths and 3 hundredths = 53 hundredths.

5. Mo = 4·27, Emma = 4·24, Danny = 8·24 (assuming that each number is chosen by only one child)

6. Zac = 54·6, Ambika = 3·77, Luis = 53·96

Reflect

Lee is not correct; the number is 30·47 which is not a 3-digit number. The number contains 4 digits, even though one of the digits is a zero.

Lesson 3: Comparing decimals

→ pages 12–14

1. a) Circled: 9·9 9·5 < 9·9
b) Circled: 8·31 8·13 < 8·31
c) Circled: 20·06 20·06 > 20·05
d) Circled: 100·52 100·25 < 100·52

2. Richard needs to consider the position of the counters in the place value grid, not the number of counters overall. Both numbers have 3 ones, but 3·21 has 2 tenths whereas 3·07 has 0 tenths. So, 3·21 is bigger than 3·07 (3·21 > 3·07).

3. 0·23 < 0·32

4. a) 4·56 < 4·72
b) 12·9 < 18·7
c) 9·45 > 9·05
d) 3·18 > 3·12
e) 26·39 < 27·49
f) 120·26 = 120·26
g) 3 tenths + 5 hundredths < 5 tenths + 4 hundredths

5. a) Different answers possible:
6·04, 6·14, 6·24, 6·34. 6·44, 6·54, 6·64
b) Different answers possible; for example:
2·03 < 2·34, 2·13 < 2·35, 2·23 < 2·36,
2·33 < 2·37 …
c) Different answers possible but whole number part of each number must be 19; for example:
19·25 < 19·31, 19·35 < 19·42, 19·45 < 19·53 …

6. Different answers possible:
29·93, 29·94, 29·95, 29·96, 29·97, 29·98, 29·99, 30·00, 30·01, 30·02

Reflect

Isla should start with the tens.

Then she should look at the ones.

Then she should look at the tenths and then the hundredths.

Lesson 4: Ordering decimals

➜ pages 15–17

1. 6·7, 7·2, 7·9

2. a) 10·97 (bottom left)
b) 10·97 > 10·79 > 10·09 > 10·07

3. a) 7·42, 27·24, 27·48, 72·45
b) 5·94, 5·49, 4·59, 4·53

4. List D is not in ascending order.

5. Aki is incorrect; the numbers are ordered biggest to smallest not smallest to biggest.

6. a)

Name	Time (in seconds)
Andy	27·79
Mo	28·02
Lee	28·24
Danny	28·42
Ebo	29·53

b) Andy was the fastest.
c) Ebo was the slowest.

7. Different answers possible; for example:
4·01, 4·19, 5·01, 5·02, 5·12 (check that numbers are in ascending order)

Reflect

0·62 and 0·65 both have 6 tenths but 0·62 has 2 hundredths whereas 0·65 has 5 hundredths, so 0·65 is bigger than 0·62. 0·71 has 7 tenths which is more than 6 tenths, so 0·71 is bigger than both 0·62 and 0·65. Thus 0·62 < 0·65 < 0·71.

Lesson 5: Rounding decimals

➜ pages 18–20

1. a) 2·7 is between 2 and 3.
2·7 rounded to the nearest whole number is 3.
b) 10·3 is between 10 and 11.
10·3 rounded to the nearest whole number is 10.
c) 28·3 is between 28 and 29.
28·3 rounded to the nearest whole number is 28.

2. a) 9·6 rounded to the nearest whole number is 10.
b) 20·8 rounded to the nearest whole number is 21.

3. a) 5 e) 50
b) 13 f) 150
c) 65 g) 400
d) 0 h) 90

4. Mo's number cannot be 55·5 since this will be 56 when rounded to the nearest whole number.

5. a) 4·9 rounded to the nearest whole number is 5.
b) 8·5 rounded to the nearest whole number is 9.
c) Possible missing digit: 1, 2, 3 or 4 (or 0)
d) Possible answers: 22·5, 22·6, 22·7, 22·8, 22·9, 23·0, 23·1, 23·2, 23·3 or 23·4

6. Possible answers: 80·3 or 80·4

Reflect

Look at the tenths to see whether to round down to the nearest whole number or to round up. If there are 4 or less tenths round down and if there are 5 or more tenths round up. There are 6 tenths in 43·6 and since this is 5 or more tenths then 43·6 is rounded up to 44.

Lesson 6: Halves and quarters

➜ pages 21–23

1. a) $0{\cdot}25 = \frac{1}{4}$ (or an equivalent fraction; for example: $\frac{25}{100}$)
b) $0{\cdot}50 = \frac{1}{2}$ (or an equivalent fraction; for example: $\frac{50}{100}$)

2. a) 75 squares shaded
b) $\frac{3}{4} = 0{\cdot}75$

3. a) $\frac{1}{4} = 0{\cdot}25$ c) $\frac{3}{4} = 0{\cdot}75$
b) $\frac{2}{4} = 0{\cdot}5$ d) $\frac{1}{2} = 0{\cdot}5$

4. a) 1 square shaded
b) 12 squares shaded
c) 6 squares shaded

5. Bella is correct; 0·5 is equivalent to $\frac{1}{2}$ and so Zac and Emma have the same number of apples (6 each).

6. 0·25 is equivalent to $\frac{1}{4}$. $\frac{1}{4}$ = 6 counters. Thus, the total number of counters is 6 × 4 = 24. Hence there are 24 – 6 = 18 grey counters.
Lee has 18 grey counters.

Reflect

Grid should show 75 squares shaded which are 75 hundredths ($\frac{75}{100}$), which is equal to 0·75.

Lesson 7: Problem solving – decimals

→ pages 24–26

1. 1 kg = 1,000 g
3 kg = 3,000 g
8,600 g = 8 kg and 600 g
5,300 g = 5 kg and 300 g

2. 2 kg 200 g   2 kg   200 g   2 g

3. Circled:
a) 1,000 ml   c) 8 litres
b) 1 l 500 ml   d) 2,030 ml

4. 3 children are tall enough to go on the ride.

5. The width of the football field is 300 metres.

6. a) 500 m
b) 6 km and 300 m
c) 5,700 m
d) 3,500 m
e) 3,050 m

7. a) 800 ml
b) 2,950 g
c) 1 kg and 700 g

8. 102 millilitres < 450 ml < $\frac{1}{2}$ a litre (500 ml) < 0·25 of 4 litres (1,000 ml) < 1 l 200 ml (1,200 ml)

Reflect

Explanations will vary but children should recognise that you need to multiply by 1,000 since 1 litre = 1,000 ml, 1 kg = 1,000 g and 1 km = 1,000 m.

End of unit check

→ pages 27–28

My journal

Same: All numbers are decimals and contain the digits 2 and 7. 7·2 and 7·20 have the same value.

Different: The values of the digits are different for the cards 7·20 and 0·27.

Power puzzle

Container	Number of litres the container holds
glass	0·2 l
jug	1 l
bucket	7 l
barrel	140 l
paddling pool	1,120 l

It would take 5,600 glasses to fill the paddling pool.

Unit 12: Money

Lesson 1: Pounds and pence

➜ pages 29–31

1. a) 159 pence b) 254 pence c) 109 pence

2. a) 2 pounds 76 pence
b) 4 pounds 25 pence
c) 7 pounds 8 pence

3. Notes/coins circled:
a) £5, £2, £1, 50p, 20p and 2p
b) £10, £2, 10p, 5p, 2p and 1p

4. Missing amounts:
a) 78p c) 195p
b) £3 and 67p d) 1,095p

5. a) £1·97 b) £4·06 c) £2·40

6. a) £2·58 f) 895p
b) £3·70 g) 209p
c) £4·08 h) 290p
d) £12·57 i) 1,115p
e) 118p j) 900p

7. Box A = £3 Box C = £3·10
Box B = £30 Box D = £29

Reflect

£3·18; £3 and 18 pence; 318p

Lesson 2: Pounds, tenths and hundredths

➜ pages 32–34

1. a) 27p = £0·27
b) 98p = £0·98
Different methods possible; some may count the number of squares with coins in, possibly counting in 10s. Another way is to subtract the empty squares from 100, i.e. 100 – 2 = 98.

2. a) 40p = £0·40 b) 90p = £0·90

3. a) £0·72 b) £2·40 c) £2·04

4. Coins circled:
a) Four possible combinations:
20p, 5p and 2p
20p, 5p, 1p and 1p
10p, 10p, 5p and 2p
10p, 10p, 5p, 1p and 1p
b) Four possible combinations:
£1, 20p and 10p
£1, 20p, 5p, 2p, 1p, 1p and 1p
£1, 10p, 10p and 10p
£1, 10p, 10p, 5p, 2p, 1p, 1p and 1p
c) Two possible combinations:
£1, 2p and 1p
£1, 1p, 1p and 1p

5. Aki is incorrect; he has £4·30, and he has counted the coins correctly but written the money notation incorrectly. When writing an amount of money in pounds and using the decimal point, you should always have two digits after the decimal point. So, there needs to be a zero after the 3 in this case, i.e. £4·3 should be written as £4·30.

6. a)

$\frac{3}{10}$ of £1	$\frac{3}{100}$ of £1	$\frac{73}{100}$ of £1	$\frac{9}{10}$ of £1	$\frac{90}{100}$ of £1
30p	3p	73p	90p	90p

b) Amal gets £0·40 change.

Reflect

Answers will vary; for example:

Same: Both amounts are made using the digits 1, 3 and 0. Both amounts have 1 pound.

Different: The amounts have different values for the pence since the 0 and 3 are in different places, so the first amount is £1 and 30 pence whereas the second amount is £1 and 3 pence.

Lesson 3: Ordering amounts of money

➜ pages 35–37

1. a) Circled: yo-yo
Explanations may vary; for example:
It is the only item with 0 pounds so must be the least expensive.
b) Circled: headphones
Explanations may vary; for example:
I converted all the prices to pence and then compared.

2. Circled: crocodile toy bucket and spade eraser

3. a) 72p > 50p £2 < £8
72p < 500p £2 = 200p
72p > 5p £2 < £2·05
72p < £5 £2 > 195p
b) Seven pounds eighty pence > £7·09
£5·99 < six pounds

4. a) £0·25 £2·05 255 pence £5·25
b) £0·84 408 pence 4 pounds eighty pence £8·04 £8·40

5. a) eight pounds ninety pence £0·99 98 pence £0·89
b) 11 pounds £1·11 110 pence 1 pound 1 pence £0·01

6. Missing digits:
a) 5 or 6
b) 8 or 9
c) 5 or 6
d) 5, 6, 8 or 9

7. Isla ➜ £3·50
Amelia ➜ £5·30
Richard ➜ 385 pence
Max ➜ 5 pounds and 3 pence

Reflect

Isla is incorrect; to make a comparison she needs to use the same units of either pounds or pence. 3 pounds = 300 pence.

257 < 300

Lesson 4: Rounding money

➜ pages 38–40

1. a) £2
b) £3
c) £10
d) Number line marked from £12 to £13
£12·70 rounded to the nearest pound is £13.

2. a) £2·40 b) £0·80

3.

Item	Price rounded to the nearest £1	Price rounded to the nearest 10p
Hat £1.95	£2	£2 (or £2·00)
Shoes £8.24	£8	£8·20
Shorts £3.50	£4	£3·50

4. Circled: ball and towel

5. Answers will vary; accept any answer between £2·45 and £2·54.

6. Yes, if the price of the baseball caps was in the range £4·45 to £4·49.

Reflect

To round to the nearest £1, look at the digit in the ten pence position (tenths in terms of place value); the 8 represents 80p and this is closer to 100p than 0p, so the amount should be rounded up to the next pound. £3·89 therefore rounds up to £4 when rounded to the nearest pound.

To round to the nearest 10p, look at the digit in the one pence position (hundredths in terms of place value); the 9 represents 9 pence, and this is closer to 10p than 0p, the amount should be rounded up to the next ten pence. £3·89 therefore rounds up to £3·90 when rounded to the nearest 10p.

Lesson 5: Using rounding to estimate money

➜ pages 41–43

1. a) £1·56 rounded to the nearest £1 is £2.
£4·12 rounded to the nearest £1 is £4.
£2 + £4 = £6
An estimate of the total cost is £6.
b) £1·56 rounded to the nearest 10p is £1·60.
£4·12 rounded to the nearest 10p is £4·10.
£1 + £4 = £5
60p + 10p = 70p
So £5 + 70p = £5·70
An estimate of the total cost is £5·70.
c) The estimate of £5·70 is more accurate because rounding to the nearest 10p is closer to the original amount.

2. Sugar = 70p; coffee = £3·60
An estimate of the total cost is £4·30.

3. Cake = £2; water = £1; rucksack = £4. Total cost is £7.
Max has an over estimate, since all prices have been rounded up.

4. £7·49

5. To the nearest £1,000 the car costs £8,000. Sofia has savings of about £2,000.
£8,000 – £2,000 = £6,000
I estimate Sofia needs to save £6,000.

6. Explanations will vary; for example:
When rounding to the nearest pound, each of these items is rounded down. So, Lexi's estimate of £19 for the total cost is an underestimate and the actual total will be more than this. This means that the actual cost could be over £20, which would mean Lexi would not have enough money.

Reflect

Suggestions may vary; for example:

An advantage with rounding to the nearest pound is that it is easy to add the amounts since it involves adding whole numbers.

A disadvantage is that it is not as accurate as rounding to the nearest 10 pence and could produce an under estimate.

Lesson 6: Problem solving – pounds and pence

➜ pages 44–46

1. a) £4·55
b) £5 and 37p
c) £5 + £4 = £9
55p + 37p = 92p
£9 and 92p = £9·92
Max and Olivia have £9·92 in total.

2. £2·45 = £2 and 45p
£1·59 = £1 and 59p
£2·45 + £1·59 = £3 and 104p = £3 + £1 + 4p = £4·04
Jamilla spends £4·04 in total.

3. a) £32·56 b) £5·67

4. £2·15

5. £3·65

6. £13·35 + £7·40 = £20·75
£25 – £20·75 = £4·25
The minimum number of coins Lexi will get in her change is 4 (£2 + £2 + 20p + 5p).

Reflect

Methods may vary.

£2·55 + 70p + £1·68 = £4·93

Richard spends £4·93 so he will get £0·07 or 7p change if he pays with a £5 note.

Lesson 7: Problem solving – multiplication and division

➜ pages 47–49

1. 3 × £1 = £3 3 × 26p = 78p
£3 and 78p = £3·78
3 glasses of milk cost £3·78.

2. a)
$$\begin{array}{cccc} & & 4 & 8 \\ \times & & & 7 \\ \hline & 3 & 3 & 6 \\ \hline & & {\scriptstyle 5} & \end{array}$$
48p × 7 = 336p
336p = £3·36

b)
$$\begin{array}{cccc} & & 9 & 2 \\ \times & & & 5 \\ \hline & 4 & 6 & 0 \\ \hline & & {\scriptstyle 1} & \end{array}$$
5 × 92 = 460p
460p = £4·60

3. a) £3·18 × 6 = £19·08
b) 5 × £7·49 = £37·45

4. a) 160p ÷ 4 = 40p 12p ÷ 4 = 3p
40p + 3p = 43p
A scone costs 43p.
b) 1 ruler costs £0·43.
(This is the same calculation as a) but with the price written in pounds rather than pence.)

5. a) £0·92 b) £1·38

6. $\frac{1}{3}$ of £9·72 = £3·24
$\frac{2}{3}$ = 2 × £3·24 = £6·48
$\frac{2}{3}$ of £9·72 = £6·48

7. Assuming that burgers and buns can be bought individually:

3 burgers costs £4·62, so 12 cost £4·62 × 4 = £18·48

1 bread bun costs £1·20 ÷ 5 = £0·24, so 12 cost £0·24 × 12 = £2·88

£18·48 + £2·88 = £21·36

The total cost is £21·36.

Reflect

Answers will vary; the easiest way is to round one book up to £8 and find the approximate cost of 8.

£8 × 8 = £64

The price of each book has been rounded up by 1p for each book, so this cost is 1p × 8 = 8p over.
£64·00 – £0·08 = £63·92

Lesson 8: Solving two-step problems

➜ pages 50–52

1. a) 4 × 17p = 68p 4 × 23p = 92p
68p + 92p = 160p = £1·60
The total cost is £1·60.
b) 23p + 17p = 40p
4 × 40p = 160p = £1·60
The total cost is £1·60.
c) The method used in part b) is more efficient. This is because when you add the price of one lemon and one pepper the answer is a multiple of 10 so it is easy to multiply.

2. 3 × 80p = £2·40
£2·40 + 0·45 = £2·85
Tom spends £2·85.

3. Yes. Explanations may vary; for example:
Each pen costs less than 50p. The ruler and the paperclip each cost less than 40p. So, the items altogether will cost less than 50p + 50p + 40p+ 40p, which is £1·80.
Others answers could involve adding exact amounts:
0·35 + 0·96 + 0·32 = £1·63

4. Carrots = 32p each onions = 18p each
32p = 18p = 50p
The total cost of buying a carrot and an onion is 50p.

5. The football costs £7. (The toy train costs £11.)

Reflect

Answers will vary depending on children's previous experience and levels of confidence.

Lesson 9: Problem solving – money

➜ pages 53–55

1. 5 × 84p = 420p = £4·20
   Andy gets £0·80 change.
2. a) If the bars of chocolate cost £1 each he would pay £8 for 8 bars and get £2 change. Since Max received more than £2 change the bars of chocolate must cost less than £1 each.
   b) £10 = 1,000p, £3·52 = 352p
   1,000p – 35p2 = 648p
   648p ÷ 8 = 81p
   A bar of chocolate costs £0·81.
3. It is cheaper to pay for 6 throws at £1·20 because this costs 20p for each throw compared with 25p a throw when paid for individually.
4. Power Cabs: £3 + (8 × £0·40) = £3 + £3·20 = £6·40
   A1 Cars: 9 × £0·70 = £6·30
   The least expensive taxi company for Sofia is A1 Cars.
5. £2·67 + £5·75 = £8·42
6. No, Amelia is not correct.
   Buying individual buns is 4 × £0·60 = £2·40, but you get 1 free so the cost is £2·40 for 5, compared with the pack of 5 at £2·50.

Reflect

Answers will vary. 4 bread rolls at 55p each = 4 × £0·55 = £2·20, so the price children suggests for 4 rolls must be less than £2·20.

End of unit check

➜ pages 56–57

My journal

Ebo will need to convert the amounts to pence (£1·34 = 134p). He can then add 134 + 72 = 206p = £2·06.

Power puzzle

1. A toaster costs £24.
   A kettle costs £48.
2. The radio costs £85.
3. A pair of speakers cost £51.
   A pair of headphones costs £17.
   A camera costs £87.
   headphones (£17) < toaster (£24) < kettle (£48)
   < speakers (£51) < radio (£85) < camera (£87)
   < laptop (£425)

Unit I3: Time

Lesson I: Units of time (I)

→ pages 58–60

1. a)

I minute 45 seconds

I minute	45 seconds
$\boxed{60}$ seconds	$\boxed{45}$ seconds

60 seconds + 45 seconds = I05 seconds

b)

3 hours I2 minutes

I hour	I hour	I hour	I2 mins
60 minute	60 minute	60 minute	I2 mins

3 × 60 minutes = I80 minutes

I80 minutes + I2 minutes = I92 minutes

c)

I57 seconds

I minute	I minute	37 secs
60 seconds	60 seconds	37 secs

2 minutes 37 seconds

2.

1 × 6 = 6	1 × 60 = 60	1 hour = 60 minutes
2 × 6 = 12	2 × 60 = 120	2 hours = 120 minutes
3 × 6 = 18	3 × 60 = 180	3 hours = 180 minutes
4 × 6 = 24	4 × 60 = 240	4 hours = 240 minutes
10 × 6 = 60	10 × 60 = 600	10 hours = 600 minutes

3. a) Completed in Practice Book
b) 1 hour and 35 minutes
c) 2 hours and 25 minutes

4. Ella's dad finished the marathon 130 minutes after the winner.

5. 3,600 drops will be in the bowl after 1 hour (60 × 60).

Reflect

Different methods are possible; for example:

There are 60 minutes in 1 hour.
152 – 60 = 92
92 – 60 = 32
So, there are 2 hours and 32 minutes in 152 minutes.

Lesson 2: Units of time (2)

→ pages 61–63

1. a)

2I days

$\boxed{7}$ days	$\boxed{7}$ days	$\boxed{7}$ days

2I ÷ 7 days = 3 weeks

The orange juice should be used within 3 weeks.

b)

3 weeks and 5 days

$\boxed{I}$ week	$\boxed{I}$ week	$\boxed{I}$ week	$\boxed{5}$ days
$\boxed{7}$ days	$\boxed{7}$ days	$\boxed{7}$ days	$\boxed{5}$ days

3 × 7 days + 5 days = 26 days

The parcel should be delivered in 26 days.

c)

36 months

I2 months	I2 months	I2 months
I year	I year	I year

3 years

The toy is suitable for children over 3 years old.

2. Lines drawn to match
4 years → 48 months
12 weeks → 84 days
2 years → 730 days
6 weeks 6 days → 48 days
7 months → about 30 weeks

3. Lee has calculated 53 × 7 = 371. This would tell you the number of days in 53 weeks.
To find the number of weeks in 53 days, Lee should have calculated 53 ÷ 7 to get the answer 7 weeks and 4 days.

4. a) 5 weeks + 13 days = 6 weeks 6 days
b) 38 months – 2 years = 14 months

5. Explanations completed:
months in a number of years, multiply by 12.
years in a number of months, divide by 12.
days in a number of weeks, multiply by 7.
weeks in a number of days, divide by 7.

6. Answers will vary; for example:
9 years, 11 weeks and 4 days
9 × 365 + 2 extra days in leap years = 3,287
11 × 7 = 77
3,287 + 77 + 4 = 3,368
I am 3,368 days old.

Reflect

Explanations may vary; for example:

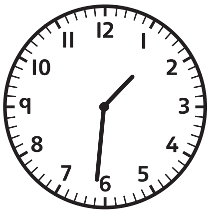
I can find the answer by dividing 20 by 12 and writing the remainder as months.

20 ÷ 12 = 1 r 8, so 20 months is 1 year and 8 months.

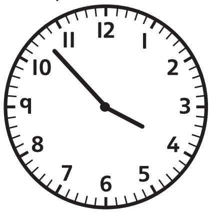
Lesson 3: Converting times (I)

➜ pages 64–66

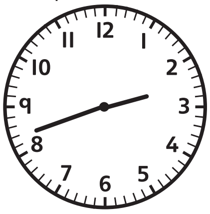
1. a) 1:31 am



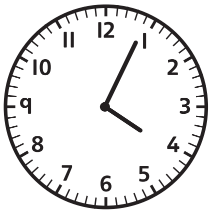
c) 3:53 pm



b) 2:42 pm



d) 4:04 am

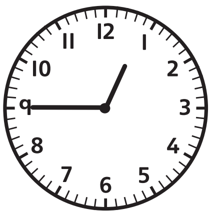


2. The correct digital time is 10:58.
Emma has mistakenly read the number each hand is closest to.
Max has correctly read the minutes as 58 but incorrectly read the hours as 11 because the hour hand is almost at 11.

3. a)

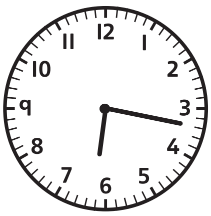
2:12 am

b)



12:45 pm

c)

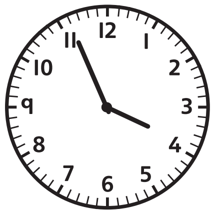


6:17 pm

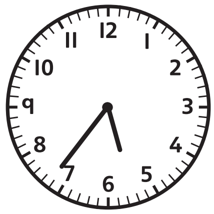
4. In the digital time, the 9 represents 9 hours because quarter to 10 is the same as 9:45.
In the analogue time, the minute hand pointing to the 9 represents 45 minutes past the hour, or a quarter to the next hour.

5. Order of answers will vary:

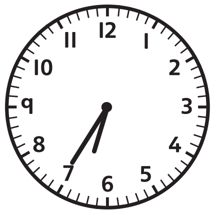
3:56 pm



5:36 pm



6:35 pm



6:53 pm

Reflect

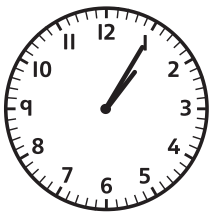
Explanations will vary; for example:

To convert from analogue into digital, I would look at the hour (short) hand to identify the hour it is pointing at or has just gone past. I would write this hour before the colon. Then I would look at the minute (long) hand and work out how many minutes it is after the hour by counting how many small intervals the minute hand has turned through (clockwise) since passing the 12. I would write this after the colon (using two digits; for example: writing 02 for 2 minutes). If the time is the morning, I would write 'am' after the time and if it is the afternoon I would write 'pm'.

Lesson 4: Converting times (2)

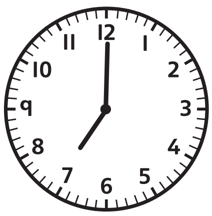
➜ pages 67–69

1. a)



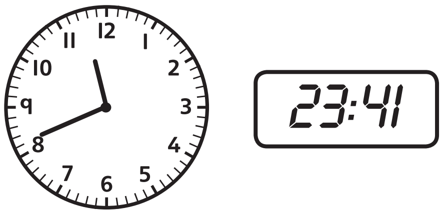
01:05

b)

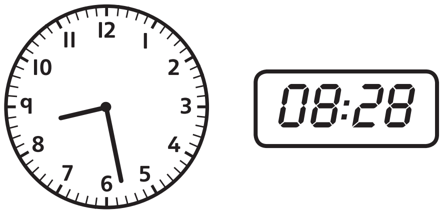


19:00

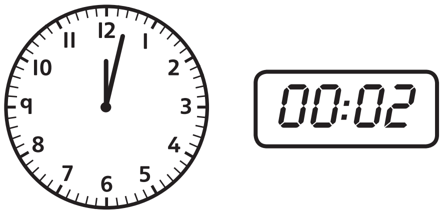
c)



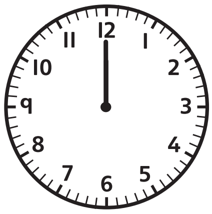
d)



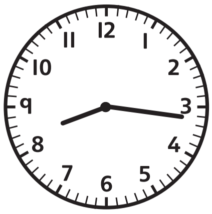
e)



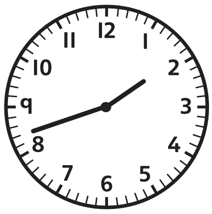
2. a) 00:00



c) 20:16



b) 13:42



d: 09:51

3. a) 03:42
24-hour time is written using 4 digits so you need to put a zero before the 3.
b) 15:42
No need for the pm after a 24-hour time.

4. Max's watch will show 15:47.

5. Many answers are possible; for example:

05:12	5:12 am
10:07	10:07 am
13:04	1:04 pm
14:30	2:30 pm

Reflect

Explanations will vary. Children should recognise that 24-hour times have 4 digits and 12-hour times need to specify whether they are 'am' or 'pm'; for example:

To convert a 12-hour am time to 24-hour:
If the hour is 12, replace with 00; if the hour is 1 to 9, write a 0 in front; if the hour is 10 or 11, leave as is.

To convert a 12-hour pm time to 24-hour:
If the hour is 12, leave as is; if the hour is 1 to 11, add 12.

To convert a 24-hour time to 12-hour:
If the hour is 00, replace with 12 and write 'am' after the time; if the hour is 01 to 09, remove the 0 and write 'am'; if the hour is 10 or 11, write 'am'; if the hour is 12, write 'pm'; if the hour is 13 to 23, subtract 12 and write 'pm'.

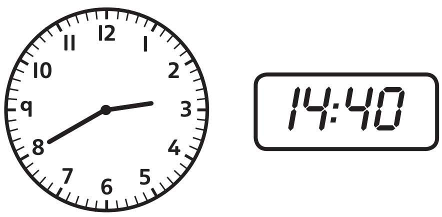
Lesson 5: Problem solving – units of time

➜ pages 70–72

1. a) Team A was the first to complete Stage I. It took 9 days.
b) It took 3 weeks and 2 days altogether for Team B to complete Stages 1 and 2.
c) Team A took 49 days.
Team B took 51 days.
Team A reached the summit 2 days before Team B.

2. 1 minute 40 seconds
3 minutes 50 seconds
7 minutes 20 seconds
1 hour 15 minutes
3 hours 32 minutes

3.



4. Dan (21 months) > Ben (22 months)) > Abdul (24 months)) > Cerys (25 months)

5. The bus left the station at 12:27.

Reflect

Explanations may vary; for example:

Divide 108 by 12 to get 9 years.

End of unit check

➜ pages 73–74

My journal

Answers will vary, but children should work out that 100 months is 8 years and 4 months, or convert their ages from years to months and compare.

Power puzzle

06:56 = 6:56 am
3 hours 46 minutes = 226 minutes
60 months = 5 years
clock showing 4 minutes to 6 = 17:56
8 weeks 4 days = 60 days
4 years 11 months = 59 months
clock showing 10 past 1 = 13:10

Odd one out is 01:02.

Unit 14: Statistics

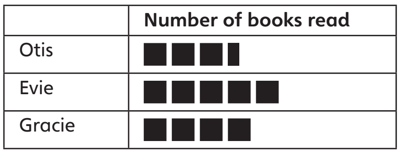
Lesson 1: Charts and tables (1)

➜ pages 75–77

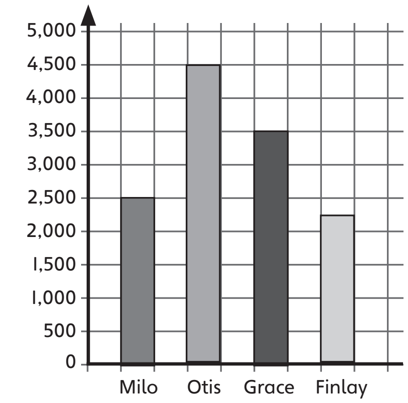
1 a) Each icon represents 8. Each half icon represents 4.
8 + 8 + 4 = 20
Kieron has 20 jigsaw piece cards.
b) Each quarter icon represents 2.
Kieron has 34 normal cards.
c) Amy has 25 shiny cards.

2. Evie read 20 fiction books.
Gracie read 8 non-fiction books.
Otis read 3 poetry books.
Gracie read 37 books in total.

3.



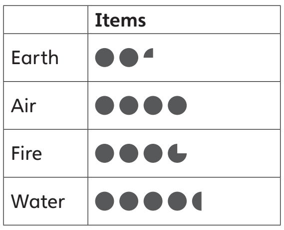
4. Milo: 2,500
Grace: 3,500



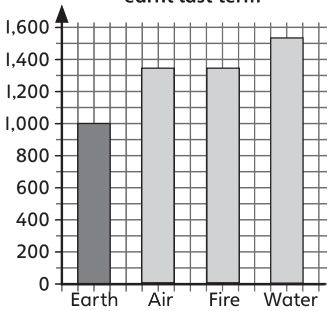
5.

Number of class points per team in Year 4

Each ● represents 100 points.



Total number of class points earnt last term



Reflect

Children may give different answers but should be able to give reasons; for example:

Pictograms are the best way to display data because it is easy to count the pictures.

Bar charts are the best way to display data because you can read the data using the scale on the axis.

Lesson 2: Charts and tables (2)

➜ pages 78–80

1. a) 21 + 14 = 35
Alice won 35 marbles in December and May.
b) Otis won 18 marbles in May.
Alice won 14 marbles in May.
18 – 14 = 4
Otis won 4 more marbles in May than Alice.
c) The children won 70 marbles in May.

2.

Number of visitors

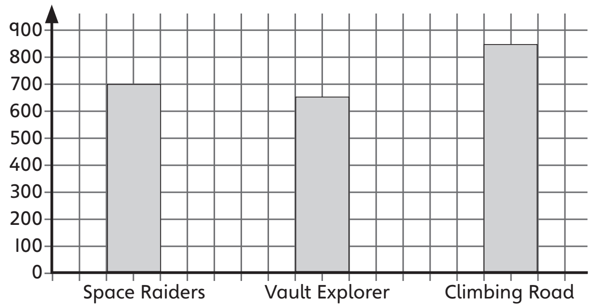
	History Museum	Science Museum	Total
Saturday	625	800	1,425
Sunday	745	725	1470
Monday	390	390	780

3.

Number of points earned

	Space Raiders	Vault Explorer	Climbing Road
Sarah	700	650	850
Tom	550	200	800

Number of points scored by Sarah



4. a) 20
b) Wednesday
130

Reflect

Answers will vary; look for children discussing both pictograms and bar charts and giving reasons for which graph they prefer.

Lesson 3: Line graphs (1)

→ pages 81–83

1. a) 20 c) 60
b) 55 d) 150

2. a) 110
b) 12 pm

3. The shadow was the longest at 8:00 am.
It was 130 cm long.
The shadow was the shortest at 12:00 pm.
It was 30 cm long.
Many different answers possible; for example:
The shadow was the same length at both 9:00 am and 10:00 am.
The shadow was the same length at both 10:15 am and 2:30 pm.

4. No. Line graphs are used to track changes over periods of time. Bar graphs are used to make comparisons between different groups. Since this data is making comparisons, a bar chart is more suitable.

5. a) Vertical axis labelled in tens from 0.
0 written at start of horizontal axis; 60 written half-way between 30 and 90.

Time	30 minutes	60 miles	90 minutes	120 minutes	150 minutes
Distance	20 miles	45 miles	55 miles	55 miles	80 miles

b) The graph is level between 90 and 120 minutes which means that the car was not moving, so it must have been in a traffic jam at this time.

Reflect

Line graphs are used to track changes over a periods of time, whereas bar graphs are used to make comparisons between different groups.

Lesson 4: Line graphs (2)

→ pages 84–86

1. a) There was 6 mm more water in the container at 11 am.
b) It took 2 hours for the water to increase from 22 mm to 32 mm.
Explanations may vary; for example:
The graph shows the water level between 11 am and 12 pm as being horizontal. This means it stopped raining for one hour and took 2 hours for the water level to raise from 22 mm to 32 mm.
At 11 am the water level reached 22 mm and at 1 pm it had reached 32 mm, so it took 2 hours for the water level to increase from 22 mm to 32 mm.

2. a) Evie took 9,000 steps during the day.
b) Evie took about 1,750 steps between 12 pm and 3 pm.
c) 1 hour

3. 72 m (approximately)
Explanations may vary; for example:
The top of the graph shows the greatest height the ball reaches before it drops back to the ground.

4. Different answers possible; for example:
The temperatures in Spain are very <u>different</u> when comparing summer and winter temperatures, with much warmer temperatures in July compared with December. The <u>warmest</u> temperature is 32 °C at 12 pm in July and the <u>coldest</u> is 5 °C at 8 am and 5 pm in December. The temperatures on 1 July are <u>more than</u> or equal to 18 °C and the temperatures on 1 December are <u>less than</u> or equal to 18 °C.

Reflect

Different answers are possible; for example:

One important thing I am going to remember when looking at line graph data is read the axes clearly / look for different gradients in the line / use the data to make comparisons / use a ruler to read across the graph.

Lesson 5: Problem solving – graphs

→ pages 87–89

1. a) Lily and Maisie took 2,000 more steps than Tom and Kieron.
b) Gracie walked 6,500 steps.

2. a) 7
b) Belfast
c) Edinburgh

3. a) Otis walked furthest in the last 2 hours of his walk.
b) Explanations may vary; for example:
In the first 2 hours he walked 5 km – 0 km = 5 km and in the last 2 hours he walked 17 km – 11 km = 6 km.
c) £72 (12 × £6)

4. Approximately 4,250 (8,500 – 4,250)

Reflect

Different questions are possible; for example:

Estimate the difference between the population of Spixworth and Windermere; Which town has the largest population?

End of unit check

➜ pages 90–92

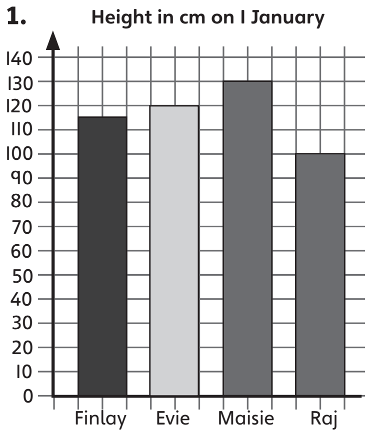
My journal

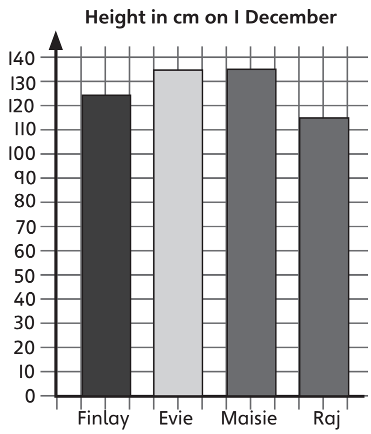
Different answers possible; for example:

The price of the car started at more than £1 at 9 am and reached a total of £5·50 altogether by 6 pm but remained less than £6. The price rose more quickly between 12 pm and 3 pm compared to between 10 am and 12 pm.

Power puzzle

1.





Unit 15: Geometry – angles and 2D shapes

Lesson 1: Identifying angles

→ pages 93–95

1. a) Ticked: 3rd and 5th angle
   b) Ticked: 4th and 5th angles
   c) Ticked: 2nd angle
2. Size and orientation of angles will vary but must be a right angle, an acute angle and an obtuse angle.
3. The trapezium (top right corner) is in the wrong place since it has 2 acute angles and 2 obtuse angles so belongs in the top left cell in the diagram.
4. Angles a) and d). Angle a) is a right angle and so will fit exactly. Angle d) is acute and so will also fit.
5. Tree or pond.

Reflect

Descriptions may vary; for example:

An acute angle is an angle that is less than a right angle (or quarter turn).
An obtuse angle is an angle greater than a right angle (or quarter turn) but less than a straight line (or half turn).
A right angle is a quarter turn or 90°.

Lesson 2: Comparing and ordering angles

→ pages 96–98

1. a) d b c a
   b) b c a d
   c) d b c a
2. a) A B D C E
   b) The more sides a regular shape has, the bigger the interior angles.
3. Answers will vary, but ensure that angles are in ascending order and ideally include an acute angle, a right angle and an obtuse angle.
4. Sometimes true; if the angles are less than 45°, then adding them together will be less than 90° and will thus make an acute angle. However, combining 2 acute angles which are both more than 45° will make an obtuse angle.

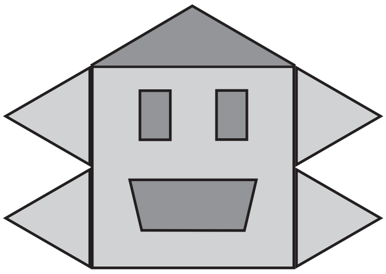
Reflect

Acute angles are smaller than a right angle (a quarter turn) and obtuse angles are greater than a right angles (a quarter turn) but smaller than a straight line (half turn).

Lesson 3: Identifying regular and irregular shapes

→ pages 99–101

1. a) Circled: square and equilateral triangle
   b) Circled: all shapes except the equilateral triangle
   c)



red blue

2. Children should have drawn two different squares.
3. Children should have drawn one regular and one irregular hexagon.
4. A
5. Different solutions are possible:
   Shape on top left can be joined to the shape at top right; the trapezium in the middle of the bottom row can be joined to another copy of itself to make a hexagon. Also, 6 equilateral triangles (in the middle of the top row) can be joined together to make a hexagon.

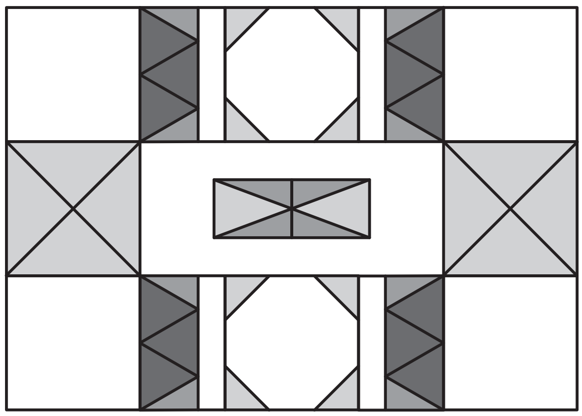
Reflect

A regular shape has sides which are all the same length and angles which are all the same size.

Lesson 4: Classifying triangles

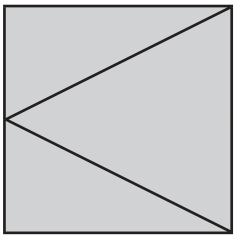
→ pages 102–104

1. a) Circled: 1st and 3rd triangles
   b) Circled: 2nd triangle
   c) Circled: 1st and 4th triangles
2.



red blue yellow

3.



4.

	2 or 3 equal sides	No equal sides
2 or 3 equal angles	A, C	
No equal angles		B, D

5. There are 25 isosceles triangles altogether.

Reflect

An equilateral triangle has sides of equal length and all angles of equal size (60°). An isosceles triangle has 2 sides the same length and 2 angles equal in size.
A scalene triangle has all sides different lengths and all angles different sizes. A right-angled triangle has 1 angle which is a right angle (90°). Right-angled triangles can be isosceles or scalene.

Lesson 5: Classifying and comparing quadrilaterals

➜ pages 105–107

1. a) Circled: rectangle (top left), rhombus (top right), square (bottom left), trapezium (bottom right)
b) Circled: both squares (bottom left, bottom right)
c) Circled: all shapes except the square

2. Answers will vary but must include 2 squares and 4 non-square quadrilaterals (orientation will vary).

3. Shapes matched:
Trapezium ➜ bottom shape
Rhombus ➜ 3rd shape from top (a square is a special sort of rhombus)
Parallelogram ➜ top shape and 3rd shape from top (a square is a special sort of parallelogram)
Rectangle ➜ 2nd shape from top and 3rd shape from top (a square is a special sort of rectangle)

4. Check children have drawn four different parallelograms.

Reflect

A rhombus has 4 equal sides but can have different sized angles. A square is a type of rhombus but with angles of equal size (right angles or 90°).

Lesson 6: Deducing facts about shapes

➜ pages 108–110

1. a) Circled: rectangle (3rd shape), triangle (4th shape)
b) Circled: parallelogram (2nd shape), rectangle (3rd shape), trapezium (4th shape)
c) Circled: parallelogram (1st shape), right-angled triangle (2nd shape), right-angled triangle (5th shape)
d) Circled: trapezium (3rd shape), triangle (4th shape), parallelogram (5th shape)

2. Different answers are possible including irregular pentagons, irregular octagons, irregular dodecagons (12-sides).

3. It could be an equilateral triangle (all angles 60°) or a scalene triangle.

4. It could be a parallelogram, a rhombus, a trapezium, a kite, an arrow-head or a quadrilateral with all sides and angles different. It cannot be a square or a rectangle since these shapes only have right angles.

5. Headings in top row left to right:
Quadrilateral Not quadrilateral
Headings in left-hand column top to bottom:
Angles not all equal Angles all equal

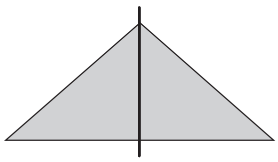
Reflect

Answers will vary. Children should recognise that they need to consider the properties of its sides, i.e. how many sides and whether they are equal in length and parallel. They should also consider the properties of its angles, i.e. whether they are equal in size, acute/obtuse or right angles.

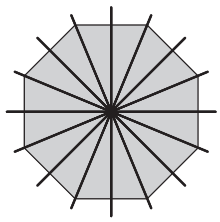
Lesson 7: Lines of symmetry inside a shape

➜ pages 111–113

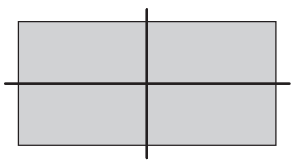
1. a)



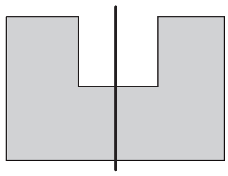
c)



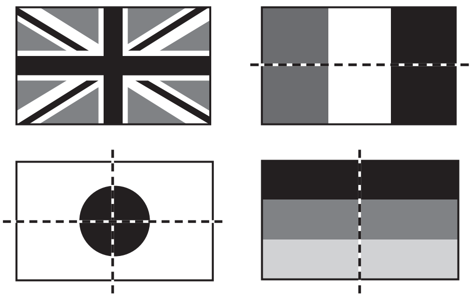
b)



d)



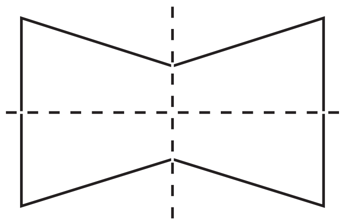
2. (No line of symmetry)



3. Shapes drawn into table:

	Regular	Irregular
4 or more lines of symmetry	Square Regular hexagon Regular octagon	
Fewer than 4 lines of symmetry	Equilateral triangle	Parallelogram Rectangle

4. Answers will vary; for example:



5. Answers will vary; for example:
a) Isosceles trapezium
b) Rhombus
c) Equilateral triangle

Reflect

Answers may vary but should include that there are infinite lines of symmetry; for example:

If you fold a circle along any line which goes through its centre, the 2 halves match exactly. There are an infinite number of such lines so a circle has infinite lines of symmetry.

Lesson 8: Lines of symmetry outside a shape

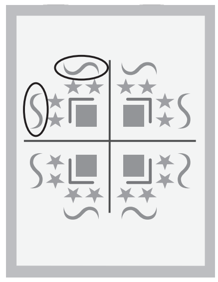
➜ pages 114–116

1. Table completed to show:
a) Symmetric
b) Not symmetric
c) Symmetric

2. 2 lines of symmetry drawn: horizontal and vertical lines through centre of pattern

3. 4 lines of symmetry drawn: horizontal, vertical and diagonal lines of symmetry through the centre of pattern

4. 'S' shapes in top left corner of the pattern are the wrong way around.



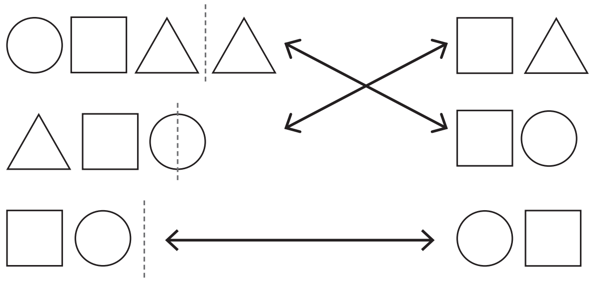
Reflect

Answers will vary; check that patterns are symmetrical.

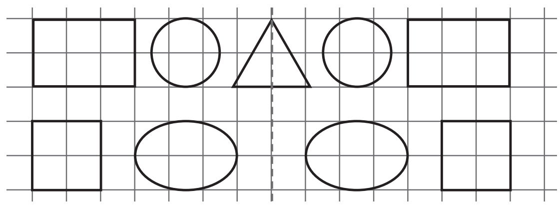
Lesson 9: Completing a symmetric figure

➜ pages 117–119

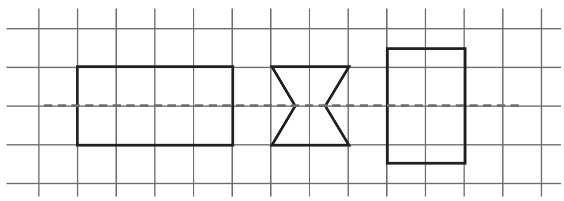
1.



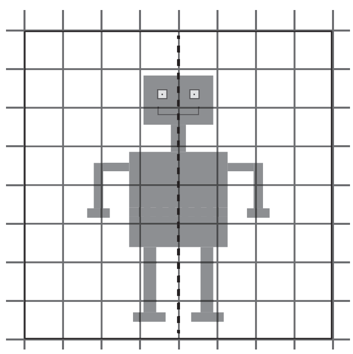
2. a)



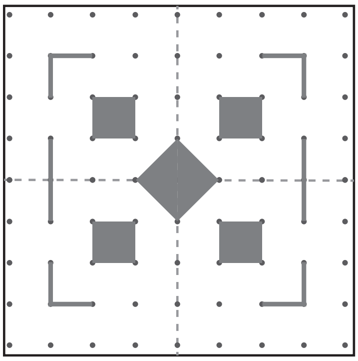
b)



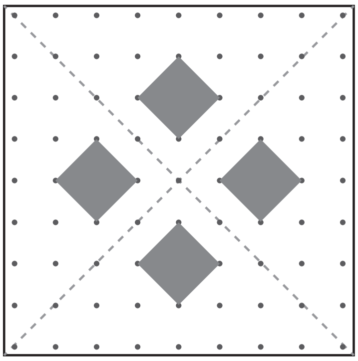
3.



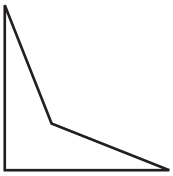
4.



5.



6. Answers will be a kite (or arrow-head); for example:



7. Answers will vary. Check children's pattern is symmetrical in both diagonal lines of symmetry.

Reflect

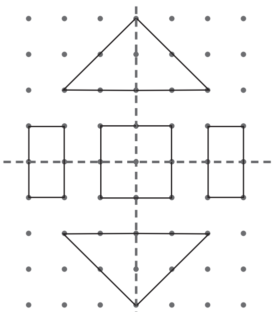
Answers will vary; ensure that pattern has 2 lines of symmetry.

Lesson 10: Completing a symmetric shape

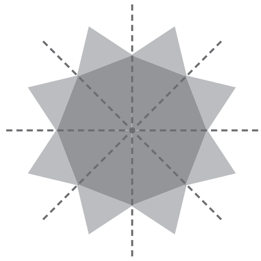
➜ pages 120–122

1. Check shapes are completed accurately to form:
a) Rectangle c) Octagon
b) Hexagon d) Triangle (isosceles)

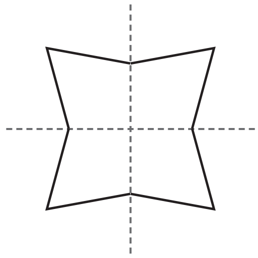
2. 2 triangles (isosceles), 1 square and 2 (non-square) rectangles.



3.



4. Answers will vary; for example:



5. No; it is correct that you cannot have a shape with exactly 2 lines of symmetry and an odd number of sides. Look for children drawing different shapes with an odd number of sides and finding the lines of symmetry.

Reflect

Answers will vary; for example:

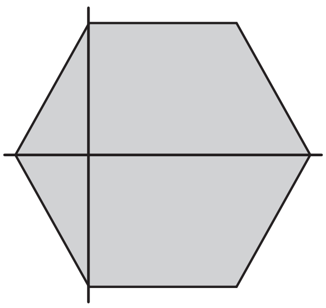
When completing a symmetric shape, it is important to use a mirror to check the shape; count the number of sides on one side of the line.

End of unit check

➜ pages 123–125

My journal

1.



2. The angles of a triangle add up to 180°. An obtuse angle is more than 90°. If 2 of the angles in the triangle were obtuse then they would make more than 90° + 90° = 180, which is not possible. Any diagrams should show this.

Power puzzle

Answers will vary. Look for children using the minimum number of folds to make the shapes.

Unit 16: Geometry – position and direction

Lesson 1: Describing position (1)

➜ pages 126–128

1. a) Cliff or hill
b) Woods
c) Moor
d) Cliff (accept moor or hill)

2. Answers will vary; for example:
a) The camp is next to the cliff, close to the hill.
b) The cave is between the swamp and the pond, close to the sea.
c) The pond is between the cave and the hill.
d) The swamp to the left of the cave.
e) The moor in between the woods and the cliff.
f) The cliff is left of the camp.

3. The line would go through the woods and the moor.

4. No; the woods are between the cave and the moor but they are closer to the moor.

5. Answers will vary; for example:
The woods are one square up from the moor.
The cave is two squares to the right of the swamp.
Using a grid makes it easier to describe where the places are because you can describe position using squares. It is also more accurate.

Reflect

Answers will vary; look for children explaining that maps provide a visual image for the locations of lots of places at once. Children should recognise that using squares or grids means that distances can be described using squares and it is easier to describe moving between the places on the map.

Lesson 2: Describing position (2)

➜ pages 129–131

1. a) The statue is at (7,4).
b) The other fence posts are at (4,6) and (6,6).
c) The other rose bush is at (3,3).

2. (1,6), (0,6) and (0,3)

3. No, Jamie has the coordinates the wrong way round. The gnome is at (5,3).

4. Answers might vary between (8,5), (8,4) or (8,3).

5. To the left of the house, in the bottom left corner.

6. a) (0,6) b) (1,3)

7. (4,5) because it is not at the entrance to the shed (A), in the middle of the patio (B) or the path (C) or in the middle of the pond (E).

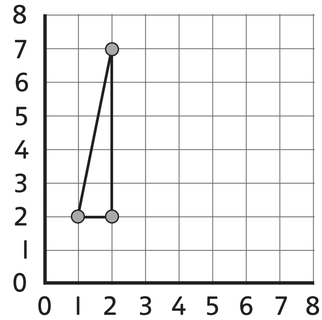
Reflect

No, Ebo is incorrect because he has the directions the wrong way round; he needs to go 2 squares right and 4 squares up.

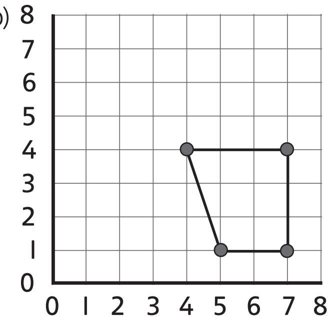
Lesson 3: Drawing on a grid

➜ pages 132–134

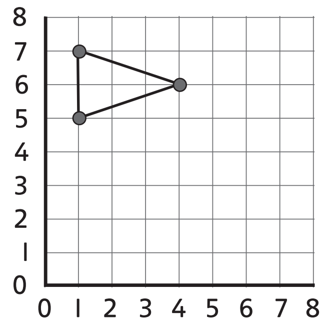
1. a)



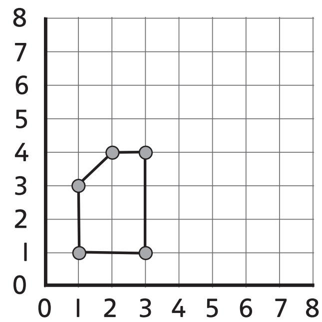
b)



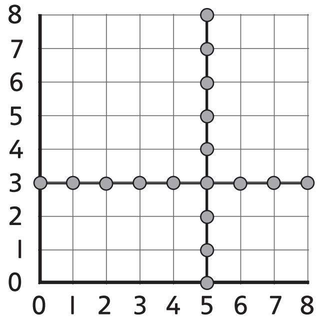
2. a) Triangle



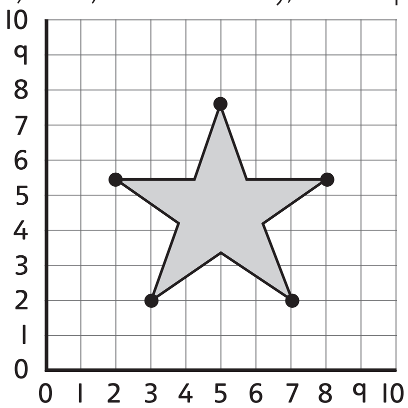
b) Pentagon



3. a) Line 1: Horizontal line going through 3 on the vertical axis.
Line 2: Vertical line going through 5 on the horizontal axis.

b) 

4. a) and b) Answers will vary; for example:



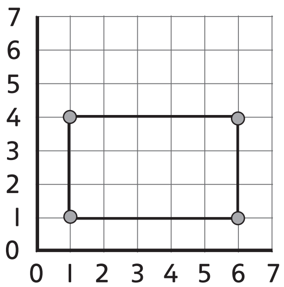
Coordinates: (3,2), (7,2), $(8,5\frac{1}{2})$, $(5,7\frac{1}{2})$, $(2,5\frac{1}{2})$

Reflect

This line will go through the 3 on the horizontal axis and is vertical. We know this because the first number, which we read along the horizontal axis, is always 3.

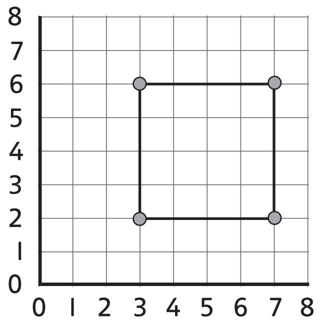
Lesson 4: Reasoning on a grid

➜ pages 135–137

1. 

(1,1)
(6,1)
(6,4)
(1,4)

2. a) (7,2), (7,6) and (3,6).

b) 

3. Answers will vary. Check children have drawn three more rectangles of same size, each with a vertex at (4,4)

4. a) (2,9), (8,9) and (8,3).
b) Order may vary:
(9,3), (9,8) and (2,8).
(7,3), (7,10) and (2,10).

Reflect

Answers will vary but should include symmetrical reasoning, understanding of the properties of shapes and addition.

Lesson 5: Moving on a grid

➜ pages 138–140

1. a) Pier
b) Turbine
c) Rig
d) Harbour

2. Start ➜ D ➜ A ➜ C ➜ B ➜ F ➜ E

3. a) (4,1)
b) (1,3)
c) (0,0)
d) (2,4)

4. a) (74,126)
b) (72,128)

5. (7,6), (7,7), (12,7), (12,6)

Reflect

Yes, if you know the coordinates at the start and end of a move you can tell whether you moved up or down and left or right. Explanations will vary; for example:,

If the first number increases (from start to end), this means a move to the right. If it decreases, it means a move to the left. Likewise, if the second number increases (from start to end), this means a move upwards and. If it decreases, it means a move downwards.

Lesson 6: Describing a movement on a grid

➜ pages 141–143

1. a) Andy goes 1 left, 2 down.
b) Danny goes 2 left, 1 up.
c) Andy goes 1 right, 2 up.
d) Andy goes 3 left, 1 down.

2. Instructions might be either way round:
a) 1 left, 3 down
b) 5 right, 1 up
c) 2 left, 2 up
d) 2 right, 2 down
e) 3 right, 4 up
f) 3 right, 0 up

3. Reena moved 2 right, 3 up.

4. Order might vary:
2 left, 1 up
1 left, 2 up
1 right, 2 up
2 right, 1 up
2 left, 1 down
1left, 2 down
1 right, 2 down
2 right, 1 down

Reflect

To do the reverse movement, do the same number of moves in the opposite direction across and the same number of moves in the opposite direction up or down; for example: the reverse moves for 5 left, 2 up are 5 right, 2 down.

End of unit check

→ pages 144–146

My journal

1. Cards A and D will take you from (5,5) to (10,10) because 5 left and 10 right gives a total of 5 right, and 10 up and 5 down gives a total of 5 up. So, the total move is 5 right and 5 up.

2. (4,5)

Power play

Grids will vary.