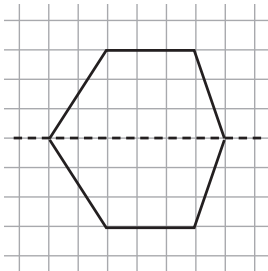


# Unit 13: Geometry – Properties of shapes

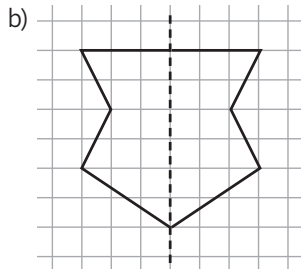
## Lesson 1: Measuring with a protractor

→ pages 6–8

1. a)  $130^\circ$       c)  $90^\circ$   
b)  $25^\circ$       d)  $73^\circ$
2. 1st angle =  $110^\circ$   
2nd angle =  $75^\circ$   
3rd angle =  $72^\circ$   
4th angle =  $113^\circ$
3. a) Angles clockwise from top left:  $77^\circ$ ,  $132^\circ$ ,  $111^\circ$ ,  $116^\circ$ ,  $104^\circ$  (total  $540^\circ$ );  
 $66^\circ$ ,  $230^\circ$ ,  $66^\circ$ ,  $112^\circ$ ,  $134^\circ$ ,  $112^\circ$  (total  $720^\circ$ )  
b) B. All angles are the same size ( $120^\circ$ ) and all sides are the same length.
4. No, all the angles are the same size ( $38^\circ$ ).
5. a)



Angles clockwise from top left:  $122^\circ$ ,  $109^\circ$ ,  $142^\circ$ ,  $109^\circ$ ,  $122^\circ$ ,  $116^\circ$  (total  $720^\circ$ ).



Angles clockwise from top left:  $65^\circ$ ,  $65^\circ$ ,  $235^\circ$ ,  $95^\circ$ ,  $95^\circ$ ,  $110^\circ$ ,  $235^\circ$  (total  $900^\circ$ ).

### Reflect

Look for answers identifying using wrong scale or misreading the scale; placing the protractor incorrectly or inaccurately.

## Lesson 2: Drawing shapes accurately

→ pages 9–11

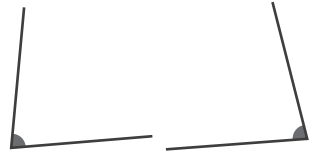
1. a)



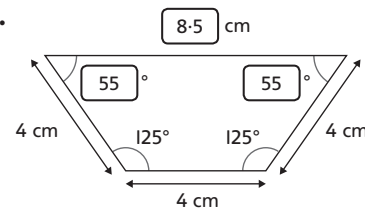
b)



c)

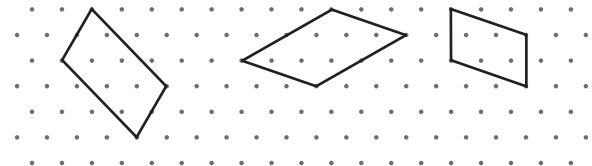


2.



Missing angles are both  $55^\circ$ . Missing length is 8.5 cm.

3.

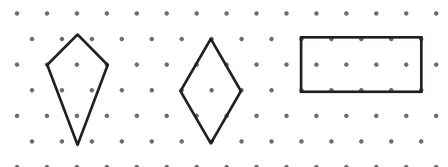


Answers will vary for the third parallelogram.

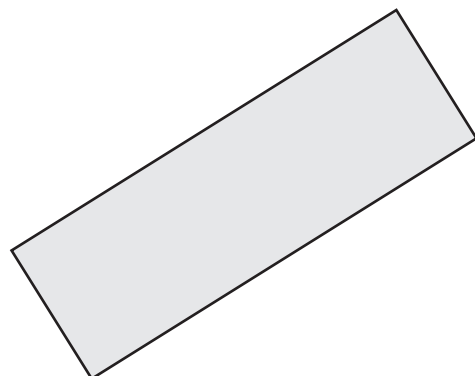
4.



5. Answers will vary; for example:

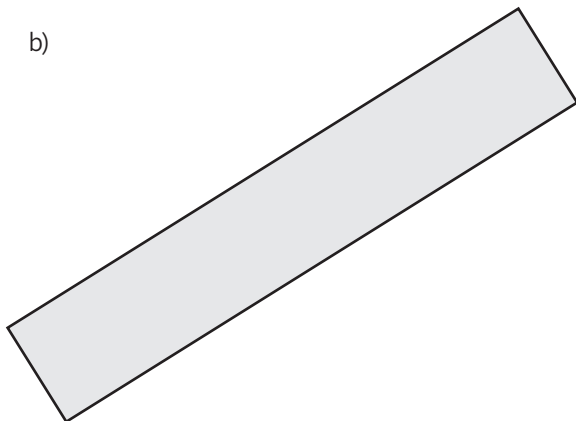


6. a)



Rectangle 6 cm by 2 cm

b)



Rectangle 8 cm by 1.5 cm

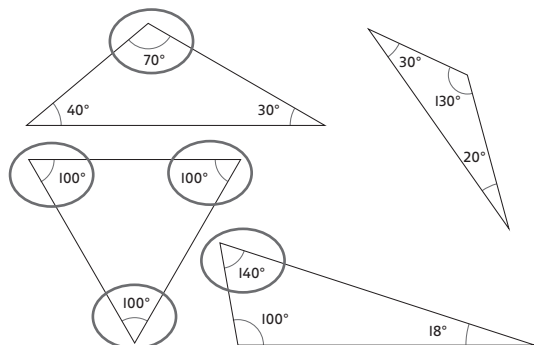
### Reflect

Answers will vary; for example: Lee needs to read the correct scale and to place the protractor accurately.

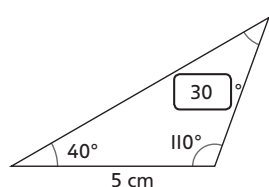
## Lesson 3: Angles in triangles (I)

→ pages 12–14

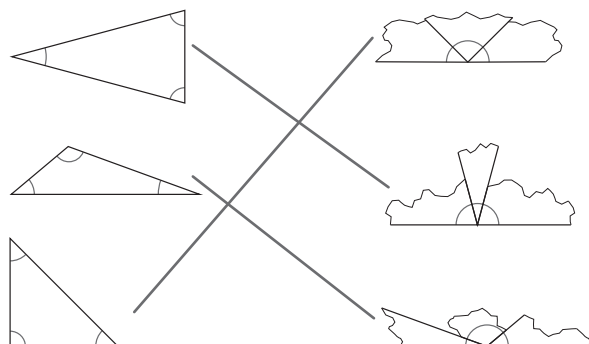
1. a)



b)



2.



3.

A triangle has ...	Always true	Sometimes true	Never true
... three acute angles.		✓	
... two right angles.			✓
... a right angle and an obtuse angle.			✓
... three different angles.		✓	
... angles that add up to 180°.	✓		
... at least two acute angles.	✓		

4. Answers will vary; for example: 45°/45°/90°. Check angles add to 180° and any isosceles triangles have two angles the same.

### Reflect

180-degree angles in a triangle can be shown to make a straight line. Angles on a straight line add to 180°.

## Lesson 4: Angles in triangles (2)

→ pages 15–17

- a) 80°  
b) 39°  
c) 25°  
d) 30°
- a = 70°  
b = 45°  
c = 65°
- p = 18°  
q = 108°  
r = 54°
- Groups will vary; for example: 40°/80°/60°; 85°/35°/60°; 50°/45°/85°; 25°/35°/120°
- a = 90°  
x = 40°  
b = 260°  
y = 65°

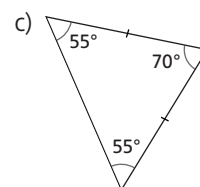
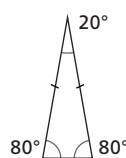
### Reflect

Children should mention that the other angles in the triangle have to make 130°.

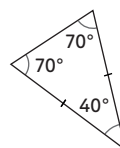
## Lesson 5: Angles in triangles (3)

→ pages 18–20

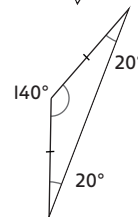
1. a)



b)



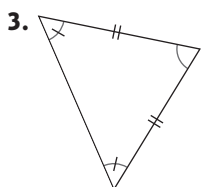
d)



2. a) 65°, 65°

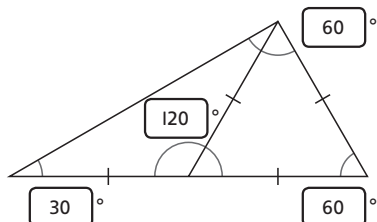
b) 12°, 156°

c) 45°, 45°



4. Amelia: 2 solutions:  $56^\circ / 56^\circ / 68^\circ$  and  $56^\circ / 62^\circ / 62^\circ$   
Bella: 1 solution:  $156^\circ / 12^\circ / 12^\circ$ . Double  $156^\circ > 180^\circ$   
so cannot be one of the equal angles.

5. a)  $335^\circ$  c)  $55^\circ$   
b)



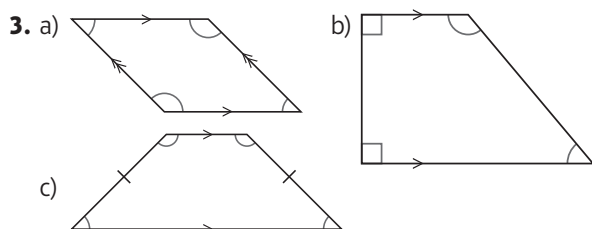
### Reflect

Answers will vary.

## Lesson 6: Angles in polygons (I)

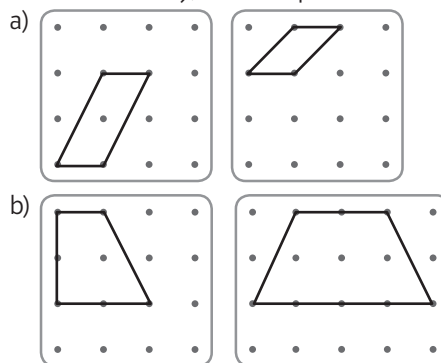
→ pages 21–23

- a) Right-angled trapezium  
b) Scalene trapezium  
c) Isosceles trapezium  
d) Parallelogram
- a) Angles from top left clockwise:  $70^\circ, 110^\circ, 70^\circ, 110^\circ$   
b)  $93^\circ, 93^\circ$



- a)  $125^\circ, 125^\circ$  b)  $114^\circ, 114^\circ$
- A parallelogram has three acute angles: Never true:  
It has 2 equal acute and 2 equal obtuse,  $1 \text{ acute} + 1 \text{ obtuse} = 180^\circ$ ;  
A trapezium has four different angles: Sometimes true: Scalene trapezium only

6. Answers will vary; for example:



- c) Both are quadrilaterals, both can be split into two triangles:  $2 \times 180^\circ = 360^\circ$

### Reflect

Look for indicators of equal angles and shapes split into 2 triangles.

## Lesson 7: Angles in polygons (2)

→ pages 24–26

- a)  $a = 25^\circ$  c)  $c = 50^\circ$   
b)  $b = 100^\circ$  d)  $d = 27^\circ$
- a)  $b = 150^\circ$  b)  $d = 21^\circ$
- Diagonals must start at the same vertex for each polygon. Children should show one of the possible images for each polygon.

- a) angle total =  $360^\circ$



- b) angle total =  $540^\circ$



- c) angle total =  $720^\circ$



- She has used more than one vertex to draw the diagonals.
- angle total =  $1,440^\circ$  ( $8 \times 180^\circ$ )  
each interior angle =  $144^\circ$  ( $1,440 \div 10$ )
- a)  $a = 30^\circ$  b)  $b = 60^\circ$   
b) Interior angles of pentagon =  $108^\circ$ ; angles in all surrounding triangles:  $30^\circ, 60^\circ$  and  $90^\circ$ .

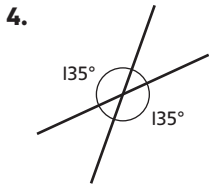
### Reflect

Answers will vary.

## Lesson 8: Vertically opposite angles

→ pages 27–29

- 1st missing angle =  $110^\circ$   
2nd missing angle =  $70^\circ$   
3rd missing angle =  $55^\circ$   
4th missing angle =  $125^\circ$
- Third diagram should be circled.
- Missing angles from the top going clockwise:
  - $135^\circ, 45^\circ, 135^\circ$
  - $142^\circ, 142^\circ, 38^\circ$
  - $114^\circ, 66^\circ, 66^\circ$



5.

	Angle a	Angle b	Angle c	Angle d
Experiment 1	$80^\circ$	$100^\circ$	$80^\circ$	$100^\circ$
Experiment 2	$120^\circ$	$60^\circ$	$120^\circ$	$60^\circ$
Experiment 3	$30^\circ$	$150^\circ$	$30^\circ$	$150^\circ$

- Missing angles from the top going clockwise:
  - $70^\circ, 25^\circ, 25^\circ, 85^\circ$  c)  $61^\circ$
  - $14^\circ, 104^\circ, 76^\circ$

### Reflect

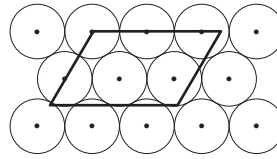
Children should mention that two pairs of angles on a line =  $180^\circ$  such as  $a + b = 180^\circ$ ,  $b + c = 180^\circ$  so  $a = c$ .

## Lesson 9: Equal distance

→ pages 30–32

- The dots children draw should form a circle. The dots are on a circle with a radius of 25 mm.
- Radius; Radius = 13 mm, Diameter = 26 mm
  - Diameter; Radius = 4 mm, Diameter = 8 mm
  - Diameter; Radius = 20 mm, Diameter = 40 mm
- Second and third statements ticked:  
The diameter passes through the centre of the circle.  
If the radius is  $x$ , then the diameter is  $x + x$ .
- 4 mm
  - 5.5 cm
  - 3.4 cm
  - 4.95 m
- Radius = 1.3 cm
  - The line is 72 mm.

- The radius of one of the circles is 1.4 cm.
  - Answers will vary: The perimeter needs to be 14 radii altogether ( $19.6 \div 1.4$ ) or 7 diameters ( $19.6 \div 2.8$ ). Side lengths therefore need to be a total of 7 radii or 3.5 diameters. For example:



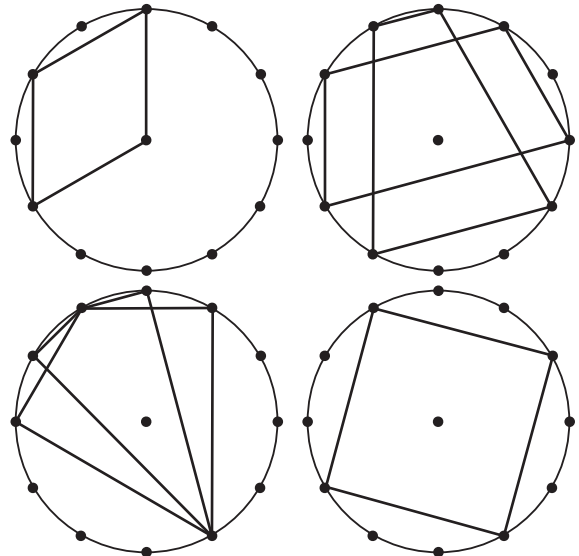
### Reflect

Use a pair of compasses set at a radius of 2 cm.

## Lesson 10: Parts of a circle

→ pages 33–35

- Third diagram ticked.
- Answers will vary.
  - Isosceles triangles
- Answers will vary; for example:



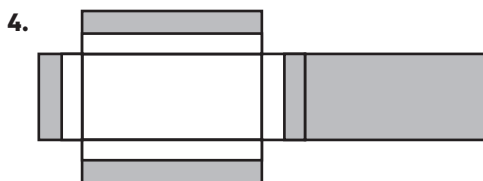
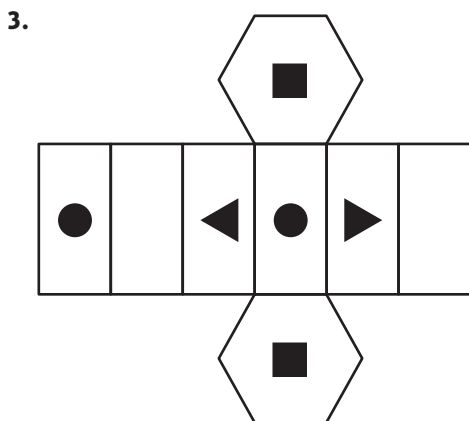
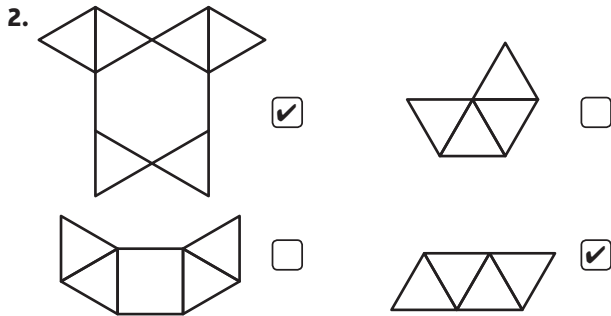
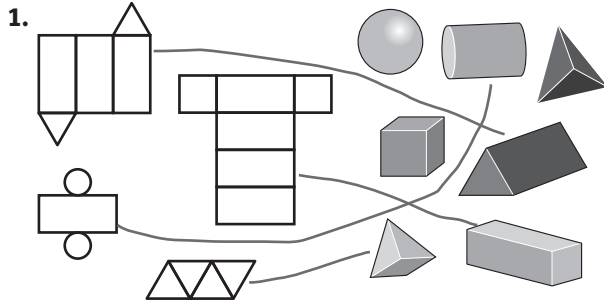
- The angle formed on the circumference will be  $90^\circ$ ; the other two angles should add to  $90^\circ$ .
- Children should count the whole and more than half squares; the area is approximately  $112\text{--}115\text{ cm}^2$ .

### Reflect

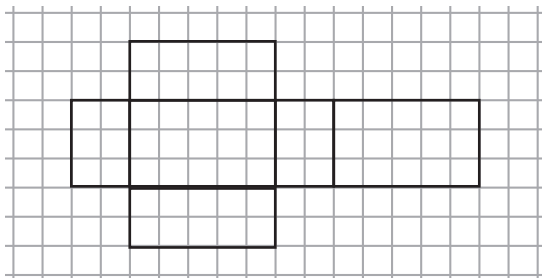
Answers will vary; children should mention using the radii for the equal sides and diameter for 3rd side.

## Lesson 11: Nets (I)

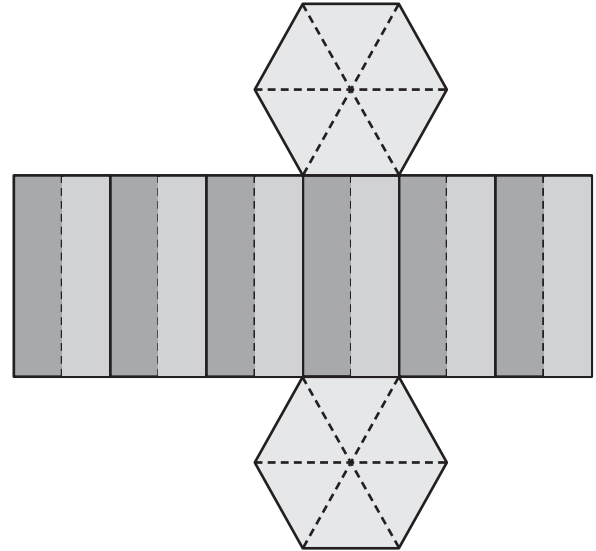
→ pages 36–39



5. Answers will vary; for example:

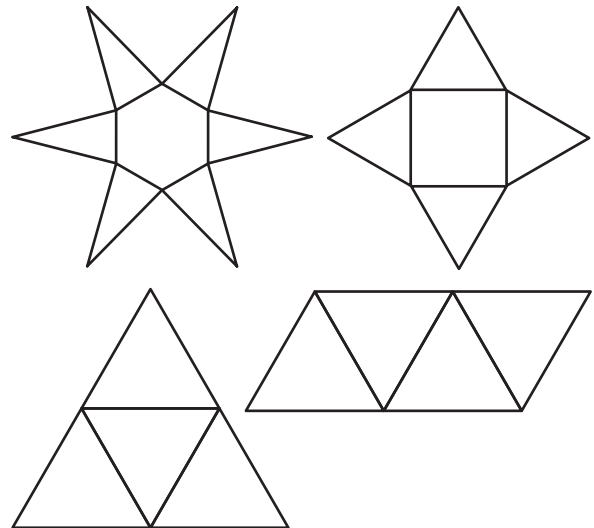


6. Answers will vary; for example:



### Reflect

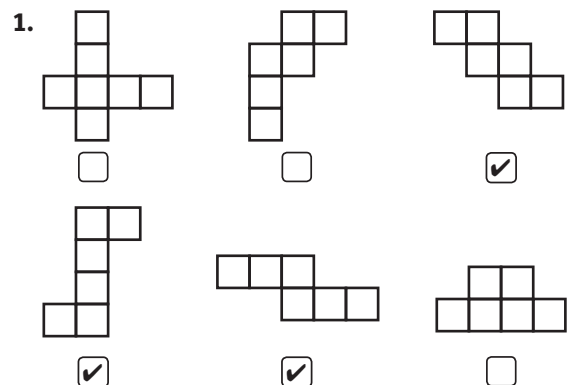
Answers will vary; for example:



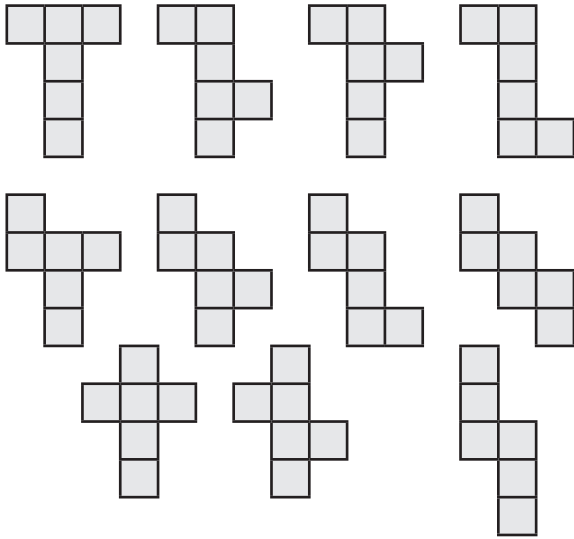
The easiest way is to show a base with the same number of triangles as sides on the base.

## Lesson 12: Nets (2)

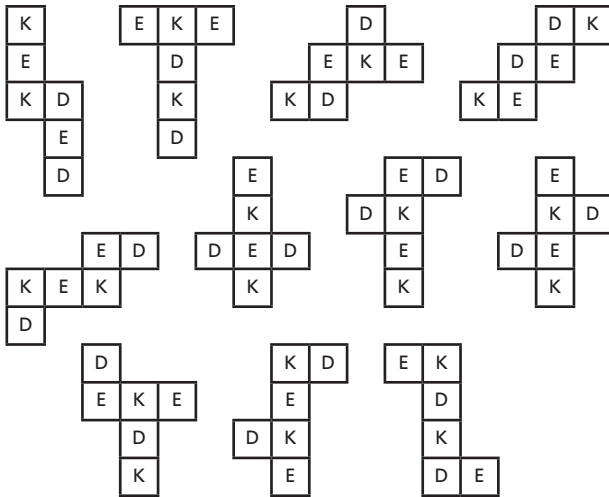
→ pages 39–41



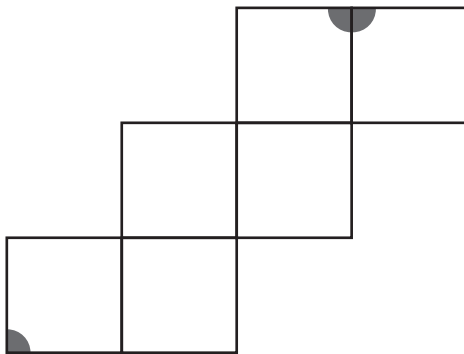
2. Answers will vary but should be one of these shapes (in any orientation):



3. Answers will vary but pairs of letters show where the opposites are. The letters can be interchanged.



4.



5. The volume is 1,000 cm<sup>3</sup>.

## Reflect

Answers will vary; for example: The net will have 6 identical square faces. There will generally be a middle row of square faces, with at least one face on either side.

## End of unit check

→ pages 42–44

## My journal

1.  $a = 63^\circ$   $b = 63^\circ$   $c = 99^\circ$   
 $d = 72^\circ$   $e = 81^\circ$   $f = 117^\circ$   
 $g = 81^\circ$   $h = 63^\circ$   $i = 81^\circ$

Explanations will vary but look for: opposite angles are equal; angles on a line add to  $180^\circ$ ; angles in a quadrilateral add to  $360^\circ$ . Angles in a square are right angles.

2. A: Does not make a 3D shape  
 B: Pyramid  
 C: Pyramid  
 D: Cube  
 E: Prism  
 F: Does not make a 3D shape  
 G: Prism  
 H: Prism

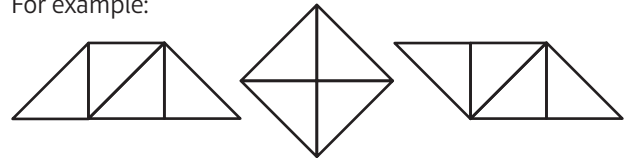
## Power puzzle

Look for evidence of a variety of different shapes – not the same ones in different orientations.

Children may group in many different ways, so talk to them about which properties they were thinking about. Could they group them differently?

They should find plenty of parallelograms, rectangles, squares, trapeziums, kites and rhombii.

For example:



# Unit 14: Problem solving

## Lesson 1: Problem solving – place value

→ pages 45–47

- Max's score < Jamilla's score
  - Richard's score < Emma's score
  - Richard's score < Emma's score < Max's score < Jamilla's score
- Rounds down to the nearest 10,000; Rounds up to the nearest 100
- 6,937, 6,973, 7,369, 7,639, 7,693, 7,963
- The y-axis intervals should be labelled in 200s (for every marker) or 400s (for the bold markers).

Days	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Sales in £	1,800	2,800	2,600	1,400	3,000	3,800

- Children should refer to numbers that round up for City X and numbers that round down for City Y; For example: the smallest possible population of City X is 482,500 and the largest possible population of City Y is 484,999 so City Y could be larger than City X.

### Reflect

Answers will vary.

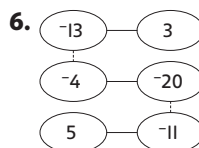
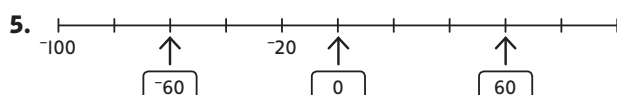
Check that the left circle number has fewer than 5 hundreds (for example, 3,498); the middle number is greater than 50,000 and has fewer than 5 hundreds (for example, 50,368); the right circle number is greater than 50,000 and has 5 or more hundreds (for example, 50,500).

123,412 is greater than 50,000 and it rounds down to 123,000 (to the nearest 1,000).

## Lesson 2: Problem solving – negative numbers

→ pages 48–50

- Answer b) should be ticked.
- 23, -16, -9, -2, 5, 12
  - 19, 13, 7, 1, -5, -11
  - 35
- London
  - London and Oslo
- winter temperature =  $-20^{\circ}\text{C}$   
summer temperature =  $28^{\circ}\text{C}$



### Reflect

Answers will vary; for example:

Find the difference ( $24 + 40 = 64$ ), halve the difference (32), then add 32 to  $-40$  or subtract 32 from 24 ( $-8$ ).

or

Add the two numbers together ( $24 + -40 = -16$ ) then halve the answer ( $-8$ ).

## Lesson 3: Problem solving – addition and subtraction

→ pages 51–53

- There are 3,210 visitors in the park.
- The third number is 3,037.
- 1,100 more children than adults visited the park on Saturday.
  - The difference is 1,200.
- They sell 186 cakes in total.

5. a) 

	H	T	O	·	Tth	Hth
	5	3	·	1	9	
+	7	8	·	8	2	
	1	3	2	·	0	1

b) 

	Th	H	T	O
	<del>8</del> 7	1	0	<del>6</del> 7
-	6	1	5	3
	2	9	1	8

6.  $\triangle = 250$   $\square = 350$   $\diamond = 750$

### Reflect

Answers will vary; for example:

117	
69	48

$$117 + 69 = 186$$

## Lesson 4: Problem solving – four operations (I)

→ pages 54–56

- An adult ticket costs £15. A child ticket costs £8.50.
- 11 van trips are needed.
- 42 mixed bags can be made.
  - 3 lemons and 1 lime are needed to complete another bag.
- Jen uses 625 ml more water for the mugs.
- Multiplying by 6 then dividing by 3 is the same as multiplying by 2 (doubling).
- There are 12 tins of red paint.

## Reflect

Answers will vary; for example: read the question carefully, write down all the number sentences needed to solve the problem, use bar models, check that you have answered the question.

## Lesson 5: Problem solving – four operations (2)

→ pages 57–59

- One spotty bead costs 23p.
- The tower is 420 cm high.
- a) The capacity of a small bottle is 450 ml.  
b) 2.7 l more water fills 10 large bottles.
- $94 \times 8 + 3$ ;  $98 \times 4 + 3$ ;  $48 \times 9 + 3$ ;  $49 \times 8 + 3$
- $\bigcirc = 12$  cm  $\bullet = 16$  cm  $\bigcirc = 20$  cm

## Reflect

Most efficient strategy is 10 times the difference ( $10 \times 270$ ) rather than  $10 \times 720 - 10 \times 450$ .

$$25 \times 270 = 6,750 \text{ ml} = 6.75 \text{ l}$$

## Lesson 6: Problem solving – fractions

→ pages 60–62

- $\frac{2}{6} < \frac{1}{2} < \frac{3}{4}$
- a) They sold 84 cookies altogether.  
b)  $\frac{2}{9}$  of the cookies were left.
- $\frac{7}{18}$
- $3\frac{7}{20}$  km
- There are 96 marbles in the bag.
- $\frac{4}{8} \times \frac{2}{3} = \frac{1}{3}$        $\frac{3}{5} + \frac{4}{4} = 1\frac{3}{5}$        $\frac{3}{10} + 4 = 4\frac{3}{10}$

## Reflect

$\frac{7}{12}$  is larger than  $\frac{1}{2}$ . 7 is more than half of 12; the other numerators are less than half of their denominator.

## Lesson 7: Problem solving – decimals

→ pages 63–65

- The mass of 1 bag of popcorn is 0.18 kg.
- a) A carton of juice costs 65p.  
b) 8 bags of popcorn cost £9.20 more than 8 cartons of juice.



- The mass of 1 tin of nuts is 0.27 kg (to two decimal places).

5.

4.6	7.1	4.8
5.7	5.5	5.3
6.2	3.0	6.4

## Reflect

0.87 is closest to 0.9 as it is only 0.03 away from 9.

## Lesson 8: Problem solving – percentages

→ pages 66–68

- The washing machine is £238 in the sale.
- 54 children walk to school.

3.

Destination	Number of flights	Percentage of total flights
Other French cities	72	30%
European cities	132	55%
Cities outside Europe	36	15%

- There were 4,500 visitors altogether.
- 35% of 180 = 30% of 210

## Reflect

$$\frac{3}{5} = \frac{12}{20} = 60\%$$

## Lesson 9: Problem solving – ratio and proportion

→ pages 69–71

- a)  $\frac{3}{8}$  of the box is pens.  
b) He will have 18 fewer pens than pencils.
- a) 30 cakes can be made.  
b) 625 g of flour is needed.
- 9 : 3 or 3 : 1
- On the map the two cities are 13 cm apart.
- There are 3 boys for every 5 girls.
- A large tin has a mass of 560 g.

## Reflect

$$24 \div 3 \times 5 = 40$$



## Lesson 10: Problem solving – time (I)

→ pages 72–74

- Max must wait 2 hours and 25 minutes.
  - Jen watches TV for 50 minutes.
  - Viewers must wait 10 full weeks.
- The teacher makes 21 appointments.
  - The last appointment on Wednesday ends at 19:55.
- Olivia raises £40.
- 12 intervals of 45 minutes = 9 hours, which is longer than one third of a day (8 hours).
- 2,904 hours = 121 days
  - The puppy was born on 17 June.

### Reflect

10 minutes past 10; 22:10; 10:10 pm

## Lesson 11: Problem solving – time (2)

→ pages 75–77

- The journey on the 16:12 bus is 3 minutes shorter.
  - It is quicker for Max to walk.
- Children spend 4 hours 15 minutes longer in lessons.
- He travelled 125 km.
  - The break was 1 hour 15 minutes long.
  - He stopped for lunch at 1:05 pm (13:05).
- Taxi company A will be the cheapest. A is 60p a minute, so £18; B is 15 minutes for £9.75 so £19.50 for 30 mins; C is 64p per minute (or £3.20 for 5 minutes) so £19.20 for 30 minutes.

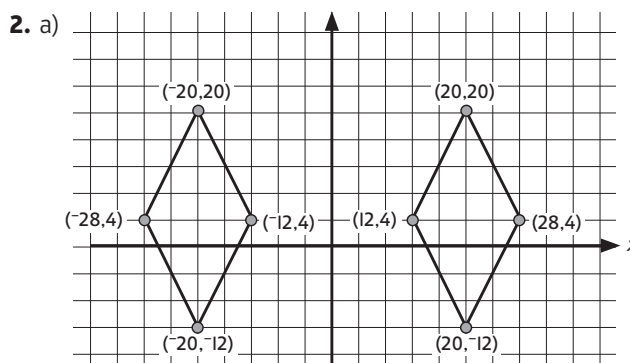
### Reflect

She has used column addition forgetting that there are 60 mins in an hour, not 100. The correct time is 1:40 (13:40).

## Lesson 12: Problem solving – position and direction

→ pages 78–80

- B(−1,5)
  - D(3,1)



b) (12,4), (20,20), (20,−12) and (28,4)

- A(12,14)  
B(12,2)  
C(19,2)
  - (12,8)
  - Circled: (16,12)
- (−1,4); (2,−5); (−1,5); (−4,−4)

### Reflect

Add each part of the coordinate then divide by 2.  
 $7 + 7 = 14$ ;  $14 \div 2 = 7$ ;  $2 + 10 = 12$ ,  $12 \div 2 = 6$ .  
 The half-way point is (7,6).

Some children will notice that the x-coordinate will be 7 as well, as the line is horizontal, parallel to x-axis.

## Lesson 13: Problem solving – properties of shapes (I)

→ pages 81–83

- $a = 30^\circ$ ,  $b = 42^\circ$ ,  $c = 68^\circ$ ,  $d = 68^\circ$
- $a = 55^\circ$ ,  $b = 35^\circ$
  - Answers will vary; for example:  $c = 180^\circ - 35^\circ$   
 $(\text{angle } b) = 145^\circ$ ,  $d = c$  (opposite angles).
- angle  $x = 28^\circ$ , angle  $y = 100^\circ$ , angle  $z = 52^\circ$
- angle  $x = 100^\circ$ , angle  $y = 60^\circ$ , angle  $z = 200^\circ$
- angle  $a = 40^\circ$ , angle  $b = 140^\circ$ , angle  $c = 40^\circ$

### Reflect

Answers will vary.

Angles  $b + c = 92^\circ$  ( $180 - 88$ ). For example:  $46^\circ$  and  $46^\circ$ ;  $80^\circ$  and  $12^\circ$ .

## Lesson 14: Problem solving – properties of shapes (2)

→ pages 84–86

- External angle is  $360^\circ \div \text{number of sides}$ ;  $360 \div 8 = 45$   
or internal angle sum:  $6 \times 180 = 1,080$ ;  $1,080 \div 8 = 135$ ;  
 $180 - 135 = 45$   
 $m = 45^\circ$
- Shapes in the wrong place: trapezium, rhombus, regular pentagon and regular hexagon.

	Interior angles add up to $360^\circ$	Interior angles do not add up to $360^\circ$
Have at least one pair of parallel sides	rectangle parallelogram	rhombus regular pentagon
Have no pairs of parallel sides	kite trapezium	triangle regular hexagon

- Internal angle of hexagon =  $120^\circ$ ,  $3 \times 120^\circ = 360^\circ$
- angle a =  $120^\circ$  (adjacent angles in parallelogram =  $180^\circ$  or opposite angles are equal), angle b =  $47^\circ$   
(internal angles in a pentagon =  $108^\circ$ ; angles round a point =  $360^\circ$ )
- angle e =  $80^\circ$ , angle f =  $40^\circ$

### Reflect

A regular pentagon has 5 angles each of  $108^\circ$ .  
 $330 \div 3 = 110^\circ$ , not 108. Alternatively: all angles must be equal in regular shapes:  $330 \div 3 = 110^\circ$ , leaving only  $210^\circ$  for the other two angles, not enough for both to be  $110^\circ$  (angle sum of pentagon =  $3 \times 180 = 540$ ).

## End of unit check

→ pages 87–88

### My journal

He will save £7,776.

Children need to find 25% and  $\frac{3}{10}$  of 1,200 to find how much is left (540) then split into the ratio 3 : 2 to find out how much he saves each month ( $540 \div 5 = 108$ ;  
 $2 \times 108 = 216$  saved) then multiply by the number of months:  $216 \times 36 \text{ months} = 7,776$

### Power play

	Money spent	Arrival time	Departure time
Jamie	£7.50	13:00	14:15
Max	£2.50	10:30	13:30
Zac	£10	11:15	13:15

Children should fill in any information given in the speech bubble first: Max's times and Zac's spend, using that to work out the rest.

# Unit 15: Statistics

## Lesson 1: The mean (I)

→ pages 90–92

- Children should draw 3 bars each 5 squares high.
  - Children should draw 4 rows of 5 counters.
- The mean number of marbles = 4.
- Children should match groups A and D, and B and C.
- 25 cm
  - 250 ml
  - 251 kg
- Circled: Group A.
- - 
  - 
  -

Each time the mean is the same as the number half-way between the two given numbers.

### Reflect

Answers will vary; for example: add together and divide by 3 or take one off the 6 and add it to the 4.

## Lesson 2: The mean (2)

→ pages 93–95

- |   |   |   |   |
|---|---|---|---|
| 2 | 4 | 6 | 4 |
| 4 | 4 | 4 | 4 |

$$2 + 4 + 6 + 4 = 16$$

$$16 \div 4 = 4$$
  - |     |     |     |     |
|-----|-----|-----|-----|
| 1   | 5   | 6   | 2   |
| 3.5 | 3.5 | 3.5 | 3.5 |

The mean = 3.5
  - |   |   |   |   |   |   |
|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 3 |
| 3 | 3 | 3 | 3 | 3 | 3 |

The mean = 3
- The mean capacity = 1.25 l
- The Brown family has the greater mean weekly spend.
- The mean length = 1.6 m
- First: Lexi      Second: Bella      Third: Amelia

### Reflect

Answers will vary; for example: To find the mean of a set of numbers, you add the numbers then divide by the amount of numbers.

## Lesson 3: The mean (3)

→ pages 96–98

- Children should draw a tower of 7 cubes in the left-hand group and a tower of 4 cubes in the right-hand group.
- Emma has 1 pet.
- The fourth group collected £2.50.
- 2
  - Answer will vary but the sum of both missing numbers must be 4.5; for example: 0 and 4.5; 2 and 2.5.
- Answer will vary but the total water added in Jugs B and E must be 550 ml; for example: B = 350 ml and E = 200 ml; B = 150 ml and E = 400 ml
- 6 and 4; 2 and 8  
Answers will vary but must have a total of 15; for example: 5, 5, 5; 3, 5, 7; 1, 5, 9; 1, 3, 11  
Answers will vary but are limited to 0 and 10 or 1 and 11 as the greatest / least; for example: 0, 2, 4, 10; 0, 3, 3, 10; 1, 2, 2, 11; 1, 1, 3, 11  
Answers will vary; for example: 2.5, 3.5, 4.5, 5.5.

### Reflect

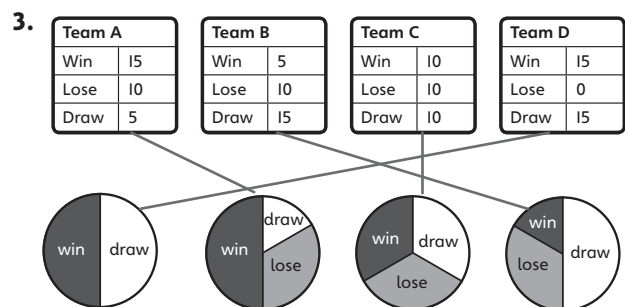
Many variations. Look for an easy method: two cards totalling 15, 4 cards totalling 30.

## Lesson 4: Introducing pie charts

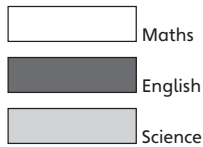
→ pages 99–101

- More than half the children in Club C play football.

	True	False
Less than half want to be a pop star.	✓	
The least popular job is vet.		✓
More children want to be a sports person than a teacher.	✓	



4. Key



5. Answers will vary; for example:

Questions to be answered using a pie chart: questions relating to most/least; fractions or percentages etc.  
Questions to be answered using a bar chart: questions relating to most/least popular, how many, how many more, totals etc.

### Reflect

Answers will vary; for example: pie charts are better for an overall view of the data and for proportions of the whole (fraction/percentages); bar charts are better for showing specific amounts for the individual categories and for comparing numerically.

## Lesson 5: Reading and interpreting pie charts

→ pages 102–105

- Children should colour 5 sections for banana, 1 for kiwi and 4 for strawberry.
  - Children should colour 1 section for orange, 1 for lemon and 3 for chocolate.
  - Children should colour 1 section for rabbits and 3 for cats.
- The best team has 4 more points than the worst team.
  - 5 possible answers: 5 wins and 1 draw; 4 wins and 4 draws; 3 wins and 7 draws; 2 wins and 10 draws; 1 win and 13 draws.
- Children should shade the pie chart to show 2 sections each for 'once a week' and 'sometimes', 1.5 sections for 'every day' and 2.5 sections for 'never'.
- Shading to show 6 sections for boys and 4 sections for girls.

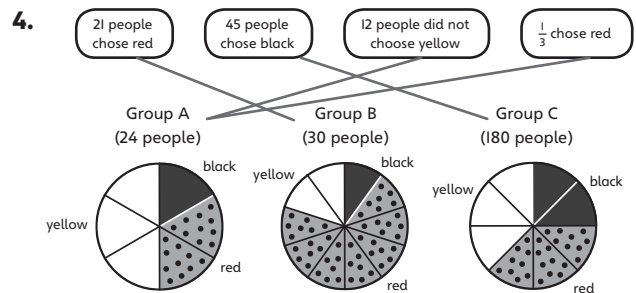
### Reflect

Answers will vary; Children should mention dividing the total by the number of sections.

## Lesson 6: Fractions and pie charts (1)

→ pages 105–107

- The horse spends  $\frac{1}{6}$  of the day sleeping.  
The cat spends  $\frac{1}{2}$  of the day sleeping.  
The boy spends  $\frac{2}{3}$  of the day awake.  
The cat sleeps most in a day and sleeps for 12 hours.
- Jamilla =  $\frac{5}{16}$ , Isla =  $\frac{6}{16} = \frac{3}{8}$ , Aki =  $\frac{4}{16} = \frac{1}{4}$ , Bella =  $\frac{1}{16}$
- Amelia is correct. The Tigers have lost  $\frac{1}{4}$  of 48 = 12;  
The Bears have lost  $\frac{1}{2}$  of 20 = 10.



- Answers will vary but should be close to the following and total 1: cat food =  $\frac{3}{20}$ , dog food =  $\frac{2}{5}$  and bird seed =  $\frac{9}{20}$ .
  - Answers will depend on the children's fractions in part a) but should be approximately: cat food = £45, dog food = £120 and bird seed = £135.

### Reflect

Answers will vary; look for children mentioning twelfths, quarters and two-thirds.

## Lesson 7: Fractions and pie charts (2)

→ pages 108–110

Type of tree	Number seen
birch	16
oak	12
pine	4
fir	8
<b>Total</b>	<b>40</b>

- 60 birds were sighted altogether.
  - 15 blackbirds were sighted.
- Bella threw more than 70 times. False
  - Max threw fewer beanbags than Bella. True
  - Bella scored 3 more bullseyes than Max. False
- $\frac{5}{12}$  like curry.  
288 children like pizza and curry.
- $\frac{1}{14}$  is mango.
  - 50 ml more pineapple is needed.

## Reflect

Answers will vary.

## Lesson 8: Percentages and pie charts

→ pages 111–113

- 25%; 16%; 30%
- Bella = 15 votes; Zac = 21 votes; Isla = 12 votes; Reena = 12 votes
- 24 more people shop online than in second-hand shops.
- Both teams were 60% successful.
- There are 30 more birch trees in Lanhay Forest than in Hetiddy Woods.

## Reflect

Children's pie charts should show  $\frac{1}{4}$  (= 25%), 10% ( $\frac{1}{10}$ ) and 15% ( $\frac{3}{20}$ ) with the remainder  $\frac{1}{2}$  or 50%.

## Lesson 9: Interpreting line graphs

→ pages 114–116

- 2:30 = 15 °C 5 pm = 7 °C
  - It decreases by 24.5 °C.
  - 4:45–4:48 pm
  - (Approximately) 7.75 °C
- 1995: answers from 65,000–74,000  
2005: answers from 200,150–200,250
- 110 km
  - The cyclist slowed to climb a steep hill between 30 minutes and 90 minutes.  
The cyclist rested for 10 minutes after 120 minutes of racing.  
After 102–105 minutes the cyclist had completed half the distance.  
The cyclist raced most quickly between 130 minutes and 160 minutes.
- $\frac{1}{3}$
  - Answers approximately 30% +/- 3%
  - Answers approximately 60% +/- 3%

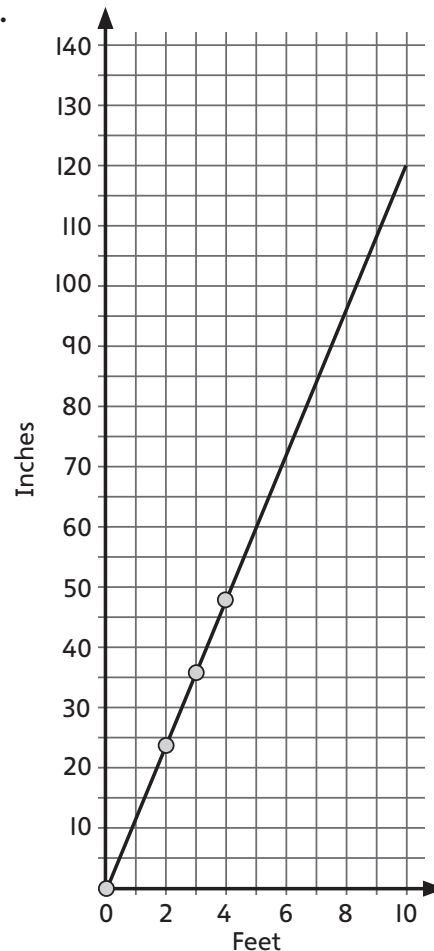
## Reflect

Answers will vary. Children should mention the scales on the axes and how to read in between the marked intervals.

## Lesson 10: Constructing line graphs

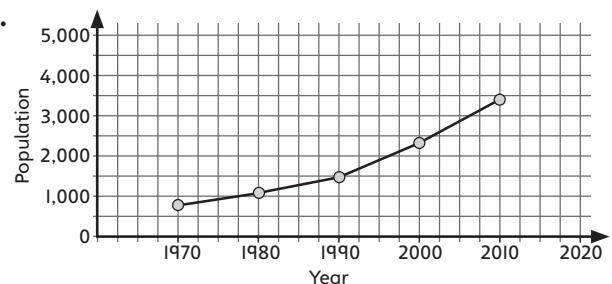
→ pages 117–119

1.



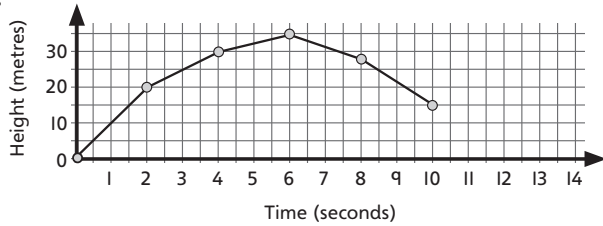
- 1 foot = 12 inches  
10 feet = 120 inches  
 $3\frac{1}{2}$  feet = 42 inches  
 $5\frac{1}{4}$  feet = 63 inches  
30 inches =  $2\frac{1}{2}$  feet  
100 inches =  $8\frac{1}{3}$  feet

2.



Predictions for the population in 2020 should be accurately read off the children's graph.  
Approximately 4,000–5,000.

3.

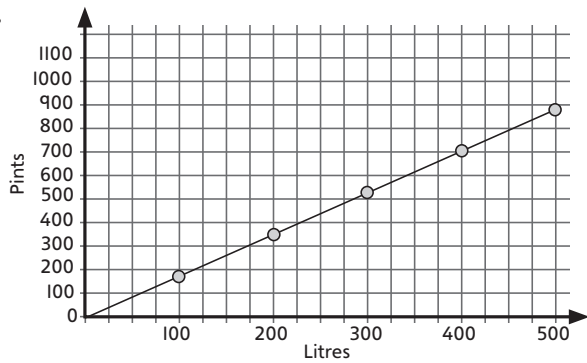


Predictions for when the firework will land should be accurately read off the children's graph.  
Approximately 11–12 seconds.

### Power play

Children should play the game and then adapt it.  
Answers will vary.

4.



Answers close to:

Pints	100	85	25	5.5
Litres	176	150	44	10

### Reflect

Answers will vary. Children should mention deciding the scales on the axes and the fact that it would be a straight line.

## End of unit check

→ pages 120–122

### My journal

- There is room for 1–1 on the scale but some children may labels in 2s. \$19 at this rate = approximately £12.50, exactly £12.67.
- Answers will vary; for example:  
Pie chart: to compare quickly each part to the whole, using fraction or percentages, to tell quickly the most/least popular, etc.  
Tally chart: to work out exact figures. They are usually then used to draw other graphs.  
Line graph: to show a trend in time or temperature, to convert between units, to show a relationship between two things, etc.  
Bar chart: to compare amounts and find total and differences easily.