Name:

Maths Assessment Year 6: Measurement

You will need a ruler for this assessment.

1. Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate.

2. Use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places.

3. Convert between miles and kilometres.

4. Recognise that shapes with the same areas can have different perimeters and vice versa.

5. Recognise when it is possible to use formulae for area and volume of shapes.

6. Calculate the area of parallelograms and triangles.

7. Calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm^3) and cubic metres (m^3), and extending to other units [for example, mm^3 and km^3].

Name: Date:

60 total marks

Maths Assessment Year 6: Measurement

1. Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate.

a) Jamie is baking scones. The recipe he is following says that 455g of flour will make 8 scones. How much flour will he need to make 24 scones? **Write your answer in kilograms.**

kg

1 mark

b) Sasha is washing cars to raise money for charity. She uses 11.5 litres of water to wash two cars. How much water would she use to wash 6 cars? **Write your answer in litres.**

l

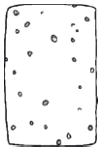
1 mark

c) Jack is filling cups with orange squash for his friends at a party. One cup can hold 325ml. How much squash is needed to fill 10 cups? **Write your answer in litres.**

l

1 mark

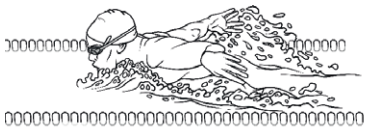
d) Emily is making fruit cakes for a school fayre. She needs to use 0.654kg of sultanas and 0.3kg of raisins. How much dried fruit does she need altogether? **Write your answer in grams.**



g

1 mark

e) Mohammed is training for a swimming race. He swims 1825 metres on Saturday and 1750 metres on Sunday. How far does he swim altogether? **Write your answer in kilometres.**



km

1 mark

Total for this page

2. Use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places.

a) Match up the equivalent units of length:

1750m	1.54m
175cm	1.75km
1564m	0.7m
154cm	1.75m
70cm	0.7km
700m	1.564km

6 marks

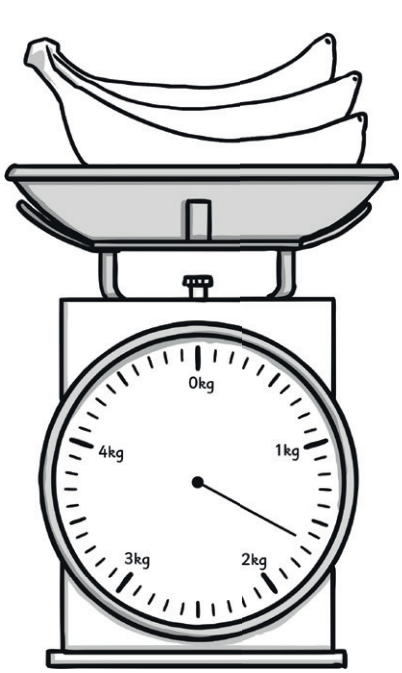
b) Complete the table to identify the equivalent lengths:

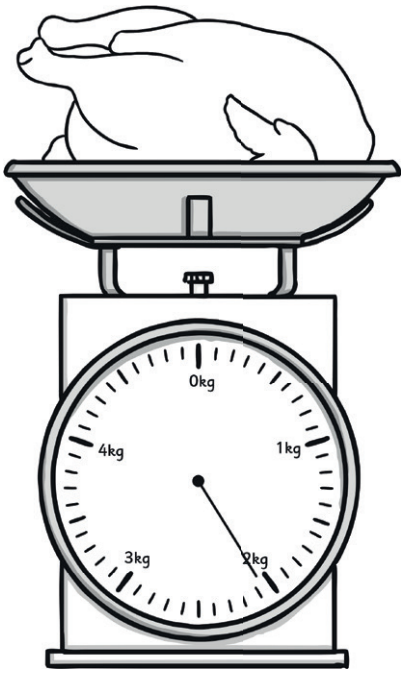
Millimetres	Centimetres
	1.5cm
20 mm	
	75.2cm
460 mm	
	86.1 cm

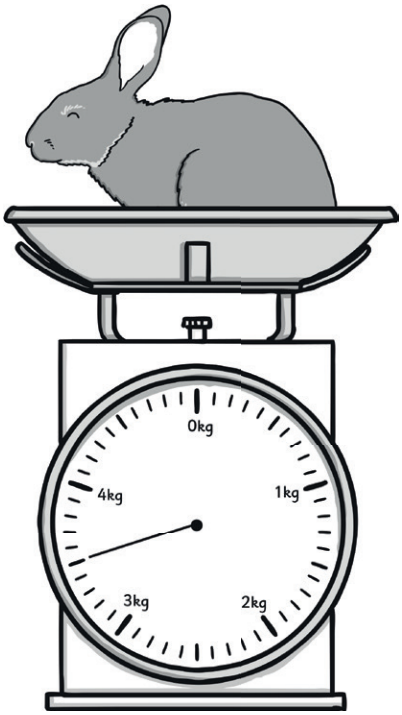
5 marks

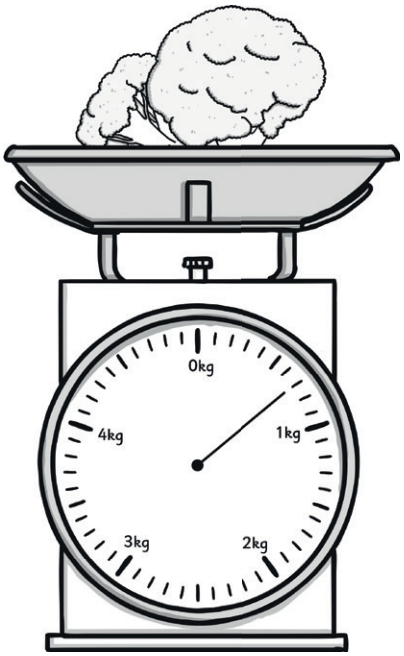
Total for this page

c) Write the mass shown on these scales, using both kilograms and grams:









	Mass in grams (for example 500g)	**Mass in kilograms** (for example 0.5 kg)
Bananas		
Chicken		
Rabbit		
Broccoli		

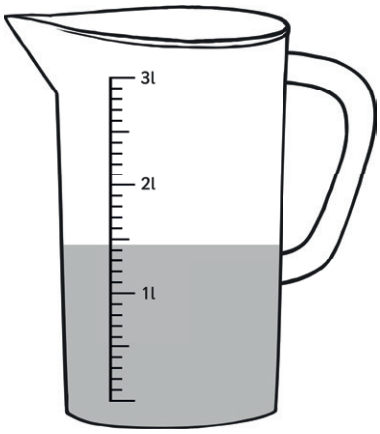
4 marks

Total for this page

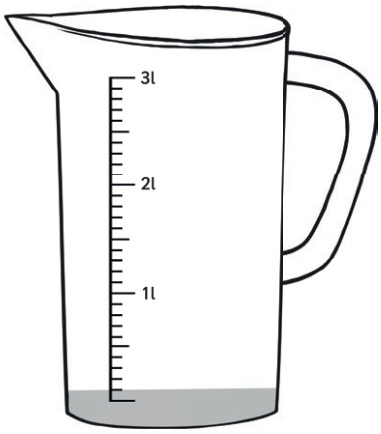
d) Write the volume of water in each jug, in both millilitres and litres:

i.

ii.



iii.



	Millilitres (for example 1000ml)	**Litres** (for example 1l)
i.		
ii.		
iii.		

3 marks

e)

How many minutes are in two and a half hours?	
How many minutes is 75 seconds?	
180 minutes is equivalent to how many hours?	
How many minutes is equivalent to three quarters of an hour?	
How many seconds are in 5 minutes?	

5 marks

Total for this page

3. Convert between miles and kilometres.

a) Identify the equivalent distances in miles and kilometres, rounded to the nearest whole number, by completing the table below:

Distance in miles	Distance in kilometres
	1.6 km
2 miles	
	4.8km
5 miles	
	16 km
20 miles	

5 marks

b) This map shows the location of some cities in Britain.

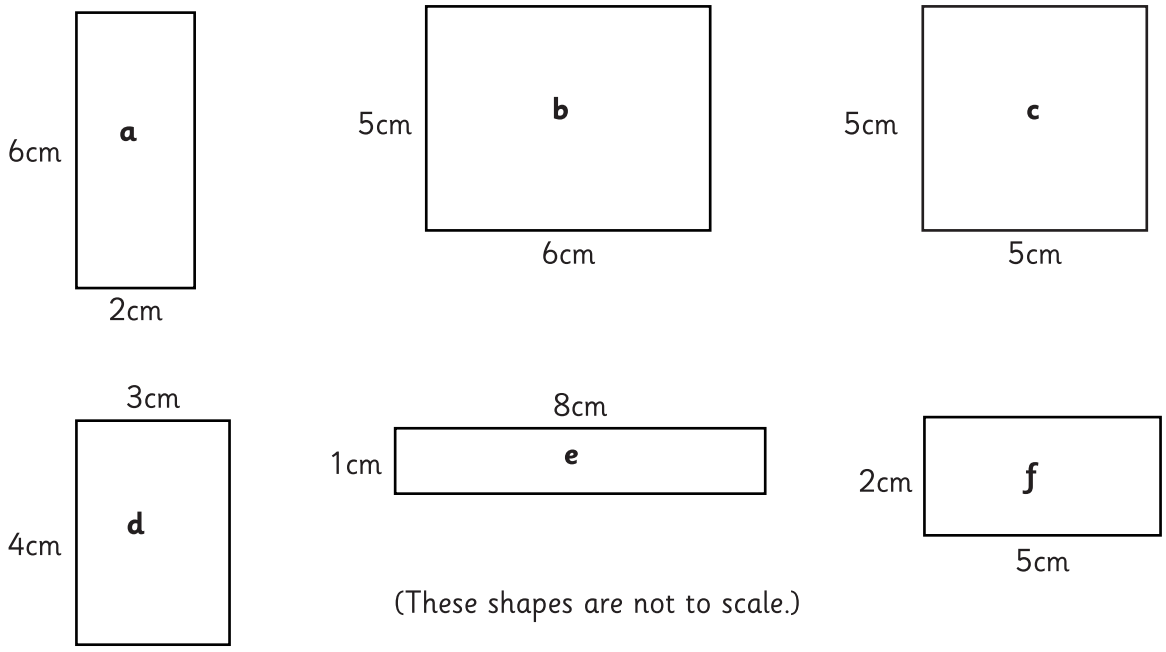
The distance from London to Leicester is approximately 100 miles. What is this distance in kilometres, to the nearest whole number?	
The distance from Edinburgh to Glasgow is approximately 80 kilometres. What is this distance in miles, to the nearest whole number?	
The distance from Cardiff to Liverpool is approximately 200 miles. What is this distance in kilometres, to the nearest whole number?	

3 marks

Total for this page

4. Recognise that shapes with the same areas can have different perimeters and vice versa.

a) Look at these shapes:



(These shapes are not to scale.)

Which two shapes have the same area? ..... and .....

Which two shapes have the same perimeter? ..... and .....

2 marks

b) Draw two different rectangles that have an area of 8cm².

1 mark

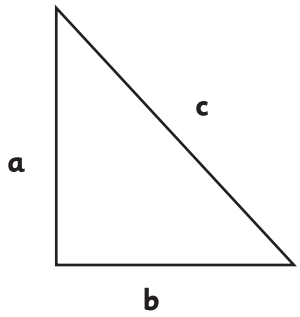
Total for this page

c) Draw two different rectangles that have a perimeter of 18cm.

1 mark

5. Recognise when it is possible to use formulae for area and volume of shapes.

a) Circle the formula that could be used to calculate the area of this right-angled triangle:



a + b x 2
ab x 0.5
a + b + c
ab x 2
a - b

1 mark

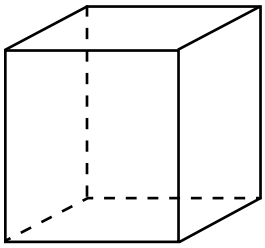
b) Circle the formula that could be used to calculate the surface area of this cuboid:

2(ab)+2(ac)+2(bc)
6(ab)
4(ab) + 2(bc)
ab + ac + bc
(ab) + 4(bc)

1 mark

Total for this page

c)



a

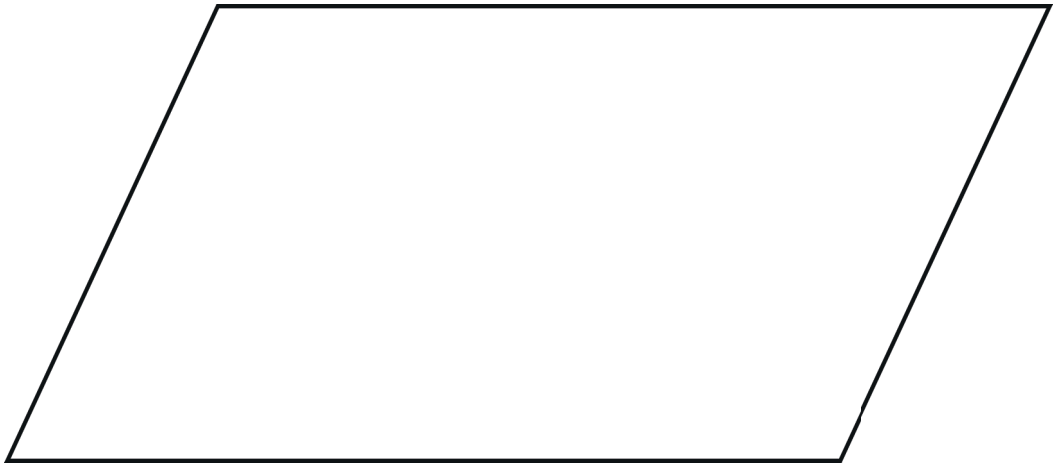
Write the formula that could be used to calculate the **surface area** of this cube.	
Write the formula that could be used to calculate the **volume** of this cube.	

2 marks

6. Calculate the area of parallelograms and triangles.

a) Circle the area of this parallelogram:

This shape is to scale. You can use a ruler for this question.



33cm²	66cm²	60cm²	22cm²	17cm²

1 mark

b) Calculate the area of this parallelogram:

This shape is to scale. You can use a ruler for this question.

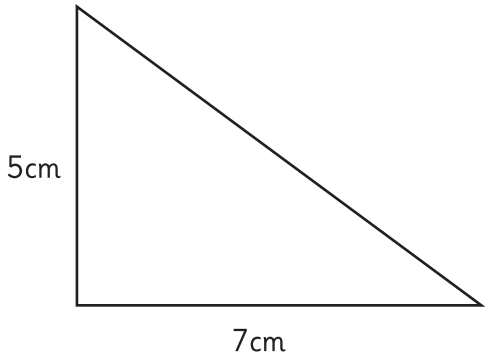
cm²

2 marks

Total for this page

c) Calculate the area of this triangle:

This shape is **not** to scale.

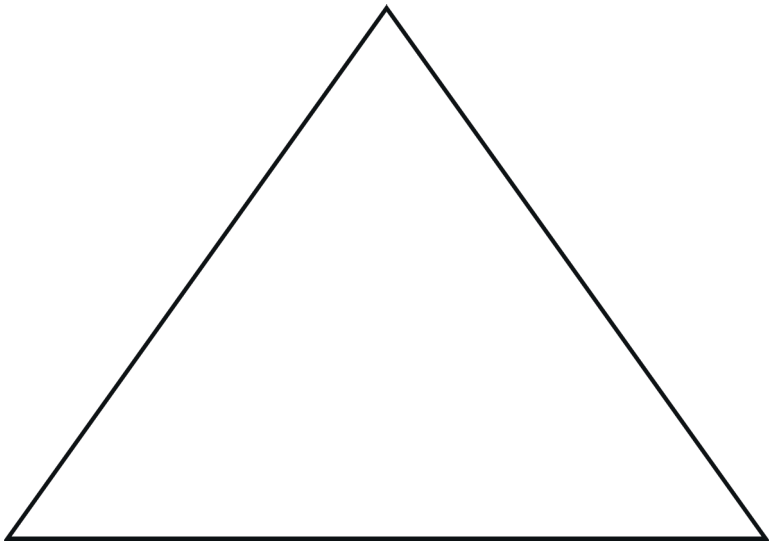


cm²

2 marks

d) Calculate the area of this triangle:

This shape is to scale. You can use a ruler for this question.



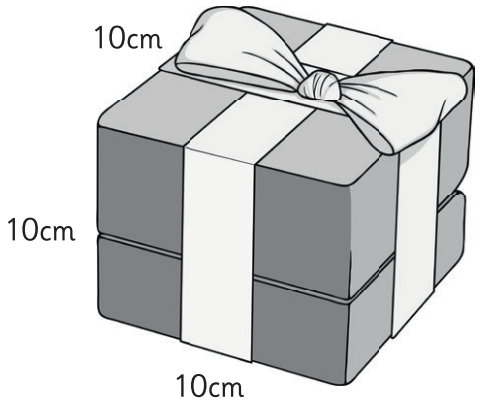
cm²

2 marks

Total for this page

7. Calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm^3) and cubic metres (m^3), and extending to other units [for example, mm^3 and km^3].

a) Circle the volume of this box:



$30cm^3$
$100cm^3$
$300cm^3$
$1000cm^3$
$3000cm^3$

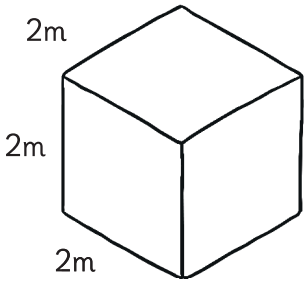
1 mark

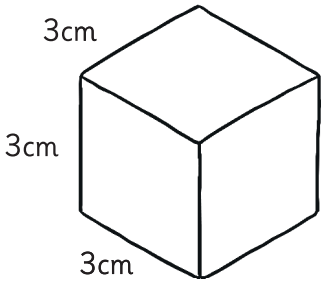
b) Calculate the volume of a cuboid that has a length of 10cm, a height of 6cm and a depth of 4cm:

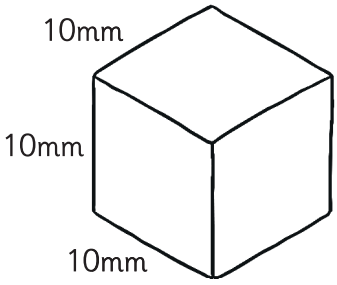
Show your working out.

2 marks

c) Tick the shape that has the largest volume:



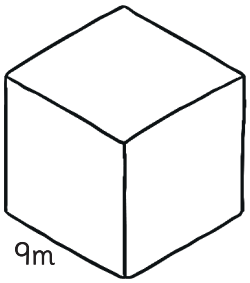




1 mark

d) Molly estimates the size of this cube.

Which would be the most sensible estimate?



(This shape is not to scale.)

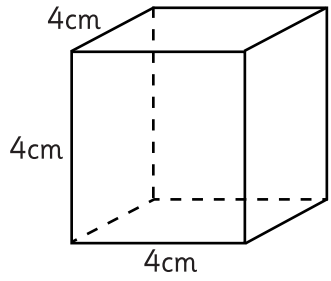
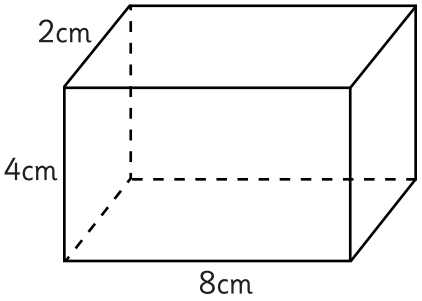
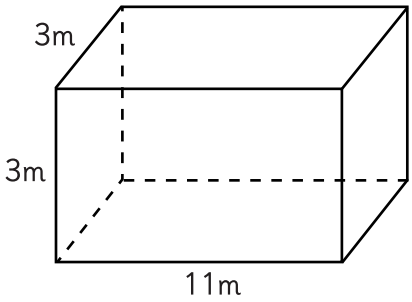
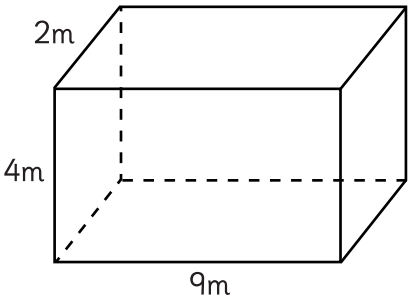
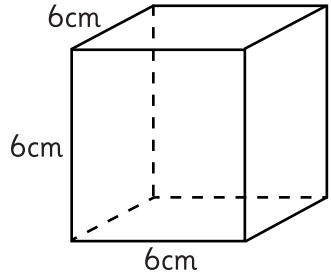
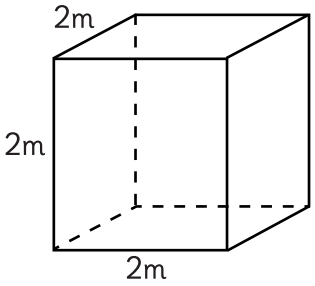
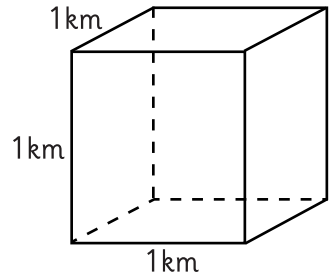
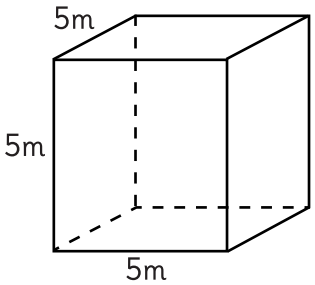
$90m^3$	$10m^3$	$800m^3$	$100m^3$	$900cm^3$

1 mark

Total for this page

e) Use the symbols < > or = to compare the volume of each pair or cubes / cuboids:

(These shapes are not to scale.)

	< > or =	
		
		
		
		

4 marks

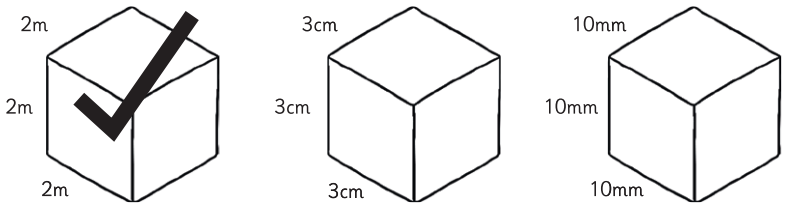
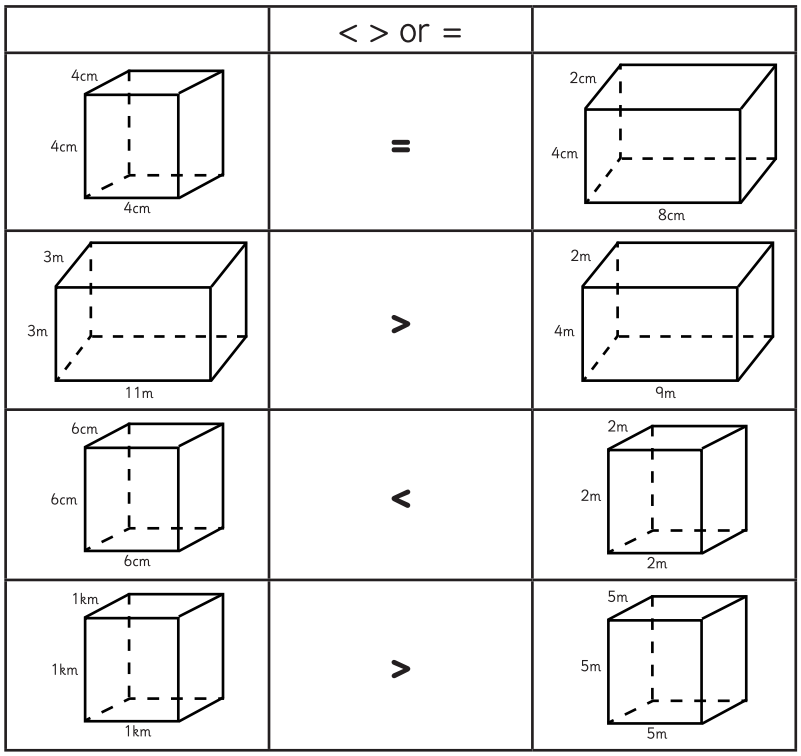
Total for this page

w

<table>
<tr><th>question</th><th>answer</th><th>marks</th><th>notes</th></tr>
<tr><td colspan="4">1. Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate.</td></tr>
<tr><td>a</td><td>1.365 kilograms</td><td>1</td><td></td></tr>
<tr><td>b</td><td>34.5 litres</td><td>1</td><td></td></tr>
<tr><td>c</td><td>3.25 litres</td><td>1</td><td></td></tr>
<tr><td>d</td><td>954 grams</td><td>1</td><td></td></tr>
<tr><td>e</td><td>3.575 kilometres</td><td>1</td><td></td></tr>
<tr><td colspan="4">2. Use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places.</td></tr>
<tr><td>a</td><td>1750m → 1.75km
175cm → 1.564km
1564m → 1.54m
154cm → 1.75m
70cm → 0.7m
700m → 0.7km</td><td>6</td><td>Award one mark for each pair correctly matched.</td></tr>
<tr><td>b</td><td>
<table>
<tr><td>Millimetres</td><td>Centimetres</td></tr>
<tr><td>15 mm</td><td>1.5cm</td></tr>
<tr><td>20 mm</td><td>2 cm</td></tr>
<tr><td>752 mm</td><td>75.2cm</td></tr>
<tr><td>460 mm</td><td>46 cm</td></tr>
<tr><td>861 mm</td><td>86.1 cm</td></tr>
</table>
</td><td>5</td><td>Award one mark for each box correctly completed.</td></tr>
<tr><td>c</td><td>
<table>
<tr><td></td><td>Mass in grams (for example 500g)</td><td>Mass in kilograms (for example 0.5kg)</td></tr>
<tr><td>banana</td><td>1650g</td><td>1.65kg</td></tr>
<tr><td>chicken</td><td>2050g</td><td>2.05kg</td></tr>
<tr><td>rabbit</td><td>3500g</td><td>3.5kg</td></tr>
<tr><td>broccoli</td><td>700g</td><td>0.7kg</td></tr>
</table>
</td><td>4</td><td rowspan="2">Award one mark for each pair correctly matched.</td></tr>
<tr><td>d</td><td>
<table>
<tr><td></td><td>millilitres</td><td>litres</td></tr>
<tr><td>i.</td><td>2900ml</td><td>2.9litres</td></tr>
<tr><td>ii.</td><td>1450 ml</td><td>1.45 litres</td></tr>
<tr><td>iii.</td><td>100 ml</td><td>0.1 litre</td></tr>
</table>
</td><td>3</td></tr>
</table>

<table>
<tr><th>question</th><th>answer</th><th>marks</th><th>notes</th></tr>
<tr><td>e</td><td><table>
<tr><td>How many minutes are in two and a half hours?</td><td>150 minutes</td></tr>
<tr><td>How many minutes is 75 seconds?</td><td>1¼ minutes (accept 1.25)</td></tr>
<tr><td>180 minutes is equivalent to how many hours?</td><td>3 hours</td></tr>
<tr><td>How many minutes is equivalent to three quarters of an hour?</td><td>45 minutes</td></tr>
<tr><td>How many seconds are in 5 minutes?</td><td>300 seconds</td></tr>
</table></td><td>5</td><td>Award one mark for each correct answer.</td></tr>
<tr><td colspan="4">3. Convert between miles and kilometres.</td></tr>
<tr><td>a</td><td><table>
<tr><td>Distance in miles</td><td>Distance in kilometres</td></tr>
<tr><td>1 mile</td><td>1.6 km</td></tr>
<tr><td>2 miles</td><td>3.2 km</td></tr>
<tr><td>3 miles</td><td>4.8km</td></tr>
<tr><td>5 miles</td><td>8 km</td></tr>
<tr><td>10 miles</td><td>16 km</td></tr>
<tr><td>20 miles</td><td>32 km</td></tr>
</table></td><td>5</td><td></td></tr>
<tr><td>b</td><td><table>
<tr><td>The distance from London to Leicester is approximately 100 miles. What is this distance in kilometres, to the nearest whole number?</td><td>160 km</td></tr>
<tr><td>The distance from Edinburgh to Glasgow is approximately 80 kilometres. What is this distance in miles, to the nearest whole number?</td><td>50 miles</td></tr>
<tr><td>The distance from Cardiff to Liverpool is approximately 200 miles. What is this distance in kilometres, to the nearest whole number?</td><td>320 km</td></tr>
</table></td><td>3</td><td>Award one mark for each correct answer.</td></tr>
<tr><td colspan="4">4. Recognise that shapes with the same areas can have different perimeters and vice versa.</td></tr>
<tr><td>a</td><td>Which two shapes have the same area? a and d
Which two shapes have the same perimeter? d and f</td><td>2</td><td>Award one mark for each pair of shapes correctly identified.</td></tr>
<tr><td>b</td><td>Two different rectangles have been drawn, each with an area of 8cm^2</td><td>1</td><td rowspan="2">Do not award a mark for the same rectangles in different orientations.</td></tr>
<tr><td>c</td><td>Two different rectangles have been drawn, each with a perimeter of 18cm.</td><td>1</td></tr>
<tr><td colspan="4">5. Recognise when it is possible to use formulae for area and volume of shapes.</td></tr>
<tr><td>a</td><td><table>
<tr><td>a + b x 2</td></tr>
<tr><td>ab x 0.5</td></tr>
<tr><td>a + b + c</td></tr>
<tr><td>ab x 2</td></tr>
<tr><td>a - b</td></tr>
</table></td><td>1</td><td></td></tr>
</table>

question	answer	marks	notes
b	2(ab)+2(ac)+2(bc) 6(ab) 4(ab) + 2(bc) ab + ac + bc (ab) + 4(bc)	1	
c	Calculate the **surface area**. Accept one of the following: **$6a^2$** or **$6(a \times a)^2$** Calculate the **volume**. Accept one of the following: **a^3** or **a x a x a**	2	Award one mark for each correct answer.
6. Calculate the area of parallelograms and triangles.			
a	33cm² | 66cm² | 60cm² | 22cm² | 17cm²	1	
b	9 x 4 or 4 x 9 = 36 cm²	2	Award two marks for a correct answer. If the answer is incorrect, award one mark for a correct calculation which involves multiplying height by length.
c	7 x 5 = 35 35 ÷ 2 = 17.5cm²	2	Award two marks for a correct answer. If the answer is incorrect, award one mark for evidence of a correct calculation which involves multiplying height by length, then halving the answer.
d	7 x 10 = 70 70 ÷ 2 = 35cm²	2	
7. Calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm³) and cubic metres (m³), and extending to other units [for example, mm³ and km³].			
a	30cm³ 100cm³ 300cm³ 1000cm³ 3000cm³	1	
b	10 x 6 x 4 = 240cm³	2	Award two marks for a correct answer. If the answer is incorrect, award two marks for evidence of a correct calculation.

question	answer	marks	notes
c		1	
d	90m³ | 10m³ | 800m³ | 100m³ | 900cm³	1	
e		4	Award one mark for each symbol correctly used.
		Total 60	