Topic Check In - 10.01a Units and measurement

1. Complete this statement.

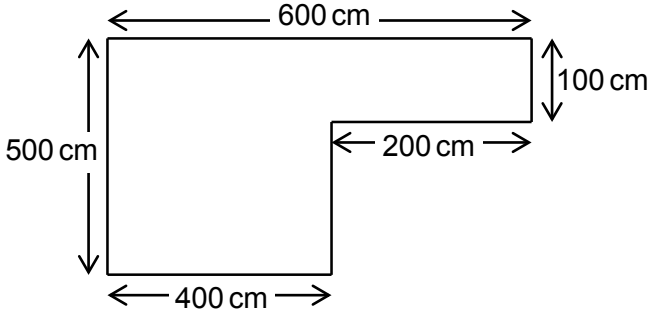
   2000 mm = _____ m

2. State the volume of a 10 cm by 10 cm by 10 cm cube and the capacity of a box of the same dimensions.

   Volume _____ cm^3 Capacity _____ litres

3. The diagram opposite shows a garden lawn.

   State appropriate units for the area of the lawn.



4. A coach takes 3 hours 50 minutes to complete a journey from Manchester to London.
   If the coach leaves Manchester at 09:25, what time does it arrive in London?

5. The luggage allowance on a British flight is 23 kg.
   If your luggage weighs 21 kg 35 g, how much more weight could you take?

6. Show that 142 minutes is less than $2\frac{1}{2}$ hours.

7. Show that 700 cm^2 is the same as 0.07 m^2.

8. Given that 1 inch is approximately 2.5 cm, show that a 12 inch ruler is approximately 30 cm.

9. Farook is designing a photo montage poster for the PE department. What is the maximum number of 5 cm by 4 cm photographs that he can fit (without overlap) on his 2 m by 2 m piece of card?

10. Here is a recipe for pancakes.

    Recipe for 10 pancakes

    100 g flour
    2 eggs
    300 ml milk
    1 lemon

    Simon looks up the prices of the ingredients on the internet.

    Flour (1 kg bag) costs £1.00
    Eggs (box of 10) cost £1.26
    Milk (1 litre bottle) costs 90p
    Lemons (bag of 3) cost £1.00

    How much would it cost to make 50 pancakes?
    Give your answer to the nearest penny.

Extension

Common units for measuring lengths are millimetres, centimetres, metres and kilometres.

Other metric units for length include femtometres, picometres, nanometres, micrometres, decimetres, megametres and gigametres.

The table below shows the conversion factors into metres.

Unit	Length in metres
Gigametre (Gm)	$1\text{ Gm} = 1 \times 10^{9}\text{ m}$
Megametre (Mm)	$1\text{ Mm} = 1 \times 10^{6}\text{ m}$
Decimetre (dm)	$1\text{ dm} = 1 \times 10^{-1}\text{ m}$
Micrometre (μm)	$1\text{ μm} = 1 \times 10^{-6}\text{ m}$
Nanometre (nm)	$1\text{ nm} = 1 \times 10^{-9}\text{ m}$
Picometre (pm)	$1\text{ pm} = 1 \times 10^{-12}\text{ m}$
Femtometre (fm)	$1\text{ fm} = 1 \times 10^{-15}\text{ m}$

Use this information to design a conversion chart between all these units of length.

Answers

1. 20 m

2. Volume 1000 cm^3 Capacity 1 litre

3. m^2 (accept cm^2)

4. 13:15 or 1.15 pm

5. 1 kg 965 g oe

6. $2\frac{1}{2}$ hours = 150 minutes so 142 minutes < 2.5 hours oe

7. 10000 cm^2 = 1 m^2
   1 cm^2 = $\frac{1}{10000}$ m^2
   700 cm^2 = $\frac{7}{100}$ m^2

8. 12 × 2.5 = 30

9. Can fit 40 photographs by 50 photographs = 2000 photographs in total

10. 500 g flour will cost 1 × 1.00 = £1.00
    10 eggs will cost 1 × 1.26 = £1.26
    1.5 l milk will cost 2 × 0.90 = £1.80
    5 lemons will cost 2 × 1.00 = £2.00
    Total £6.06

Extension

		TO										
		fm	pm	nm	μm	mm	cm	dm	m	km	Mm	Gm
FROM	fm		$\div 10^3$	$\div 10^6$	$\div 10^9$	$\div 10^{12}$	$\div 10^{13}$	$\div 10^{14}$	$\div 10^{15}$	$\div 10^{18}$	$\div 10^{21}$	$\div 10^{24}$
	pm	$\times 10^3$		$\div 10^3$	$\div 10^6$	$\div 10^9$	$\div 10^{10}$	$\div 10^{11}$	$\div 10^{12}$	$\div 10^{15}$	$\div 10^{18}$	$\div 10^{21}$
	nm	$\times 10^6$	$\times 10^3$		$\div 10^3$	$\div 10^6$	$\div 10^7$	$\div 10^8$	$\div 10^9$	$\div 10^{12}$	$\div 10^{15}$	$\div 10^{18}$
	μm	$\times 10^9$	$\times 10^6$	$\times 10^3$		$\div 10^3$	$\div 10^4$	$\div 10^5$	$\div 10^6$	$\div 10^9$	$\div 10^{12}$	$\div 10^{15}$
	mm	$\times 10^{12}$	$\times 10^9$	$\times 10^6$	$\times 10^3$		$\div 10$	$\div 10^2$	$\div 10^3$	$\div 10^6$	$\div 10^9$	$\div 10^{12}$
	cm	$\times 10^{13}$	$\times 10^{10}$	$\times 10^7$	$\times 10^4$	$\times 10$		$\div 10$	$\div 10^2$	$\div 10^5$	$\div 10^8$	$\div 10^{11}$
	dm	$\times 10^{14}$	$\times 10^{11}$	$\times 10^8$	$\times 10^5$	$\times 10^2$	$\times 10$		$\div 10$	$\div 10^4$	$\div 10^7$	$\div 10^{10}$
	m	$\times 10^{15}$	$\times 10^{12}$	$\times 10^9$	$\times 10^6$	$\times 10^3$	$\times 10^2$	$\times 10$		$\div 10^3$	$\div 10^6$	$\div 10^9$
	km	$\times 10^{18}$	$\times 10^{15}$	$\times 10^{12}$	$\times 10^9$	$\times 10^6$	$\times 10^5$	$\times 10^4$	$\times 10^3$		$\div 10^3$	$\div 10^6$
	Mm	$\times 10^{21}$	$\times 10^{18}$	$\times 10^{15}$	$\times 10^{12}$	$\times 10^9$	$\times 10^8$	$\times 10^7$	$\times 10^6$	$\times 10^3$		$\div 10^3$
	Gm	$\times 10^{24}$	$\times 10^{21}$	$\times 10^{18}$	$\times 10^{15}$	$\times 10^{12}$	$\times 10^{11}$	$\times 10^{10}$	$\times 10^9$	$\times 10^6$	$\times 10^3$	

GCSE (9–1) MATHEMATICS

We'd like to know your view on the resources we produce. By clicking on the 'Like' or 'Dislike' button you can help us to ensure that our resources work for you. When the email template pops up please add additional comments if you wish and then just click 'Send'. Thank you.

OCR Resources: *the small print*

OCR's resources are provided to support the teaching of OCR specifications, but in no way constitute an endorsed teaching method that is required by the Board, and the decision to use them lies with the individual teacher. Whilst every effort is made to ensure the accuracy of the content, OCR cannot be held responsible for any errors or omissions within these resources. We update our resources on a regular basis, so please check the OCR website to ensure you have the most up to date version.

OCR acknowledges the use of the following content: Maths and English icons: Air0ne/Shutterstock.com

Oxford Cambridge and RSA

Assessment Objective	Qu.	Topic	R	A	G
AO1	1	Convert between units of length.			
AO1	2	Convert between volume and capacity.			
AO1	3	Recognise that area units are length units squared.			
AO1	4	Use units of time.			
AO1	5	Calculate with different units of mass.			
AO2	6	Compare time given in different units.			
AO2	7	Convert between units of area.			
AO2	8	Convert between imperial and metric units of length.			
AO3	9	Solve measurement problem involving different units.			
AO3	10	Calculate total cost of shopping list.			

Assessment Objective	Qu.	Topic	R	A	G
AO1	1	Convert between units of length.			
AO1	2	Convert between volume and capacity.			
AO1	3	Recognise that area units are length units squared.			
AO1	4	Use units of time.			
AO1	5	Calculate with different units of mass.			
AO2	6	Compare time given in different units.			
AO2	7	Convert between units of area.			
AO2	8	Convert between imperial and metric units of length.			
AO3	9	Solve measurement problem involving different units.			
AO3	10	Calculate total cost of shopping list.			

Assessment Objective	Qu.	Topic	R	A	G
AO1	1	Convert between units of length.			
AO1	2	Convert between volume and capacity.			
AO1	3	Recognise that area units are length units squared.			
AO1	4	Use units of time.			
AO1	5	Calculate with different units of mass.			
AO2	6	Compare time given in different units.			
AO2	7	Convert between units of area.			
AO2	8	Convert between imperial and metric units of length.			
AO3	9	Solve measurement problem involving different units.			
AO3	10	Calculate total cost of shopping list.			

Assessment Objectiv	Qu.	Topic	R	A	G
AO1	1	Convert between units of length.			
AO1	2	Convert between volume and capacity.			
AO1	3	Recognise that area units are length units squared.			
AO1	4	Use units of time.			
AO1	5	Calculate with different units of mass.			
AO2	6	Compare time given in different units.			
AO2	7	Convert between units of area.			
AO2	8	Convert between imperial and metric units of length.			
AO3	9	Solve measurement problem involving different units.			
AO3	10	Calculate total cost of shopping list.