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Book 6

Key Stage 2 - Ages 10/11

Measurement in Mathematics Series

**Practical measuring activities for the
classroom.**

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Topics/Skills

This book is designed to complement the teaching of measurement concepts in mathematics and to meet the requirements of the Numeracy Strategy as set down in Strategy documents. The book covers the concepts outlined below directed towards meeting curriculum references for:

- * *Making sense of number problems; Problems involving measures (length; mass; volume; time; capacity; area); Data handling.*
- * *Shape and space: Properties of 2D shapes; Properties of 3D shapes.*

Length:

- ☐ measurement to nearest metre, centimetre, millimetre
- ☐ calculations using kilometres/miles
- ☐ perimeter of polygons
- ☐ diameters and circumferences
- ☐ relate measurement of length to other measures.

Area:

- ☐ cover surfaces using tessellations
- ☐ informal measurement of regions
- ☐ simple calculation of area - concrete experiences
- ☐ determine areas beyond concrete experience
- ☐ relate measurement of area to other measures.

Mass:

- ☐ activities based on comparing mass
- ☐ measure to the nearest gram and kilogram
- ☐ activities involving suspension and projection
- ☐ relate measurement of mass to other measures.

Volume and Capacity:

- ☐ measure to the nearest millilitre and litre
- ☐ measure volume of solids
- ☐ measure volume using cubes
- ☐ relate measurement of volume to other measures.

Time:

- ☐ calculations based on the calendar
- ☐ timeline with BC and AD (or common era and before common era)
- ☐ activities requiring rhythmic response
- ☐ time activities in minutes and seconds
- ☐ conversion of time measures
- ☐ read clock to the nearest minute and second (12 and 24 hour clocks)
- ☐ read and use simple timetables.

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Name:

How long is a piece of string?

What you need: a ruler.

Guess the lengths of the items listed below and record your guesses. Then use your ruler to find the length of each item. How close was your guess?

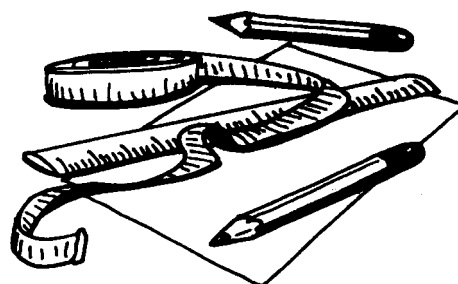
Item	mm		cm		m	
	guess	actual	guess	actual	guess	actual
The width of your maths book						
Your handspan						
The length of the blackboard						
The height of your seat						
The length of your desk						
The width of your desk						
The length of this page						
The width of this page						
The height of the door of your classroom						
The width of the door of your classroom						

☐ Now can you work out the distance around the outside of:

1. Your desk?

2. This page?

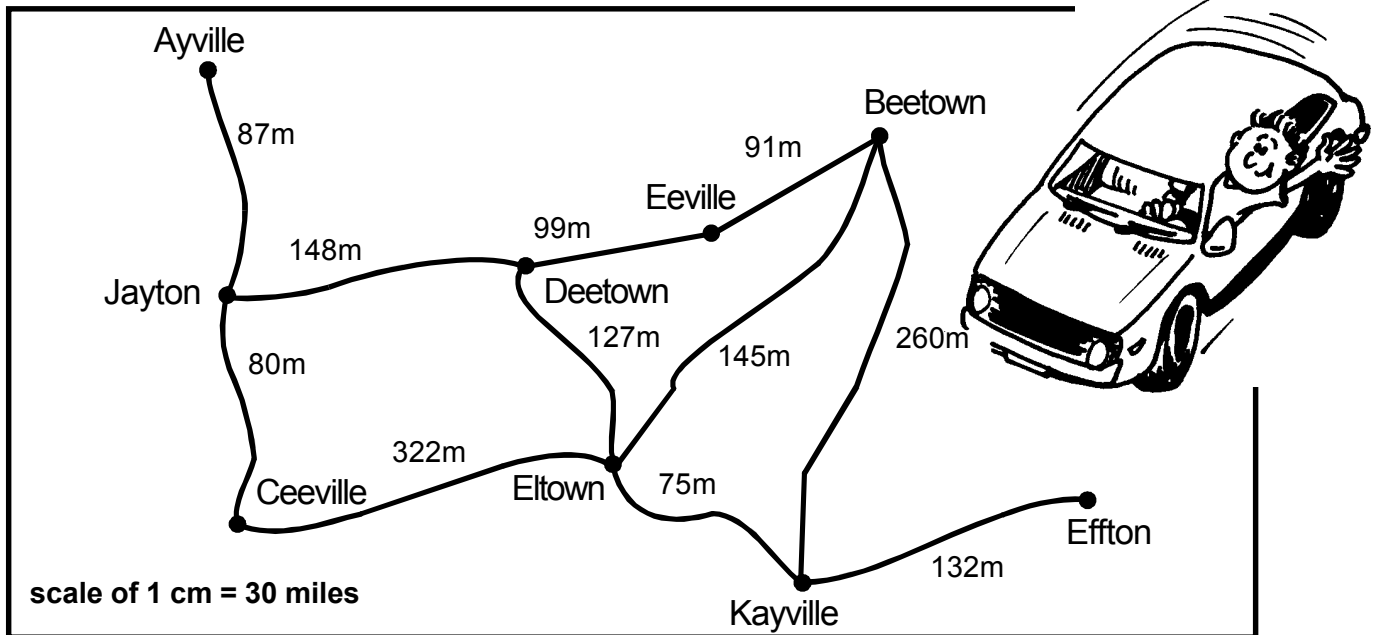
3. The door of your classroom?



Name:

Are we there yet?

- ☐ Your task: The distances between the towns on a map below are usually measured in miles in the UK (metric = kilometres). Use the map to help you answer the questions.



1. What is the shortest distance to drive from:
 - a. Ayville to Ceeville?
 - b. Beetown to Ceeville?
 - c. Jayton to Deetown?
 - d. Ayville to Effton?
 - e. Effton to Kayville?
 - f. Eeville to Effton?
2. If the road from Deetown to Eeville was blocked by floods, what would your answers for question 1 be now?
 - a. Ayville to Ceeville
 - b. Beetown to Ceeville
 - c. Jayton to Deetown
 - d. Ayville to Effton
 - e. Effton to Kayville
 - f. Eeville to Effton
3. If you were to fly a direct route, the distances would be different. Use the scale on the map to find the direct route distances (to the nearest 5 miles).
 - a. Ayville to Ceeville
 - b. Beetown to Kayville
 - c. Jayton to Deetown
 - d. Ayville to Effton
 - e. Effton to Kayville
 - f. Eltown to Effton

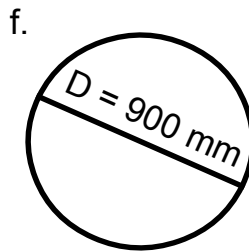
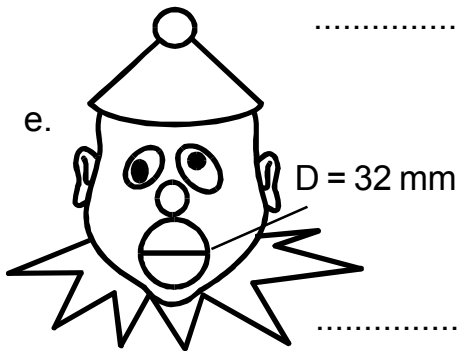
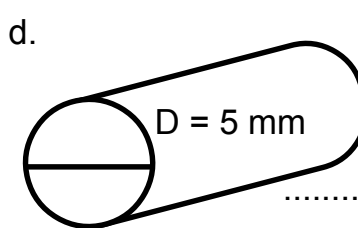
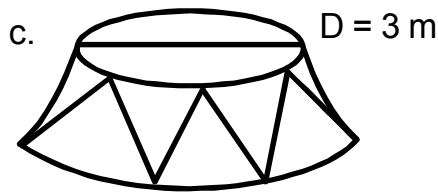
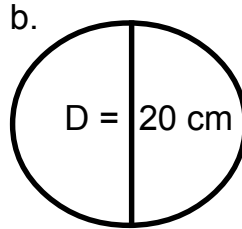
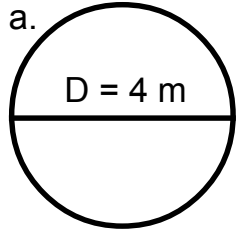
Activity

Draw a map of your local area and put in some of the important features/towns. Ensure that the scale is accurate.

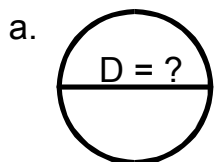
Name:

Circumference

☐ Your task: Calculate the circumference of the following circles. (Use $\pi = 3.14$.)
Remember circumference is $C = \pi \times D$ or $2 \times \pi \times r$.

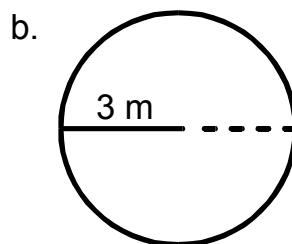


These are a little different. You will need to be careful and think hard!

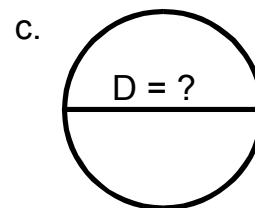


Circumference = 42 m

D =

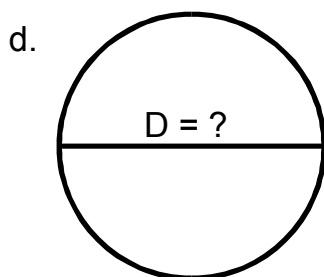


C =



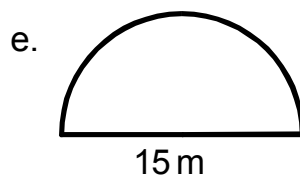
Circumference = 94 cm

D =



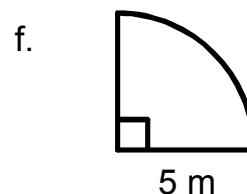
Fred ran 157 m around this track.

D =



What is the distance around this lake?

P =



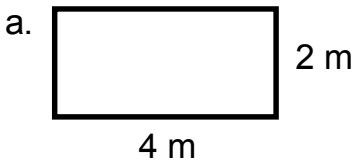
What is the perimeter of this shape?

P =

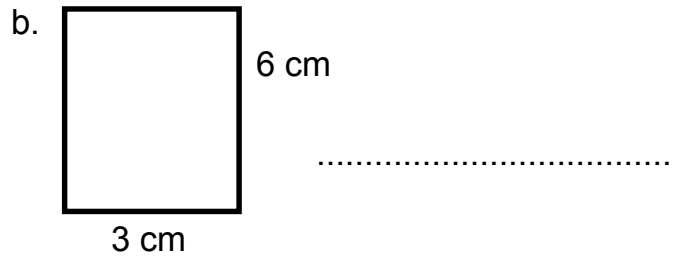
Name:

The big cover-up

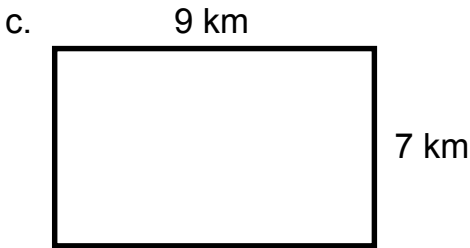
1. Your task: Find the area of the following shapes.



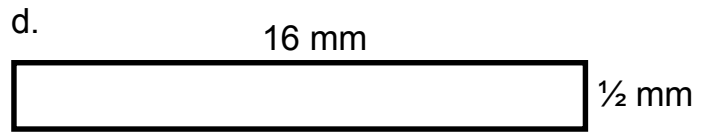
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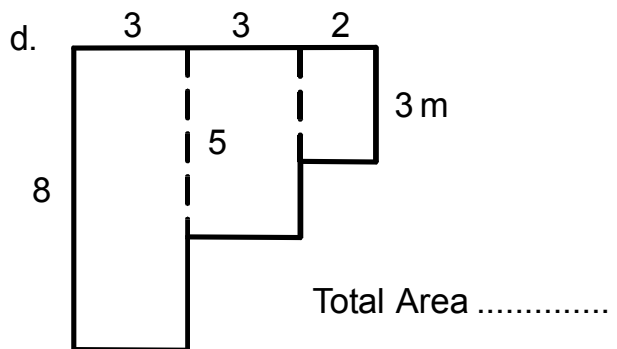
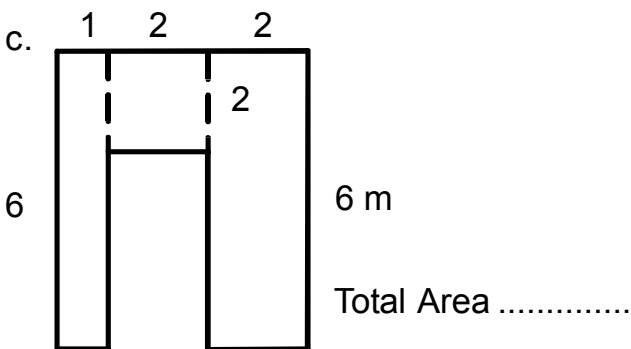
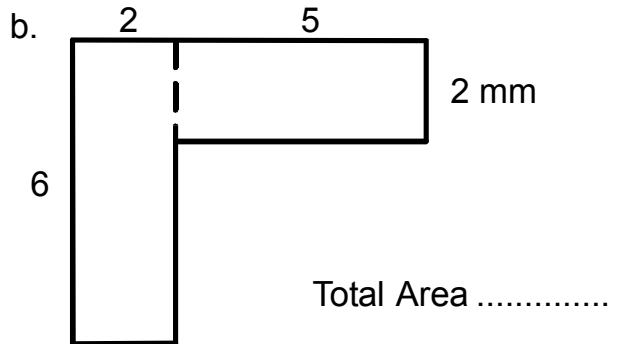
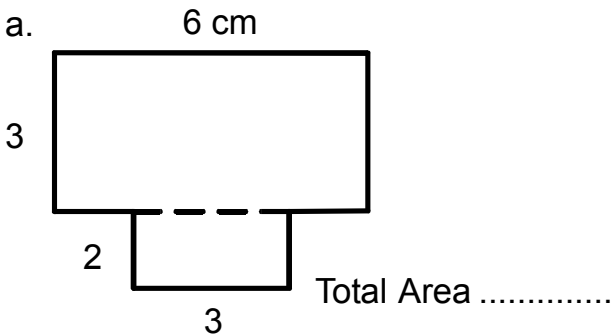


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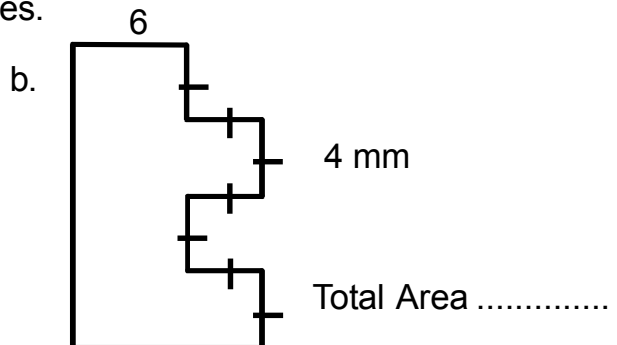
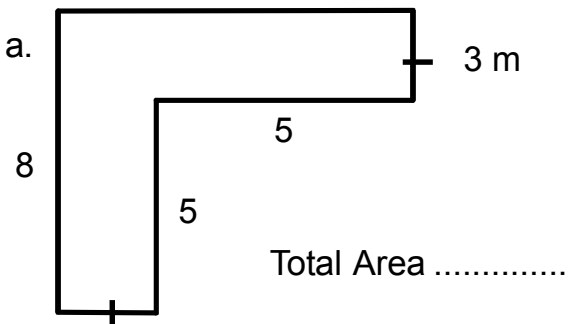


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2. Now try these!



3. Challenge: Find the area of these 2 shapes.



Name:

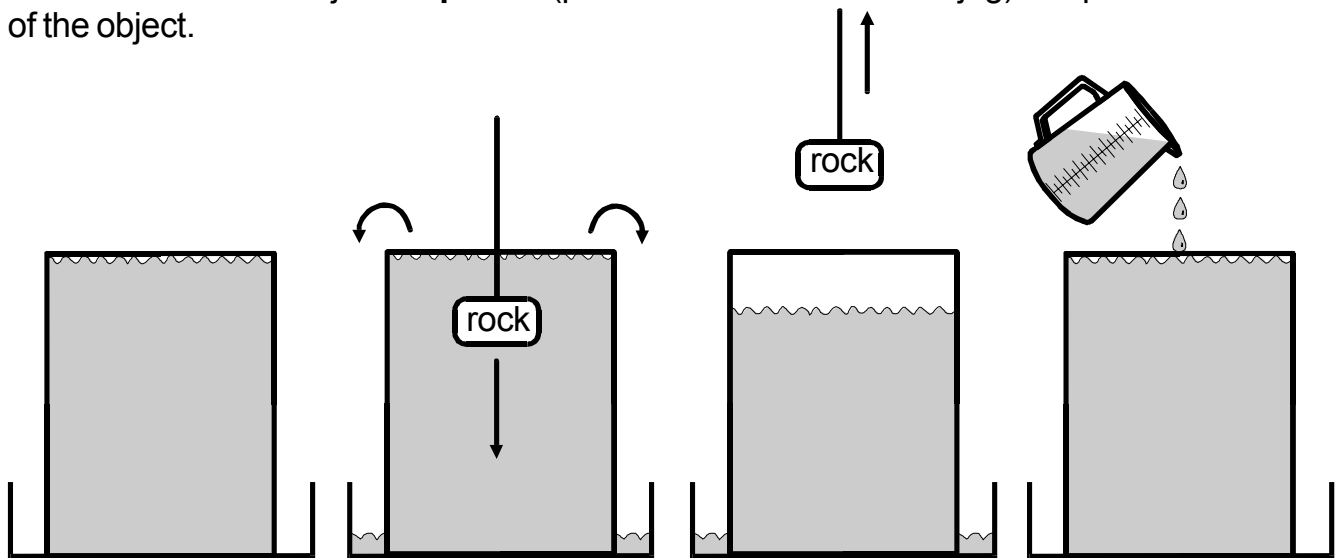
Measuring the volume of solids

- ☐ What you need: a large container of water, a graduated jug, a tray with sides to it, string, 10 solid items.

Remember that 1 litre of water is equal to 1000 cm³
and 1 mL of water is equal to 1 cm³.

- ☐ Your task:

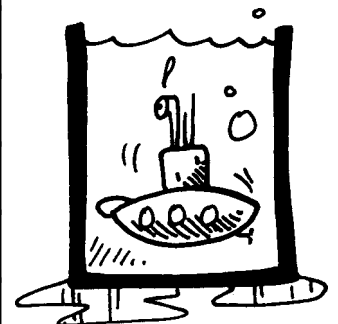
Fill the container with water to the very top. Tie a piece of string around one of your objects and lower it to the bottom of the container. Water will spill out. Now take the object out and, using the graduated jug, see how much water is needed to fill the container again. The amount of water an object **displaces** (pushes over the side of the jug) is equal to the volume of the object.



Repeat the steps for each item and fill in the table below.
(Hint: If an object floats, you may need to push it under the water.)

Item	Volume	Rank
1. e.g. rock	400 mL	
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		


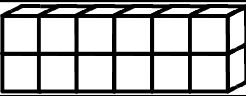
When you have finished the table, rank the items in order from the greatest volume to the least.



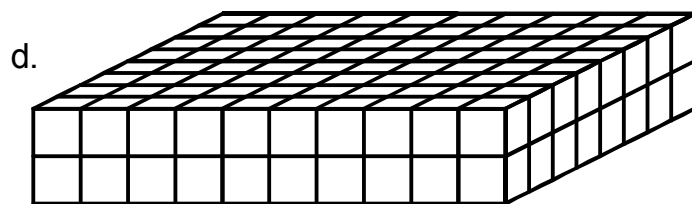
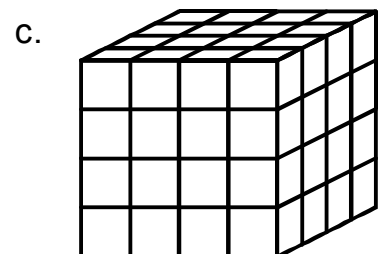
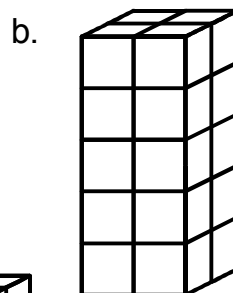
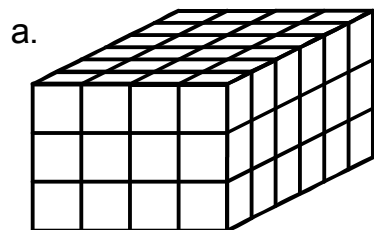
Name:

Volume using cubes

☐ Your task: Using 12 cubes, make as many different prisms as you can and draw each shape in the table below (each one must have straight sides).

shape	length	width	area of base	height	volume
	12	1	12 cm ²	1	12 cm ³
					

Now make the following shapes out of cubes, and record your results in the table at the bottom of the page.



shape	length	width	area of base	height	volume

See if you can work out a short way of getting the volume of a prism. Check that it works. If it doesn't then check with your teacher.