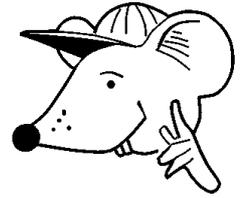




MATHEMATICS



N.S. Yr. 5 P.93

**Units to estimate or measure
length, mass or capacity.**

Equipment

Paper, pencil,
30 cm ruler, metre ruler,
tape measures, string

MathSphere

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Concepts

Children will have begun to use cm and mm to measure lines in year 4. The early work in this module is designed as re-inforcement of this as accuracy improves with further practice.

It is a good idea to ask children to estimate the lengths of anything before they measure it. They often make rapid improvement when doing this.

Many school and household items can be measured, from spoons to calculators.

Interesting discussions can evolve when children are asked to round to the nearest whole centimetre. If the measurement is very close to the half way point then both rounding up or down could be acceptable - all measurement is only approximate!

This becomes even more important when rounding to the nearest millimetre - it is not always clear what the answer should be.

The idea that measurements of length can be written in several different ways can be introduced eg

$$15 \text{ mm} = 1 \text{ cm and } 5 \text{ mm} = 1.5 \text{ cm}$$

and children should begin to write lengths in both forms.

Please note when printing these pages out that the printer should be at 100%, otherwise the measurements may not be accurate.

Measuring to the nearest millimetre

Use a ruler to measure these lines to the nearest millimetre (mm)

Write the answers in centimetres and millimetres:

Eg a. _____ line a is 4cm 8mm long

1. _____

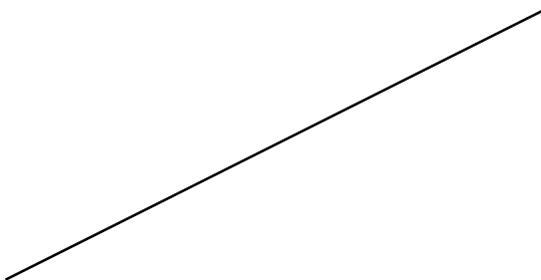
2. _____

3. 

4. 

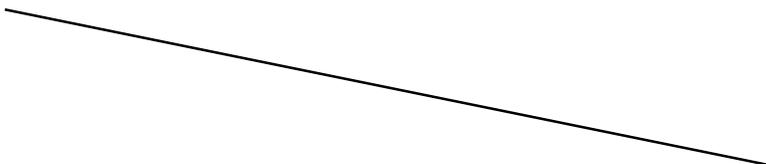
5. _____

6. _____

7. 

8. 

9. _____

10. 

Why were these difficult to measure accurately?

Measuring to the nearest millimetre

Use a ruler to measure these lines to the nearest millimetre (mm)

Write the answers in centimetres and millimetres:

Eg a. _____ line a is 5cm 9mm long

1.



2.



3.



4.



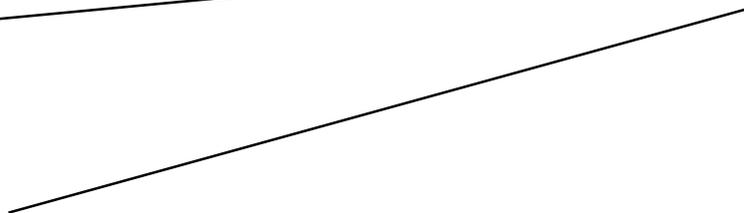
5.



6.



7.



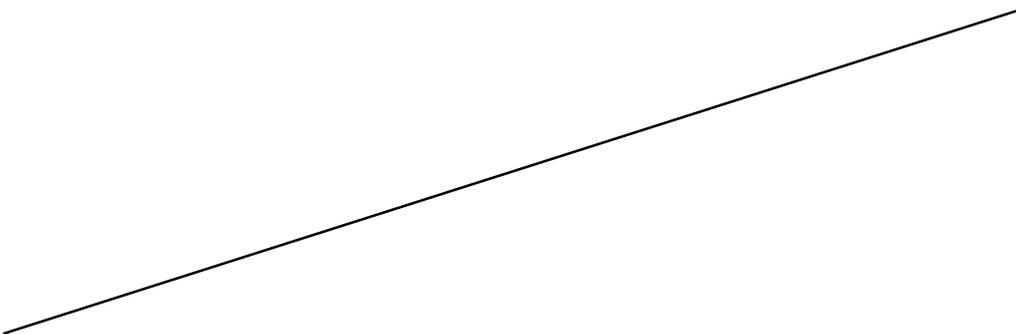
8.



9.



10.



Measuring to the nearest centimetre

Sometimes it is only necessary to measure a line to the nearest centimetre.

This gives an approximate answer.

Estimate and then measure these lines to the nearest cm.

Remember if the line is 5mm or more you round up to the next whole cm.

Write out a table like this:

LINE	ESTIMATE	MEASUREMENT (to nearest whole cm.)
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		

1. _____ 2. _____

3. _____ 4. _____

5. _____ 6. _____ 7. _____

8. _____

Measuring to the nearest centimetre

Estimate and then measure these lines to the nearest cm.

Remember if the line is 5mm or more you round up to the next whole cm.

Write out a table like this:

LINE	ESTIMATE	MEASUREMENT (to nearest whole cm.)
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

1. _____ 2. _____

3. _____ 4. _____

5. _____ 6. _____ 7. _____

8. _____ 9. _____

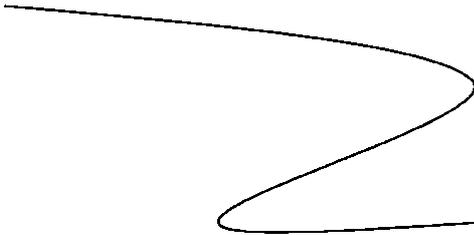
10. _____

Use string to measure how far these lines are.

Estimate first to the NEAREST CM.



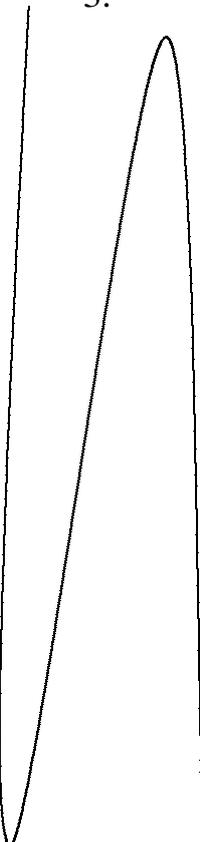
1.



2.



3.

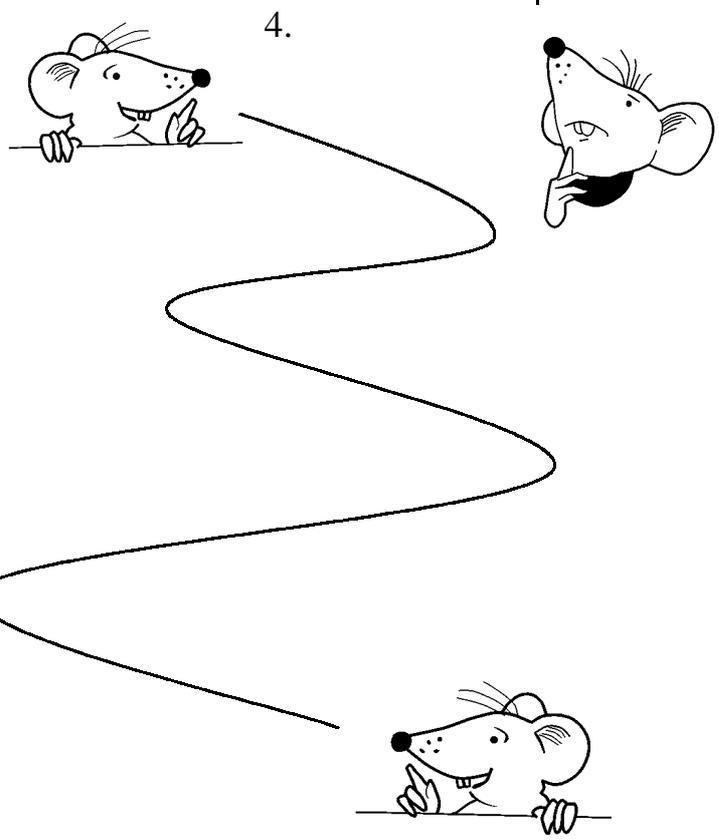
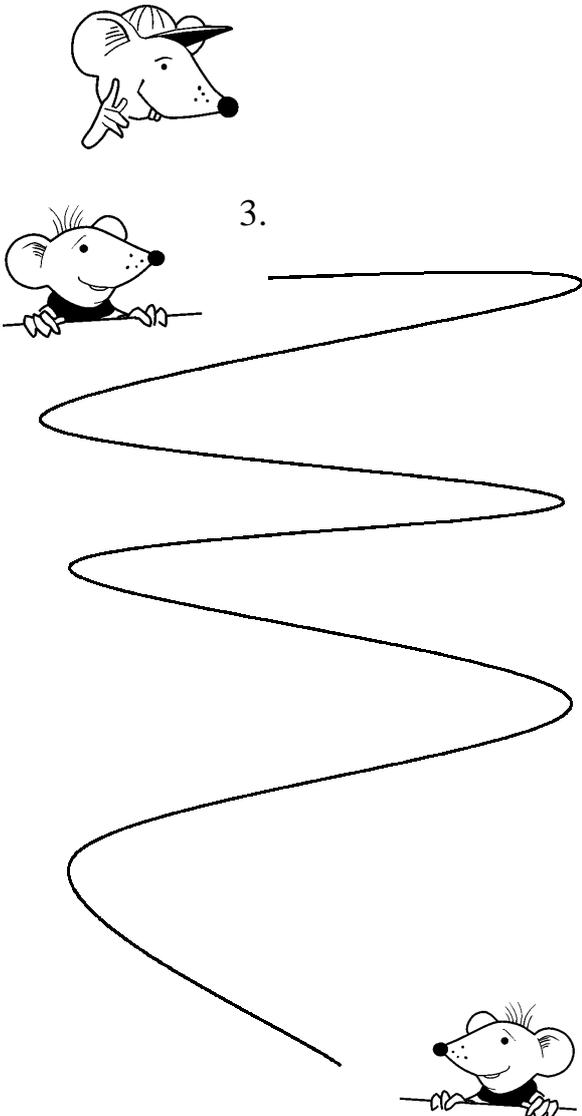
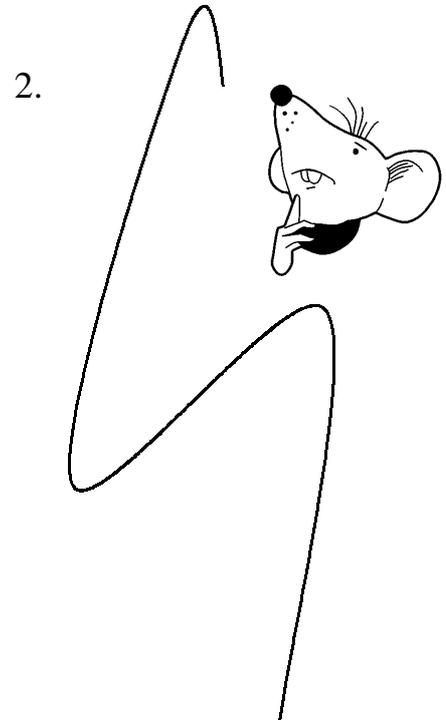
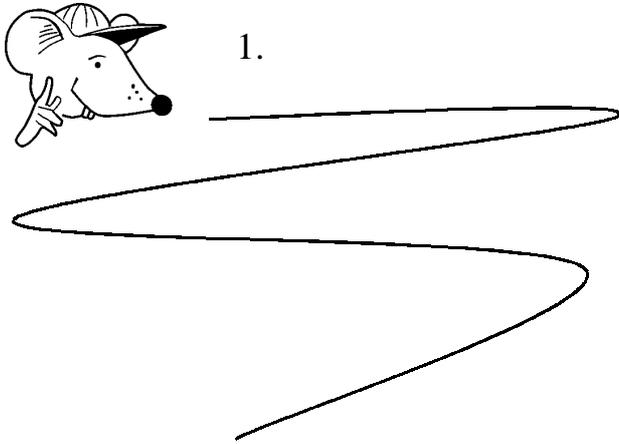


4.



Use string to measure how far these lines are.

Estimate first to the NEAREST CM.

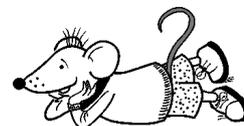


Estimate and measure

Take each of these classroom items. Estimate their length to the nearest whole cm. Then measure them to the nearest whole cm.

Object	Estimate	Measurement
Pencil length		
Calculator length		
Exercise book width		
Reading book width		
Width of this paper		
Watch strap length		
Crayon length		
Scissor length		
Door thickness		
Paint brush length		

Compare answers with a friend.
Did you agree?

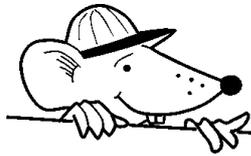


Estimating and measuring using a metre ruler

For measuring longer lengths a metre ruler is really useful.

1. Estimate the length of the room you are in, to the nearest metre.

Use a metre ruler to measure. Record your results.



2. Now do the same with the width of the room.

Remember to estimate first (but only to the nearest metre).

3. Find an area that you can pace out 10 strides. Mark the start and finish. Estimate the distance and then measure it using a metre ruler.

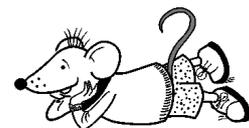


4. Estimate the length of the hall or corridor.

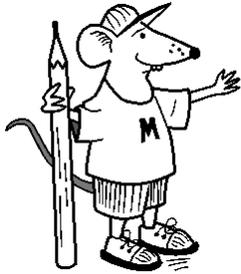
Measure it to the nearest whole metre.



5. Find one other distance which is suitable for measuring using a metre ruler. Estimate to the nearest whole metre before you measure.



Estimating and measuring using a metre ruler



1. The world long jump record for men is over 8.90 metres.

Use a metre ruler to measure how far this is.

Could you jump that far???

2. If you think that is a long way, try the world triple jump (hop, step and jump) record.

This is over 18 metres.

Find out just how far this is by measuring with a metre ruler.



3. Incredible!

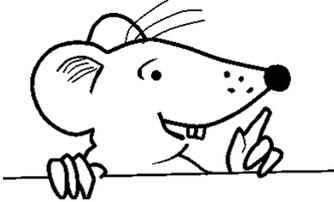
The world record for the high jump is over 2 metres 40 cm.

Use a metre ruler to find how high this is.

4. Try and find the up to date records for the men's long jump, triple jump and high jump.

You can look for the women's records too. They are just as amazing!



Measuring length using a tape measure

Most tape measures are 150 cm long. Make sure that you start at the right end of the tape or you will get some very strange answers.

Find ten things which are suitable to measure using a tape measure.

Estimate the measurement for each one before measuring.

Draw a chart out like the one below.

OBJECT	ESTIMATE	MEASURE
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

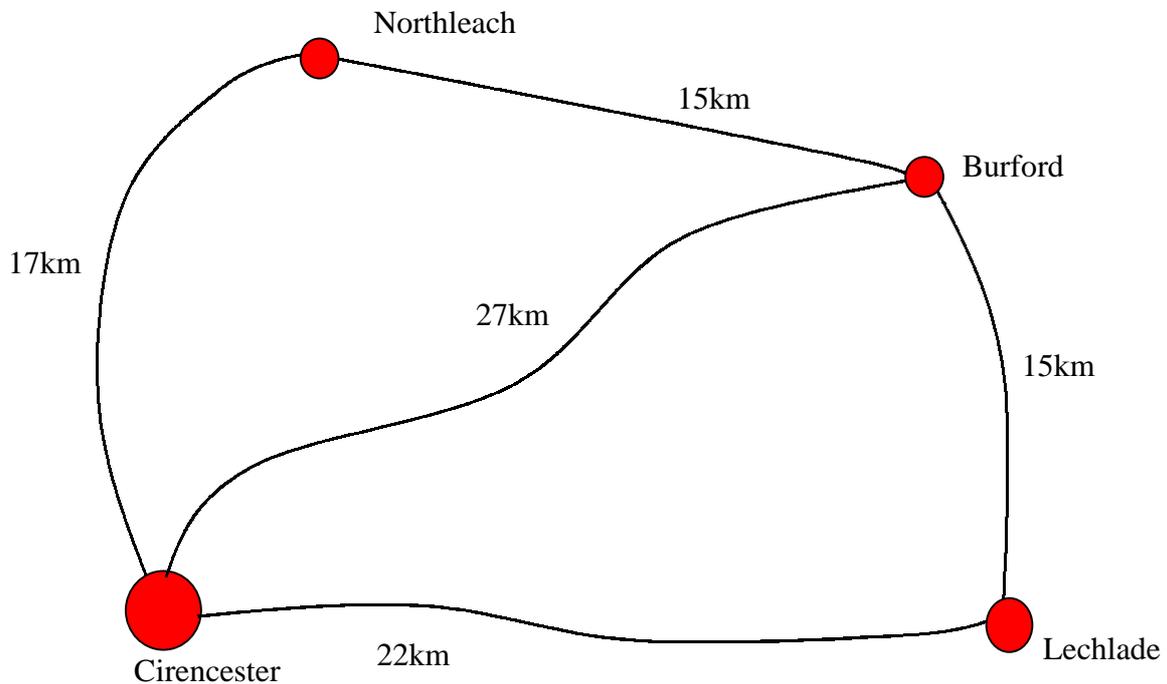
Measuring length - USING THE RIGHT UNITS

For each of the items below say what you would use to measure with and what units you would measure in.

The first one has been done for you.

OBJECT	EQUIPMENT	UNIT
1. A pencil	A ruler	cm and mm
2. Width of a football pitch		
3. Round a tree		
4. Height of a fence		
5. Width of a book		
6. Length of a house		
7. London to Glasgow		
8. Width of a window		
9. Distance a ball is thrown		
10. Perimeter of a field		

Distances and routes



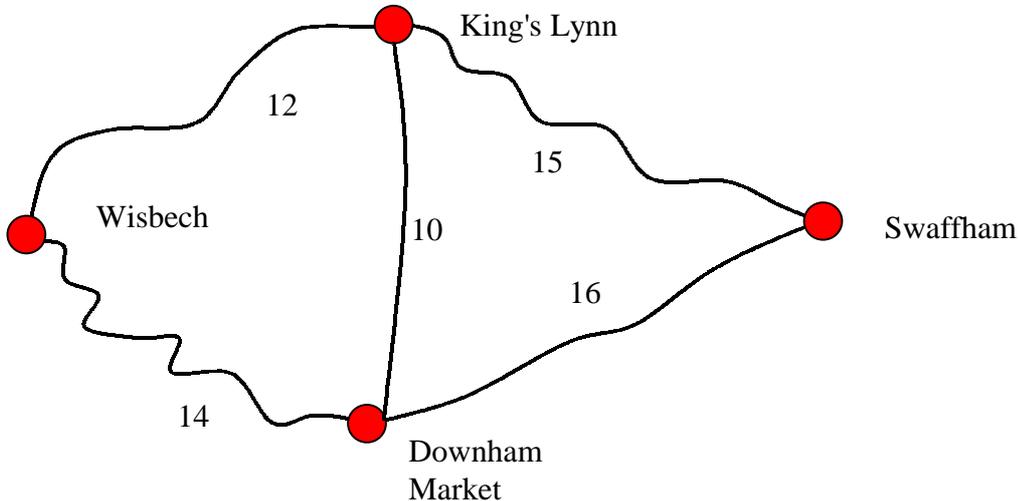
(Not drawn to scale)

The map above shows part of England. The measurements are in kilometres.

1. How far is it from Lechlade to Cirencester?
2. How far is from Burford to Northleach?
3. A bus goes from Cirencester to Northleach and then on to Burford before returning to Cirencester by the shortest route. How far did the bus travel?
4. What is the shortest route the bus would have to travel to visit all four towns and return to the start?
5. If the fare worked out at 10p a km how much would it cost for a journey from Northleach to Lechlade, passing through Burford?

Distances and routes

(Not drawn to scale)



The map above shows part of England. The measurements are in miles.

- How far is it from Wisbech to Downham Market?
- What is the shortest distance from Swaffham to Wisbech?
- What is the shortest route the bus would have to travel from King's Lynn to visit all three towns and return to the start?
- Below is a chart showing map distances.

		Downham Market	
	King's Lynn		10
	Swaffham		16
Wisbech	27		

Look at it carefully to find out how it works, then fill in the missing distances.

Volume and capacity

More than a litre?



You should have a pretty good idea of how much a litre is by now....so try the investigation below. You will need to keep a record so you could use the sheet or make up your own table.

How often do you use more than a litre of water at home during the week?

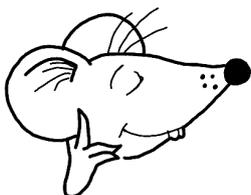


Well, I had a bath last night, so that must be more than a litre!



About time too, there was a funny smell developing around here!

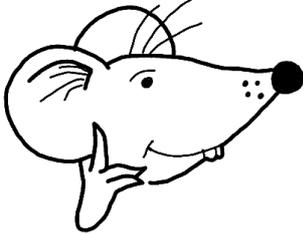
I put the dishwasher on - I'm sure that used more than a litre!



I cleaned my teeth whilst letting the water run - I wonder if I used more than a litre?



Day	Activities
Monday	
Tuesday	
Wednesday	
Thursday	
Friday	
Saturday	
Sunday	

What would you measure with?

Which measurement unit would be best to use to measure the things below?

millilitres**litres****grams****kilograms****millimetres****centimetres****metres****kilometres**

Object	Unit of measurement
1. Your height	
2. A bucket of water	
3. The weight of a lettuce	
4. The distance from home to school	
5. The length of an ant	
6. The weight of an elephant	
7. A spoonful of medicine	
8. A cupful of water	

What would you measure?

Write down three things that you could sensibly measure with each of these units.

Unit of measurement	1	2	3
Grams			
Kilograms			
Millimetres			
Centimetres			
Metres			
Kilometres			
Millilitres			
Litres			

Answers

Page 3 (Allow at least 1mm error either side)
 1. 10cm 4mm 2. 8cm 9mm 3. 3cm 1mm 4. 4cm 1mm 5. 5cm 6mm
 6. 1cm 4mm or 5mm 7. 8cm 8. 6cm 8mm 9. 7cm 3mm 10. 10cm 4mm

Page 4 (Allow at least 1mm error either side)
 1. 8cm 6mm 2. 10cm 3mm 3. 12cm 2mm 4. 6cm 3mm 5. 7cm 3mm
 6. 7cm 8mm 7. 10cm 1mm 8. 8cm 2mm 9. 8cm 9mm 10. 14cm 1mm

Page 5
 1. 3cm 2. 6cm 3. 12 cm 4. 1 cm 5. 2 cm 6. 5 cm 7. 3 cm 8. 15 cm

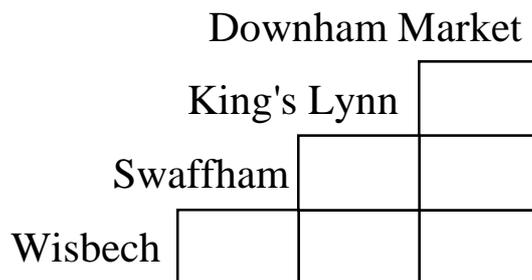
Page 6
 1. 5cm 2. 7 cm 3. 5 cm 4. 8cm 5. 3cm
 6. 5 cm 7. 4 cm 8. 6 cm 9. 7 cm 10. 13 cm

Page 7 (Allow at least 1 cm error - discuss margins of error)
 1. 25 cm 2. 28 cm 3. 33 cm 4. 29 cm

Page 8 (Allow at least 1 cm error - discuss margins of error)
 1. 26 cm 2. 18 cm 3. 44 cm 4. 27 cm

Page 14
 1. 22 km 2. 15 km 3. 59 km 4. 69 km 5. £3.00 or 300p

Page 15
 1. 14 miles 2. 27 miles 3. 57 miles 4.



Page 18
 1. metres or centimetres 2. litres 3. grams 4. metres or kilometres
 5. millimetres 6. kilograms 7. millilitres 8. millilitres or litres