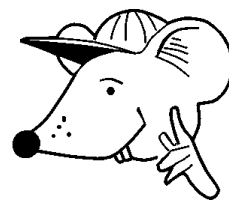




MATHEMATICS



N.S. Yr. 3 P.73

Measure and compare

Equipment

Paper, pencil, ruler, tape measure (metre)
1 cm cubes Litre container or measuring jug.
Scales.

MathSphere

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Concepts

By the end of year 3 children are expected to know that:

1 kilometre = 1 000 metres

1 metre = 100 centimetres

1 kilogram = 1 000 grams

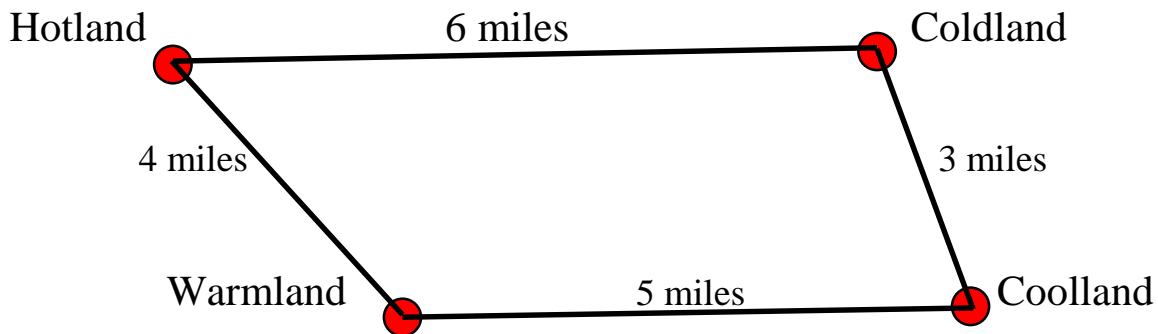
1 litre = 1 000 millilitres

They are also expected to recognise half units, such as half a kilometre and that this can be written as $\frac{1}{2}$ km, or 0.5 km or 500 m.

Problems involving comparisons continue in length, capacity and mass, and once again most of these should be on a practical basis.

One of the most useful benefits of the metric system is the relationship between the units:

a litre of water can be contained in a 10 cm cube (1 000 cubic cm) and has a mass of 1 kg. Hence a 1 cm cube of water has a mass of 1 gram and is known as 1 ml.

Problems in miles

1. How far is it from Hotland to Coldland?

2. How far is it from Coolland to Warmland?

3. How far is it from Warmland to Coldland, going through Hotland?

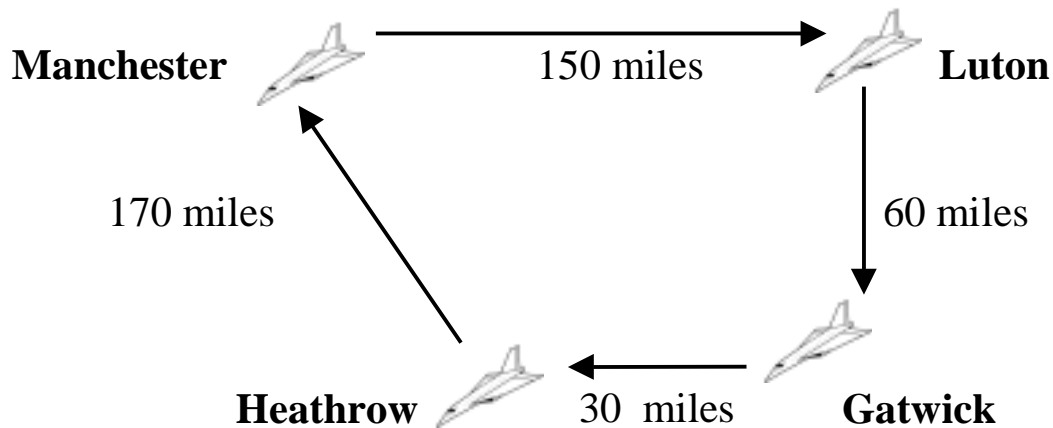
4. How far is it from Hotland to Coolland, going through Warmland?

5. How far is the shortest route from Warmland to Coldland?

6. How far is it to go from Hotland and visit all the other lands and then return to Hotland?

Problems with miles

(Distances approximate)



1. How far is it from Manchester to Luton?
2. How far is it from Gatwick to Heathrow?
3. How far is it from Luton to Heathrow going by the shortest route?
4. How far is it from Gatwick to Manchester going by the shortest route?
5. How much further is it from Luton to Manchester than Luton to Gatwick?

Measuring in kilometres

Did you know that there
are 1 000 metres in a
kilometre?

1 000 metres = 1 kilometre

1 000 m = 1 km

1. How many metres in 2 kilometres?

2. How many metres in 5 kilometres?

3. How many metres in 4 kilometres?

4. How many metres in 7 kilometres?

5. How many metres in half a kilometre?

6. How many metres in a quarter of a kilometre?

7. How many metres in 3 $\frac{1}{2}$ kilometres?

8. How many metres in 6 $\frac{1}{2}$ kilometres?

Measuring in kilometres

Remember, there are
1 000 metres in a
kilometre?

500 metres, or half a kilometre, can be written as 0.5 km.

1 500 metres = 1.5 kilometres

1. How many kilometres in 3 000 metres?

2. How many kilometres in 5 000 metres?

3. How many kilometres in 8 000 metres?

4. How many kilometres in 2 000 metres?

5. How many kilometres in 2 500 metres?

6. How many kilometres in 4 500 metres?

7. How many kilometres in 5 500 metres?

8. How many kilometres in 6 500 metres?

Measuring in kilometres

Remember, there are
1 000 metres in a
kilometre?

500 metres, or half a kilometre, can be written as 0.5 km.

1 500 metres = 1.5 kilometres

1. How many kilometres in 4 000 metres?

2. How many kilometres in 7 000 metres?

3. How many kilometres in 9 000 metres?

4. How many kilometres in 6 000 metres?

5. How many kilometres in 500 metres?

6. How many kilometres in 3 500 metres?

7. How many kilometres in 8 500 metres?

8. How many kilometres in 7 500 metres?

Problems involving measurement

1. Zoe is 110 cm tall. Claire is 10 cm taller.
How tall is Claire?

2. Henry is 120 cm tall. Gary is 20 cm shorter.
How tall is Gary?

3. Sumit ran $2\frac{1}{2}$ kilometres.
How many metres is this?

4. Draw a line more than 5 centimetres long?

5. Draw a square with each side 4 centimetres long.

6. It is 16 kilometres to the seafront.
How far is it there and back?

7. How many centimetres in 5 metres?

8. How many centimetres in half a metre?

Problems involving measurement

1. Sam is 105 cm tall. Colin is 10 cm taller.
How tall is Colin?

2. Gita is 110 cm tall. Laura is 20 cm shorter.
How tall is Laura?

3. Brian ran $3\frac{1}{2}$ kilometres.
How many metres is this?

4. Draw a line more than 4 centimetres long?

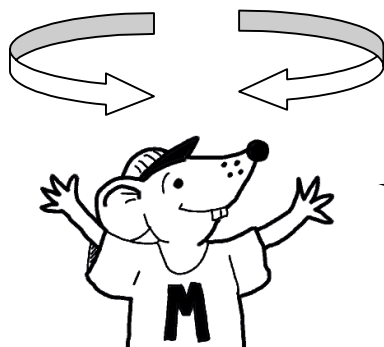
5. Draw a square with each side 3 centimetres long.

6. It is 15 kilometres to the town centre.
How far is it there and back?

7. How many centimetres in 6 metres?

8. How many centimetres in one and a half metres?

How big or small is your head?



Did you know that three times round an adult's head is the same distance as their height? Well, almost!

Can you check this out?

Find an adult. Measure his/her height.

Measure the distance round his/her head. Multiply by three.

Is it about the same?

Now try it with some of your friends.

Use the table below to help you.

You may need a calculator to multiply by 3.

Name	Head measure	Head measure multiplied by 3	Height

What do you notice?

More or less than a kilogram

Think whether the objects below are about a kilo, more than or less than a kilogram in weight. Tick the correct boxes.

Object	Less than a kilo	About a kilo	More than a kilo
A television			
A bar of chocolate			
1 litre of milk			
An orange			
A football			
10 apples			
A CD			

Write down 4 things which are more than a kilo in weight.

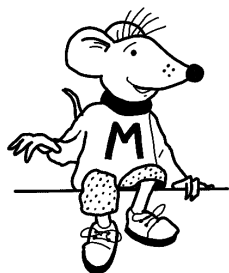
- 1.
- 2.
- 3.
- 4.

Write down 4 things which are less than a kilo in weight.

- 1.
- 2.
- 3.
- 4.

Write down 4 things which are about a kilo in weight.

- 1.
- 2.
- 3.
- 4.

Litres and millilitres

Did you know that there are
1 000 millilitres in a litre.

**Imagine a cube, 10 cm long, wide and tall.
Fill it with water and you will have exactly 1 litre.
There are 1 000 millilitres in a litre.**

**A millilitre of water is the same size as a one centimetre cube.
Look at a one centimetre cube and imagine that much water.**

1. How many millimetres are there in one litre?

2. How many millimetres are there in half a litre?

3. How many millimetres are there in quarter of a litre?

4. How many litres are 4 000 millilitres?

5. How many litres are 3 000 millilitres?

6. How many litres are 3 500 millilitres?

7. How many litres are 500 millilitres?

More or less than a litre

Think whether the containers below are about a litre, more than or less than a litre.
Tick the correct boxes.

Object	Less than a litre	About a litre	More than a litre
A bathful of water			
A cup of tea			
A carton of milk			
A sinkful of water			
A can of coke			
An egg cup			
A teaspoon			

Write down 4 containers which hold more than a litre.

- 1.
- 2.
- 3.
- 4.

Write down 4 containers which hold less than a litre.

- 1.
- 2.
- 3.
- 4.

Write down 4 things which hold about a litre.

- 1.
- 2.
- 3.
- 4.

Finding the mass (weight) of water

You need to roll your sleeves up to do this page!

You need a measuring jug and a pair of scales. You might need a calculator as well!

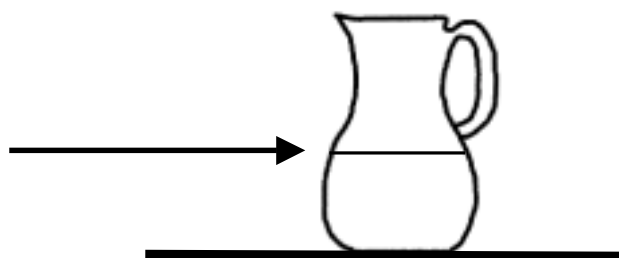
Oh, and don't forget the water!

No splashing!

Record all your measurements on the table below.

1. Find a measuring jug and weigh it on the scales.
2. Now fill it with 100 ml of water. Weigh it again.
3. Subtract the mass (weight) of the jug from the mass of the jug and water. This will give you the mass of 100 g of water.
4. Repeat for 200 ml, 300 ml, 400 ml, 500 ml, 600 ml, etc up to 1 000 ml.

Each time you measure the water try to be as accurate as you can.
Put the measuring jug flat on a table and look at eye level.



Finding the mass (weight) of water

	Mass of jug + water	Mass of jug and water less mass of jug
Empty jug		
100 ml water		
200 ml		
300 ml		
400 ml		
500 ml		
600 ml		
700 ml		
800 ml		
900 ml		
1 000 ml (1 litre)		

Do you notice anything?

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Answers**Page 3**

1. 6 miles 2. 5 miles 3. 10 miles 4. 9 miles 5. 8 miles 6. 18 miles

Page 4

1. 150 miles 2. 30 miles 3. 90 miles 4. 200 miles 5. 90 miles

Page 5

1. 2 000 m	2. 5 000 m	3. 4 000 m	4. 7 000 m
5. 500 m	6. 250 m	7. 3 500 m	8. 6 500 m

Page 6

1. 3 km	2. 5 km	3. 8 km	4. 2 km
5. 2 ½ or 2.5km	6. 4 ½ or 4.5km	7. 5 ½ or 5.5 km	8. 6 ½ or 6.5 km

Page 7

1. 4 km	2. 7 km	3. 9 km	4. 6 km
5. ½ or 0.5km	6. 3 ½ or 3.5km	7. 8 ½ or 8.5 km	8. 7 ½ or 7.5 km

Page 8

1. 120 cm 2. 100 cm or 1m 3. 2 500 m 4. - 5. - 6. 32 km 7. 500 cm 8. 50 cm

Page 9

1. 115 cm 2. 90 cm 3. 3 500 m 4. - 5. - 6. 30 km 7. 600 cm 8. 150 cm

Page 13

1. 1 000 ml 2. 500 ml 3. 250 ml 4. 4 l 5. 3 l 6. 3 ½ or 3.5 l 7. ½ or 0.5 l

Page 17

For each measurement the mass should be approximately the same as the volume of water ie 100 ml of water should weigh approx 100 grams.