

4

Allotments, gardens and garden centres



I love my garden. It's full of life. It changes all the time. It's great to have something different from the office work I do, where I never get any exercise!

Is there any maths in my gardening? Well, I suppose there is. I need to know how far apart and how deep to plant my seeds; and working out how much fertiliser to put on is quite difficult. I keep an eye on the weather forecast to see if there's going to be a frost – is that maths?

One thing is definitely maths. That's keeping an eye on the money I spend at the garden centre!

Talk about it

Do you have a garden or an allotment?

Have you seen gardening programmes on TV or been to a garden centre?

Do you measure things?

Do you read measurements on tins of food or other things you buy?

Do you watch the weather forecast?

What numeracy skills do you think you might need for these things?

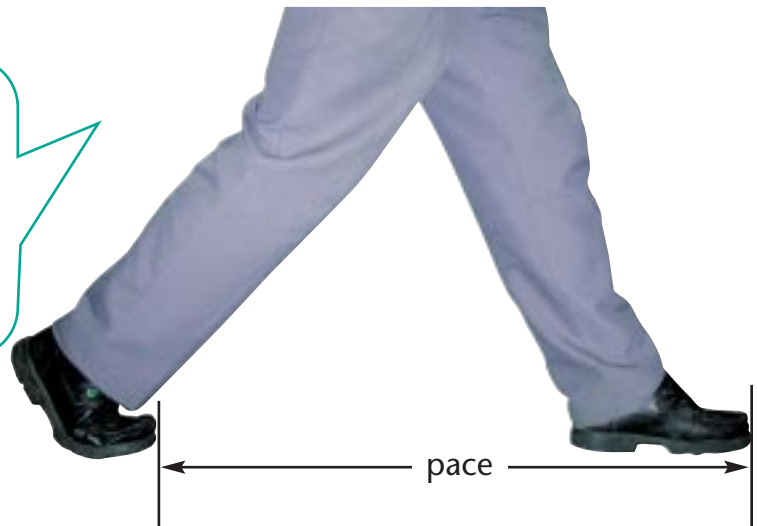
These are the skills you will practise in this unit.

Which are the most useful for you? Tick the boxes.

- | | |
|--------------------------------------------------------------------------------------------|----------------------|
| <input type="checkbox"/> Use centimetres and metres to measure length | MSS1/E2.5, MSS1/E2.9 |
| <input type="checkbox"/> Use kilograms to measure weight | MSS1/E2.6, MSS1/E2.9 |
| <input type="checkbox"/> Use litres to measure volume | MSS1/E2.7, MSS1/E2.9 |
| <input type="checkbox"/> Use degrees Celsius (°C) to measure temperature | MSS1/E2.8 |
| <input type="checkbox"/> Recognise and name common mathematical shapes | MSS2/E2.1, MSS2/E2.2 |

How long or how deep is it?

When I am planning where to plant things, I mark out a plot. If I only need a rough estimate of size, I pace it out because my pace is about 1 metre. If I want to measure exactly, I use a tape measure and measure in metres.



Activity 1

Use a metre ruler to measure your pace.

Work with another person and take it in turns to measure your pace.

- 1 Is your pace more or less than a metre?
- 2 Measure the **length** of the room in paces.
- 3 Measure the **width** of the room in paces.
- 4 Now measure the length of the room in metres, to the nearest metre.
- 5 Now measure the width of the room in metres, to the nearest metre.
- 6 Did everybody get the same answers when you measured in paces?
- 7 Did everybody get the same answer when you measured in metres?

Remember

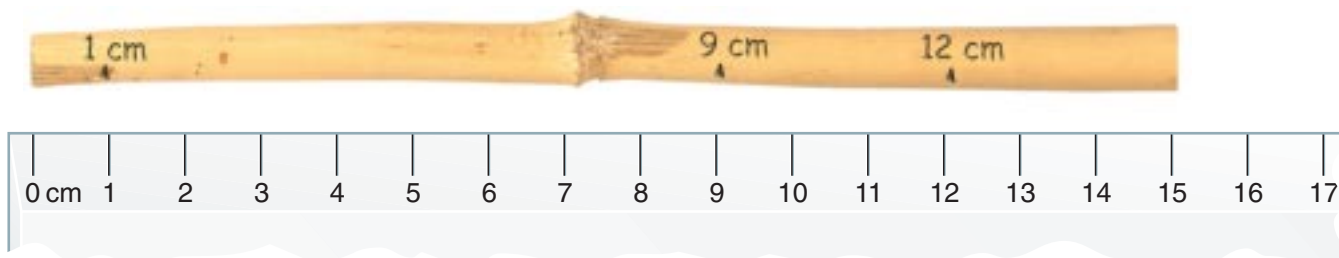
- A **metre** is a **STANDARD** measure of length used across the world.



Activity 2

*The instructions on seed packets are usually given in **centimetres**, so that's what I use for measuring how far apart to plant seeds, and how deep.*

In the allotment, I use a stick that I've marked in centimetres. I also use it to make holes for the seeds. I've cut notches in the stick so that I can make the holes the right depth.



Use a ruler to measure this stick.

Start with the 0 at the end.

Check the lengths marked on the stick.

How long is the stick?

Make marks on the stick at **intervals** of one centimetre.
Some have been done for you.

Remember

- Metres and centimetres are **metric** units.
- 1 metre = 100 centimetres
- centimetre is written **cm**
- metre is written **m**



Activity 3

Work with another person and practise measuring in metres or in centimetres.

Choose some small and some large items.

Complete the table.

Items to measure	Unit: centimetres or metres	Measurement
Door height	metres	2 m

Make sure you write **cm** or **m**.



Do you need more practice in measuring – in centimetres?
– in metres?

Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
Yes	<input type="checkbox"/>	No	<input type="checkbox"/>

For more work on this, go to H1/H2 (page 13) or E1 (page 15).

This work links to mini-project M1 (page 16).

How heavy is it?

When I have dug up my potatoes I like to know how much they weigh.

Potatoes can be weighed in **kilograms**, which is the **metric** unit.

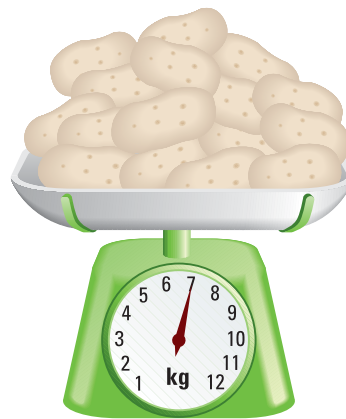
Some people use **pounds**, which is the **imperial** unit.

Remember

- A **kilogram** is a metric measure of weight
- **Kilogram** can be written like this: **kilo**
or like this: **kg**

These potatoes weigh 7 kilograms.

I can write 7 kilograms, 7 kilos or 7 kg.



Activity 4

Write down the weight shown on each scale in THREE different ways.

1

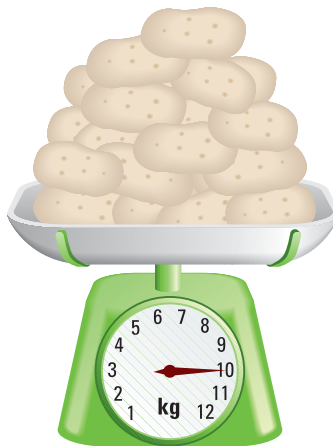


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.....

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2



.....

.....

.....

3



.....

.....

.....

4 The heaviest weight is

5 The lightest weight is

Mark the weight on the dial of the scale.

6 3 kg



7 1 kilogram



Talk about it

What do you buy in kilograms?

Talk about it in the group and make a list.

.....

.....

.....

What is the weight of a bag of sugar?

Practical activity

Try weighing some food items.

Check your result with the label.

Item	Weight (scales)	Weight (label)



Do you need more practice with weighing?

Yes

☐

No

☐

For more work on this, go to H3 (page 14).

This work links to mini-project M1 (page 16).

How much does it hold?

Remember

- A **litre** is a metric measure of capacity.
- It measures how much something holds, usually of liquids such as water.
- Litre is written **l**. So for example, two litres is written **2 l**

What things do you buy in litres? Make a list.

.....

.....

.....

One of the problems is that the tap is a long way from my allotment. So, I have a water barrel in the allotment to collect rainwater from the shed roof. But sometimes I still have to fill it using a bucket.



The barrel holds 100 litres.



Activity 5

This is the bucket I use. I have to carry it all the way from the tap.



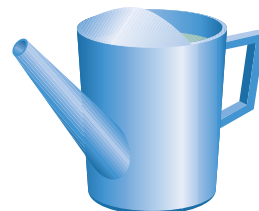
The label shows that it holds 10 litres.

1 When the water barrel is half-full how many litres of water are in it?

.....

2 The watering can holds half as much as the bucket.

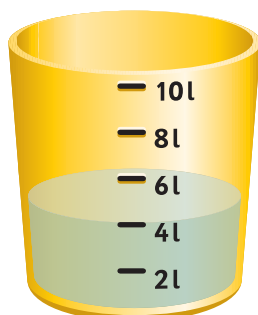
The watering can holds litres.



Here are two more buckets.

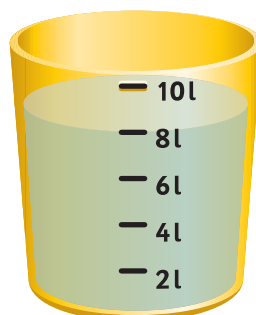
How much water is in each of them?

3



.....

4



.....

Activity 6

Look at the capacity on different containers, for example how much drinks bottles and cartons hold.

Write down the capacities in the table.

Container	Capacity (l)
Large cola bottle	2 l

Find two containers of different shapes that each hold one litre.
Write what you found in the space provided.

..... and

Sketch them below.



Do you need more practice working with litres?

Yes

☐

No

☐

For more work on this, go to H4 or H5 (page 14).

This work links to mini-project M1 (page 16).

How warm is it?

*I keep an eye on the weather forecast.
I look at the temperature.*



Activity 7

*If the temperature falls below 5 °C I have
to protect my plants against frost so
that they are not damaged.*

Remember

- Temperature can be measured in **degrees Celsius (°C)** or **degrees Fahrenheit (°F)**.
- Water freezes at 0 °C and boils at 100 °C.

This is the forecast for the next five days.

The temperatures are given in **degrees Celsius**.

Find **Friday** in the first column. Now read across and you will see that

- There will be **showers**
- The **day temperature** will be **9 °C**
- The **night temperature** will be **2 °C**.

Day	Weather	Temperature (day)	Temperature (night)
Wednesday	Cloudy	7 °C	6 °C
Thursday	Light rain. Wind	8 °C	3 °C
Friday	Showers	9 °C	2 °C
Saturday	Scattered showers	11 °C	7 °C
Sunday	Mostly cloudy	10 °C	5 °C

1 On which two days is no rain forecast?

.....

2 On which two nights is the temperature forecast to be below 5 °C?

.....

3 Which is forecast to be the warmest day?

.....



Activity 8

Temperature is measured in degrees ($^{\circ}\text{C}$).

1 Use this table to estimate the temperature today

- in the room you are working

- outside

2 Describe what it feels like

- in the room

- outside

3 You are going on a day trip to the seaside by coach.

During the day you have to carry everything you need, as you cannot return to the coach.

Write down or draw the clothes and other items it would be important to take for these forecasts.

a Showers 18°C

.....

b Fine 12°C

.....

c Sunny 30°C

.....

d Find tomorrow's forecast and decide what you would take.

.....

Temperature	What it feels like
0°C	a freezing cold day
5°C	a cold day
15°C	a warm spring day
20°C	an warm day in early summer
25°C	a sunny summer day
30°C	a very hot day



Do you need to do some more work on everyday temperatures?

Yes

☐

No

☐

For more work on this, go to E2 (page 15).

This work links to mini-project M2 (page 16).

What shape is it?

I sometimes go to a garden centre to buy things.

There are many different shapes of paving slabs.

This shape is a **rectangle**.



It has 4 **sides**.

It has 4 **corners**.

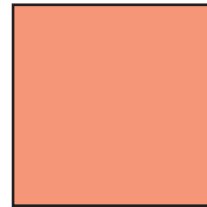
Activity 9

Fill in the details for these paving slabs.

1 This shape is a

It has sides.

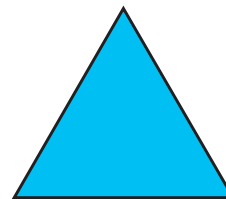
It has corners.



2 This shape is a

It has sides.

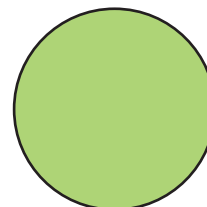
It has corners.



3 This shape is a

It has sides.

It has corners.



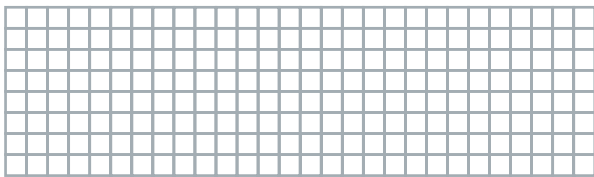
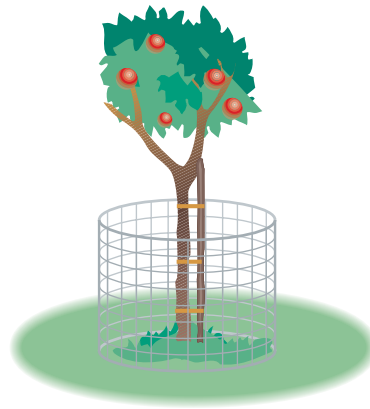
4 Which of the above shapes is the only one with a curved side?

.....

Cylinders

*I've planted a small apple tree.
I want to protect it from getting
knocked over, so I've bought a length
of wire fencing to put round it.*

The fencing makes a **cylinder** that is open at both ends. It looks like this.



Activity 10

Roll a **rectangle** of paper into a tube and use paper clips, staples or sticky-tape to join the edges to make an open cylinder.

Try different-sized rectangles and see what the cylinders look like.

The rectangle makes one **curved surface** of a cylinder.

- 1 If the cylinder had a top and bottom, how many surfaces would it have altogether?

.....

A bicycle pump is a shape based on a cylinder.



- 2 Write down three more everyday objects that are like cylinders.

.....

.....

.....

Boxes

Inside the shop at the garden centre, there are all sorts of different shaped boxes.



This box is a **cube**.

It has 8 corners.

It has 6 faces.

It has 12 edges.

Activity 11

1



This box is a **cuboid**.

It has faces.

It has corners.

It has edges.

2



This shape is a **square-based pyramid**.

It has faces.

It has corners.

It has edges.

3



This box is a

It has faces.

It has corners.

It has edges.

4 What shape is a box of matches?

5 What shape are dice?

6 What shape is a can of beans?



Do you know the names of the
2-D and 3-D shapes used in activities 10 and 11?

Yes ☐

No ☐

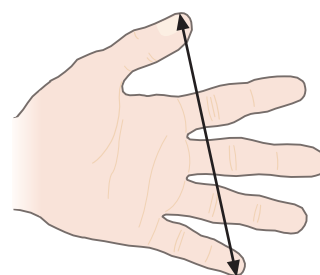
For more work on shapes go to E3 (page 15).

Activity H1

Work with another person. Make an estimate first.

Take it in turns to help each other measure each of these:

	Estimate	Measurement
My pace		
My hand span		
My thumb width		
My height		
My elbow to finger tip		



This is a hand span.

Choose some more items to measure.

Activity H2

Make marks on these sticks at intervals of one centimetre.

Write down the length of each stick.



..... cm



..... cm



..... cm



..... cm

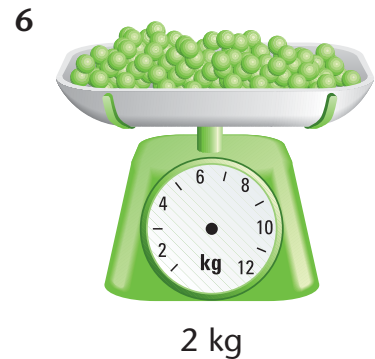
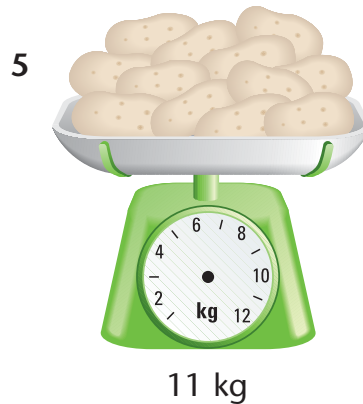
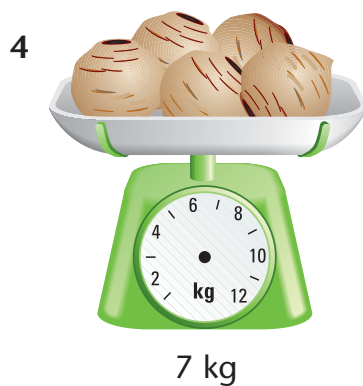
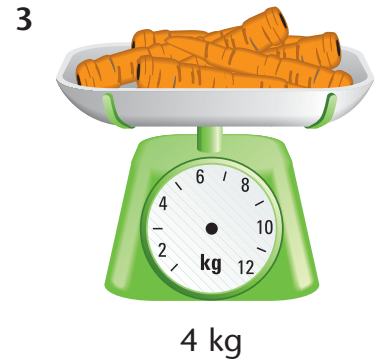
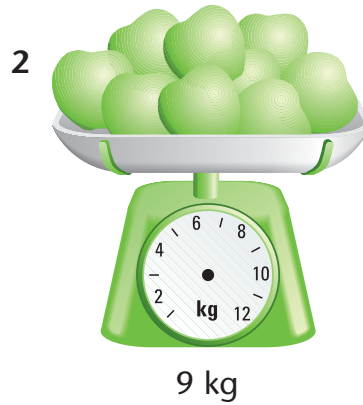
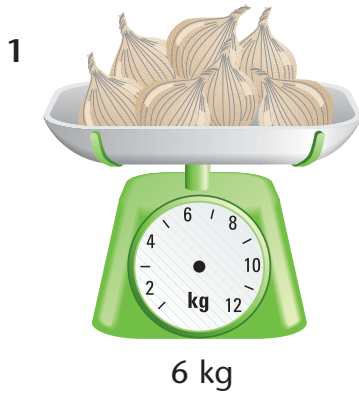


..... cm



Activity H3

Mark the weight on the dial of the scale.



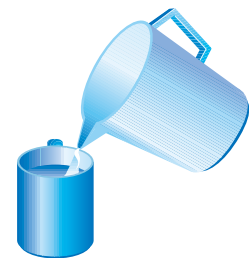
Activity H4

You need a 1 litre measuring jug full of water and a drinking mug.

How many mugs can you fill from the jug?

Think about how many drinks you have in a day.

About how many litres do you drink in a day?



Activity H5

You need a bucket or washing-up bowl.

Use a one litre measuring jug, or an empty bottle that holds one or two litres.

How many litres of water do you need to fill the bucket or bowl?



.....

Extension

Activity E1

Work with another person.

Estimate the length of each of the following, then measure to see how close you were.

Add three more items of your own to the list.

	Estimate	Measurement
the width of the door in metres		
the length of this page in centimetres		
the width of this page in centimetres		
the length of the table or desk you are working at, in cm		
the width of the table or desk you are working at, in cm		

Activity E2

Check out the weather.

Five-day weather forecasts predict weather for the coming days.

They are useful if you are planning a short holiday or an outdoor activity.

They can be found in newspapers and on websites.

Investigate the temperatures in different places in England and abroad.
Choose places that interest you.

Try these websites or look in a newspaper.

www.greatweather.co.uk

www.Weather.co.uk

www.onlineweather.com

Activity E3

Use a simple graphics package to draw some 2-D shapes.



Mini-projects



Activity M1

Go to a garden centre, look in a catalogue or use the Internet.

In the table below, list some items that are sold by: weight, capacity and length.

Weight	Capacity	Length
Sand	Liquid fertilizer	Fence panel

Find some plants with care labels. What temperature should they be kept at?



Activity M2

Watch the weather forecast on TV, or listen to the weather forecast on the radio, or look at the weather forecast in a newspaper.

Try to do this each day for a week. Keep a record of the highest daily temperature in the area where you live.

Sunday	
Monday	
Tuesday	
Wednesday	
Thursday	
Friday	
Saturday	

What was the highest temperature?

What was the lowest temperature?

Describe the weather for the whole week.

.....



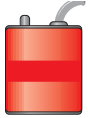
Check it



Activity C1

Ring each correct answer. There might be more than one in each row.

1 Which of these would you buy in **kilograms**?



2 Which of these would you buy in **litres**?



3 Which of these would you buy in **metres**?



4 Which of these would you buy in **centimetres**?



Activity C2

Look at this weather forecast:

Saturday	Sunday	Monday
Fair	Showers	Rain
Low 8 °C High 13 °C	Low 7 °C High 11 °C	Low 8 °C High 10 °C

1 The hottest day is

The highest temperature is

2 The coldest day is

The lowest temperature is



Activity C3

Draw lines to match the labels with the shapes.

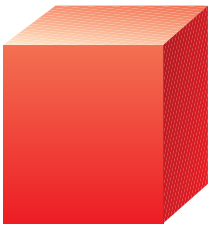


rectangle

square

cylinder

cube



How am I doing?

Now look back at the skills listed on page 1.

Then finish the sentences below.

I am confident with

.....

.....

I need more practice with

.....

Date

Activity 1

Check with teacher

Activity 2

Stick is 15 cm long

Activity 3

Check with teacher

Activity 4

- 1 2 kilograms, 2 kilos, 2 kg
- 2 10 kilograms, 10 kilos, 10 kg
- 3 4 kilograms, 4 kilos, 4 kg
- 4 10 kg
- 5 2 kg

6



7



Practical activity

Check with teacher

Activity 5

- 1 50 litres
- 2 5 litres
- 3 4 litres
- 4 8 litres

Activity 6

Check with teacher

Activity 7

- 1 Wednesday and Sunday
- 2 Thursday and Friday
- 3 Saturday

Activity 8

Check with teacher

Activity 9

- 1 square (or rectangle), 4, 4
- 2 triangle, 3, 3
- 3 circle, 1, 0
- 4 circle

Activity 10

- 1 3
- 2 Check with teacher

Activity 11

- 1 6, 8, 12
- 2 5, 5, 8
- 3 cylinder, 3, 0, 2
- 4 cuboid
- 5 cube
- 6 cylinder

Help

Activity H1

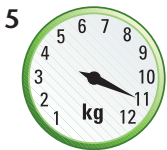
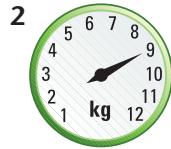
Check with teacher

Activity H2

- 1 10 cm
- 2 7 cm
- 3 5 cm
- 4 11 cm
- 5 14 cm



Activity H3



Activities H4, H5, E1, E2, E3, M1, M2

Check with teacher

Check it

Activity C1

- 1 potatoes, flour
- 2 milk, paint, petrol
- 3 fabric, string
- 4 screws

Activity C2

- 1 Saturday, 13 °C
- 2 Sunday, 7 °C

Activity C3

