



W  
I d c M d 3

Practical measuring skills are an essential part of many jobs in construction. Learners may be applying measure to real situations for the first time and it is important that their skills are secure. The learning in this module focuses on







## PAGES 3:1–3:2

## M c a

## Occ a a

The construction industry could not operate without the use of measurement. Measurement of height, length, weight and liquids happens in countless scenarios on a daily basis.

Understanding the units used for measuring and their abbreviations is vital underpinning for the development of measuring skills and calculating with measures. The focus for measurement should be metric units, but learners may come across imperial measures and should be aware of these.

## Ma a

Selection of measuring instruments used in construction, including:

measuring tapes (a range of tapes to show different markings, but also the standard tape used in their workplace)

a measuring wheel

ultrasonic distance measurer (if available)

any trade-specific measuring devices that are available

## L a c

- 1 To know the standard metric units of length, weight and capacity including abbreviations (focus page)
- 2 To know the common imperial units of length, weight and capacity as appropriate to construction (focus page)
- 3 To choose and use appropriate units and measuring instruments (Tasks 1 and 2)

## S d a ac

## l d c

- Ask learners to consider why things need to be measured. Start with things relating to their own experience (e.g. body weight, speed (of cars, etc.), height). Write these up on the board/flipchart. Ask learners about the importance of accurate measurement in different situations. For example, for personal

weight it is probably enough to weigh to the nearest kilogram, but when measuring ingredients for a recipe, it is necessary to measure to the nearest 5 g.

- Note that speed is a compound measure (distance and time). Whilst it may be a familiar measure, it is complex to calculate, requiring a formula, and is a Level 2 skill.
- Extend this discussion to measurement at work. What needs to be measured? Why? How accurate do measurements need to be?

## F c a

- Discuss learners' experiences with measuring tools, at home and at work – which measuring tools have learners used or seen being used at work? What was being measured?
- Look at the range of measuring tools you have collected. Ask what each of them is used to measure. Discuss how advances in technology have brought about new measuring devices (e.g. ultrasonic distance measurers). Demonstrate these if possible. Check learners understand the units of measure used with each measuring tool.
- If you feel it is appropriate and not likely to confuse learners, discuss imperial measures. Have learners come across imperial units at work? Many tape measures show metric and imperial units (show them an example). Distances are recorded in miles. Carpentry requisitions may still refer, at least verbally, to 2" × 2" timber. Old oil tanks are measured in gallons. Old pipe work will be of imperial dimensions and metric/imperial connectors may be needed for soldered joints.
- Check learners have an idea of the size of each metric unit relative to familiar quantities – *How does one metre relate to your height? How many kilograms is a standard bag of sugar?*
- Discuss which measuring tool you would use for which purpose (e.g. for measuring a wall, a brick).





↩ a

Ask learners to make a chart showing a range of







## PAGES 3:3–3:5

## M a



## Occ a a

Workers in construction are expected to use measuring tapes accurately and to measure in millimetres. Although imperial measurements are used less and less, there are still some situations, particularly in the renovation of old buildings, in which imperial measurements may be needed or at least referred to. For this reason 'standard' tapes often display both imperial and metric units. Usually the metric part of these 'standard' tapes is presented in centimetres and metres, with millimetres shown as unlabelled divisions. Translating millimetre measurements from drawings or method statements to centimetres and metres is an integral part of using these tapes. In order to do this effectively, learners need to be confident in multiplication and division by 10, 100 and 1000.

## Ma a

'Standard' tapes, displaying both metric and imperial

## L a c

- 1 To recognise measurements are the same whether they are written as mm, cm or m (focus page, Tasks 1 and 2)
- 2 To convert mm measurements to m and cm (focus page, Tasks 1 and 2)
- 3 To understand that tapes use cm divisions from 1 to 100 between each marked metre (focus page, Task 1)

## S d a c

## l d c

- Ask learners to look at both sides of a 'standard' tape and ask if they know of occasions when imperial measurements may be used (they may quote old plumbing, woodworking). Discuss why imperial is not widely used nowadays. Confirm that it is vital not to mix these two systems of measure.

- Look at the metric side of the tape and discuss the features – the marks (longer, bolder lines for metres, etc.) and labels (the numbers and any abbreviations). Confirm what these mean.
- Confirm that the standard unit of measure used in construction is millimetres. Discuss why this might be the case (accuracy).
- Ask learners how they use this side of the tape with main divisions marked in cm and m, when measurements on drawings or method statements are given in mm.
- Remind them that the millimetres are marked but are not labelled – they are the small divisions between the centimetres. Ask how many they can see between each cm.
- Pose simple questions that involve converting between mm and cm: *If there are 10 mm in 1 cm, how many mm in 2 cm? 2.5 cm? 10 cm?*, etc. *How many mm in 5 cm?*, etc. Practise converting between mm and cm, using the tape measure to help.

## F c a

- Ask learners how they multiply/divide by 10. Demonstrate this and give as much practice as appropriate. Repeat for multiplying/dividing by 100 and 1000 with reference to converting between cm and m and between mm and m. Useful support for written methods of multiplication can be found on page 35 of the Adult Numeracy Core Curriculum document.
- It might be useful to make a 'crib' card of these conversions as a permanent reminder for learners to carry with them.
- Give plenty of practice in this skill. Pay particular attention to zero as a place holder (e.g. the value of zero in measures such as 1.05 m and how this is different to 1.50 m).
- Note that converting between units by multiplying or dividing by 10, 100, etc. can be particularly confusing for some learners because when converting to larger units you divide (making something bigger by dividing), and when converting to smaller units you multiply (making something smaller by multiplying).

- Learners need to be familiar with multiplication and division by 10, 100 and 1000 in order to transfer this skill confidently to workplace situations. Learners struggling with this area of work should be supported using *Skills for Life* Numeracy materials Level 1, Unit 1.
- Discuss the use of zero positioned to the right of the decimal point in measures such as 1.0 m. For example: 100.0 cm may be used to record the same measure as 100 cm and 1.500 m may be used to record the same as 1.5 m. Give some practice in this. These zeros to the right of the decimal point identify the accuracy of the measurement (e.g. it is accurate to two or three decimal places).
- Look at the two different ways of noting measures that include metres (i.e. 1 m 50 cm is the same as 1.5 m). Learners need to understand that these are the same and that although they will use the former to locate the position on a tape measure, the latter version is the correct written notation.
- Learners may need a lot of varied practice to confirm measurement skills. It is a good idea for learners to practise writing down measures that are given verbally, to get used to the range of ways measures can be given (e.g. 'seven fifty mill' is 'seven hundred and fifty millimetres' = 750 mm).
- Ask learners to write down 725 mm in centimetres; 3250 mm in centimetres, metres and centimetres, and metres.
- Allow opportunities for practical use of these skills. For example, prepare some cards with measurements in mm. Working in pairs, one learner reads out the measurement. The second learner marks out the measurement using a tape measure. The first learner checks the measurement.
- Ask learners to measure their own workshop or classroom and record the measurements.

## Ta 1

Recognise equivalent mm measurements

MSS1/L1.4

MSS1/L1.7

- Remind learners that reading a measuring tape accurately requires them to look carefully at the way that units of measurement are presented on that particular tape. Give each learner a tape to examine. Ask for the value of the unlabelled divisions.
- Remind learners that 10 mm = 1 cm, so to convert from mm to cm, you divide by 10. Ensure they understand how to multiply and divide by 10. Learners with problems in this area will need additional support, perhaps with *Skills for Life* materials Level 1, Unit 1.
- Ask learners to confirm their understanding of the decimal point. Ensure they know that the decimal point separates whole units from parts or fractions of a unit.
- Ask learners to convert 10 mm to cm before measuring it out. Repeat convert 5 1 Tu convert 5 1 Tu c















M d 3 W













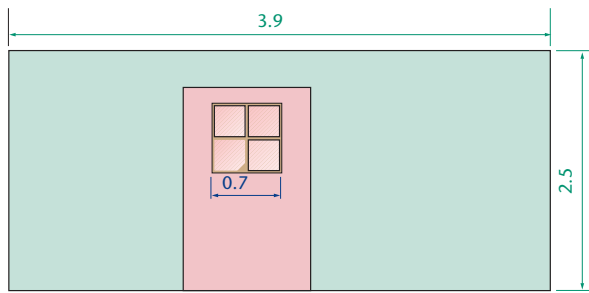
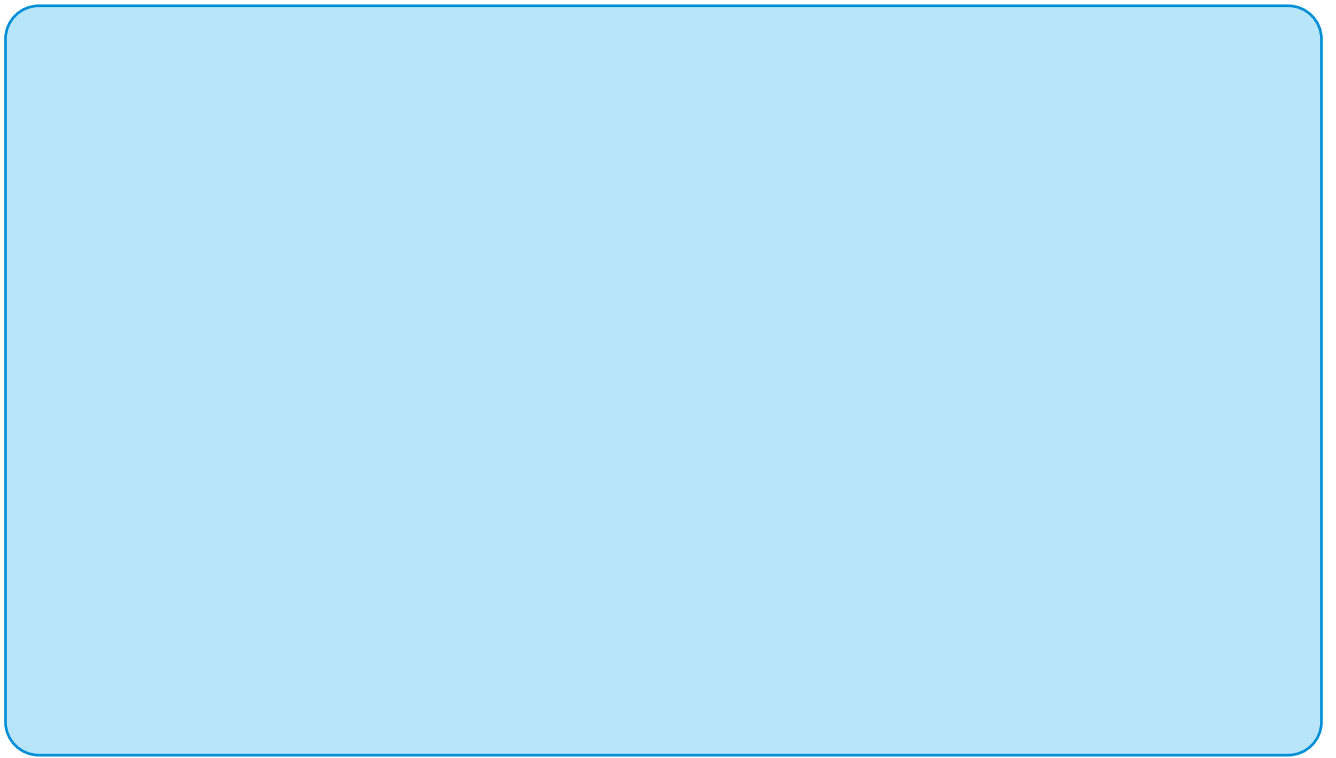
M d 3 W















M d 3 W













