

# NCEA Level 1 Numeracy - Measurement

## Understanding the metric measurement system and simple conversions within that system

### Content

This resource supports the teaching and learning of understanding of the metric measurement system and simple conversions within that system. The sequence is suitable for learners in any context which requires the use of measurement to solve problems and also where tutors are gathering naturally occurring evidence for the achievement of the NCEA Level 1 Numeracy Unit Standard 26627.

### Alignment

The content aligns with Step 4 of the *Measure and Interpret Shape and Space* strand of the Learning Progressions, in particular the *Measurement* Progression.

Learners should have a sense of the size of a metre, litre and gram before undertaking the activities described in this resource. Teaching and learning sequences to develop this can be found on pages 12, 22 and 24 of [Teaching Adults to Measure and Interpret Shape and Space](#).

### Intent

After completing the teaching and learning sequence learners will be able to identify and discuss the features of the metric measurement system and carry out simple metric unit conversions within that system. For example, 100 centimetres = 1 metre, 2 litres = 2000 millilitres.

### Sequence

There are four parts to this sequence. Learners will:

1. brainstorm any units of measurement they know, identify the metric units and the feature each metric unit measures
2. identify and order common prefixes used in metric measurement
3. carry out simple unit conversions within the metric measurement system.

## 1. Brainstorm units of measurement the learners know, identify the metric units and the feature each metric unit measures

**Step one:** As a group ask learners for any units of measurement they use or know and record.

**Step two:** Ask learners the following questions:

- What is the official system of measurement in New Zealand?  
 (*The answer is 'the metric measurement system', although learners may give examples of when this system is not used – heights, baby weights, automotive parts.*)
- Is this used all over the world?  
 (*No, the United States is a significant exception.*)
- What are the metric units in the measurements recorded in the brainstorm?  
 (*Highlight these metric units.*)
- What feature do these metric units measure?  
 (*Make sure that you have at least one metric unit for measuring length, weight and capacity in the record.*)

### Key learning point

The base metric unit and symbol for:

- length is metres and m
- weight/mass is grams and g
- capacity is litres and l or L

No plurals are used in the symbols.

## 2. Identify and order common prefixes used in metric measurement

**Step one:** Ensure learners understand what a prefix is and ask what prefixes are used in the metric measurements already recorded. Prompt for other prefixes and record these. There are many metric prefixes. Learners only need to be familiar with the common ones.

**Step two:** Working in pairs, ask learners to order the common prefixes from largest to smallest.

### Key learning point

Common prefixes from largest to smallest:

Mega (M), kilo (k), centi (c), milli (m), micro ( $\mu$ )

**Step three:** Check the answers together.

**Step four:** Using the table in the key learning point below, discuss the meaning of each prefix.

### Key learning point

The common prefixes with their symbols and meaning are:

mega (M)	kilo (k)	centi (c)	milli (m)	micro ( $\mu$ )
1 million times	1 thousand times	one hundredth of	one thousandth of	one millionth of
1 000 000 times	1 000 times	$\frac{1}{100}$ of	$\frac{1}{1\ 000}$ of	$\frac{1}{1\ 000\ 000}$ of

**Step five:** Ask questions such as:

- How many grams in a kilogram?
- How many millilitres in a litre?
- How many centimetres in a metre?
- How many microseconds in a second?
- How many millimetres in a kilometre?

### 3. Carry out simple unit conversions within a metric measurement system

**Step one:** As a group, ask learners to complete some simple metric conversions.

For example: How many metres is 300cm? How many millilitres in 3 litres?

**Step two:** In pairs, have the learners complete the exercise in [Matching cards to practise simple conversions within the metric measurement system](#) and check their answers with another pair.