

Making measurements

This unit covers:

- quantities and measurement
- quantities and units

Exercise 1.1 Quantities and how they are measured

This exercise checks that you understand some of the important words we use when we take measurements in physics.

1. Ana wanted to measure the length of a table of wood. She used a ruler. In her notebook, she wrote:

length of table = 120 cm

- a) Complete the third column in the table using information from the text above.

Term	Definition	Example from text above
quantity	something that can be measured	
measuring instrument	a device used to measure a quantity	
value	the result of measuring a quantity	

- b) The value of a quantity has both a number and a unit.
What is the unit of length in the text above?

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Exercise 1.2 Quantities and units

In this exercise, you will practise using ideas about quantities and units.

1. In physics we use the SI base units. Complete the table with the quantities that are missing.

Measure	Units	Symbol
Thermodynamic temperature		
	Kilogram	
Electric current		
	candela	
Amount of a substance		
	Second	
		m

2. Each unit has a symbol, for example ‘g’ stands for grams – by this we mean ‘g’ represents or means ‘grams’.

The size of a unit can be changed by adding a prefix in front of the symbol. For example, ‘k’ stands for ‘kilo-’, which means one thousand. A kilogram (kg) is one thousand grams.

Take care! The letter ‘m’ can stand for a unit. It can also stand for a prefix.

- a) In the unit cm, what does the prefix ‘c’ stand for?

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- b) What unit is represented by ‘m’?

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- c) What does ‘m’ stand for when it is a prefix, for example in ‘ms’?

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- d) What does the symbol ‘mm’ stand for?

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- e) Give the names and symbols for two units of mass.

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- f) Give the names and symbols for two units of length which are smaller than a metre.

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- g) What does the symbol ‘ms’ stand for?

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- h) Which is bigger, 1 ms or 1 μ s?

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i) What quantity can be measured in m³ and cm³?
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Adjectives are used to describe nouns, or 'things'. To compare two nouns, you need to use the **comparative** form of the adjective. For example, *longer* is the comparative form of *long*. It is followed by *than*.

This is a *long* book. It is *longer* than the Chemistry book.

We can also use the **superlative** form of the adjective when we mean something is the 'most'. *Longest* is the superlative form of *long*. In general, to make a superlative we use *-est* for small words like 'long', or *most* for longer words like 'expensive'.

If an adjective ends with 'y', we use *-ier* and *-iest* to make the comparative and superlative.

This book is the *longest* in the bookshop. Also, it is the *most expensive*.

3. In each example below, there are three sentences. Underline the adjective in the first sentence. Then fill the gaps in the second and third sentences using the comparative and superlative forms of the adjective. The first has been done for you.

Hydrogen is a light gas. It is *lighter* than helium. It is the *lightest* gas in the Periodic Table.

- a) Josip is lifting heavy weights. The red weight is than the blue one. The green one is the weight of all.
- b) Today we have experienced high winds. The wind today has been than yesterday. Tomorrow we will experience the winds this month.
- c) The pressure is low today. Tomorrow it is forecast to be The pressures are usually during the winter.
- d) Gold is a dense metal. It is than silver. Osmium is the metal in the Periodic Table.