

Monday, 20 July 2026

Connect

Title

SI International units of measurement
Applications



Today's Target

Recall the 7 SI fundamental units

Link SI dimensions and units of measurement with different
engineering applications

Connect:

Candela cd

**Health & Safety
Executive**

Software



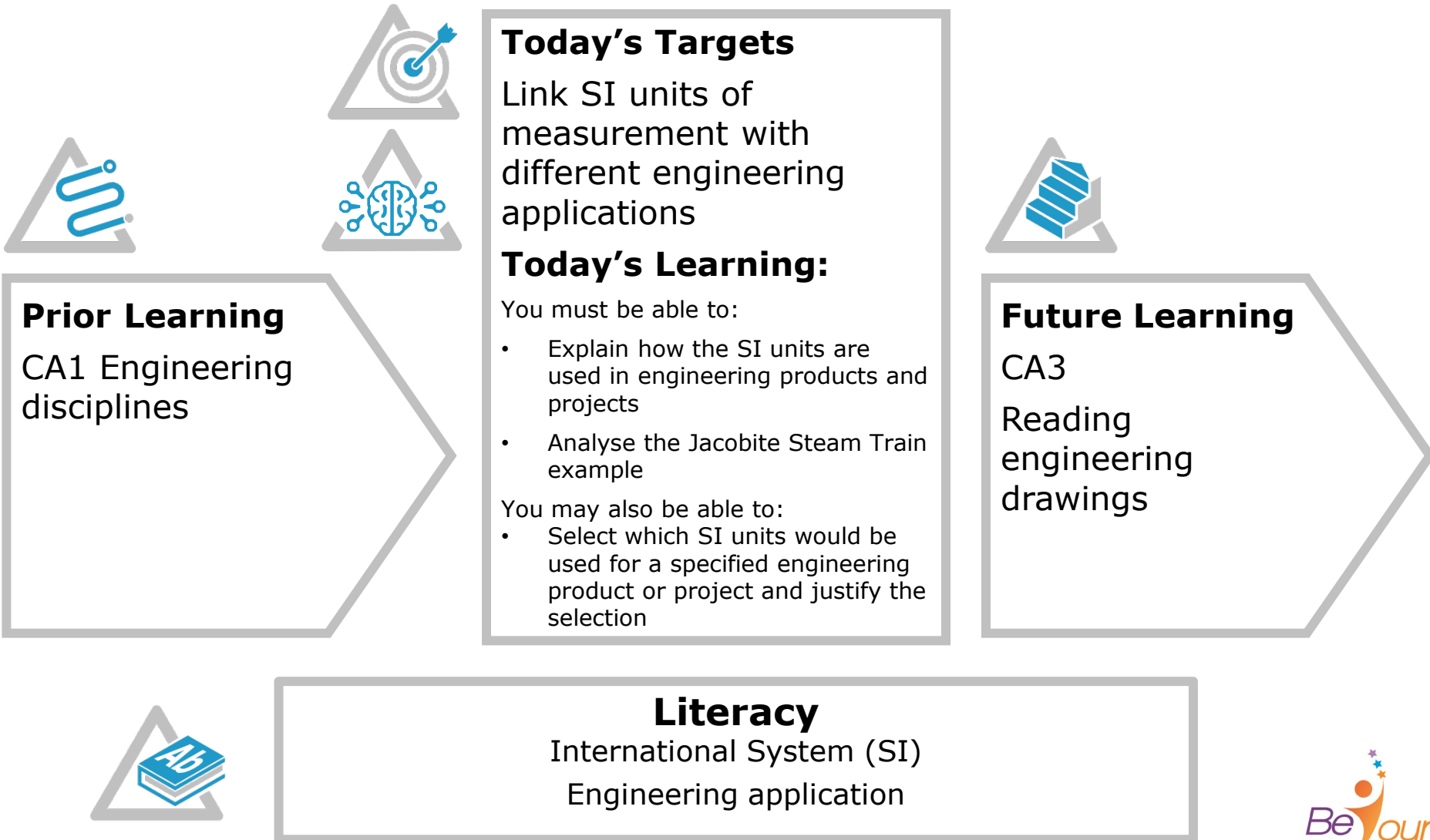
NCFE Level 1 / 2 Technical Award in Engineering

CA2 - Applied science and mathematics in engineering

2.1.1 SI Units of Measurement - applications Lesson 2

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Today's title: SI units of measurement - applications



Today's title: 2.1: Application of SI Units



Your target

- Recall the 7 SI fundamental units
- Link SI units of measurement with different engineering applications



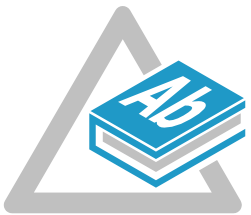
Steps to success

- Explain how the SI units are used in engineering products and projects
- Analyse the Jacobite Steam Train example



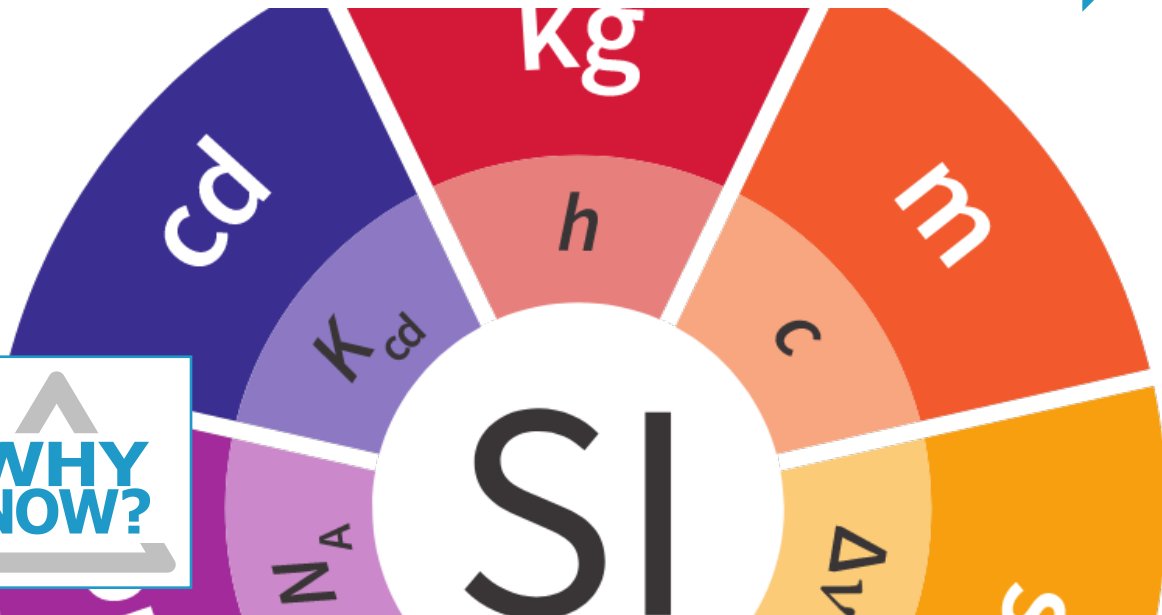
Path to progress

- Select which SI units would be used for a specified engineering product or project and justify the selection



Key terms

International System (SI)
Application



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Think and link

Mass	Amount of substance	Electric current	Temperature	Length (Distance)	Time	Luminous intensity
Kelvin, K	Mole, mol	Candela, cd	Kilogram, kg	Ampere, A	Second, s	Metre, m

Diagram illustrating the relationship between physical quantities and their units. The table shows the following connections:

- Mass is linked to Kilogram, kg.
- Amount of substance is linked to Mole, mol.
- Electric current is linked to Ampere, A.
- Temperature is linked to Kelvin, K.
- Length (Distance) is linked to Metre, m.
- Time is linked to Second, s.
- Luminous intensity is linked to Candela, cd.



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Application of SI units

Look at the image of the Jacobite steam train travelling across the Glenfinnan Railway Viaduct in Scotland and consider the questions below.

Which **disciplines** of engineering are evident?

Which SI units of measurement would have been needed in this scenario?

Consider the **specific applications** of these SI units.
E.g. distance calculation



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Answers

SI units are used in all aspects of engineering to develop products and projects.

Civil, **Automotive** and **Mechanical** are likely evident here.

Some SI units and their specific applications:

Kelvin - calculate temperatures of the steam train functions.

Metre - for the dimension of the train and stopping distances

Mass - for the weight for stopping distances, maximum loads, power required to pull

Time - stopping distances, journey times.



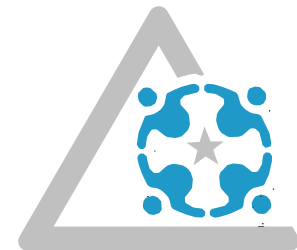
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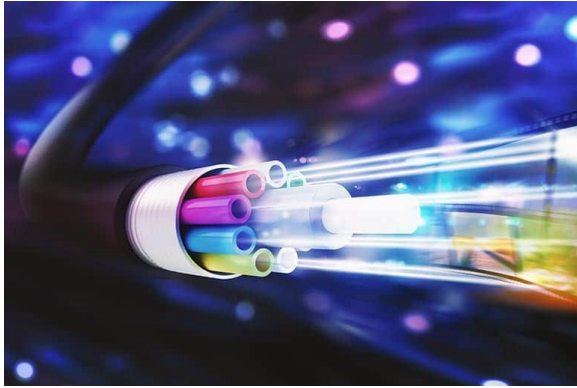
Application of SI units

You are now going to be given an image which represents an **engineering discipline**.

In your table groups, you need to identify and agree on the following information:

1. Engineering discipline e.g. automotive
2. SI dimension required e.g. distance
3. SI units of measurement e.g. metre
4. Application of SI unit(s) e.g. calculate distance

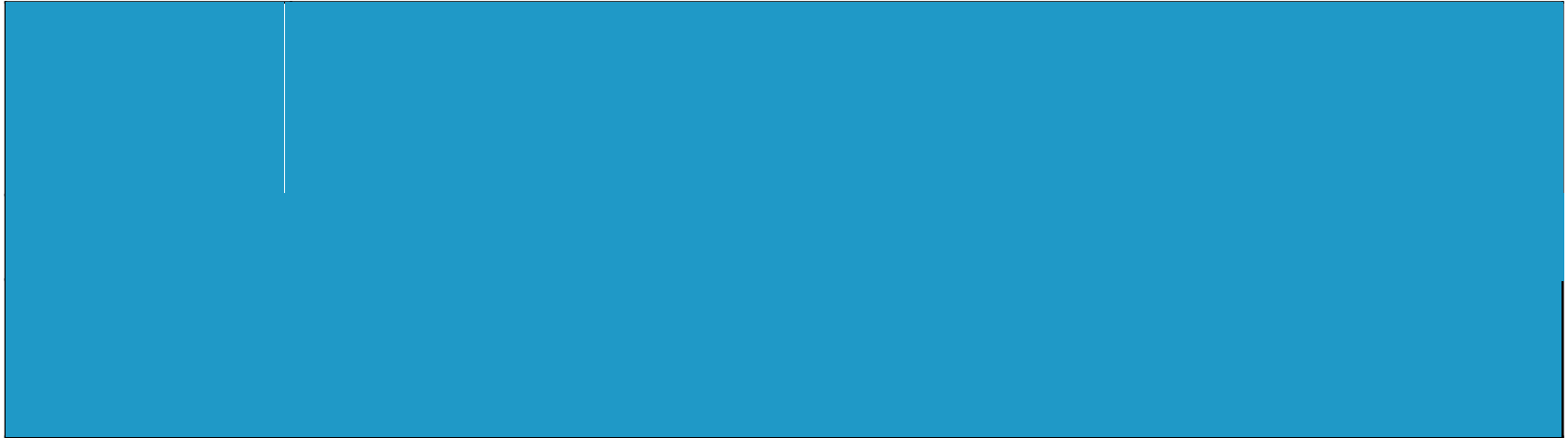




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Mechanical Engineering



Use these slides to clarify
misconceptions following discussion

Dimension	Unit	Symbol
Mass	Kilogram	m
Distance	metre	kg
Time	Second	s
Current	Ampere	A
Amount of Substance	Mole	K
Temperature	Kelvin	mol
Light Intensity	Candela	cd



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Electrical & Electronic Engineering

Dimension	Unit	Symbol
Mass	Kilogram	m
Distance	metre	kg
Time	Second	s
Current	Ampere	A
Amount of Substance	Mole	K
Temperature	Kelvin	mol
Light Intensity	Candela	cd



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Aerospace Engineering

Dimension	Unit	Symbol
Mass	Kilogram	m
Distance	metre	kg
Time	Second	s
Current	Ampere	A
Amount of Substance	Mole	K
Temperature	Kelvin	mol
Light Intensity	Candela	cd



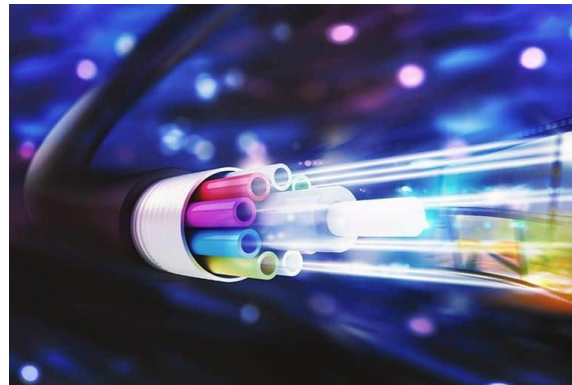
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Telecommunications Engineering

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Dimension	Unit	Symbol
Mass	Kilogram	m
Distance	metre	kg
Time	Second	s
Current	Ampere	A
Amount of Substance	Mole	K
Temperature	Kelvin	mol
Light Intensity	Candela	cd



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Chemical Engineering

Dimension	Unit	Symbol
Mass	Kilogram	m
Distance	metre	kg
Time	Second	s
Current	Ampere	A
Amount of Substance	Mole	K
Temperature	Kelvin	mol
Light Intensity	Candela	cd



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Civil Engineering



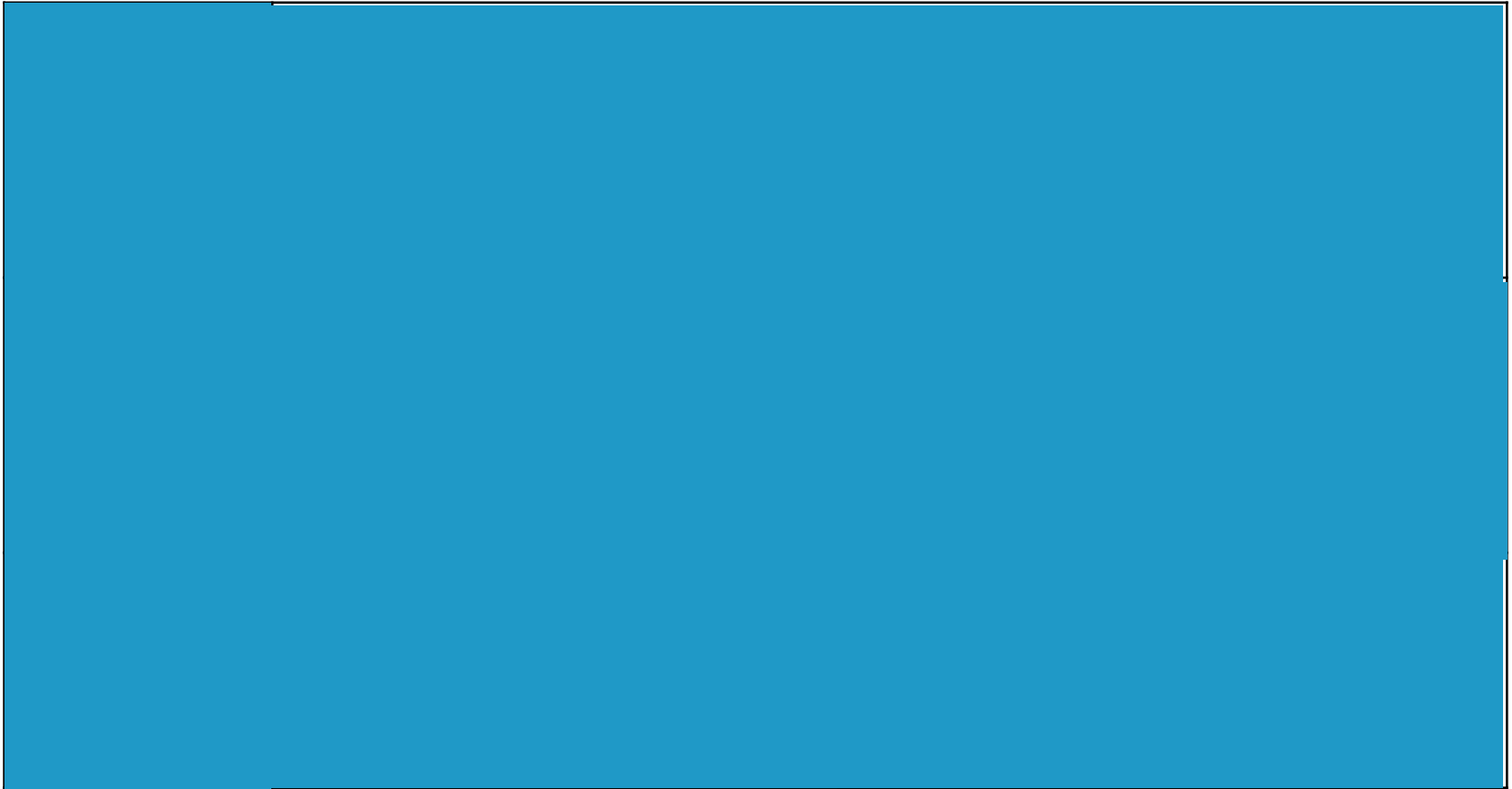
Dimension	Unit	Symbol
Mass	Kilogram	m
Distance	metre	kg
Time	Second	s
Current	Ampere	A
Amount of Substance	Mole	K
Temperature	Kelvin	mol
Light Intensity	Candela	cd



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Automotive Engineering



Dimension	Unit	Symbol
Mass	Kilogram	m
Distance	metre	kg
Time	Second	s
Current	Ampere	A
Amount of Substance	Mole	K
Temperature	Kelvin	mol
Light Intensity	Candela	cd



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Biomedical Engineering

Dimension	Unit	Symbol
Mass	Kilogram	m
Distance	metre	kg
Time	Second	s
Current	Ampere	A
Amount of Substance	Mole	K
Temperature	Kelvin	mol
Light Intensity	Candela	cd



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Software Engineering



Dimension	Unit	Symbol
Mass	Kilogram	m
Distance	metre	kg
Time	Second	s
Current	Ampere	A
Amount of Substance	Mole	K
Temperature	Kelvin	mol
Light Intensity	Candela	cd



Demonstrate

Now complete the table detailing how SI units are used in the development of products and projects across a range of engineering disciplines.

Use your lesson notes and peers to support you.

Discipline	Applications of SI units		
Mechanical			
Electrical & Electronic			
Aerospace			
Telecommunications			

Chemical			
Civil			
Automotive			
Biomedical			
Software			



Think and link—complete the matching task



Mass	Amount of substance	Electric current	Temperature	Length (Distance)	Time	Luminous intensity
Kelvin, K	Mole, mol	Candela, cd	Kilogram, kg	Amps, A	Second, s	Metre, m

Next lesson...

We will learn about...

...how science and mathematics is applied in engineering and the equations used to describe and calculate energy.