Measurement [1]

- In this unit we look at some of the different ways of expressing the functions of measurement in English as measurement is fundamental to science.

- There is nothing complicated about this function. Measurement is expressed mainly by means of the lexis. However, it must be remembered that there are four different ways of expressing height, width, length, depth, etc.

- Lexis: all the words and phrases of a particular language.
  Synonym: vocabulary.

Measurement			
1 Language	2 Structures	3 Approximate measurements	4 Use of prepositions

1 Language		
1.1 Adjectives	1.2 Nouns	1.3 Verbs

1.1 Adjectives
Long, short, high, low, deep, shallow, wide/broad, heavy, light, thick, thin, fast, slow, far, average, mean, typical, standard, random, even, odd, accurate ...

1.2 Nouns
Length, height, depth, width/breadth, radius, weight, thickness, size, area, speed, amount, extent, survey, rate, scale, level, step, stage, span, root, cross-section ...

1.3 Verbs
To measure, to count, to calculate, to enumerate, to work out, to weigh, to check, to monitor, to plot, to reach, to attain, to range, to increase, to decrease, to drop, to fall, to rise ...

Lexis		
Accurate	✓ Quartz watches are extremely accurate.	Exact.
Amount	✓ A large amount of money. ✓ The amount of a substance is measured in mole.	Quantity.
Average	✓ The average velocity is 10m per sec.	Mean.
Breadth	✓ What is the breadth of the Mississippi?	Width.
Deep	✓ The Pacific Ocean is the deepest.	Profound.
Even	✓ The road is not even.	Smooth.
	✓ 2, 4, 6 are even numbers.	Divisible by 2.
Far	✓ It is not far to the town centre.	Distant.
Height	✓ What is the height of the Eiffel tower?	A vertical extension.
Length	✓ What is the length of a tennis court?	The distance of the longest side.
Level	✓ 200 meters above sea level.	A horizontal plane.
Random	✓ The position of gas molecules is random.	Unplanned.
Shallow	✓ The Mediterranean is a relatively shallow sea.	Not deep.
Short	✓ To be short of money.	Not having enough.
Size	✓ What is the size of your shoes?	The dimensions.
Weigh	✓ The car weighs 900 kg.	To measure in kg.

2 Structures

Dimensions can be expressed by for different constructions

It	is	10 cm	Wide, high, long, thick, deep ...
It	is	10 cm	in width, in height, in depth, in diameter…
Its	radius thickness length depth weight ...	is	x cm/kg/ ...
It has	a length a circumference	of	x cm

Note: Questions are regular in construction

- How high is the Eiffel tower?
- What is the length of the Limpopo River?

3 Approximate measurements

These can be expressed by means of adverbial modifiers

It	is	almost…nearly roughly…more or less approximately…about a little over slightly under	5 cm long

Note: The word 'over' has many different meanings. For our purposes three are important:

It is over 6 cm long.	more than
Over the last 5 months he has been studying at Brighton.	during
The experiment is over.	finished

4. Use of prepositions

Prepositions and postpositions are widely used to express measurement:

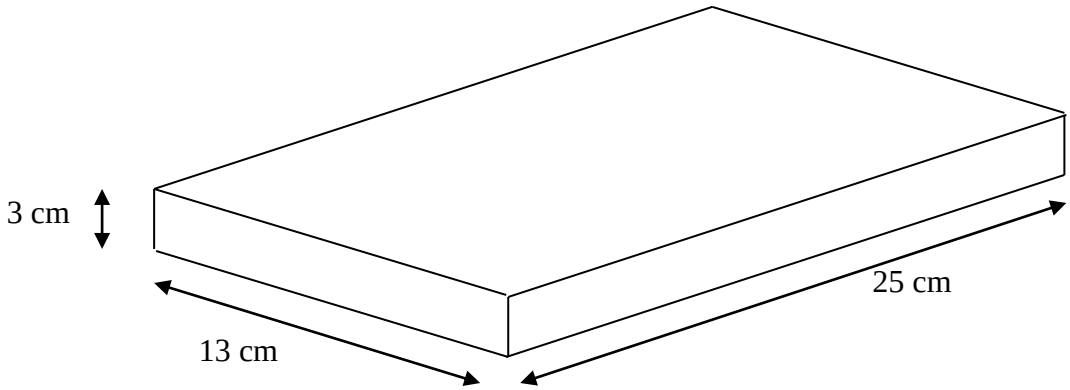
To at by from between up to above

- Methane freezes at minus 164°C.
- To count up to thirty.

Bibliography: [1] Minimum Competence In Scientific English

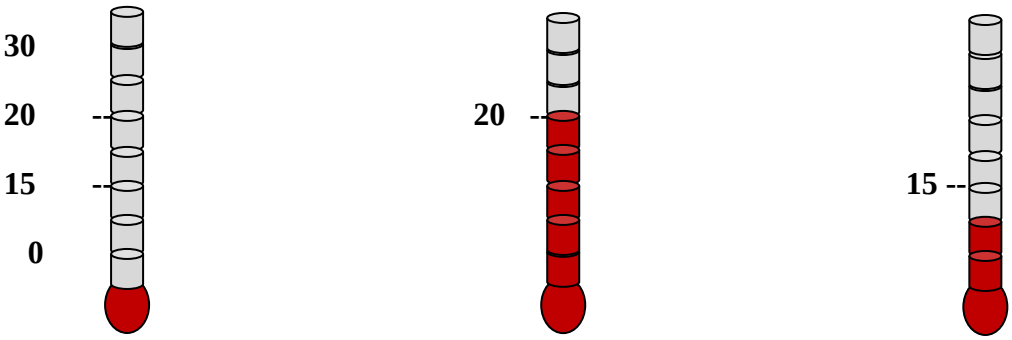
Examples:

Example 1



- ✓ The block is 25 cm long but it is only 13 cm in width. It is 3 cm deep.
- ✓ The volume is 975cm^3. This figure can be worked out by multiplying the length by the width by the depth.
- ✓ The surface area of the cross-section is 39 cm^2.

Example 2



- ✓ Sea water freezes at slightly under 0°C.
- ✓ The temperature rose to 20°C.
- ✓ The temperature fell from 20°C to 15°C.
- ✓ The temperature fell by 10°C.

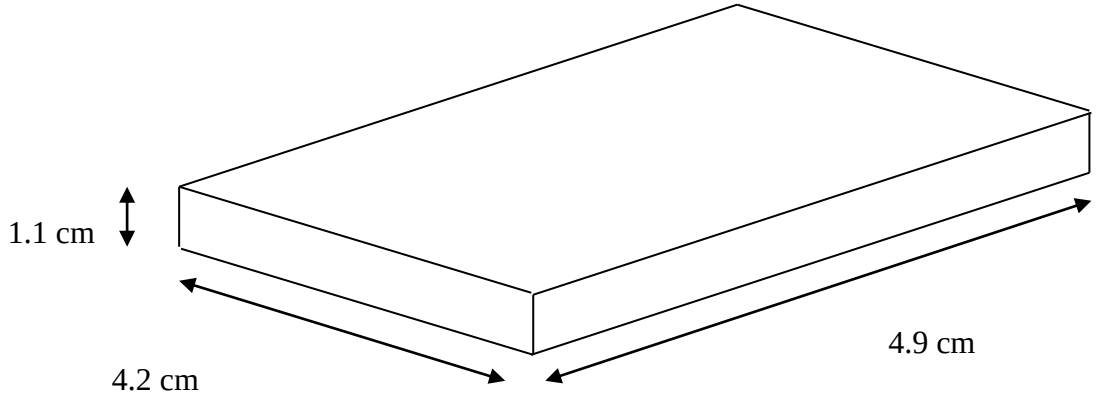
Exercise 1

- ✓ Complete the text by filling the blanks with an appropriate word according to the context.

✓ Mount Everest is 8848.....	H:
✓ The plane flew at a .....of 9,000 metres as it crossed the Atlantic.	H:
✓ After heavy rains the .....of the Amazon often reaches 50 kilometres.	L:
✓ If the rectangle is 3 cm across and 5 cm long, then its .....is 15 cm^2.	C:
✓ How.....is the Eiffel tower?	H:
✓ He lives .....from the town centre.	F:
✓ The circumference of a circle is obtained by multiplying the .....by two and then multiplying the result by Pi.	R:
✓ South Africa exports a large.....of uranium.	Quantity
✓ Computer simulations forecast that the planet's temperature will.....by between 3°F and 9°F by the year 2000.	Go up
✓ A supplement must be paid on air France planes if luggage.....more than 20 kg.	To measure heaviness

Exercise 2

1. Give the five different measurements (including weight/mass) of this zirconium block (density 6.5)



- ✓ Its top surface area is ..... cm^2.
- ✓ It is 4.9 cm.....
- ✓ It has a width of .....cm.
- ✓ .....in height.
- ✓ .....is 22.64 cm^3.
- ✓ .....147.15 g.

2. Give the approximate measurements of the block (use alternative expressions of measurements).

- ✓ Its length is slightly.....
- ✓ .....of a little more than 4 cm.
- ✓ It is roughly 1 cm.....
- ✓ .....almost 21 cm^2.
- ✓ It weighs just.....