

## SESSION 4: CONVERSIONS & UNITS OF TIME

### KEY CONCEPTS:

- Measurement and Units
- Units of length and distance
- Units of area
- Units of volume
- Units of capacity
- Units of mass
- Units of time

### X-PLANATION

We measure things to make accurate comparisons. There are two main systems of measurement used in different parts of the world. The metric system is the most common system. Most of the measurement calculation we do are based on the metric system. The other system is called the Imperial system of measurement and is used mainly in the USA and the UK. In all systems of measurement you need to use the appropriate unit to get accurate measurements.

#### Measuring distance or length

The standard unit of length in the metric system is 1 metre. There are other units that are big or smaller than this standard. You convert from one unit to the next unit by multiplying or dividing by a multiple of 10.

We measure length in kilometres, metres, centimetres and millimetres (biggest to smallest).

$$\begin{aligned}1 \text{ km} &= 1000 \text{ m} \\1 \text{ m} &= 100 \text{ cm} \\1 \text{ m} &= 1000 \text{ mm}\end{aligned}$$

When converting from a bigger unit to a smaller unit you multiply.  
When converting from a smaller unit to a bigger unit you divide.

In the Imperial system of measurement length is measured in miles, yards, feet and inches. There are different factors to convert between these units – not based on factors of 10. You will be given the factors of conversion in calculations.

#### Measuring Area

We find the area of a two dimensional shape by multiplying the length and the breadth. The standard unit of area in the metric system is 1 metre squared ( $1 \text{ m}^2$ )

For very large areas we use kilometres squared.  
 $1 \text{ km}^2 = 1 \text{ km} \times 1 \text{ km} = 1000 \text{ m} \times 1000 \text{ m} = 1\,000\,000 \text{ m}^2$

For smaller areas we use centimetres squared and millimetres squared.

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### Measuring Volume

We find the volume of a three dimensional object by multiplying the length, the breadth and the height. The standard unit of volume in the metric system is 1 metre cubed ( $1 \text{ m}^3$ ).  
 $1 \text{ m}^3 = 1 \text{ m} \times 1 \text{ m} \times 1 \text{ m}$

It is more common to use smaller units of volume such as centimetres cubed.

We use these volume measurements for solid objects. When we measure the volume of liquids, we call these measurements of capacity.

### Measuring Capacity

The standard unit of area in the metric system is 1 litre ( 1 ℓ)

$$1 \text{ ℓ} = 1000 \text{ ml} = 1000 \text{ cm}^3$$

$$1 \text{ kℓ} = 1000 \text{ ℓ}$$

In a kitchen or recipe book you will also find measurement like teaspoon (1 tsp), tablespoon ( 1 Tsp) and cup. 1 tsp = 5 ml 1 Tsp = 15 ml 1 cup = 250 ml

### Measuring Mass

The standard unit of mass (commonly called weight) in the metric system is 1 kg. Mass is also measured in tonnes, grams and milligrams.

$$1 \text{ tonne} = 1\,000 \text{ kg} \quad 1 \text{ kg} = 1000 \text{ g} \quad 1 \text{ g} = 1\,000 \text{ mg}$$

### Measuring time

Time is measured in years, months, weeks, days, hours, minutes and seconds

$$1 \text{ week} = 7 \text{ days}$$

$$1 \text{ day} = 24 \text{ hrs}$$

$$1 \text{ hr} = 60 \text{ min}$$

$$1 \text{ min} = 60 \text{ s}$$

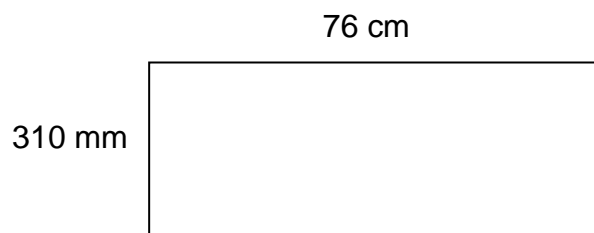
### X-AMPLE QUESTIONS:

#### Question 1:

Convert:

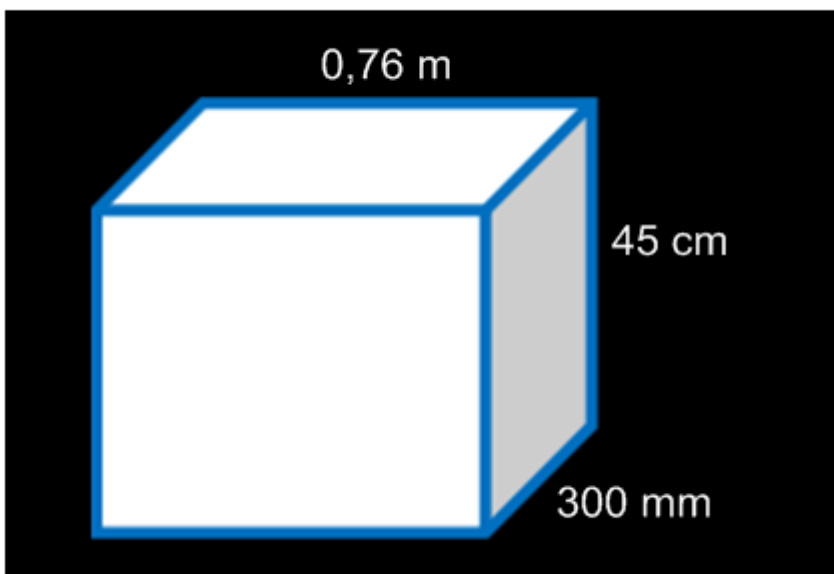
- a) 0,56km to m
- b) 4 550mm to m
- c) 1,67m to cm.
- d) 3,5km to mm.
- e) 568mm to m.
- f) 1 345 652cm to km.

#### Question 2:



Calculate the area of the rectangle  
Use the formula: **Area = length x breadth**  
Give you answer in  $\text{cm}^2$

#### Question 3:



Calculate the volume of the rectangular prism  
Use the formula: **Volume = length x breadth x height**  
Give you answer in  $\text{cm}^3$

**Question 4:**

Convert the following:

- a.) 2,5ℓ to mℓ
- b.) 3,8kℓ to ℓ
- c.) 3586 mℓ to ℓ
- d.) 410 ℓ to kℓ

**Question 5:**

DJ is baking scones so he can sell them and make money for a soccer tour. The recipe requires:

500ml of milk  
375ml of flour  
45ml of baking powder  
7,5ml of salt

Unfortunately DJ has no measuring jugs, but he does have cups, tablespoons and teaspoons in his kitchen. Can you help DJ make the correct conversions in order for him to bake his delicious scones?

**Question 5:**

Convert:

- a) 3kg to g
- b) 25g to mg
- c) 2,6kg to mg
- d) 3,3 tons to kg
- e) 1235g to kg
- f) 235mg to g
- g) 13546mg to kg
- h) 2345kg to tons

**Question 6:**

Convert the following times:

- a.) 360 hours to minutes
- b.) 24 minutes to seconds
- c.) 21 600 seconds to minutes
- d.) 360 hours to days
- e.) 294 days to weeks
- f.) 7 days to minutes
- g.) 1 058 400 seconds to days