

# C5.1 Units of measure

Name: \_\_\_\_\_ Class: \_\_\_\_\_ Date: \_\_\_\_\_

Total: 20 marks

KEY WORDS area 面积 • length 长度 • volume 体积

## Objective

Use units of measure to solve Core IGCSE Mathematics problems.

**You must be able to:**

- Convert lengths, areas and volumes using the correct powers
- Convert litres, millilitres and cubic units
- Use consistent units before counting containers

## 1 Key knowledge and worked examples

### ■ Key knowledge: Units of measure

Length scales by the unit conversion factor; area scales by its square and volume by its cube.  $1 \text{ m} = 100 \text{ cm}$ , so  $1 \text{ m}^2 = 10000 \text{ cm}^2$  and  $1 \text{ m}^3 = 1000000 \text{ cm}^3$ .  $1 \text{ litre} = 1000 \text{ ml} = 1000 \text{ cm}^3$ . Also  $1 \text{ kg} = 1000 \text{ g}$  and  $1 \text{ km} = 1000 \text{ m}$ . Keep units attached.

### ■ Worked example: Units of measure

length:  $\times 100$ area:  $\times 10000$ volume:  
 $\times 1000000$ 

Convert  $0.035 \text{ m}^2$  to  $\text{cm}^2$ .

- There are two length dimensions:  $A = 0.035(100)^2 = 350 \text{ cm}^2$ .
- Convert  $0.004 \text{ m}^3$  to litres:  $V = 0.004 \times 1000 = 4 \text{ litres}$ .
- Convert  $3750 \text{ g}$  to  $\text{kg}$ :  $m = 3750/1000 = 3.75 \text{ kg}$ .

### ■ Method check

Area conversion squares the length factor and volume conversion cubes it. A factor for length cannot be reused unchanged for area or volume.

## 2 Practice

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**2.1** Convert 2.7 km to m and 48 mm to cm. [2]

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**2.2** Convert 6200 cm<sup>2</sup> to m<sup>2</sup>. [2]

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**2.3** Convert 0.008 m<sup>3</sup> to cm<sup>3</sup>. [2]

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**2.4** Convert 2.35 litres to ml and 4500 g to kg. [2]

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## 3 Exam-style questions

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**3.1** Apply the units of measure methods below. Show working and include units where appropriate.

(a) A tank holds 0.075 m<sup>3</sup>. Convert this to litres. [2]

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(b) Find the number of full 250 ml bottles it can fill. [2]

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(c) A label has area  $18 \text{ cm}^2$ . Convert this to  $\text{mm}^2$ . [2]

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**3.2** A tank holds  $0.024 \text{ m}^3$  of water. Water is poured into 750 ml bottles.

(a) Convert the capacity to litres and find how many full bottles it fills. [3]

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(b) A label has area  $0.015 \text{ m}^2$ . Convert this to  $\text{cm}^2$  and explain why multiplying by 100 would be incorrect. [3]

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