

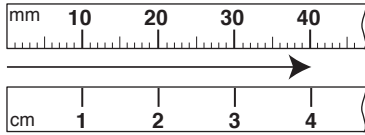
28. [Units of Measurement]

Skill 28.1 Converting units of measurement for length.

MM7 1 1 2 2 3 3 4 4
MM8 1 1 2 2 3 3 4 4

CONVERSION FACTORS

$$\begin{aligned} 1 \text{ km} &= \mathbf{1000} \text{ m} = \mathbf{100\,000} \text{ cm} = \mathbf{1\,000\,000} \text{ mm} \\ 1 \text{ m} &= \mathbf{100} \text{ cm} = \mathbf{1000} \text{ mm} \\ 1 \text{ cm} &= \mathbf{10} \text{ mm} \end{aligned}$$



Changing from smaller units (e.g. 40 mm) into larger units (e.g. 4 cm), you always divide by the conversion factor (e.g. 10).

Changing from larger units (e.g. 4 cm) into smaller units (e.g. 40 mm), you always multiply by the conversion factor (e.g. 10).

Q. 400 m = cm	A. $400 \text{ m} = 400 \times 100 \text{ cm}$ $= 40\,000 \text{ cm}$	$1 \text{ m} = 100 \text{ cm}$ Because centimetres are smaller units than metres, you will need more of them, so multiply.
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Q. 5000 m = km	A. $5000 \text{ m} = \frac{5000}{1000} \text{ km}$ $= 5 \text{ km}$	$1000 \text{ m} = 1 \text{ km}$ Because kilometres are larger units than metres, you will need fewer of them, so divide.
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a) $8 \text{ m} = 8 \times 1000 \text{ mm}$ $= 8000 \text{ mm}$	b) $1000 \text{ cm} = \frac{1000}{100} \text{ m}$ $= 10 \text{ m}$	c) $15 \text{ km} = \dots \text{ m}$ $= \dots \text{ m}$
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d) $5 \text{ km} = \dots \text{ cm}$ $= \dots \text{ cm}$	e) $300 \text{ mm} = \dots \text{ cm}$ $= \dots \text{ cm}$	f) $9 \text{ cm} = \dots \text{ mm}$ $= \dots \text{ mm}$
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g) $43\,000 \text{ m} = \dots \text{ km}$ $= \dots \text{ km}$	h) $800 \text{ mm} = \dots \text{ m}$ $= \dots \text{ m}$	i) $5 \text{ km} = \dots \text{ m}$ $= \dots \text{ m}$
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j) How many millimetres make 0.4 metres? $0.4 \text{ m} = 0.4 \times 1000 \text{ mm}$ $= 400 \text{ mm}$	k) How many kilometres is 300 metres? $300 \text{ m} = \dots \text{ km}$ $= \dots \text{ km}$	l) How many metres make 20 centimetres? $20 \text{ cm} = \dots \text{ m}$ $= \dots \text{ m}$
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CONVERSION FACTORS

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

$$1 \text{ kg} = 1000 \text{ g}$$

Q. $6 \text{ kg} = \dots\dots\dots \text{ g}$

A. $6 \text{ kg} = 6 \times 1000 \text{ g}$
 $= 6000 \text{ g}$

$1 \text{ kg} = 1000 \text{ g}$

Because grams are lighter units than kilograms, you will need many more of them, so multiply.

Q. $20\,000 \text{ kg} = \dots\dots\dots \text{ t}$

A. $20\,000 \text{ kg} = \frac{20\,000}{1000} \text{ t}$
 $= 20 \text{ t}$

$1000 \text{ kg} = 1 \text{ t}$

Because tonnes are heavier units than kilograms, you will need fewer of them, so divide.

a) $30 \text{ kg} = 30 \times 1000 \text{ g}$
 $= 30\,000 \text{ g}$

b) $4000 \text{ g} = \frac{4000}{1000} \text{ kg}$
 $= 4 \text{ kg}$

c) $75 \text{ kg} = \dots\dots\dots \text{ g}$
 $= \dots\dots\dots \text{ g}$

d) $80 \text{ t} = \dots\dots\dots \text{ kg}$
 $= \dots\dots\dots \text{ kg}$

e) $195 \text{ kg} = \dots\dots\dots \text{ g}$
 $= \dots\dots\dots \text{ g}$

f) $5000 \text{ kg} = \dots\dots\dots \text{ t}$
 $= \dots\dots\dots \text{ t}$

g) $0.9 \text{ t} = \dots\dots\dots \text{ kg}$
 $= \dots\dots\dots \text{ kg}$

h) $75\,500 \text{ g} = \dots\dots\dots \text{ kg}$
 $= \dots\dots\dots \text{ kg}$

i) $180 \text{ g} = \dots\dots\dots \text{ kg}$
 $= \dots\dots\dots \text{ kg}$

j) How many grams in 1.5 kilograms?

$1.5 \text{ kg} = 1.5 \times 1000 \text{ g}$
 $= 1500 \text{ g}$

k) How many grams in 0.6 kg?

$0.6 \text{ kg} = \dots\dots\dots \text{ g}$
 $= \dots\dots\dots \text{ g}$

l) How many tonnes make 2500 kilograms?

$2500 \text{ kg} = \dots\dots\dots \text{ t}$
 $= \dots\dots\dots \text{ t}$

m) An astronaut weighs 12 kg on the Moon. Express this in grams.

$12 \text{ kg} = \dots\dots\dots \text{ g}$
 $= \dots\dots\dots \text{ g}$

n) The average weight of an adult blue whale is 120 t. Express this in kilograms.

$120 \text{ t} = \dots\dots\dots \text{ kg}$
 $= \dots\dots\dots \text{ kg}$

o) An average person eats 50 000 kg of food in a lifetime. Express this in tonnes.

$50\,000 \text{ kg} = \dots\dots\dots \text{ t}$
 $= \dots\dots\dots \text{ t}$

CONVERSION FACTORS

1 ML (megalitre) = 1 000 000 L

1 L = 1000 mL

Q. 20 L = mL

A. $20\text{ L} = 20 \times 1000\text{ mL}$
 $= 20\,000\text{ mL}$

1000 mL = 1 L

Because mL are smaller units than litres, you will need more of them, so multiply.

Q. 14000 mL = L

A. $14\,000\text{ mL} = \frac{14\,000}{1\,000}\text{ L}$
 $= 14\text{ L}$

1000 mL = 1 L

Because litres are larger units than millilitres, you will need less of them, so divide.

a) $17\text{ L} = 17 \times 1000\text{ mL}$
 $= 17\,000\text{ mL}$

b) $3000\text{ mL} = \frac{3000}{1000}\text{ L}$
 $= 3\text{ L}$

c) $8\text{ L} = \dots\dots\dots\text{ mL}$
 $= \dots\dots\dots\text{ mL}$

d) $132\text{ L} = \dots\dots\dots\text{ mL}$
 $= \dots\dots\dots\text{ mL}$

e) $15\,000\text{ mL} = \dots\dots\dots\text{ L}$
 $= \dots\dots\dots\text{ L}$

f) $200\,000\text{ mL} = \dots\dots\dots\text{ L}$
 $= \dots\dots\dots\text{ L}$

g) $0.5\text{ L} = \dots\dots\dots\text{ mL}$
 $= \dots\dots\dots\text{ mL}$

h) $750\text{ mL} = \dots\dots\dots\text{ L}$
 $= \dots\dots\dots\text{ L}$

i) $0.33\text{ L} = \dots\dots\dots\text{ mL}$
 $= \dots\dots\dots\text{ mL}$

j) How many millilitres in 2.5 litres?

$2.5\text{ L} = 2.5 \times 1000\text{ mL}$
 $= 2500\text{ mL}$

k) How many litres in 1250 mL?

$1250\text{ mL} = \dots\dots\dots\text{ L}$
 $= \dots\dots\dots\text{ L}$

l) How many millilitres make 0.75 litres?

$0.75\text{ L} = \dots\dots\dots\text{ mL}$
 $= \dots\dots\dots\text{ mL}$

m) Whilst brushing your teeth, a running tap wastes 5 L of water. Express this in mL.

$5\text{ L} = 5 \times 1000\text{ mL}$
 $= 5000\text{ mL}$

n) A full toilet flush uses 12 L of water. How many millilitres is this?

$12\text{ L} = \dots\dots\dots\text{ mL}$
 $= \dots\dots\dots\text{ mL}$

o) A sprinkler uses 1000 L of water in one hour. How many millilitres is this?

$1000\text{ L} = \dots\dots\dots\text{ mL}$
 $= \dots\dots\dots\text{ mL}$