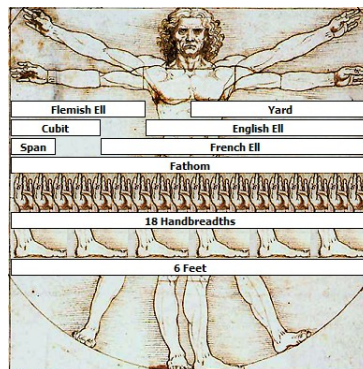
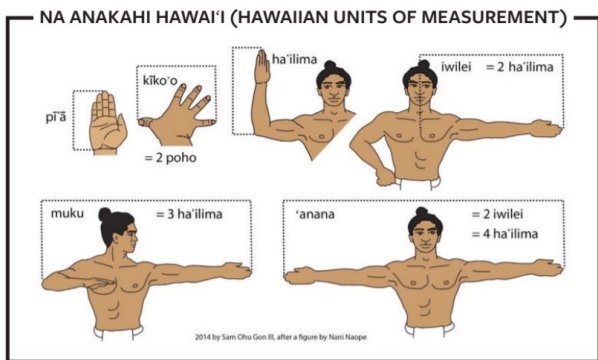


## 5.1 The Metric System

### Different units of measurement

Measurements were often based around body parts! Why?



What are some issues with these units of measurement?

The **International Bureau of Weights and measures** developed the **metric system** to ensure everyone around the world can take measurements independently and get the same value.

### The Metric System

Attaches a prefix to a base unit →

<b>Time:</b> seconds	<b>Length:</b> metres
<b>Mass:</b> grams	<b>Volume:</b> litres

moving right? Multiply (decimal moves right)



moving left? Divide (decimal moves left)



kilo	hecto	deca	BASE Unit	deci	centi	milli
km	hm	dam	metre (m)	dm	cm	mm
kg	hg	dag	gram (g)	dg	cg	mg
kl	hl	dal	litre (l)	dl	cl	ml

1 hectare = 0.01 km <sup>2</sup>	1 tonne = 1000 kg	1 mL = 1 cm <sup>3</sup>
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moving right? Multiply (decimal moves right)



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1 hectare = 0.01 km <sup>2</sup>	1 tonne = 1000 kg	1 mL = 1 cm <sup>3</sup>
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**Example 1:** Convert the following measurements.

a) 72.9 mm = 0.729 dm

b) 44.25 dag = 442500 mg

c) 149.05 kL = 14905000 cL

d) 50.125 cg = 0.0050125 hg

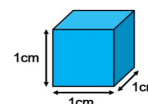
149.05000

0.0050.125

**Volume:**

- measured in cubic units (km<sup>3</sup>, m<sup>3</sup>, cm<sup>3</sup>)
- or in litres for liquids (L, cL, mL)

1 mL = 1 cm<sup>3</sup>



**Example 2:** Convert the following measurements.

a) 591 mL = 591 cm<sup>3</sup>

b) 350 L = 350000 cm<sup>3</sup>

c) 1425 cm<sup>3</sup> = 142.5 cL

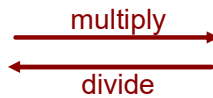
Convert to mL  
Decimal 3 →  
350000 mL

1425 mL

### Converting Between Imperial and Metric Systems

Note: " = inches

' = feet



Length	Mass	Capacity	Liquid Volume
1" = 2.54 cm	1 oz = 28.38 g	1 tsp = 5 ml	1 fl oz = 30 ml
1' = 30.48 cm	1 lb = 453.59 g	1 <u>tblsp</u> = 15 ml	1 pint = 480 ml*
1 yd = 91.44 cm	1 stone = 6.4 kg	1 cup = 240 ml *	1 quart = 960 ml*
1 mile = 1.62 km	1 ton = 0.9072 tonne		1 gallon = 3.8 L*

\*\*conversions differ between Canada, US, UK

1 square foot = 0.0929 m <sup>2</sup>	1 cubic foot = 0.0283 m <sup>3</sup>	1 acre = 0.4047 hectares
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#### A. Length

Ex. 3 Convert the following measurements.

a) 2" = 5.08 cm      b) 4 ft = 121.92 cm      c) 5 cm = 1.97 inches

$2 \times 2.54$                        $4 \times 30.48$                        $5 \div 2.54$

d) 3 yd. 2 ft. = 3.35 m

$3 \text{ yd} = 3 \times 91.44 \text{ cm}$                        $2 \text{ ft} = 2 \times 30.48 \text{ cm}$

$= 274.32 \text{ cm}$                                        $= 60.96 \text{ cm}$

$= 335.28 \text{ cm}$

$= 3.35 \text{ m}$

#### B. Mass

Ex. 4 Convert the following measurements.

a) 500 g = 1.1 lb      b) 6 stone = 38.4 kg      c) 8.8 lb = 3.99 kg

$500 \div 453.59$        $6 \times 6.4$                        $8.8 \times 453.59 \text{ g}$

$= 3991.592$

#### C. Capacity

Ex. 5 Convert the following measurements.

a) 3 gallons = 11.4 litres      b) 180 litres = 47.4 gallons      c) 21 litres = 44.4 pints

$3 \times 3.8$                        $180 \div 3.8$                        $1 \text{ pint} = 480 \text{ mL}$

$21 \text{ L}$

$= 21000 \text{ mL}$

$\div 480$

## You try!

Ex. 6 Which one is larger?

6 cm or 2 inches

formula sheet

Ex. 7 Taslin ran 100 m in 15 seconds. Jobira ran 120 yards in 16 seconds.

Who ran faster?

$$\text{Taslin} = \frac{100 \text{ m}}{15 \text{ s}}$$

$$= 6.7 \text{ m/s}$$



$$\text{Jobira} = \frac{120 \text{ yards}}{16 \text{ s}}$$

$$120 \text{ yds}$$

$$\times 91.44$$

$$= 10972.8 \text{ cm}$$

$$= 109.7 \text{ m}$$

?

Jobira  
was faster!



$$\frac{109.7 \text{ m}}{16 \text{ s}}$$

$$= 6.86 \text{ m/s}$$