

Exercise 1 :

1. Express the following quantities using the prefixes and the unit abbreviations.

For example, 10000 meters = 10 km

a. 1 000 000 watts b. 0.002 gram c. 3×10^{-6} meters d. 30 000 seconds.

a) 1 000 000 watt

$$1 \times 10^6 \text{ W} = 1 \text{ MW}$$

b) 0.002 gram = 0.002 g

$$2 \times 10^{-3} \text{ g} = 2 \text{ mg}$$

c) 3×10^{-6} meter = $3 \mu\text{m}$

d) 30 000 seconds = $30 \times 10^3 \text{ s} = 30 \text{ ks}$

prefix	symbol	exponent	number
tera	T	10^{12}	1,000,000,000,000
giga	G	10^9	1,000,000,000
mega	M	10^6	1,000,000
kilo	K	10^3	1,000
(base)	(base)	10^0	1
deci	d	10^{-1}	0.1
centi	c	10^{-2}	0.01
milli	m	10^{-3}	0.001
micro	μ	10^{-6}	0.000001
nano	n	10^{-9}	0.000000001
pico	p	10^{-12}	0.000000000001

2. Write each of the following in *scientific notation* (without using prefixes)

(a) $40 \mu\text{W}$ (b) 4 ns (c) 3 MW (d) 25 km

$$\text{a) } 40 \times 10^{-6} \text{ W} = 4 \times 10^{-6+1} = 4 \times 10^{-5} \text{ W}$$

$$\text{b) } 4 \times 10^{-9} \text{ s}$$

$$\text{c) } 3 \text{ MW} = 3 \times 10^6 \text{ W}$$

$$\text{d) } 25 \text{ km} = 25 \times 10^3 \text{ m} = 2.5 \times 10^4 \text{ m}$$

3. Convert a speed of 10 km/h to mi/h.

$$1 \text{ mile} = 1.609 \text{ km}$$

$$10 \frac{\text{km}}{\text{h}} = \frac{10}{1.609} \frac{\text{mi}}{\text{h}} = 6.215 \text{ mi/h}$$

4. Knowing that one gallon = 231 in³ and 1 in = 2.54 cm, then the Volume of 5 gallons of water equals in cm³ to :

5 gallon $\xrightarrow{\quad}$ in³ $\xrightarrow{\quad}$ cm³

$$1 \text{ gallon} = 231 \text{ in}^3$$

$$1 \text{ in} = 2.54 \text{ cm}$$

$$5 \times 231$$

$$\times 16.387$$

$$1 \text{ in}^3 = 2.54^3 \text{ cm}^3$$

$$5 \times 231 \times 16.387 = 18926.9 \text{ cm}^3$$

$$1 \text{ in}^3 = 16.387 \text{ cm}^3$$

?

5. Given $1 \text{ in} = 2.54 \text{ cm}$ The volume of an object is 21 cm³ then its volume in in³ is:

21 cm³ $\xrightarrow{\quad}$ in³

$$1 \text{ in} = 2.54 \text{ cm}$$

$$1 \text{ in}^3 = 2.54^3 \text{ cm}^3$$

$$\frac{21}{16.387} = 1.281 \text{ in}^3$$

$$1 \text{ in}^3 = 16.387 \text{ cm}^3$$

6. Complete the following: (a) 100 yd = m (b) 60 mi/h = ft/s

$$a) \quad 100 \text{ yd} = \quad \text{m} \quad \quad \quad 1 \text{ yd} = 0.9144 \text{ m}$$

$$100 \times 0.9144 = 91.44 \text{ m}$$

$$b) \quad 60 \text{ mi/h} = \quad \text{ft/s} \quad \quad \quad 1 \text{ mile} = 5280 \text{ ft}$$

$$\frac{60 \text{ mi}}{1 \text{ h}} = \frac{60 \times 5280}{1 \times 3600} \frac{\text{ft}}{\text{s}}$$

$$= 88 \text{ ft/s}$$

6. Complete the following: (a) 100 yd = m (b) 60 mi/h = ft/s

