

key

### Dimensional Analysis Practice Problems

1) 0.56kg = ? mg

$$0.56 \text{ kg} \times \frac{10^3 \text{ g}}{1 \text{ kg}} \times \frac{10^3 \text{ mg}}{1 \text{ g}} = 5.6 \times 10^5 \text{ mg}$$

2) 1.2ng = ? g

$$1.2 \text{ ng} \times \frac{1 \text{ g}}{10^9 \text{ ng}} = 1.2 \times 10^{-9} \text{ g}$$

3) 2.0 in = ? mm (1in = 2.54 cm)

$$2.0 \text{ in} \times \frac{2.54 \text{ cm}}{1 \text{ in}} \times \frac{1 \text{ m}}{10^2 \text{ cm}} \times \frac{10^3 \text{ mm}}{1 \text{ m}} = 50.8 \text{ mm}$$

4) 500ft = ? m

$$500 \text{ ft} \times \frac{12 \text{ in}}{1 \text{ ft}} \times \frac{2.54 \text{ cm}}{1 \text{ in}} \times \frac{1 \text{ m}}{10^2 \text{ cm}} = 1.52 \times 10^2 \text{ m}$$

5) 10μL = ? cc (1mL = 1cm³ = 1 cc)

$$10 \mu\text{L} \times \frac{1 \text{ L}}{10^6 \mu\text{L}} \times \frac{10^3 \text{ mL}}{1 \text{ L}} \times \frac{1 \text{ cc}}{1 \text{ mL}} = 1.00 \times 10^{-2} \text{ cc}$$

6) 3 wk = ? min (2 sigs)

$$3 \text{ wk} \times \frac{7 \text{ day}}{1 \text{ wk}} \times \frac{24 \text{ hr}}{1 \text{ day}} \times \frac{60 \text{ min}}{1 \text{ hr}} = 3.0 \times 10^4 \text{ min}$$

7) 50mL = ? cups (1L = 4.226cups)

$$50 \text{ mL} \times \frac{1 \text{ L}}{10^3 \text{ mL}} \times \frac{4.226 \text{ cups}}{1 \text{ L}} = 0.21 \text{ cups}$$

8) 5.33km = ? dm

$$5.33 \text{ km} \times \frac{10^3 \text{ m}}{1 \text{ km}} \times \frac{10^1 \text{ dm}}{1 \text{ m}} = 5.33 \times 10^4 \text{ dm} \quad 53,000$$

9) 123.0 ng = ? Mg

$$123.0 \text{ ng} \times \frac{1 \text{ g}}{10^9 \text{ ng}} \times \frac{1 \text{ Mg}}{10^6 \text{ g}} = 1.23 \times 10^{-13} \text{ Mg}$$

10) 3yds = ? in (1 yd = 3ft) (4 sig figs)

$$3 \text{ yds} \times \frac{3 \text{ ft}}{1 \text{ yds}} \times \frac{12 \text{ in}}{1 \text{ ft}} = 1.080 \times 10^2 \text{ in}$$

Key

Name: \_\_\_\_\_ class: \_\_\_\_\_

### Unit Conversions Worksheet

1) How many inches are there in <sup>3sf</sup> 45.6 cm? (There are 2.54 cm in 1 inch) 17.95

$$45.6 \text{ cm} \left| \frac{1 \text{ in}}{2.54 \text{ cm}} \right. = \underline{18.0 \text{ in}}$$

2) How many centimeters are there in <sup>3sf</sup>  $1.23 \times 10^{-6}$  kilometers?

$$1.23 \times 10^{-6} \text{ km} \left| \frac{10^3}{1 \text{ km}} \right| \left| \frac{10^2 \text{ cm}}{1 \text{ m}} \right. = \underline{1.23 \times 10^{-1} \text{ cm}}$$

3) How many hours are there in <sup>3sf</sup> 34.5 years?

$$34.5 \text{ yrs} \left| \frac{365 \text{ days}}{1 \text{ yr}} \right| \left| \frac{24 \text{ hrs.}}{1 \text{ day}} \right. = \underline{3.02 \times 10^5 \text{ hrs}}$$

4) How many inches are there in <sup>3sf</sup> 355 millimeters?

$$355 \text{ mm} \left| \frac{1 \text{ m}}{10^3 \text{ mm}} \right| \left| \frac{10^2 \text{ cm}}{1 \text{ m}} \right| \left| \frac{1 \text{ in}}{2.54 \text{ cm}} \right. = \underline{1.39 \text{ in}}$$

5) How many milliliters are in a cubic meter? (There are 1,000 L in  $1 \text{ m}^3$ )

$$1 \text{ m}^3 \left| \frac{(10^2 \text{ cm})^3}{(1 \text{ m})^3} \right| \left| \frac{1 \text{ mL}}{1 \text{ cm}^3} \right. = \underline{1.0 \times 10^6 \text{ mL}}$$

6) How many miles are there in  $3.44 \times 10^8$  inches? There are 0.61 miles in 1 km).

$$3.44 \times 10^8 \text{ in} \left| \frac{2.54 \text{ cm}}{1 \text{ in}} \right| \left| \frac{1 \text{ m}}{10^2 \text{ cm}} \right| \left| \frac{1 \text{ km}}{10^3 \text{ m}} \right| \left| \frac{0.61 \text{ miles}}{1 \text{ km}} \right. = \underline{5.43 \times 10^3 \text{ miles}}$$

$5.43 \times 10^3$  miles