

Dimensional Analysis Metric $\leftrightarrow$ English Conversions

Show your work (dimensional analysis) for each of the following!

Name Key Period _____

1. 37 in = 93.98 cm

1 in = 2.54 cm

$$\begin{array}{r} 37 \text{ in} \times \frac{2.54 \text{ cm}}{1 \text{ in}} \\ \hline \end{array}$$

2. 26.6 oz = 752.78 g

1 oz = 28.3 g

$$\begin{array}{r} 26.6 \text{ oz} \times \frac{28.3 \text{ g}}{1 \text{ oz}} \\ \hline \end{array}$$

3. 21.0 mile = 33.81 km

1 mile = 1.61 km

$$\begin{array}{r} 21.0 \text{ mi} \times \frac{1.61 \text{ km}}{1 \text{ mi}} \\ \hline \end{array}$$

4. 30 cm³ = 30 mL

1 cm³ = 1 mL

$$\begin{array}{r} 30 \text{ cm}^3 \times \frac{1 \text{ mL}}{1 \text{ cm}^3} \\ \hline \end{array}$$

5. 93.48 ft = 31.16 yd

3 ft = 1 yd

$$\begin{array}{r} 93.48 \text{ ft} \times \frac{1 \text{ yd}}{3 \text{ ft}} \\ \hline \end{array}$$

6. 14.034 cm = .15354 yd

1 yd = .914 m

1 m = 100 cm

$$\begin{array}{r} 14.034 \text{ cm} \times \frac{1 \text{ m}}{100 \text{ cm}} \times \frac{1 \text{ yd}}{.914 \text{ m}} \\ \hline \end{array}$$

7. 116.5 m = 382.0 ft

~~1 ft~~ 1 ft = 30.5 cm

1 m = 100 cm

$$\begin{array}{r} 116.5 \text{ m} \times \frac{100 \text{ cm}}{1 \text{ m}} \times \frac{1 \text{ ft}}{30.5 \text{ cm}} \\ \hline \end{array}$$

km $\rightarrow$ mi $\rightarrow$ ft

8. $0.006394 \text{ km} = \underline{20.97} \text{ ft}$

$1.61 \text{ km} = 1 \text{ mi}$
 $1 \text{ mi} = 5280 \text{ ft}$

$$\frac{0.006394 \text{ km}}{1.61 \text{ km}} \times \frac{1 \text{ mi}}{1 \text{ mi}} \times \frac{5280 \text{ ft}}{1 \text{ mi}}$$

9. $4.7 \text{ kg} = \underline{10.} \text{ lb}$
 $1 \text{ lb} = .454 \text{ kg}$

kg $\rightarrow$ lb

$$\frac{4.7 \text{ kg}}{.454 \text{ kg}} \times \frac{1 \text{ lb}}{1 \text{ lb}}$$

10. $138.4 \text{ oz} = \underline{3917.} \text{ g}$
 $1 \text{ oz} = 28.3 \text{ g}$

oz $\rightarrow$ g

$$\frac{138.4 \text{ oz}}{1 \text{ oz}} \times \frac{28.3 \text{ g}}{1 \text{ oz}}$$

11. $23.6 \text{ ft} = \underline{720.} \text{ cm}$
 $1 \text{ ft} = 30.5 \text{ cm}$

ft $\rightarrow$ cm

$$\frac{23.6 \text{ ft}}{1 \text{ ft}} \times \frac{30.5 \text{ cm}}{1 \text{ ft}}$$

12. $2.36 \times 10^4 \text{ s} = \underline{.273} \text{ days}$

$1 \text{ hr} = 60 \text{ min}$ $1 \text{ day} = 24 \text{ hrs}$
 $1 \text{ min} = 60 \text{ sec}$

s $\rightarrow$ min $\rightarrow$ hr $\rightarrow$ day

$$\frac{2.36 \times 10^4 \text{ s}}{60 \text{ sec}} \times \frac{1 \text{ min}}{60 \text{ min}} \times \frac{1 \text{ hr}}{24 \text{ hr}} \times \frac{1 \text{ day}}{1 \text{ day}}$$

13. $13.6 \text{ L} = \underline{14.4} \text{ qts}$

$1 \text{ qt} = .946 \text{ L}$

L $\rightarrow$ qt

$$\frac{13.6 \text{ L}}{.946 \text{ L}} \times \frac{1 \text{ qt}}{1 \text{ qt}}$$

14. $20.6 \text{ km/hr} = \underline{12.8} \text{ mph}$

$1 \text{ mi} = 1.61 \text{ km}$

km/hr $\rightarrow$ mi/hr

$$\frac{20.6 \text{ km}}{\text{hr}} \times \frac{1 \text{ mi}}{1.61 \text{ km}}$$

15. $3.49 \text{ km/hr} = \underline{.969} \text{ m/s}$

$1000 \text{ m} = 1 \text{ km}$
 $1 \text{ hr} = 60 \text{ min}$
 $1 \text{ min} = 60 \text{ sec}$

km $\rightarrow$ m/hr $\rightarrow$ m/min $\rightarrow$ m/sec

$$\frac{3.49 \text{ km}}{\text{hr}} \times \frac{1000 \text{ m}}{1 \text{ km}} \times \frac{1 \text{ hr}}{60 \text{ min}} \times \frac{1 \text{ min}}{60 \text{ sec}}$$