

FACTOR-LABEL WORKSHEET # 3

1) 325 Gm = ? nm *three sig figs*

$$\frac{325 \text{ Gm}}{1 \text{ Gm}} \times \frac{10^{18} \text{ nm}}{1 \text{ Gm}} = 3.25 \times 10^{20} \text{ nm}$$

2) 75.0 L = ? mL *three sig figs*

$$\frac{75.0 \text{ L}}{1 \text{ L}} \times \frac{10^3 \text{ mL}}{1 \text{ L}} = 7.50 \times 10^4 \text{ mL}$$

3) 10 lbs / in² = ? mg / km² *one sig figs*

$$\frac{10 \text{ lbs}}{\text{in}^2} \times \frac{454 \text{ g}}{1 \text{ lbs}} \times \frac{10^3 \text{ mg}}{1 \text{ g}} \times \frac{1 \text{ in}^2}{(2.54 \text{ cm})^2} \times \frac{(10^5 \text{ cm})^2}{(1 \text{ km})^2} = 7 \times 10^{15} \frac{\text{mg}}{\text{km}^2}$$

4) 120 lbs = ? kg *three sig figs*

$$\frac{120 \text{ lbs}}{1 \text{ lbs}} \times \frac{454 \text{ g}}{1 \text{ lbs}} \times \frac{1 \text{ kg}}{10^3 \text{ g}} = 54.5 \text{ kg}$$

5) 45 g / inch³ = ? lbs / nm³ *two sig figs*

$$\frac{45 \text{ g}}{\text{in}^3} \times \frac{1 \text{ lbs}}{454 \text{ g}} \times \frac{1 \text{ in}^3}{(2.54 \text{ cm})^3} \times \frac{(1 \text{ cm})^3}{(10^7 \text{ nm})^3} = 6.1 \times 10^{-24} \frac{\text{lbs}}{\text{nm}^3}$$

6) 2.35 x 10⁻¹¹ dm = ? Mm *three sig figs*

$$\frac{2.35 \times 10^{-11} \text{ dm}}{10^7 \text{ dm}} \times \frac{1 \text{ Mm}}{10^7 \text{ dm}} = 2.35 \times 10^{-18} \text{ Mm}$$

7) 3.0 mile = ? mm *two sig figs*

$$\frac{3.0 \text{ mile}}{1 \text{ mile}} \times \frac{5280 \text{ ft}}{1 \text{ mile}} \times \frac{12 \text{ in}}{1 \text{ ft}} \times \frac{2.54 \text{ cm}}{1 \text{ in}} \times \frac{10^1 \text{ mm}}{1 \text{ cm}} = 4.8 \times 10^6 \text{ mm}$$

Conversions:

1 mile = 5280 ft

1 in = 2.54 cm

1 ft = 12 in

1 lbs = 454 g

1 gallon = 3.785 L

in = inch

ft = feet or foot

lbs = pound

8) 2.0 L = ? gallons *two sig figs*

$$\frac{2.0 \text{ L}}{3.785 \text{ L}} \times \frac{1 \text{ gallon}}{3.785 \text{ L}} = 0.53 \text{ gallon}$$

9) 23.65 mL / hour = ? kL / sec *four sig figs*

$$\frac{23.65 \text{ mL}}{\text{hour}} \times \frac{1 \text{ hour}}{60 \text{ min}} \times \frac{1 \text{ min}}{60 \text{ sec}} \times \frac{1 \text{ kL}}{10^6 \text{ mL}} = 6.569 \times 10^{-9} \frac{\text{kL}}{\text{sec}}$$

10) 25.3 kL = ? μ L *three sig figs*

$$\frac{25.3 \text{ kL}}{1 \text{ kL}} \times \frac{10^9 \mu\text{L}}{1 \text{ kL}} = 2.53 \times 10^{10} \mu\text{L}$$