

Practice Problems Using Conversion Factors
 Physics, Profits & Politics of River Restoration

1. $1000 \text{ mL} \times \frac{1 \text{ K}}{1000 \text{ mL}} \times \frac{1 \text{ ga}}{3.785 \text{ K}} = 0.264 \text{ ga}$ yes, it will fit.

2. $3.4 \text{ lb} \times \frac{453.6 \text{ g}}{1 \text{ lb}} = 1542.24 \text{ g}$ Pumpkin is heavier

3. a) $\frac{194.3 \text{ g}}{18.5 \text{ mL}} = 10.5 \text{ g/mL} = 10.5 \text{ g/cm}^3$

b) $\frac{10.5 \text{ g}}{1 \text{ cm}^3} \times \frac{1 \text{ kg}}{1000 \text{ g}} \times \frac{1000000 \text{ cm}^3}{1 \text{ m}^3} = 10500 \text{ kg/m}^3$

4. $\$175.18 \times \frac{30 \text{ min}}{\$4.25} \times \frac{1 \text{ hr}}{60 \text{ min}} = 20.609 \rightarrow 21 \text{ hrs}$

5. $\frac{\$1.19}{525 \text{ mL}} \times \frac{1000 \text{ mL}}{1 \text{ K}} \times \frac{3.785 \text{ K}}{1 \text{ ga}} \times \frac{1 \text{ ga}}{8 \text{ pt}} = \$1.07/\text{pt}$

The 525 mL is cheaper (\$1.07/pt)

6. $1 \text{ wk} \times \frac{7 \text{ d}}{1 \text{ wk}} \times \frac{24 \text{ h}}{1 \text{ d}} = 168 \text{ h}$

7. $45 \text{ psi} \times \frac{6894.76 \text{ Pa}}{1 \text{ psi}} = 310264 \approx 310000 \text{ Pa}$ (I looked up the conversion factor)

8. $310 \text{ Cal} \times \frac{1000 \text{ cal}}{1 \text{ Cal}} \times \frac{4.184 \text{ J}}{1 \text{ cal}} = 129704 \approx 130000 \text{ J}$

9. $\frac{\$0.99 \text{ CAD}}{1 \text{ K}} \times \frac{\$1 \text{ USD}}{\$1.34 \text{ CAD}} \times \frac{3.785 \text{ K}}{1 \text{ ga}} = \$2.7963 \approx \$2.80 \text{ USD/ga}$

Canada is cheaper.

$$10. \quad 6'2'' = (6 \times 12) + 2 = 74 \text{ inches}$$

$$74 \cancel{\text{in}} \times \frac{2.54 \cancel{\text{cm}}}{1 \cancel{\text{in}}} \times \frac{1 \text{ m}}{100 \cancel{\text{cm}}} = 1.8796 \approx 1.9 \text{ m}$$

$$11. \quad \frac{100 \cancel{\text{km}}}{1 \text{ h}} \times \frac{1 \text{ mi}}{1.609 \cancel{\text{km}}} = 62.15 \approx 60 \text{ mi/hr}$$