

Pre-AP Chemistry/AP Chemistry/Chemistry
Unit #2—Measurement

Dimensional Analysis and Conversion Factors

Single Step

1. How many individual donuts are in 2 dozen doughnuts?

$$1 \text{ doz} = 12 \text{ donuts}$$

$$\frac{2 \text{ doz} \left| \begin{array}{l} 12 \text{ donuts} \\ 1 \text{ doz} \end{array} \right.}{1 \text{ doz}} = 24 \text{ donuts}$$

2. How many minutes are in 18 hours?

$$1 \text{ hour} = 60 \text{ minutes}$$

$$\frac{18 \text{ hours} \left| \begin{array}{l} 60 \text{ minutes} \\ 1 \text{ hour} \end{array} \right.}{1 \text{ hour}} = 1,080 \text{ minutes}$$

3. How many feet are in 37 inches?

$$12 \text{ inches} = 1 \text{ foot}$$

$$\frac{37 \text{ inches} \left| \begin{array}{l} 1 \text{ foot} \\ 12 \text{ inches} \end{array} \right.}{12 \text{ inches}} = 3.083 \text{ feet}$$

Multiple Step

1. How many seconds are in 92 hours?

$$1 \text{ hour} = 60 \text{ minutes}$$

$$1 \text{ minute} = 60 \text{ seconds}$$

$$\frac{92 \text{ hours} \left| \begin{array}{l} 60 \text{ minutes} \\ 1 \text{ hour} \end{array} \right. \left| \begin{array}{l} 60 \text{ seconds} \\ 1 \text{ minute} \end{array} \right.}{1 \text{ hour} \left| \begin{array}{l} 60 \text{ seconds} \\ 1 \text{ minute} \end{array} \right.}} = 331,200 \text{ secs}$$

2. A car is traveling 90.0 km/hr. What is its speed in mi/min?

$$1 \text{ km} = 0.62 \text{ mi}$$

$$1 \text{ hour} = 60 \text{ minutes}$$

$$\frac{90 \text{ km} \left| \begin{array}{l} 0.62 \text{ mi} \\ 1 \text{ km} \end{array} \right.}{1 \text{ hour} \left| \begin{array}{l} 1 \text{ km} \\ 1 \text{ km} \end{array} \right.}} = 55.80 \text{ mi/hr}$$

$$\frac{55.8 \text{ mi} \left| \begin{array}{l} 1 \text{ hour} \\ 1 \text{ hour} \end{array} \right.}{1 \text{ hour} \left| \begin{array}{l} 60 \text{ min} \\ 1 \text{ hour} \end{array} \right.}} = 0.93 \text{ mi/min}$$

3. How many kilometers per minutes are in 550 meters per second?

$$1000 \text{ m} = 1 \text{ km}$$

$$60 \text{ seconds} = 1 \text{ minute}$$

$$\frac{550 \text{ m} \left| \begin{array}{l} 1 \text{ km} \\ 1000 \text{ m} \end{array} \right.}{1 \text{ sec} \left| \begin{array}{l} 1 \text{ km} \\ 1000 \text{ m} \end{array} \right.}} = 0.550 \text{ km/sec}$$

$$\frac{0.550 \text{ km} \left| \begin{array}{l} 60 \text{ sec} \\ 1 \text{ sec} \end{array} \right.}{1 \text{ sec} \left| \begin{array}{l} 60 \text{ sec} \\ 1 \text{ min} \end{array} \right.}} = 33 \text{ km/min}$$