

**Dimensional analysis notes:** (aka factor label, multiplying by a unity/conversion factor)

You need to learn the Method so that you can easily substitute in grams per mole, the ratio of one element to another the coefficients of a balanced equation etc. as the year and life continue

These notes are available on my web-site but I want you to have them in your notes and follow each step for credit on the next test/quiz)

**Conversion factor:** any “ratio” of numbers and units that equal “one”

12/1 = 1; when the 12 represents inches and the 1 represents feet

1/365 = 1; when the 1 represents a “normal” year and the 365 represents days

Dimensional analysis PLAN OF ATTACK:

- 1- write down what you know (whether it is a measurement or a ratio)
- 2- leave lots of space for work
- 3- write an equal (*or is it “equals”*) sign, a smaller space and then the UNITS of what you WANT TO KNOW
- 4- fill in the middle with conversion factors to cancel the units you don't want (you will most likely have to consult outside information in a real world problem)
- 5- check the plan using the units before you do the math
- 6- do the math
- 7- convert to proper sig figs
- 8- Make sure your answer is reasonable. CHECK IT (Units and Math)
- 9- Circle the final answer (with UNITS)

**Example:**

- 1) 35 furlongs per minute to miles per hour

$$\frac{35 \text{ Furlongs}}{1 \text{ minute}} \left( \frac{60 \text{ minutes}}{1 \text{ hour}} \right) \left( \frac{660 \text{ feet}}{1 \text{ furlong}} \right) \left( \frac{1 \text{ mile}}{5,280 \text{ ft}} \right) = \frac{1,386,000}{5,280} = \underline{\underline{262.5 \text{ mile}}}$$

**Rounded to 2 sig figs we would have 260 M.P.H.**

In class practice

1. How many weeks would you have to save if you received \$5 per week for doing chores and the object you want to buy costs 65 dollars? (how many months?)

2. If I have \$100. How many rides can I go on if the tickets cost \$8.50 for 20 tickets and the average ride requires 4 tickets?

3. If I make \$65 per day for day labor how many days of work does my \$3500 car represent? (how many weeks would I have to get a ride before I can purchase this vehicle)?

4. How many 5 ounce glasses of soda can you get from 3, 2-liter bottles of soda (6 liters total)? Look up the conversions you need

5.  $1 \text{ ☺} = 5 \text{ ♥}$   
 $1 \text{ ♥} = 3 \text{ ☽}$   
 $1 \text{ ☽} = 10 \text{ ☒}$

How many  $\text{☒} = 7 \text{ ☺} ?$



- 7) A 1200 watt hair dryer is using how many horsepower?
  
  
  
  
  
  
  
  
  
  
- 8) A man described as 12 stone would be how many kilograms?
  
  
  
  
  
  
  
  
  
  
- 9) How many fortnights are there in a year?
  
  
  
  
  
  
  
  
  
  
- 10) How many meters is a 2-furlong race (assume it is 2.00 furlongs)?
  
  
  
  
  
  
  
  
  
  
- 11) Convert 25 leagues per fortnight to meters per second.

Come up with your own crazy comparison and challenge someone to solve it.