

# The Art of Conversion!!

*The Goal is mastery!! Mastery takes practice!! Here are some practice problems to help you master the Art of Conversion!!*

*But why should I do conversions by hand and not utilize Google? Because putting in the effort to become proficient at conversion yields the following benefits. You will,*

- *Improve your reasoning and critical thinking skills, both very important life skills.*
- *Familiarize yourself with units and how they cancel which will be crucial to your ability to problem solve in physics and many other of the sciences.*
- *Understand the basic calculations found in physics, basic chemistry and statistics to name a few.*

## Instructions

*To gain mastery, use only the conversions supplied when solving the problems!! **No shortcuts!!***

### **Needed Conversions**

0.454 kg = 1 pound	73 gallons = 2 barrels
1.05 quarts = 1 liter	4 quarts = 1 gallon
0.034 ounces = 1 milliliter	1 mile = 5280 feet
1 minutes = 60seconds	1 hour = 60 minutes

*Make sure you have the basic idea!! Do the following **one-step** unit conversions:*

- 1) Convert 23 miles to feet.
- 2) Convert 120 lbs to kilograms.
- 3) Convert 451 mL to ounces.
- 4) Convert 6 feet to miles.
- 5) Convert 4 quarts to liters.
- 6) Convert 0.045 barrels to gallons.

*Now let's extend that basic idea!! Do the following **multi-step** unit conversions:*

- 7) Convert 75 minutes to days.
- 8) Convert 46 inches to miles (there are 12 inches in one foot).
- 9) Convert 65 ounces to liters. (There are 1000 mL in one liter).
- 10) Convert one million seconds to years.
- 11) Convert 12 liters to barrels.

Have you mastered the Art of Conversion? Challenge yourself with these **Fun Ones!!**

1. Water filtered through a  $0.02\ \mu\text{m}$  filter will be very nearly bacteria and virus free (ok, this one is only fun if you are not used to working with prefixes and scientific notation!! If you don't know them, you can check the math packet I have on this site, or look at Science Mom's notes page 12.)
  - a) What size is this filter in nm?
  
  - b) What size is this filter in m?
  
2. Jules Verne wrote the *very* excellent book "20000 Leagues Under the Sea". If 1 league is 3 nautical miles and 1 nautical mile is 1.15 miles, how many miles are 20000 leagues? Do you suppose this referred to the depth he went, or the distance he traveled?
  
3. A thoroughbred runs at a speed of about 18 m/s (meters/second).
  - a) Convert this speed to MPH (miles / hour).
  
  - b) If 1 fathom is 6 feet, and 1 fortnight is 2 weeks, convert 18m/s to fathoms/fortnight!!
  
4. While boldly going where no man had gone before, we came across a planet with some strange but friendly alien creatures. They taught us that in their world, time is measured in snorgblasts and distance is measured in grumples. In order to leave the planet, we needed to reach a speed of 1500 m/s. If 5 grumples = 8 feet, and 16 snorgblasts = 3 minutes, what is our speed in grumples / sorgblasts?