

Chemistry Worksheet: Dimensional Analysis**SHOW ALL WORK ON A SEPARATE PIECE OF PAPER WITH CORRECT UNITS AND SIG FIGS!**

1. **In class.** Use Dimensional Analysis to solve the following problems. Remember units.
- How many seconds old are you? (Express with 2 sig figs in scientific notation.)
 - Convert your distance from school to home from miles to inches. (Express with 2 sig figs in scientific notation.)
 - How many kilometers is it from your house to school? (Express with 2 sig figs in scientific notation.)
 - A person's weight is 154 pounds. Convert this to kilograms. (1 lbs. = 454 grams)
 - An aspirin tablet contains 325 mg of acetaminophen. How many grains is this equivalent to? (1 gram = 15.432 grains)
2. Changes in latitude, Changes in attitude. Each requires conversion factors that are listed in the table below.
- Your cruise ship is leaving for a 610-league adventure. How many nautical miles is this?
 - Later the ship is discovered at 38 fathoms deep under water. Convert this to meters.
 - Fortunately you survived! You are stranded on a deserted island that is located 12.5 degrees north of the equator. How many kilometers is this?
 - If you are rationed to 32 gills of fresh water a day. How many liters is this?
 - The island has an area of 3.5 townships. How many square yards is this? (Please use scientific notation.)
 - To reach the top of a palm tree for a coconut you will have to climb 7.4 meters. How many hands is this?
 - The island is rich with hot chile peppers. You can collect 1.6 pecks a day. How many liters could you collect in **1 week**?

Table of Weights and Measures		
Length	Area	Volume
1 nautical mile = 6076.11549 feet 1 inch = 2.54 cm 1 league = 5 280 yards 1 cable = 120 fathoms 1 fathom = 6 feet 1 degree = 69.047 miles 1 mile = 5280 feet 1 hand = 4 inches	1 township = 36 square miles *Derive your area conversion factors by working with length and squaring all dimensions. Ex. $12^2 \text{ inch}^2 = 1^2 \text{ foot}^2$ or 144 square inch = 1 square foot	4 gills = 1 pint 2 pints = 1 quart 1 liter = 1.0567 quarts 1 bushel = 4 pecks = 32 quarts 1 gallon = 4 quarts

3. More conversions with specific information that is given **in the problem**.
- Each liter of air has a mass of 1.80 grams. How many liters of air are contained in 2.5×10^3 kg of air?
 - 16.0 grams of food contain 130 calories. How many grams of food would you need in order to consume 2150 calories?
 - The cost of 1.00 Liters of gas is 26.9 cents. How many dollars will 12.0 gallons cost?
 - An automobile engine is 2.60 Liters. How many cubic inches is this? See Table above. Volume is a cubic dimension.
 - Light travels 186 000 miles / second. How long is a light year in meters? (1 light year is the distance light travels in one year)
 - 1 mole of Si atoms contains 6.02×10^{23} atoms. 6.02×10^{23} atoms of Si have a mass of 28.1 g. How many atoms of Si are contained in a computer chip that masses 38.02-mg?