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.
   a.) How many seconds old are you? (Express with 2 sig figs in scientific notation.)
   b.) Convert your distance from school to home from miles to inches. (Express with 2 sig figs in scientific notation.)
   c.) How many kilometers is it from your house to school? (Express with 2 sig figs in scientific notation.)
   d.) A person’s weight is 154 pounds. Convert this to kilograms. (1 lbs. = 454 grams)
   e.) 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.
   a.) Your cruise ship is leaving for a 610-league adventure. How many nautical miles is this?
   b.) Later the ship is discovered at 38 fathoms deep under water. Convert this to meters.
   c.) 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?
   d.) If you are rationed to 32 gills of fresh water a day. How many liters is this?
   e.) The island has an area of 3.5 townships. How many square yards is this? (Please use scientific notation.)
   f.) To reach the top of a palm tree for a coconut you will have to climb 7.4 meters. How many hands is this?
   g.) 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>
<thead>
<tr>
<th>Table of Weights and Measures</th>
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<tbody>
<tr>
<td><strong>Length</strong></td>
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<tr>
<td>1 nautical mile = 6076.11549 feet</td>
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<tr>
<td>1 inch = 2.54 cm</td>
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<tr>
<td>1 league = 5 280 yards</td>
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<tr>
<td>1 cable = 120 fathoms</td>
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<tr>
<td>1 fathom = 6 feet</td>
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<tr>
<td>1 degree = 69.047 miles</td>
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<tr>
<td>1 mile = 5280 feet</td>
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<tr>
<td>1 hand = 4 inches</td>
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3. More conversions with specific information that is given in the problem.
   a.) Each liter of air has a mass of 1.80 grams. How many liters of air are contained in 2.5 x 10³ kg of air?
   b.) 16.0 grams of food contain 130 calories. How many grams of food would you need in order to consume 2150 calories?
   c.) The cost of 1.00 Liters of gas is 26.9 cents. How many dollars will 12.0 gallons cost?
   d.) An automobile engine is 2.60 Liters. How many cubic inches is this? See Table above. Volume is a cubic dimension.
   e.) 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)
   f.) 1 mole of Si atoms contains 6.02 x 10²³ atoms. 6.02 x 10²³ 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?