

Dimensional Analysis Worksheet 2

Name _____ Period _____ Date _____

Use dimensional analysis to solve the following problems. For each problem:

see page 2 for ext. probs

- Restate the question in equation form.
- Show all steps needed to convert from starting units to ending units (aka show your "road map").
- Set up your conversion USING THE STRAIGHT LINE METHOD as was discussed in class. Show all of your work!
- Use any of the following relationships if needed:

1 mile = 1760 yds	16 oz = 1 lb	1 L = 1.06 qts
1 yd = 3 ft	2000 lbs = 1 ton	4 qts = 1 gal
1 ft = 12 in	1 oz = 28.35 g	32 oz = 1 qt
1 mile = 1.61 km	1 kg = 2.2 lbs	1 qt = 2 pts

- How many seconds are there in 6 hours?
- A runner competed in a 5-mile run. How many kilometers did she run?
- In the Tour de France, cyclist ride 3,653.6 km over 20 days. How many miles do they go? (Hint: watch for unimportant information!!)
- McGill is located 5.4 miles from "The Lip" athletic complex.
 - How many yards apart are the two locations?
 - How many feet apart are they?
- After a nice meal, perhaps you'd finish it off with a pound cake for dessert. What would the name of this cake be in grams?
- In the US milk is sold by the gallon, while in Italy it is sold by the liter. How many liters of milk would you need to equal one gallon?
- An aspirin tablet contains 325 mg of acetaminophen. How many grains is this equivalent to? (1 gram = 15.432 grains)
- If you go to school for 180 days each year and each day is 7 hours long, how many hours are spent in school for one year?
- The moon is 238,000 miles from Earth. If a Coke can is 4.75 inches tall, how many Coke cans would fit between the Earth and the moon?

For questions 10-15, use any of the relationships listed in the table below. Show all of your work. Answers are listed in brackets.

1 nautical mile = 6076.11549 feet	1 township = 36 square miles	4 gills = 1 pint
1 inch = 2.54 cm	*Derive your area conversion factors by working with length and squaring all dimensions. Ex.	2 pints = 1 quart
1 league = 5 280 yards	$12^2 \text{ inch}^2 = 1^2 \text{ foot}^2$	1 liter = 1.0567 quarts
1 cable = 120 fathoms	or	1 bushel = 4 pecks = 32 quarts
1 fathom = 6 feet	144 square inch = 1 square foot	1 gallon = 4 quarts
1 degree = 69,047 miles		
1 mile = 5280 feet		
1 hand = 4 inches		

10. Your cruise ship is leaving for a 610-league adventure. How many nautical miles is this? [1,600 nautical miles]
11. Later the ship is discovered at 38 fathoms deep under water. Convert this to meters. [69 meters]
12. 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? [1,390 km]
13. If you are rationed to 32 gills of fresh water a day, how many liters is this? [3.8 L]
14. To reach the top of a palm tree for a coconut you will have to climb 7.4 meters. How many hands is this? [73 hands]
15. 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? [85 L]

Example Problem Setup

16) Jamie needs to make 10 gallons of Gatorade for a soccer tournament. How many ounces ("oz") will she make?

16. a) $10 \text{ gal} = \underline{\hspace{2cm}} \text{ oz}$

b) $\text{gal} \rightarrow \text{qts} \rightarrow \text{oz}$

c)

10 gal	4 qts	32 oz
1	1 gal	1 qt

$= \boxed{1280 \text{ oz}}$