Use conversion factors and ratio reasoning to convert measurement units,

Practice Set C

Name:

Date:

Use the Measurement Conversion Chart to find conversion factors.

1. Compare each pair of measurements using <, >, or =.. Clearly show your work and/or explain your reasoning.

a. 2 quarts ☐ 1,900 milliliters

b. 2.5 tons (US) ☐ 2,200 kilograms

c. 192 teaspoons ☐ 1 quart

d. 3.5 miles ☐ 5,500 meters

2. Find the conversion factor that gives you a ratio between liters and fluid ounces. Show and explain your reasoning.

3. For a nutrition project students kept track of how much water they drink over a two-week period, however the teacher forgot to specify what units to use to record the amounts. Also, Isabella was absent for the first week of the unit so her data only reflects on week. Of the three students below, who do you think drinks the most water? Rank the students, and justify your reasoning.

Student	Amount of water in 2 weeks
Darin	800 ounces
Andrew	20 liters
Isabella*	3 gallons

** reflects 1 week*

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LearnZillion

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Answer Key

Use the Measurement Conversion Chart to find conversion factors.

Note that metric to US conversion factor are rounded, and therefore answers may vary slightly depending on which factors/operations students use.

1. Compare each pair of measurements using <, >, or =.. Clearly show your work and/or explain your reasoning.

a. 2 quarts [<] 1,900 milliliters

1 quart x 2 = 2 quarts 1 cup x **8** = 8 cups

4 cups x 2 = **8 cups** 236.6 ml x 8 = **1892.8 ml**

b. 2.5 tons (US) [>] 2,200 kilograms

1 ton x 2.5 = 2.5 tons **1 lb** x 5000 = 5000 lbs

2000 lbs x 2.5 = **5000 lbs** .45 kg x 5000 = **2250 kg**

c. 192 teaspoons [=] 1 quart

1 quart = 2 pints

1 pint x 2 = 2 pints **1 cup** x 4 = 4 cups **1 Tbs** x 64 = 64 Tbs

2 cups x 2 = **4 cups** 16 Tbs x 4 = **64 Tbs** 3 tsp x 64 = **192 tsp**

d. 3.5 miles [>] 5,500 meters

1 mile x 3.5 = 3.5 miles **1 foot** x 18,480 = 3.5 miles

5280 ft x 3.5 = **18,480 ft** 12 inches x 18,480 = **221,760 in**

1 in x 221,760 = 221,760 in 1 meter = 100 cm, *so*

2.54 cm x 221,760 = **563,270 cm** 563,270 ÷ 100 = **5,632.7 m**

2. Find the conversion factor that gives you a ratio between liters and fluid ounces. Show and explain your reasoning. **1 liter = 1.06 quarts**

$$\frac{\textbf{1 quart}}{4 \text{ cups}} \times \frac{1.06}{1.06} = \frac{1.06 \text{ quarts}}{\textbf{4.24 cups}} \qquad \frac{\textbf{1 cup}}{8 \text{ fl oz}} \times \frac{4.24}{4.24} = \frac{4.24 \text{ cups}}{\textbf{33.92 fl oz}}$$

1 liter = 33.9 fl oz

3. For a nutrition project students kept track of how much water they drank over a two-week period; however the teacher forgot to specify what units to use to record the amounts. Also, Isabella was absent for the first week of the unit, so her data only reflects one week. Of the three students below, who do you think drinks the most water? Rank the students, and justify your reasoning.

Student	Amount of water in 2 weeks
Darin	800 ounces
Andrew	20 liters
Isabella*	3 gallons

** 1 week*

Answers will vary depending upon the conversions students choose to make. Example:

Darin drank the most (800 fl oz), then Isabella (768 fl oz), then Andrew (678 fl oz).

I converted all units to ounces in order to compare.

Darin: **800 fluid ounces**

Andrew: **678 fluid ounces**

(using my unit conversion factor from #2)

$$\frac{\textbf{1 liter}}{33.9 \text{ fl oz}} \times \frac{20}{20} = \frac{20 \text{ liters}}{\textbf{678 fl oz}}$$

Isabella: **768 fluid ounces**

In order to make a comparison I will assume that if Isabella drank 3 gallons in 1 week, she will drink about 6 gallons in 2 weeks. (This is assuming the week she

recorded reflects a typical amount of water that she drinks.)

1 gal	x 6	=	6 gal	**1 quart**	x 24	=	24 quarts
4 qts	x 6		**24 quarts**	4 cups	x 24		**96 cups**

1 cup	x 96	=	96 cups
8 fl oz	x 96		**768 fl oz**