



Helping With Math

USA
GRADES

Word Problems Involving Measurements

Suitable for students aged 8-10



This pack is suitable for learners aged 8-10 years old or 4th to 5th graders (USA). The content covers fact files and relevant basic and advanced activities involving word problems about measurement.

- There are two primary systems of measurements. Customary system and metric system.
- The customary system is the system of measurement primarily used in the United States while the metric system is the system of measurement commonly used in science.

The Customary System of Measurement

- The customary system of measurement, also known as the U.S. Customary System, is based on the English system of measurement.
- In mathematics context, the customary system refers to a set of weights and measures used for measuring length, weight, capacity and temperature.

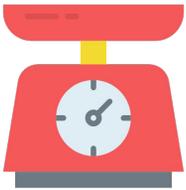


CONCEPTS



The customary system for length and distances are measured in inches, feet, yards and miles.

CUSTOMARY UNIT	CUSTOMARY EQUIVALENT
1 inch (in)	---
1 foot (ft)	12 inches
1 yard (yd)	3 feet
1 mile (mi)	1760 yards



The U.S. customary weight measurement units are ounces, pounds, and tons.

CUSTOMARY UNIT	CUSTOMARY EQUIVALENT
1 ounce (oz)	16 drams
1 pound (lb)	16 ounces
1 ton (t)	2000 pounds



CONCEPTS



The U.S customary capacity or volume measurement units are ounces, cups, pints, quarts, and gallons.

CUSTOMARY UNIT	CUSTOMARY EQUIVALENT
1 fluid ounce	2 tablespoons
1 cup	8 fluid ounces
1 pint	2 cups
1 quart	2 pints
1 gallon	4 quarts

Example: How many cups of buttermilk are there in 3500 teaspoons of the same liquid?

SOLUTION:

Conversion Factor: 1 cup = 8 fluid ounces
1 fluid ounce = 2 teaspoons

$$\begin{aligned} &= 3500 \div 2 \text{ fluid ounces} \\ &= (3500 \div 2) \text{ fl. oz} \\ &= 1,750 \text{ fl. Oz.} \end{aligned}$$

$$\begin{aligned} &= 1,750 \div 8 \text{ cups} \\ &= (1,750 \div 8) \text{ cups} \\ &= 218.75 \text{ cups} \end{aligned}$$

Thus, there are 218.75 cups in 3500 teaspoons of buttermilk.



CONCEPTS

The Metric System of Measurement

- This system of measurement is being considered as the international decimal system of weights and measures, based on the metre for length and the kilogram for mass.
- It is commonly used in France in 1795 and is now used officially in almost all nations in the world.



Length	Weight	Capacity
1 km = 1,000 m	1 kg = 1,000 g	1 kL = 1,000 L
1 m = 0.001 km	1 g = 0.001 kg	1 L = 0.001 kL
1 m = 100 cm	1 g = 100 cg	1 L = 100 cL
1 cm = .01 m	1 cg = 0.01 g	1 cL = 0.01 L
1 m = 1, 000 mm	1 g = 1,000 mg	1 L = 1,000 mL
1 mm = 0. 001 m	1 mg = 0.001 g	1 mL = 0.001 L



SAMPLE/APPLICATION

2. In a restaurant, a huge water tank can handle 187, 710 mL of water. If you wish to convert it to liters, how much would its equivalent be?

Conversion Factor: 1 liter = 1000 mL

$$= 187, 710 \div 1000 \text{ liters}$$

$$= (187, 710 \div 1000) \text{ liters}$$

$$= \mathbf{187. 71 L}$$

PRACTICE EXERCISES

1. If there are 3000 fl oz in a container, what is its equivalent number of cups?

2. A 2500-lb of meat is equivalent to how many kilogram?



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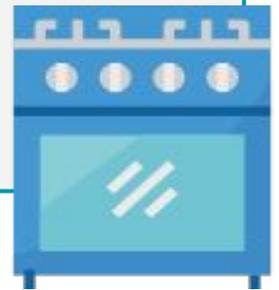


KITCHEN ITEMS

G4
Basic

Chef Gordon would like to buy new kitchen items for his restaurant. He has a list of the items. Use your understanding of measurement for length (metric system) to answer the following problems.

1. He wishes to buy a kitchen table whose length is 2.5 meters, a half-dozen set of placemats whose length is 30 cm, and a table runner that is 180 cm in length. Given all these items, what are their total length in cm?



2. The length of the cooking area in his restaurant is 10.5 m. if he owns three more restaurants that have the same cooking area length, how many meters are there in total?



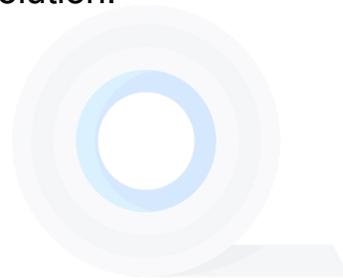
ITEMS ON SALE!

G4
Basic

As Chef Gordon is purchasing more kitchen items, he ran off on a store with some kitchen items that are on sale. Help Chef Gordon calculate the payment that he needs to settle.

1. Chef Gordon needs a thermal insulator. The original price of the item is \$1.53 per ft in length. If he will buy 48 ft of it, how much should he pay?

Solution:



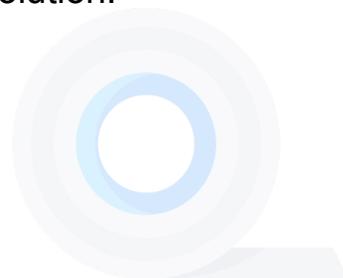
2. If the same item is on sale by \$0.64 less than its original price, how much would be the total cost of the purchase?

Solution:



3. Chef Gordon would like to add more thermal insulator so he wants to buy 72 inches more of the same product and price in item no. 2. How much would be the additional cost?

Solution:



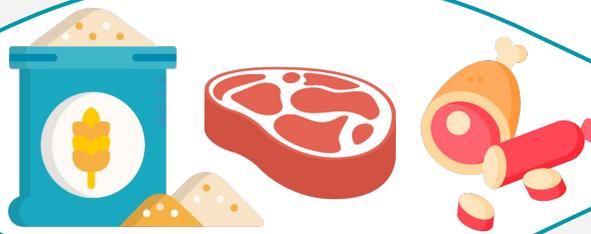
DELIVERY ITEMS TODAY

G4
Basic

Chef Gordon is expecting the delivery of the finest ingredients today. Help him solve the related word problems.

1. He is expecting a total of 280 kg of flour. If 52 kg has been delivered already and 30,500 g are to be delivered today, how many kg did he already receive in all?

2. A box of A5 Wagyu beef will also be delivered today. Each box weighs 15.8 kg. If 25 boxes will arrive today, how many kg will there be in all?



3. There will be a delivery of jamón ibérico, a high-graded ham from Spain. It will be a 14,710 g of cured pork that is \$4,500. How much is the price of ham per g?

4. There will be 34.3 kg of chicken, 18.45 kg of ground beef, and 13.75 kg of pork shoulders. How many kg of meat are there in all?



MENU FOR TODAY

G4
Basic

The following problems can be solved using measurements. Read and answer each question carefully and help Chef Gordon prepare the menu for today.

1. He needs $4 \frac{1}{3}$ lbs of celery. How many ounces are there in $4 \frac{1}{3}$ lbs?



2. A pound of carrots and quarter pounds of green peas are needed for a new dish, what is the total of those in drams?

3. 900 oz of beef ribs is needed for today's dish. How many pounds is the equivalent of this weight?



4. Based on the recipe, he needs to mince 500 drams of garlic, 13 ounces of onion, and 0.25 lbs of ginger. What is the total weight of these ingredients in ounces?

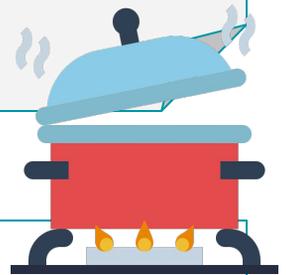


MY OWN KITCHEN

G4
Basic

Get some ingredients and cooking tools at your kitchen. From them, create two word problems: one word problem about length and one word problem about weight. Provide the solution and answer.

1.



2.



LIQUID INGREDIENTS

G5
Advanced

Chef Gordon is looking for new suppliers of liquid ingredients that he need for his restaurant. Help him to do so as you answer the following word problems. Encircle the letter of your choice.

1. A bottle of maple syrup has 350 mL of liquid. How many cL is the equivalent of that?

- A. 35 B. 350 C. 3.5 D. 3500

2. How many mL are there in a container of corn syrup (4500 cL) and honey (1200 cL) ?

- A. 57 B. 5700 C. 5.7 D. 57000

3. If a bottle of 750 mL extra virgin olive oil costs \$24, how much is the cost of a 0.75 L of the same product?

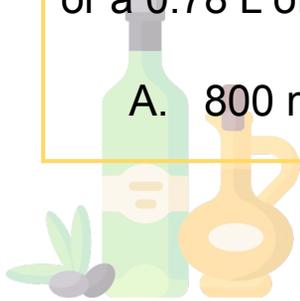
- A. \$2.4 B. \$24 C. \$240 D. \$0.24

4. 500 ml of vanilla extract is the only available bottle in the supermarket. But he found another one which contains 5000 cL of the same product. Which one is more?

- A. 500 mL B. 5000 cL C. they are just the same

5. Which one is worth to buy? A 800 mL bottle of olive oil for \$14 or a 0.78 L of the same product for \$12?

- A. 800 mL B. 0.78 L C. both D. neither



DELICIOUS SAUCE

G5
Advanced

Read and analyze each word problem carefully. Use your understanding of customary units of volume to answer them.

1. Chef Gordon would like to make a gallon of Marinara sauce. If he wants to put it in a jar that can handle at most two pints, how many jars does he need?



2. He also needs to make 3.5 gallons of bechamel sauce. If in each gallon he needs 6 cups of milk, how many cups of milk does he need in all? How many fluid ounces is the equivalent of that?



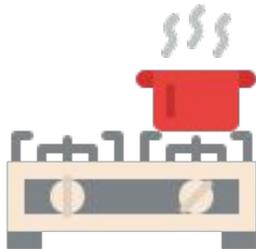
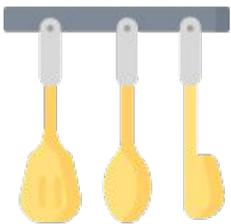
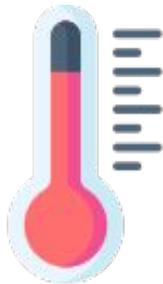
DON'T LET IT BURN!

G5
Advanced

Chef Gordon reminded his cooking staff to make sure that no food will get burn at his restaurant. The temperature on his list are on degree Celsius. His staff does not know how to convert it to Fahrenheit. Help his staff.

Can you convert the following temperature readings from Celsius to Fahrenheit. My staff can only gauge temperature in Fahrenheit. Help them so that they won't make the food burn.

- a. 180 °C b. 150 °C c. 215 °C d. 142 °C



Solution:



MEASUREMENT CROSSOVER

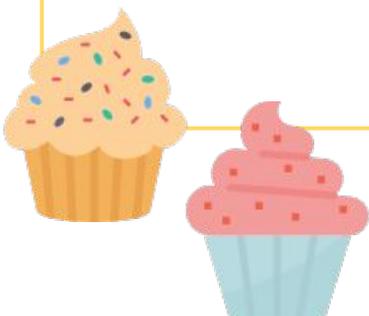
G5
Advanced

The following word problems are common scenarios in a busy restaurant kitchen. Use your understanding of measurement to solve for the final answer.

1. Chef Gordon needs 24 fl. Oz. of light soy sauce to cook braised short beef ribs. Would a 500 mL soy sauce enough for his recipe? Why or why not? If it is not enough, how much more mL of soy sauce is needed?



2. Chef Gordon needs to deliver 58 lbs of of his baked sweets to his friend, Laura. Laura would sell this to \$ 3.5 per 250 g to raise funds for the children on a certain orphanage. How much would she be able to raise, at least, if all of the baked sweets will be sold out?

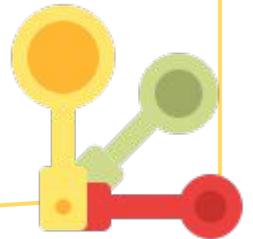


CHEF GORDON'S THOUGHTS

G5
Advanced

Put yourself to the shoes of Chef Gordon and answer the following questions below.

1. Give three importance of understanding measurement in cooking/baking?



2. What do you think will happen if we inaccurately measured liquids, weights, or length when we are in the kitchen? Give at most five answers.

3. Aside from cooking/baking, into which scenarios are conversion of measurements useful in real life?



ANSWER GUIDE

Activity 1

1. 610 cm
2. 42 m

Activity 1

1. 82.5 kg
2. 395 kg
3. \$3.268/g or \$3.27/g
4. 66.5 kg in all

Activity 5

Answers may vary.

Activity 7

1. 4 jars
2. He needs 21 cups. That is also equal to 168 fl. oz.

Activity 8

1. 356 °F 2. 302 °F
3. 410 °F 4. 287.6 °F

Activity 10

Answers may vary.

Activity 2

1. \$ 73.44
2. \$ 42.72
3. \$ 5.54

Activity 4

1. 69.28 oz
2. 320 drams
3. 56.25 lbs
4. $31.25 \text{ oz} + 13 \text{ oz.} + 4 \text{ oz}$
 $= 48.25 \text{ oz}$

Activity 6

1. A 2. D 3. B 4. B
57.42 ml/\$ for 800 ml
65 ml/\$ for 0.78 L, thus this is
the more worthy to buy, B

Activity 9

1. Not enough because 24 fl oz = 709.765 ml of soy sauce. Chef needs 209.765 mL more to have the desired amount of soy sauce.
2. 58 lbs = 26308.4 g. Thus, there are at most 105 pieces of 250-g pack of baked sweets. She will earn \$367.5.



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