Culinary Math

Culinary Math

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Contents

Welcome To Mathematics-Cost Control

For Culinary and Bakery Students

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I.

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Instructions for Word Problems

How to Solve Word Problems

Since we have calculators to work with, it might seem as if we would always get the correct answer to a math problem. But calculators are actually just tools to help us do quick and accurate math calculations. That frees us to understand the problems we are trying to solve. We can focus our attention on what a problem is asking and how to use the numbers we are given to solve a problem.

Math has four basic processes: adding, subtracting, multiplying, and dividing. Using these four processes correctly is the first step in learning how to use math to solve problems in the field of culinary arts.

One way to understand word problems is to look for clues in the problem to help decide which process to use. For example, for **addition**, some clue words are: total,

increase, all together, and combine. Let's look at a problem:

If your restaurant spent $649.37 for the monthly solid waste fee, and $749.23 for the monthly utilities fee, how much did your restaurant spend all together?

Notice the words "all together" in the problem. This is a clue that we want to add the two numbers. So we will add 649.37 + 749.23 = 1398.6 When we are talking about money, unless the answer comes out in even dollars, we want it to come out in dollars and cents. So we will say the total the restaurant spent on solid waste and utilities was $1398.60.

Some clue words for **subtraction** are: fewer than, decrease, take away, and left.

If you make 124 cakes for the bake sale, and you sell 103 of them, how many cakes will you have left?

Notice the word "left" in the problem. This is a clue that we want to subtract the two numbers. We will start with the number of cakes we started with: 124 − 103 = 21. We will have 21 cakes left.

Multiplication uses some of the same clue words as addition, such as total and all together. It also uses words such as each, twice, double, triple, and times.

If the restaurant pays $157.50 for each case

of roasted garlic granules, how much would 5 cases cost in total?

The word "total" is a clue that we will either want to add or multiply, but the word "each" is a clue that we want to multiply. We will multiply 157.50 × 5 = 787.5. Again, we want to give the answer in dollars and cents, so our answer will be $787.50.

Some clue words for **division** are: divided, equally, half, third. The word "each" is also used in division problems.

If it costs you $33.75 to make a batch of 125 cookies, how much does it cost to make each cookie?

This problem can't be solved simply by looking at the clue word. Does "each" mean to multiply or to divide? **While clue words are helpful in setting up and solving word problems, it's always necessary to read word problems carefully and understand what they are asking.** In this case read the problem carefully. We are starting with a total cost, and then we want to find the cost for a part of the total. We want to *divide* the cost between each of the 125 cookies. 33.75 ÷ 125 = 0.27 It costs $0.27 (or 27 cents) to make each cookie.

Assignment

Purpose | Outcomes | Instructions | Tips for Success

Purpose

To practice reading and solving word problems relating to culinary math.

Outcomes

By completing this assignment, you will be able to...

1. Read word problems for understanding, looking for clue words.
2. Correctly solve word problems using the four basic processes.

Instructions

To complete this assignment...

1. Read the problems carefully and find the correct answers.
2. Be sure to show how you set up each problem.

Tips for Success

To help in the completion of this assignment, make sure to:

- Read each problem carefully and understand what it is asking.
- Look for clue words in the problems.
- Include how you set up each problem in order to get credit.

Word Problems Assignment

1) The utility bills for the restaurant were $486.97 in January, $523.32 in February, and $531.98 in March. What was the total utility bill for the quarter?

2) Sara made 351 pastries, and she packed them into boxes of 13 pastries each. How many boxes did she need?

3) The restaurant budget for produce for the week is $500. If the restaurant has spent $397.26 so far this week for produce, how much money is left in the budget?

4) The recipe calls for 1.25 pints of heavy cream. If you want to triple the recipe, how much cream will you use?

5) Bill made a cake that used 0.75 pound of flour. How much flour is left in the bag if it contained 20 pounds of flour to begin with?

6) If you buy carrots at 50 cents per pound, how much will 8.5 pounds of carrots cost?

7) One case of sunflower oil costs $71.09, one case of peanut oil costs $55.06, one case of of butter-flavored coconut oil costs $61.78, and one case of vegetable salad oil costs $43.13. How much would the total cost be to buy one of each?

8) There are 250 grams of confectioners sugar in the bag. If LaToya wants to sprinkle

the sugar equally over 8 cakes, how many grams would she sprinkle over each cake?

9) The budget for utilities for the restaurant for an entire year is $6510. What would the monthly budget for utilities be?

10) If 250 guests are expected in Banquet Room 1, and 575 guests in Banquet Room 2, how many guests are expected all together?

11) If the server makes $13.56 per hour including tips, how much would she make after working a 52 hour week?

12) If Joe discovers that 20.875 pounds of potatoes are spoiled, how many pounds of potatoes will he have left to use if he started with 100 pounds of potatoes?

13) If kitchen rental fees are $28.75 per hour, how much would it cost to rent a kitchen for 4 hours?

14) If Renee wants to make a cake that uses 1.5 pounds of flour, and another that uses 1.25 pounds of flour, how much flour will she need all together?

15) If the grocer wants to separate parsley into bunches of 55 grams, and she starts with 1870 grams, how many bunches of parsley can she make?

16) If a bottle of olive oil contains 25.4 fluid ounces, and the recipe calls for 6 fluid ounces of olive oil, how much will be left in the bottle?

17) If the banquet hall has 32 tables, and

there are 256 chairs in total, how many chairs should you put at each table if you divide them evenly?

18) The dessert calls for 8 pounds of peaches. If Joe wants to triple the recipe, how many pounds of peaches will he need?

19) If Jin buys 3.78 pounds of carrots, 5.97 pounds of celery, 6.42 pounds of bell pepper, and 12.23 pounds of potatoes, how many total pounds of produce will be in his bag?

20) Loose-leaf oolong tea comes in a package weighing 8 ounces. If one pot of tea uses 0.5 ounce of tea, how many ounces will be left after making a pot of tea with a new package?

2. The Four Operations with Fractions

Instructions for Fractions

When you use the four processes with fractions, they behave like whole numbers and decimal numbers, and there are calculators available to do fraction calculations. This is a worthwhile investment for a chef or a baker. If you don't have access to a kitchen calculator or another calculator that has fraction functions, here is a helpful link you can use to do fraction calculations: Calculator Soup You may use this link for assignments and quizzes in this class.

Addition and subtraction word problems with fractions are done the same way as other word problems. Here are a couple of examples:

If the recipe calls for $\frac{1}{2}$ cup of sugar, and $1\frac{1}{4}$ cups of brown sugar, how much sugar will there be in total?

$\frac{1}{2} + 1\frac{1}{4} = 1\frac{3}{4}$ There will be a total of $1\frac{3}{4}$ cups of sugar used in the recipe.

If there are 6 cups of rice in the box, and you use $2\frac{1}{3}$ cups of rice, how much rice will be left in the box?

$6 - 2\frac{1}{3} = 3\frac{2}{3}$ There will be $3\frac{2}{3}$ cups of rice left in the box.

Many multiplication problems with fractions are done in the same way as other word problems, as well. For example:

If the recipe calls for $2\frac{1}{2}$ teaspoons of vanilla, and you want to triple the recipe, how much vanilla will you use?

$2\frac{1}{2} \times 3 = 7\frac{1}{2}$ You will use $7\frac{1}{2}$ teaspoons of vanilla.

There is another type of fraction multiplication problem, in which the word "of" is used. For example, if you say, What is $\frac{1}{2}$ of 5? you are really saying, What is $\frac{1}{2} \times 5$?

The answer would be $2\frac{1}{2}$

Example: If you have a two-quart bottle of oil, and you want to use $\frac{3}{4}$ of it, how much oil would you use?

$2 \times \frac{3}{4} = 1\frac{1}{2}$ You will use $1\frac{1}{2}$ quarts.

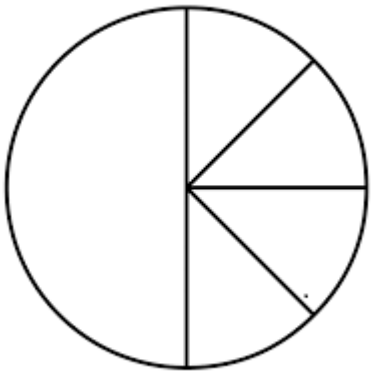
Many division word problems with

fractions are done in the same way as other word problems. For example:

If there are $3\frac{1}{2}$ cakes, and you want to divide them evenly between two people, how much cake would each person get?

$3\frac{1}{2} \div 2 = 1\frac{3}{4}$ Each person will get $1\frac{3}{4}$ cake.

There is another type of fraction division problem, and that is dividing by a fraction. It's important to understand what it means to divide by a fraction. For example, the problem $\frac{1}{2} \div \frac{1}{8}$ is really saying, "How many $\frac{1}{8}$s are there in $\frac{1}{2}$?" In other words, if you have a half of a cake, how many eighth-sized pieces could you cut from that cake?



There are four $\frac{1}{8}$s in $\frac{1}{2}$.

$$\frac{1}{2} \div \frac{1}{8} = 4$$

THE ORDER OF FRACTIONS IN A DIVISION PROBLEM MAKES A DIFFERENCE! The first fraction in the problem is what you are starting with, and the second fraction is the value of the size or quantity you want to divide what you started with into.

Assignment

Purpose | Outcomes | Instructions | Tips for Success

Purpose

To practice reading and solving word problems using fractions relating to culinary math.

Outcomes

By completing this assignment, you will be able to...

1. Read word problems using fractions for understanding.
2. Correctly solve word problems with fractions using the four basic processes.

Instructions

To complete this assignment...

1. Read the problems carefully and find the correct answers.
2. Be sure to show how you set up each problem.

Tips for Success

To help in the completion of this assignment, make sure to:

- Read each problem carefully and understand what it is asking.
- Look for clue words in the problems.
- Include how you set up each problem in order to get credit.

Fractions Assignment

1) If there are $12\frac{2}{3}$ cups of sugar in the bag, and I use $4\frac{1}{3}$ cups of sugar in my recipe, how many cups of sugar will be left in the bag?

2) If the recipe calls for $3\frac{1}{4}$ teaspoons of almond extract, and you want to triple the recipe, how many teaspoons will you use?

3) The jar of tomato sauce contains $4\frac{1}{2}$ cups. The can of tomato sauce contains $2\frac{3}{4}$ cups. How many cups of tomato sauce will you have if you combine the jar and the can?

4) Bashir has three cakes, and he wants to

cut them into $\frac{1}{6}$ -sized pieces. How many pieces will he be able to cut?

5) Amanda is making a sauce that makes a total of $5\frac{1}{4}$ cups. If she wants to divide the sauce between three platters, how much sauce will she put on each platter?

6) If the bottle contains $2\frac{1}{2}$ quarts of vinegar, how many quarts would $\frac{3}{4}$ of the bottle be?

7) Luz made five pizzas for the party. If she cuts the pizza into $\frac{1}{8}$ -sized slices, how many slices will she have?

8) If one recipe calls for $1\frac{1}{4}$ teaspoons of salt, and another recipe calls for $2\frac{1}{2}$ teaspoons of salt, how much salt will Ming use if he makes both recipes?

9) If the recipe for roast vegetables will make $8\frac{1}{2}$ servings, how many servings will you make if you double the recipe?

10) The bottle of cooking oil contains 42 fluid ounces. How many ounces will be left if you use $5\frac{1}{2}$ fluid ounces in a recipe?

11) If a stick of butter is 8 tablespoons, how many tablespoons are in $\frac{1}{4}$ of a stick of butter?

12) Alonzo has $1\frac{2}{3}$ cups of cinnamon sugar. If he wants to sprinkle it over five trays of cookies, how much sugar will he sprinkle over each tray?

13) Betty has 12 celery stalks, and she wants to cut them into $\frac{1}{4}$ -sized sticks for the veggie tray. How many sticks will she cut?

14) If the cake recipe calls for $2\frac{1}{2}$ sticks of butter, how many sticks of butter will you need if you want to make three cakes?

15) Jamal is making a salsa that calls for $2\frac{1}{2}$ tablespoons of lime juice, and a marinade that calls for $4\frac{1}{2}$ tablespoons of lime juice. How much lime juice will he need all together?

16) If there are $2\frac{1}{2}$ pints of half and half in the pitcher, and you want to divide it between four creamers, how many pints of half and half will you put in each creamer?

17) If there are 8 ounces of tea leaves in the tin, and you take out $1\frac{1}{2}$ ounces to make tea, how many ounces of tea will be left in the tin?

18) If the recipe calls for $5\frac{1}{2}$ cups of flour,

and you want to make half of the recipe, how many cups of flour will you use?

19) If there are 12 cups of sugar in the bag, and you use $2\frac{2}{3}$ cups of sugar, how much sugar will be left in the bag?

20) Kendra is making one cake that calls for $1\frac{3}{4}$ sticks of butter, and another cake that calls for $1\frac{1}{2}$ sticks of butter. How many sticks of butter will she need all together?

21) If you have 18 fluid ounces of orange juice in the pitcher, and you want to pour $\frac{1}{3}$ of the juice into a glass, how many fluid ounces of orange juice will you pour into the glass?

22) If there are $3\frac{1}{2}$ pies left over from the party, and Sam wants to divide the leftovers into $\frac{1}{4}$ -sized pieces, how many pieces will he cut?

23) If the recipe makes $3\frac{1}{3}$ cups of pudding, and you want to divide it between 5 bowls, how many cups of pudding will be in each bowl?

24) If the recipe for salad dressing calls for $\frac{3}{4}$ cup of oil, and you want to make a

triple recipe, how many cups of oil will you use?

3. Ratios and Proportions

Instructions for Ratios and Proportions

A ratio is used to show a relationship between two numbers. The numbers are separated by a colon (:) as in 1:2.

The relationship can represent something as simple as the 1:3 ration commonly used to mix frozen juices. We use 1 can of frozen juice concentrate to 3 cans of water. This is an example of a part-to-part ratio. You can also have part-to-whole ratios. For example, the ratio of frozen juice concentrate to reconstituted juice is 1:4, that is, 1 can of concentrate to four cans of total reconstituted juice.

Proportions are two equivalent ratios in which the terms of the first ratio have the same relationship as the terms of the second ratio. For example, 1 cup of butter to 3 cups of sugar (1:3) is in proportion to 2 cups of butter to 6 cups of sugar (2:6). The easiest way to visualize proportions is to write the ratios in fraction form, like this:

$$\frac{1\ cup\ butter}{3\ cups\ sugar} = \frac{2\ cups\ butter}{6\ cups\ sugar}$$

Notice that in this proportion, the butter is on top, and

the sugar on the bottom in both ratios. This is a helpful way to check that you are setting up a proportion correctly.

To solve for an unknown number in a proportion, you cross multiply, like this:

$$\frac{4}{5} = \frac{x}{30}$$

$$4 \cdot 30 = 5 \cdot x$$

$$120 = 5x$$

$$24 = x$$

So let's say that you are using a recipe of 2 teaspoons of vanilla for 3 cups of sugar. If you want to change the recipe so that it uses $4\frac{1}{2}$ cups of sugar, how much vanilla would you use?

$$\frac{2 \textit{ teaspoons vanilla}}{3 \textit{ cups of sugar}} = \frac{x \textit{ teaspoons of vanilla}}{4\frac{1}{2} \textit{ cups of sugar}}$$

$$2 \times 4\tfrac{1}{2} = 3 \times x$$

$$9 = 3x$$

$$3 = x$$

You would use 3 teaspoons of vanilla.

If 12 eggs cost $1.49, how much to 18 eggs cost?

$$\frac{12\ eggs}{\$1.49} = \frac{18\ eggs}{x}$$

$$12 \times x = \$1.49 \times 18$$

$$12 \times x = \$26.82$$

$$x = \$2.235, \textit{rounded to } \$2.24$$

If one can serves 2.5 people, how many cans serve 10 people?

$$\frac{1\ can}{2.5\ people} = \frac{x}{10\ people}$$

$$1 \times 10 = 2.5x$$

$$x = 4$$

$$4\ \textit{cans will serve } 10\ \textit{people}$$

Sometimes proportions that contain fractions can be confusing, but they are solved in exactly the same way:

$$\frac{\frac{1}{2}}{\frac{1}{4}} = \frac{x}{\frac{3}{4}}$$

$$\frac{1}{2} \times \frac{3}{4} = \frac{1}{4} \times x$$

$$\frac{3}{8} = \frac{1}{4} \times x$$

$$\frac{3}{8} \div \frac{1}{4} = x$$

$$1\frac{1}{2} = x$$

One way we use proportions in cost analysis is by finding the unit rate and

seeing which of two options would be the better buy. Let's say one store has a 24-ounce jar of spaghetti for $6.55, and another store has a 45-ounce jar for $13.40. Which is the better buy? What you would do is find the unit price for each jar. The first jar:

$$\frac{24\ ounces}{6.55} = \frac{1\ ounce}{?}$$

$$\frac{45\ ounces}{13.40} = \frac{1\ ounce}{?}$$

1 × $6.55 = 24 ounces × ?

1 × $13.40 = 45 ounces × ?

$6.55 = 24 ounces × ?

$13.40 = 45 ounces × ?

$0.272 . . . = ?

$0.297 . . . = ?

1 ounce of spaghetti sauce =

1 ounce of spaghetti sauce=

27 cents (round to the nearest hundredth)

30 cents (round to the nearest hundredth)

The 24-ounce jar is the better buy!

Note: In this class we will always round answers to the nearest hundredth. To do that, you first have to determine where the hundredths place is, shown in red below. The next place over, in green, and beyond that, will drop out. The hundredths place number will either stay the same or increase by one. It is the number in the

thousandths place, in green, that determines that. If the number in green is 0-4, the number in red stays the same. If the number in green is 5-9, the number in red increases by one.

4.367⟶ 4.37 0.211⟶ 0.21
21.0175⟶ 21.02 6.195⟶ 6.20
4.497⟶ 4.50

Notice for the last two, you add 1 to the 9 and it carries over to the next place. You would keep the 0 in this case.

Assignment

Purpose Outcomes
Instructions Tips for Success

Purpose

To practice reading and solving ratio and proportion word problems relating to culinary math.

Outcomes

By completing this assignment, you will be able to...

1. Read ratio and proportion word problems for understanding.
2. Correctly set up and solve ratio and proportion word problems.

Instructions

To complete this assignment...

1. Read the problems carefully and find the correct answers.
2. Be sure to show how you set up each problem.
3. Use fractions for common volume measures (cups, teaspoons, etc.) and decimals for weights (grams, ounces, pounds) and money. Round decimals to the nearest hundredth.

Tips for Success

To help in the completion of this assignment, make sure to:

- Read each problem carefully and understand what it is asking.
- Understand whether to use a fraction or a decimal for your answer.
- Include how you set up each problem in order to get credit.

Ratios and Proportions Assignment

1) If you are using a recipe that has the proportion of 1 cup of butter to 3 cups of sugar, how many cups of butter will you need if you will be using 8 cups of sugar?

2) Maria is going to make a salad dressing that has the proportion of 3 tablespoons of olive oil to 1 tablespoon of lemon juice. If she wants to use 4 tablespoons of lemon juice, how much olive oil should she use?

3) I want to make a barbecue sauce that has the proportion of $\frac{1}{4}$ cup of packed brown sugar to $\frac{1}{2}$ cup apple cider vinegar.

How much brown sugar should I use if I use $1\frac{1}{2}$ cups of vinegar?

4) Yesenia is going to make a salmon glaze that has the proportion of 2 tablespoons of lemon juice to $\frac{1}{4}$ cup of soy sauce. How many cups of soy sauce should she use if the uses 3 tablespoons of lemon juice?

5) Mitch has a recipe for cake icing that has the proportion of 3 cups of confectioners sugar to $\frac{1}{2}$ cup of butter. How much butter should he use if he uses $4\frac{1}{2}$ cups of confectioners sugar?

6) The recipe has the proportion of 1 tablespoon of soy sauce to 3 pounds of chicken wings. How many pounds of chicken wings should you use if you want to use $1\frac{1}{2}$ tablespoons of soy sauce?

7) If a dozen eggs costs $1.60, how much would 8 eggs cost?

8) If a dozen doughnuts costs $8.99, how much would 18 doughnuts cost?

9) If 6 cans of soda cost $2.75, how much would 24 cans of soda cost?

10) If 8 bakery cookies cost $14, how much would 12 bakery cookies cost?

11) If a dozen dinner rolls cost $3.99, how much would 32 rolls cost?

12) If 8 deli fried chicken legs cost $8.72, how much would 6 chicken legs cost?

13) If a 19-fluid ounce bottle of dish soap costs $2.89, and a 40-fluid ounce bottle costs $5.79, which one is the better buy?

14) If a 32-fluid ounce bottle of lemon juice costs $3.29, and a 48-fluid ounce bottle costs $6.99, which one is the better buy?

15) If a 20-ounce bottle of ketchup costs $2.99, and a 32-ounce bottle of ketchup costs $3.19, which one is the better buy?

16) If a 29-ounce can of peaches costs $2.99, and a 15-ounce can of peaches costs $1.89, which one is the better buy?

17) If a 2-pound bag of flour costs $1.89, and a 5-pound bag of flour costs $3.86, which one is the better buy?

18) If a 26-ounce canister of salt costs $0.99, and a 64-ounce box of salt costs $1.69, which one is the better buy?

4. Conversion Factors for Changing Recipe Yields

Instructions for Changing Recipe Yields

While proportions can be very helpful for adjusting a recipe, there is a shortcut that makes the process go faster, and that is using a conversion factor. A conversion factor is a ratio that is converted to a decimal number and then used to change the amount of each ingredient in proportion. Here is how you find the conversion factor:

$$\frac{\text{New Yield}}{\text{Old Yield}} = \text{Conversion Factor}$$

If you have a recipe that yields four dozen, or 48, cookies, and you want to make five dozen, or 60, cookies, you would find the conversion factor like this:

$$\frac{60}{48} = 60 \div 48 = 1.25$$

Your conversion factor is 1.25, so you would

simply take every ingredient amount and multiply it by 1.25 for your new recipe.

If you have fractions in your recipe, you can convert the decimal number to a fraction so you can use a calculator to adjust the recipe. Here is a link that will convert a decimal to a fraction: Decimal to Fraction You may use it for assignments and quizzes in this course. In the above case, the conversion factor of 1.25 converts to $1\frac{1}{4}$.

It's also helpful to memorize how some common fractions are expressed as decimals:

1/8	0.125
1/4	0.25
1/3	033*
3/8	0.375
1/2	0.5
5/8	0.625
2/3	0.67*
3/4	0.75
7/8	0.875

*Not exact. Rounded to nearest hundredth.

Let's try this with a recipe for salad dressing:

3 *tablespoons olive oil*

$\frac{1}{2}$ *teaspoon garlic powder*

1 tablespoon red wine vinegar
1 teaspoon Dijon mustard
$\frac{1}{2}$ *teaspoon salt*
$\frac{1}{4}$ *teaspoon black pepper*
1 teaspoon honey
1 teaspoon dried basil

This recipe yields $\frac{1}{3}$ cup. But let's say you want to make more for a much bigger salad. Instead of $\frac{1}{3}$ cup, you would like to make $1\frac{1}{2}$ cups. To find the conversion factor, you would divide the new yield by the old yield:

$$\frac{\textit{new yield}}{\textit{old yield}} = \frac{1\frac{1}{2}}{\frac{1}{3}} = 1\frac{1}{2} \div \frac{1}{3} = 4\frac{1}{2}, \textit{ or } 4.5$$

Your conversion factor is 4.5, although if you want to use a fraction calculator to make the adjustments, you will find it easier to use $4\frac{1}{2}$.

Now we will multiply each ingredient amount by 4.5, or $4\frac{1}{2}$:

3 tablespoons olive oil $\times 4\frac{1}{2} = 13\frac{1}{2}$ tablespoons olive oil

$\frac{1}{2}$ teaspoon garlic powder $\times 4\frac{1}{2} = 2\frac{1}{4}$ teaspoons garlic powder

1 tablespoon red wine vinegar $\times 4\frac{1}{2} = 4\frac{1}{2}$ tablespoons red wine vinegar

1 teaspoon Dijon mustard $\times 4\frac{1}{2} = 4\frac{1}{2}$ teaspoons Dijon mustard

$\frac{1}{2}$ teaspoon salt $\times 4\frac{1}{2} = 2\frac{1}{4}$ teaspoons salt

$\frac{1}{4}$ teaspoon black pepper $\times 4\frac{1}{2} = 1\frac{1}{8}$ teaspoons black pepper

1 teaspoon honey $\times 4\frac{1}{2} = 4\frac{1}{2}$ teaspoons honey

1 teaspoon dried basil $\times 4\frac{1}{2} = 4\frac{1}{2}$ teaspoons dried basil

Assignment

Purpose | Outcomes | Instructions | Tips for Success

Purpose

To practice changing recipe yields using the conversion factor.

Outcomes

By completing this assignment, you will be able to…

1. Calculate the conversion factor to adjust a recipe yield.
2. Use the conversion factor to adjust the ingredients in a recipe.

Instructions

To complete this assignment…

1. Look at the recipes you are given.
2. Calculate the conversion factors based on the changes in yield you are given.
3. Change the amounts to use for each ingredient in the recipe.

Tips for Success

To help in the completion of this assignment, make sure to:

- Look carefully at the change in yield so you can calculate the correct conversion factor.
- Understand that if an ingredient amount is given as a fraction, the new ingredient amount should also be given as a fraction.

Changing Recipe Yields Assignment

This recipe for cookies yields 24. Adjust the recipe so that that it will yield 12.

1 cup butter, softened
$\frac{3}{4}$ cup white sugar
$1\frac{1}{2}$ cups packed brown sugar
2 eggs
1 teaspoon vanilla extract
2 cups all-purpose flour
1 teaspoon baking powder
1 teaspoon salt
$1\frac{1}{2}$ teaspoons ground cinnamon

3 cups quick cooking oats

This recipe for chicken wing sauce yields enough for 50 chicken wings. Adjust the recipe so it will yield enough for 125 chicken wings.

$\frac{1}{2}$ cup honey
4 tablespoons soy sauce
4 large garlic cloves crushed
1 tablespoon fresh ginger finely diced
$\frac{1}{2}$ teaspoon chili powder
$\frac{1}{2}$ teaspoon cinnamon
$\frac{1}{4}$ teaspoon cloves
$\frac{1}{4}$ cup water
1 teaspoon corn starch

This recipe for sauted green beans yields 5 cups. Adjust the recipe so it will yield $7\frac{1}{2}$ *cups.*

2 tablespoons olive oil
$\frac{1}{2}$ teaspoon red pepper flakes
$\frac{1}{2}$ teaspoon dried cilantro
$1\frac{1}{2}$ pounds green beans, trimmed
2 cloves garlic, minced
$\frac{1}{2}$ teaspoon salt
2 tablespoons water

5. Recipe Ratios

Instructions for Recipe Ratios

Sometimes you will have a recipe that is simply a ratio, or a set of ratios. For example, to make cooked rice you would use 1 part rice, 2 parts water. So how do you figure out how much of each to use if you want to make 2 cups of cooked rice?

First you set up an equation, like this:

1 part rice + 2 parts water = 2 cups rice

1 part + 2 parts = 2 cups

3 parts = 2 cups

Take those 2 cups and divide them into 3 parts: $2 \div 3 = \frac{2}{3}$

So that means that 1 part = $\frac{2}{3}$ cup

If 1 part = $\frac{2}{3}$ cup, then 2 parts = $2 \times \frac{2}{3}$ cup, or $1\frac{1}{3}$ cups

You would use $\frac{2}{3}$ cup rice and $1\frac{1}{3}$ cups of water to make 2 cups of cooked rice.

Lemonade can be made using 1 part sugar, 2 parts lemon juice, and 6 parts water. How much of each ingredient would you use to make 36 cups of lemonade?

1 part sugar + 2 parts lemon juice + 6 parts water = 36 cups lemonade

1 part + 2 parts + 6 parts = 36 cups

9 parts = 36 cups

36 ÷ 9 = 4

1 part = 4 cups

1 part sugar = 4 cups sugar

2 parts lemon juice = 2 × 4 cups lemon juice = 8 cups lemon juice

6 parts water = 6 × 4 cups water = 24 cups water

Assignment

Purpose | Outcomes | Instructions | Tips for Success

Purpose

To practice determining the correct amounts in recipe ratios.

Outcomes

By completing this assignment, you will be able to...

1. Understand how a recipe ratio is set up.
2. Determine the correct amounts of each ingredient in a recipe given as a ratio between its parts.

Instructions

To complete this assignment...

1. Look at the recipes you are given.
2. Calculate the amount for each ingredient in the recipe based on the recipe ratios.

Tips for Success

To help in the completion of this assignment, make sure to:

- Start with the total amount and figure out the parts from there.
- Use fractions for common volume measures (cups, teaspoons, etc.) and decimals for weights (grams, ounces, pounds.)

Recipe Ratios Assignment

1) To make cooked brown rice, use 2 parts rice to 5 parts water. If you want to make $3\frac{1}{2}$ cups of brown rice, how much of each ingredient would you use?

2) To make mirepoix, use 1 part carrots, 1 part celery, and 2 parts onions. If you want to make 3 cups of mirepoix, how much of each ingredient would you use?

3) To make a salad dressing, use 1 part vinegar and 3 parts oil. If you want to make 2 cups of salad dressing, how much of each ingredient would you use?

4) To make fruit punch, use 3 parts orange juice, 3 parts pineapple juice, 4 parts ginger

ale, and 8 parts cranberry juice. If you want to make 27 cups of punch, how much of each ingredient would you use?

5) To make basic cookie dough, use 1 part sugar, 2 parts butter, and 3 parts flour. If you want to make 15 pounds of cookie dough, how much of each ingredient would you use?

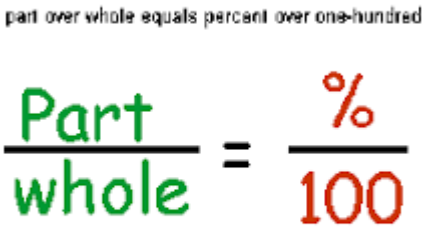
6) To make a basic marinade, use 2 parts vinegar, 3 parts soy sauce, 3 parts lemon juice, 4 parts brown sugar, and 8 parts olive oil. If you want to make 5 cups of marinade, how much of each ingredient would you use?

7) The roast vegetable recipe calls for 1 part onions, 2 parts red peppers, and 5 parts potatoes. If you want to make 4 pounds of roast vegetables, how much of each ingredient would you use?

6. Using Percentages

Instructions for Percentages

Percentages are used in many aspects of culinary math. You can visualize percent problems in this form:



Let's put this proportion into practice:

What is 20% of 140? You would set up the proportion like this:

$$\frac{x}{140} = \frac{20}{100}$$

$100x = 140 \times 20$

$100x = 2800$

$x = 28$

What percent of 250 is 30?

$\frac{30}{250} = \frac{x}{100}$

250x = 30 × 100

250x = 3000

x = 12

90 is 30% of what number?

$\frac{90}{x} = \frac{30}{100}$

90 × 100 = 30x

9000 = 30*x*

300 = *x*

With word problems, it is very important to pay close attention to the wording in order to solve them correctly. The easiest way to tell the difference between part and whole is that the number that comes after "of" is the whole.

There are 30 pounds of potatoes in the bin. Three pounds of potatoes are rotten. What percent of the potatoes are rotten?

You can rewrite this problem as: What percent of 30 is 3?

$\frac{3}{30} = \frac{x}{100}$

100 × 3 = 30x

300 = 30x

10 =x

10% of the potatoes are rotten.

Two cases of beans cost $40. The

wholesaler is giving you a 5% discount. How much will the discount be?

You can rewrite this problem as: What is 5% of 40?

$$\frac{x}{40} = \frac{5}{100}$$

$100x = 40 \times 5$
$100x = 200$
$x = 2$
You will get a $2 discount.

Unemployment tax is 3% of a worker's base wages. If the restaurant owner pays $0.45 per hour in unemployment tax for a prep cook, what are the cook's base wages per hour?

You can rewrite this problem as 0.45 is 3% of what?

$$\frac{0.45}{x} = \frac{3}{100}$$

$0.45 \times 100 = 3x$
$45 = 3x$
$15 = x$
The cook's base salary is $15 per hour.

Assignment

Purpose | Outcomes | Instructions | Tips for Success

Purpose

To practice finding missing values in percent problems by using a proportion.

Outcomes

By completing this assignment, you will be able to...

1. Read and understand real-world percent problems related to culinary math.
2. Correctly set up the problems as proportions and solve for the missing value.

Instructions

To complete this assignment...

1. Read the problems you are given.

2. Determine what value you need to find, and set up the problem as a proportion.
3. Solve the problem.

Tips for Success

To help in the completion of this assignment, make sure to:

- Read carefully to understand what value is missing.
- Round all answers to the nearest hundredth, if necessary.

Percentages Assignment

1) The capacity of the banquet room is 150 people. How many people are seated in the room if it is at 60% capacity?

2) About 52% of a pineapple is usable in food preparation. If Sahra prepared 33.8 ounces of pineapple chunks, how many ounces of whole pineapple did she begin with?

3) If you buy products valued at $342.57, and the wholesaler is giving you an 8% discount, how much will be discounted from this price?

4) Nimo bought a carton of strawberries, and he discovered that 35% of the strawberries were not yet ripe. If 4.2 pounds of strawberries were not ripe, how many pounds of strawberries were in the carton?

5) If the restaurant bill was $72.65, and the guest leaves a tip of $14.53, what was the percentage of the tip?

6) If the restaurant owner pays 2% of the server's wages for worker's compensation, how much will the owner pay per hour if the server's wages are $2.24 an hour?

7) The restaurant has 12 servers scheduled to be on duty. If 3 servers call in sick, what percentage of servers is that?

8) If the rental fee for the kitchen was discounted 20%, and the discount was $48, what was the original rental fee?

9) If there are 54 apples in the crate, and 13 of these apples are bruised, what percentage of apples is bruised?

10) About 88% of fresh green beans is usable in food preparation. If Joe buys 14.5 pounds of green beans, how many pounds of beans will he be able to prepare?

11) The restaurant is at 60% capacity. If

there are 36 people in the restaurant, what is its full capacity?

12) If the utilities rate for the month increased by 12%, and the bill last month was $354, how many dollars did the bill increase this month?

13) If there are 30 pounds of potatoes in the bin, and 5 pounds of potatoes are too small to make baked potatoes, what percentage of potatoes is too small?

14) Sarah's restaurant donated $580 to charity last year. If the restaurant made a profit of $12,421, what percentage of the profit did Sarah donate to charity?

15) Don got a discount of 10% from the wholesaler. If his discount was $14.32, what was his bill before the discount?

16) If the restaurant bill was $124.63, and the diner wants to give a 25% tip, what will the tip be?

17) About 82% of green peppers is usable in food preparation. If Cara prepared 61.2 ounces of julienned green peppers, how many ounces of whole green peppers did she start with?

18) Naima's restaurant employs 3 salaries employees out of a total of 36 staff. What percentage of the staff is salaried?

7. Costs and Budgeting

Instructions for Costs and Budgeting

An in-depth look at business costs, budgeting, and benefits is beyond the scope of this course. We will simply learn a few basic concepts and practice some math around them.

Fixed Costs in running a business are costs that do not change no matter what the circumstances are. Some examples of fixed costs are rent or mortgage, insurance, salaries, interest payments, and property taxes.

Variable Costs go up or down depending on the circumstances of your business. Some examples of variable costs are food, hourly labor wages, and utilities. Variable costs generally go up when your business volume goes up.

For **Semi-Variable Costs,** part of the cost does not change for any reason, but part of the cost does change depending on the circumstances. A good example of a semi-variable cost is payroll. Labor costs for managers who are on salary stay the same no matter what the business volume is, but

hourly labor wages go up when business volume goes up. So in the overall payroll, part of the costs stay the same, and part of the costs fluctuate with business.

Benefits for employees need to be taken into account when making a budget. Some examples of benefits are: paid time off, health insurance (which might include vision or dental), retirement, disability, wellness programs, and tuition reimbursement.

The homework assignment and quiz will simply look at some numbers related to the above concepts.

Assignment

Purpose

To learn some basic concepts related to business costs and budgeting and to practice math around these concepts.

Outcomes

By completing this assignment, you will be able to…

1. Understand different types of business costs.
2. Do some math related to basic budgeting of business costs.
3. Understand different types of benefits and how they affect a budget.

Instructions

To complete this assignment…

1. Read the problems carefully and find the correct answers.
2. Round answers to the nearest hundredth, if necessary.
3. Be sure to show how you set up each problem.

Tips for Success

To help in the completion of this assignment, make sure to:

- Read each problem carefully and understand what it is asking.
- Round all answers to the nearest hundredth, if necessary.
- Include how you set up each problem in order to get credit.

Costs and Budgeting Assignment

1) If a monthly mortgage payment is $1,891.42, how much should you budget for the year?

2) If your restaurant manager has a salary of $42,000 per year, and she is paid on the 15th and the 30th of each month, how much will her base pay be for each paycheck?

3) If you are planning to spend 5% of your budget on the lease, and your lease payment is $11,200 a month, what is your total restaurant budget for the month?

4) Property taxes for your restaurant for the year will be $13,500. If you pay

property taxes twice a year, how much will you pay in each payment?

5) If your servers receive wages of $13.69 per hour, how much in base wages will one server make if he works a 50-hour week?

6a) If you want to make a profit of 30% on the food you serve, and it costs $29.61 to make a particular dinner, how much profit would you want to make on that dinner?

b) How much should you charge for that dinner to make 30% profit?

7a) If your utilities bill goes up 20% in October from the bill in September, and the bill in September was $965, how much did it go up in the month of October?

b) What was the utilities bill in the month of October?

8a) If your food costs in February were $38,450, and in March they were $41,235, how much did they increase in the month of March?

b) What percent of February's costs was the increase in food costs?

9) If a line cook gets 40 hours of paid time off in a year, and is paid $15 an hour, how much will this benefit cost you?

10a) If health insurance costs $267 per month per employee, how much will you pay per month if you have 15 employees?

b) How much will you pay for these employees for a full year?

11a) If disability insurance for an employee costs $468 per year, how much will the monthly payment be?

b) What will you pay per month if you cover 20 employees?

8. Common Measurements with Factor Labeling

Instructions for Common Measurements

If you have lived in the United States for awhile, you will be fairly familiar with common measurements. In this class, we will focus on volume and weight. These are the volume relationships you will need to know:

- 3 teaspoons = 1 tablespoon
- 2 tablespoons = 1 fluid ounce
- 8 fluid ounces = 1 cup
- 2 cups = 1 pint
- 2 pints = 1 quart
- 4 quarts = 1 gallon

And this is the weight relationship you should know:

- 16 ounces = 1 pound

Please note that ounces and fluid ounces are two different things. One measures volume, and is usually used for liquids, and the other measures weight.

To convert between these measurements, we will use something called factor labeling. It might be that you can do these conversions in your head, but in this class you are asked to show your work by setting problems up like this:

How many fluid ounces are in 5 quarts? Start with what you are given, 5 quarts. Set up each conversion with the new measure on top and the old on the bottom. This way they will cancel, and you will end up with an answer in the right measurement:

$$5\ quarts \times \frac{2\ pints}{1\ quart} \times \frac{2\ cups}{1\ pint} \times \frac{8\ fluid\ ounces}{1\ cup} = 160\ fluid\ ounces$$

This problem is set up in the same way. How many cups are in 2 gallons?

$$2\ gallons \times \frac{4\ quarts}{1\ gallon} \times \frac{2\ pints}{1\ quart} \times \frac{2\ cups}{1\ pint} = 32\ cups$$

Sometimes you will move from a smaller measure to a larger measure. You set up the problem in the same way, but in this case you will multiply across the top, then across the bottom, and finally divide. For example, how many gallons are in 12 cups? Multiply $12 \times 1 \times 1 \times 1 = 12$ across the top, then $2 \times 2 \times 4 = 16$ across the bottom. Finally, divide 16 by 12 for your answer. For common volume measures, use fractions.

$$12\ cups \times \frac{1\ pint}{2\ cups} \times \frac{1\ quart}{2\ pints} \times \frac{1\ gallon}{4\ quarts} = 0.75\ gallon\ or\ \frac{3}{4}\ gallon$$

You can use the same method for pounds and ounces. How many ounces are in 3.5

pounds? For pounds and ounces, use decimals.

$$3.5\ pounds \times \frac{16\ ounces}{1\ pound} = 56\ ounces$$

Assignment

Purpose | Outcomes | Instructions | Tips for Success

Purpose

To practice making conversions for measurements in the common system using factor labeling.

Outcomes

By completing this assignment, you will be able to...

1. Know the relationships between weight and volume measurements in

the common system.
2. Use factor labeling to make conversions between common measurements.

Instructions

To complete this assignment...

1. Use the relationships you have been given to make the conversions.
2. Use factor labeling to set up the problems.
3. Use fractions for common volume measures (cups, teaspoons, etc.) and decimals for weights.

Tips for Success

To help in the completion of this assignment, make sure to:

- Understand whether to use a fraction or a decimal for your answer.
- Include the factor label set-up for each problem in order to get credit.

Common Measurements Assignment

1) 5 cups = _____ fluid ounces
2) 3 pints = _____ tablespoons
3) 2 quarts = _____ cups
4) 16 fluid ounces = _____ teaspoons
5) 4 gallons = _____ pints
6) 6 pints = _____ gallons
7) 5.25 pounds = _____ ounces
8) 24 ounces = _____ pounds
9) $3\frac{1}{2}$ quarts = _____ cups
10) $5\frac{1}{4}$ cups = _____ teaspoons
11) 12 teaspoons = _____ fluid ounces
12) 36 ounces = _____ pounds
13) 2.75 pounds = _____ ounces
14) 20 tablespoons = _____ cups
15) 3 cups = _____ pints
16) 12 cups = _____ quarts
17) 10 pints = _____ gallons
18) 2 gallons = _____ cups
19) $4\frac{1}{2}$ quarts = _____ fluid ounces
20) 18 teaspoons = _____ fluid ounces

9. The Metric System

Instructions for the Metric System

If you grew up in the United States, you might not be as familiar with the metric system in everyday life as you will need to be in the culinary or bakery professions. There are four measurements that you need to be familiar with:

The *kilogram*, which is roughly the weight of a bunch of bananas, a cantaloupe, or a pineapple.

The *gram*, which is roughly the weight of a quarter teaspoon sugar, a pinch of salt, or two raisins.

The *liter*, which is a little more than a quart.

The *milliliter*, which is less than a quarter teaspoon.

There are two conversions you need to know:

- 1 kilogram = 1000 grams
- 1 liter = 1000 milliliters

When you convert *within* the metric system in this class, you don't need to do any rounding. We will use the factor

labeling method to do the conversions for this class. You will need to show your work using factor labeling.

For example, how many grams are in 3.24 kilograms?

$$3.42\ kilograms \times \frac{1000\ grams}{1\ kilogram} = 3420\ grams$$

How many liters are in 546 milliliters?

$$546\ milliliters \times \frac{1\ liter}{1000\ milliliters} = 0.546\ liter$$

Assignment

Purpose | Outcomes | Instructions | Tips for Success

Purpose

To become familiar with the metric system and practice making conversions for measurements in the metric system using factor labeling.

Outcomes

By completing this assignment, you will be able to...

1. Understand the most likely measurement of volumes and weights in the metric system.
2. Make conversions for measurements in the metric system using factor labeling.

Instructions

To complete this assignment...

1. Use the examples given in the instructions to choose the most likely measurements of given quantities.
2. Use the relationships you have been given to make the conversions.
3. Use factor labeling to set up the problems.

Tips for Success

To help in the completion of this assignment, make sure to:

- Include the factor label set-up for each problem in order to get credit.
- You do not need to round the answers to conversions within the metric system.
- You do not need to show your work for numbers 1-8.

Metric System Assignment

1) What is the most likely measurement for a bottle of soda?

A. 2 liters
B. 2 milliliters
C. 2 grams

2) What is the most likely measurement for a watermelon?

A. 9.5 grams
B. 9.5 liters
C. 9.5 kilograms

3) What is the most likely measurement for a bunch of parsley?

A. 55 kilograms
B. 55 grams
C. 55 liters

4) What is the most likely measurement for vanilla extract added to a cookie recipe?

A. 5 kilograms
B. 5 milliliters
C. 5 liters

5) What is the most likely measurement for an apple?

A. 100 grams
B. 100 kilograms
C. 100 liters

6) What is the most likely measurement for a bottle of vodka?

A. 750 kilograms
B. 750 liters
C. 750 milliliters

7) What is the most likely measurement for a bottle of vegetable oil?

A. 5 milliliters
B. 5 grams

C. 5 liters

8) What is the most likely measurement for a bag of flour?

A. 3 grams
B. 3 milliliters
C. 3 kilograms

9) 13 kilograms = _____ grams
10) 4587 grams = _____ kilograms
11) 32 grams = _____ kilograms
12) 46 liters = _____ milliliters
13) 6703 milliliters = _____ liters
14) 842 milliliters = _____ liters
15) 0.5 kilogram = _____ grams
16) 0.34 liter = _____ milliliters
17) 35 milliliters = _____ liters
18) 56,000 grams = _____ kilograms
19) 0.064 kilograms = _____ grams
20) 26.2 liters = _____ milliliters
21) 14 liters = _____ milliliters
22) 53.2 kilograms = _____ grams
23) 5 grams = _____ kilograms
24) 600 milliliters = _____ liters

10. Baker's Percent

Instructions for Baker's Percent

A baker's percent are used to set out basic bread recipes as a series of percentages, making it very easy to change a recipe according to your needs. A b*aker's percent always use weight, not volume.* You can start with a recipe, like this:

- 5 pounds flour
- 3 pounds water
- 0.1 pound salt

You can change this recipe to a series of percentages, starting with making the flour 100%. For the water, you would figure out what percentage of the 5 pounds of flour the 3 pounds of water is. In other words, what percent of 5 is 3? The answer is 60%. Then you do the same with the salt. What percent of 5 is 0.1? The answer is 2%. So you can set out the basic recipe like this:

- 100% flour
- 60% water
- 2% salt

Now you can use this basic recipe for any amount of this basic bread you might want to make. Let's say you want to use 12 pounds of flour. How much water should you use? It would be 60% of 12 pounds, or 7.2 pounds. The salt would be 2% of 12 pounds, or 0.24 pound. Your new basic recipe would look like this:

- 12 pounds flour
- 7.2 pounds water
- 0.24 pound salt

You can also use a baker's percent to change a recipe based on particular conditions. For example, what if you want to change the hydration of the recipe to 70%? That would mean you would use 70% water instead of 60% water. In the original recipe above, you would use 70% of 5 pounds, or 3.5 pounds of water. In the revised recipe, you would use 70% of 12 pounds, or 8.4 pounds of water.

Assignment

Purpose

To practice using baker's percentages to modify bread recipes.

Outcomes

By completing this assignment, you will be able to...

1. Use a bread recipe to calculate bakery percentages.
2. Use bakery percentages to modify a bread recipe.

Instructions

To complete this assignment...

1. Use the recipes you are given to calculate the bakery percentages.
2. Use the bakery percentages to modify the recipes as instructed.
3. Round all answers to the nearest

hundredth, if necessary.

Tips for Success

To help in the completion of this assignment, make sure to:

- Look carefully at the unit of measurement you are given. Remember that bakery percentages always use weight, not volume!
- Round your answers to the nearest hundredth.

Baker's Percent Assignment

1) Calculate the bakery percentages for this quick bread recipe:

- 1000 grams flour
- 1000 grams water
- 500 grams eggs
- 500 grams butter

2) Modify the above recipe so that it uses 1500 grams flour.

3) If you want to decrease the water to 75%, how much water would you use in the original recipe?

4) If you want to increase the butter to 60%, how much butter would you use in the original recipe?

5) Calculate the bakery percentages for this bread recipe:

- 50 pounds flour
- 32.5 pounds water
- 1 pound salt
- 0.6 pound yeast

6) Modify the above recipe so that it uses 80 pounds flour.

7) If you want to increase the water to 70%, how much water would you use in the original recipe?

8) If you want to increase the salt to 2.5%, how much salt would you use in the original recipe?

11. Conversions Between the Metric and Common Systems

Instructions for Conversions

It's often necessary to convert between the metric and the common system. Here are the conversions you will need to know for this class:

- 1 kilogram = 2.21 pounds
- 1 ounce = 28.35 grams
- 1 liter = 33.8 fluid ounces
- 1 teaspoon = 4.93 milliliters

Please be aware that none of these conversions is exact.

We will use factor labeling to make these conversions. We will round our answers to the nearest hundredth **after** we have completed the conversion.

How many kilograms are in 43 pounds?

$$43\ pounds \times \frac{1\ kilogram}{2.21\ pounds} = 19.457\ldots\ kilograms, rounded\ to\ 19.46\ kilograms$$

How many milliliters are in 3 teaspoons?

$$3\ teaspoons \times \frac{4.93\ milliliters}{1\ teaspoon} = 14.79\ milliliters$$

Factor labeling is especially useful if you need to use more than one factor. Use the above conversions as "bridges" between one system and the other, and use conversions you have already learned.

How many cups are in one liter?

$$1\ liter \times \frac{33.8\ fluid\ ounces}{1\ liter} \times \frac{1\ cup}{8\ fluid\ ounces} = 4.225\ cups, round\ to\ 4.23\ cups$$

How many grams are in 5 pounds? We can set this up two ways,

and get slightly different answers (because, remember, none of the bridge conversions is exact.) Both answers will be considered correct, and will be close enough to work with in the kitchen.

$$5\ pounds \times \frac{1\ kilogram}{2.21\ pounds} \times \frac{1000\ grams}{1\ kilogram} = 2262.443\ldots\ grams, rounded\ to\ 2262.44\ grams$$

OR

$$5\ pounds \times \frac{16\ ounces}{1\ pound} \times \frac{28.35\ grams}{1\ ounce} = 2268\ grams$$

We will use decimals to express all our answers when we convert between the two systems.

Assignment

Purpose | Outcomes | Instructions | Tips for Success

Purpose

To practice making conversions between the common system and the metric system using factor labeling.

Outcomes

By completing this assignment, you will be able to...

1. Use bridges to convert between the common and the metric system.
2. Make conversions with more than one step using factor labeling.

Instructions

To complete this assignment...

1. Use the relationships you have been given to make the conversions.
2. Use factor labeling to set up the problems.
3. Express all answers using decimals. Round the final answer to the nearest hundredth.

Tips for Success

To help in the completion of this assignment, make sure to:

- Round your answer *after* you have complete your calculations.
- Use the bridge relationships to convert between the common and the metric systems.

Conversions Assignment

1) 5.6 kilograms = _____ pounds
2) 12 kilograms = _____ pounds
3) 7.5 pounds = _____ kilograms
4) 36 pounds = _____ kilograms
5) 30 ounces = _____ grams
6) 12.25 ounces = _____ grams
7) 320 grams = _____ ounces
8) 568 grams = _____ ounces
9) 2.5 liters = _____ fluid ounces
10) 1.75 liters = _____ fluid ounces
11) 64 fluid ounces = _____ liters
12) 128 fluid ounces = _____ liters
13) 4 teaspoons = _____ milliliters
14) 1.75 teaspoons = _____ milliliters
15) 18 milliliters = _____ teaspoons
16) 27 milliliters = _____ teaspoons
17) 12 pounds = _____ grams
18) 2.5 kilograms = _____ ounces
19) 3 liters = _____ pints
20) 35 milliliters = _____ tablespoons
21) 500 grams = _____ pounds
22) 76 ounces = _____ kilograms

23) 1 liter = _____ quarts
24) 4 tablespoons = _____ milliliters

12. Conversions for Volume and Weight

Instructions for Volume and Weight

Sometimes it's necessary to convert between weight and volume. For example, if you need a cup of blanched almonds, and they are sold by the ounce, how many ounces should you buy? Food items can be converted from weight to volume, or volume to weight, using the chart below. Based on this chart, you can see that 5 1/3 ounces of blanched almonds will give you a cup of blanched almonds. You will refer to this chart for the homework assignment and also for the quiz.

If the recipe calls for 2 cups of dried lima beans, how many ounces is that?

$$2\ \textit{cups dried lima beans} \times \frac{6\frac{1}{2}\ \textit{ounces dried lima beans}}{1\ \textit{cup dried lima beans}} = 13\ \textit{ounces dried lima beans}$$

Using factor labeling, you can also make a series of conversions. For example, if the bag contains 3 pounds of cocoa, how many cups is that?

$$3\ pounds\ cocoa \times \frac{16\ ounces\ cocoa}{1\ pound\ cocoa} \times \frac{1\ cup\ cocoa}{4\ ounces\ cocoa} = 12\ cups\ cocoa$$

If a recipe calls for 6 teaspoons baking powder, how many ounces is that?

$$6\ teaspoons\ baking\ powder \times \frac{1\ tablespoon\ baking\ powder}{3\ teaspoons\ baking\ powder} \times \frac{\frac{1}{2}\ ounce\ baking\ powder}{1\ tablespoon\ baking\ powder} = 1\ ounce\ baking\ powder$$

RULE OF THUMB FOR THIS CLASS:

For more complex factor labeling problems:

- If there are only fractions and whole numbers in the problem, calculate the problem using fractions and then change the answer to a decimal number.
- If there are both fractions and decimal numbers in the problem, convert the fractions to decimal numbers, then do the problem.

To convert a fraction to a decimal, divide the top number (numerator) by the bottom number (denominator). For example, $\frac{3}{4} = 3 \div 4 = 0.75$

Item	Volume
Allspice, ground	Tablespoon
Almonds, blanched	Cup
Apples, peeled, 1/2″ cubes	Cup
Applesauce, canned	Cup
Apples, pie, canned	Cup
Apricots, drained	Cup
Apricots, cooked	Cup
Apricots, halves	Cup
Apricots, pie, packed	Cup
Asparagus, cut, canned	Cup
Baking powder	Tablespoon
Baking powder	Cup
Bananas, diced	Cup
Barley	Cup
Beans, bakes	Cup
Beans, lima, dried	Cup
Beans, lima, cooked	Cup
Beans, kidney	Cup
Beans, kidney, cooked	Cup
Beans, navy, dried	Cup
Beans, navy, cooked	Cup
Beans, cut, canned, drained	Cup
Bean sprouts	Cup
Beets, cooked, diced	Cup
Beets, cooked, sliced	Cup
Blueberries, fresh	Cup
Blueberries, canned	Cup
Bread crumbs, dried	Cup

Bread crumbs, soft	Cup
Brussels sprouts	Cup
Butter	Cup
Cabbage, shredded	Cup
Cake crumbs, soft	Cup
Carrots, diced, raw or cooked	Cup
Celery, diced	Cup
Celery seed	Tablespoon
Cheese, cottage	Cup
Cheese, cream	Cup
Cheese, grated	Cup
Cherries, glaceed	Cup
Chicken, cooked, cubed	Cup
Chili powder	Tablespoon
Chili Sauce	Cup
Chocolate, grated	Cup
Chocolate, melted	Cup
Cinnamon, ground	Tablespoon
Citron, dried, chopped	Cup
Cloves, ground	Tablespoon
Cloves, whole	Cup
Cocoa	Cup
Coconut, shredded	Cup
Corn, canned	Cup
Corn flakes	Cup
Cornmeal	Cup
Corn syrup	Cup
Cornstarch	Tablespoon
Cornstarch	Cup

Cracker crumbs	Cup
Cranberries, raw	Cup
Cranberries sauce	Cup
Cream of tartar	Tablespoon
Cream of wheat	Cup
Cream, whipping	Cup
Cream, whipped	Cup
Cucumbers, diced	Cup
Currants, dried	Cup
Curry powder	Tablespoon
Dates, pitted	Cup
Eggs, dried, whites	Cup
Eggs, dried, yolks	Cup
Eggs, fresh, whites (9)	Cup
Eggs, fresh, yolks (10)	Cup
Eggs, raw, shelled (5 eggs)	Cup
Farina, raw	Cup
Figs, dried, chopped	Cup
Flour, all-purpose	Cup
Flour, bread, unsifted	Cup
Flour, bread, sifted	Cup
Flour, cake/pastry, sifted	Cup
Flour, rye	Cup
Flour, soy	Cup
Flour, wheat	Cup
Gelatin, granulated	Tablespoon
Gelatin, granulated	Cup
Ginger, ground	Tablespoon
Ginger, ground	Cup

Grapes, cut, seeded	Cup
Grapes, whole	Cup
Ham, cooked, diced	Cup
Honey	Cup
Horseradish	Tablespoon
Jam	Cup
Jelly	Cup
Lard	Cup
Lettuce, shredded	Cup
Margarine	Cup
Marshmallows, large	80 each
Mayonnaise	Cup
Meat, cooked, chopped	Cup
Milk, liquid	Cup
Milk, condensed	Cup
Milk, evaporated	Cup
Milk, nonfat dry	Cup
Milk, nonfat dry	Tablespoon
Mincemeat	Cup
Molasses	Cup
Mustard, dry, ground	Cup
Mustard, prepared	Tablespoon
Mustard seed	Tablespoon
Noodles, cooked	Cup
Nutmeats	Cup
Nutmeg, ground	Tablespoon
Oil, vegetable	Cup
Onions, chopped	Cup
Oysters, shucked	Cup

Paprika	Tablespoon
Parsley, coarsely chopped	Cup
Peanuts	Cup
Peanut Butter	Cup
Peaches, chopped	Cup
Peas, canned, drained	Cup
Peas, dried, split	Cup
Pears, canned, drained, diced	Cup
Pecans	Cup
Pepper, ground	Tablespoon
Pepper, ground	Cup
Peppers, green, chopped	Cup
Pimiento, chopped	Cup
Pineapple, crushed	Cup
Poppy seed	Cup
Potatoes, cooked, diced, mashed	Cup
Potato chips	Cup
Prunes, dried	Cup
Prunes, cooked, pitted	Cup
Pumpkin, cooked	Cup
Raisins	Cup
Raisins, after cooking	Cup
Raspberries	Cup
Rhubarb, cooked	Cup
Rhubarb, raw, 1″ diced	Cup
Rice, uncooked	Cup
Rice, cooked	Cup
Rice, puffed	Cup
Rutabaga, cubed	Cup

Sage, ground	Cup
Salad dressing	Cup
Salmon, canned	Cup
Salt	Tablespoon
Sauerkraut	Cup
Sesame seed	Tablespoon
Sesame seed	Cup
Shallots, diced	Tablespoon
Shortening	Cup
Soda, baking	Tablespoon
Soybeans	Cup
Spinach, raw	Quart
Spinach, cooked	Cup
Squash, Hubbard, cooked	Cup
Strawberries	Cup
Suet, ground	Cup
Sugar, brown, lightly packed	Cup
Sugar, brown, solidly packed	Cup
Sugar, granulated	Cup
Sugar, powdered, sifted	Cup
Tapioca, quick-cooking	Cup
Tapioca, pearl	Cup
Tea, loose-leaf	Cup
Tea, instant	Cup
Tomatoes, canned	Cup
Tomatoes, fresh, diced	Cup
Tuna	Cup
Vanilla	Tablespoon
Vinegar	Cup

Walnuts, shelled	Cup
Water	Cup
Yeast, compressed cake	each
Yeast, envelope	each

Assignment

Purpose | Outcomes | Instructions | Tips for Success

Purpose

To practice converting between volume and weight for different kinds of food.

Outcomes

By completing this assignment, you will be able to...

1. Use a conversion chart to understand

the relationships between volume and weight for different kinds of food.
2. Use factor labeling to make conversions, including those that involve three or more steps.

Instructions

To complete this assignment…

1. Read each problem and look up the conversion on the chart given.
2. Use factor labeling to make each conversion.
3. Use conversions you have already learned to set up multi-step problems.
4. Express all answers in decimal form. Round to the nearest hundredth, if necessary.

Tips for Success

To help in the completion of this assignment, make sure to:

- Remember the conversions you have already learned.
- Use factor labeling efficiently and correctly.

Volume and Weight Assignment

1) If the recipe calls for 3 cups of shredded lettuce, how many ounces is that?

2) If the recipe calls for $\frac{1}{2}$ cup of honey, how many ounces is that?

3) If a canister of salt weighs 26 ounces, how many tablespoons does it contain?

4) If a bag of pecans weighs 12 ounces, how many cups does it contain?

5) If the recipe calls for $2\frac{1}{2}$ cups of granulated sugar, how many ounces is that?

6) If the recipe calls for 2 tablespoons of cornstarch, how many ounces is that?

7) If a box of cornflakes weighs 24 ounces, how many cups does it contain?

8) If a bag of fresh cranberries weighs 12 ounces, how many cups does it contain?

9) If the recipe calls for $1\frac{3}{4}$ cups of cornmeal, how many ounces is that?

10) If the recipe calls for $\frac{1}{2}$ cup of diced celery, how many ounces is that?

11) If a jar of molasses contains 32 fluid ounces, how many ounces does the molasses weigh?

12) How many ounces does a pint of whipping cream weigh?

13) How many ounces does $1\frac{1}{2}$ teaspoons of baking powder weigh?

14) How many grams does 3 cups of barley weigh?

15) If a bag of all-purpose flour weighs 2000 grams, how many cups does it contain?

16) If the bottle of celery seed weighs 1 pound, how many tablespoons does it contain?

17) If the recipe calls for 2 cups of canned blueberries, how many grams would that be?

18) How many pounds does $2\frac{1}{2}$ cups of butter weigh?

19) How many grams does 9 teaspoons of cinnamon weigh?

20) How many pounds does 2 pints of milk weigh?

13. Yield Percents

Instructions for Yield Percents

When you buy fresh fruit and vegetable produce and prepare it, there is almost always some waste, or trim. Some produce has very little trim, and some has a lot. Produce in general has yield percentages, which can give you a good idea of how much of what you buy is going to be usable. For this lesson, we will use a chart which gives the yield percentages of a number of kinds of produce. We can then talk about how much usable food we will have after preparing what we've bought.

Let's take cucumbers, for example. If you look at the chart below, the yield percentage of cucumbers is 95%. So, if you buy 3 pounds of cucumbers, the usable portion after you prepare them would be 95% of 3 pounds. Remember the formula we've used in the past: $\frac{part}{whole} = \frac{percent}{100}$ We call the part the edible portion quantity, or EPQ, and the whole the as-purchased quantity, or APQ.

The APQ would be 3 pounds. So: $\frac{EPQ}{APQ} = \frac{yield\ \%}{100}$, so $\frac{EPQ}{3\ pounds} = \frac{95}{100}$

$95 \times 3 =$ EPQ $\times 100$

$\frac{285}{100} = EPQ$

The usable part would be 2.85 pounds.

Another example: If you buy a carton of strawberries that weighs 5000 grams, what would the usable portion be after you prepared them? The yield percentage for strawberries from the chart below is 87%. What is 87% of 5000 grams? The usable part would be 4350 grams.

We can also do a problem like this: If a recipe calls for 32 ounces of sliced pears, how many ounces would you need to buy? The yield percentage for pears is 78%. We would ask, 32 ounces is 78% of what? Our formula would look like this: $\frac{32\ ounces}{APQ} = \frac{78}{100}$

The whole would be 41.03 ounces, which would be approximately what we'd want to buy for the recipe.

Item	Yield %
Anise	75
Apples	76
Apricots	94
Artichokes	48
Asparagus	56
Avocado	75
Bananas	68
Beans, green/wax	88
Beans, Lima in shell	40
Beets, no tops	76
Beets, with tops	49
Beet greens	56
Blackberries	92
Blueberries	92
Broccoli	61
Brussels sprouts	74

Cabbage, green	79
Cantaloupe, no rind	50
Carrots, no tops	82
Carrots, with tops	60
Cauliflower	45
Celery	75
Celery root (Celeriac)	75
Chard	77
Coconut	53
Collards	77
Cucumbers	95
Eggplant	81
Endive, Chicory, Escarole	74
Figs	82
Fruit for juice:	
Grapefruit	*45
Lemon	*45
Lime	*35
Oranges, Florida	*50

*: % of total weight

Garlic bulb (10-12 cloves)	87
Grapefruit sections	47
Grapes, seedless	94
Kale	74
Kohlrabi	55

Leeks	52
Lettuce, Iceberg	74
Lettuce, leaf	67
Melons:	
Cantaloupe	50
Casaba	50
Cranshaw	50
Honeydew, no rind	60
Watermelon, flesh	46
Mushrooms	97
Mustard greens	68
Nectarines	86
Okra	78
Onions, green (10-12)	60
Onions, large	89
Orange sections	70

Parsley	76
Parsnips	85
Peaches	76
Pears	78
Peas, green in the shell	38
Peppers, green	82
Persimmons	82
Pineapple	52
Plums, pitted	85
Pomegranates	54
Potatoes, new	81
Potatoes, old	73
Potatoes, sweet	80
Radishes, with tops	63
Radishes, no tops	85
Raspberries	97
Rhubarb, no leaves	86
Rutabagas	85
Salsify	63
Shallots	89
Spinach	74
Squash	
Acorn	78
Butternut	52
Hubbard	66
Yellow	95
Zucchini	95
Strawberries	87

Assignment

Purpose | Outcomes | Instructions | Tips for Success

Purpose

To practice using yield percentages.

Outcomes

By completing this assignment, you will be able to…

1. Find the usable portion of food using the yield percent chart.
2. Determine the amount of food you need to buy using the yield percent chart.

Instructions

To complete this assignment...

1. Use the yield percent chart to find the percentage you need to use.
2. Express all answers in decimal form.
3. Round to the nearest hundredth, if necessary.

Tips for Success

To help in the completion of this assignment, make sure to:

- Round all answers to the nearest hundredth.
- Include how you set up each problem in order to get credit.

Yield Percents Assignment

1) If you buy 1.25 pounds of spinach, what

will the usable portion be after you prepare it?

2) If you buy a pineapple that weighs 1.36 kilogram, how much will the usable portion weigh?

3) If you need 1000 grams of prepared new potatoes, how much should you buy?

4) If you need 6 ounces of prepared green onions, how much should you buy?

5) If you buy 14 ounces of mushrooms, what will the usable portion be after you prepare them?

6) If you buy a 20-pound box of peaches, what will the usable portion be?

7) If you need 12 ounces of prepared okra, how much should you buy?

8) If you need 300 grams of prepared leaf lettuce, how much should you buy?

9) If you buy a cantaloupe that weighs 2.5 kilograms, what will the usable portion be?

10) If you buy 60.45 grams of garlic, how much will the usable portion weigh?

11) If you buy 3 pounds of lemons, what will be the weight of the juice you squeeze from them?

12) If you want to make 680 grams of fresh-squeezed orange juice, how many grams of oranges should you buy?

13) If you need 12 ounces of prepared broccoli, how much should you buy?

14) If you need 3.5 pounds of prepared

brussel sprouts, how many pounds should you buy?

15) If you buy a 0.75 kilogram cabbage head, what will the prepared cabbage weigh?

16) If you buy 400 grams of blueberries, what will the usable portion be?

17) If you need 3 pounds of prepared blackberries, how much should you buy?

18) If you need 42 ounces of prepared cauliflower, how much should you buy?

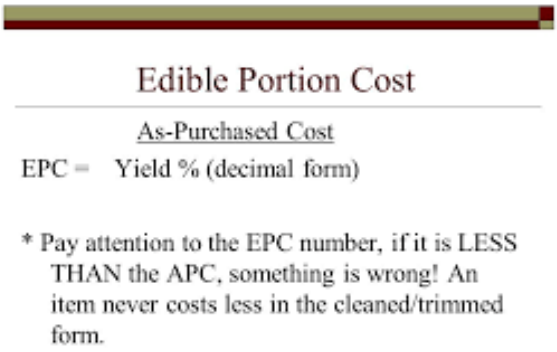
19) If you buy 5.4 pounds of eggplant, what will the usable portion be?

20) If you need 1000 grams of prepared seedless grapes, how many grams should you buy?

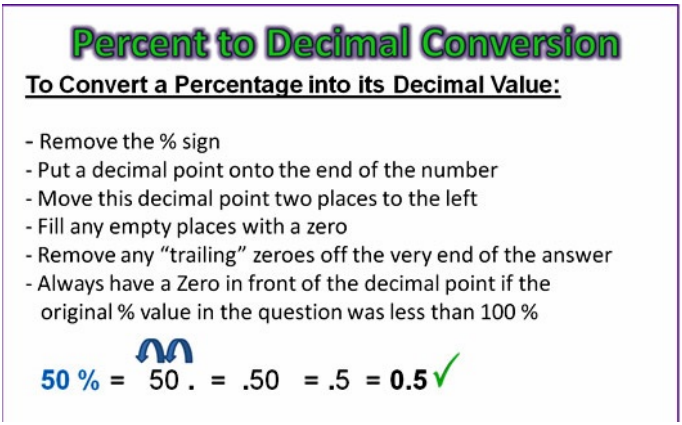
14. Edible Portion Cost

Instructions for Edible Portion Cost

As you work with yield percentages, you will notice that when you buy produce, the edible amount of what you buy is less than the food you actually buy. In other words, you get less than you pay for. Or, if you want to make sure that the edible portion of what you buy is enough for your recipe, you need to buy more than your recipe calls for. In other words, you pay for more than you get. So when you are trying to determine the actual cost of a recipe, you can use a formula with the yield percent to calculate the actual cost of the food you are buying. Here is the formula you can use:



How do you put yield percent into decimal form?



Here are some examples:

- 20% ⟶ 0.2
- 87% ⟶ 0.87
- 62% ⟶ 0.62
- 15% ⟶ 0.15

Finally, you still need to look up the yield percentages in the previous chapter.

Let's put all this together. Let's say that strawberries are priced at $3.49 per pound. This would be the as-purchased cost. The yield percent for strawberries is 87%. This converts to 0.87 in decimal form.

What is the edible portion cost for these strawberries?

$$EPC = \frac{\$3.49}{0.87} = \$4.011\ldots$$

The edible portion cost for these

strawberries is $4.01 per pound, rounded to the nearest hundredth.

If broccoli is priced at $1.48 per pound, and the yield percent is 61%, what is the edible portion cost?

$$EPC = \frac{\$1.48}{0.61} = \$2.426\ldots$$

The edible portion cost for this broccoli is $2.43 per pound, rounded to the nearest hundredth.

Assignment

Purpose | Outcomes | Instructions | Tips for Success

Purpose

To practice finding the edible portion cost of various foods.

Outcomes

By completing this assignment, you will be able to…

1. Use the formula given to make calculations.
2. Calculate the edible portion cost when given the as-purchased cost.

Instructions

To complete this assignment…

1. Use the formula to find the edible portion cost for each item given.
2. Use the table in the the previous chapter to find the yield percent."
3. Round each answer to the nearest hundredth, if necessary.
4. Be sure to show how you set up each problem.

Tips for Success

To help in the completion of this assignment, make sure to:

- Convert the yield percent to a decimal number.
- Round answers to the nearest hundredth.
- Include how you set up each problem in order to get credit.

Edible Portion Cost Assignment

What is the edible portion cost per pound for:

1) Bananas at $0.90 per pound
2) Apples at $1.06 per pound
3) Seedless grapes at $2.75 per pound
4) Raspberries at $8.65 per pound
5) Broccoli at $2.16 per pound
6) Strawberries at $3.00 per pound
7) Oranges (to be sectioned) at $0.95 per pound
8) Lemons (for juice) at $1.50 per pound
9) Spinach at $2.20 per pound
10) Celery at $2.40 per pound
11) Onions at $0.24 per pound
12) Asparagus at $3.55 per pound

13) Potatoes (old) at $0.26 per pound
14) Pears at $1.33 per pound
15) Carrots without tops at $0.69 per pound
16) Blackberries at $7.10 per pound
17) Mushrooms at $3.86 per pound
18) Green peppers at $1.46 per pound

15. Costing Sheets

Instructions for Costing Sheets

In this unit we will pull several concepts together in order to learn how to fill out a costing sheet. A costing sheet gives detailed information about how much each ingredient in a recipe costs, and then allows you to figure out how much it costs to make a recipe, as well as how much each individual serving costs. This will allow you to set a menu price for various items.

In the recipe below, we will look at a recipe for stuffed green peppers. The costing sheet lists each ingredient, as well as the weight, volume, or count of that item. By using factor labeling to make conversions, it's possible to figure out exactly how much each ingredient costs. If the ingredient is produce, you can go on to figure out the edible portion cost. However, **if the yield is 100%, you don't have to do that step.**

The costing sheet will give you yield percentages, but you will have to know or look up other conversions. For conversions between volume and weight, you should

use the conversion on the chart given in Chapter 12.

Menu Item: Stuffed Green Peppers **Number of Servings:** 6

Cost per Serving:

Ingredient	Recipe Quantity			Cost			Total Cost
	Weight	Volume	Count	APC/Unit	Yield Percent	EPC/ Unit	
green bell peppers			6	1/$0.99	100%		
salt		1/4 teaspoon		$9.15/4 pounds	100%		
ground beef	1 pound			$7.99/ pound	100%		
ground black pepper		1/8 teaspoon		$6.99/6 ounces	100%		
canned whole peeled tomatoes	14.5 ounces			$1.19/ 14.5-ounce can	100%		
chopped onion		1/2 cup		$3.99/3 pounds	89%		
Worcestershire sauce		1 teaspoon		$7.99/15 fluid ounces	100%		
uncooked rice		1/2 cup		$23.99/15 pounds	100%		
shredded Cheddar cheese		1 cup		$8.99/32 ounces	100%		
condensed tomato soup	21.5 ounces			$1.49/ 10.75-ounce can	100%		
Cost						**Total Recipe**	

We will fill out this costing sheet one ingredient at a time. We'll start with green

bell peppers. The recipe calls for 6 of them. Although this is fresh produce, we are not costing by volume or weight, so we won't worry about the yield percent. That we will cut off the tops and scoop out the innards of a green pepper doesn't affect how much we buy. We start with what we are given, 6 green peppers, and want to move to the pricing, which is also by count. So we can do this with two factor label terms:

$$6\ \text{green peppers} \times \frac{\$0.99}{1\ \text{green pepper}} = \$5.94$$

Next we have $\frac{1}{4}$ teaspoon salt. Salt is sold by weight in pounds, so we will have to use a volume to weight conversion:

$$\frac{1}{4}\ \text{teaspoon salt} \times \frac{1\ \text{tablespoon salt}}{3\ \text{teaspoons salt}} \times \frac{\frac{2}{3}\ \text{ounce salt}}{1\ \text{tablespoon salt}} \times \frac{1\ \text{pound salt}}{16\ \text{ounces salt}} \times \frac{\$9.15}{4\ \text{pounds salt}} = \$0.007\ldots$$

We will round to the nearest hundredth: $0.01

Next is 1 pound of ground beef:

$$1\ \text{pound ground beef} \times \frac{\$7.99}{1\ \text{pound ground beef}} = \$7.99$$

Next is $\frac{1}{8}$ teaspoon black pepper:

$$\frac{1}{8}\ \text{teaspoon black pepper} \times \frac{1\ \text{tablespoon black pepper}}{3\ \text{teaspoons black pepper}} \times \frac{\frac{1}{4}\ \text{ounce black pepper}}{1\ \text{tablespoon black pepper}} \times \frac{\$6.99}{6\ \text{ounces black pepper}} = \$0.012\ldots$$

We will round to the nearest hundredth: $0.01

Next is 14.5 ounces canned whole peeled tomatoes:

$$14.5\ ounces\ tomatoes \times \frac{\$1.19}{14.5-ounce\ can\ of\ tomatoes} = \$1.19$$

Next is $\frac{1}{2}$ cup chopped onion:

$$\frac{1}{2}\ cup\ chopped\ onion \times \frac{6\frac{1}{2}\ ounces\ chopped\ onion}{1\ cup\ chopped\ onion} \times \frac{1\ pound\ onion}{16\ ounces\ onion} \times \frac{\$3.99}{3\ pounds\ onion} = \$0.270\ldots$$

We will round it to $0.27. However, we aren't finished with the onion. Now we need to figure out the edible portion cost. Remember that

$$EPC = \frac{APC}{Yield\ \%\ (decimal\ form)} = \frac{\$0.27}{0.89} = \$0.303\ldots$$

Again, we will round to the nearest hundredth: $0.30

Next is the Worcestershire sauce:

$$1\ teaspoon\ Worcestershire\ sauce \times \frac{1\ tablespoon}{3\ teaspoons} \times \frac{1\ fluid\ ounce}{2\ tablespoons} \times \frac{\$7.99}{15\ fluid\ ounces\ Worcestershire\ sauce} = \$0.088\ldots$$

We will round to the nearest hundredth: $0.09

Next is the uncooked rice:

$$\frac{1}{2}\ cup\ uncooked\ rice \times \frac{8\ ounces\ uncooked\ rice}{1\ cup\ uncooked\ rice} \times \frac{1\ pound}{16\ ounces} \times \frac{\$23.99}{15\ pounds\ uncooked\ rice} = \$0.399\ldots$$

We will round to the nearest hundredth: $0.40

Next is Cheddar cheese:

$$1\ cup\ grated\ cheese \times \frac{4\ ounces\ grated\ cheese}{1\ cup\ grated\ cheese} \times \frac{\$8.99}{32\ ounces\ cheese} = \$1.123\ldots$$

We will round to the nearest hundredth: $1.12

Finally we come to the condensed tomato soup:

$$21.5\ ounces\ condensed\ tomato\ soup \times \frac{\$1.49}{10.75-ounce\ can\ condensed\ tomato\ soup} = \$2.98$$

Now we have the total cost for each of the ingredients. Our next step is to add all of the total costs up:

$5.94 + $0.01 + $7.99 + $0.01 + $1.19 + $0.30 + $0.09 + $0.40 + $1.12 + $2.98 = $20.03

Now we know how much it costs to make 6 servings of stuffed green peppers. To find out how much it costs to make one serving, simply divide by the number of servings, 6:

$20.03 ÷ 6 = $3.338 . . . We will round that to the nearest hundredth, $3.39

It costs $3.39 to make one serving of stuffed green peppers.

Menu Item: Stuffed Green Peppers **Number of Servings:** 6
Cost per Serving: _____ $3.39

Ingredient	Recipe Quantity			Cost			Total Cost
	Weight	Volume	Count	APC/Unit	Yield Percent	EPC/ Unit	
green bell peppers			6	1/$0.99	100%		$5.94
salt		$\frac{1}{4}$ teaspoon		$9.15/4 pounds	100%		$0.01
ground beef	1 pound			$7.99/ pound	100%		$7.99
ground black pepper		$\frac{1}{8}$ teaspoon		$6.99/6 ounces	100%		$0.01
canned whole peeled tomatoes	14.5 ounces			$1.19/ 14.5-ounce can	100%		$1.19
chopped onion		$\frac{1}{2}$ cup		$3.99/3 pounds	89%	$\frac{\$0.27}{0.89}$	$0.30
Worcestershire sauce		1 teaspoon		$7.99/15 fluid ounces	100%		$0.09
uncooked rice		$\frac{1}{2}$ cup		$23.99/15 pounds	100%		$0.40
shredded Cheddar cheese		1 cup		$8.99/32 ounces	100%		$1.12
condensed tomato soup	21.5 ounces			$1.49/ 10.75-ounce can	100%		$2.98
						Total Recipe Cost	$20.03

Assignment

Purpose | Outcomes | Instructions | Tips for Success

Purpose

To practice filling out a costing sheet.

Outcomes

By completing this assignment, you will be able to…

1. Find the cost per unit of a particular item by converting weights, volumes, and unit prices with factor labeling.
2. For conversions between volume and weight, you should use the conversion on the chart given in Chapter 12.
3. Adjust cost for yield percentage.
4. Find the total cost of a menu item, as

well as the cost per serving.

Instructions

To complete this assignment...

1. Find the unit cost of each ingredient in the recipe below.
2. Adjust prices for yield percent, if applicable.
3. Find the total price of the recipe.
4. Calculate the price per serving.

Tips for Success

To help in the completion of this assignment, make sure to:

- Pay close attention to the units and convert them to match the cost.
- Pay attention to yield percents where

applicable.

Costing Sheets Assignment

Find the cost values below, numbered 1-10:

Menu Item: Shrimp Scampi **Number of Servings:** 10

Cost per Serving: 10)_____

Ingredient	**Recipe Quantity**			**Cost**			**Total Cost**
	Weight	**Volume**	**Count**	**APC/ Unit**	**Yield Percent**	**EPC/ Unit**	
olive oil		5 tablespoons		$29.99/ 102 fluid ounces	100%		1)
butter		10 tablespoons		$2.57/8 ounces	100%		2)
minced garlic	1.75 ounces			$4.48/ 1.25 pounds	87%		3)
large shrimp prawns	3.25 pounds			$15.98/ pound	100%		4)
dry white wine		4 fluid ounces		$14.99/ 750 milliliters	100%		5)
lemon juice		5 tablespoons		$6.69 gallon	100%		6)
chopped parsley		$\frac{1}{2}$ cup		$0.75/ ounce	76%		7)
salt		$\frac{1}{4}$ teaspoon		$9.15/4 pounds	100%		8)
Cost						**Total Recipe**	9)

Appendix - Answer Keys to Assignments

Chapter 1 – Word Problems

1) $1542.27
2) 27 boxes
3) $102.74
4) 3.75 pints
5) 19.25 pounds
6) $4.25
7) $231.06
8) 31.25 grams
9) $542.50
10) 825 guests
11) $705.12
12) 79.125 pounds
13) $115
14) 2.75 pounds
15) 34 bunches
16) 19.4 fluid ounces
17) 8 chairs
18) 24 pounds
19) 28.4 pounds
20) 7.5 ounces

Chapter 2 – Fractions

1) $8\frac{1}{3}$ cups

2) $9\frac{3}{4}$ teaspoons

3) $7\frac{1}{4}$ cups

4) 18 pieces

5) $1\frac{3}{4}$ cups

6) $1\frac{7}{8}$ quarts

7) 40 slices

8) $3\frac{3}{4}$ teaspoons

9) 17 servings

10) $36\frac{1}{2}$ fluid ounces

11) 2 tablespoons

12) $\frac{1}{3}$ cup

13) 48 sticks

14) $7\frac{1}{2}$ sticks

15) 7 tablespoons

16) $\frac{5}{8}$ pint

17) $6\frac{1}{2}$ ounces

18) $2\frac{3}{4}$ cups

19) $9\frac{1}{3}$ cups

20) $3\frac{1}{4}$ sticks

21) 6 fluid ounces

22) 14 pieces

23) $\frac{2}{3}$ cup

24) $2\frac{1}{4}$ cups

Chapter 3 – Ratios and Proportions

1) $2\frac{2}{3}$ cups

2) 12 tablespoons

3) $\frac{3}{4}$ cup

4) $\frac{3}{8}$ cup

5) $\frac{3}{4}$ cup

6) 4.5 or $4\frac{1}{2}$ pounds

7) $1.07

8) $13.49

9) $11

10) $21

11) $10.64

12) $6.54

13) the 40-fluid ounce bottle

14) the 32-fluid ounce bottle
15) the 32-ounce bottle
16) the 29-ounce can
17) the 5-pound bag
18) the 64-ounce box

Chapter 4 – Changing Recipe Yields

Cookies

$\frac{1}{2}$ cup butter, softened
$\frac{3}{8}$ cup white sugar
$\frac{3}{4}$ cup packed brown sugar
1 egg
$\frac{1}{2}$ teaspoon vanilla extract
1 cup all-purpose flour
$\frac{1}{2}$ teaspoon baking powder
$\frac{1}{2}$ teaspoon salt
$\frac{3}{4}$ teaspoon ground cinnamon
$1\frac{1}{2}$ cups quick cooking oats

Chicken Wing Sauce

$1\frac{1}{4}$ cups honey
10 tablespoons soy sauce
10 large garlic cloves, crushed
$2\frac{1}{2}$ tablespoons fresh ginger, finely sliced
$1\frac{1}{4}$ teaspoons chili powder
$1\frac{1}{4}$ teaspoons cinnamon
$\frac{5}{8}$ teaspoon cloves
$\frac{5}{8}$ cup water
$2\frac{1}{2}$ teaspoons corn starch

Sauteed Green Beans

3 tablespoons olive oil
$\frac{3}{4}$ teaspoon red pepper flakes
$\frac{3}{4}$ teaspoon dried cilantro
$2\frac{1}{4}$ pounds green beans, trimmed
3 garlic cloves, minced

$\frac{3}{4}$ teaspoon salt
3 tablespoons water

Chapter 5 – Recipe Ratios

1) 1 cup rice
$2\frac{1}{2}$ cups water
2) $\frac{3}{4}$ cup carrots
$\frac{3}{4}$ cup celery
$1\frac{1}{2}$ cups onions
3) $\frac{1}{2}$ cup vinegar
$1\frac{1}{2}$ cup oil
4) $4\frac{1}{2}$ cups orange juice
$4\frac{1}{2}$ cups pineapple juice
6 cups ginger ale
12 cups cranberry juice
5) 2.5 pounds sugar
5 pounds butter
7.5 pounds flour
6) $\frac{1}{2}$ cup vinegar

$\frac{3}{4}$ cup soy sauce
$\frac{3}{4}$ cup lemon juice
1 cup brown sugar
2 cups olive oil
7) 0.5 pound onions
1 pound red peppers
2.5 pounds potatoes

Chapter 6 – Percentages

1) 90 people
2) 65 ounces
3) $27.41
4) 12 pounds
5) 20%
6) $0.04
7) 25%
8) $240
9) 24.07%
10) 12.76 pounds
11) 60 people
12) $42.48
13) 16.67%
14) 4.67%
15) $143.20
16) $31.16
17) 74.63 ounces
18) 8.33%

Chapter 7 – Costs and Budgeting

1) $22,697.04
2) $1750
3) $224,000
4) $6750
5) $684.50
6a) $8.88
6b) $38.49
7a) $193
7b) $1158
8a) $2785
8b) 7.24%
9) $600
10a) $4005
10b) $48,060
11a) $39
11b) $780

Chapter 8 – Common Measurements

1) 40 fluid ounces
2) 96 tablespoons
3) 8 cups
4) 96 teaspoons
5) 32 pints
6) $\frac{3}{4}$ gallon
7) 84 ounces
8) 1.5 pounds
9) 14 cups
10) 252 teaspoons

11) 2 fluid ounces
12) 2.25 pounds
13) 44 ounces
14) $1\frac{1}{4}$ cup
15) $1\frac{1}{2}$ pints
16) 3 quarts
17) $1\frac{1}{4}$ gallons
18) 32 cups
19) 144 fluid ounces
20) 3 fluid ounces

Chapter 9 – Metric System

1) A
2) C
3) B
4) B
5) A
6) C
7) C
8) C
9) 13,000 grams
10) 4.587 kilograms
11) 0.032 kilogram
12) 46,000 milliliters
13) 6.703 liters
14) 0.842 liter
15) 500 grams
16) 340 milliliters
17) 0.035 liter

18) 56 kilograms
19) 64 grams
20) 26,200 milliliters
21) 14,000 milliliters
22) 53,200 grams
23) 0.005 kilogram
24) 0.6 liter

Chapter 10 – Baker's Percent

1) 100% flour
100% water
50% eggs
50% butter
2) 1500 grams flour
1500 grams water
750 grams eggs
750 grams butter
3) 750 grams water
4) 600 grams butter
5) 100% flour
65% water
2% salt
1.2% yeast
6) 80 pounds flour
52 pounds water
1.6 pounds salt
0.96 pound yeast
7) 35 pounds water
8 1.25 pounds yeast

Chapter 11 – Conversions

1) 12.38 pounds
2) 26.52 pounds
3) 3.39 kilograms
4) 16.29 kilograms
5) 850.5 grams
6) 347.29 grams
7) 11.29 ounces
8) 20.04 ounces
9) 84.5 fluid ounces
10) 59.15 fluid ounces
11) 1.89 liters
12) 3.79 liters
13) 19.72 milliliters
14) 8.63 milliliters
15) 3.65 teaspoons
16) 5.48 teaspoons
17) 5443.2 *OR* 5429.86 grams
18) 88.4 *OR* 88.18 ounces
19) 6.34 pints
20) 2.37 tablespoons
21) 1.11 *OR* 1.10 pounds
22) 2.15 kilograms
23) 1.06 quarts
24) 59.16 milliliters

Chapter 12 – Volume and Weight

1) 6.75 ounces
2) 6 ounces
3) 39 tablespoons

4) 2.67 cups
5) 20 ounces
6) 0.5 ounce
7) 24 cups
8) 3 cups
9) 9.33 ounces
10) 2 ounces
11) 48 ounces
12) 16 ounces
13) 0.25 ounce
14) 680.4 grams
15) 17.64 cups
16) 64 tablespoons
17) 368.55 grams
18) 1.25 pounds
19) 21.26 grams
20) 2.13 pounds

Chapter 13 – Yield Percents

1) 0.93 pound
2) 0.71 kilogram
3) 1234.57 grams
4) 10 ounces
5) 13.58 ounces
6) 15.2 pounds
7) 15.38 ounces
8) 447.76 grams
9) 1.25 kilograms
10) 52.59 grams
11) 1.35 pounds
12) 1360 grams
13) 19.67 ounces

14) 4.73 pounds
15) 0.59 kilogram
16) 368 grams
17) 3.26 pounds
18) 93.33 ounces
19) 4.37 pounds
20) 1063.83 grams

Chapter 14 – Edible Cost Portion

1) $1.32 per pound
2) $1.39 per pound
3) $2.93 per pound
4) $8.92 per pound
5) $3.54 per pound
6) $3.45 per pound
7) $1.36 per pound
8) $3.33 per pound
9) $2.97 per pound
10) $3.20 per pound
11) $0.27 per pound
12) $6.34 per pound
13) $0.36 per pound
14) $1.71 per pound
15) $0.84 per pound
16) $7.72 per pound
17) $3.98 per pound
18) $1.78 per pound

Chapter 15 – Costing Sheets

1) $0.74
2) $1.61
3) $0.45
4) $51.94
5) $2.37
6) $0.13
7) $0.50
8) $0.01
9) $57.75
10) $5.78