A review of basic mathematics operations is presented with problems and examples applied to activities in the food service industry. The text is divided into eight units: measurement, fractions, arithmetic operations, money and decimals, percentage, ratio and proportion, wages and taxes, and business records. Each unit contains a series of lessons which follow the format of stated objectives, background information, demonstration or procedure, and assignments. Recipes, guest checks, tax forms, and inventory sheets accompany many of the lessons and serve as worksheets for doing the assignments. A conversion chart showing the number of ounces necessary to make tablespoons, cups, pints, and quarts for many foods is included. (KJ)
mathematics for COMMERCIAL FOODS

WERSAN - INSTRUCTOR
SEX COUNTY VOCATIONAL AND TECHNICAL HIGH SCHOOLS
UNSWICK, NEW JERSEY
MATHEMATICS
FOR
COMMERCIAL FOODS

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I wish to express my thanks to a number of people:

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To Mabel Latino for her text, “Mathematics for Cosmetology,” which has provided a wealth of new ideas and material which I have used in class and in this text.

To Mrs. Mary Baumlin, Commercial Foods teacher and Melvin Bogdany, Baking teacher, for their help with recipes and pricing.

To Mr. James Schofield, Commercial Art Shop teacher, and to his students, for preparing the front cover.

To Dr. J. Henry Zanzalari, Superintendent of Schools of the Middlesex County Vocational and Technical High School system, who has encouraged the development of new materials for vocational and technical education.

To the students in my classes, who have helped by using this material and making suggestions for its improvement.
To the Teacher

This text is intended to be used in the tenth year. It is the product of a number of years of teaching related mathematics. It is an attempt to improve the basic skills of the student while at the same time relating them to the student’s shop experience. The author has attempted to reinforce each basic skill by relating it to a shop problem.

The order of the material presented is the order that the author has found most practical in actual classroom work. The work on measurements, which starts the book, is essential to recipe work. Fractions are needed early for the same reason. Then it’s on with the material that generally starts off as more conventional text.

The author recommends working on income tax material in the text when supplemental material is available through the “Teaching Taxes program” issued by the IRS during January and February of each new year.

This is by no means a complete text. Each time the author has used the material, additions have been made to better prepare the student for the assignments.

The use of transparencies made from pages in the text is recommended. Pre- and post-tests, although not included, are well worth considering. The author has included material for bakers, although in a very limited way, because of class composition in his own school.

Your comments and suggestions are most welcome.

Norman Wersan
To the Student

Some knowledge of mathematics is necessary for every occupation, and Commercial Foods is no exception. You may have to change recipes, measure quantities of materials, fill out guest checks, operate the cash register, purchase foods, keep an inventory, and certainly receive wages and pay taxes. All these activities use mathematics.

This textbook provides a review of the basic math operations so essential to doing any mathematics work. In each unit the basic mathematics is applied to activities you will be doing in the food-service industry. There will be word problems and forms to fill out similar to the forms used in cafeterias and restaurants. All of the math in this book should be of help to you in your career.
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Conversion Chart for Common Food Items 248
UNIT I - MEASUREMENT

Lesson 1

Introduction

Objective: You will learn the importance of standard measuring devices in commercial foods.

Related Information:

Suppose you had a recipe that called for a tablespoonful of dry mustard. What if you didn’t have a standard tablespoon? Suppose Company A made nice big tablespoons, and Company B made small tablespoons, and Companies C, D, and X each put out a different size. Would it make any difference in your recipe which tablespoon you had on hand? You bet it would!

In this world of ours, where everything from recipes to space-exploring vehicles depends upon measurements of one sort or another, standard measurements are absolutely essential. An inch must equal the same distance in California as in New Jersey; a pound must have the same weight in Oregon as in Florida; a pint must hold the same amount wherever you happen to be. If it were not so, no one could ever be sure of getting the same result as anyone else, whatever he or she tried to do. Machinery wouldn't work right, cars wouldn't run, buildings, wouldn't stand straight....The world would be a mess!

The problem is that, while all countries have standardized their own measurements, they do not all use the same units of measurement. We in the United States have the English system, based on pounds, quarts, and feet, while most of the countries of the world have adopted the metric system, based on grams, liters, and meters. Our country is expected to gradually change over to the metric system because of its simplicity. It is also a fact that many countries refuse to buy our machinery because it is not metric, and this has hurt our industries.

Our country has set up a Bureau of Standards in Washington, D.C., where there is the most accurate measuring equipment, along with the standards which all manufacturers use as a check on their products. When companies make scales, weights, containers, etc., their design is based on the standards kept in Washington.

WHY IS A STANDARD IMPORTANT?

The term “cup” is used very loosely. We know that coffee cups vary in size, shape, and capacity, and yet they are all called cups. We cannot use these for accurate measurement in commercial foods. We must depend on commercially purchased measuring cups that are accurate.

If you measure your own weight and are off an ounce or more, it would not make much difference, but in weighing portions out, you must be accurate to the fraction of an ounce in some cases.
BASIC PRINCIPLES

1. We must select a measuring device which will be accurate enough for the job we assign it.

2. In general, the smaller the measurement we are making, the more accurate the measuring device must be.

3. A measuring device is only as good as the accuracy with which it is used.

4. Measuring devices must be periodically checked for accuracy and adjusted if necessary.

In the following pages we will discuss the various types of measures and measuring equipment in common use in commercial foods.
UNIT I – MEASUREMENT

Lesson 2 Units of Count

Objective: You will gain skill in converting various units of count to other units.

Related Information:

Items for commercial establishments are usually purchased in large quantities. Many are purchased by count. For that reason we must learn the various types of units we will deal with and how to convert from one to another.

Units of Count (abbreviations in brackets)

- 2 pieces (or units) = 1 pair (pr)
- 12 pieces (or units) = 1 dozen (doz)
- 12 dozen = 1 gross (gr)
- 144 pieces (or units) = 1 gross
- 12 gross = 1 great gross (gt gr)

Very often we need to convert from one unit to another. Sometimes we are puzzled as to whether to multiply or divide. Whatever type of measurement we are dealing with, we need only remember this general principle: There will always be more of a smaller unit, so we multiply; there will always be fewer of a large unit, so we divide.

For example: How many pieces are there in 3 dozen? Well, a piece is a smaller unit than a dozen, so we multiply.

3 dozen × 12 pieces in a dozen = 36 pieces

How many gross in 42 dozen? In this case, a gross is a larger unit than a dozen, so we divide.

\[
\frac{42 \text{ dozen}}{12 \text{ dozen in a gross}} = 3\frac{1}{2} \text{ gross}
\]

ASSIGNMENT

1. How many dozen in a gross?
2. How many eggs to a case? (30 dozen to a case)
3. How many pieces in a gross and a half?
4. If you needed 500 eggs, how many dozen would you need?
5. How many cases would you have to order for problem #4?
6. How many dozen in 3 gross?
7. Write 4\frac{1}{2} gross in terms of dozens.
8. 468 dozen equals how many gross?
9. 216 units equals how many dozen?
10. 1,152 units equals how many gross?

11. 7-ounce cups cost $4.40 a dozen. 
   How much would 6 dozen cost?

12. 9-inch dinner plates cost $6.60 a dozen. 
   How much would a gross and a half cost?

13. 10-ounce water tumblers cost $1.70 a dozen. 
   How much would 3 gross cost us?

14. Serrated-blade knives cost $2.40 a dozen. 
   How much are they per knife?

15. In lots of 1 to 11 dozen, plain-blade knives cost $8.20 a dozen. 
    In lots of 12 to 39 dozen, they cost $8.00 a dozen. 
    
    a. Difference in cost per dozen? 
    b. Difference in cost per knife?
UNIT I — MEASUREMENT

Lesson 3  Ways of Measuring Ingredients

Objectives: You will understand two of the main ways that ingredients can be measured. You will know the principal units in each type of measurement. You will understand the difference between fluid ounces and ounces of weight.

Related Information:

Anyone in the foods trade must know measurements.

There are two main ways of measuring ingredients — by capacity (the size of the container) and by weight (on a scale). Capacity includes both liquid and dry measures.

Ways of Measuring Ingredients

1. By capacity ,
   a. Liquid  teaspoons, tablespoons, ounces, cups, pints, quarts, gallons (or cubic centimeters and liters).
   b. Dry

2. By weight — ounces and pounds (or grams and kilograms)

Now all of this would be clear enough except for one bad actor, known as the ounce. The ounce is really two different measures. Four ounces of cocoa would be weighed on a scale. Four "ounces" of vanilla really means 4 fluid (liquid) ounces, and would be measured out with a measuring cup. Ounces used to measure liquids are really fluid ounces, but the word "fluid" is often left out. Confusing, isn't it?

It is perfectly true that, for many substances, one fluid ounce weighs just about one ounce on a scale, but this is only approximate. You should understand that the fluid ounce measures capacity (volume, or size), while the regular ounce measures weight.

PREASSIGNMENT:
Check as many places as apply to the following measures:

<table>
<thead>
<tr>
<th></th>
<th>Unit of:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Weight</td>
</tr>
<tr>
<td>1.</td>
<td>Quart</td>
</tr>
<tr>
<td>2.</td>
<td>Pound</td>
</tr>
<tr>
<td>3.</td>
<td>Ounce</td>
</tr>
</tbody>
</table>
ASSIGNMENT:

<table>
<thead>
<tr>
<th>Unit of:</th>
<th>Weight</th>
<th>Liquid Measure</th>
<th>Dry Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Tablespoon</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Gallon</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Gram</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Liter</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Pint</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Cubic centimeter</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. 2 ounces</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Cup</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Kilogram</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. 4 teaspoons</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. 6 pounds</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. 3 fluid ounces</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. 4 ounces</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. 2 cups</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. 10 pounds</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Objective: You will review the different units of liquid and dry measure, commonly used in the foods trade, and gain skill in converting from one unit to another.

Related Information:

Milk, water, oil, sauces, mayonnaise, soup stock, and similar liquid ingredients are generally measured by capacity (volume) rather than by weight. Dry ingredients such as salt, pepper, and spices are almost always measured by capacity, and such foods as chopped raw vegetables and fruits are often measured out rather than weighed.

The same measurements can be used for both liquid and dry ingredients. Some sizes are more likely to be used for one than for the other, but all can be used for either. You could, for example, have a teaspoon of vanilla as well as a teaspoon of salt. You could have a quart of milk or a quart of chopped celery. You could have a cup of rice as well as a cup of salad oil. In measuring dry ingredients, you know that the surface must be level if the measurement is to be accurate.

The following table of measurements should be memorized, except for the last two items, which you would not normally have to know.

<table>
<thead>
<tr>
<th>Table of Capacity Equivalents – Liquid and Dry Measure (Abbreviations in brackets)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 teaspoons (t) = 1 tablespoon (T)</td>
</tr>
<tr>
<td>2 tablespoons                         = 1 fluid ounce (oz)</td>
</tr>
<tr>
<td>8 fluid ounces                        = 1 cup (c)</td>
</tr>
<tr>
<td>16 tablespoons                        = 1 cup</td>
</tr>
<tr>
<td>2 cups                                = 1 pint (pt)</td>
</tr>
<tr>
<td>16 fluid ounces                       = 1 pint</td>
</tr>
<tr>
<td>2 pints                               = 1 quart (qt)</td>
</tr>
<tr>
<td>4 quarts                              = 1 gallon (gal)</td>
</tr>
<tr>
<td>128 ounces                            = 1 gal</td>
</tr>
<tr>
<td>4 gills                               = 1 pt</td>
</tr>
</tbody>
</table>

When converting from one measure to another, remember that you multiply to get more of a smaller measure, and you divide to get fewer of a larger measure.

PRE-ASSIGNMENT

1. How many pints in 3 quarts? 

2. How many cups in 2 gallons? 

3. How many ounces in 8 tablespoons?
ASSIGNMENT:

A. Find the number of:

1. pints in 5 qts
2. cups in 3 qts
3. teaspoons in 2T
4. quarts in 10 pts
5. pints in 4 gal
6. pints in 13 c
7. tablespoons in 2 c
8. quarts in 3 gal
9. ounces in 10T
10. quarts in 2.5 gal
11. quarts in 6 gal 1 qt
12. cups in 5 pts.
13. gallons in 12 pts.
14. teaspoons in ½ c
15. cups in 3½ qts
16. cups in 16 oz
17. quarts in 9 pts
18. ounces in 6 t
19. quarts in 14 pts
20. ounces in 3 pts
21. gallons in 10 qts
22. tablespoons in ¾ c
23. gallons in 15 qts
24. ounces in 2½ c
25. ounces in 6 T
26. cups in 10 oz
27. tablespoons in 12 t
28. pints in 2 gal
29. teaspoons in 6 T
30. cups in 8 T

B. Express the following measurements as indicated:

1. 3½ cups to the nearest quart
2. 4 gal 1 qt. to the nearest gallon
3. 3½ pints to the nearest quart
4. 6 gal 3 qts to the nearest gallon
5. 9 qts ½ pint to the nearest quart
6. 15 cups to the nearest quart
A Puzzle for You

Here is a chart full of measurements. Each is equal to one or more of the other measurements. Fill in the letters of any other measurement equal to those of the letters listed below.

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4 cup</td>
<td>3 cups</td>
<td>2 qt.</td>
<td>3/4 cup</td>
<td>1 tsp.</td>
</tr>
<tr>
<td>F</td>
<td>G</td>
<td>H</td>
<td>I</td>
<td>J</td>
</tr>
<tr>
<td>1/2 cup</td>
<td>16 oz.</td>
<td>3 tsp.</td>
<td>4 oz.</td>
<td></td>
</tr>
<tr>
<td>K</td>
<td>L</td>
<td>M</td>
<td>N</td>
<td>O</td>
</tr>
<tr>
<td>1 oz.</td>
<td>2 cups</td>
<td>2 pt.</td>
<td>8 oz.</td>
<td>4 qt.</td>
</tr>
<tr>
<td>P</td>
<td>Q</td>
<td>R</td>
<td>S</td>
<td>T</td>
</tr>
<tr>
<td>32 oz.</td>
<td>1 gal.</td>
<td>2 oz.</td>
<td>1/2 pt.</td>
<td>1/2 oz.</td>
</tr>
<tr>
<td>U</td>
<td>V</td>
<td>W</td>
<td>X</td>
<td>Y</td>
</tr>
<tr>
<td>1 cup</td>
<td>4 pts.</td>
<td>6 oz.</td>
<td>2 tbsp.</td>
<td>1 pt.</td>
</tr>
</tbody>
</table>

A. _______ I. _______ K. _______ R. _______
B. _______ J. _______ L. _______ S. _______
C. _______ K. _______ M. _______ T. _______
D. _______ L. _______ N. _______ U. _______
E. _______ M. _______ O. _______ V. _______
F. _______ N. _______ P. _______ W. _______
G. _______ O. _______ Q. _______ X. _______
H. _______ P. _______ Q. _______ Y. _______
UNIT I – MEASUREMENT

Lesson 5

Objectives: You will review the units of weight.
You will learn the different types of scales used in the foods trade.
You will learn several ways of measuring weight indirectly.

Related Information:

There is much less confusion in measuring by weight than by capacity. We know that 16 ounces equals 1 pound. Someday soon we will deal with grams and kilograms, but until that time comes we will

1. Multiply by 16 to convert pounds to ounces.
2. Divide by 16 to convert ounces to pounds.

Various types of scales are used in the foods trade.

Platform scale. This is a large scale used to weigh heavy quantities.

The items may be moved onto the scale by a hand truck. Everyone must get off the scale to take the reading. Another method of using the platform scale is to leave the hand truck on the scale so you save energy (and your back) and after taking the reading subtract the weight of the hand truck from the total weight.

Total weight on the dial: 245 lbs.
The hand truck weighs: 42 lb.
Therefore the material weighs: 203 lbs.

Balance scale. Used by bakers. Weights (metal pieces) are put on one side of the scale, and a pan on the other. When the scale balances you have the accurate weight. The weights may be in pounds, and the ounces can be read off on a sliding beam beneath the scale. Your instructor will demonstrate this scale.

Spring scale. Commonly used in the shop. Different types may be purchased, able to handle light or heavy weights. Spring scales may have special designs, such as the vegetable scale, or butcher scale.

Sometimes in the foods trade we weigh foods indirectly. Since a quart of many common substances (particularly liquids) weighs about 2 pounds, the cook is often able to weigh liquids by measuring them. (One can also measure liquids by weighing them – if it happens to be more convenient.) For most recipes this is accurate enough.
Example: A recipe calls for 3 qts... Weigh 6 pounds of the liquid.

Example: A recipe calls for 4 lbs of water... Measure 2 quarts.

In the same way, scoop sizes are a measure of capacity, but can be used roughly as a measure of weight. The number on the scoop tells how many of that size scoop make up a quart.

### Scoop and Dipper Sizes

<table>
<thead>
<tr>
<th>Scoop number</th>
<th>Approximate weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>5 oz.</td>
</tr>
<tr>
<td>10</td>
<td>4 oz.</td>
</tr>
<tr>
<td>12</td>
<td>3 oz.</td>
</tr>
<tr>
<td>16</td>
<td>2-2 1/2 oz.</td>
</tr>
<tr>
<td>20</td>
<td>1 2/3 oz.</td>
</tr>
<tr>
<td>24</td>
<td>1 1/2 oz.</td>
</tr>
<tr>
<td>30</td>
<td>1 1/4 oz.</td>
</tr>
<tr>
<td>40</td>
<td>1 oz.</td>
</tr>
</tbody>
</table>

Ladles also are a measure of capacity. They too can be used to get an approximate weight of many substances.

### Ladle Sizes and Approximate Weights

<table>
<thead>
<tr>
<th>Ladle size</th>
<th>Approximate Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>¼ cup</td>
<td>2 oz.</td>
</tr>
<tr>
<td>½ cup</td>
<td>4 oz.</td>
</tr>
<tr>
<td>⅜ cup</td>
<td>6 oz.</td>
</tr>
<tr>
<td>1 cup</td>
<td>8 oz.</td>
</tr>
</tbody>
</table>

**Counting by weight**

You can make mathematics work for you and save time and effort when you have to count something. Assume someone wants to buy 200 of some item, say cookies. We sell cookies by the pound, not by the count.

**Procedure:**
Place cookies one at a time on the scale until the scale reads one pound. Let us assume you counted 22 cookies. Therefore there are 22 cookies in one pound.

But the customer wants 200 cookies.

If you know how to work a proportion (we'll study proportion later), the easy way to get the proper number of pounds required is:
\[
\frac{22 \text{ cookies}}{1 \text{ pound}} = \frac{200 \text{ cookies (wanted)}}{N \text{ pounds}}
\]

\[
22N = 200
\]

\[
N = 9 \text{ pounds (approx.)}
\]

So you can weigh out 9 pounds of cookies and the customer will get about 200 of them.

Three of the most common ingredients used in cooking are sugar, fat, and flour. It happens that we can get fairly accurate weights of the three by using measures of capacity. Sometimes we will find this more convenient, and for many recipes the capacity measurements are accurate enough.

Approximate Equivalents

- 2 cups water or milk = 1 pound
- 2 cups sugar (plus a little more) = 1 pound
- 2 cups fat (plus a little more) = 1 pound
- But 4 cups flour = 1 pound

ASSIGNMENT:

1. How many ounces in a pound?
2. How many pounds in 40 ounces?
3. How many ounces in 5 pounds?
4. How many ounces in 10 pounds?
5. How many pounds in 12 ounces?
6. How many cups in a pound of fat?
7. How many cups of sifted flour in 1 pound of flour?
8. How many cups in 3 pounds of sugar?
9. A recipe calls for 2 pounds of milk. How many cups is that?
10. How many quarts of sifted flour are needed for a recipe calling for 8 lbs of flour?
Objective: You will gain skill in solving time problems that can arise in commercial foods establishments.

Related Information:

Time plays an important role in the operation of the commercial food establishment. Food is cooked for a certain length of time; you work and get paid by the hour; time schedules for employees have to be made out; and many of the activities you do involve a specified length of time. In a later unit you will be asked to time an operation in the shop and learn the importance of time and its relation to the cost of operating the shop.

Time Measures

<table>
<thead>
<tr>
<th>Time Unit</th>
<th>Equivalent Time Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>60 seconds (sec)</td>
<td>= 1 minute (min)</td>
</tr>
<tr>
<td>60 minutes</td>
<td>= 1 hour (hr)</td>
</tr>
<tr>
<td>24 hours</td>
<td>= 1 day (da)</td>
</tr>
<tr>
<td>7 days</td>
<td>= 1 week (wk)</td>
</tr>
<tr>
<td>365 days</td>
<td>= 1 year (yr)</td>
</tr>
<tr>
<td>366 days</td>
<td>= 1 leap year</td>
</tr>
<tr>
<td>360 days</td>
<td>= 1 year for purpose of figuring simple interest</td>
</tr>
<tr>
<td>¼ hour</td>
<td>= 15 minutes</td>
</tr>
<tr>
<td>½ hour</td>
<td>= 30 minutes</td>
</tr>
<tr>
<td>⅓ hour</td>
<td>= 45 minutes</td>
</tr>
</tbody>
</table>

Once again, when converting time measurements, multiply to get more of a smaller measurement, and divide to get fewer of a larger measurement.

ASSIGNMENT A:

1. How many minutes in 1½ hours?
2. 360 minutes is equal to how many hours?
3. James worked from: 6:00 to 12:00 on Monday
   6:00 to 11:30 on Tuesday
   6:00 to 1:00 on Wednesday
   5:30 to 12:00 on Thursday
   6:30 to 2:30 on Friday
   How many hours did he work this week?
4. Joan worked from: 9:00 to 5:00 on Monday
   9:00 to 5:30 on Tuesday
   9:30 to 5:00 on Wednesday
   8:30 to 5:00 on Thursday
   6:00 to 11:00 on Friday
   How many hours did she work this week?
5. What was your morning schedule in shop? Indicate what activities you were involved in and how long they lasted.

6. Select 3 different recipes and figure out about how long it would take to prepare them.

7. Calculate how long it would take to wash dishes for 100 people; for 200 people; for 500 people. Figure this out for a typical meat lunch.

TIMING MEAT COOKING:

Instructions for roasting are sometimes given as minutes per pound of meat at a given temperature.

Example: At 20 minutes roasting time per pound of beef, how much oven time will be needed for a 5½ lb. roast?

Method 1: Using decimals.

Change the 5½ to 5.5 minutes.

\[
5.5 \times 20 = 110.0 \text{ minutes} \quad \text{or 1 hour and 50 minutes}
\]

Method 2: Using fractions.

5½ is changed to \( \frac{11}{2} \)

\[
\frac{11}{2} \times 20 = \frac{220}{2} = 110 \text{ minutes} = 1 \text{ hour and 50 minutes}
\]
ASSIGNMENT B:

1. At 20 minutes roasting time per pound of beef, how much oven time will be needed for 4½ lb. roast?

2. 8 lb roast?

3. 6 lb. roast?

4. 7½ lb roast?

5. At 35 minutes per pound, how long will it take to roast a 6-pound pork cushion shoulder?

6. At 30 minutes per pound, how long will it take to roast a 14-pound fresh ham?

7. At 12 minutes per pound, how long will it take to roast a 22-pound standing beef rib roast?
UNIT 1 – MEASUREMENT

Lesson 7  Measuring Temperature

Objective: You will learn the use of temperature in commercial food.

Related Information:

The standard unit for measuring temperature is the degree. A small circle to the upper right of the number is used to indicate the degree.

80°

The standard piece of equipment for measuring temperature is the thermometer. There are two main systems of measuring temperature, the Fahrenheit (English) or Celsius (or centigrade – metric). At present the most commonly used system in this country in restaurants is the English. Someday it will be metric.

<table>
<thead>
<tr>
<th>Metric Celsius</th>
<th>English Fahrenheit</th>
</tr>
</thead>
<tbody>
<tr>
<td>100°</td>
<td>212° Water boils</td>
</tr>
<tr>
<td>98.6° Normal temp. of blood</td>
<td>32° Water freezes</td>
</tr>
<tr>
<td>0°</td>
<td>0°</td>
</tr>
</tbody>
</table>

Just as with all metric systems, the Celsius is actually easier to use. Note above that the freezing point is 0°C, while it is 32°F in the English system. (Note that C or F is placed next to a temperature reading to indicate which system it is in.) The boiling point is 100°C or 212°F.
How to change from Celsius to Fahrenheit.

There is a formula for converting any temperature given in Celsius to Fahrenheit. It is

\[ F = \frac{9}{5}C + 32 \]

Example: Convert 50° Celsius to Fahrenheit.

\[ F = \frac{9}{5} \times 50 + 32 \]
\[ F = \frac{450}{5} + 32 \]
\[ F = 90 + 32 \]
\[ F = 112° \]

How to change from Fahrenheit to Celsius.

The formula for changing from Fahrenheit to Celsius is

\[ C = \frac{5}{9} (F - 32) \]

Example: What is the normal body temperature in degrees Celsius?

\[ C = \frac{5}{9} (98.6 - 32) \]
\[ C = \frac{5}{9} (66.6) \]
\[ C = \frac{333}{9} \]
\[ C = 37° \]

ASSIGNMENT

A. Change the following Celsius (Centigrade) temperatures to Fahrenheit:

1. 37°
2. 45°
3. 200°
4. 22°
5. 0°
B. Change the following Fahrenheit temperatures to Celsius (Centigrade):

1. 350°
2. 32°
3. 70°
4. 212°
5. 0°
Objective: You will learn what "tolerance" means in recipes. You will learn to round off numbers.

Related Information:

A scientist or engineer needs to have extremely accurate numbers in his work. In the foods trades, however, great accuracy is not usually required.

By tolerance we mean the degree of accuracy of any measurement — just how exact the measurement has to be.

At different times we need different degrees of accuracy. When it comes to the manufacture of parts for a mixer or slicer, in order for the machine to operate smoothly for many years the parts must be made very accurately. In making a macaroni-cheese casserole, however, the measurements may be quite rough and the casserole will still taste good.

Experience plays an important part in applying tolerance in Commercial Foods. Part of this experience is taste. Each restaurant and each cook has his or her or its own method. Part of the learning process in shop is to gain the experience necessary to judge tolerance, i.e., how far can I be off in whatever I am making and still produce a good product.

Positive and negative tolerance

Positive means we can be over a certain amount with little effect upon the resulting product. Negative means we can be under a certain amount with little effect upon the resulting product.

If we added too much salt to a recipe we would be in trouble, because it would be difficult to remove. Under such conditions it is better to play it safe and be either very accurate or on the negative side. The customer can always add salt later on.

A freezer or refrigerator could be too cold with little effect, but if it were too warm, the food might be ruined. In this case negative tolerance is more desirable, positive tolerance dangerous.

In heating substances, we should also tend to favor the negative side, since we can always heat the substance longer; but if our oven were too hot we could burn the food.
Rounding Off

Under some circumstances we need to be very accurate. In most cooking, however, this is neither practical nor desirable. We need to know our tolerance, or the amount we can vary without damaging results.

“Rounding off” means being practical in mathematics. If a recipe called for five pounds of potatoes and we had a quarter of a pound extra, we certainly would not want to throw out the extra potato. If the teacher asked us if we had five pounds, we would not state that we had 5.250 pounds, but we would round the amount off and indicate that we had five pounds.

In dealing with many of the math problems in this book, it is not necessary to keep all the numbers that result from a calculation.

Example: 2.54
\[
\begin{array}{c}
\times 2.3 \\
762 \\
508 \\
\hline
5.842
\end{array}
\]

Do we need the accuracy called for in the answer above?

That depends on what our tolerance is.

If tolerance is permitted (i.e., we do not need that great an accuracy), we should learn to round off the numbers as much as possible.

Since we may have a different tolerance for each substance we are working with, we must know the tolerance before we can decide how far to round off. Shall it be 5.842? or 5.84? or 5.8? or 6?

We will assume for the following problems that you know the tolerance. We shall only be concerned with how to round off numbers.

Rule 1: To round off any number to a specific place, observe the digit to the right of the digit in that place. If it is less than 5, leave the digit in the desired place exactly as it is and replace all digits to the right of it with zeros. (If you are working to the right of a decimal point, do not replace the digits with zeros, but simply drop them.)

Example: To round off 32 to the nearest group of tens: The digit in the tens place is 3. The digit to the right of it is 2, which is less than 5. Therefore we leave the 3 as it is and replace the 2 with a zero. The rounded-off number is therefore 30.
As you can see from the chart shown here, the 32 is closer to 30 than it is to 40.

Rule 2: If the digit to the right of the desired place is 5 or greater than 5, increase the digit in the desired place to the next higher digit and replace all following digits to the right of it with zero. (If you are working to the right of a decimal point, drop the digits rather than replacing them with zeros.)

Example: To round off 5.842 pounds to the nearest pound: The 8 in the tenths column is greater than 5; therefore we increase the 5 to 6. Since the digits to be dropped are to the right of the decimal point, we do not replace them with zeros. Our answer is 6 pounds.

PRE-ASSIGNMENT:

1. Round off to the nearest ten: 81
2. Round off to the nearest ten: 17
3. Round off to the nearest ten: 85
4. Round off to the nearest thousand: 12,847
5. Round off to the nearest pound: 10.2 pounds
6. Round off the nearest quart: 5.75 quarts
7. Round off to the nearest hundred: 298
8. Round off to the nearest cent: $10.675

ASSIGNMENT

A. Round off the following to the nearest ten:
   1. 39
   2. 25
   3. 40
   4. 136
   5. 451
   6. 52
   7. 683
   8. 88
   9. 109
  10. 498
B. Round off to the nearest hundred:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>135</td>
</tr>
<tr>
<td>2</td>
<td>647</td>
</tr>
<tr>
<td>3</td>
<td>276</td>
</tr>
<tr>
<td>4</td>
<td>355</td>
</tr>
<tr>
<td>5</td>
<td>2975</td>
</tr>
<tr>
<td>6</td>
<td>1,480</td>
</tr>
<tr>
<td>7</td>
<td>32,049</td>
</tr>
<tr>
<td>8</td>
<td>133.9</td>
</tr>
<tr>
<td>9</td>
<td>248.2</td>
</tr>
<tr>
<td>10</td>
<td>992.7</td>
</tr>
</tbody>
</table>

C. Round off to the nearest cent:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$.267</td>
</tr>
<tr>
<td>2</td>
<td>$.594</td>
</tr>
<tr>
<td>3</td>
<td>$1.316</td>
</tr>
<tr>
<td>4</td>
<td>$5.8682</td>
</tr>
<tr>
<td>5</td>
<td>$24.6754</td>
</tr>
<tr>
<td>6</td>
<td>$.643</td>
</tr>
<tr>
<td>7</td>
<td>$6.572</td>
</tr>
<tr>
<td>8</td>
<td>$.834</td>
</tr>
<tr>
<td>9</td>
<td>$14.9615</td>
</tr>
<tr>
<td>10</td>
<td>$30.2137</td>
</tr>
<tr>
<td>11</td>
<td>$6.28</td>
</tr>
<tr>
<td>12</td>
<td>$1.574</td>
</tr>
<tr>
<td>13</td>
<td>$28.28</td>
</tr>
<tr>
<td>14</td>
<td>$39.784</td>
</tr>
</tbody>
</table>

D. Round off to the nearest tenth:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.25</td>
</tr>
<tr>
<td>2</td>
<td>.87</td>
</tr>
<tr>
<td>3</td>
<td>.984</td>
</tr>
<tr>
<td>4</td>
<td>4.16</td>
</tr>
<tr>
<td>5</td>
<td>5.205</td>
</tr>
<tr>
<td>6</td>
<td>.14</td>
</tr>
<tr>
<td>7</td>
<td>.32</td>
</tr>
<tr>
<td>8</td>
<td>1.83</td>
</tr>
<tr>
<td>9</td>
<td>3.718</td>
</tr>
<tr>
<td>10</td>
<td>2.39</td>
</tr>
</tbody>
</table>

E. Round off to the nearest hundredth:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.517</td>
</tr>
<tr>
<td>2</td>
<td>.308</td>
</tr>
<tr>
<td>3</td>
<td>5.845</td>
</tr>
<tr>
<td>4</td>
<td>9.3794</td>
</tr>
<tr>
<td>5</td>
<td>15.2963</td>
</tr>
<tr>
<td>6</td>
<td>.320</td>
</tr>
<tr>
<td>7</td>
<td>.934</td>
</tr>
<tr>
<td>8</td>
<td>6.544</td>
</tr>
<tr>
<td>9</td>
<td>8.3025</td>
</tr>
<tr>
<td>10</td>
<td>14.9962</td>
</tr>
</tbody>
</table>

F. Round off to the nearest whole number:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6.3</td>
</tr>
<tr>
<td>2</td>
<td>19.4</td>
</tr>
<tr>
<td>3</td>
<td>2.09</td>
</tr>
<tr>
<td>4</td>
<td>34.28</td>
</tr>
<tr>
<td>5</td>
<td>868.26</td>
</tr>
<tr>
<td>6</td>
<td>9.6</td>
</tr>
<tr>
<td>7</td>
<td>68.5</td>
</tr>
<tr>
<td>8</td>
<td>100.81</td>
</tr>
<tr>
<td>9</td>
<td>25.989</td>
</tr>
<tr>
<td>10</td>
<td>399.704</td>
</tr>
</tbody>
</table>
UNIT I – MEASUREMENT

Lesson 9

Standard Package Sizes

Objective: At the end of this lesson you should have some idea of size number and the quantity of food in the different size containers.

Related Information:

Can and jar sizes go by numbers, as follows:

<table>
<thead>
<tr>
<th>Container Size</th>
<th>Capacity</th>
<th>Approximate Weight of Contents</th>
<th>Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>8-ounce can or jar</td>
<td>1 cup</td>
<td>8 ounces</td>
<td>Called 8-oz or buffet size. Used for fruits, vegetables, and specialties.</td>
</tr>
<tr>
<td>Picnic can</td>
<td>1½ c</td>
<td>10½ to 12 ounces</td>
<td>Used for condensed soups, some fruits, vegetables, meat and fish products, and specialties.</td>
</tr>
<tr>
<td>12-ounce can</td>
<td>1½ c</td>
<td>12 ounces</td>
<td>Used largely for vacuum-packed corn.</td>
</tr>
<tr>
<td>No. 300 can</td>
<td>1⅛ c</td>
<td>14 to 16 oz</td>
<td>Commonly called the “1-pound” can. Pork and beans, baked beans, meat products, specialties.</td>
</tr>
<tr>
<td>No. 303 can, jar</td>
<td>2 c</td>
<td>16 to 17 oz</td>
<td>Often called the 16- or 17-oz can or jar. Fruits, vegetables, meats, ready-to-serve soups, and specialties.</td>
</tr>
<tr>
<td>No. 2 can</td>
<td>2½ c</td>
<td>20 oz</td>
<td>Juices, ready-to-serve soups, pineapple, apple slices, some specialties.</td>
</tr>
<tr>
<td>No. 2½ can, jar</td>
<td>3½ c</td>
<td>17 to 29 oz</td>
<td>Fruits, some vegetables (pumpkin, sauerkraut, spinach and other greens, tomatoes).</td>
</tr>
<tr>
<td>No. 5 can</td>
<td>1 qt</td>
<td>3 lbs</td>
<td>Fruit juices, chopped clams, and soups.</td>
</tr>
<tr>
<td>46-ounce can</td>
<td>5½ c</td>
<td>51 oz</td>
<td>Fruit and fruit juices, whole chicken, pork and beans, condensed soup.</td>
</tr>
<tr>
<td>No. 10 can</td>
<td>3 qts</td>
<td>6½ to 7½ lbs</td>
<td>Restaurant and institutional size. Fruits, vegetables, entrees.</td>
</tr>
</tbody>
</table>
Additional information:  
No. 2 can comes 24 to the case.  
No. 2 ½ can comes 24 to the case.  
No. 5 can comes 12 to the case.  
No. 10 can comes 6 to the case.  

ASSIGNMENT:  
1. What is the most commonly used can size in restaurants and institutions?  
2. What can size is approximately half the size of the No. 10?  
3. How many No. 10 cans are there in a case?  
4. How many cups are in a No. 10 can?  
5. What is the difference in number of cups between No. 303 can and a No. 2 can?  
6. What sizes of cans are commonly used for fruit juices?  
7. Sauerkraut often comes packed in can size.  
8. Does the No. 2 ½ can contain 2 ½ cups?  If not, how many cups?  
9. How many No. 2 cans are usually packed in a case?  
10. You need 12 ounces of corn; what size can would you select?  
Objective: You will learn how to use a portion-control chart.

Related Information:

Determining what to charge a customer and doing it accurately enough to make certain of a profit is not difficult, but it does require the gathering of certain facts.

In order to set prices, the restaurant owner uses standard recipes. This gives control over the type of materials and the quantities going into any one serving.

It is one thing to prepare a large batch of soup, but if we use the wrong size bowl to serve it, we may wind up short as a result of serving too much, or over if we use too small a container. To prevent this, portion control must be exercised.

Portion control means giving out food in quantities that are accurate, or controlled.

By having small containers (paper or plastic cups) prepared ahead of time with juice, syrup, catsup, mustard, etc. time is saved on the food-serving line, and less waste results.

The following chart and exercise will give you some practice in the use of charts and will also provide information necessary for determining costs:

**PORTIONING CHARTS**

<table>
<thead>
<tr>
<th>(1) Product</th>
<th>(2) Size</th>
<th>(3) Yield</th>
<th>(4) No. of Servings</th>
<th>(5) Weight or Count of Portion</th>
<th>(6) Cup No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beans, lína</td>
<td>No. 10</td>
<td>72 oz.</td>
<td>28</td>
<td>2½ oz.</td>
<td>400</td>
</tr>
<tr>
<td>Beets, Harvard</td>
<td>No. 10</td>
<td>80 oz.</td>
<td>20</td>
<td>4 oz.</td>
<td>400</td>
</tr>
<tr>
<td>Carrots</td>
<td>No. 10</td>
<td>72 oz.</td>
<td>28</td>
<td>2½ oz.</td>
<td>400</td>
</tr>
<tr>
<td>Cauliflower, fresh</td>
<td>Head</td>
<td>2½ lb.</td>
<td>10</td>
<td>4 oz</td>
<td>—</td>
</tr>
<tr>
<td>Corn, creamed</td>
<td>No. 10</td>
<td>96 oz.</td>
<td>24</td>
<td>4 oz</td>
<td>400</td>
</tr>
<tr>
<td>Corn, kernels</td>
<td>No. 10</td>
<td>72 oz.</td>
<td>24</td>
<td>3 oz</td>
<td>400</td>
</tr>
<tr>
<td>Peas</td>
<td>No. 10</td>
<td>72 oz.</td>
<td>24</td>
<td>3 oz</td>
<td>400</td>
</tr>
</tbody>
</table>
## Fruit Desserts

<table>
<thead>
<tr>
<th>(1) Product</th>
<th>(2) Size</th>
<th>(3) Yield</th>
<th>(4) No. of Servings</th>
<th>(5) Weight or Count of Portion</th>
<th>(6) Cup No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apricots</td>
<td>No. 10</td>
<td>86 pc.</td>
<td>17</td>
<td>5 pc.</td>
<td>550</td>
</tr>
<tr>
<td>Cherries</td>
<td>No. 10</td>
<td>300 pcs.</td>
<td>43</td>
<td>7 pc.</td>
<td>550</td>
</tr>
<tr>
<td>Peach halves</td>
<td>No. 10</td>
<td>38 pc.</td>
<td>19</td>
<td>2 pc.</td>
<td>550</td>
</tr>
<tr>
<td>Plum halves</td>
<td>No. 10</td>
<td>38 pc.</td>
<td>13</td>
<td>3 pc.</td>
<td>550</td>
</tr>
<tr>
<td>Peaches, sliced</td>
<td>No. 10</td>
<td>106 oz.</td>
<td>21</td>
<td>5 oz.</td>
<td>550</td>
</tr>
<tr>
<td>Prunes, stewed</td>
<td>No. 10</td>
<td>112 oz.</td>
<td>28</td>
<td>6 pc.</td>
<td>550</td>
</tr>
<tr>
<td>Strawberries, fresh</td>
<td>Qt.</td>
<td>20 oz.</td>
<td>7</td>
<td>3 oz.</td>
<td>550</td>
</tr>
</tbody>
</table>

### Reading the Chart:

1. Column 1 gives the name of the product.
2. Column 2 indicates the probable size of the can that you will have on the shelf.
3. Column 3 indicates the weight of the particular item.
4. Column 4 indicates the number of servings from a can or container.
5. Column 5 indicates the amount in each serving — weight or number of pieces.
6. Column 6 indicates the size of paper container suggested for that product.

### Example:

Peaches, sliced  
No. 10  
106 oz.  
21  
5 oz.  
550

Note: Peach halves are easy to measure, but slices are not. Therefore for peach halves we might call for two, but for slices, weight or capacity must be used.

1. What size container do the peaches usually come in? **#10**
2. What is the usual weight of the contents of the can? **106 oz**
3. How many servings can you get from one can, assuming 5 oz. per serving? **21**
4. What size paper cup is suggested? **#550**

There is a standard code system adopted by the paper-container industry:

- A No. 400 cup holds 4 fluid ounces of liquid.
- A No. 550 cup holds 5 1/2 fluid ounces of liquid.
- A No. 100 cup holds 1 fluid ounce of liquid.
- A No. 075 cup holds 3/4 fluid ounce of liquid.
- A No. 050 cup holds 1/2 fluid ounce of liquid.

5. How many fluid ounces of peach slices would be a serving? **5 1/2**
ASSIGNMENT A:

1. How many servings of peach halves can we get from a No. 10 can?
2. How many peach halves go into a standard portion of peaches?
3. Strawberries are usually purchased by the
4. What size cup would you use for stewed prunes?
5. How many apricots (canned) are in a standard portion?
6. How many servings can be made from a No. 10 can of corn kernels?
7. How many ounces of canned peas equals a standard portion?
8. What size cup would you use for canned Harvard beets?
9. How many ounces of carrots to a standard serving?
10. How many servings can we get from a 2½-lb head of cauliflower?

How would we figure out the cost per serving of peach halves?

1. Looking on the chart, we find we use 2 peach halves to a standard portion.
2. We find that there are 19 servings in a number 10 can.
3. We look up the price of the No. 10 can of peaches. Let’s say our chart shows 6 No. 10 cans of peaches (a case) cost $10.74.

\[
\begin{align*}
  6 \times \frac{10.74}{1} &= \$1.79 \text{ per } \#10 \text{ can} \\
  19 \text{ servings in a } \#10 \text{ can} \\
  \frac{19}{1.79} &= \$0.094 \\
  \$0.09 \text{ per serving (rounded off)}
\end{align*}
\]

ASSIGNMENT B:

Find the cost of an individual serving of:

1. Creamed corn. Cost per case of #10 cans is $6.38.
2. Apricots. Cost per case of #10 cans is $11.44.
3. Fresh strawberries. Cost per quart is $0.89.
UNIT I – MEASUREMENT

Lesson 11

Denominate Numbers

Objective: You will gain skill in working with denominate numbers.

Related Information:

The numbers we have been working with in the previous lessons involve some type of measurement, such as ounces, pounds, minutes, and degrees, to name a few. Numbers like 7 feet, 6 pounds, 20 minutes, etc., are called denominate numbers because they stand for specific measurements. They have “names.” “Abstract” or “pure” numbers have no description after them.

- 6 feet .......... a denominate number
- 6 ........... a pure number

In the foods trade, when we must multiply or divide numbers, we find both types in the same problem. For example, as in the previous lesson, suppose we wanted to figure out how many 4-ounce portions we could get out of 2 pounds of fruit salad. Two pounds can be changed to 32 ounces. We divide a denominate number by a denominate number:

\[
\frac{32 \text{ ounces}}{4 \text{ ounces}} = 8
\]

Here 8 is a pure number. It is just a count of 8 items. In this case we will call it 8 portions, but it is really just a plain number.

Suppose we want to double a recipe. We multiply the amount of each ingredient by 2. By 2 what? By the number 2, that’s what.

- 3 cups of sugar \( \times 2 \)

We multiply a denominate number, 3 cups, by the pure number 2, and we end up with the denominate number 6 cups.

In doing measurement problems, you will often have to change from a small unit to a larger unit.

How many inches in 1½ feet?

Analysis: An inch is a small unit; a foot is a larger unit.

We must change from feet (larger) to inches (smaller).

There are 12" to the foot (" is the symbol for inch)

( is the symbol for foot)
RULE: To change from a larger unit to a smaller unit, multiply.

\[ 12'' \times 1 \frac{1}{2} = 12 \times \frac{3}{2} = \frac{36}{2} = 18 \text{ inches} \]

To change from a small unit to a large unit:

Change 40" to feet.

Analysis: An inch is a small unit; a foot a larger unit, there are 12" to the foot.

RULE: To change from a smaller unit to a larger unit, divide.

\[ \begin{array}{c|c}
\text{36} & \hline
\text{4/12 (or 4'')} \\
\hline
\text{40} & \text{Answer: 3 ft. 4 in.}
\end{array} \]

When changing recipe quantities very often we must change from larger to smaller units or vice-versa.

PRE-ASSIGNMENT A:
1. 20 in = _____ ft _____ in
2. 2½ gal = _____ qt
3. 48 oz = _____ lb

ASSIGNMENT A:
1. 21 oz = _____ lb _____ oz
2. 5 pt = _____ qt _____ pt
3. 4 ft = _____ yd
4. 22 in = _____ ft _____ in
5. 4 hr 20 min = _____ min
6. 1½ gal = _____ qts
7. 3 qt = _____ pts
8. 10 pts = _____ qts
9. 9 articles = _____ doz
10. 6 qt = _____ gal
11. 2½ lb = _____ oz
12. 1½ gross = _____ doz
13. 12 fl oz = _____ c
14. 3 lb = _____ oz
15. 3 T = _____ t
16. 36 fl oz = _____ c
17. 100 min = _____ hr _____ min
18. 3½ doz = _____ pieces
19. 9 pt = _____ qt
20. 15 T = _____ oz
Adding Denominate Numbers:

When adding, subtracting or multiplying denominate numbers, it is usually the practice to put the answer in the simplest form, as, for example:

11 ft 16 in should be changed to: 12 ft 4 in

PRE-ASSIGNMENT B:

Add these units and simplify.

1. 1 ft 7 in
   4 ft 8 in

ASSIGNMENT B:

1. 5 yd 2 ft 2 yd 2 ft
   2 gal 2 qt 2 gal 3 qt
   3. 5 hr. 30 min 2 hr. 45 min
2. 3 gal 2 qt 2 qt 1 pt
   4. 6 lb 9 oz 5 lb 8 oz
   5. 2 qt 1 pt 3 qt 1 pt

6. 2 hr 40 min 1 hr 20 min
   1 gal 3 qt 3 qt 1 pt
7. 6 gal 2 qt 4 lb 9 oz
   8. 12 lb 8 oz 3 qt 1 pt
   9. 2 qt. 1 pt 2 qt 1 pt
10. 7 hr 48 min 9 hr 32 min

Subtracting Denominate Numbers:

In subtracting denominate numbers, we sometimes have to subtract a large number from a smaller one. In such a case we need to borrow, as this example shows:

Subtract: 6 feet 2 inches
   - 4 feet 6 inches

We cannot subtract 6 inches from 2 inches, so we borrow one of the 6 feet, call it 12 inches, and add it to the 2 inches, making 14.

5 feet 14 inches
   - 4 feet 6 inches
   1 foot 8 inches Answer
ASSIGNMENT C:

1. 12 lbs 4 oz - 6 lbs 2 oz
2. 18 lbs 9 oz - 11 lbs 4 oz
3. 21 lbs 10 oz - 7 lbs 10 oz

4. 13 lbs 1 oz - 5 lbs 3 oz
5. 6 qts 2 pts - 2 qts
6. 18 qts - 7 qts 1 pt

7. 5 gal 3 qts - 1 gal 2 qts
8. 9 gal 1 qt - 2 gal 3 qts
9. 6 yds - 1 yd 1 ft

10. 18 yds - 7 yds 2 ft
11. 5 ft 9 in - 1 ft 7 in
12. 14 ft 10 inches - 5 ft 11 inches

13. 4 hrs 30 min - 2 hrs 25 min
14. 17 hrs 45 min - 6 hrs 50 min
15. 12 hrs 7 min - 4 hrs 22 min

Multiplication of Denominate Numbers

PRE-ASSIGNMENT D:

Multiply and reduce to simplest form.

1. 2 ft. 7 in \times 5

ASSIGNMENT D:

Multiply and reduce to simplest form.

1. 3 qt 1 pt \times 4
2. 1 hr 30 min \times 7

Ans

3. 5 gal 2 qt \times 3
4. 5 lb 9 oz \times 4

\[ \begin{array}{c}
\text{40} \\
31
\end{array} \]
5. 1 qt. 1 pt  \times 2

6. 3 lb 8 oz  \times 5

7. 12 gal 3 qt  \times 4

8. 2 hr 16 min  \times 6
UNIT II – FRACTIONS

Lesson 1

Objective: You will review the meaning of fractions.

Related Information:

Fractions are frequently used in our daily affairs. In the store we may buy a quarter-pound of cheese, ¼ dozen eggs, or 2½ pounds of vegetables. We are familiar with the expression “one-half off” when referring to sale merchandise.

A fraction is something that is less than a whole thing.

½ lb of rice is less than a whole pound.

¼ pound of cheese is less than a whole pound of cheese.

¾ yard of material is less than a whole yard of material.

A fraction is composed of two parts.

a. The number below the line (or to the right of the line) shows how many parts the whole thing has been divided into.

The number below the line is called the denominator.

In the fraction ½, the number below the line is 2.

It means the whole thing has been divided into two equal parts.

In the fraction 1/12, the 12 means the whole thing has been divided into 12 equal parts.

Example: A dozen eggs can be considered one whole thing, divided into 12 separate eggs.

b. The number above the line (or to the left of the line) in a fraction shows how many of those parts have been taken or used.

The number above the line is called the numerator.

1/2 You want 1 out of the 2 parts.
1/12 You want 1 out of the 12 parts.

You want 1/4 lb: the whole pound is considered to be divided into four equal parts, and you want 1 of them.

You want 3/4 lb: The whole pound is divided into four equal parts and you want 3 of them.

Again: The denominator tells how many equal parts the whole has been divided into.

The numerator tells how many of the parts you are talking about.
What you do with the numerator depends on the problem.

Additional example:
The fraction 1/8 is less than 3/8.
In 1/8 you are talking about only 1 part out of 8.
In 3/8 you are talking about 3 parts out of 8.

ASSIGNMENT:

1. We can divide a pound into two halves (1/2) + (1/2).
The denominator tells us how many parts we are dividing the item into.

   Into how many thirds can you divide a pie? 
   Into how many quarters can you divide a pound of butter? 
   Into how many eighths can you divide something? 
   Into how many twelfths can you divide something?

2. In the fraction 2/3, we mean two out of three parts.
   What do we mean when we see:
   \[
   \frac{1}{3} \quad \frac{3}{8} \quad \frac{1}{5} \quad \frac{5}{12} \quad \frac{4}{5} \quad \frac{7}{8} \]

3. Name the denominator in the following fractions:
   \[
   \frac{5}{16} \quad \frac{7}{64} \quad \frac{9}{16} \quad \frac{1}{32} \quad \frac{3}{8} \quad \frac{1}{12} \]

4. Name the numerators:
   \[
   \frac{5}{16} \quad \frac{7}{64} \quad \frac{9}{16} \quad \frac{1}{32} \quad \frac{3}{8} \quad \frac{1}{12} \]

5. Take a nickel out of your pocket and draw eight circles.
   Shade the portion indicated by the following fractions:
   \[
   \frac{1}{2}, \quad \frac{1}{4}, \quad \frac{1}{8}, \quad \frac{3}{8}, \quad \frac{3}{4}, \quad \frac{7}{8}, \quad \frac{3}{16}, \quad \frac{5}{16} \]
6. Write the following expressions as fractions:
   One egg out of a dozen
   Six eggs out of a dozen
   One quarter out of a dollar
   One cent out of a dollar
   Three minutes out of one hour
   Three ounces out of one pound
   One quart out of a gallon
   One cup out of a pint
   Three cans out of a case of twelve cans
   Thirty cents out of a dollar

7. Put the following groups of fractions in proper order, from smallest to largest:
   a. \( \frac{3}{4}, \frac{1}{4} \)
   b. \( \frac{7}{8}, \frac{3}{8}, \frac{1}{8}, \frac{5}{8} \)
   c. \( \frac{5}{16}, \frac{3}{16}, \frac{7}{16}, \frac{9}{16} \)
Lesson 2

Types of Fractions

Objective: You will learn the different types of fractions.

Related Information:

There are three different types of fractions:

1. The proper fraction (common).
   - Example: \( \frac{1}{4} \) In the proper fraction the numerator is smaller than the denominator.
   - The proper fraction is always less than one whole thing.

2. The improper fraction.
   - Example: \( \frac{4}{3} \) In the improper fraction the numerator is generally larger than the denominator.
   - Example: \( \frac{4}{4} \) Sometimes the numerator is equal to the denominator.
   - The value of an improper fraction can be 1 or more than 1.

3. The mixed number.
   - Example: \( 2 \frac{1}{4} \) The mixed number contains a whole number (2) plus a proper fraction (1/4).
   - When giving the answer to a problem, an improper fraction is usually changed to a mixed number.
   - A mixed number is often changed into an improper fraction to make the solving of certain fraction problems easier.

How to change an improper fraction to a whole number or mixed number:

- \( \frac{8}{4} \) Divide the denominator into the numerator:
  - 4 into 8 = 2 (Answer)
  - \( \frac{8}{7} \) Divide 7 into 8 = \( 1 \frac{1}{7} \) (Answer)

How to change mixed numbers into improper fractions:

- \( 1 \frac{3}{4} \) Multiply the 1 times the 4 (whole number \( \times \) denominator) (=4); then add the numerator (3) = 7
  - Place the 7 over the denominator of the fraction part: \( \frac{7}{4} \) (Ans.)

Example: \( 5 \frac{3}{8} \) \( 5 \times 8 = 40 + 3 = 43 \), over \( 8 = \frac{43}{8} \)
Just as a check, change the 43/8 back to a mixed number:
\[
\frac{43}{8} = 8 \frac{5}{40} = 5\frac{3}{40}
\]
(Back to where we started.)

ASSIGNMENT:

1. Tell which of the following are proper fractions, improper fractions, and mixed numbers.
   a. \(3\frac{1}{3}\)  
   b. \(\frac{1}{12}\)  
   c. \(\frac{3}{2}\)  
   d. \(\frac{5}{6}\)  
   e. \(\frac{7}{8}\)  
   f. \(\frac{5}{2}\)  
   g. \(4\frac{1}{7}\)  
   h. \(\frac{3}{10}\)

2. Change the following mixed numbers to improper fractions:
   a. \(1\frac{1}{2}\)  
   b. \(1\frac{1}{3}\)  
   c. \(5\frac{3}{4}\)  
   d. \(7\frac{1}{5}\)  
   e. \(12\frac{3}{8}\)  
   f. \(5\frac{5}{16}\)  
   g. \(8\frac{7}{8}\)  
   h. \(4\frac{2}{3}\)

3. Change the following improper fractions to mixed numbers:
   a. \(\frac{8}{3}\)  
   b. \(\frac{24}{9}\)  
   c. \(\frac{33}{4}\)  
   d. \(\frac{41}{10}\)  
   e. \(\frac{22}{4}\)  
   f. \(\frac{21}{2}\)  
   g. \(\frac{35}{4}\)  
   h. \(\frac{39}{8}\)  
   i. \(\frac{72}{16}\)  
   j. \(\frac{25}{5}\)

4. How many pies do I need for 7 quarters?

5. Change the following to improper fractions:
   a. \(2\frac{1}{2}\)  
   b. \(5\frac{1}{4}\)  
   c. \(5\frac{3}{8}\)  
   d. \(6\frac{3}{10}\)  
   e. \(2\frac{3}{4}\)  
   f. \(4\frac{1}{8}\)  
   g. \(6\frac{3}{5}\)  
   h. \(2\frac{3}{16}\)  
   i. \(3\frac{1}{4}\)  
   j. \(6\frac{1}{2}\)  
   k. \(7\frac{3}{4}\)  
   l. \(9\frac{2}{3}\)  
   m. \(2\frac{3}{8}\)  
   n. \(7\frac{1}{3}\)  
   o. \(5\frac{5}{16}\)  
   p. \(10\frac{3}{8}\)

6. Change to a mixed number or whole number:
   a. \(\frac{14}{3}\)  
   b. \(\frac{33}{4}\)  
   c. \(\frac{18}{12}\)  
   d. \(\frac{7}{4}\)  
   e. \(\frac{17}{6}\)  
   f. \(\frac{20}{10}\)  
   g. \(\frac{18}{5}\)  
   h. \(\frac{27}{12}\)  
   i. \(\frac{32}{4}\)  
   j. \(\frac{25}{6}\)  
   k. \(\frac{28}{3}\)  
   l. \(\frac{46}{8}\)  
   m. \(\frac{85}{10}\)  
   n. \(\frac{48}{16}\)  
   o. \(\frac{1000}{2}\)  
   p. \(\frac{202}{5}\)

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UNIT II – FRACTIONS

Lesson 3: Reducing Fractions to Lowest Terms

Objective: You will be able to reduce fractions to lowest terms.

Related Information:

It is common practice to reduce fractions to lowest terms and use them in that form. If we need 8 ounces of flour, we would ask for 1/2 pound, not 8/16 of a pound. If something took 30 minutes, we would say 1/2 hour rather than 30/60 of an hour.

When we reduce fractions to lowest terms, we do not in any way change the value of the fraction. The fraction 2/4 has the same value as the fraction 1/2.

Fractions that look different but have the same value are called equivalent fractions. When finding answers to problems, unless otherwise stated you must reduce answers to fractions in their lowest terms.

Some students have trouble reducing fractions to lowest terms. Below are a few different procedures which may help you.

Procedure 1:

Reduce 4/8 to lowest terms.

Look for a number that will divide evenly into both the numerator and the denominator. In some fractions, like the 4/8 above, the numerator itself will work as the divisor.

\[
\frac{4}{8} \text{ divided by } 4 = \frac{1}{2}
\]

Procedure 2:

Reduce 6/9 to lowest terms.

If the numerator will not divide evenly into the denominator, look for a smaller number that will divide evenly into both the numerator and the denominator.

In this case the numerator 6 will not divide evenly into the denominator. We then look for a divisor that will divide evenly into both numerator and denominator. Try the small numbers like 2, 3, 4, 5, 6, etc.

In this case, 2 does not work, because it will not divide evenly into 9. Try 3 next. Good – 3 will go evenly into both.

\[
\frac{6}{9} \text{ divided by } 3 = \frac{2}{3}
\]
Procedure 3:

Reduce \( \frac{100}{1000} \)

In cases where there are zeros ending both the numerator and denominator, we can divide by 10 or 100, depending on the fraction. A shortcut is to cross out the zeros. **You can cross out an ending zero in the numerator for every such zero in the denominator.** This is the same as dividing by ten.

\[
\frac{100}{1000} = \frac{1}{10}
\]

Procedure 4:

Reduce \( \frac{26}{39} \)

In the problem above, many students will decide that the fraction is in its lowest terms and cannot be reduced. It is true that there are many fractions that cannot be reduced. Examples are:

\[
\frac{5}{9}, \quad \frac{17}{23}, \quad \frac{6}{11}, \quad \frac{7}{19}, \text{ etc.}
\]

However, before making the statement that a fraction cannot be reduced, try procedure 4. Divide the numerator by a low number such as 2 or 3. **This may provide you with a divisor that will divide evenly into both numerator and denominator.**

\[
\frac{26}{39} \rightarrow \text{divided by 2} = \frac{13}{19} \quad \frac{26}{39} \rightarrow \text{divided by 13} = \frac{2}{3} \quad \text{Answer} \quad \frac{2}{3}
\]

Summary: Reduce fractions to lowest terms where possible. Use whatever procedure is easiest for you. Two or more steps may be necessary in some cases.

**ASSIGNMENT:**

1. Reduce the following fractions to lowest terms:
   
   a. \( \frac{2}{6} \)       d. \( \frac{9}{36} \)       g. \( \frac{24}{48} \)
   
   b. \( \frac{5}{10} \)       e. \( \frac{4}{12} \)       h. \( \frac{25}{125} \)
   
   c. \( \frac{9}{18} \)       f. \( \frac{3}{27} \)       i. \( \frac{60}{360} \)

2. Reduce the following fractions to lowest terms:
   
   a. \( \frac{15}{20} \)       d. \( \frac{10}{50} \)       g. \( \frac{45}{60} \)
   
   b. \( \frac{9}{12} \)       e. \( \frac{16}{32} \)       h. \( \frac{10}{25} \)
   
   c. \( \frac{25}{35} \)       f. \( \frac{12}{16} \)       i. \( \frac{4}{16} \)
3. Reduce those fractions which are not in lowest terms:
   a. \( \frac{9}{10} \)  
   b. \( \frac{15}{21} \)  
   c. \( \frac{16}{21} \)  
   d. \( \frac{18}{81} \)  
   e. \( \frac{21}{25} \)  
   f. \( \frac{63}{72} \)  
   g. \( \frac{27}{54} \)  
   h. \( \frac{9}{15} \)  
   i. \( \frac{5}{16} \)  

4. Reduce the following fractions to lowest terms:
   a. \( \frac{30}{100} \)  
   b. \( \frac{75}{100} \)  
   c. \( \frac{125}{1000} \)  
   d. \( \frac{15}{100} \)  
   e. \( \frac{125}{250} \)  
   f. \( \frac{150}{350} \)  
   g. \( \frac{2000}{1000} \)  
   h. \( \frac{190}{380} \)  
   i. \( \frac{4500}{10000} \)  

5. Reduce the following fractions to lowest terms:
   - 6/12 of a dozen equals _____ dozen
   - 4/16 pound of flour equals _____ pound
   - 12/16 pound equals _____ pound
   - 15/16 pound equals _____ pound

6. Making your own fractions:
   The denominator represents the number of equal parts the whole has been divided into.

   Example: A pie has been cut into 8 parts or slices.
            Make the denominator 8.
            The whole pie = 8/8
            If you gave away 1 piece, you would give away 1/8.
            You would have 7 pieces left, or 7/8.

   In the problems below, after setting up each fraction, reduce it to lowest terms if possible.
   a. Three eggs out of a dozen
   b. Eight ounces out of a pound
   c. One spoon out of a dozen
   d. Eight cups out of two dozen cups
   e. Two parts out of a melon cut into four parts
   f. One teaspoon out of a tablespoon
   g. One cup out of a quart
   h. Three quarts out of a gallon
   i. Seven inches out of a foot
   j. One No. 10 can out of a case of 6
   k. Five portions out of a No. 10 can containing 25 portions
   l. Three servings out of 25 servings prepared
UNIT II – FRACTIONS

Lesson 4

Raising Fractions to Higher Terms

Objective: You will be able to raise fractions to higher terms.

Related Information:

In the previous lesson we practiced reducing fractions to lowest terms. We indicated that answers are usually given in lowest terms. But it is sometimes necessary to raise fractions to higher terms in order to do certain types of fraction problems. This will not change the value of the fraction.

Procedure: \( \frac{1}{2} \) is to be changed to a fraction with a denominator of 10.

\[
\frac{1}{2} = \frac{?}{10} \quad \text{Divide 2 into 10 to find the multiplier.}
\]

\[
2) 10 \quad 5 \quad \text{is the multiplier.}
\]

\[
\frac{1}{2} \times 5 \Rightarrow \frac{5}{10} \quad \text{Multiply both numerator and denominator by this number.}
\]

ASSIGNMENT:

1. Change the following fractions to equivalent fractions having the indicated denominators.
   a. \( \frac{1}{4} \) to 8ths
   b. \( \frac{1}{3} \) to 9ths
   c. \( \frac{1}{4} \) to 16ths
   d. \( \frac{5}{8} \) to 16ths
   e. \( \frac{1}{2} \) to 10ths
   f. \( \frac{4}{5} \) to 20ths
   g. \( \frac{3}{8} \) to 24ths
   h. \( \frac{1}{16} \) to 32nds
   i. \( \frac{1}{10} \) to 100ths

2. Change the following fractions to equivalent fractions having denominators as indicated:
   a. \( \frac{2}{16} \)
   b. \( \frac{2}{5} \)
   c. \( \frac{7}{32} \)
   d. \( \frac{2}{10} \)
   e. \( \frac{5}{7} \)
   f. \( \frac{2}{3} \)
   g. \( \frac{3}{4} \)
   h. \( \frac{1}{5} \)
   i. \( \frac{1}{3} \)
Objective: You will learn how to find the least common denominator.

Related Information:

Fractions that have the same denominator can be added or subtracted, depending upon what the problem calls for. When fractions have the same denominator, they are said to have a common denominator.

If they do not have the same denominator, then in order to add or subtract them, the fractions must be changed to equivalent fractions with a common denominator.

\[
\frac{1}{8} \quad \frac{3}{8} \quad \frac{5}{8} \quad \text{These fractions all have the same denominator. The common denominator is 8.}
\]

\[
\frac{1}{8} \quad \frac{1}{4} \quad \text{These fractions do not have the same denominator.}
\]

If we needed to add \( \frac{1}{8} \) and \( \frac{1}{4} \), the denominators would have to be made the same. We must find a number that both denominators will divide into evenly. Like reducing fractions, finding a common denominator is sometimes simple, but at other times more involved. The easiest type is illustrated above.

The smallest number that all denominators will divide into evenly is called the least common denominator.

\[
\frac{1}{8} \quad \text{and} \quad \frac{1}{4} \quad \text{Try the 4. The 8 will not divide into the four therefore it is not acceptable}
\]

\[
\text{Try the 8. The 4 will divide evenly into the 8, so it can be used as the least common denominator.}
\]

The above problem can be solved by procedure 1.

Procedure 1: When all the denominators will divide evenly into one of them, that one will be the least common denominator.

To get both fractions above into equivalent fractions having a denominator of 8:

\[
\frac{1}{8} = \frac{1}{8} \quad \text{(No problem here)}
\]

\[
\frac{1}{4} = \frac{2}{8} \quad \text{(We just learned how to do this — divide the 4 into the 8, getting 2. Multiply 2 X 1.)}
\]

\[
\frac{1}{4} = \frac{2}{8}
\]
We now have two fractions, $\frac{1}{8}$ and $\frac{2}{8}$, which are in a form where they can be added or subtracted.

Here is another example:

$$\frac{1}{5}, \frac{2}{5}, \text{ and } \frac{3}{10}$$

All denominators will divide evenly into 10, so 10 is the least common denominator.

$$\frac{1}{5} = \frac{2}{10}$$

$$\frac{2}{5} = \frac{4}{10}$$

$$\frac{3}{10} = \frac{3}{10}$$

Procedure 2: When one denominator will not divide evenly into the other, multiply one denominator by the other. For example,

$$\frac{1}{3} \text{ and } \frac{1}{4}$$

$$3 \times 4 = 12$$

Use 12 as the least common denominator.

$$\frac{\frac{1}{3}}{\frac{1}{4}} = \frac{4}{12} \left\{ \text{From the procedure you practiced in lesson 4.} \right\}$$

We now have two fractions with the same denominator, and we can add them or subtract them.

$$\frac{4}{12} \text{ and } \frac{3}{12}$$

Procedure 3: Sometimes procedure 2 is difficult because the numbers are too large, or when there are three or more different denominators. For example,

$$\frac{3}{4} \text{ and } \frac{1}{8} \text{ and } \frac{2}{3}$$

Select the largest number. In this case it is 8.

See if the other denominators will divide evenly into this number. The 4 will, but the 3 will not. Reject the 8 and try $2 \times 8$ instead. $2 \times 8 = 16$.

Again try each denominator: 4 will divide evenly into 16.

8 obviously will.

3 will not. Reject 16.
Try $3 \times 8$ this time.

$3 \times 8 = 24$

4 will divide evenly into 24.
8 will obviously divide evenly into 24.
3 will divide evenly into 24.

Therefore 24 can be used as the least common denominator.

To complete the problem: $\frac{3}{4}$ and $\frac{1}{8}$ and $\frac{2}{3}$

become $\frac{18}{24}$ and $\frac{3}{24}$ and $\frac{16}{24}$ by the procedure of lesson 4.

Note: It is not always necessary to have the least common denominator. The numbers 48, 72, and 96 would all have worked in this case, but the end result would require reducing. So finding the actual least common denominator will give you smaller numbers to work with and will save extra work in the final operations – when adding or subtracting.

**ASSIGNMENT**

1. Find the least common denominator in the following problems:
   - a. $\frac{5}{8}$ and $\frac{2}{3}$
   - b. $\frac{1}{2}$ and $\frac{5}{6}$
   - c. $\frac{1}{8}$ and $\frac{5}{16}$
   - d. $\frac{1}{4}$ and $\frac{1}{8}$ and $\frac{1}{2}$
   - e. $\frac{4}{5}$ and $\frac{1}{4}$ and $\frac{2}{3}$
   - f. $\frac{1}{3}$ and $\frac{1}{4}$ and $\frac{1}{6}$
   - g. $\frac{1}{5}$ and $\frac{1}{3}$ and $\frac{1}{6}$ and $\frac{1}{2}$
   - h. $\frac{1}{2}$ and $\frac{1}{3}$ and $\frac{1}{4}$ and $\frac{1}{5}$
   - i. $\frac{9}{16}$ and $\frac{1}{4}$ and $\frac{1}{8}$
   - j. $\frac{3}{64}$ and $\frac{5}{8}$ and $\frac{1}{4}$
   - k. $\frac{2}{3}$ and $\frac{7}{12}$ and $\frac{7}{16}$
   - l. $\frac{5}{6}$ and $\frac{9}{10}$ and $\frac{1}{12}$

Arranging fractions in order is sometimes difficult without first changing them to the same denominator. It is very obvious then which is the smallest, next etc.

2. Arrange the following fractions in order, from smallest to largest:
   - a. $\frac{1}{8}$, $\frac{7}{8}$, $\frac{5}{8}$, $\frac{3}{8}$
   - b. $\frac{1}{2}$, $\frac{1}{4}$, $\frac{3}{4}$
3. Which is larger, 1/3 cup or 1/4 cup?
4. Which is larger, 2/3 cup or 3/4 cup?
UNIT II — FRACTIONS

Lesson 6

Addition of Fractions

Objectives:
You will learn how to add fractions and mixed numbers.
You will learn how addition of fractions is used in food service.

Related Information:
Fractions that have the same (common) denominator can be added immediately.

\[
\frac{1}{8} + \frac{3}{8} \quad \text{Example of fractions with a common denominator.}
\]

If the fractions do not have the same denominator:

\[
\frac{1}{4} + \frac{3}{8}
\]

You must follow the procedures outlined in the previous lesson and change them so they do have a common denominator.

\[
\frac{1}{4} + \frac{3}{8} \quad \text{becomes} \quad \frac{2}{8} + \frac{3}{8}
\]

Procedure: Rules for adding fractions:

They must have a common denominator. If they do not, change them so they do have a common denominator. Then add the numerators, using the same denominator.

\[
\frac{1}{8} + \frac{3}{8} = \frac{4}{8} \quad \text{Answer}
\]

Note: Fractions can be added either horizontally or vertically. It is usually easier to add mixed numbers vertically.

\[
2\frac{3}{8} \quad \text{Add the fractions (if they have the same denominator)}
\]

\[
+ \quad 5\frac{7}{8} \quad \text{Add the whole numbers. Reduce answer to lowest terms.}
\]

\[
\frac{10}{8} = 7 + \frac{2}{8} = \frac{8}{8} = 1\frac{1}{4} \quad \text{Answer}
\]

Notice how you are combining many of the procedures learned in the last few sections. When you reduce \(\frac{10}{8}\) it becomes 1 and \(\frac{2}{8}\). The 1 is added to the \(\frac{7}{8}\), and the \(\frac{2}{8}\) is reduced to \(\frac{1}{4}\).
Add: \( \frac{1}{4} + \frac{2}{3} + \frac{1}{8} \) Find the least common denominator. Change each fraction as described before.

\( \frac{6}{24} + \frac{16}{24} + \frac{3}{24} \) Change each fraction as described before.

\( \frac{25}{24} \) Add numerators, placing the sum over the common denominator.

\( \frac{1}{24} \) Answer

Assignments:

(Reduce all answers to lowest terms)

1. \( \frac{3}{4} + \frac{3}{4} \)
2. \( \frac{8}{4} + \frac{3}{4} \)
3. \( \frac{4}{3} + \frac{2}{3} \)
4. \( \frac{7}{3} + \frac{1}{3} \)

5. \( \frac{2}{8} + \frac{3}{8} + \frac{1}{8} \)
6. \( \frac{1}{4} + \frac{9}{16} + \frac{7}{16} \)
7. \( \frac{25}{8} + \frac{6}{8} \)
8. \( \frac{10}{4} + \frac{22}{8} \)

9. \( 4\frac{1}{4} + 5\frac{1}{2} + 6\frac{5}{8} \)

10. \( 5\frac{2}{3} + 8\frac{3}{4} \)

11. \( 1\frac{1}{2} + 5\frac{1}{16} \)

12. \( 5\frac{3}{10} + 8 \)

13. Joan worked part time as a waitress: Monday 3\( \frac{1}{2} \) hours, Tuesday 3\( \frac{1}{4} \) hours, Wednesday 3\( \frac{3}{4} \) hours, Thursday 3\( \frac{3}{4} \) hours. How many hours did she work that week?
14. Pete worked the following hours. What was his total for the week? Sunday 8½, Monday 9, Tuesday 6½, Wednesday 8¾, Thursday 8, Friday 10¼.

15. Sue worked the following hours. What was her total? Wednesday 7¼, Thursday 8¼, Friday 10½, Saturday 8¼, Sunday 6½.

16. The following quantities of materials were used in the kitchen. Find the total of each to the nearest whole unit.

   a. Flour: \(2\frac{1}{8}\) c, \(4\frac{1}{4}\) c, \(1\frac{3}{4}\) c, \(3\frac{1}{2}\) c

   b. Eggs: \(\frac{1}{12}\) doz, \(2\frac{3}{12}\) doz, \(2\frac{1}{3}\) doz, \(3\frac{1}{6}\) doz.

   c. Butter: \(\frac{1}{4}\) lb, \(2\frac{1}{8}\) lb, \(3\frac{1}{16}\) lb, \(1\frac{3}{4}\) lb.

   d. Milk: \(1\frac{3}{4}\) qts, \(4\frac{1}{4}\) qts, \(5\frac{1}{8}\) qts, \(3\frac{1}{2}\) qts.
Lesson 7  Subtraction of Fractions

Objectives: You will learn how to subtract fractions and mixed numbers.
You will learn how subtraction of fractions can be used in food service.

Related Information:

Subtraction of fractions has similar rules to addition of fractions, namely, in order to subtract fractions the denominators must be the same.

If the denominators are not the same, change the fraction to an equivalent fraction containing the same common denominator.

It is advisable when subtracting fractions to place them vertically (one above the other).

A subtraction problem can be read in different ways:

Subtract \( \frac{1}{5} \) from \( \frac{3}{5} \)

or \( \frac{3}{5} \) minus \( \frac{1}{5} \)

or \( \frac{3}{5} - \frac{1}{5} \)

To complete the above problem, subtract the numerators. 1 from 3 equals 2. The answer is \( \frac{2}{5} \).

(Note that the denominator remains the same in the answer.)

Here is a different type of problem:

\( \frac{7}{8} - \frac{1}{4} \) (Note that the denominators are not the same.)

Arrange vertically \( \frac{7}{8} \) Change to common denominator: \( \frac{7}{8} \)

\( -\frac{1}{4} \)

Then subtract: \( \frac{5}{8} \)

To subtract a fraction from a whole number:

\( \frac{8}{16} - \frac{1\frac{3}{16}}{16} \)

Borrow 1 from the 8 and change it into a fraction. Since we are dealing with 16ths, the 1 becomes \( \frac{16}{16} \).

\( \frac{7}{16} \)

Subtract the 5 from the 16, getting 11, to make the fraction part \( \frac{11}{16} \).

\( -\frac{1\frac{5}{16}}{16} \)

Subtract the 1 from the 7, getting 6 for the whole-number part.

\( \frac{6\frac{11}{16}}{16} \)

Answer
Borrowing in subtraction of fractions gives many students a difficult time.

When the numerator of the top fraction is smaller than the numerator of the bottom fraction (after changing both to the same denominator when necessary), then it is necessary to borrow.

You can only borrow from the whole number (6).

You borrow 1, making the 6 a 5.

Change the 1 into a fraction, using the common denominator.

\[ \frac{5\, \frac{8}{8} + \frac{1}{8}}{\frac{7}{8}} \]

Since we are working with 8ths, change the 1 to 8/8th.

\[ \frac{\frac{8}{8} + \frac{1}{8}}{\frac{7}{8}} = \frac{9}{8} \]

7 from 9 = 2. Fraction part of answer is 2/8.

Whole-number part: nothing from 5 = 5.

Reduce to 5 \( \frac{1}{4} \) (Answer)

Another way to look at the process of borrowing:

Since you are borrowing 1 from 6, bring the 1 over to the fraction 1/8.

Now you have 5 and \( 1 \frac{1}{8} \). The \( 1 \frac{1}{8} \) is a mixed number; therefore change it to an improper fraction. It equals \( \frac{9}{8} \).

After you have the 9/8, follow the same procedure as above to subtract.

ASSIGNMENT:
(Reduce all answers to lowest terms.)

1. Subtraction with the same denominators:
   a. \( \frac{3}{5} - \frac{1}{5} \)  
   b. \( \frac{7}{8} - \frac{3}{8} \)  
   c. \( \frac{5}{7} - \frac{2}{7} \)  
   d. \( \frac{3}{4} - \frac{1}{4} \)  
   e. \( \frac{15}{16} - \frac{5}{16} \)
2. Subtraction with different denominators:
   a. \( \frac{5}{8} \text{ minus } \frac{1}{4} \)
   b. \( \frac{9}{16} \text{ minus } \frac{3}{8} \)
   c. \( \frac{3}{4} \text{ minus } \frac{7}{16} \)
   d. \( \frac{7}{8} \text{ minus } \frac{1}{2} \)
   e. \( \frac{1}{2} \text{ minus } \frac{3}{8} \)
   f. \( 1 \frac{3}{4} \text{ minus } \frac{5}{8} \)
   g. \( 8 \frac{6}{8} \text{ minus } 2 \frac{3}{4} \)
   h. \( 200 \frac{1}{2} \text{ minus } 45 \frac{1}{8} \)
   i. \( 24 \frac{7}{8} \text{ minus } 17 \frac{1}{4} \)
   j. \( 14 \frac{15}{16} \text{ minus } 2 \frac{3}{8} \)

3. Subtraction requiring borrowing:
   a. \( 6 \frac{3}{5} \text{ minus } 1 \frac{4}{5} \)
   b. \( 4 \frac{1}{4} \text{ minus } 2 \frac{3}{4} \)
   c. \( 12 \frac{1}{2} \text{ minus } 4 \frac{3}{4} \)
   d. \( 18 \frac{1}{4} \text{ minus } 6 \frac{1}{2} \)
   e. \( 2 \frac{1}{8} \text{ minus } 5/16 \)
   f. \( 8 \frac{1}{4} \text{ minus } 4 \frac{2}{3} \)
   g. \( 11 \frac{1}{3} \text{ minus } 2 \frac{1}{4} \)
   h. \( 12 \frac{1}{16} \text{ minus } 3 \frac{5}{16} \)
   i. \( 340 \frac{1}{8} \text{ minus } 245 \frac{1}{2} \)
   j. \( 36 \frac{1}{2} \text{ minus } 18 \frac{5}{8} \)
Word problems:

4. Four and one quarter pounds of vegetable fat were issued by the storeroom. Two and one-eighth pounds were used. What remained at the end of the meal?

5. There were 2 2/3 dozen oranges in the refrigerator. The salad cook used 1 1/4 dozen. How many dozen were left?

6. 25 1/4 lbs. potatoes minus 10 3/4 pounds.

7. 7 gallons of milk minus 4 1/4 gallons.

8. The cafeteria used 3 #10 cans of apricots last week. Each can weighed 6 1/2 lbs. What was the total number of pounds used? If there were 5 #10 cans in the storeroom at the beginning of last week, how many pounds were left?
Objective: You will learn how to multiply fractions and mixed numbers.

Related Information:

In the previous two units we found that the rules for addition and subtraction of fractions were the same in that they both required the same common denominator. This is not true for multiplication of fractions. Multiplication and division of fractions are closely related. They do not require a common denominator.

As a worker in the foods trades, you will often have to multiply fractions. You may need to change the amounts of the ingredients in a recipe so as to get, say, half as many portions, or three-fourths as many portions, or 1 1/2 times the number, and so on. You may need to calculate time and a half to check up on your pay. You would be surprised at how often you will need to do this.

There are different combinations involved in multiplying fractions:

a. A fraction times a fraction: \( \frac{1}{2} \times \frac{1}{2} \)

b. A fraction times a whole number: \( \frac{1}{4} \times 10 \)

c. A mixed number times a fraction: \( 3\frac{1}{2} \times \frac{7}{8} \)

d. A mixed number times a mixed number: \( 2\frac{3}{4} \times 1\frac{5}{8} \)

Procedure:

1. Fractions are easiest to multiply in the horizontal position (as shown above)

2. Prepare mixed numbers for multiplication by changing mixed numbers to improper fractions.

3. Place whole numbers over 1 to put them in fraction form. This does not change their value.

4. Multiply all numerators.

5. Multiply all denominators.

6. State all answers in lowest terms.

Multiplication may be indicated by: the symbol “\( \times \)”, the word “times”, the word “of”
Type A: Multiplying a fraction by a fraction.

\[
\frac{1}{2} \times \frac{1}{2} = \frac{1}{4} \quad \Rightarrow \quad (1 \times 1 = 1)
\]

\[
\frac{3}{8} \times \frac{1}{4} = \frac{3}{32} \quad \Rightarrow \quad (3 \times 1 = 3)
\]

Type B: Multiplying a whole number by a fraction.

\[
\frac{1}{4} \times 10 \quad \text{Place the 10 over 1:} \quad \frac{1}{4} \times \frac{10}{1}
\]

\[
\frac{1}{4} \times \frac{10}{1} = \frac{10}{4} \quad \Rightarrow \quad (1 \times 10 = 10) \quad \text{Multiplying numerators}
\]

\[
\frac{10}{4} = \frac{4}{2} \quad \Rightarrow \quad (4 \times 1 = 4) \quad \text{Multiplying denominators}
\]

\[
\frac{10}{4} \text{ is an improper fraction. Reduce it to lowest terms.}
\]

\[
= 2 \frac{2}{4} \quad \text{which is further reduced to}
\]

\[
= 2 \frac{1}{2}
\]

Type C: A mixed number times a fraction.

\[
3 \frac{1}{2} \times \frac{7}{8} \quad \text{Change mixed number to improper fraction.}
\]

\[
\frac{7}{2} \times \frac{7}{8} = \frac{49}{16} \quad \Rightarrow \quad (7 \times 7 = 49)
\]

\[
= 3 \frac{1}{16}
\]

Type D: A mixed number times a mixed number.

\[
2 \frac{3}{4} \times 1 \frac{5}{8} \quad \text{Change all mixed numbers to improper fractions.}
\]

\[
\frac{11}{4} \times \frac{13}{8} = \frac{143}{32} \quad \Rightarrow \quad (11 \times 13 = 143)
\]

\[
= 4 \frac{15}{32}
\]

Note: When you multiply any number by a proper fraction, you will always end up with a smaller number than you started with! If you don't, then you have surely made an error. Go back over the problems above (types A, B, and C) and check this for yourself. Can you explain why this is so?

Additional information on procedure:

a. You can multiply more than two fractions at a time.

\[
\frac{1}{2} \times \frac{3}{5} \times \frac{2}{3} = \frac{6}{30} \quad \Rightarrow \quad (1 \times 3 = 3, \ 3 \times 2 = 6)
\]

\[
\frac{6}{30} = \frac{1}{5} \quad \text{(Reduce to lowest terms.)}
\]
b. Similarly, you can multiply two or more mixed or whole numbers or different combinations of them.

c. You can cancel to save time and make the multiplication easier.

You do not have to cancel. If you do not cancel, your answer will come out the same, but you will do a lot more work.

\[
\frac{10}{33} \times \frac{9}{25}
\]

Where the numbers in numerator and denominator have common factors, you can cancel them. (A factor of a number is a smaller number that will divide into the larger number evenly.)

In the above example, 10 in the numerator and 25 in the denominator have a common factor – 5. That is, 5 will divide evenly into both 10 and 25.

\[
\frac{2}{33} \times \frac{9}{5}\]

There is another common factor:
3 will divide evenly into 33 and 9.

\[
\frac{2}{11} \times \frac{3}{5} = \frac{6}{55} \Leftarrow (2 \times 3 = 6)
\]

You can also cancel where you have three or more fractions. Still follow the rule of dividing by a common factor in numerator and denominator. The original number can be canceled once, and the new amount canceled a second time. The problem gets shorter and easier with each cancellation.

ASSIGNMENT, Part A:

1. \( \frac{9}{10} \times \frac{3}{4} \)
2. \( \frac{1}{5} \times \frac{1}{3} \)
3. \( \frac{3}{4} \times \frac{5}{8} \)
4. \( \frac{3}{4} \times \frac{8}{9} \)
5. \( \frac{1}{2} \times \frac{3}{15} \times \frac{5}{6} \)
6. \( 7 \times \frac{1}{2} \)
7. \( 48 \times \frac{3}{16} \)
8. \( 6 \times \frac{5}{12} \)
9. \( 8 \frac{1}{3} \times \frac{3}{5} \)
10. \( 2 \frac{2}{5} \times 4 \frac{2}{3} \)
11. \( 1 \frac{3}{4} \times 3 \frac{1}{7} \times 1 \frac{3}{5} \)
12. \( 2 \frac{1}{2} \times 2 \frac{1}{2} \)
13. \( 3 \frac{1}{4} \times 1 \frac{1}{2} \)
14. \( 1 \frac{1}{2} \times 1 \frac{1}{3} \times 2 \)
15. \( 2 \frac{2}{5} \times 10 \times \frac{1}{2} \)
ASSIGNMENT, Part B:

1. \( \frac{3}{4} \) of 48  
2. \( \frac{1}{2} \) of 32¢  
3. \( \frac{3}{4} \) of 860
4. \( \frac{1}{4} \) of 52¢  
5. \( \frac{5}{8} \) of 98  
6. 2/5 of 45¢
7. 3/10 of $235  
8. 5/8 of $158  
9. 5/12 of $2,400  
10. \( \frac{1}{2} \) of $1.80  
11. \( \frac{1}{2} \) of $2.40  
12. \( \frac{5}{12} \) of $3.20  
13. 1\% \text{ times } 12  
14. 2\% \text{ times } 16  
15. 1\% \text{ times } 144
16. How many pieces in \( \frac{5}{6} \) of a dozen?
17. How many pieces in \( \frac{3}{4} \) of a gross?
18. How many ounces in \( \frac{1}{4} \) of a pound?
19. Find the cost of \( \frac{1}{2} \) dozen at $1.80 a dozen.
20. Find the total weight of 5 #10 cans weighing 6\% pounds each.
UNIT II - FRACTIONS

Lesson 9

Objectives:
- You will learn how multiplication of fractions is used in food service.
- You will practice changing a recipe by means of multiplication of fractions.

Related Information:

A standard recipe is one that has been designed for a set number of portions, for example, 25 portions, 50 portions, or 100 portions. It is sometimes necessary to take a standard recipe and change it to serve more, or fewer, people.

If we had a standard recipe that served 25 people and we wished to make 50 portions, we would simply multiply each quantity by 2. Another example:

6 lbs onions (for 25 portions) to 100 portions

25 divides into 100 four times.....therefore multiply the quantity by 4.

4 × 6 lbs of onions = 24 lbs of onions for 100 portions

In some cases we may wish to make the portions smaller. Fractions can be useful in this situation. Our standard (for example) may serve 50 people, and we wish to make only 25 portions:

\[
\frac{25 \text{ (portions) \ desired}}{50 \text{ (portions) \ standard}} = 25 \div 50 = \frac{1}{2}
\]

Take \(\frac{1}{2}\) of each quantity. We could also use simple division and divide each quantity by 2.

Example 2: Standard recipe: 50 portions; we want 10 portions.

\[
\frac{10 \text{ (desired)}}{50 \text{ (standard)}} = \frac{1}{5}
\]

Therefore take \(\frac{1}{5}\) of each quantity.

\[
\frac{1}{5} \times 6 \text{ lbs} = \frac{1}{5} \times \frac{6}{1} = \frac{6}{5} = 1\frac{1}{5} \text{ lbs}
\]

What is \(\frac{1}{5}\) of a lb? Hint: \(\frac{1}{5}\) of 16 oz.

Full final answer is 1 lb and 3 oz (approximately)
ASSIGNMENT:

1. \( \frac{1}{2} \) of 4 oz of butter: _______

2. \( \frac{3}{4} \) of 2 gallons of milk is ____ gallons or ____ quarts.

3. \( \frac{3}{4} \) of 3 gallons of clams is ____ gallons or ____ quarts.

4. \( \frac{1}{3} \) of 6 lbs of potatoes: _______

5. \( \frac{1}{4} \) of 8 oz of tomato puree: _______

6. Your recipe serves 50 people; you wish to feed 25. Set up a fraction in lowest terms to represent the quantity you need. _______

7. Your recipe serves 100 people; you wish to feed 25. Set up a fraction that you can use to multiply each quantity in the original recipe. _______

8. Your recipe serves 100 people; you wish to feed 30. Set up the proper fraction to use to multiply each quantity. _______

9. Change the following recipe to 12 portions. (Hint — use a reasonable approximation.)

   Baked stuffed pork chops. Yield: 50 portions
   Ingredients Standard 12 portions
   Pork chops, 6 oz. 50 _______
   Basic bread stuffing 2½ qts _______
   Whole-kernel corn 1 lb _______
   Brown sauce 1 gal _______

10. Change the following recipe to 30 portions. (Give realistic amounts.)
    Ham croquette mixture Yield: 50 portions
    Ingredients Standard 30 portions
    Celery, minced 1 lb _______
    Onions, minced 1 lb _______
    Green pepper, minced 1 lb _______
    Butter or shortening 1½ lb _______
    Bread flour 1½ lb _______
    Hot milk 2 qts _______
    Prepared mustard \( \frac{1}{4} \) cup _______
    Dry mustard 2 T _______
    Cooked chopped ham 8 lbs _______
    Parsley, chopped 1 cup _______
11. Change the following recipe to 40 portions. (Give realistic amounts.)

**Lamb a l'Indienne.**  Yield:  50 portions

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Standard</th>
<th>40 portions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lamb, boneless and cubed</td>
<td>17 lb</td>
<td></td>
</tr>
<tr>
<td>Water</td>
<td>2 gal</td>
<td></td>
</tr>
<tr>
<td>Salt</td>
<td>2 oz</td>
<td></td>
</tr>
<tr>
<td>Butter</td>
<td>1 lb</td>
<td></td>
</tr>
<tr>
<td>&quot;Curry powder&quot;</td>
<td>4 t</td>
<td></td>
</tr>
<tr>
<td>Flour</td>
<td>8 oz</td>
<td></td>
</tr>
<tr>
<td>Onions, chopped</td>
<td>3 lb</td>
<td></td>
</tr>
<tr>
<td>Apples, raw, with skins</td>
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<tr>
<td>Ham, chopped fine</td>
<td>½ lb</td>
<td></td>
</tr>
<tr>
<td>Tomatoes, medium</td>
<td>1 #2½ can</td>
<td></td>
</tr>
<tr>
<td>Cream</td>
<td>½ gal</td>
<td></td>
</tr>
</tbody>
</table>

12. Change the following recipe to 15 portions. (Give realistic amounts.)

**Irish lamb stew.**  Yield:  50 portions

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Standard</th>
<th>15 portions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water, boiling</td>
<td>2 gal</td>
<td></td>
</tr>
<tr>
<td>Lamb, fores, cut in ⅜&quot; cubes</td>
<td>17 lb</td>
<td></td>
</tr>
<tr>
<td>Potatoes, sliced</td>
<td>6 lb</td>
<td></td>
</tr>
<tr>
<td>Pearl onions</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Potatoes, Parisienne</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>White turnips, ⅜&quot; cubes</td>
<td>1 pint</td>
<td></td>
</tr>
<tr>
<td>Carrots, ⅜&quot; cubes</td>
<td>1 qt</td>
<td></td>
</tr>
<tr>
<td>Salt and pepper</td>
<td>to taste</td>
<td></td>
</tr>
</tbody>
</table>
Objective: You will learn how to divide fractions.

Related Information:

At times it is necessary to divide a number by a fraction. If you understand how to multiply fractions, you will have no trouble dividing by fractions. To divide by a fraction, invert the fraction (turn it upside down) and multiply. It's as easy as that!

Example 1 – dividing a fraction by a fraction.

\[ \frac{3}{4} \div \frac{3}{8} \]

Turn the fraction upside down and change the sign of the operation.

\[ \frac{3}{4} \cdot \frac{8}{3} \]

Now multiply in the same manner as in lesson 8.

\[ \frac{3 \times 8}{4 \times 3} = \frac{24}{12} = \frac{2}{1} \text{ (Answer)} \]

Example 2 – dividing a whole number by a fraction.

Place the whole number over 1 and proceed as above.

\[ 24 \div \frac{1}{4} \]

\[ \frac{24}{1} \div \frac{1}{4} \]

\[ \frac{24}{1} \times \frac{4}{1} = \frac{96}{1} = 96 \text{ (Answer)} \]

Example 3 – dividing a mixed number by a fraction or mixed number.

Change the mixed number(s) into improper fraction(s) and proceed as above.

\[ 4\frac{1}{2} \div \frac{1}{8} \]

Change the mixed number to an improper fraction.

\[ \frac{9}{2} \div \frac{1}{8} \]

Invert divisor and multiply.

\[ \frac{9}{2} \times \frac{8}{1} = \left( \frac{9 \times 8}{2} \right) = \frac{72}{2} = 36 \text{ (Answer)} \]

Take each step carefully......Don't try to combine steps. That's a good way to make a mistake.

Note that when you divide by a proper fraction, your answer is larger than the number you started with. Do you understand that a fraction is less than a whole? Therefore if, for example, we were to divide 1" by 1/4, our answer would be larger than 4 1".
1/4 goes into 1" four times. Check this by working it as a division problem.

How many \( \frac{1}{2} \)-cups of milk can we get from a gallon?

1. A gallon contains 16 cups.

2. Divide 16 by \( \frac{1}{2} \).

   \[
   16 \div \frac{1}{2} = \frac{16}{1} \times \frac{2}{1} = 32 \text{ (half cups)}
   \]

ASSIGNMENT:

1. \( \frac{1}{3} + \frac{3}{4} \) ______

2. \( \frac{2}{3} \div \frac{5}{12} \) ______

3. \( 2 \div \frac{1}{4} \) ______

4. \( 16 \div \frac{1}{5} \) ______

5. \( 7 \div \frac{2}{3} \) ______

6. \( 14 \div \frac{7}{8} \) ______

7. \( \frac{1}{4} \div \frac{1}{4} \) ______

8. \( \frac{1}{8} \div \frac{1}{8} \) ______

9. \( 18 \div \frac{1}{8} \) ______

10. \( 11 \frac{1}{3} + 2 \frac{5}{6} \) ______

11. \( 2 \frac{3}{4} \div \frac{3}{8} \) ______

12. \( 1 \frac{1}{2} \times 2 \frac{3}{4} \div 1 \frac{3}{8} \) ______

13. \( 1 \frac{1}{8} \div \frac{2}{3} \times 2 \frac{1}{4} \) ______

14. \( 16 \text{ oz } \div 1 \frac{1}{2} \) ______

15. \( 16 \text{ oz } \div 2 \frac{1}{4} \) ______
UNIT III  —  ARITHMETIC OPERATIONS

Lesson 1  —  Addition of Whole Numbers

Objectives:

You will review the addition of whole numbers.
You will gain some experience in adding figures on an adding machine.

Related Information:

Addition is basic to working with numbers. In the field of commercial foods, you may have to fill out guest checks, check orders, work out schedules, or compute costs in preparing meals.

You can improve your ability to add by practice. Accuracy is essential in the everyday world of work. Consider how embarrassing it would be to hand a customer an incorrectly totaled check:

Many restaurants provide adding machines for their employees, so as to prevent errors of this sort. It would be great if you could always depend upon having an adding machine handy. Unfortunately, you cannot. Therefore you must be able to add accurately, and with reasonable speed.

HOW TO AVOID ERRORS:

1. Copy numbers correctly.
2. Write your numbers neatly and in straight columns.
3. Double-check your figures by adding again from the opposite direction.
4. Double-check your figures by estimating.
5. Watch carefully for the placement of decimals.
When working with a long column of numbers, you can divide the column in half and work with two shorter columns.

When you see the following words or signs, it means add: “sum,” “total,” “+” or “addition.”

In the assignment problems, you will be expected to first make all the calculations and then, if an adding machine is available, check your work on the machine.

**ASSIGNMENT:**

A. Add the following:

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<td></td>
</tr>
</tbody>
</table>

72
B. Copy the following figures in vertical columns and add them.

1. $99 + 295 + 68 + 13$
2. $8 + 108 + 22 + 26 + 15$
3. $65 + 9 + 200 + 32 + 5$
4. $26 + 189 + 12 + 74 + 14$
5. $11 + 12 + 7 + 63 + 148$
6. $38 + 7 + 106 + 14 + 678$
7. $4.65 + 2.35 + 1.07$
8. $8.08 + .23 + .94 + 1.00$
9. $8.75 + .45 + .19 + .34$
10. $234.88 + 49.87 + 2.36$
UNIT III – ARITHMETIC OPERATIONS

Lesson 2

The Guest Check

Objectives: You will learn how to fill out a guest check and why each part of it is important. You will gain practice in addition by working with guest checks.

Related Information:

The guest check is a record of what the customer has eaten. The guest check is different for each restaurant. Some are pre-printed (see next page). The pre-printed form is used where there are a set number of food items offered. It is a simple matter to check off each item on such a guest check: this saves time and errors. The pre-printed check shown is from a pancake house. Similar checks are in use at many of the fast-food places.

The guest check we use in school is a simple form. Look at the empty spaces at the top. It is not necessary in school to enter the table number or number of persons fed. In a restaurant, however, it is. Where more than one person is covered by the bill, it is important for the cashier to know this. She must look to see that all customers walking out have properly paid their bill.

The checks are numbered, and this may be useful for record-keeping by the office.

The “server number” is useful to show the amount of work one person has done. Where waitresses rotate assignments, this can make sure that each one has had a fair number of customers. Waitresses receive tips when they serve; therefore someone who has served fewer customers may make less money.

How to fill out the guest check.

(Demonstration with overhead projector)

1. Items in the top row were explained above.

2. In first column, enter the number or quantity of each item.

3. Describe the item in the center section.

4. The two columns on the right are for the amount of each item. Remember to keep the dollars and cents in the proper columns. Keep columns neat for easy addition.

5. Total up columns by adding.

6. Look up tax on tax chart and enter below total.

7. Add tax total to get full amount to be paid.
The Pre-Printed Guest Check

1. Note: All items are printed on the form, saving time and energy. This also keeps the guest check neat.

2. Persons, table, and waitress-number are self-explanatory.

3. Enter quantity in left-hand column. Room is also provided for an entry next to the description of the different types of pancakes.

4. Note these abbreviations.
   - CE =
   - UP =
   - PO =
   - SCR =
   - R =
   - M =
   - W =
   - B.L.T. =

5. Note how clearly the total, the sales tax, and the gross total are shown. This is particularly helpful for the customer.

6. Note instructions to pay the cashier.

---

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<thead>
<tr>
<th>PERSONS</th>
<th>TABLE</th>
<th>WAITRESS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>235702</td>
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</tbody>
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<table>
<thead>
<tr>
<th></th>
<th>BUTTERMILK</th>
<th>BUCKWHEAT</th>
<th>SWEDISH R.</th>
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<td>STRAWBERRY R.</td>
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</tr>
<tr>
<td>CORN</td>
<td>DOLLAR-15</td>
<td>PEACH R.</td>
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<tr>
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<td>HAWAIIAN</td>
<td>APPLE R.</td>
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<td>CHOC. CHIP</td>
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<td>SOUR C. R.</td>
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</tr>
<tr>
<td>Pigs-Blanket</td>
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<table>
<thead>
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<th>HAM WAFFLE</th>
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<td>BLUE WAFFLE</td>
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<td>BACON OMELE.</td>
<td></td>
</tr>
<tr>
<td>CHEESE OMELE.</td>
<td>H. &amp; C. OMELE.</td>
<td>MUSH OMELE.</td>
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<tr>
<td>HAM STEAK</td>
<td>MINCEO HAM &amp; SCR.</td>
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<table>
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<th>JR. PLATE</th>
<th>HAM &amp; EGGS</th>
<th>BACON &amp; EGGS</th>
<th>SAUS. &amp; EGGS</th>
<th>SIDE: 2 EGGS</th>
<th>SIDE: 1 EGG</th>
<th>SIDE: HAM BACON S&amp;U. L SAUS.</th>
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<td>OE UP PO SCR</td>
<td>OE UP PO SCR</td>
<td>-OE UP .PO SCR</td>
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<td>OE UP PO SCR</td>
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<td>HAM &amp; CHEESE</td>
<td>TUNA SAND.</td>
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<tr>
<td></td>
<td>ROAST BEEF SAND.</td>
<td>CORN BEEF SAND.</td>
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PLEASE PAY CASHIER GROSS TOTAL
ASSIGNMENT A:

Problems 1 - 8 on the next page are to be done on the eight blank guest-check forms supplied in this book.

Each problem indicates what has been ordered by customers at the CLAM HUT restaurant. Do each problem on a separate guest check. Look on the HUT menu for the price of each item. Look each item up carefully. A shrimp salad sandwich is very different from a shrimp-salad platter.

Use the tax chart below to compute the tax on your guest check. Notice that the amounts of the purchase are given in “ranges”: .11 to .20, .21 to .40, etc. If the amount of the purchase is 11 cents, you put down 1 cent tax. If the amount is 16 cents, you still put down 1 cent tax. If the amount is .22, how much would you put down? If your answer is 2 cents, you are correct.

If the bill comes to over $10.00, take the amount over $10.00, look that up on the chart, and add it to the 50 cents for the first $10.00.

Example: $14.60 bill

$ 4.60 = .23 tax
10.00 = .50 tax
.73 Total tax

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<td>9.81 to 10.10</td>
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Try the following:

a. \[ 75¢ \text{ total} \cdot \text{tax} = \]  
d. \[ \$10.80 \text{ total} \cdot \text{tax} = \]

b. \[ \$1.24 \text{ total} \cdot \text{tax} = \]  
e. \[ \$15.20 \text{ total} \cdot \text{tax} = \]

c. \[ \$5.60 \text{ total} \cdot \text{tax} = \]  
f. \[ \$22.99 \text{ total} \cdot \text{tax} = \]

Assignment A:

1. Frank Taylor ordered the following at the Clam Hut restaurant: A cup of clam chowder, a combination hot seafood platter, and iced tea. (Don’t forget to write the item out on the guest check.)

2. Barbara Henson ordered \( \frac{1}{2} \) dozen clams, fried shrimp, ice cream cake roll, and milk.

3. The Kozak family of four ordered: 3 cups of clam chowder, 1 lobster bisque, a bucket of steamers, 2 fried clams, 1 baked bluefish, 1 shrimp salad platter, and 1 chicken in the basket. 4 large soft drinks completed their order.

4. Joanne Jones ordered an appetizer of shrimp cocktail and an order of fried oysters. She completed her order with coffee and cheesecake.

5. Rochelle and Mike went out to dinner together and ordered a clam bucket of steamers, 2 cups of clam chowder, 1 fried scallops, 1 stuffed flounder. Rochelle had a large soft drink and Mike had iced tea.

6. Lucy dropped into the Hut for lunch and ordered tomato juice, a hamburger basket, and hot chocolate.

7. The Carr family of four ordered 2 tomato juice and 2 shrimp cocktails, 1 order of broiled fillet, 1 cold seafood platter, 1 lobster salad platter, 1 hot seafood combination, 2 milks, and 2 coffees.

8. Betsy and Terry went to the Hut and ordered 2 shrimp cocktails, 2 cups of clam chowder, 1 fried shrimp and 1 fried soft clams, 2 soft drinks, and 2 ice cream rolls.
The CLAM HUT

STEAMERS

<table>
<thead>
<tr>
<th>Item</th>
<th>Price</th>
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<tbody>
<tr>
<td>Clam Bucket</td>
<td>$2.90</td>
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<tr>
<td>Extra Butter and Bread</td>
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</table>

CLAMS ON THE HALF SHELL

<table>
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<tr>
<th>Item</th>
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<tr>
<td>1/2 Dozen</td>
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<td>1 Dozen</td>
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Nibblers

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<tr>
<td>Tomato Jumbo</td>
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<tr>
<td>Cup of Clam Broth</td>
<td>$0.25</td>
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<tr>
<td>Baked Stuffed Clams</td>
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<tr>
<td>Shrimp Cocktail</td>
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Manhattan Clam Chowder

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<tbody>
<tr>
<td>Cup</td>
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Lobster Bisque

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<tr>
<td>Cup</td>
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From the Galley

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<td>Tuna Salad Platter</td>
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<tr>
<td>Fish Platter (fried or broiled)</td>
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<tr>
<td>Fried Smelts</td>
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<tr>
<td>Baked Stuffed Clams</td>
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</tr>
<tr>
<td>Chef’s Clammed Salad</td>
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<tr>
<td>Fried Soft Clams</td>
<td>$4.25</td>
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<tr>
<td>Fried Clamshsh</td>
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<tr>
<td>Baked Clams</td>
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<tr>
<td>Fried Maryland Oysters</td>
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<tr>
<td>Shrimp Salad Platter</td>
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<tr>
<td>Soft Shell Crab Platter</td>
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</tr>
<tr>
<td>Clam Baked Platter</td>
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<tr>
<td>Stuffed Pauanato</td>
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<tr>
<td>Fried Scallop (or broiled)</td>
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<tr>
<td>Lobster Salad Platter</td>
<td>$9.25</td>
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All Children’s Platters—Half Price

A Light Bite

Sandwiches

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<tbody>
<tr>
<td>Tuna Salad</td>
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<tr>
<td>Fritt</td>
<td>$1.00</td>
</tr>
<tr>
<td>Fried Soft Clam</td>
<td>$1.50</td>
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<tr>
<td>Fried Clamshsh</td>
<td>$1.60</td>
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<tr>
<td>Fried Shrimp</td>
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<tr>
<td>Shrimp Salad</td>
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<tr>
<td>Soft Shell Crab</td>
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<tr>
<td>Crab Salad</td>
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<tr>
<td>Lobster Salad</td>
<td>$3.00</td>
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Baskets

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<tr>
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<tbody>
<tr>
<td>Hot Dog Basket</td>
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</tr>
<tr>
<td>Hamburger Basket</td>
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</tr>
<tr>
<td>Cheeseburger Basket</td>
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<tr>
<td>California Basket</td>
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<tr>
<td>Chicken in the Basket</td>
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All Baskets include French Fries and Apple sauce

Sea Sweets

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<td>Ice Cream Coke Roll</td>
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<tr>
<td>Jello</td>
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<td>Pudding</td>
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<tr>
<td>Cheesecake</td>
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Sea Sips

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<td>Coke</td>
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<td>White</td>
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<td>Ice Tea</td>
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<td>Soft Drinks</td>
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<td>Hot Chocolate</td>
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Combination Hot Seafood — A Hearty Eater’s Delight

Fillet, Shrimp, Scallops, Clams, French Fries & Cole Slaw... $6.75

Cold Seafood Platter — Half a cold boiled Lobster, Shrimp Salad, King Crab Salad, French Fries and Cole Slaw… $6.75

Alaskan King Crab Legs and Claws

Priced According to the Market

North American Lobsters

<table>
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<tr>
<th>Item</th>
<th>Price</th>
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<tbody>
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<tr>
<td>1 ½ LBS.</td>
<td>$1.35</td>
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<tr>
<td>3 LBS. &amp; UP</td>
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All Lobsters are Priced According to Size

A Grand Boiled Lobster Takes Time to Prepare

Lobster, King Crab Legs, Clams, Steamed Clams, Shrimp, Scallops, French Fries & Cole Slaw...

78
<table>
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<td>80</td>
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ASSIGNMENT B:

1. Total Joanne's weekly tips: Monday $8.45, Tuesday $7.90, Wednesday $6.90, Thursday $5.50, Friday $10.25.

2. Sarah earned the following tips: $12.75, $10.35, $9.70, $11.80, $13.20. Find the sum of Sarah's tips for the week.

3. Karen earned the following weekly wages for October: $125.70, $114.20, $109.60 and $120.85. Find her total for the month.

4. Mrs. Brown's wages amounted to the following for the month: $156.23, $174.55, $118.45, $166.23. Find the total of her wages for the month.

5. There were six outgoing orders for the diner on Monday, for $14.65, $9.80, $6.75, $3.80, $8.75, and $7.90. What does this total?

ASSIGNMENT C – Bakeshop Supplement

Use the bakeshop pricelist and order blanks for the following problems:

1. Mrs. Kurtiak ordered the following items from the bake shop for Oct. 15th: 1 dozen dinner rolls, 1 rye bread (small), and two lbs of mini-Danish.

2. Mrs. Jones ordered a layer cake (large cream), a dozen apple turnovers, a half-dozen eclairs, and one coffee ring. She is going to pick up the order on Nov. 30.

3. Mr. Delaney ordered 1 large apple pie, 1 large peach pie and a dozen cream tarts. In addition he selected 1 large pumpernickel and 3 lbs of rye bread. The date of his order was June 12th.

4. Mrs. Cohen ordered 2 dozen onion rolls, 1 large chafe, and 3 dozen filled danish pastry for Nov. 8th.

5. Mrs. Brown is celebrating her anniversary on January 25 and placed an order for a single-layer sheet cake to be picked up that day. She left a $3.75 deposit.

6. Mrs. Stevens placed an order for 1 dozen jelly donuts, ½ dozen cream donuts, 1 small fruit pie, 3 lbs butter cookies, and 4 dozen large hard rolls, all to be picked up on November 24.

7. Mrs. Wersan left an order for October 10, for 9 lbs of mini-Danish, a small white bread, a large rye bread, a coffee ring, and 6 charlotte russes.

8. Mrs. Soto picked up 2 coffee-cake loaves and a large white bread, and placed an order for a double-layer sheet cake, to be ready December 23. She paid the full amount for everything.
## BAKESHOP PRICE LIST

### BREAD AND ROLLS

<table>
<thead>
<tr>
<th>Item</th>
<th>Price</th>
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<tbody>
<tr>
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<td>LARGE SOFT ROLLS</td>
<td>.09</td>
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<tr>
<td>SMALL HARD ROLLS</td>
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<tr>
<td>LARGE HARD ROLLS</td>
<td>.09</td>
</tr>
<tr>
<td>RYE ROLLS</td>
<td>.12</td>
</tr>
<tr>
<td>ONION ROLLS</td>
<td>.09</td>
</tr>
<tr>
<td>TWIST ROLLS</td>
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</tr>
<tr>
<td>BAGELS</td>
<td>.09</td>
</tr>
<tr>
<td>HOAGIE ROLLS</td>
<td>.10</td>
</tr>
<tr>
<td>SMALL WHITE BREAD</td>
<td>.25</td>
</tr>
<tr>
<td>LARGE WHITE BREAD</td>
<td>.50</td>
</tr>
<tr>
<td>SMALL RYE BREAD</td>
<td>.40</td>
</tr>
<tr>
<td>LARGE RYE BREAD</td>
<td>.80</td>
</tr>
<tr>
<td>RYE BREAD BY THE POUND</td>
<td>.40</td>
</tr>
<tr>
<td>SMALL PUMPERNICKEL BREAD</td>
<td>.45</td>
</tr>
<tr>
<td>LARGE PUMPERNICKEL BREAD</td>
<td>.90</td>
</tr>
<tr>
<td>SMALL CHALE TWIST BREAD</td>
<td>.50</td>
</tr>
<tr>
<td>LARGE CHALE TWIST BREAD</td>
<td>.65</td>
</tr>
<tr>
<td>LINSTER TARTS</td>
<td>.20</td>
</tr>
<tr>
<td>COFFEE BUNS</td>
<td>.20</td>
</tr>
<tr>
<td>CHINESE COOKIES</td>
<td>.06</td>
</tr>
<tr>
<td>SINGLE-LAYER SHEET CAKE</td>
<td>$7.50</td>
</tr>
<tr>
<td>DOUBLE-LAYER SHEET CAKE</td>
<td>$15.00</td>
</tr>
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### DONUTS, PIES, CAKES, COOKIES

<table>
<thead>
<tr>
<th>Item</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>JELLY DONUTS</td>
<td>.10</td>
</tr>
<tr>
<td>CREAM DONUTS</td>
<td>.12</td>
</tr>
<tr>
<td>TWIST AND RING DONUTS</td>
<td>.10</td>
</tr>
<tr>
<td>LARGE SUGAR COOKIES</td>
<td>.06</td>
</tr>
</tbody>
</table>
| BUTTER COOKIES                | $1.40 lb.
| BUTTER COOKIES                | .70 ½ lb.|
| BUTTER COOKIES                | .35 ¾ lb.|
| SMALL FRUIT PIES              | .65     |
| SMALL CREAM PIES              | $1.30   |
| LARGE FRUIT PIES              | $1.30   |
| LARGE CREAM PIES              | $1.90   |
| FRUIT TARTS                   | .30     |
| CREAM TARTS                   | .40     |
| CHARLOTTE RUSSE               | .25     |
| CUPCAKES                      | .10     |
| SMALL BUTTERCREAM LAYERS      | $1.15   |
| LARGE BUTTERCREAM LAYERS      | $1.50   |
| SMALL CREAM LAYERS            | $1.35   |
| LARGE CREAM LAYERS            | $1.90   |
| ECLAIRS                       | .30     |
| BROWNIES                      | .12     |
| MINI DANISH                   | $1.65   |
| FILLED DANISH PASTRY          | .15     |
| PLAIN DANISH PASTRY           | .12     |
| APPLE TURNOVERS               | .15     |
| COFFEE RINGS                  | .90     |
| COFFEE CAKE LOAVES            | .95     |

* 50% deposit required

---

82

73
### MIDDLESEX COUNTY VOCATIONAL AND TECHNICAL HIGH SCHOOL

**BAKE SHOP**

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>@</th>
<th>Ext.</th>
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</thead>
<tbody>
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</tbody>
</table>

**Total**

<table>
<thead>
<tr>
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<th>Amt.</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
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</table>

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</tbody>
</table>

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<tr>
<th>Given out by</th>
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### MIDDLESEX COUNTY VOCATIONAL AND TECHNICAL HIGH SCHOOL

**BAKE SHOP**

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
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<th>Ext.</th>
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**Total**

<table>
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<tr>
<th>Taken by</th>
<th>Amt.</th>
<th>Date</th>
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<th>Put up by</th>
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</tbody>
</table>

<table>
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<tr>
<th>Given out by</th>
</tr>
</thead>
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</tr>
<tr>
<td>No.</td>
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<td>-----</td>
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</tr>
</tbody>
</table>

Total

Taken by

Amt.  Date

Put up by

Given out by

MIDDLESEX COUNTY
VOCATIONAL AND TECHNICAL HIGH SCHOOL
BAKE SHOP

Wanted

Name

No.  Item  @  Ext.

Total

Taken by

Amt.  Date

Put up by

Given out by

MIDDLESEX COUNTY
VOCATIONAL AND TECHNICAL HIGH SCHOOL
BAKE SHOP

Wanted

Name

No.  Item  @  Ext.

Total

Taken by

Amt.  Date

Put up by

Given out by

MIDDLESEX COUNTY
VOCATIONAL AND TECHNICAL HIGH SCHOOL
BAKE SHOP

Wanted

Name

No.  Item  @  Ext.

Total

Taken by

Amt.  Date

Put up by

Given out by

MIDDLESEX COUNTY
VOCATIONAL AND TECHNICAL HIGH SCHOOL
BAKE SHOP

Wanted

Name

No.  Item  @  Ext.

Total

Taken by

Amt.  Date

Put up by

Given out by
UNIT III – ARITHMETIC OPERATIONS

Lesson 3  

Objective: You will review writing numbers from words and writing words from numbers.

Related Information:

As soon as you get your first full-time job, or perhaps before then, you will no doubt open a checking account at a bank. Every check you write must have the dollar-amount written two ways, in figures and in words. You can see how important it is to know how to do both accurately.

When working as a cook or performing other duties in food service, it is often necessary to translate numbers into words in passing information on to other personnel. When listening to instructions from other people, you must be able to translate words into numbers and write them correctly.

Orders for supplies are often placed over the phone. It is good procedure to have the person receiving the order repeat the details of the order to prevent errors. Make certain the quantities are indicated clearly.

ASSIGNMENT:
A. Change the following words into numbers:

1. Three hundred
2. One hundred and forty-three
3. Sixteen dollars and seven cents
4. Seventy-nine dollars and sixty-three cents
5. One hundred and sixty degrees.
6. One thousand five hundred and twenty-three
7. Three thousand and ten
8. The new delivery truck cost five thousand four hundred and sixty-three dollars and seventy-five cents.
9. John’s wages for the year came to twelve thousand two hundred and five dollars.
10. Jean earns two dollars and sixty-six cents an hour.
11. Let the roast cook for two hours and fifteen minutes.
12. The order totaled ninety-seven dollars and twenty-two cents.
13. Your invoice number is seven thousand five hundred and four.
14. Send two dozen platters, catalog number three hundred and thirteen.
15. If you have any complaints on your order, call six-three-four-seven five hundred.

16. Our restaurant grossed three hundred and fifty thousand dollars for the year.

17. Check our requisition number one thousand one hundred and twelve.

18. We do not have item seven on your purchase order number three thousand two hundred and seven.

19. Deliver the order on November seventh, to fourteen-forty Broadway.

20. Three hundred twenty-four thousand, five hundred and seventy-two satisfied customers.

B. Rewrite the following numbers in words:

1. $17.05
2. $189.76
3. 1003
4. 10,008
5. 7,653
6. 982
7. $71.93
8. $23.87
9. 124,000
10. 19,000,238
11. $1,600,058
12. $54,006
13. $4,694.75
14. $8.97
15. $15.02
UNIT III – ARITHMETIC OPERATIONS

Lesson 4 Subtraction of Whole Numbers

Objective: You will review the subtraction of numbers.

Related Information:

Subtraction is used in many operations involving money. For example, you earned $100.00 last week and your employer deducted $20.00 from your pay for taxes and social security. You found $80.00 in your pay envelope. When you deduct you are subtracting: 20 dollars subtracted from 100 dollars leaves 80 dollars. The amount you earned is called your gross pay; the amount you take home is called your net pay.

The cafeteria showed $1,000.00 on the cash-register tape last week. The total amount of money taken in is called gross sales or gross income. The school had to pay for food, labor, electricity, gas, heat, etc. All these items are called expenses, and they must be paid out of the gross income. The net income (or profit) is what you have left after subtracting the expenses. Look at the drawing below. The cafeteria does not keep the gross income...it keeps the net income.

GROSS INCOME - EXPENSES = NET INCOME (PROFIT)

In subtraction we use the sign "-". In word problems the words "subtract," "difference," "minus," "deduct," or "take away" are some of the words used to indicate a subtraction operation. Others are "net" as opposed to "gross," "amount left," "take-home (pay)," and others.

ASSIGNMENT, Part A:

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>87</td>
<td>2.</td>
<td>538</td>
<td>3.</td>
<td>4328</td>
</tr>
<tr>
<td>4.</td>
<td>2317</td>
<td>5.</td>
<td>184.15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>834.18</td>
<td>7.</td>
<td>8593</td>
<td>8.</td>
<td>5994</td>
</tr>
<tr>
<td>9.</td>
<td>23,108</td>
<td>10.</td>
<td>489,340</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5.23</td>
<td></td>
<td>3056</td>
<td></td>
<td>5917</td>
</tr>
<tr>
<td>11.</td>
<td>2,550</td>
<td></td>
<td>265,932</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

78
ASSIGNMENT, Part B:

1. The cafeteria received 300 containers of milk yesterday. At the end of the day 26 were left. How many containers of milk had been sold?

2. Four dozen chocolate cones were available for sale this morning, and 32 were sold during lunch. How many cones were left?

3. Forty-eight #10 cans of pear halves were shown on the inventory list at the beginning of the month. Six were left on the shelf at the end of the month. How many cans had been used?

4. Joanne took in $18.90 in tips at the dinner meal. She gave $4.70 to the busboy. How much did she have left?

5. Karen’s gross pay for the week came to $156.78. Her deductions amounted to $35.13. What was her take-home pay?

6. Sales at the Griddle restaurant came to $28,560 for the month. Expenses amounted to $27,150. What was the net profit?

7. The difference between 18 and 11 is:

8. Two hundred and twenty-five dollars minus one hundred and fifty-three dollars amounts to:

9. The restaurant had 60 pounds of hamburger patties on hand at the beginning of the week. Twelve pounds were used on Monday, 5 pounds on Tuesday, 16 pounds on Wednesday, 21 pounds on Thursday. How many pounds were on hand for Friday’s meals?

10. Sally is a waitress. Last week she took home $158.40. Only $120.67 of this was in her pay envelope; the rest was in tips. How much had she earned in tips?

11. A basket of grapes weighed 10 pounds. If the basket itself weighed 1 pound, what was the net weight of the grapes?

12. A store clerk weighed out 2 pounds of fish fillets in a cardboard tub. If the tub weighed 1 ounce, how much fish was there?
UNIT III – ARITHMETIC OPERATIONS

Lesson 5

The Production Report

Objective: You will use subtraction in making out production reports.

Related Information:

It is important to know how much of each item to prepare. While some items can be stored and sold the next day, or frozen, others cannot, and may represent waste. Waste costs money, and the objective of every business is to make a profit.

Guessing or estimating may be necessary when a business first opens, but once a record of what has been sold can be obtained, it is then possible to plan more accurately for the next day, week, or month.

A production report lists the items of food that have been made, what is left over, and what has been sold. Below you will find a section of a production report form, showing how to fill one out.

<table>
<thead>
<tr>
<th>FOOD</th>
<th>Number Prepared</th>
<th>Number Returned</th>
<th>Number Sold</th>
</tr>
</thead>
<tbody>
<tr>
<td>steaks</td>
<td>60</td>
<td>8</td>
<td>52</td>
</tr>
</tbody>
</table>

Note: Subtract the number returned from the number prepared, and you have the number sold.

Number prepared: 60
Number returned: 8
Number sold: 52
ASSIGNMENT:

1. Using the following information, fill out a production report:

<table>
<thead>
<tr>
<th>Food</th>
<th>Number Prepared</th>
<th>Number Returned</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soup</td>
<td>100</td>
<td>18</td>
</tr>
<tr>
<td>Baked pork chops</td>
<td>65</td>
<td>12</td>
</tr>
<tr>
<td>Chicken croquettes</td>
<td>40</td>
<td>6</td>
</tr>
<tr>
<td>Mashed potatoes</td>
<td>100</td>
<td>15</td>
</tr>
<tr>
<td>Gravy</td>
<td>3 qts</td>
<td>1 pint</td>
</tr>
<tr>
<td>Layer cakes</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>Fruit cups</td>
<td>50</td>
<td>15</td>
</tr>
<tr>
<td>Rice custard</td>
<td>30</td>
<td>13</td>
</tr>
<tr>
<td>Ham sandwiches</td>
<td>25</td>
<td>5</td>
</tr>
<tr>
<td>Cheese sandwiches</td>
<td>20</td>
<td>3</td>
</tr>
</tbody>
</table>

PRODUCTION REPORT

<table>
<thead>
<tr>
<th>Food</th>
<th>Number Prepared</th>
<th>Number Returned</th>
<th>Number Sold</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

Name of person preparing report: _______________________

Date: ___________________
2. Fill out a production report using the following information:

<table>
<thead>
<tr>
<th>Food</th>
<th>Number Prepared</th>
<th>Number Returned</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tomato soup</td>
<td>60</td>
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</tr>
<tr>
<td>Clam chowder</td>
<td>50</td>
<td>0</td>
</tr>
<tr>
<td>Potato soup</td>
<td>30</td>
<td>9</td>
</tr>
<tr>
<td>Split pea</td>
<td>60</td>
<td>10</td>
</tr>
<tr>
<td>Egg salad sandwiches</td>
<td>30</td>
<td>9</td>
</tr>
<tr>
<td>Tapicoa pudding</td>
<td>30</td>
<td>10</td>
</tr>
<tr>
<td>Apple pie</td>
<td>50</td>
<td>30</td>
</tr>
<tr>
<td>Pumpkin pie</td>
<td>50</td>
<td>0</td>
</tr>
<tr>
<td>Hamburger and roll</td>
<td>125</td>
<td>19</td>
</tr>
<tr>
<td>Frankfurter and roll</td>
<td>75</td>
<td>14</td>
</tr>
</tbody>
</table>

PRODUCTION REPORT

<table>
<thead>
<tr>
<th>Food</th>
<th>Number Prepared</th>
<th>Number Returned</th>
<th>Number Sold</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Name of person preparing report: _____________________________

3. The cook ordered 25 porterhouse steaks. Five were left at the end of the day. There was a record of 19 sold. Does this record balance? What is the difference? What might be some reasons for the discrepancy?

4. The production report showed that 75 portions of spaghetti were prepared. The server was able to get 70 from the pan. What was the difference? How might it be accounted for?

5. Sixty-five baked custards were prepared. The counter server accidentally dropped four. How many were actually available for sale?

6. The sandwich cook received 45 slices of ham, 20 slices of cheese, and 40 slices of ham bologna for sandwiches. At the end of the day there were 5 slices of ham, 10 slices of cheese, and 15 slices of bologna left. How many sandwiches of each kind had been sold if one slice of each was used for a sandwich?
Lesson 6

Objective: You will review the multiplication of numbers.

Related Information:

Multiplication is used in many operations around the restaurant.

Example 1: To compute costs of materials from price lists:
12 cans at $4.10 a can. Multiply 12 X 4.10.

\[ \begin{array}{c}
\$\ 4.10 \\
\times 12 \\
\hline \\
\$\ 49.20 \\
\end{array} \]

Example 2: To work out pay for work:
Joan worked 40 hours at $2.25 per hour.

\[ \begin{array}{c}
\$\ 2.25 \\
\times 40 \\
\hline \\
\$\ 90.00 \\
\end{array} \]

Example 3: To change quantities in recipes:
A recipe calls for 3 quarts of creole sauce. To get five times the amount:

\[ 5 \times 3 = 15 \text{ qts} \]

Certain words will help you recognize multiplication problems. We have already seen that the word "of" in many fraction problems usually indicates the operation of multiplication; similarly the word "at" or the symbol @ does (so many at such and such a price). "Times" and "X" and "find the product" also indicate multiplication, as you know.

ASSIGNMENT:

Multiply the following:

1. \[ 156 \times 8 \]
2. \[ 543 \times 60 \]
3. \[ 765 \times 32 \]
4. \[ 784 \times 209 \]
<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>5.</td>
<td>3,595</td>
<td>6.</td>
<td>1,876</td>
</tr>
<tr>
<td></td>
<td>× 890</td>
<td></td>
<td>× 607</td>
</tr>
<tr>
<td>7.</td>
<td>$4.75</td>
<td>8.</td>
<td>$144</td>
</tr>
<tr>
<td></td>
<td>× 40</td>
<td></td>
<td>× 2.10</td>
</tr>
<tr>
<td>9.</td>
<td>$5.25</td>
<td>10.</td>
<td>$1.85</td>
</tr>
<tr>
<td></td>
<td>× 12</td>
<td></td>
<td>× 23</td>
</tr>
<tr>
<td>11.</td>
<td>$18.95</td>
<td>12.</td>
<td>6092</td>
</tr>
<tr>
<td></td>
<td>× 16</td>
<td></td>
<td>× 104</td>
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</tbody>
</table>
REFERENCE PAGE

The following information summarizes the material on measurements (in Unit I) and may be useful to you while working on the assignments in this book:

**Abbreviations**
- tsp = teaspoon
- Tbsp = tablespoon
- c = cup
- pt = pint
- qt = quart
- bu = bushel
- lb = pound
- gal = gallon

**Equivalents**
- 3 tsp = 1 T
- 2 T = 1 lb
- 8 fl oz = 1 cup
- 16 T = 1 cup
- 2 c = 1 pint

One #10 can will yield approximately 25 servings (4 oz each)
1 quart of any liquid equals approximately 2 lbs.

**MULTIPLICATION TABLE**

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<th>1</th>
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<th>3</th>
<th>4</th>
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<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>4</td>
<td>6</td>
<td>8</td>
<td>10</td>
<td>12</td>
<td>14</td>
<td>16</td>
<td>18</td>
<td>20</td>
<td>22</td>
<td>24</td>
</tr>
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<td>3</td>
<td>3</td>
<td>6</td>
<td>9</td>
<td>12</td>
<td>15</td>
<td>18</td>
<td>21</td>
<td>24</td>
<td>27</td>
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<td>4</td>
<td>4</td>
<td>8</td>
<td>12</td>
<td>16</td>
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<td>24</td>
<td>28</td>
<td>32</td>
<td>36</td>
<td>40</td>
<td>44</td>
<td>48</td>
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<td>5</td>
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<td>15</td>
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<td>6</td>
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<td>66</td>
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<td>7</td>
<td>14</td>
<td>21</td>
<td>28</td>
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<td>42</td>
<td>49</td>
<td>56</td>
<td>63</td>
<td>70</td>
<td>77</td>
<td>84</td>
</tr>
<tr>
<td>8</td>
<td>8</td>
<td>16</td>
<td>24</td>
<td>32</td>
<td>40</td>
<td>48</td>
<td>56</td>
<td>64</td>
<td>72</td>
<td>80</td>
<td>88</td>
<td>96</td>
</tr>
<tr>
<td>9</td>
<td>9</td>
<td>18</td>
<td>27</td>
<td>36</td>
<td>45</td>
<td>54</td>
<td>63</td>
<td>72</td>
<td>81</td>
<td>90</td>
<td>99</td>
<td>108</td>
</tr>
<tr>
<td>10</td>
<td>10</td>
<td>20</td>
<td>30</td>
<td>40</td>
<td>50</td>
<td>60</td>
<td>70</td>
<td>80</td>
<td>90</td>
<td>100</td>
<td>110</td>
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</tr>
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<td>11</td>
<td>11</td>
<td>22</td>
<td>33</td>
<td>44</td>
<td>55</td>
<td>66</td>
<td>77</td>
<td>88</td>
<td>99</td>
<td>110</td>
<td>121</td>
<td>132</td>
</tr>
<tr>
<td>12</td>
<td>12</td>
<td>24</td>
<td>36</td>
<td>48</td>
<td>60</td>
<td>72</td>
<td>84</td>
<td>96</td>
<td>108</td>
<td>120</td>
<td>132</td>
<td>144</td>
</tr>
</tbody>
</table>
Lesson 7

Objective: You will use multiplication in several different types of work in the foods trades.

Related Information:

In this lesson you will practice multiplying numbers just as you might have to in the trades.

CHANGING RECIPES BY MULTIPLICATION

ASSIGNMENT:
Part A: Room is provided for two changes on each recipe given below. Your instructor may wish to change the instructions, however, from those given. Express each answer in units that you would be likely to use.

### Beef Stroganoff

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Amount</th>
<th>New Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tenderloin tips</td>
<td>12 lbs</td>
<td></td>
</tr>
<tr>
<td>Vinegar</td>
<td>1 cup</td>
<td></td>
</tr>
<tr>
<td>White wine</td>
<td>1 cup</td>
<td></td>
</tr>
<tr>
<td>Rich brown sauce</td>
<td>3 qts</td>
<td></td>
</tr>
<tr>
<td>Sour cream</td>
<td>24 oz</td>
<td></td>
</tr>
<tr>
<td>Mushrooms, sliced</td>
<td>24 oz</td>
<td></td>
</tr>
<tr>
<td>Butter</td>
<td>6 oz</td>
<td></td>
</tr>
</tbody>
</table>

Yield 48 portions. New yields 144 and 240.

### Potato Salad

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Amount</th>
<th>New Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Celery, diced fine</td>
<td>1½ lbs</td>
<td></td>
</tr>
<tr>
<td>Onion, 'minced</td>
<td>3 oz</td>
<td></td>
</tr>
<tr>
<td>Hard-cooked eggs, chopped</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Pimentos, diced, drained</td>
<td>7-oz can</td>
<td></td>
</tr>
<tr>
<td>Mayonnaise</td>
<td>1 qt</td>
<td></td>
</tr>
<tr>
<td>Potatoes</td>
<td>12 lbs</td>
<td></td>
</tr>
<tr>
<td>French dressing</td>
<td>5 oz</td>
<td></td>
</tr>
<tr>
<td>Salt and pepper</td>
<td>to taste</td>
<td></td>
</tr>
<tr>
<td>Lettuce</td>
<td>8 heads</td>
<td></td>
</tr>
</tbody>
</table>

Yield 50 portions. New yields 200 and 300.
### French Salad Dressing

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Amount</th>
<th>New Amount</th>
<th>New Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vinegar, cider</td>
<td>1 cup</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salt</td>
<td>1 tbsp</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mustard, dry</td>
<td>1 tbsp</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sugar</td>
<td>1 tsp</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White pepper</td>
<td>½ tsp</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salad oil</td>
<td>3 cups</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Yield 1 qt.

### Manhattan Clam Chowder

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Amount</th>
<th>New Amount</th>
<th>New Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clams, chopped</td>
<td>3 qts or 2 # 5 cans</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water</td>
<td>5 qts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potatoes</td>
<td>1 lb</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salt pork, chopped fine</td>
<td>12 oz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Garlic</td>
<td>1 tsp</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Celery</td>
<td>1 lb</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Onions</td>
<td>2 lbs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carrots</td>
<td>8 oz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leeks, diced small</td>
<td>8 oz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peppers, green, diced small</td>
<td>8 oz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tomatoes, canned, chopped</td>
<td>1 qt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sachet bag</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salt</td>
<td>1 ½ tbsp</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White pepper</td>
<td>½ tsp</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Worcestershire sauce (optional)</td>
<td>1 tbsp</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Yield 50 portions.

New yields 3 qts and 7 qts.

New yields 200 and 800.
Part B: Costs and Wages

1. The cafeteria ordered 4 cases of sliced mushrooms at $32.18 a case (4 #10 cans to the case). What was the amount due on the order?

2. Jim Reynolds worked 40 hours at $3.78 an hour. What was his gross pay for the week?

3. The Admiral restaurant ordered:
   - 8 Chinese strainers at $9.50 ea
   - 3 Wire whips at $3.20 ea
   - 4 slotted turners at $.90 ea
   - 5 # 20 ice cream scoops at $3.95 ea
   What was the total amount of the order?

4. The cafeteria was planning to replace the chairs with new tubular steel stacking chairs at $12.95 apiece. How much would 285 chairs cost?

5. What is the total cost of 7 polyethylene containers at $8.50 each?

6. Oscar worked 8 hours on Monday, 6 hours on Tuesday, 7 hours on Wednesday, 8 hours on Thursday, and 4 hours on Friday. At $2.85 an hour, what was his gross pay for the week?

7. Compute the cost of 5 cases of lasagna at $3.92 a case.

8. The Jones family visited the Admiral restaurant and ordered 4 filet dinners at $4.75 ea. What was the total amount on the bill?

9. Joan works 4 hours a day, 5 days a week, at $2.10 an hour. What is her gross pay?

10. The electric bill for the Hut restaurant averages $220 a month. How much would it come to for a year?

Part C: The Counter Report

The counter report is similar to the production report you filled out in lesson 5, but it contains additional information. The counter report includes the price of the item.

After determining how many items have been sold, you must multiply the unit price (the price for one) by the number sold to determine the total value of what has been sold.

The counter report, if done accurately on all items, would give the restaurant supervisor some control over what is being sold. The total value as shown on the counter reports should equal what is shown on the cash register.
### COUNTER REPORT

**Date:** __________________________

<table>
<thead>
<tr>
<th>Food</th>
<th>Number Prepared</th>
<th>Number Returned</th>
<th>Number Sold</th>
<th>Price per item</th>
<th>Total value sold</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tomato soup</td>
<td>75</td>
<td>25</td>
<td></td>
<td>.30</td>
<td></td>
</tr>
<tr>
<td>Egg salad sand.</td>
<td>50</td>
<td>8</td>
<td></td>
<td>.60</td>
<td></td>
</tr>
<tr>
<td>Tuna sandwich</td>
<td>50</td>
<td>12</td>
<td></td>
<td>.70</td>
<td></td>
</tr>
<tr>
<td>Ham sandwich</td>
<td>50</td>
<td>0</td>
<td></td>
<td>.85</td>
<td></td>
</tr>
<tr>
<td>Veal cutlet</td>
<td>75</td>
<td>17</td>
<td></td>
<td>1.10</td>
<td></td>
</tr>
<tr>
<td>Tuna salad</td>
<td>25</td>
<td>3</td>
<td></td>
<td>.95</td>
<td></td>
</tr>
<tr>
<td>Apple pie</td>
<td>40</td>
<td>5</td>
<td></td>
<td>.35</td>
<td></td>
</tr>
<tr>
<td>Custard</td>
<td>50</td>
<td>9</td>
<td></td>
<td>.25</td>
<td></td>
</tr>
<tr>
<td>Chocolate layer</td>
<td>30</td>
<td>6</td>
<td></td>
<td>.35</td>
<td></td>
</tr>
<tr>
<td>Cup cakes</td>
<td>30</td>
<td>2</td>
<td></td>
<td>.20</td>
<td></td>
</tr>
</tbody>
</table>

**Total:** __________________________

Name of person preparing report

---

### COUNTER REPORT

**Date:** __________________________

<table>
<thead>
<tr>
<th>Food</th>
<th>Number Prepared</th>
<th>Number Returned</th>
<th>Number Sold</th>
<th>Price per item</th>
<th>Total value sold</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clam chowder</td>
<td>100</td>
<td>8</td>
<td></td>
<td>.40</td>
<td></td>
</tr>
<tr>
<td>Split pea</td>
<td>75</td>
<td>14</td>
<td></td>
<td>.30</td>
<td></td>
</tr>
<tr>
<td>Steak sandwich</td>
<td>75</td>
<td>4</td>
<td></td>
<td>.85</td>
<td></td>
</tr>
<tr>
<td>Fish dinner</td>
<td>75</td>
<td>18</td>
<td></td>
<td>.85</td>
<td></td>
</tr>
<tr>
<td>Chicken salad</td>
<td>40</td>
<td>11</td>
<td></td>
<td>.80</td>
<td></td>
</tr>
<tr>
<td>Cottage cheese</td>
<td>15</td>
<td>2</td>
<td></td>
<td>.55</td>
<td></td>
</tr>
<tr>
<td>Cherry pie</td>
<td>50</td>
<td>7</td>
<td></td>
<td>.35</td>
<td></td>
</tr>
<tr>
<td>Milk</td>
<td>100</td>
<td>14</td>
<td></td>
<td>.25</td>
<td></td>
</tr>
<tr>
<td>Coffee</td>
<td>50</td>
<td>0</td>
<td></td>
<td>.20</td>
<td></td>
</tr>
<tr>
<td>Iced tea</td>
<td>50</td>
<td>15</td>
<td></td>
<td>.25</td>
<td></td>
</tr>
</tbody>
</table>

**Total:** __________________________

Name of person preparing report

---

98
Recipe Cost Control Form

Prices for food items are determined by calculating the cost of all the ingredients that go into the recipe. In addition to the cost of the ingredients, the person who determines prices must add on:

- **Labor costs**: wages for all the people working in the restaurant
- **Overhead**: rent, heat, electricity, repairs, new equipment, insurance, taxes, etc.
- **Profit**: the reason for the owner's being in business

The "recipe cost control form" helps determine how much a portion of food costs. This form could be a printed card kept on file and changed as prices change on the food items. Below is the explanation of the various items on the form.

<table>
<thead>
<tr>
<th>Recipe Item:</th>
<th>Yield:</th>
<th>Portion Size:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>STANDARD RECIPE COST CONTROL FORM</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ingredients</td>
<td>Quantity</td>
<td>Market Price</td>
</tr>
<tr>
<td>Date Prices computed:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total cost</td>
<td>Cost per portion</td>
<td></td>
</tr>
</tbody>
</table>

1. **Recipe Item**: the name of the food. Example: Hamburger platter
2. **Yield**: the number of portions from this recipe. (25, 50, 100)
3. **Portion size**: All foods, even hamburgers, can be made in different sizes.
4. **Ingredients**: the names of the items going into the food.
5. **Quantity**: the amount of each ingredient the recipe calls for.
6. **Market price**: the price one unit of each ingredient costs the restaurant.
7. **Extension**: Here you *multiply* the quantity times the price.
8. **Total cost**: Add up all of the extensions.
9. **Cost per portion**: Divide the number of portions (yield) into the total cost to find the price per portion.

Don't forget: **this is not the selling price**. Remember the wages, overhead, and profit mentioned above.
Part D: Complete the following recipe cost control forms:

### Recipe Item: Macaroni & Cheese

**Yield:** 50

**Portion Size:** 6-oz ladle

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Quantity</th>
<th>Market Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Macaroni</td>
<td>6 lbs</td>
<td>.35 per lb</td>
</tr>
<tr>
<td>Water</td>
<td>6 gallons</td>
<td></td>
</tr>
<tr>
<td>Salt</td>
<td>3 oz</td>
<td>.08 per lb</td>
</tr>
<tr>
<td>Butter</td>
<td>2¼ lbs</td>
<td>.90 per lb</td>
</tr>
<tr>
<td>Flour</td>
<td>1½ lbs</td>
<td>.25 per lb</td>
</tr>
<tr>
<td>Hot milk</td>
<td>3½ gallons</td>
<td>1.30 per gal</td>
</tr>
<tr>
<td>Worcestershire sauce</td>
<td>3 T</td>
<td>.20</td>
</tr>
<tr>
<td>American cheese</td>
<td>8 lbs</td>
<td>1.59 lb</td>
</tr>
</tbody>
</table>

**Total cost**

**Date prices computed:**

**Cost per portion**

### Recipe Item: Sausage patty

**Yield:** 50

**Portion Size:** 2 oz.

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Quantity</th>
<th>Market Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ground pork</td>
<td>15 lbs</td>
<td>1.49 per lb</td>
</tr>
<tr>
<td>Luncheon meat</td>
<td>3 lbs</td>
<td>1.59 per lb</td>
</tr>
<tr>
<td>Rolled oats</td>
<td>3 lbs</td>
<td>.45 per lb</td>
</tr>
<tr>
<td>Eggs</td>
<td>10 eggs</td>
<td>.79 per doz</td>
</tr>
<tr>
<td>Milk</td>
<td>3 qts</td>
<td>.35 per qt</td>
</tr>
<tr>
<td>Pepper</td>
<td>1 T</td>
<td>.04</td>
</tr>
<tr>
<td>Salt</td>
<td>2 oz</td>
<td>.08 per lb</td>
</tr>
<tr>
<td>Poultry seasoning</td>
<td>1 T</td>
<td>.06</td>
</tr>
</tbody>
</table>

**Total cost**

**Date prices computed:**

**Cost per portion**
### STANDARD RECIPE COST CONTROL FORM

**Recipe Item:** Chicken Chow Mein  
**Yield:** 50  
**Portion Size:** 6 oz

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Quantity</th>
<th>Market Price</th>
<th>Extension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chicken, boiled</td>
<td>8 lbs</td>
<td>$1.05 per lb</td>
<td></td>
</tr>
<tr>
<td>Salad oil</td>
<td>1 pint</td>
<td>$1.20 per qt</td>
<td></td>
</tr>
<tr>
<td>Onion</td>
<td>6 lbs</td>
<td>$0.15 per lb</td>
<td></td>
</tr>
<tr>
<td>Chicken stock</td>
<td>1½ gal</td>
<td></td>
<td>$0.60</td>
</tr>
<tr>
<td>Soy sauce</td>
<td>4 oz</td>
<td>$0.39 per 4-oz btl</td>
<td></td>
</tr>
<tr>
<td>Bean sprouts</td>
<td>2 #10 cans</td>
<td>$2.10 per #10 can</td>
<td></td>
</tr>
<tr>
<td>Corn starch</td>
<td>14 oz</td>
<td>$0.39 per lb</td>
<td></td>
</tr>
<tr>
<td>Cold water</td>
<td>1 pint</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total cost**

**Date prices computed:**

<table>
<thead>
<tr>
<th>Cost per portion</th>
</tr>
</thead>
</table>

---

### STANDARD RECIPE COST CONTROL FORM

**Recipe Item:** Salisbury steak  
**Yield:** 100  
**Portion Size:** 3 oz

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Quantity</th>
<th>Market Price</th>
<th>Extension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chopped meat</td>
<td>20 lbs</td>
<td>$0.95 per lb</td>
<td></td>
</tr>
<tr>
<td>Onion soup</td>
<td>1 envelope</td>
<td>$0.49 box of 2 env</td>
<td></td>
</tr>
<tr>
<td>Garlic powder</td>
<td>1 tsp</td>
<td></td>
<td>$0.02</td>
</tr>
<tr>
<td>Eggs</td>
<td>9</td>
<td>$0.79 doz</td>
<td></td>
</tr>
<tr>
<td>Bread, crumbs</td>
<td>2½ lbs</td>
<td>$0.59 per lb</td>
<td></td>
</tr>
<tr>
<td>Milk</td>
<td>2 cups</td>
<td>$0.33 per qt</td>
<td></td>
</tr>
<tr>
<td>Beef base</td>
<td>½ cup</td>
<td>$1.75 for 1-lb jar</td>
<td></td>
</tr>
<tr>
<td>Water</td>
<td>1 cup</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total cost**

**Date prices computed:**

<table>
<thead>
<tr>
<th>Cost per portion</th>
</tr>
</thead>
</table>

---
UNIT III – ARITHMETIC OPERATIONS

Lesson 8

Objectives:
You will review the practice of division.
You will solve shop-related problems by using division.

Related Information:

One use for division is in finding averages. For example, the teacher finds your test grade for the marking period by using division.

Example: Average these test scores: 90%, 70%, 80% and 75%.

Add: 90
70
80
+75
315

Divide the total by the number of tests taken.

78

= 78 ¼ or 79 average

We may have reason in food service to find the average number of a particular item sold per day in order to come up with an amount to prepare each day. (For this we would use results of production reports.)

We may have reason to find the average number of customers served per day, the average amount spent by each customer, the average number of hours worked by each employee, the average number of days absent, or the average amount of sales each week.

UNIT PRICING

Unit pricing means determining what we are actually paying for a standard amount of an item when we shop. Foods often come packaged in a variety of packages of different shapes and sizes. To actually compare them, it is necessary to compare the price of a standard quantity of each product.

One ounce of product A compared to one ounce of B.

One pound of product X compared to one pound of Y.

One quart of product M compared to one quart of product N.

To find the price of the standard unit we generally must divide.

1 dozen eggs cost 96¢. What is the cost of one egg?

There are 12 eggs to the dozen

12) 96

8 cents.
As the result of demands for consumer protection, some cities and states have passed laws making it necessary for stores to give the unit prices as well as the actual selling prices of the food packages.

For example, Brand X of pancake syrup costs .89 for 12 fluid ounces. 

Unit price? Divide 12 into 89 to find the price of one fluid ounce.

\[
\begin{array}{c}
\text{Cost per fluid ounce} \\
\text{84} \\
\text{50}
\end{array}
\]

Brand Y, found in a larger size, costs 1.59 for 24 fluid ounces.

\[
\begin{array}{c}
\text{Cost per fluid ounce} \\
\text{144} \\
\text{150}
\end{array}
\]

Brand Y costs about 1¢ less per fluid ounce than Brand X.

Other considerations may, of course, override the saving of 1¢ per ounce. Taste, ingredients, or even the size and shape of the container are a few of the considerations for this particular product.

Sometimes we do not wish to purchase the quantity listed in the catalog.

Example: Plastic trays cost $13.80 a dozen. We wish to order only three trays. How much will 3 trays cost?

First find the unit price: 12) 13.80

\[
\begin{array}{c}
\text{cost per tray} \\
\text{18} \\
\text{12} \\
\text{60} \\
\text{60}
\end{array}
\]

3 X $1.15 = $3.45 for three trays

So you see that the words “average,” “for each,” “per unit” all suggest the operation of division, as well as the words “divide” or “go into.”

ASSIGNMENT:

A. Divide the following:

1. \[\frac{836}{4}\]

2. \[\frac{2390}{8}\]

3. \[\frac{1924}{37}\]

4. \[\frac{10800}{54}\]

94
5. $ \frac{2575}{15}$  
6. $ \frac{829}{23}$  
7. $ \frac{81875}{25}$  
8. $ \frac{1500}{25}$  
9. $ \frac{3750}{125}$  
10. $ \frac{83490}{18}$  

B. Word Problems

1. Your grades in 6 tests were 75%, 90%, 100%, 80%, 60% and 85%. What is your test average?

2. A can of pears costs $1.25, peaches $1.10, apricots $1.50. What is the average cost per can of fruit?

3. Waitress Joan earned $8.60 in tips one day, Alice $6.70, Sarah $7.40. What was the average for our waitresses?

4. On Monday our restaurant had 60 customers for breakfast, 78 on Tuesday, 94 on Wednesday, 82 on Thursday, 88 on Friday, 64 on Saturday and 112 on Sunday. What was the average number of customers we served this week for breakfast?

5. Our restaurant took in $4,500 the first week in October, $5,800 the second week, $5,650 the third week, and $6,400 the fourth week. What was the average income of the restaurant per week for the month of October?

6. A case of Old Bean Pot baked beans contains 12 No. 5 cans of beans. The price per case is $8.85. What is the price of one can?

7. One case of Smoothee mayonnaise contains 12 bottles. The cost of the case is $12.79. What is the price of one bottle?

8. A case of Prickle dill pickles costs $4.29. It contains twelve 16-ounce bottles. What does one bottle of pickles cost? What is the cost per ounce?

9. Stainless steel teaspoons cost $1.60 per dozen. What is the unit price?

10. Medium-heavy stainless steel spoons cost $1.20 a dozen. What is the unit price? How much will be saved per spoon over the spoons in problem 9?
11. A No. 10 can of peaches costs $2.20. With 25 servings to the can, what will one serving cost?

12. Ten-inch heavy plastic plates regularly cost $14.40 per dozen. The special sale price is $6.60 per dozen. 
   a. What is the unit cost at the regular price?
   b. What is the unit cost at the sale price?
   c. How much money is saved per plate at the sale price?

13. Mr. Clark’s annual salary is $11,460. What is his monthly salary? What is his weekly salary?

14. The eight cooks and waitresses decided to chip in to buy a wedding present for one of the employees. The present cost $34.90. What was each person’s share?

15. Richard earns $140 a week for a 40-hour week. What is his hourly rate?

16. A restaurant can usually save money by buying in larger quantities. We generally ask for the “price break”. One dozen sugar pourers cost $5.40 a dozen. When you buy 3 or more dozen, the price goes down to $4.80 a dozen.
   a. What is the saving per dozen at the “price break” price?
   b. How much is saved per pourer at the “price break” price?

17. Sugar-packet holders cost $7.20 a dozen in lots of 5 dozen or less. In lots of 6 dozen or over they cost $6.60 per dozen. How much is saved per holder in lots over 6 dozen?

18. Gloppy-brand ketchup costs 32¢ per 14-oz bottle. What is the unit price (price per ounce)?

19. Glazed doughnuts cost 69¢ per 12-oz package. At 6 per package, what is the price per doughnut?

20. Flavor-Flow instant coffee sells for $1.95 per 10-oz jar. Wake-Up brand costs $2.05 per 8 oz jar. What is the difference in cost per ounce between the two different brands? (Hint: find the unit price of each first.)
UNIT III – ARITHMETIC OPERATIONS

Lesson 9

Objective: You will practice looking up prices and computing costs per unit.

Related Information:

On the next page is a price list for commercial food supplies, and on page 106 is a similar list for bakeshop ingredients. The prices on the list are the costs per case, per 100-lb bag, etc. In your recipes you generally use pounds, cans, cups, ounces. In short, your recipes call for much smaller quantities than those you buy in.

You have to change the cost per 100 pounds to cost per pound or per cup or per ounce, as called for in the recipe. Begin with the price list and change the cost per case to unit cost (cost per can, pound, etc). This will help you to find the cost of smaller units as needed in your recipe.

The chart below may prove helpful in finding the unit you need.

<table>
<thead>
<tr>
<th>To find cost of:</th>
<th>When you know the cost of:</th>
<th>Divide:</th>
<th>(Because there are:)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 pound</td>
<td>100-lb bag</td>
<td>100 ( \frac{\text{price per 100 lb}}{\text{lb}} )</td>
<td>(100 lb to bag)</td>
</tr>
<tr>
<td>1 ounce</td>
<td>1 pound</td>
<td>16 ( \frac{\text{price per lb}}{\text{oz}} )</td>
<td>(16 oz to lb)</td>
</tr>
<tr>
<td>1 #10 can</td>
<td>1 case</td>
<td>6 ( \frac{\text{price per case}}{\text{can}} )</td>
<td>(6 cans to case)</td>
</tr>
<tr>
<td>1 portion</td>
<td>1 #10 can</td>
<td>25 ( \frac{\text{price per can}}{\text{portion}} )</td>
<td>(25 portions to can)</td>
</tr>
<tr>
<td>1 piece</td>
<td>1 dozen</td>
<td>12 ( \frac{\text{price per dozen}}{\text{piece}} )</td>
<td>(12 pieces in doz)</td>
</tr>
<tr>
<td>1 dozen eggs</td>
<td>1 case</td>
<td>30 ( \frac{\text{price per case}}{\text{dozen}} )</td>
<td>(30 dozen eggs in case)</td>
</tr>
<tr>
<td>1 quart</td>
<td>1 gallon</td>
<td>4 ( \frac{\text{price per gallon}}{\text{quart}} )</td>
<td>(4 qts a gal)</td>
</tr>
<tr>
<td>1 pint</td>
<td>1 quart</td>
<td>2 ( \frac{\text{price per quart}}{\text{pint}} )</td>
<td>(2 pints to a qt)</td>
</tr>
<tr>
<td>1 cup</td>
<td>1 quart</td>
<td>4 ( \frac{\text{price per quart}}{\text{cup}} )</td>
<td>(4 cups to a qt)</td>
</tr>
<tr>
<td>1 fl oz</td>
<td>1 cup</td>
<td>8 ( \frac{\text{price per cup}}{\text{fl oz}} )</td>
<td>(8 oz to 1 cup)</td>
</tr>
<tr>
<td>1 tablespoon</td>
<td>1 cup</td>
<td>16 ( \frac{\text{price per cup}}{\text{tablespoon}} )</td>
<td>(16 T to a cup)</td>
</tr>
<tr>
<td>1 tablespoon</td>
<td>1 ounce</td>
<td>2 ( \frac{\text{price per oz}}{\text{tablespoon}} )</td>
<td>(2 T to an oz)</td>
</tr>
<tr>
<td>1 teaspoon</td>
<td>1 T</td>
<td>3 ( \frac{\text{price per T}}{\text{teaspoon}} )</td>
<td>(3 t to a T)</td>
</tr>
<tr>
<td>1 pinch</td>
<td>1 t</td>
<td>2 ( \frac{\text{price per t}}{\text{pinch}} )</td>
<td>(2 pchs to a t)</td>
</tr>
</tbody>
</table>

Here are two examples of how you might use these tables:

Example 1: Your recipe calls for 2 lbs brown sugar.

From the table on the next page, 24 1-lb boxes cost $12.25
One pound costs 24 \( \frac{\$12.25}{2} = .51 \) (Fill in the unit cost on the table.)
Then 2 lbs cost 2 \( \times .51 = \$1.02 \).
Example 2: Your recipe calls for 4 oz salad oil.

6 1-gallon cans cost $36.50
Dividing, you get $6.08 for 1 gallon. (Write it in on the chart.)
Divide 4 into $6.08 to find cost per quart = $1.52
Divide 4 into $1.52 to find cost per cup = .38
There are 8 oz to a cup, and you need 4 oz. That is 1/2 of .38, or .19

It is possible to take shortcuts to save time.....so think as you do the problems.
Round off your figures if necessary as you go along.
ASSIGNMENT A:
Compute the unit price for each food in the chart below.

<table>
<thead>
<tr>
<th>Item</th>
<th>Size of Package Used</th>
<th>Amt. in Case (or Amt. Purchased)</th>
<th>Price Per Case (or Per Purchase)</th>
<th>Price Per Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Almond extract</td>
<td>1-qt bottle</td>
<td>1 bottle</td>
<td>$3.50</td>
<td>per oz</td>
</tr>
<tr>
<td>Apples, canned</td>
<td>#10 can</td>
<td>6 cans</td>
<td>14.50</td>
<td>per can</td>
</tr>
<tr>
<td>Bacon</td>
<td>1 lb</td>
<td>1 pound</td>
<td>1.13</td>
<td></td>
</tr>
<tr>
<td>Basil, dry</td>
<td>1-lb can</td>
<td>1 can</td>
<td>7.65</td>
<td>per oz</td>
</tr>
<tr>
<td>Beans, kidney</td>
<td>#10 can</td>
<td>6 cans</td>
<td>11.10</td>
<td>per can</td>
</tr>
<tr>
<td>Beans, string</td>
<td>#10 can</td>
<td>6 cans</td>
<td>8.55</td>
<td>per can</td>
</tr>
<tr>
<td>Beef, bottom round</td>
<td>1 lb</td>
<td></td>
<td>1.69</td>
<td></td>
</tr>
<tr>
<td>Beef, ground</td>
<td>10 lb-</td>
<td>10-lb bag</td>
<td>10.40</td>
<td>per lb</td>
</tr>
<tr>
<td>Beef base</td>
<td>1-lb can</td>
<td>12 cans</td>
<td>21.45</td>
<td>per lb</td>
</tr>
<tr>
<td>Butter, prints</td>
<td>1 lb</td>
<td>30 lbs</td>
<td>23.40</td>
<td>per lb</td>
</tr>
<tr>
<td>Bread crumbs</td>
<td>1 lb</td>
<td>25-lb bag</td>
<td>8.75</td>
<td>per lb</td>
</tr>
<tr>
<td>Cabbage</td>
<td>head</td>
<td>med. head</td>
<td>.34</td>
<td></td>
</tr>
<tr>
<td>Carrots, canned</td>
<td>#10 can</td>
<td>6 cans</td>
<td>7.25</td>
<td>per can</td>
</tr>
<tr>
<td>Celery</td>
<td>stalk</td>
<td>36 per crate</td>
<td>9.25</td>
<td>per stalk</td>
</tr>
<tr>
<td>Chicken, fryer</td>
<td>whole</td>
<td>per pound</td>
<td>.59</td>
<td></td>
</tr>
<tr>
<td>Chicken base</td>
<td>1-lb can</td>
<td>12 cans</td>
<td>21.45</td>
<td>per lb</td>
</tr>
<tr>
<td>Cheese, parmesan</td>
<td>1-lb jar</td>
<td>12 jars</td>
<td>24.36</td>
<td>per lb</td>
</tr>
<tr>
<td>Cinnamon</td>
<td>14-oz can</td>
<td>1 can</td>
<td>3.06</td>
<td>per oz</td>
</tr>
<tr>
<td>Corn starch</td>
<td>1-lb box</td>
<td>24 boxes</td>
<td>6.90</td>
<td>per oz</td>
</tr>
<tr>
<td>Eggs</td>
<td>1 egg</td>
<td>doz</td>
<td>.85</td>
<td>each</td>
</tr>
<tr>
<td>Flour, all-purpose</td>
<td>100-lb bag</td>
<td>100-lb bag</td>
<td>14.95</td>
<td>per lb</td>
</tr>
<tr>
<td>Ginger</td>
<td>1-lb can</td>
<td>1-lb can</td>
<td>2.96</td>
<td>per oz</td>
</tr>
<tr>
<td>Ham, boneless</td>
<td>1 lb</td>
<td></td>
<td>1.79</td>
<td></td>
</tr>
<tr>
<td>Lemons</td>
<td>1 lemon</td>
<td>1 doz</td>
<td>1.00</td>
<td>each</td>
</tr>
<tr>
<td>Lobster meat, cooked</td>
<td>1 lb</td>
<td></td>
<td>5.80</td>
<td>per oz</td>
</tr>
<tr>
<td>Margarine</td>
<td>1-lb print</td>
<td>30 lbs</td>
<td>16.50</td>
<td>per lb</td>
</tr>
<tr>
<td>Milk</td>
<td>qt</td>
<td>1 gallon</td>
<td>1.29</td>
<td>per qt</td>
</tr>
<tr>
<td>Mushrooms</td>
<td>1 lb</td>
<td></td>
<td>.99</td>
<td>per oz</td>
</tr>
<tr>
<td>Noodles</td>
<td>10-lb box</td>
<td>10-lb box</td>
<td>4.90</td>
<td>per lb</td>
</tr>
<tr>
<td>Oil, olive</td>
<td>1 gal·can</td>
<td>1 can</td>
<td>10.61</td>
<td>per cup</td>
</tr>
<tr>
<td>Oil, salad</td>
<td>1 gal can</td>
<td>6 cans</td>
<td>36.50</td>
<td>per cup</td>
</tr>
<tr>
<td>Item</td>
<td>Size of Package Used</td>
<td>Amt. in Case (or Amt. Purchased)</td>
<td>Price Per Case (or Per Purchase)</td>
<td>Price Per Unit</td>
</tr>
<tr>
<td>-------------------</td>
<td>----------------------</td>
<td>----------------------------------</td>
<td>----------------------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>Onions</td>
<td>50-lb bag</td>
<td>1 bag</td>
<td>5.75</td>
<td>per lb</td>
</tr>
<tr>
<td>Parsley, dry flaked</td>
<td>8-oz can</td>
<td>1 can</td>
<td>1.75</td>
<td>per oz</td>
</tr>
<tr>
<td>Peaches, canned</td>
<td>#10 can</td>
<td>6 cans</td>
<td>12.60</td>
<td>per can</td>
</tr>
<tr>
<td>Peas, canned</td>
<td>#10 can</td>
<td>6 cans</td>
<td>8.90</td>
<td>per can</td>
</tr>
<tr>
<td>Peppers, green</td>
<td>1 pepper</td>
<td>6 medium</td>
<td>.75</td>
<td>each</td>
</tr>
<tr>
<td>Pickles, sweet</td>
<td>1 jar</td>
<td>jar (20 pickles)</td>
<td>.69</td>
<td>per pickle</td>
</tr>
<tr>
<td>Pimentos</td>
<td>7-oz can</td>
<td>24 cans</td>
<td>11.67</td>
<td>per can</td>
</tr>
<tr>
<td>Rice</td>
<td>25-lb bag</td>
<td>25-lb bag</td>
<td>12.20</td>
<td>per lb</td>
</tr>
<tr>
<td>Salt</td>
<td>1 lb 10oz box</td>
<td>1 box</td>
<td>.13</td>
<td>per oz</td>
</tr>
<tr>
<td>Sugar, brown</td>
<td>1-lb box</td>
<td>24 boxes</td>
<td>7.45</td>
<td>per lb</td>
</tr>
<tr>
<td>Sugar, granulated</td>
<td>100-lb bag</td>
<td>100-lb bag</td>
<td>19.75</td>
<td>per lb</td>
</tr>
<tr>
<td>Tomatoes</td>
<td>#10 can</td>
<td>6 cans</td>
<td>11.80</td>
<td>per can</td>
</tr>
<tr>
<td>Tomato puree</td>
<td>#10 can</td>
<td>6 cans</td>
<td>10.70</td>
<td>per can</td>
</tr>
<tr>
<td>Veal leg, boned</td>
<td>1 lb</td>
<td></td>
<td>1.73</td>
<td></td>
</tr>
</tbody>
</table>
ASSIGNMENT B:

Fill in the missing amounts on cards #1 through #10 and compute the cost per portion of each item. (For all liquids, assume that 1 lb. equals 1 pint.)

(1) STANDARD RECIPE COST CONTROL FORM

Recipe Item: Spaghetti sauce
Yield: 150
Portion Size: 6-oz ladle

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Quantity</th>
<th>Market Price</th>
<th>Extension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil, salad</td>
<td>3 pint(s)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Onions</td>
<td>3 lbs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tomatoes</td>
<td>8 #10 cans</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tomato Puree</td>
<td>1 #10 can</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parsley</td>
<td>1 cup</td>
<td></td>
<td>.22</td>
</tr>
<tr>
<td>Parmesan cheese</td>
<td>2 lbs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Basil</td>
<td>4 T</td>
<td></td>
<td>.10</td>
</tr>
<tr>
<td>Sugar</td>
<td>1 cup</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Garlic powder</td>
<td>4 t</td>
<td></td>
<td>.08</td>
</tr>
<tr>
<td>Beef base</td>
<td>1 cup</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total cost

Date prices computed: Cost per portion

(2) STANDARD RECIPE COST CONTROL FORM

Recipe Item: Meatballs
Yield: 150 meatballs
Portion Size: 2 2-oz meatballs

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Quantity</th>
<th>Market Price</th>
<th>Extension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ground beef</td>
<td>30 lbs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bread crumbs</td>
<td>3 lbs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eggs</td>
<td>16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Milk</td>
<td>3 cups</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Garlic powder</td>
<td>2 T</td>
<td></td>
<td>.04</td>
</tr>
<tr>
<td>Onions, minced</td>
<td>1 lb</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parmesan cheese</td>
<td>2 cups (½ lb)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total cost

Date prices computed: Cost per portion
### Peach Crisp Recipe

**STANDARD RECIPE COST CONTROL FORM**

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Quantity</th>
<th>Market Price</th>
<th>Extension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brown sugar</td>
<td>2 lbs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flour</td>
<td>2 lbs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Butter</td>
<td>1½ lbs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peaches</td>
<td>2 #10 cans</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ginger</td>
<td>4 t</td>
<td></td>
<td>.05</td>
</tr>
<tr>
<td>Almond extract</td>
<td>4 t</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total cost**

Date prices computed:  
Cost per portion

### Beef Rouladen Recipe

**STANDARD RECIPE COST CONTROL FORM**

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Quantity</th>
<th>Market Price</th>
<th>Extension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bottom round</td>
<td>5 lbs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bacon</td>
<td>1 lb</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ham</td>
<td>½ lb</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hamburger</td>
<td>¾ lb</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Onion, chopped</td>
<td>1 cup (6oz weight)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eggs</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bread crumbs, dry</td>
<td>1½ pt (14 oz)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sweet pickles</td>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Red wine</td>
<td>1 cup</td>
<td></td>
<td>.25</td>
</tr>
<tr>
<td>Tomato puree</td>
<td>1 cup</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brown sauce</td>
<td>2 qts</td>
<td></td>
<td>.45</td>
</tr>
<tr>
<td>Garlic</td>
<td>3 cloves</td>
<td></td>
<td>.10</td>
</tr>
</tbody>
</table>

**Total cost**

Date prices computed:  
Cost per portion
### Recipe Item: Chicken-noodle soup

**STANDARD RECIPE COST CONTROL FORM**

Yield: 50

Portion Size: 6 - 7-oz

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Quantity</th>
<th>Market Price</th>
<th>Extension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Celery</td>
<td>1 stalk</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Onions</td>
<td>1½ lb</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carrots, raw</td>
<td>2 lbs</td>
<td>.19/lb</td>
<td></td>
</tr>
<tr>
<td>Chicken base</td>
<td>¾ lb</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Noodles</td>
<td>1½ lbs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oil, salad</td>
<td>4 oz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water</td>
<td>3 gals</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total cost**

Date prices computed:  

Cost per portion

---

### Recipe Item: Arroz con pollo

**STANDARD RECIPE COST CONTROL FORM**

Yield: 4 portions

Portion Size: ½ chicken

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Quantity</th>
<th>Market Price</th>
<th>Extension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broiler or fryer</td>
<td>2 2-lb chickens</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Olive oil</td>
<td>1/3 cup</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Onions</td>
<td>1 (1/3 lb)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Green pepper</td>
<td>1 medium</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Garlic</td>
<td>1 clove</td>
<td>.03</td>
<td></td>
</tr>
<tr>
<td>Chicken stock (from base)</td>
<td>12 oz</td>
<td>.20</td>
<td></td>
</tr>
<tr>
<td>Raw rice</td>
<td>1 cup (½ lb)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tomatoes, canned</td>
<td>1 pint</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pimentos</td>
<td>½ can</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Saffron</td>
<td>1/8 t</td>
<td>.05</td>
<td></td>
</tr>
<tr>
<td>Peas</td>
<td>4 oz</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total cost**

Date prices computed:  

Cost per portion

---
### Lobster Newburg

**Recipe Item:** Lobster Newburg  
**Yield:** 48 portions  
**Portion Size:** 4 oz

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Quantity</th>
<th>Market Price</th>
<th>Extension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooked lobster meat</td>
<td>12 lbs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Butter</td>
<td>1 lb</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paprika</td>
<td>3 T</td>
<td></td>
<td>.05</td>
</tr>
<tr>
<td>Dry sherry</td>
<td>6 oz</td>
<td></td>
<td>.40</td>
</tr>
<tr>
<td>Lemon juice</td>
<td>1 lemon</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medium cream sauce</td>
<td>2 gal</td>
<td>1.95 per gal</td>
<td></td>
</tr>
<tr>
<td>Salt and pepper</td>
<td>to taste</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total cost**

Date prices computed:  
Cost per portion: 113

### Minestrone soup

**Recipe Item:** Minestrone soup  
**Yield:** 50  
**Portion Size:** 4-oz ladle

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Quantity</th>
<th>Market Price</th>
<th>Extension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beef base</td>
<td>¼ lb</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oil</td>
<td>1 cup</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Onions</td>
<td>1 lb 8 oz</td>
<td></td>
<td>.20</td>
</tr>
<tr>
<td>Celery</td>
<td>1 lb</td>
<td></td>
<td>.15</td>
</tr>
<tr>
<td>Carrots</td>
<td>1 lb</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peppers</td>
<td>2 med</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cabbage</td>
<td>1 lb</td>
<td></td>
<td>.24</td>
</tr>
<tr>
<td>Garlic powder</td>
<td>1 t</td>
<td></td>
<td>.02</td>
</tr>
<tr>
<td>Tomatoes</td>
<td>1 qt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Basil</td>
<td>1 t</td>
<td></td>
<td>.01</td>
</tr>
<tr>
<td>Parmesan cheese</td>
<td>1 c (4oz weight)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parsley</td>
<td>2 t</td>
<td></td>
<td>.02</td>
</tr>
<tr>
<td>Kidney beans</td>
<td>½ #10 can</td>
<td></td>
<td></td>
</tr>
<tr>
<td>String beans</td>
<td>½ #10 can</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water</td>
<td>2 ½ gal</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total cost**

Date prices computed:  
Cost per portion: 104
### Veal Scaloppine

#### Recipe Item: Veal scaloppine

**Yield:** 6 portions  
**Portion Size:** 4 oz

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Quantity</th>
<th>Market Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Veal, leg, boneless</td>
<td>1½ lb</td>
<td></td>
</tr>
<tr>
<td>Salt and pepper</td>
<td>to taste</td>
<td></td>
</tr>
<tr>
<td>Flour</td>
<td>as needed</td>
<td></td>
</tr>
<tr>
<td>Butter</td>
<td>3 oz</td>
<td></td>
</tr>
<tr>
<td>Marsala wine</td>
<td>½ c</td>
<td>.15</td>
</tr>
<tr>
<td>Lemon juice</td>
<td>½ lemon</td>
<td></td>
</tr>
<tr>
<td>Brown sauce</td>
<td>½ c</td>
<td>.03</td>
</tr>
<tr>
<td>Mushrooms</td>
<td>½ lb</td>
<td></td>
</tr>
</tbody>
</table>

**Total cost:**

Date prices computed:

**Cost per portion:**

---

### Pumpkin Pie Filling

#### Recipe Item: Pumpkin pie filling

**Yield:** 4 10" pies  
**Portion Size:** 8 per pie

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Quantity</th>
<th>Market Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brown sugar</td>
<td>10 oz</td>
<td></td>
</tr>
<tr>
<td>White sugar</td>
<td>10½ oz</td>
<td></td>
</tr>
<tr>
<td>Cinnamon</td>
<td>4 t</td>
<td>.07</td>
</tr>
<tr>
<td>Corn starch</td>
<td>1 oz</td>
<td></td>
</tr>
<tr>
<td>Ginger</td>
<td>2¼ t</td>
<td>.04</td>
</tr>
<tr>
<td>Salt</td>
<td>2½ t</td>
<td>.01</td>
</tr>
<tr>
<td>Pumpkin</td>
<td>4 lbs 2 oz</td>
<td>.12/lb</td>
</tr>
<tr>
<td>Eggs</td>
<td>2 cups</td>
<td>.53/lb</td>
</tr>
<tr>
<td>Milk</td>
<td>1¼ qts</td>
<td></td>
</tr>
<tr>
<td>Molasses</td>
<td>¼ c</td>
<td>.15</td>
</tr>
</tbody>
</table>

**Total cost:**

Date prices computed:

**Cost per portion:**
Assignment C:
Complete the unit price for each item in the chart below.

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount Purchased</th>
<th>Price</th>
<th>Unit Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple filling</td>
<td>#10 can (7 lb)</td>
<td>$21.84</td>
<td>per lb</td>
</tr>
<tr>
<td>Baking powder</td>
<td>10-lb can</td>
<td>3.75</td>
<td>per oz</td>
</tr>
<tr>
<td>Baking soda</td>
<td>24 1-lb cans</td>
<td>6.54</td>
<td>per oz</td>
</tr>
<tr>
<td>Chocolate chips</td>
<td>10-lb box</td>
<td>16.50</td>
<td>per lb</td>
</tr>
<tr>
<td>Cinnamon</td>
<td>5-lb box</td>
<td>15.00</td>
<td>per oz</td>
</tr>
<tr>
<td>Cocoa</td>
<td>2.10-lb boxes</td>
<td>12.00</td>
<td>per lb</td>
</tr>
<tr>
<td>Eggs, fresh whole</td>
<td>30-lb can</td>
<td>15.90</td>
<td>per lb</td>
</tr>
<tr>
<td>Eggs, frozen</td>
<td>30-lb can</td>
<td>17.40</td>
<td>per lb</td>
</tr>
<tr>
<td>Egg whites</td>
<td>10-lb can</td>
<td>3.80</td>
<td>per lb</td>
</tr>
<tr>
<td>Flavor</td>
<td>1-gal jug</td>
<td>2.95</td>
<td>per oz</td>
</tr>
<tr>
<td>Flour, bread or patent</td>
<td>100-lb bag</td>
<td>14.80</td>
<td>per lb</td>
</tr>
<tr>
<td>Flour, clear</td>
<td>100-lb bag</td>
<td>14.50</td>
<td>per lb</td>
</tr>
<tr>
<td>Flour, high-gluten</td>
<td>100-lb bag</td>
<td>15.65</td>
<td>per lb</td>
</tr>
<tr>
<td>Flour, pastry</td>
<td>100-lb bag</td>
<td>16.75</td>
<td>per lb</td>
</tr>
<tr>
<td>Flour, silk-tex</td>
<td>100-lb bag</td>
<td>15.25</td>
<td>per lb</td>
</tr>
<tr>
<td>Margarine</td>
<td>50-lb cube</td>
<td>16.50</td>
<td>per lb</td>
</tr>
<tr>
<td>Milk, non-fat dry powder</td>
<td>50-lb bag</td>
<td>35.60</td>
<td>per lb</td>
</tr>
<tr>
<td>Puff Do</td>
<td>30-lb box</td>
<td>19.50</td>
<td>per lb</td>
</tr>
<tr>
<td>Salt</td>
<td>100-lb bag</td>
<td>5.00</td>
<td>per lb</td>
</tr>
<tr>
<td>Shortening, high-ratio</td>
<td>50-lb cube</td>
<td>33.00</td>
<td>per lb</td>
</tr>
<tr>
<td>Shortening, Nutex (liquid)</td>
<td>5-qt cans (Case of 6)</td>
<td>38.80</td>
<td>per qt</td>
</tr>
<tr>
<td>Shortening, regular</td>
<td>50-lb cube</td>
<td>32.50</td>
<td>per lb</td>
</tr>
<tr>
<td>Sugar, brown</td>
<td>100-lb bag</td>
<td>30.70</td>
<td>per lb</td>
</tr>
<tr>
<td>Sugar, confectionery (6X)</td>
<td>100-lb bag</td>
<td>20.75</td>
<td>per lb</td>
</tr>
<tr>
<td>Sugar, granulated</td>
<td>100-lb bag</td>
<td>19.75</td>
<td>per lb</td>
</tr>
<tr>
<td>Vanilla (imitation)</td>
<td>1-gal jug</td>
<td>4.25</td>
<td>per oz</td>
</tr>
<tr>
<td>Yeast</td>
<td>1-lb block</td>
<td>.35</td>
<td>per lb</td>
</tr>
</tbody>
</table>
ASSIGNMENT D:

Using the table on the previous page, fill in the missing amounts on cards #11 through #20 and compute the cost per portion of each item.

### (11) STANDARD RECIPE COST CONTROL FORM

**Recipe Item:** Spritz cookies  
**Yield:** 12 lbs – 280 cookies  
**Portion Size:**

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Quantity</th>
<th>Market Price</th>
<th>Extension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Granulated sugar</td>
<td>2 lbs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shortening</td>
<td>5 lbs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salt</td>
<td>1 oz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Egg whites</td>
<td>1 lb</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vanilla</td>
<td>1 oz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patent flour</td>
<td>5 lbs</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total cost**

Date prices computed:  
Cost per pound

### (12) STANDARD RECIPE COST CONTROL FORM

**Recipe Item:** White bread  
**Yield:** 24  
**Portion Size:** 14 oz

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Quantity</th>
<th>Market Price</th>
<th>Extension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salt</td>
<td>4 oz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Granulated sugar</td>
<td>1 lb</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Milk powder</td>
<td>1 lb</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regular shortening</td>
<td>1 lb</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cold water</td>
<td>8 lbs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yeast</td>
<td>1 lb</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patent flour</td>
<td>15 lbs</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total cost**

Date prices computed:  
Cost per loaf

107

116
## Puff Pastry

**Recipe Item:** Puff Pastry  
**Yield:** 18 lbs - 115 pieces  
**Portion Size:** 2½ oz

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Quantity</th>
<th>Market Price</th>
<th>Extension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bread flour</td>
<td>10 lbs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salt</td>
<td>2 oz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water</td>
<td>6 lbs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Puff-Do</td>
<td>5 lbs</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total cost**

**Date prices computed:**

**Cost per piece**

---

## Gingerbread

**Recipe Item:** Gingerbread  
**Yield:** 21 lbs - 134 pieces  
**Portion Size:** 2½ oz

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Quantity</th>
<th>Market Price</th>
<th>Extension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brown sugar</td>
<td>3 lbs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Granulated sugar</td>
<td>3 lbs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Margarine</td>
<td>3 lbs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spices (Use cinnamon)</td>
<td>2½ oz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baking soda</td>
<td>½ oz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Whole eggs, frozen</td>
<td>1 lb</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pastry flour</td>
<td>10 lbs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baking powder</td>
<td>2½ oz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water</td>
<td>1 lb</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total cost**

**Date prices computed:**

**Cost per piece**
### Recipe Item: Topping for Sour Cream Loaf

**Yield:** 20 toppings

**Portion Size:** 1/4 lb.

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Quantity</th>
<th>Market Price</th>
<th>Extension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Granulated sugar</td>
<td>3 lbs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water</td>
<td>1 lb</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chocolate chips</td>
<td>1 lb</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cinnamon</td>
<td>1 oz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cocoa</td>
<td>1 oz</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total cost**

**Date prices computed:**

**Cost per topping:**

### Recipe Item: Pizza Dough

**Yield:** 8 pies

**Portion Size:** 9 oz

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Quantity</th>
<th>Market Price</th>
<th>Extension</th>
</tr>
</thead>
<tbody>
<tr>
<td>High-gluten flour</td>
<td>3 lbs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water</td>
<td>8 oz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yeast</td>
<td>3 oz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Granulated sugar</td>
<td>6 oz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regular shortening</td>
<td>7 oz</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total cost**

**Date prices computed:**

**Cost per pie:**
### Recipe Item: Butter cream

**STANDARD RECIPE COST CONTROL FORM**

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Quantity</th>
<th>Market Price</th>
<th>Extension</th>
</tr>
</thead>
<tbody>
<tr>
<td>High-ratio shortening</td>
<td>5 lbs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salt</td>
<td>2 oz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Milk powder</td>
<td>1 lb 4 oz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water</td>
<td>3 lbs 8 oz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vanilla</td>
<td>1 oz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Confectionery sugar</td>
<td>20 lbs</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Yield:** 30 lbs

**Portion Size:**

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Quantity</th>
<th>Market Price</th>
<th>Extension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sugar</td>
<td>4 lbs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salt</td>
<td>4 oz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Margarine</td>
<td>4 lbs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patent flour</td>
<td>12 lbs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pastry flour</td>
<td>6 lbs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dry milk</td>
<td>1 lb</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Whole eggs, fresh</td>
<td>3 lbs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yeast</td>
<td>2 lbs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flavor</td>
<td>1 oz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water</td>
<td>8 lbs</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total cost**

<table>
<thead>
<tr>
<th>Date prices computed:</th>
<th>Cost per pound:</th>
</tr>
</thead>
</table>

### Recipe Item: Bun dough

**STANDARD RECIPE COST CONTROL FORM**

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Quantity</th>
<th>Market Price</th>
<th>Extension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sugar</td>
<td>4 lbs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salt</td>
<td>4 oz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Margarine</td>
<td>4 lbs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patent flour</td>
<td>12 lbs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pastry flour</td>
<td>6 lbs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dry milk</td>
<td>1 lb</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Whole eggs, fresh</td>
<td>3 lbs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yeast</td>
<td>2 lbs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flavor</td>
<td>1 oz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water</td>
<td>8 lbs</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Yield:** 35 lbs – 280 pieces

**Portion Size:** 2 oz

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Quantity</th>
<th>Market Price</th>
<th>Extension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sugar</td>
<td>4 lbs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salt</td>
<td>4 oz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Margarine</td>
<td>4 lbs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patent flour</td>
<td>12 lbs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pastry flour</td>
<td>6 lbs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dry milk</td>
<td>1 lb</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Whole eggs, fresh</td>
<td>3 lbs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yeast</td>
<td>2 lbs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flavor</td>
<td>1 oz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water</td>
<td>8 lbs</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total cost**

<table>
<thead>
<tr>
<th>Date prices computed:</th>
<th>Cost per piece:</th>
</tr>
</thead>
</table>
### Windsor Cake

#### Recipe Item: Windsor cake

- **Yield:** 78
- **Portion Size:** 7" cake

#### Ingredients

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Quantity</th>
<th>Market Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cake flour (High-gluten)</td>
<td>10 lbs</td>
<td></td>
</tr>
<tr>
<td>Nutex shortening</td>
<td>7 lbs</td>
<td></td>
</tr>
<tr>
<td>Granulated sugar</td>
<td>12 lbs 8 oz</td>
<td></td>
</tr>
<tr>
<td>Salt</td>
<td>6 oz</td>
<td></td>
</tr>
<tr>
<td>Baking powder</td>
<td>10 oz</td>
<td></td>
</tr>
<tr>
<td>Milk powder</td>
<td>14 oz</td>
<td></td>
</tr>
<tr>
<td>Whole eggs, fresh</td>
<td>9 lbs</td>
<td></td>
</tr>
<tr>
<td>Flavor</td>
<td>6 oz</td>
<td></td>
</tr>
<tr>
<td>Water</td>
<td>4 lbs 10 oz</td>
<td></td>
</tr>
</tbody>
</table>

#### Total cost

Date prices computed:

**Cost per cake:**

---

### Pie Crust

#### Recipe Item: Pie crust

- **Yield:** 120 single crusts
- **Portion Size:**

#### Ingredients

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Quantity</th>
<th>Market Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pastry flour</td>
<td>10 lbs</td>
<td></td>
</tr>
<tr>
<td>Regular shortening</td>
<td>7 lbs</td>
<td></td>
</tr>
<tr>
<td>Cold water</td>
<td>3 lbs 8 oz</td>
<td></td>
</tr>
<tr>
<td>Salt</td>
<td>5 ¼ oz</td>
<td></td>
</tr>
</tbody>
</table>

#### Total cost

Date prices computed:

**Cost per crust:**

---

111

120
UNIT IV – MONEY AND DECIMALS

Lesson 1

Making Change

Objectives:
You will learn the importance of giving out the correct change.
You will practice giving out change.
You will learn how to use the cash register.

Related Information:

Depending upon the size of the restaurant, you may find yourself in the position of having to operate the cash register; you may also give change to customers as a waiter or waitress. In a previous unit you practiced filling out a guest check. Some waiters are required to fill out the guest check, and in some cases they take the money to the register for the customer.

THE CASH REGISTER

The cash register provides safe storage for money taken in, as it can be locked. It also, if used properly, keeps the money sorted in proper denominations (dollar bills, five-dollar bills, 10-dollar bills, nickels, dimes, etc.) making it easy to make change.

Through use of a tape, the cash register keeps a record of the cash received and paid out. Money is generally not left overnight in the register, even though it can be locked.

A register report is generally filled out. It records all the money placed into the register in the morning. At the end of the day a total is made of the amount of money in the register.

Example:

Cash put into register: $ 20.00
Cash at the end of the day: $ 500.00

Actual cash received: $500.00 - $20.00 = $480.00

The printed amount on the tape is compared with the actual amount in the drawer.

If the two are the same, everything is correct.

If there is more actual cash than there should be, the register is said to be over. The cashier probably did not pay out enough money in making change.

If there is less actual cash in the register than on the tape, the register is said to be short. Again an error has been made: not enough money was taken in, or too much was paid out.

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To prevent errors, you must: Know how to operate your register properly.

Be accurate in operating the machine.

Be careful in handling the money.

An experienced operator puts the bill received on the plate in front of the register. This will prevent a customer from making an erroneous claim, and will also prevent the operator from forgetting the amount received.

When the customer is given change, state out loud the amount of the sale. Then start with the smallest denomination and count off the change until it equals the amount of the bill still visible on the register. This bill is then placed properly in the drawer.

ASSIGNMENT: Part A:

1. Write the following in words:
   
   a. $5.68
   b. $0.19
   c. 45¢
   d. $1.09
   e. $25.89
   f. $124.83

2. Express in figures:
   
   a. three hundred and seventeen
   b. eighteen dollars and sixty-three cents
   c. thirty-three dollars and six cents
   d. fifty-one dollars and twelve cents
   e. two dollars and seventy-seven cents

3. Change the following amounts to dollars and cents:
   
   a. 10 nickels = $____
   b. 12 dimes = $____
   c. 4 quarters = $____
   d. 25 nickels = $____
   e. 10 quarters = $____
   f. 18 dimes = $____

113
4. Give the proper amount of change for the following:
   a. Amount of check $2.75; amount of money given: $5.00
   b. Amount of check $3.06; amount of money given: $5.00
   c. Amount of check $1.34; amount of money given: $2.00
   d. Amount of check $4.67; amount of money given: $10.00
   e. Amount of check $12.19; amount of money given: $20.00
   f. Amount of check $8.98; amount of money given: $20.00
   g. Amount of check $2.78; amount of money given: $20.00
   h. Amount of check $7.54; amount of money given: $10.00
   i. Amount of check $6.65; amount of money given: $1.00
   j. Amount of check $1.06; amount of money given: $2.00

ASSIGNMENT, Part B:

Example: You sold a $1.35 lunch and received $5.00 from the customer. Tell how you would give the customer change.

Always use the largest possible cash and coins when making change. Always start with the amount of the sale and give the change back starting with the lowest coin first.

The answer to the above problem would be: Say: $1.35..., 1.40 (a nickel), 1.50 (a dime), 1.75 (a quarter) 2 dollars (another quarter), three, four, five dollars (three 1-dollar bills).

1. You sold a 65¢ lunch and received $1.00.
2. You sold a $1.30 lunch and received a $10.00 bill.
3. Fill out the chart on the following page. Use a check mark (✓) for each coin.
<table>
<thead>
<tr>
<th>Amount of Sale</th>
<th>Amount Received</th>
<th>Coins</th>
<th>Bills</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1¢</td>
<td>5¢</td>
</tr>
<tr>
<td>1.</td>
<td>$ 1.25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>.77</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>$ 2.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>$ 4.07</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>$11.75</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>$11.75</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>$11.75</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>$ 1.98</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>$ 6.67</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10:</td>
<td>$ 5.17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>$23.83</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>$ 4.32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>$ 3.79</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td>.65</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15.</td>
<td>$13.33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16.</td>
<td>$12.33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17.</td>
<td>$ 9.08</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18.</td>
<td>$ 8.01</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

124
115
THE CASH REGISTER REPORT FORM

The instructor will explain how to fill out the cash-register report form by projecting a transparency of the form in this book.

The BEFORE column shows the different denominations of coins and cash that were received and placed in the register when it was first opened. These are totaled up below each section, and the full total is entered below, as "Total all money in the register."

The AFTER is done the same way, listing the amounts of each coin and cash and totaling up each section. The total "before" is subtracted from the total "after" to get the "actual cash taken in" for the day.

ASSIGNMENT C:

1. Do this one with the instructor:

   Before:  20 - 1¢; 20 - 5¢; 10 - 10¢; 8 - 25¢; 5 - $1.00; 1 - $5.00
   After:  8 - 1¢; 36 - 5¢; 14 - 10¢; 8 - 25¢; 37 - $1.00; 13 - $5.00; 1 - $10.00

2. Do these register reports yourself:
   a. Before:  20 - 1¢; 20 - 5¢; 10 - 10¢; 8 - 25¢; 5 - $1.00
      After:  4 - 1¢; 9 - 5¢; 31 - 10¢; 27 - 25¢; 37 - $1.00; 13 - $5.00; 7 - $10.00
   b. Before:  50 - 1¢; 40 - 5¢; 20 - 10¢; 16 - 25¢; 10 - $1.00; 2 - $5.00
      After:  35 - 1¢; 12 - 5¢; 18 - 10¢; 4 - 25¢; 76 - $1.00; 4 - $5.00; 2 - $10.00; 2 - $20.00
## CASH REGISTER REPORT

<table>
<thead>
<tr>
<th>Name:</th>
<th>Date:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Quantity</th>
<th>BEFORE Coin</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1¢</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5¢</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10¢</td>
<td></td>
</tr>
<tr>
<td></td>
<td>25¢</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>AFTER Coin</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1¢</td>
<td></td>
</tr>
<tr>
<td>5¢</td>
<td></td>
</tr>
<tr>
<td>10¢</td>
<td></td>
</tr>
<tr>
<td>25¢</td>
<td></td>
</tr>
</tbody>
</table>

Total of coins = 117

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Bills</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$ 1.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$ 5.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$10.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$20.00</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bills</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>$ 1.00</td>
<td></td>
</tr>
<tr>
<td>$ 5.00</td>
<td></td>
</tr>
<tr>
<td>$10.00</td>
<td></td>
</tr>
<tr>
<td>$20.00</td>
<td></td>
</tr>
</tbody>
</table>

Total of cash = 117

Total of coins from above = 117

Total all money in register = 117

Cash in register AFTER = 117
Cash in register BEFORE = 117
Actual cash taken in = 117
Reading on tape = 117
Amount short = 0

Signed: 

Approved: 

Cash in register AFTER
Cash in register BEFORE
Actual cash taken in
Reading on tape
Amount short

126

117
## CASH REGISTER REPORT

<table>
<thead>
<tr>
<th>Quantity</th>
<th>BEFORE</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1¢</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5¢</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10¢</td>
<td></td>
</tr>
<tr>
<td></td>
<td>25¢</td>
<td></td>
</tr>
</tbody>
</table>

**Total of coins =**

<table>
<thead>
<tr>
<th>Quantity</th>
<th>AFTER</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1¢</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5¢</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10¢</td>
<td></td>
</tr>
<tr>
<td></td>
<td>25¢</td>
<td></td>
</tr>
</tbody>
</table>

**Total of coins =**

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Bills</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$ 1.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$ 5.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$10.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$20.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td></td>
</tr>
</tbody>
</table>

**Total of cash**

**Total of coins from above**

**Total all money in register**

---

- **Cash in register AFTER**
- **Cash in register BEFORE**
- **Actual cash taken in**
- **Reading on tape**
- **Amount short over**

Signed: 

Approved: 

---

127

118
# CASH REGISTER REPORT

<table>
<thead>
<tr>
<th>Name:</th>
<th>Date:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Quantity</th>
<th>BEFORE</th>
<th>Amount</th>
<th>AFTER</th>
<th>Coin</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1¢</td>
<td></td>
<td></td>
<td>1¢</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5¢</td>
<td></td>
<td></td>
<td>5¢</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10¢</td>
<td></td>
<td></td>
<td>10¢</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25¢</td>
<td></td>
<td></td>
<td>25¢</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total of coins =

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Bills</th>
<th>Amount</th>
<th>Quantity</th>
<th>Bills</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>$ 1.00</td>
<td></td>
<td></td>
<td>$ 1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$ 5.00</td>
<td></td>
<td></td>
<td>$ 5.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$10.00</td>
<td></td>
<td></td>
<td>$10.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$20.00</td>
<td></td>
<td></td>
<td>$20.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td>Other</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total of cash =

<table>
<thead>
<tr>
<th>Total of coins from above</th>
<th>Total of coins from above</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Total all money in register</th>
<th>Total all money in register</th>
</tr>
</thead>
</table>

Cash in register AFTER
Cash in register BEFORE
Actual cash taken in
Reading on tape
Amount short over

Signed

Approved
Lesson 2

Objective: You will learn how to read and write decimals.

Related Information:

In Unit II we studied fractions. A fraction is less than a whole thing. It is also possible to express less than a whole thing by the use of decimals. Usually it is easier to work with decimals than with fractions — except for the simplest fractions. When we convert to the metric system, we will be using decimals most of the time. At present, your chief use for decimals will be in dealing with money.

We use the word “decimal,” but what we mean is “decimal fraction.” A decimal fraction is a fraction whose denominator is 10, 100, 1000, etc.

For example, look at the number 57.45

The 57 represents the whole number

The numbers to the right of the decimal point (in this case 45) mean that we have more than 57, but not enough to make 58.

We could also express the above amount this way:

\[ \frac{57}{100} \]

You must memorize the following table in order to properly read and write decimals.

- One place (number) is read as tenths: \( .05 \) is five tenths (\( \frac{5}{10} \))
- Two places (numbers) is read as hundredths: \( .05 \) is five hundredths (\( \frac{5}{100} \))
- Three places (numbers) is read as thousandths: \( .005 \) is five thousandths (\( \frac{5}{1000} \))
- Four places (numbers) is read as ten thousandths: \( .0005 \) is five ten-thousandths (\( \frac{5}{10,000} \))

How To Read Decimals:

Read the number to the left of the decimal point as you would any whole number. Follow this example:

\[ 247.89 \]
Say "Two hundred forty-seven..."

Read the decimal point by saying "and":

"Two hundred forty-seven and..."

Read the number to the right of the decimal point normally:

"Two hundred forty-seven and eighty-nine..."

Complete the statement by counting the number of places to the right of the decimal point. In this case the two digits, 8 and 9, take two places. Therefore (check your chart for two places)....

You add the words "hundredths."

247.89 The complete statement:

"Two hundred forty-seven and eighty-nine hundredths."

Don't get fooled by zeros!

.09 Say the number: "nine." Count the places...two.

Complete the statement..."nine hundredths."

.9 Say the number "nine." Count the places...one.

The number is "nine tenths."

.909 Say the number "nine hundred nine." Since there are three places, add "thousandths."

Note: A zero at the right end of the decimal does not change the value of the number. But you should read it as if it were any other digit. For example: .50 and .500 and .5000 mean the same as .5 for computation purposes, but should be read as "fifty hundredths," "five hundred thousandths," and "five thousand ten-thousandths."

ASSIGNMENT:

A. Write the following in word form: (Use the word "and" only to show the decimal point. For example, 702.207 is read "seven hundred two and two hundred seven thousandths.")

1. .4
2. .10
3. .04
4. 14
5. 1.4
<table>
<thead>
<tr>
<th>Number</th>
<th>Decimal Fraction</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.</td>
<td>.14</td>
</tr>
<tr>
<td>7.</td>
<td>1.14</td>
</tr>
<tr>
<td>8.</td>
<td>14.14</td>
</tr>
<tr>
<td>9.</td>
<td>104.104</td>
</tr>
<tr>
<td>10.</td>
<td>114.004</td>
</tr>
<tr>
<td>11.</td>
<td>.86</td>
</tr>
<tr>
<td>12.</td>
<td>.0009</td>
</tr>
<tr>
<td>13.</td>
<td>6.060</td>
</tr>
<tr>
<td>14.</td>
<td>60.06</td>
</tr>
<tr>
<td>15.</td>
<td>60.60</td>
</tr>
<tr>
<td>16.</td>
<td>323.002</td>
</tr>
<tr>
<td>17.</td>
<td>17.107</td>
</tr>
<tr>
<td>18.</td>
<td>21.758</td>
</tr>
<tr>
<td>19.</td>
<td>23.9001</td>
</tr>
<tr>
<td>20.</td>
<td>2,045.91</td>
</tr>
</tbody>
</table>

B. Write the following as decimal fractions:

1. Eight tenths
2. Eight hundredths
3. Eight and eighty hundredths
4. Sixty-three and forty-nine thousandths
5. Sixteen and six thousandths
6. Five hundred seven and five tenths
7. Two and seven hundredths
8. Ninety-four thousandths
9. Eight hundred forty-seven
10. One thousand nine and eighty-four hundredths
Lesson 3

UNIT IV — MONEY AND DECIMALS

Rounding Off Decimals

Objectives: You will learn how to round off decimals.

Related Information:

When working with numbers we are often left with more numbers than we need for a correct and accurate answer. It is necessary to eliminate some of these numbers. For that reason we shall practice rounding off numbers again — this time decimals.

$140.68 \times .12$

\[
\begin{array}{c}
28136 \\
14068 \\
\hline
$16.8816$
\end{array}
\]

In the above multiplication problem our answer comes out $16.8816$. The smallest coin we have is a penny. When we pay a bill, for example, we cannot pay someone $0.8816. We can pay $0.88 (88c) or $0.89 (89c). The .16 must be removed for almost all purposes.

There are certain rules we must follow in rounding off decimals. They are mostly the same rules we followed in rounding off whole numbers.

In some problems you will be told how far to round off. In dealing with money, however, without being told, we normally round numbers off to the nearest cent, as explained above (to two places).

**RULE A:** If the digit to be dropped is 5 or more (5, 6, 7, 8, 9), increase the number before it by 1.

**RULE B:** If the digit to be dropped is 4 or less (4, 3, 2, 1, 0), do not increase the number before it.

Example 1: $34.652$

We wish to round this amount off to the nearest cent (two decimal places). We want to drop the 2.

The 2 we wish to drop is less than 5 (rule B above), so we drop it without changing the 5 in front of it.

$34.65$

The amount becomes $34.65$

Example 2: $208.385$

We wish to round off this number to the nearest cent (two decimal places).

The number to be dropped is 5. As indicated by rule A, we must add 1 to the preceding number. The 8 is therefore changed to 9.

$208.39$

The amount becomes $208.39$. 

123

132
ASSIGNMENT:

A. Find the following correct to the nearest cent:

1. 1.2658
2. 0.09
3. 1.108
4. 12.2349
5. 8.829
6. 145.032
7. 6.001
8. 0.009
9. 435.892
10. 32.297
11. 5.999
12. 41.1278
13. 1489.4549
14. 32.095
15. 3.9978

B. Find the following correct to the nearest tenth:

1. 0.37
2. 0.289
3. 8
4. 0.16
5. 3.11
6. 1.92
7. 3.74896
8. 2.38
9. 5.06
10. 0.90
11. 6.975
12. 2.0495
13. 0.996
14. 13.95
15. 7.0499

C. Find the following correct to the nearest hundredth:

1. 0.321
2. 0.2048
3. 0.289
4. 4.845
5. 0.320
6. 39.18932
7. 2.904
8. 15.29567
9. 399.7049
10. 5.9965
11. 3.0019
12. 0.009

D. a. What is the difference in meaning between the following numbers?

<table>
<thead>
<tr>
<th>Number</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>35</td>
<td>Any number between 34.5 and 35.00</td>
</tr>
<tr>
<td>35.0</td>
<td>Any number between 34.95 and 35.00</td>
</tr>
<tr>
<td>35.00</td>
<td>Any number between 34.995 and 35.00</td>
</tr>
</tbody>
</table>

b. Which of the above three numbers is the most exact?

c. Which of these is the most exact number?

10.30
10.300
10.3

133
\sqrt{124}
Example 3: $208.3845 We wish to round off this number to the nearest cent or two decimal places.

Now look at the digits after the 38. There are two: 4 and 5. The only digit we are concerned with is the one immediately after the digit in the cents place. This is a 4. By rule B above, since it is less than 5, we drop it (and any others) without changing the preceding 8.

$208.38 The amount becomes $208.38.

Examples:

$208.3845 Drop the 45. Answer: $208.38

$208.385 Drop the 5 but add 1 to the 8. Ans: $208.39

$208.3865 Drop the 65 but add 1 to the 8. Ans: $208.39

$208.38358 Drop the 358. Ans: $208.38

Correct to the nearest tenth means:

.2568 Tenth means correct to one place. Underline it to help you remember. Drop all numbers except the .2, but change the .2 to .3 because the next digit is a 5.

.2 568
.3

Correct to the nearest hundredth means:

.35843 Hundredth means two places to the right of the decimal. Underline the two places. The following digit is an 8. Therefore change the 5 in the .35 to a 6.

.35 843
.36

Correct to the nearest thousandth means:

23.15432 Thousandth means three places. Underline the three places if it will help you. The following digit is a 3. Therefore the last two digits (32) are dropped.

23.154 32
23.154

Correct to the nearest whole number means:

23.41 Drop all numbers to the right of the decimal point. Also drop the decimal point itself.

23 The correct answer is 23.

Note: When you need an answer correct to a certain place, always give that place its digit even if it is a zero.

Example: Round off 2.97 correct to the nearest tenth.

Since the digit in the next place is a 7, you must raise the preceding digit, 9, by 1. Raising 9 by 1 gives 10. So in order to raise the 9, we have to carry the 1 to the next place. We get 3.0 as the answer. We do not drop the zero if we have been asked to give an answer correct to the nearest tenth. The zero shows that the answer is correct to the nearest tenth, and not to the nearest whole number.

The same number, 2.97, correct to the nearest whole number, would be simply 3.
UNIT IV — MONEY AND DECIMALS

Lesson 4

Addition and Subtraction of Decimals

Objective: You will review the addition and subtraction of decimals.

Related Information

You have been using decimals from the first chapter in this book. Any time you work with money you have to concern yourself with decimals. The rule for addition and subtraction of decimals is simple: The decimal points must be kept in a straight column, each one decimal point right under the other.

Example: Add the following numbers: .189 + .905 + .45 + .34.908

\[
\begin{array}{c}
.189 \\
.905 \\
.45 \\
34.908 \\
\end{array}
\]

Note how the decimal points are lined up.

\[
\begin{array}{c}
.189 \\
.905 \\
.450 \\
34.908 \\
\end{array}
\]

It may help to keep your columns straight if you add zeros. All the numbers have 3 places except the .45. Add a 0 to make that a 3-place number also. It does not affect its value. Now add.

Example: Subtract 145.89 from 457.03

\[
\begin{array}{c}
457.03 \\
-145.89 \\
\end{array}
\]

Note how the decimal points are lined up.

Subtract as you would in any subtraction problem.

Example: Subtract .43 from 890

\[
\begin{array}{c}
890.00 \\
- .43 \\
\end{array}
\]

The 890 does not show a decimal point, but being a whole number it has the decimal point understood after the 0 in the 890. The number 890 is the same as 890.

We then add two more zeros to make the numbers line up and easier to subtract.

ASSIGNMENT:

A. Arrange the following numbers in columns and add. After you have added, round off the answer correct to the nearest hundredth.

1. 7.026 + 4.495 + 117.02 + 65.17

2. 3.507 + 33.08 + 2.1 + 4.009 + 35

3. .005 + 105.75 + 178.2 + 143 + .110.728

135
4. $325.07 + $10.04 + $2.23 + $1.45 + $1000.00

5. 5.0245 + .07 + 14.2003 + 4.2

6. 85.34 + 81.06 + 845.90 + .99

B. Arrange the following and subtract. After you have subtracted, round off your answer correct to the nearest tenth.

1. 306.6 - 32.9

2. 205.06 - 140

3. 302.09 - 215.387

4. 35.613 - .7.475

5. 78.5137 - 7 59.306

C. Add the following:

1. 1.25 2. 1.8 3. .379 4. 24.056

57. 2.6 2.05 18.287

.32 .759 .876 .94

.18 .375 .91 7.876

48. 1.48 .8 .093

D. Subtract the following:

1. $101.76 2. $92.65 3. $64.57 4. $843.72

- 43.25 - 1.97 - 27.85 - 81.56

5. $587.24 6. $845.27 7. $1,276.35 8. $671.19

- 218.78 - .97 - 145.18 - 98.07

E. Word Problems:

1. The Acme restaurant had the following overhead expenses for the month: electricity $143.67, heat $137.50, gas $45.07, insurance $150.00, rent $900.00. What did the overhead expenses total?

2. The Hut restaurant placed an order for the following items: 1 cook's knife $6.95, 1 dozen serving trays at $16.80 a dozen, 1 5-qt soup tureen at $4.95, 1 ingredient bin at $46.00. What did the order total?

3. Howard's restaurant ordered the following items: 1 32-gallon trash can $8.95, 1 roll clear vinyl seal-wrap $6.95, 1 case sani-liners $11.05 per case, 1 tray-stand $5.75. What did the bill total? He returned the tray stand because it was defective. What was the final bill?
4. The Steak Pub received an estimate on the following items:

   2-compartment kitchen sink $145.00
   1 deep-fat fryer $295.00
   1 stainless-steel-top worktable $198.50
   1 electric dishwasher $1,465

   What was the total on the estimate?

F. Can you figure out why you do not round off figures before adding or subtracting them?
UNIT IV - MONEY AND DECIMALS

Lesson 5  Multiplication of Decimals

Objectives: You will review the rules pertaining to multiplication of decimals.
You will understand the importance of multiplication of decimals in food
service.

Related Information:
Wherever money is used, it is necessary to know how to multiply decimals. When
multiplying decimals, it is not necessary for the decimal points to line up vertically (as it
is in addition or subtraction).

Example: (a.) 479.84  X  8.01  or  (b.)  34.7984  X  8.5

Step 1: Multiply as you would in any multiplication problem.

Step 2: Count the total number of decimal places in the numbers being multiplied.

In example (a) above, there are two decimal places in the first number (.84); there are two decimal places in the second number also (.01). Two places plus two places equals four places. Our answer then will have to have four decimal places.

479.84
X 8.01
---
3837.20

Count four places from the right and put in the decimal point.

In (b) above, without even multiplying, we can see that we will have to count five places from the right in our answer to place the decimal point.

We can expect that almost everyone will own one of the mini-computers in the near future, making all math work easier. Even with computers, however, we must know how to set up the problems and how to interpret the answers. Many restaurants provide waitresses with adding machines to make their work easier, faster, and more accurate.

Note: We call the first number the multiplicand: 2.45  X  2.4
and the second number the multiplier: 2.4
and the answer is called the product: 5.880

When numbers are to be multiplied, it does not matter which one you make the multiplier and which the multiplicand: 3·X 2 is the same as 2·X 3. It is usually easier to multiply by the smaller number in problems such as the ones in part A of the assignment.
ASSIGNMENT:

A. Multiply the following:

1. \( 909.50 \times 73 \)

2. \( 45.3 \times 2.4 \)

3. \( 804.3 \times 0.7 \)

4. \( 0.0075 \times 4.23 \)

5. \( -0.24 \times 78.5 \)

6. \( $300.45 \times 36 \)

B. Complete the following:

1. \( 5.724 \times 28 \)

2. \( 847.3 \times 0.46 \)

3. \( 0.083 \times 1.54 \)

4. \( 5.042 \times 8.1 \)

5. Two scales were ordered at $13.50 a scale. What was the total cost?

6. What did the bill come to if fiberglass trays cost $19.80 a dozen and twelve dozen were ordered?

7. What is the cost of 5 plastic washing machine racks at $11.95 a rack?

8. Condiment holders with a gold finish cost $2.40 each. How much would it cost the cafeteria to order one for each table? There are 28 tables.

9. What would it cost to replace all the seats in the cafeteria if one fiberglass stack chair costs $11.95? There are 224 seats in the cafeteria.
10. **WAGE PROBLEMS.** Find the gross pay for:

a. 40 hours at $2.20 per hour

b. 40 hours at $2.45 per hour

c. 36 hours at $1.95 per hour

d. 30 hours at $3.40 per hour

e. 15 hours at $2.60 per hour

11. **COMPUTING COSTS:**

Sometimes costs per portion of an item are very small. These must still be calculated because, when making hundreds of portions, they "add up." After completing the multiplication of the following problems, don't forget to round off to two places. We usually consider costs to the nearest whole cent.

a. 17 servings at 0.125 per serving

b. 150 pork chops at .6375 per serving

c. 50 bowls of soup at .0572 per serving

d. 74 portions of pie at 0.183 per piece

e. 200 portions at .855 per portion

f. 350 portions at $1.245 per portion

g. 75 portions at .65 per portion
UNIT IV — MONEY AND DECIMALS

Lesson 6

Inventory and Stock Record Card

Objective: You will practice filling in two forms used in the foods trade — the inventory list and the stock record card.

Related Information:

Keeping a proper inventory is a necessary part of the management of any food-service establishment. An inventory is a list of all the items on hand. The inventory may involve every single item in the restaurant — chairs, tables, ovens, food, etc., but we are interested here in the inventory of stores only.

The cook must have the necessary supplies on hand when he or she prepares the food. The cook must depend on the storeroom's having certain items in stock all the time. Other items he knows he must order for special occasions such as banquets, parties, or holiday occasions.

The inventory may be done DAILY, WEEKLY, SEMIMONTHLY, or MONTHLY. A perpetual inventory means that every time an item is put into stores or taken out, it is recorded or an adjustment is made on an inventory card or sheet.

The month-end inventory is most important. Food costs cannot be accurately calculated without accurate inventories on what is actually used each month.

ASSIGNMENT A:

On the next page is an example of part of an inventory taken by a worker in a restaurant. Following the instructions given, find the unit price of each food and the extension.

To find the "extension" —

If 6 cans of potato granules cost $11.64, find the price of 1 can by dividing 6 into $11.64. This gives you the unit price.

Multiply the unit price by the quantity on the shelf — 7 cans — to find the extension.

Add all the extensions to find the grand total of all items.

(B) Assuming 25 portions per No. 10 can on the desserts (fruits), are we able to feed 300 students with each item? If not, which one(s) are we short of?
## INVENTORY

**DATE TAKEN** _______________  **Page #** _______________

**INVENTORY BY**__

<table>
<thead>
<tr>
<th>Qty.</th>
<th>Size</th>
<th>Description</th>
<th>Price Per Package</th>
<th>Unit Price</th>
<th>Extension</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>#10 can</td>
<td>Potato granules</td>
<td>11 64</td>
<td>1.94</td>
<td>13.58</td>
</tr>
<tr>
<td>7</td>
<td>#10 can</td>
<td>Pork and beans</td>
<td>8 19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>3 lb</td>
<td>Peanut butter</td>
<td>12 80</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>6 oz</td>
<td>Solid light tuna</td>
<td>32 74</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>#10 can</td>
<td>Catsup</td>
<td>10 93</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>#10 can</td>
<td>Peas</td>
<td>7 95</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>#10 can</td>
<td>Mixed Vegetables</td>
<td>8 38</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>#10 can</td>
<td>Cut wax beans</td>
<td>8 00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>#10 can</td>
<td>Potatoes</td>
<td>7 70</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>#10 can</td>
<td>Peaches</td>
<td>11 83</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>#10 can</td>
<td>Fruit mix</td>
<td>12 27</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>#10 can</td>
<td>Sauerkraut</td>
<td>6 67</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>#10 can</td>
<td>Pear halves</td>
<td>12 66</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>#10 can</td>
<td>Chow mein noodles</td>
<td>6 63</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>#10 can</td>
<td>Cherry filling</td>
<td>17 05</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>1 lb can</td>
<td>Mushrooms</td>
<td>27 87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>21 oz</td>
<td>Ajax</td>
<td>5 55</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total this page 133

133
The stock record card is useful in checking and controlling inventories in the storeroom. In large storerooms it is useful because:

1. It indicates the LOCATION of the food items.
2. It indicates the SIZE of the item: #10 can, or #5 can, etc.
3. HIGH LIMIT and LOW LIMIT: This gives the storeroom attendant, manager, or purchasing agent an idea of how many to order. He knows he must not go over the high limit; he knows that when the number of items on the shelf gets down to the low limit, he must order.
5. RECD: the number of items put into stores.
6. ISSUED: the number of items given over to the kitchen. This gives the manager an idea as to how much to keep on hand by knowing how often the item is called for.
7. BALANCE: the number of items remaining off a particular date.

A card like this requires close storeroom control. The card is useless unless each time an item is received or checked out it is recorded. Control like this would be necessary in large restaurants, dining rooms in hospitals, etc.

ASSIGNMENT C:

Make the proper entries on the STOCK RECORD CARD on the following page.

Item: Sweet peas, #10 cans, which are kept on shelf 2A. The stock is permitted to vary between 6 cans and 15 cans.

On May 1 we had 3 cans on the shelf
On May 2 we received 2 cases. During the day we issued 2 cans to the cook.
On May 4 we issued 2 cans to the cook.
On May 5 we issued 2 cans to the cook.

Is it time to reorder peas yet?
### Stock Record Card for Inventory Control

<table>
<thead>
<tr>
<th>Location:</th>
<th>Size</th>
<th>High Limit</th>
<th>Low Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Date</th>
<th>Rec'd</th>
<th>Issued</th>
<th>Balance</th>
<th>Date</th>
<th>Rec'd</th>
<th>Issued</th>
<th>Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Capacity: **

- High Limit: 144
- Low Limit: 135
UNIT IV – MONEY AND DECIMALS

Lesson 7

Objectives:
You will review the division of decimals.
You will practice using division in food-related problems.

Related Information:
There are three general types of problems involving the division of decimals:

1. Dividing a whole number into a decimal:
   \[ \frac{8}{7.89} \]

2. Dividing a decimal into a whole number:
   \[ \frac{8.8}{4578} \]

3. Dividing a decimal into a decimal:
   \[ \frac{8.8}{234.866} \]

BASIC RULE:
If there is a decimal point in the divisor (the number outside the box), move it to the right of the last digit and count the number of places you are moving it. Then move the decimal point inside the box the same number of places.

Example 1:
\[ \frac{8}{7.89} \]
Rule does not apply – there is no decimal point in the divisor.

Example 2:
\[ \frac{8.8}{234.866} \]
Move point in the divisor one place to the right; then do the same thing to the number inside the box.

Example 3:
\[ \frac{8.80}{234.866} \]
Move point in the divisor three places to the right; then do the same thing to the number inside the box.

If there is no decimal point in the number inside the box, add a decimal point at the end and as many zeros as necessary to permit moving the decimal point as many places as needed.

Example 4:
\[ \frac{8.8}{4578} \]
No decimal inside the box.

\[ \frac{8.8}{4578.0} \]
Since we must move the decimal point in the divisor one place, add a decimal point and one zero inside the box. This does not change the value of the number.

\[ \frac{88}{45780} \]
Now move decimal point in the divisor and move decimal point inside box, as in example 2 above.

Example 5:
\[ \frac{8.90}{234} \]
No decimal inside box.

\[ \frac{8.90}{234.00} \]
Add a point and two zeros inside box.

\[ \frac{890}{23400} \]
Move both decimal points

In all these problems, we must complete the preliminaries by putting in a decimal point for the answer. It is placed directly above the decimal point inside the box.
Now divide as you would in any other division problem. Carry out your division to the same number of decimal places above the line as there are decimal places below the line. Then look to see whether the next digit would be 5 or more. If so, increase your last digit by 1.

When dealing with money amounts, always carry out the division to 2 places beyond the decimal point. Then go a step further to see what the next digit will be, so you can round off your answer properly.

**ASSIGNMENT:**

1. There are approximately 25 servings in a #10 can. Work the following problems:

   a. $45.90 divided by 25

   b. $4.55 divided by 25

   c. $7.50 divided by 25

   d. $1.25 divided by 25

   e. $2.50 divided by 25

   f. $4.00 divided by 25

   g. $4.75 divided by 25

   h. $7.40 divided by 25

   i. $8.88 divided by 25

   j. $14.80 divided by 25

   k. $4.49 divided by 25

   l. $37.12 divided by 25
2. a. $23.18 divided by 12
b. $14.07 divided by 6
c. $8.72 divided by 50
d. $18.97 divided by 15
e. $40.89 divided by 12
f. $2.37 divided by 100
g. $27.35 divided by 18
h. $89.09 divided by 22

3. a. 82.50 divided by 1.25
b. 1.44 divided by 3.7
c. .45 divided by 15
d. 1.7243 divided by .43
e. 580.5 divided by 21.5
f. 82.614 divided by .028

4. Compute the cost per serving based on the total recipe costs given:
   a. 30 portions, $4.00
   b. 35 portions; $35.75
   c. 20 portions; $9309
   d. 35 portions; $14.00
e. 50 portions; $85.00

f. 12 portions; $0.6552

5. Compute the cost per serving, assuming 25 servings per #10 can.

   a. Number 10 cans of peaches cost $10.91 per case of 6. What is the cost per can? What is the cost per serving?

   b. One case of plums costs $10.59. What is the cost per can? What is the cost per serving?

   c. One case of apricots costs $14.61. What is the cost per can? What is the cost per serving?

   d. Two cases of cherries cost $21.48. What is the cost per can? What is the cost per serving?

6. At $9.20 per dozen, what is the cost of one 11" oval platter?

7. Heavy-weight 6¾-oz. cups come packed in cartons of 4 dozen. They cost $6.30 per dozen. How much does a carton cost? How much are they per cup?

8. Large dinner plates, 10", cost $10.80 a dozen and come packed two dozen to the carton. How much is a carton? One plate?
Objective: You will learn to fill out a simple requisition form.

Related Information:

You may someday be in a position where you have to order supplies. Some institutions have open orders on food items, where all you have to do is call up and order over the phone. In some restaurants the person in charge of the storeroom keeps a regular inventory, and orders as required.

Where equipment is involved, procedures may vary. In a small restaurant the boss may approve a purchase in a matter of minutes and leave the rest up to you. In some businesses, orders may have to go through many channels before being approved for purchase. Sometimes it is necessary to order equipment a year in advance, as in schools.

No matter what method your own business uses, you should know how to fill out a simple requisition form. A sample form is shown on the next page.
Requisition for ordering supplies outside of restaurant.

PURCHASE REQUISITION
TO: PURCHASING DEPARTMENT. Please order the following:

<table>
<thead>
<tr>
<th>Vendor:</th>
<th>No.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Date Ordered</th>
<th>Terms</th>
<th>F.O.B.</th>
<th>Ship via</th>
<th>Date Promised</th>
<th>Quotation Number</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>QUANTITY</th>
<th>PART NO.</th>
<th>DESCRIPTION AND MANUFACTURER</th>
<th>UNIT PRICE</th>
<th>TOTAL PRICE</th>
</tr>
</thead>
</table>

Date of requisition | Date required

Required for: | Requisitioned by: | Approved by |

The first five lines are usually taken care of by the purchasing department. It may have to shop around to get the items:

- a. at the best price
- b. delivered promptly
- c. from a dependable supplier

1. QUANTITY: The number of items you want.
2. PART NO: Manufacturers catalog no.
3. DESCRIPTION AND MANUFACTURER: Tell what it is you are ordering and what manufacturer you are referring to.
4. UNIT PRICE: How much one item costs.
5. Required for: What department (or reason).
6. Requisitioned by: Who is ordering the part.
7. Date of requisition: Today's date
8. Date required: When you need it.
QUALITY PROFESSIONAL CUTLERY

COOKS' KNIVES: Chrome Tool Steel, Flexible, forged blade & bolster, Rosewood Handle. Finest made.
- #60766-0, 8" blade .......... $ 5.25 ea.
- #60766-10, 10" blade .......... $ 5.75 ea.
- #60766-12, 12" blade .......... $ 6.00 ea.
- #60766-14, 14" blade .......... $ 9.65 ea.

COOKS' KNIVES: Carbon Steel, stiff blade, Ebonwood handle.
- #61166-4, 8" blade .......... $ 2.65 ea.
- #61166-10, 10" blade .......... $ 3.10 ea.
- #61166-12, 12" blade .......... $ 3.75 ea.
- #61166-14, 14" blade .......... $ 4.70 ea.

MEAT SLICERS: Flexible Blade, Rosewood Handle.
- No. 6545 Stainless Steel .......... $ 2.55 ea.

BREAD KNIVES: Serrated Stainless Steel.
- #6949, 9" blade .......... $ 3.10 ea.
- #BB88, 8" blade .......... $ 1.55 ea.
- #BB99, 9" blade .......... $ 1.85 ea.

UTILITY KNIFE: Serrated Blade, Wonderful for slicing tomatoes, rolls etc.
- #RUK-5 5" Wave-Cut Blade .......... $ 30 ea.

GRAPEFRUIT KNIVES: 3½" blade.
- #EGK-3, Household Type .......... $ 45 ea.
- #GBK-3, Restaurant Type .......... $ 80 ea.
- #65-12, Hotel Type .......... $ 1.70 ea.

UTILITY KNIVES: Stainless Steel, Rosewood Handle.
- #6515, 6" Blade .......... $ 1.70 ea.

PARING KNIVES: Stainless Steel, Rosewood Handle.
- #BP-39, 3" serrated blade .......... $ 50 ea.
- #RPK-3, 3½" blade, standard .......... $ 50 ea.
- #RPK-3B, 3½" with bolster .......... $ 55 ea.
- #69-19, 3½" professional .......... $ 95 ea.

PARING KNIVES: Stainless Steel, Rosewood Handle.
- #69-20, 3½" blade .......... $ 95 ea.
- #69-16, 3½" blade .......... $ 1.35 ea.

BUTCHER KNIVES: Chrome Tool Steel Blade
- #6200-8, 8" blade .......... $ 3.00 ea.
- #6200-10, 10" blade .......... $ 3.65 ea.
- #6200-12, 12" blade .......... $ 4.40 ea.

BUTCHER STEELS: (Knife Sharpeners)
- #WSS-4, Economy Stainless Steel ..... $ 4.95 ea.
- #WSS-6, Deluxe Model Stainless Steel .......... $ 6.55 ea.

BONING KNIVES: 6" wide blade.
- #RBK-06, Carbon Steel ........... $ .95 ea.
- #6280-6, Chrome Tool Steel ........... $ 2.05 ea.

BONING KNIVES: Stainless Steel, Serrated Blade, Extra-heavy construction.
- #6280-10, 10" blade .......... $ 2.65 ea.
- #6280-12, 12" blade .......... $ 3.35 ea.
- #6280-14, 14" blade .......... $ 5.25 ea.

COOKS' FORKS: Heavy duty, Forged Carbon Steel, Extra-heavy construction.

FORKS: Utility, Kitchen, Pot.
- #RUF-10, 10" Stainless Steel .......... $ 5.80 ea.
- #770-6, 6" x 2" Stainless Steel .......... $ 1.15 ea.

HEAVY DUTY CLEAVERS
- No.L-85, 7" blade .......... $ 3.80 ea.
- No.L-828, 8" blade .......... $ 4.10 ea.
- Chicken CLEAVERS, light duty No.RCC-7 6" blade .......... $ 1.70 ea.

SANDWICH SPREADER: Stainless Steel Blade, 3½" x 1½".
- #630-5B, Commercial .......... $ 1.65 ea.
- #655-4, Economy .......... $ .55 ea.

ICING KNIFE: 6½" x 1½" Stainless Steel Blade, Rosewood Handle, Best Quality.
- #65-05, 5 ½" blade .......... $ 2.40 ea.

PIE SERVER: 6" x 2½" Offset Stainless Steel Blade, Rosewood Handle. Best Quality.
- #KTC-27, Deluxe Model ...... $ 1.40 ea.
- #PS-10, Deluxe Model .......... $ 2.55 ea.
- #SPS-10, all stainless ........ $ .85 ea.

PAN SCRAPER: 3" x 6" SS blade
- Please Specify:
  S-177, Stiff blade .......... $ 1.65 ea.

BAKERS' SCRAPERS
- Carbon Steel 6" x 3" Blade, $ 1.20 ea.
- #66 Flexible .......... $ 1.60 ea.

NEW...ALL STAINLESS STEEL
- #BKP-4 4-1/8" x 3½" Stiff Blade .......... $ 1.25 ea.
- #BKP-6 6½" x 3½" Stiff Blade .......... $ 1.50 ea.

BOWL SCRAPERS: Heavy Rubber Blade, Rosewood Handle.
- #8R, 8" x 2½" blade .......... $ 2.55 ea.

SPATULAS: Flexible Stainless Steel Blade.
- No.
  BLADE SIZE  PRICE
  #BK-03  3" x 11/16" $ 1.20 ea.
  #BK-04  4" x 3/4" $ 1.00 ea.
  #BK-05  5" x 13/16" $ 1.15 ea.
  #6301-b  6½" x 1½" $ 1.55 ea.
  #6301-10 10" x 1" $ 2.35 ea.
  #6301-14 14½" x 1½" $ 4.65 ea.
  #6301-18 18½" x 1½" $ 10.25 ea.

TURNERS: Stainless Steel Offset Blade, Rosewood Handle. Sizes shown are for flat surface of blade.
- #255, Stiff blade, heavy duty $ 1.70 ea.
- #491, Small, semi flexible .......... $ 1.15 ea.
- #255, 4½" x 3½" blade .......... $ 1.50 ea.
- #491, 3½" x 2½" blade .......... $ 1.05 ea.

TURNERS: Long Blade, 8" x 3½" blade, offset, 14" overall.
- #VB-50, Stainless Steel .......... $ 2.25 ea.

CAKE TURNER: 6" x 2½" Stainless Steel Blade.
- #65-078, 6½" blade .......... $ 3.50 ea.

PARING KNIVES
- #R-335 Stainless Steel Blade, Deluxe Bolster Construction.
- Less than doz 2.45 ea.

IMPORT CLOSEOUT, $5.00 Value
- Forged Stainless Steel Forks
- Wood Grain Plastic Handles
- 10-1/2" long, for Serving, Carving and general Kitchen use.
- No. CKF-11, $ 2.75
- 6 or more .......... $ 1.00 ea.
ASSIGNMENT A:

Use Page 11 from the Admiral Craft Equipment catalog and the blank form below to order the following items:

1 10" Cook's knife, chrome steel
1 17" Cook's fork, heavy duty
5 3¼" professional paring knives
1 4" x 3" blade turner

Note: Use the Admiral Craft catalog numbers and make certain your description is written clearly and completely. Use prices from catalog and total the requisition.

Requisition for ordering supplies outside of restaurant.

<table>
<thead>
<tr>
<th>QUANTITY</th>
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<th>UNIT PRICE</th>
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</table>

Date Ordered | Terms | F.O.B. | Ship via | Date Promised | Quotation Number |

Date of requisition | Date required

Required for: | Requisitioned by: | Approved by: |
MISCELLANEOUS PLASTIC ITEMS

**LARGE 20 OUNCE UNBREAKABLE POLYETHYLENE SUGAR & NO-DRIP SYRUP SERVER**
- Big 20 Oz. Capacity
- Unbreakable Frost-White Containers
- Colorful Tops

No. D-115 - SUGAR, 20 OZ.
Saves sugar - Pours only 1 teaspoon at a time (special feature in top may be removed for regular free-flow pouring) 3" Dia., 6½" High. Frost-White Lids, Colorful Tops.

In carton lots of 2 dozen assorted:
- 6 each tops in Tan, Pink, Yellow and Turquoise.

In solid color packing (cart. lots of 2 dozen):
Your choice: Tan, Yellow, Pink or Turquoise with Frost-White lower containers.

￥4.80

In 1 dozen lots:
Less than 1 dozen $5.50 ea.

￥4.80

No. D-116 - NO-DRIP SERVER

For: Syrup, Milk, Cream - Etc. 3" Dia., 6½" High. Frost-White Lids, Colorful Tops.

In carton lots of 2 dozen assorted:
- 6 each tops in Tan, Pink, Yellow or Turquoise.

In solid color packing (cart. lots of 2 dozen):
Your choice: Tan, Yellow, Pink or Turquoise with Frost-White lower containers.

￥6.00

In 1 dozen lots:
Less than 1 dozen $7.20 ea.

￥6.00

**ADMIRAL**

*NOISELESS “LITEWEIGHT "UNBREAKABLE" *WON'T RUST or DENT

Farr... Gasoline, Naphtha, Kerosene, Solvents, Ink, Acid, Water, Food Stuffs, Drugs, Chemicals, etc.

**HEAVY-DUTY JERRY JUGS**

Equipped with cap, pouring spout, stop for spout, measuring cup.

No. JJ-1, 1 Gallon

Order Now

￥1.50

**HEAVY-DUTY DISH BOXES**

Polyethylene, in Tan or Dark Gray

No. CDB-2205, 15½" x 20" x 6½" reg. $3.00... $2.25 ea.

In full carton lots of 12 or more $1.95 ea.

**HEAVY-DUTY POLYETHYLENE DISH BOXES**

The most modern and durable plastic boxes you can buy: Safe in Dishwashers, Boilable, Unbreakable and Sanitary.

They nest for easy storage, Fits all standard dish cans.

Colors: White, Tan, Gray or Red.

12 to a carton

￥4.95

**SQUEEZE-OUTS**

Plastic Dispensers for Ketchup, Mustard, and other table liquids, have an 8-ounce capacity.

The Squeeze-Dot dispenser features a No-Drip nozzle which regulates the flow as the user desires and also controls the contents of each dispenser so that it will not drip even when knocked over.

OPD-1, "Ketchup" Red
OPD-2, "Mustard" Yellow
OPD-3, No working, natural

￥1.95

**CUTLERY BOX**

Heavy Duty Polyethylene, Big 21½" x 11½" x 3½" deep

￥145

**NO-DRIP SERVER**

For: Syrup, Milk, Cream - Etc. 3" Dials., 6" High. Frost-White Lids, Colorful Tops.

In carton lots of 2 dozen assorted:
- 6 each tops in Tan, Pink, Yellow and Turquoise.

In solid color packing (cart. lots of 2 dozen):
Your choice: Tan, Yellow, Pink or Turquoise with Frost-White lower containers.

￥5.40

In 1 dozen lots:
Less than 1 dozen $5.75 ea.

￥5.40

**MARLEX POLYETHYLENE SILVER-SAVER TOTE BOX**

Holds 3 Silver Cylinders

Extra-Deep, Holds More Size: 27" x 16" x 7½" deep

Model 260A Tote Box

￥5.00

Model 260AW3C With Cylinders $8.80 ea.

Extra Silver Cylinders $1.95 ea.

**HEAVY-DUTY JERRY JUGS**

Equipped with cap, pouring spout, stop for spout, measuring cup.

No. JJ-1, 1 Gallon

Order Now

￥1.50

**HEAVY-DUTY DISH BOXES**

Polyethylene, in Tan or Dark Gray

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￥4.95

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In carton lots of 2 dozen assorted:
- 6 each tops in Tan, Pink, Yellow and Turquoise.

In solid color packing (cart. lots of 2 dozen):
Your choice: Tan, Yellow, Pink or Turquoise with Frost-White lower containers.

￥5.40

In 1 dozen lots:
Less than 1 dozen $5.75 ea.

￥5.40
ASSIGNMENT B:

Complete the following requisition, using page 58 in the Admiral Craft Equipment catalog.

1 dozen sugar servers, turquoise-color top only.
6 no-drip servers, turquoise top only
6 15" X 20" X 5" dish boxes, tan
3 dozen squeeze-outs, mustard, standard
3 dozen squeeze-outs, ketchup, standard

Total your order and put total on the requisition.

Requisition for ordering supplies outside of restaurant.

<table>
<thead>
<tr>
<th>QUANTITY</th>
<th>PART NO.</th>
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<tbody>
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<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

Date of requisition

Date required

Required for: Requisitioned by: Approved by:

145

154
Lesson 1

UNIT V – PERCENTAGE

Getting Reacquainted

Objective: You will understand the meaning of percentage and know some of its uses.

Related Information:

Percent plays an extremely important role in our daily lives.

Tests are scored by percent.

Bank accounts pay interest by percent.

A YEAR FROM DAY
OF DEPOSIT

2-Year Savings Certificates:
Minimum only $500

We make loans and pay interest by percent.
A waiter or waitress gets tips by percent.

Sales in stores are often quoted in percent.

We pay sales tax by percent.

Businesses state their profit or loss in percent.
It should be clear by now that percent plays an important role in our lives. Every student and worker should understand what percent means and how to do some basic percentage problems. You will be working with percents of one sort or another for your whole life.

BUT

Before we go forward...we have to go back and make sure we know how to change from fractions to decimals and to percents, and vice-versa. Without this skill we will constantly make errors while doing percentage problems.

Some things can be said in many different ways. For example, if we write the number "1" or the word "one" or the Roman numeral "I" we all understand that they mean the same thing. This is also true with fractions, decimals, and percents. They are different ways of saying the same thing.

1/2 of a pie ... is the same as 50% of a pie ... is the same as .50 (fifty-hundredths) of a pie.

Each occupation or business has its own customs and has adopted the expressions which they feel most comfortable with.

We generally say: a 15% to 20% tip rather than a 15/100 tip or 1/5th tip

We generally say: 1/2 pound rather than 50% of a pound

ASSIGNMENT:

Circle the expression that you think is most commonly used:

(a) 1/4 lb. .25 lb. 25% of a pound
(b) 15/100 off list .15 off 15% off
(c) 1/2 dollar $.50 50% of a dollar
(d) 8/100 interest .08 interest 8% interest
(e) 2/10 mile .2 mile 50% of a mile
(f) 1/50 off list .02 off 2% off
(g) 23/100 increase .23 increase 23% increase
(h) 1/4 dollar $.25 25% of a dollar
**UNIT V – PERCENTAGE**

**Lesson 2**

**Objective:** You will be able to change percents to decimal fractions.

**Related Information:**

Percents are great. We see them all the time, and we even use them a lot ourselves. When the ad says: “20% off regular price,” we have a pretty good idea of how much this means.

There’s one big trouble with percents, however — we cannot use them in working out problems in arithmetic. In order to use a percent in a problem we must first convert it to an ordinary fraction or a decimal fraction that means the same thing.

**TO CHANGE A PERCENT TO A DECIMAL.**

**MEMORIZE THIS RULE:** To change a percent to a decimal, drop the % sign and move the decimal point TWO places to the left.

Remember — whether you see it or not, every number has a decimal point.

\[
35\% \quad 35.\% \quad 35.0 \quad 35.00 \quad 0.35
\]

Look at the sketch above. It contains a good clue to remembering which direction to move the decimal point. Notice that the percent sign looks something like an arrow. It is indicating which direction to move.

**BUT** — You have to remember to move TWO places . . . always two places, regardless of whether the number has one, two, or three digits. You may have to insert a zero to get the two places.

Sample problems:

\[
35\% = 35.0\% = 0.35 \\
5\% = 0.5\% = 0.05 \\
155\% = 1.55 \quad 155.0\% = 1.55 \\
25\frac{1}{2}\% = 25.5\% = 0.255
\]

In order to do the last problem above, you have to know that 1/2 equals .5. We will talk about the decimal equivalents of most common fractions later.
ASSIGNMENT A:

Do the following problems. Your instructor will go over them in a few minutes. If you get them all correct, you will soon be ready for the main assignment.

1. 30% Change to a decimal: ____________________ 6. 6.1% ____________________
2. 60% Change to a decimal: ____________________ 7. 7.85% ____________________
3. 8% Change to a decimal: ____________________ 8. 8.2% ____________________
4. 125% Change to a decimal: ____________________ 9. 9.2½% ____________________
5. 18½ Change to a decimal: ____________________ 10. 6½% ____________________

11. When changing from a percent to a decimal you (sometimes) (always) (never) move the decimal point two places to the left. (Circle the correct answer.)

12. When converting a percent containing a fraction, such as 5½% 

First ____________________

Then ____________________

In the problems above, we sometimes found it necessary to change ½ to .5, its decimal equivalent. But suppose we had a more difficult problem – suppose we had to change 4⅛% to its decimal equivalent. How would we do it?

First we would have to convert the ⅛ to a decimal. To do that, carry out the division that is indicated by the form of the fraction:

\[ \frac{7}{8} = 8 \div 7 \]

We see that 8 will not go into 7. So we add a decimal point after the 7 and some zeros, and we carry out the division.

\[
\begin{array}{c}
\phantom{.000}0.875 \\
8 \) \phantom{.}7.000 \\
\phantom{.}64 \\
\phantom{000}60 \\
\phantom{000}56 \\
\phantom{000}40 \\
\phantom{000}40 \\
\end{array}
\]

Now we know that 4⅛% = 4.875%, and we can proceed to find its decimal equivalent.

\[ 4\frac{7}{8}\% = 4.875\% = \frac{4.875}{\%} = 0.04875 \]

It would be pretty sad if, every time you saw a fraction and needed to know what percent it equaled, you had to go through the actual division. Since there are only a few common fractions that you will use often, it is not too difficult to memorize their decimal equivalents. Particularly if you use a calculator, you need to know the decimal form of a fraction, for calculators use decimals, not fractions.
Here is the table of equivalents you need to memorize.

<table>
<thead>
<tr>
<th>Fraction</th>
<th>Decimal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2</td>
<td>.5</td>
</tr>
<tr>
<td>1/4</td>
<td>.25</td>
</tr>
<tr>
<td>3/4</td>
<td>.75</td>
</tr>
<tr>
<td>1/8</td>
<td>.125</td>
</tr>
<tr>
<td>3/8</td>
<td>.375</td>
</tr>
<tr>
<td>5/8</td>
<td>.625</td>
</tr>
<tr>
<td>7/8</td>
<td>.875</td>
</tr>
<tr>
<td>1/3</td>
<td>.333</td>
</tr>
<tr>
<td>2/3</td>
<td>.667</td>
</tr>
<tr>
<td>3/5</td>
<td>.6</td>
</tr>
<tr>
<td>2/5</td>
<td>.4</td>
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<tr>
<td>3/10</td>
<td>.3</td>
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<tr>
<td>1/5</td>
<td>.2</td>
</tr>
<tr>
<td>4/5</td>
<td>.8</td>
</tr>
<tr>
<td>3/4</td>
<td>.75</td>
</tr>
<tr>
<td>5/8</td>
<td>.625</td>
</tr>
<tr>
<td>7/8</td>
<td>.875</td>
</tr>
<tr>
<td>4/5</td>
<td>.8</td>
</tr>
<tr>
<td>etc.</td>
<td></td>
</tr>
</tbody>
</table>

Now it is a simple matter to change a fractional percent to a decimal.

Example: Change 5 3/8% to a decimal.

   5 3/8%  (1) Change fractional part to a decimal: 3/8 to .375.

   5.375%  (2) Substitute the .375 for the 3/8. Note: The .375 has the decimal. The % sign remains.

   .05375  (3) Now move the decimal point two places and drop the percent sign.

There may be other occasions when you are working with fractions (as in addition, subtraction, multiplication, or division), when it would be easier to use their decimal equivalents. Always use the way that is easiest for you. If you forget a decimal equivalent, or have an unusual fraction for some reason, all you have to do is divide out the fraction, as we did above with 7/8. This can even be done with a calculator if you have one handy.

ASSIGNMENT B:

Change the following percents to decimals.

1. 48%  
2. 76%  
3. 19%  
4. 15%  
5. 300% 
6. 250% 
7. 6%   
8. 2%   
9. 1%   
10. 10% 
11. 45% 
12. 42.7% 
13. 39.4% 
14. 156.8% 
15. 32.6% 
16. 4.3% 
17. 5.7% 
18. 100% 
19. 8.2% 
20. 3½% 
21. .16% 
22. 825% 
23. .15% 
24. .02% 
25. 2000% 
26. .032% 
27. .04% 
28. 3.9% 
29. ½% 
30. ⅔%
Lesson 3

Objective: You will be able to change a decimal to a percent.

Related Information:

If you learned your rule well for changing a percent to a decimal, you will have little difficulty learning how to change a decimal to a percent. It’s just the opposite.

TO CHANGE A DECIMAL TO A PERCENT: Move the decimal point two places to the right and add a percent sign.

Examples:

- \( .50 = 50\% \)
- \( .5 = 50\% \)
- \( 5.5 = 550\% \)
- \( 50 = 5000\% \)

Note above that in each case we moved the decimal point two places to the right. Add zeros if necessary... but make sure you move two places.

Where there is a whole number to be changed to a percent, as in 50 above, the decimal is understood to be after the 50 — although we did not have to show it in the whole number. But when you must change the 50 to a percent, you need to show that decimal. You put it in and move it two places to the right.

In all the examples above, the percent that we obtained was a whole number. Therefore we were able to drop the decimal point after the number. But if you obtain a decimal fraction for an answer, you would naturally keep the decimal point.

Examples:

- \( .125 = 12.5\% \) (You might prefer to call this \( 12\frac{1}{2}\% \).)
- \( 6.3333 = 63.33\% \) (You might prefer to call this \( 63 \frac{1}{3}\% \).)

ASSIGNMENT A:

Do the following problems. Your instructor will go over them in a few minutes. If you get them correct, you are about ready for the main assignment.

1. .10 Change to a percent:

2. .80 Change to a percent:

3. .2 Change to a percent:

4. .45 Change to a percent:

5. .45 Change to a percent:

6. 20

7. 2.05

8. .725

9. .3

10. .3075
So far we have avoided problems involving fractions. Following is an example of how to change a mixed number to a percent:

8½
   Step 1. Change the fraction to a decimal (½ = .5)

8.5
   This is the equivalent decimal.

8.50
   Step 2. Move decimal point two places to the right.

850%  Step 3. Add the percent sign.

ASSIGNMENT B:
1. 2¼ Change to a percent:
2. 10½ Change to a percent:
3. 1¾ Change to a percent:
4. 6⅔ Change to a percent:
5. 1⅔ Change to a percent:

ASSIGNMENT C:
Change the following decimals to percents:
1. .43
2. 3
3. .17
4. 1.34
5. 2.08
6. .07
7. .02
8. .325
9. .304
10. 2.5
UNIT V – PERCENTAGE

Lesson 4

Objective: You will be able to change a percent to a fraction.

Related Information:

What does “Percent” actually mean?

The “cent” part comes from the Latin word “centum,” meaning hundred. “Percent” means for each hundred.

If we say 5% we mean 5 out of each 100.

If we say 30% we mean 30 out of each 100.

Percent is simply another way of expressing a fraction. (Remember we said that, even when the language is different, the meaning may be the same.)

3% means 3 out of a hundred or $\frac{3}{100}$

10% means 10 out of a hundred or $\frac{10}{100}$

We can reduce this latter fraction to lowest terms, and we get $\frac{1}{10}$, or one out of 10.

ASSIGNMENT:

A. Change the following percents to fractions with 100 as the denominator.

1. 30% expressed as a fraction equals
2. 8% expressed as a fraction equals
3. 75% expressed as a fraction equals
4. 124% expressed as a fraction equals
5. 1% expressed as a fraction equals

B. Now practice reducing the fractions to lowest terms.

1. $\frac{20}{100}$ reduced to lowest terms is:
2. $\frac{5}{100}$ reduced to lowest terms is
3. $\frac{200}{100}$ reduced to lowest terms is
4. $\frac{25}{100}$ reduced to lowest terms is
5. $\frac{75}{100}$ reduced to lowest terms is

164
C. Change the following percents to fractions or mixed numbers in lowest terms:

Note: If you cannot reduce the fraction, that means it is already in its lowest terms.

Example: 23% = 23/100 (That is the answer.)

1. 40% 
2. 60% 
3. 45% 
4. 80% 
5. 100% 
6. 5% 
7. 73%
8. 15% 
9. 47% 
10. 125% 
11. 7% 
12. 88% 
13. 200% 
14. 325%

You will sometimes have to convert fractional percents to ordinary fractions. This can be done by actually dividing by 100. For example, to express 37 1/2% as a fraction, here is what you would do:

\[
\frac{75}{2} \div \frac{100}{1} = \frac{75}{2} \times \frac{1}{100} = \frac{75}{200}
\]

The number 25 divides evenly into both parts of the fraction:

\[
\frac{75}{200} = \frac{3}{8}
\]

You may already have recognized the 37 1/2% as .375 or 3/8.

In Assignment D, if you recognize any of the fractional percents, just write in the correct answer without going through the division process.

ASSIGNMENT D:
1. 12 1/2%
2. 33 1/3%
3. 8 1/3%
4. 16 2/3%
5. 62 1/2%
6. 66 2/3\%  

7. 2 1/2\%  

8. 6 1/4\%  

9. 87 1/2\%  

10. 83 1/3\%  

Another difficulty students have with percent:  

\( \frac{1}{2}\% \) is not 50\%:  \( \frac{1}{2}\% \) is very small; 50\% is large  

\( \frac{1}{4}\% \) is not 25\%:  \( \frac{1}{4}\% \) is very small; 25\% is fairly large  

**ASSIGNMENT E:** Convert the following percents to fractions in lowest terms.

1. 25\%  

2. 250\%  

3. 75\%  

4. \( \frac{3}{4}\% \)  

5. \( \frac{1}{4}\% \)  

6. \( \frac{1}{4}\% \)  

7. 7.5\%  

8. 12 1/2\%  

9. 1/8\%  

10. 2\%  

You will not have much use for small fractional percents, except in figuring interest, and then they are usually part of a mixed number. For example, a bank might pay interest at 5\%/\% or 6\%/\%, etc. The fractional percent adds just a bit extra.
UNIT V – PERCENTAGE

Lesson 5

Reading Decimals

Objective: You will be able to read decimal fractions accurately.

Related Information:

Sometimes you will find it necessary to change a decimal fraction to an ordinary, proper fraction. Changing a decimal fraction to an ordinary fraction is a very simple procedure if you know how to read a decimal properly. For this reason a simple review is in order.

2 or 2. is read as “two”
.2 is read as “two tenths”
.22 is read as “twenty-two hundredths”
.222 is read as “two hundred twenty-two thousandths”

MEMORIZE:
1.0 one place = tenths
.00 two places = hundredths
.000 three places = thousandths
.0000 four places = ten-thousandths

Some more examples before the assignment:

2.2 = two and two tenths (Note: the decimal point is read as “and.”)
2.02 = two and two hundredths (the zero is silent)
2.002 = two and two thousandths
22.0022 = twenty-two and twenty-two ten-thousandths

Read the number before the decimal; then say the and; then read the number after the decimal and indicate the number of places by saying tenths, hundredths, thousandths, or ten-thousandths.

Note: Thousandths and ten-thousandths are very important in certain trades, where great accuracy in measurements is needed – for example, in the machinist trade. As a foods trade worker, you will rarely see them, but still, you should know what they mean.

ASSIGNMENT

A. Write in words and read orally the following:

1. .8
2. .1
3. 1.5
4. .03
5. .24
B. Write the following in words:

1. .86
2. 1.6
3. 2.9
4. 38.5
5. 14.3
6. 126.4
7. 7.37
8. 89.03
9. 30.46
10. 248.19
11. .005
12. .008
13. .025
14. .832
15. 6.005
16. 1.758
17. 86.528
18. 200.042
19. .606
20. .045
Objective: You will be able to convert a decimal fraction to an ordinary fraction.

Related Information:

Now that we have reviewed how to read decimal fractions, you should have no trouble learning to convert decimal fractions to ordinary fractions.

Step 1. READ THE NUMBER. Example: .5 = 5 tenths

Step 2. Put the number (5) over the word: \( \frac{5}{10} \) (change to ten)

Step 3. Reduce to lowest terms: \( \frac{5}{10} \) becomes \( \frac{1}{2} \).

Example 2: .25 becomes "twenty-five hundredths," or \( \frac{25}{100} \).

Remember:

When you say "tenths," put a 10 under the line of the fraction.

When you say "hundredths," put 100 under the line of the fraction.

When you say "thousandths," put 1000 under the line of the fraction.

Example 3: .125 becomes "one hundred and twenty-five thousandths," or \( \frac{125}{1000} \).

You can often reduce the fraction. This one becomes \( \frac{1}{8} \). Perhaps you recognize an old friend, \( .125 = \frac{1}{8} \).

ASSIGNMENT A:

1. .8 Change to a fraction:
2. .30 Change to a fraction:
3. .02 Change to a fraction:
4. .800 Change to a fraction:
5. .17 Change to a fraction:

Sometimes a problem involves a whole number and a decimal:

Example: 2.5 is read as "two and five tenths," which becomes \( 2 \frac{5}{10} \).

Reducing, it becomes \( 2 \frac{1}{2} \).
ASSIGNMENT B:
1. 31.5 Change to a whole number and fraction:
2. 2.4 Change to a whole number and fraction:
3. 50.5 Change to a whole number and fraction:

ASSIGNMENT C:
Change the following to fractions or mixed numbers in lowest terms.
1. .20
2. .75
3. .05
4. .10
5. .625
6. 2.40
7. .375
8. 50.75
9. 1.5
10. 4.25
11. 20.80
12. .875
UNIT V – PERCENTAGE

Lesson 7

Fractions to Decimals to Percents

Objectives: You will be able to change a fraction to a decimal. Based upon work in previous units, you should then be able to convert the decimal to a percent.

Related Information:

Back on page 150, we showed you how to convert an ordinary fraction to a decimal fraction. So as to avoid having to do this, we suggested that you memorize the decimal equivalents of the most frequently used fractions.

Sometimes, however, you may forget these equivalents. Then you have to work them out again. So let us review how this is done.

To change a fraction to a decimal, divide the denominator into the numerator.

Example: \( \frac{1}{2} \) becomes \( 2 \div 1 \).

The 2 won’t go into the 1. So we add a decimal point and one or two zeros. (If we are aiming for a percent, it is helpful to use two zeros, or more if necessary.)

\[
\begin{align*}
2 & \overline{) 1.00} \\
& \text{Then divide: } 2 \overline{) 1.00}
\end{align*}
\]

The answer, .50, can now be changed simply to 50%.

(Recall the rule: To change a decimal fraction to a percent, move the decimal point two places to the right and add the % sign.)

ASSIGNMENT A:

1. 1/4 Change to a decimal and percent: \( \underline{\hspace{2cm}} \) \( \underline{\hspace{2cm}} \)

2. 1/8 Change to a decimal and percent: \( \underline{\hspace{2cm}} \) \( \underline{\hspace{2cm}} \)

3. 1/5 Change to a decimal and percent: \( \underline{\hspace{2cm}} \) \( \underline{\hspace{2cm}} \)

ASSIGNMENT B:

Change the following to decimals and percents:

1. 1/10 \( \underline{\hspace{2cm}} \) \( \underline{\hspace{2cm}} \)

2. 3/8 \( \underline{\hspace{2cm}} \) \( \underline{\hspace{2cm}} \)

3. 3/5 \( \underline{\hspace{2cm}} \) \( \underline{\hspace{2cm}} \)

4. 1/3 \( \underline{\hspace{2cm}} \) \( \underline{\hspace{2cm}} \)
| 5. | 1/5 |
| 6. | 1/100 |
| 7. | 3/10 |
| 8. | 4/5 |
| 9. | 1/6 |
| 10. | 2/3 |
| 11. | 1/16 |
| 12. | 1/12 |

What do you suppose could delight 100% of these bakers so much?
ASSIGNMENT C:

By now you should be able to convert from any one form to any other... so let's try this chart. Refer back to previous pages if you have trouble. Do not try to do the ratio column at this point.)

<table>
<thead>
<tr>
<th>No.</th>
<th>Fraction</th>
<th>Decimal</th>
<th>Percent</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td>.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>$\frac{1}{4}$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
<td>75%</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td>.125</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>$\frac{3}{8}$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td></td>
<td>.333</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>$\frac{1}{10}$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td></td>
<td></td>
<td>66 $\frac{2}{3}$%</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td></td>
<td>.20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td></td>
<td></td>
<td>15%</td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td></td>
<td></td>
<td>80%</td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td></td>
<td>.875</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>$\frac{1}{25}$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td></td>
<td></td>
<td>62 $\frac{1}{2}$%</td>
<td></td>
</tr>
<tr>
<td>15.</td>
<td></td>
<td></td>
<td>$\frac{1}{2}$%</td>
<td></td>
</tr>
</tbody>
</table>
Objectives: You will review the meaning of percent.
You will learn to solve two different types of percentage problems.

Related Information:

Up to this point you have been learning the mechanics of changing from decimal fraction to percent, percent to decimal fraction, and decimal fraction to ordinary fraction. At this point it is important that you make certain you understand the meaning of percent.

In a previous unit we mentioned that percent means for each hundred.

50% means 50 out of each 100 or \( \frac{50}{100} \), which equals \( \frac{1}{2} \).

You should memorize certain percentages.

100% equals the whole thing.

Two whole things equals 200%.

When we think of percent we must know what is meant by the whole thing. Someone must tell us what it is.

A 12" apple pie might be the whole thing or the original amount, or 100%.

An 8" apple pie might be the whole thing or the original amount, or 100%.

100% of the 12" pie is certainly not the same thing as 100% of the 8" pie.

If the 12" pie represents the whole thing, then two 12" pies would be 200%, three 12" pies 300%.

If we cut the 12" pie in half, we now have 1/2 or 50% (of the 12" pie).

Original pie: 100%

Half of the original pie: 50%

One-quarter of the original pie: 25%
Learn to picture the whole thing or the original amount in your mind. A 20% tip is 20% of the whole cost of the dinner; 5% interest on your bank account means 5% of all the money you have in the bank (the whole thing). It also means 5 dollars for each 100 dollars. Keep these two related concepts in mind.

100% means the whole thing;
50% is half of the whole thing;
25% is one quarter of the whole thing.
1% is a very small amount (1 out of each 100) of the whole thing, and ½% is an even smaller amount (½ of 1%).

Here we have two things, each being 100% — but they are not equal. In thinking about percent, you must always have in mind what the original amount is.

When working with percentages, we generally must be very exact. A difference in ¼% in a mortgage loan on a business may amount to thousands of dollars over a long period of time. When a discount is made on an item, it must be correct to the nearest cent.
DIFFERENT USES OF PERCENT

In the food-service industry, tips are based on a percent of the price of the meal: either 15% or 20% is standard today for a waiter or waitress.

When a restaurant bill is added up, often a tax must be added to it. This tax presently amounts to 5% in the State of New Jersey.

If you pay your bills promptly, you may be allowed a 2% discount. On the other hand, you may have to pay extra if you do not pay your bill on time.

Whether taking out a loan for the business, paying a mortgage, or dealing with your own personal savings account, interest is expressed as a percent. We hear about inflation and how the cost of living goes up; this too is expressed as a percent. Businessmen, in discussing their business, use terms such as "we did 20% better than last month."

Percentage problems seem difficult to do because there are three different types of problems. Since one of the types is not often met with in everyday living, we shall skip it, and learn to do the two types that you will come upon often in your work and in your nonworking life. We will call them Type A and Type B problems.

TYPE-A PERCENTAGE PROBLEM

You total up a guest check. . . this total is called the original amount. Example: Price of a dinner — $5.00. You must charge the sales tax, now 5% in New Jersey. It is called the rate. The rate is always the number with the percent sign (%).

You are looking for the amount to add on to the original amount. You want to know this in dollars and cents, so you can compute the new total.

This is the most common type of percentage problem, where you know the original amount and the rate, but must find the amount to add on or subtract. You do not always add on, you know. When you get a discount, you deduct (subtract) from the original amount.
Here is a chart of a typical type-A problem:

<table>
<thead>
<tr>
<th>Original amount</th>
<th>Rate</th>
<th>Amount of increase or Amount of decrease</th>
</tr>
</thead>
<tbody>
<tr>
<td>$25.00</td>
<td>5%</td>
<td>?</td>
</tr>
</tbody>
</table>

**TYPE-B PERCENTAGE PROBLEM**

One wholesaler offers you a 15% discount off the original price of a new dishwasher (type A problem), but another wholesaler tells you he will save you 50 dollars on the list price. How do you compare the two different net prices? In the case of the second dealer he did not tell you the rate — the amount with the percent sign — you must figure it out yourself.

Other examples of TYPE B problems: The customer left $1.00 on a $5.00 meal. *What was the percent of the tip?*

Our business went up from $30,000 income last year to $40,000 this year. *What was the rate of increase?*

Here is a type-B problem illustrated on a chart:

<table>
<thead>
<tr>
<th>Original amount, or List price</th>
<th>Rate</th>
<th>Amount of increase or Amount of decrease</th>
</tr>
</thead>
<tbody>
<tr>
<td>$25.00</td>
<td>?</td>
<td>$1.25</td>
</tr>
</tbody>
</table>

Now let's put the two charts together, and look carefully at them.

<table>
<thead>
<tr>
<th>Original amount, or List price, or Catalog price</th>
<th>Rate (%)</th>
<th>Amount to be added on or taken off</th>
</tr>
</thead>
<tbody>
<tr>
<td>A (of $25.00)</td>
<td>10%</td>
<td>(Multiply $25.00 by 10%)</td>
</tr>
<tr>
<td>B (of $25.00)</td>
<td></td>
<td>$2.50</td>
</tr>
</tbody>
</table>

(Multiply $25.00 into $2.50)
We used the same amounts in both types of problems. Note how each one has something different missing.

A typical A-type problem might read: The list price was $25.00 and the discount is 10%. How much is the discount (the amount to be taken off)?

A typical B-type problem might read: A discount of $2.50 was allowed on a purchase of $25.00. What percent was it? (A B-type problem is very easy to identify because of the missing percent.)

The math operations for each type will be shown in more detail later, and you will get practice doing the problems on the following pages.

An additional comment on placing the proper numbers in the proper boxes. Place the word “of” before the first box. The number after the “of” usually goes into the first box.

10% of $25.00? ($25.00 goes into first box.)
What percent is $2.50 of $25.00? ($25.00 goes into first box)

It sometimes helps to add a box to the end of the chart to indicate the NEW PRICE. In most problems, not only must the amount to be added be found, but the new price is also required. What is the amount you must pay on a $5.00 meal if the sales tax is 5%? Rate = 5%. 5% of $5.00 = $0.25. Add $0.25 to the $5.00, and you must pay $5.25.

Our $25.00 order was raised 10%, due to inflation. What is the price we had to pay?

| $25.00 | 10% | Ans. $2.50 | $27.50 |
### Percentage Problem Analyzer

<table>
<thead>
<tr>
<th></th>
<th>Original amount</th>
<th>Rate</th>
<th>Amount of Increase or Decrease</th>
<th>New Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>(of)</td>
<td>%</td>
<td>?</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>(of)</td>
<td>%</td>
<td>?</td>
<td></td>
</tr>
</tbody>
</table>

The following words may be used instead of the terms above.

- Regular price
- List price
- Catalog price
- Original price
- Regularly
- Cost price
- Cost
- Base
- Interest problems
- Principal

<table>
<thead>
<tr>
<th>Percent</th>
<th>Discount</th>
<th>Sale price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross profit</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rate</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interest</td>
<td></td>
</tr>
</tbody>
</table>
Using the chart, see if you can identify the following problems as to type:

1. "10% of 40" is a Type ___ problem.
2. "50 dollars is what percent of 300 dollars?" is a Type ___ problem.

ASSIGNMENT A.
Fill in the letter of the type of problem only (A or B):

3. 8% of 30. ___ ___
4. What percent is a $2.00 tip on an $18.00 meal? ___ ___
5. 5% interest on $1,000 in the bank. ___ ___
6. A 15% discount on a $60.00 suit. ___ ___
7. I saved $1.00 on a $5.00 tie on sale. What was the percent of the discount? ___ ___
8. 45% of 450. ___ ___
9. What percent is 25 of 50? ___ ___

171 180
10. 5% sales tax on a $22.00 dinner.

11. If the social security tax is 5.85% and you earned $100.00 last week, how much did they take out of your pay for social security?

12. 3 is what percent of 30?

13. You are allowed a 2% discount for paying your $500.00 food bill on time. How much do you save?

14. A 30% discount on all old-style serving trays. The original price of the trays was $15.00 per dozen. How much do you save?

15. We earned $15,000 last year in our business. This year we made $18,000. What is the percent increase in profit this year over last year?

PROCEDURE – How to do type-A percentage problems:

Example 1: Find 5% of 200

a. All type-A problems are multiplication problems. (Remember our hint – “of” means the original amount.)

b. First the 5% is changed to a decimal (.05). (Remember that a percent cannot be used to work out a problem – it must be changed to a decimal fraction or regular fraction.)

c. Multiply 200
   X .05
   10.00

d. Answer 10.00 or 10 (The zeros are not necessary)

e. Check: Does the answer seem reasonable? Yes, it does.

Example 2: Find 35% of 942

a. Recognize this as a type-A problem, requiring multiplication.

b. Multiply 942 (Whole amount)
   X .35 (Percent, changed to a decimal)
   4710
   2826
   329.70 Answer

c. Check: 35% is close to 1/3 (33%).
   329 is about 330, and this is fairly close to 1/3 of 942.
   The estimate indicates the answer is at least approximately correct.
Example 3: Find $25\%$ of 250.

a. Recognize the need to multiply.

b. Recognize that 25\% is equivalent to the fraction $1/4$.

c. Decide that it is probably easier to use the fraction $1/4$ than the decimal .25.

d. Multiply $250 \times \frac{1}{4} = \frac{250}{4} = 62 \frac{1}{4}$ Answer

e. Is the answer reasonable? The number 250 is a little more than 240, which is evenly divided by 4, giving 60. Therefore $62\frac{1}{4}$ is at least approximately correct.

PRE-ASSIGNMENT

1. 50\% of 24

2. 30\% of 50

3. $66 \frac{2}{3}\%$ of 18

ASSIGNMENT B:

1. 40\% of 25

2. 10\% of 32

3. $12\frac{1}{2}\%$ of 72

4. 75\% of 28

5. 50\% of 98

6. $37\frac{1}{4}\%$ of 200

7. $87\frac{1}{2}\%$ of 56

8. 90\% of 845

9. 12\% of 864

10. $33\frac{1}{3}\%$ of 90

11. 60\% of $\$55.50$

12. 25\% of $\$1,764$

13. 5\% of 38

14. 2\% of 200

15. 100\% of 57
PROCEDURE – How to do type-B percentage problems:

Example 1: What percent of 40 is 8?

a. Identify problem as to type. The percent (rate) is missing; therefore it is a Type B problem.

b. 40 is the original amount. (Note the word “of.”)

Note: It is the first number on the chart.

We are looking for the % of 40. Therefore we divide by the original amount:

\[
\frac{8}{40} = \frac{1}{5} = 20\%
\]

c. In a simple problem like this, it is easy to check by simply taking 20% of 40. Does it equal 8?

\[
20\% = .20 \\
\frac{40 \times .20}{8.00} = 8 
\]
The answer is correct.

Example 2: What percent of 20 is 60?

a. Identify type of problem as type B, which calls for division.

b. The original amount is 20. (Note the word “of.”)

c. Divide by the original amount:

\[
\frac{60}{20} = 3 = 300\%
\]

d. Is the answer reasonable? If you think carefully about the meaning of the problem, you will see that it is. Check the arithmetic by multiplying 20 by 3. (which is 300% converted to decimal form).

\[
20 \times 3 = 60
\]

PRE-ASSIGNMENT

1. $15$ is what percent of $860$?

2. $875$ is what percent of $8375$?

3. What percent of 300 is 15?

ASSIGNMENT C:

4. $820$ is what percent of $8160$?

5. $812$ is what percent of $8240$?
6. $600 is what percent of $660?
7. 50 is what percent of 250?
8. 33 is what percent of 100?
9. $140 is what percent of $700?
10. 292 is what percent of 146?
11. What percent of .60 is .30?
12. What percent of $12.00 is $2.00?
13. What percent of $200 is $237.50?
14. What percent of .75 is .50?
15. What percent of 50¢ is 2¢?
16. What percent of 50 portions is 150 portions?
17. What percent of $38 is $46?
18. What percent of $1.00 is 17¢?
19. What percent of $2.00 is 28¢?
20. What percent of 5 dollars is 5 cents?

ASSIGNMENT D:

1. - 15. Work out the arithmetic for the problems on pages 171 and 172.

16. What tip might you expect on a $22 restaurant bill at a tipping rate of 15%?

17. The store ad said: “Special sale – chrome-plated bar stools, regularly $49.95, on sale this week for $34.95.” What percent markdown is this? (Use approximate figures to calculate.)

18. At 40% off list price, what would you pay for glassware listed at $96 a gross?

19. What is the social security tax on an annual wage amounting to $11,500 at a rate of 5.85 percent. If the employer paid the same amount as the employee, how much went into the social security fund altogether?

20. What is the discount rate if Jean paid $9.00 for a uniform listing at $12.00?

21. Sue paid $6.75 for a cookbook that carried approximately a $9.95 price tag. How much did she save? Approximately what percent did she save?
22. A cooking school advertised a "Brush-Up Special" for $40 for 4 sessions. It claimed the sessions were usually priced at $15 each. What percent savings was it offering?

23. Read over the ad for Rosie O'Grady's restaurant on the next page. Note that on Wednesday, all dinners are 10% off. On Monday and Tuesday, discounts are given on two sizes of butt steaks. Compute the percent of discount for each (use approximate figures). Compute the approximate percent of discount given for prime ribs on Thursday and Friday.

Brain teaser: Snuffy's Tavern made a net profit of $37,500 last year. This year it increased its profit by 12%. Mike's Spot made $45,000 last year, but due to increased expenses suffered a 14% decrease in profit this year. Which tavern made more money this year? How much more?
FIGHTING INFLATION with DAILY SPECIALS

Monday & Tuesday
Rosie's Own Big Top Butt Steak $5.95 4.49
Rosie's Own Little Top Butt Steak $4.95 3.49

Wednesday
All dinners 10% Off!*

Thursday & Friday
Rosie's Prime Ribs of Beef $6.75 4.79

All Dinners Include:
Unlimited Salad Bar & Choice of Potato, Plus Individual Loaf of French Bread.

* Dinner Only. Alcoholic Beverages Not Included In Discount

A HOUSE OF GREAT REPUTE

Route Thirty-Five, Easttown, N.J.
Phone: Five, Four, Two-Oh, Ate, Oh, Oh!
UNIT V – PERCENTAGE

Lesson 9

Objective: You will learn how prices are marked up by fractions and by percents.

Related Information:

Marking up prices can be simple or complex depending upon some of the following factors: An item may have a price marked on it, set by the manufacturer. In cases like that, most retailers sell the product at the suggested price. Examples of this in a restaurant might be tobacco, candy, and gum items—probably sold at the cash register.

A second circumstance involves a type of item that is simple in nature, where we can determine the cost of each item. Examples of this might be baked goods. For example, a muffin costs us 5¢ to make, we will mark it up to 10¢. A danish costs us 10¢, and we will sell it for 25¢. An ice cream pop costs us 10¢, and we will sell it for 20¢.

A more complex situation results when we must take materials from many sources and combine them. A salad, a veal-cutlet dinner, a turkey dinner. What makes it complex is that we must figure out how much of each item is used and how much each item costs. In a salad we may have lettuce, tomatoes, mayonnaise, celery, tuna-fish, onion, etc. Even a simple sandwich may have four or five items going into it, which need to be included when computing its cost.

Back in Unit III we computed portion costs for several different menu items (see pages 101 through 113). Once we know portion costs, we are then able to apply a certain markup figure.

Some of the factors to be considered when marking up the price from the actual cost of ingredients include:

Labor – the cost of all the people who must be employed to make the product, serve the product, keep the place clean, and manage the place.

Overhead – rent, electricity, insurance, repairs, water, furniture, taxes, etc., etc.

Profit – A person is in business to make a profit. How much must he add on to get his profit?

There are different methods used to mark up prices. In the first instance above it was determined by the price marked on the item. In the next two cases we had to figure out the cost of the item. To this cost we add an amount to cover the items listed above: labor, overhead, and profit.

There are two simple methods which can be used: fractional and percent.
MARKING UP PRICES BY THE FRACTION METHOD

Example: Mark up a $1.00 cost by 1/3.

Cost: $1.00

$1.00 \times \frac{1}{3} = \frac{1.00}{3} = .33

Marked up price: $1.00 + .33 or $1.33

MARKING UP PRICES USING PERCENTAGE

Example: Mark up a $2.40 cost by 33%.

(You can use your knowledge and change the percent to a fraction and proceed as above, or you can convert 33% to .33 and multiply by the decimal fraction.)

Cost: $2.40

33% of $2.40 (Type A problem)

$2.40 \times .33 = .7920 = .79

Marked up price: $2.40 + .79 = $3.19

ASSIGNMENT:

Mark up the following prices by the percent indicated. You may use approximations provided they are close approximations.

1. 40¢; 30% markup
2. 80¢; ¼ markup
3. 92¢; 50% markup
4. 85¢; 75% markup
5. $1.25; 33% markup
6. $2.50; 1/3 markup
7. $3.20; 50% markup
8. 8¢; 200% markup
9. 23¢; 150% markup
10. $25.98; 15% markup
11. $145.00; 25% markup
12. 65¢; 125% markup
13. 18¢; 1/3 markup
14. 27¢; 200% markup
15. 35¢; ½ markup
16. $1.98; 33% markup
17. $4.13; 75% markup
18. $5.23; 100% markup
UNIT V — PERCENTAGE

Lesson 10

Simple Interest

Objective:
You will learn to figure simple interest on money borrowed.

Related Information:

When you borrow money from a bank or loan company you must pay a certain amount, called interest, for the use of this money. The original amount of money you borrow is called the principal. Businessmen often have to borrow money. When they start a business or buy a business from someone, they may have to make a loan. When they want to enlarge or improve their business, they may have to seek extra funds. Although it costs money to borrow money, if your business is successful you should be able to pay the money back with interest.

When you borrow money you want to know the amount of interest you must pay. The amount of interest will depend on how much you borrow, how long you keep the money, how you pay it back, and the rate of interest. Rate of interest means a certain percent of the principal for one year. You can borrow money for one year, two years, three years, or longer. Homeowners have mortgages that may take 20 or 30 years to pay back, and they pay interest over the entire period.

Businessmen usually borrow from banks, and they pay simple interest on a loan. The loan comes due at a certain time, and they pay it back at that time plus a certain percent of the loan (the interest rate) for each year.

There are many other ways of borrowing money. You may borrow from a bank or finance company (loan company) and pay a certain amount back each month, plus an interest charge on the money not yet paid back. Or the interest amount can be figured out in advance and then deducted (discounted) from the amount you receive, which you then pay off at a certain amount each month. For these loans it takes extra arithmetic to calculate the true annual interest.

We will deal only with loans that are paid off in one payment, at a stated (true) annual rate.

Think of the terms principal, rate, and interest the same way as you did for the typical percentage problem:

<table>
<thead>
<tr>
<th>Principal</th>
<th>Rate</th>
<th>Interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>(the original amount you borrow)</td>
<td>%</td>
<td>(the amount added on that you must pay back)</td>
</tr>
</tbody>
</table>
Example 1: You borrow $500 for one year at the rate of 10% (Type A)

\[
\frac{500}{.10} \quad \text{Change the percent to a decimal.}
\]

\[
50.00 \quad \text{Multiply as in all type-A problems}
\]

Example 2: You borrow $500 for 3 years at the rate of 10% per year.

Get the interest for one year, as in problem 1 above. Then multiply your answer by 3.

\[
3 \times 50.00 = 150.00 \quad \text{Remember, the rate is 10% per year. Since you are borrowing the money for three years, you must pay 10% interest for each year of the loan.}
\]

Example 3: You borrow $500 for 3 months at the rate of 10% per year.

The year is divided into 12 months. You are borrowing the money for 3 months out of 12, or 3/12 of a year.

\[
\frac{3}{12} = \frac{1}{4}
\]

Interest cost for a full year = $50.00 (Found as in problem 1.)

\[
\frac{1}{4} \times \frac{50}{1} = \frac{50}{4} = 12\frac{1}{2} = 12.50
\]

Therefore you pay $12.50 for borrowing $500 for 3 months at 10%.

You can change days into months:

60 days equals 2 months = 2/12 of a year

\[
\frac{2}{12} = \frac{1}{6}
\]

You can also use days as follows: 60 days / 360 days (used for a whole year)

This also reduces to \(\frac{1}{6}\)

In either case you would take \(\frac{1}{6}\) of the interest for a year.

You can find the rate by following the same procedure you used in doing type-B percentage problems.
ASSIGNMENT:

1. Find the annual interest for the following loans:

<table>
<thead>
<tr>
<th>Amount borrowed (principal)</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. $8350</td>
<td>8%</td>
</tr>
<tr>
<td>b. $8425</td>
<td>10%</td>
</tr>
<tr>
<td>c. $8225</td>
<td>10%</td>
</tr>
<tr>
<td>d. $4500</td>
<td>8%</td>
</tr>
<tr>
<td>e. $10,000</td>
<td>9%</td>
</tr>
<tr>
<td>f. $2,250</td>
<td>6½%</td>
</tr>
</tbody>
</table>

2. Find the interest on the following loans:

<table>
<thead>
<tr>
<th>Amount of loan</th>
<th>Rate</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. $650</td>
<td>8%</td>
<td>3 years</td>
</tr>
<tr>
<td>b. $1,250</td>
<td>9%</td>
<td>2 years</td>
</tr>
<tr>
<td>c. $20,000</td>
<td>8%</td>
<td>20 years</td>
</tr>
<tr>
<td>d. $8,500</td>
<td>10%</td>
<td>3 years</td>
</tr>
<tr>
<td>e. $4,000</td>
<td>9½%</td>
<td>3 years</td>
</tr>
</tbody>
</table>

3. Find the interest on the following loans:

<table>
<thead>
<tr>
<th>Principal</th>
<th>Rate</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. $750</td>
<td>8%</td>
<td>6 months</td>
</tr>
<tr>
<td>b. $430</td>
<td>10%</td>
<td>9 months</td>
</tr>
<tr>
<td>c. $1,200</td>
<td>9%</td>
<td>3 months</td>
</tr>
<tr>
<td>d. $420</td>
<td>8½%</td>
<td>4 months</td>
</tr>
</tbody>
</table>

Interest

<table>
<thead>
<tr>
<th>Interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>$</td>
</tr>
<tr>
<td>$</td>
</tr>
<tr>
<td>$</td>
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<tr>
<td>$</td>
</tr>
<tr>
<td>$</td>
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<tr>
<td>$</td>
</tr>
</tbody>
</table>

Interest

<table>
<thead>
<tr>
<th>Interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>$</td>
</tr>
<tr>
<td>$</td>
</tr>
<tr>
<td>$</td>
</tr>
</tbody>
</table>

---

192

183
4. Find the annual rate of interest on the following problems:

<table>
<thead>
<tr>
<th>Principal</th>
<th>Interest</th>
<th>Time</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>$540</td>
<td>$43.20</td>
<td>1 year</td>
<td></td>
</tr>
<tr>
<td>$350</td>
<td>$21.00</td>
<td>1 year</td>
<td></td>
</tr>
<tr>
<td>$600</td>
<td>$68.00</td>
<td>1 year</td>
<td></td>
</tr>
<tr>
<td>$1,200</td>
<td>$120.00</td>
<td>1 year</td>
<td></td>
</tr>
<tr>
<td>$3,000</td>
<td>$480.00</td>
<td>2 years</td>
<td></td>
</tr>
<tr>
<td>$460</td>
<td>$124.20</td>
<td>3 years</td>
<td></td>
</tr>
<tr>
<td>$200</td>
<td>$17.00</td>
<td>1 year</td>
<td></td>
</tr>
<tr>
<td>$5,000</td>
<td>$900.00</td>
<td>3 years</td>
<td></td>
</tr>
</tbody>
</table>

5. Find the annual rate of interest for the following loans:

<table>
<thead>
<tr>
<th>Amount borrowed</th>
<th>Time</th>
<th>Amount paid</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>$300</td>
<td>6 mos.</td>
<td>$318.00</td>
<td></td>
</tr>
<tr>
<td>$150</td>
<td>90 days</td>
<td>$153.00</td>
<td></td>
</tr>
<tr>
<td>$200</td>
<td>6 mos.</td>
<td>$206.00</td>
<td></td>
</tr>
<tr>
<td>$200</td>
<td>3 mos.</td>
<td>$206.00</td>
<td></td>
</tr>
<tr>
<td>$80</td>
<td>30 days</td>
<td>$81.00</td>
<td></td>
</tr>
<tr>
<td>$674</td>
<td>60 days</td>
<td>$680.74</td>
<td></td>
</tr>
</tbody>
</table>

6. Mr. Gerber borrowed $6,000 from the bank for 6 months at 8%. How much interest did Mr. Gerber pay?

7. A $1,300 loan was necessary if we wanted to replace the tables and chairs in our restaurant. At 8½%, how much interest would we pay on a 2-year loan?
8. A stainless-steel-top worktable costs $1,354.00. At an annual rate of 8%, what would the interest amount to if I took out a loan for 6 mos? for 1 year? for 18 months?

9. A dishwasher unit costs $2400. The amount of interest came to $216 for 1 year. What was the rate?

10. A roasting oven with a stainless-steel finish costs $650. At an annual rate of 10%, what would the interest amount to on a 3-month loan?

11. A restaurant fryer, stainless-steel finish all over, costs $438. At 9% annual rate, what would the interest amount to for 6 months?

12. The Rusty Nail restaurant is paying 8½% on a $24,000 mortgage. If the mortgage runs for 20 years, how much will the interest amount to? How much money in all (principal and interest) will the owner have to pay over that period?
UNIT V - PERCENTAGE

Lesson 11

The Trade Discount

Objective: You will learn how discounts are calculated in the food service industry.

Related Information:

People in the restaurant or food-preparation business purchase food from wholesalers or direct from the factory that makes the food, supplies, or equipment. The purchases made by a restaurant are usually in large quantities.

A wholesaler saves money when he sells in large quantities. It may cost him very little more to assemble and ship a large order than a small order. Many wholesalers pass some of these savings along to those who order in large quantities, and this encourages businesses to buy in larger quantities. Discounts from list prices for quantity purchases are called quantity discounts.

Wholesalers also encourage businessmen to pay their bills promptly by offering trade discounts. If a buyer pays the bill before a certain date he may deduct a certain percent from the amount, usually 2%.

Example 1: A restaurant buys 8 loaves of bread a day (2-lb. white loaf). The regular or list price is 55¢ per loaf. Because the restaurant buys large quantities it is given a 10% discount. Compute the cost of a 30-day supply of bread.

\[
8 \text{ loaves} \times 30 \text{ days} = 240 \text{ loaves} \\
240 \times .55 = 132.00 \\
\text{At a 10\% discount:} \\
132.00 \times .10 = 13.20 \text{ discount} \\
132.00 - 13.20 = 118.80 \text{ Answer}
\]

The business world uses a simple code system to describe the conditions under which you can receive a discount for paying your bills early or on time.

Terms: 2/30 n/31

- the 2 stands for 2\% discount
- the 30 means 30 days: you will get a 2\% discount if you pay your bill within 30 days.
- n means net: you will pay the regular amount (no discount) if you pay after 30 days. (You may be subject to a penalty if you take too long to pay.)
Example 2: An item was purchased for $200.00, terms: 2/30 n/31. If the bill was paid within 30 days from date of billing, how much was paid?

\[
\begin{align*}
\frac{\$200.00}{\times \cdot 0.02} &= 2.00 \\
&= \$198.00 \text{ Answer}
\end{align*}
\]

(The discount may be small, but every bit helps the businessman.)

Example 3: Some restaurants purchase equipment on a “cost plus 10%” arrangement. This means that whatever it costs the wholesaler or manufacturer, he sells it for 10% more. He takes a markup of only 10% on the sale.

A stainless-steel dishwasher cost the equipment distributor $1,850. He agrees to sell it to you on a cost-plus-10% arrangement because you are a good customer.

\[
\begin{align*}
\frac{\$1,850}{\times \cdot 0.10} &= 185.00 \\
\$1,850 + 185 (10\%) &= 1,850.00 + 185.00 \\
\text{Cost to you} &= \$2,035.00
\end{align*}
\]

ASSIGNMENT A:

1. A medium-weight aluminum saucepan costs $5.60. What price would you have to pay with a 10% trade discount?

2. If 2½-quare pitchers cost $2.25 each, and you purchased 1 dozen, what was your price with a 10% trade discount? How much money did you save?

3. Anodized aluminum pitchers cost $2.95 each in lots of 12 or more. In smaller quantities they cost $3.25 each. What percent do you save by buying the pitchers in lots of 12 or more?

4. You purchased the following items:
   1 8-oz ladle, $1.40 ea.
   2 16-oz ladles, $2.40 ea.
   1 perforated-bowl spoon, $1.25 ea.
   1 13” serving fork, $1.40 ea.
What was the total bill? How much would these items cost you with a 10% discount? How much would you save with the discount?

5. Quantity discount:
   12 pieces — less 10%
   13 to 35 pieces — less 15%
   36 or more pieces — less 20%

187

196
You purchased

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 solid spoons</td>
<td>$2.80</td>
<td></td>
</tr>
<tr>
<td>12 slotted spoons</td>
<td>$2.80</td>
<td></td>
</tr>
<tr>
<td>24 utility knives</td>
<td>$2.60</td>
<td></td>
</tr>
<tr>
<td>48 pie servers</td>
<td>$3.60</td>
<td></td>
</tr>
</tbody>
</table>

6. The price in the catalog on deep ladles is $4.60 each. In cartons of six or more they are $4.40 each. What is the percent discount on cartons of six or more for each ladle?

7. A deluxe full-size chafer costs $45.00 (list price). What will it cost me with a 15% discount?

8. A commercial can opener costs $15.75. What will my price be with a 5% discount?

9. Ten-gallon plastic storage cans cost $3.00 each. If I purchase four, the price is only $2.50 per can. What percent discount will I receive?

**ASSIGNMENT B:**

1. A portable vegetable peeler costs $225.00. The terms of your purchase are 2/30 n/31. You paid your bill 15 days after the date on the invoice. Did you get a discount? If so, how much?

2. A gravity-feed slicer lists at $350.00. The terms are 2/30 n/31. Assume you paid the bill within the 30 days. How much did the slicer cost you?

3. A 1-gallon commercial blender lists at $295.00. Terms are 2/30 n/31: It was 40 days from the date of the invoice when you paid your bill. How much did you pay?

4. A 22-quart food mixer lists at $595.00. Terms are 2/30 n/31. Your invoice is dated July 15, and you paid the bill on August 10. Did you receive a discount? How much? What did the mixer cost you?
ASSIGNMENT C:

The cost to the wholesaler for each of the following items is given. You buy the items on a cost-plus-10% basis. Determine how much each item costs you.

1 45-qt S. S. mixing bowl, $60.00
1 3-shelf utility cart, $34.00
12 fiberglass trays at $22.20 a dozen
4 dozen fiberglass trays at $22.20 a dozen
1 gross sherbets at $6.60 per dozen
200 juice glasses at $1.20 per dozen
2 gross cups at $4.40 per dozen
UNIT VI — RATIO AND PROPORTION

Lesson 1

Objectives: You will learn the meaning of ratio.
You will be able to simplify ratios to lowest terms and change ratios to fractions.

Related Information:

Ratio and proportion are important mathematical ideas which will enable you to quickly find solutions to problems involving price markups and recipe changes.

A ratio is the comparison of one item to another.

In proportion you work with two ratios. Proportion will be dealt with in the next lesson.

We may compare any two (or more) things that have weight, size, or numbers and thereby set up a ratio between them.

We will compare the number of cups to the number of saucers shown here:

1 cup
1 saucer

The ratio is 1 to 1.

Now compare the number of cups to the number of saucers shown here:

3 saucers
2 cups

The ratio is 2 to 3.

What we did was to count up the number of cups (2) and compare this number with the number of saucers (3).

We can indicate the ratio this way: 2 : 3. The : sign means “is to.”

We are saying “two is to three,” or simply “two to three.”

A complete sentence would read: “The ratio of cups to saucers is two to three.”
We can also reverse the relationship by comparing the number of saucers to the number of cups, in which case we would have 3 to 2.

Ratios can also be written as fractions. The number after the colon or the word “to” is the denominator. The first number is the numerator.

Example 1: 1 : 3 can also be written as the fraction \( \frac{1}{3} \).

Example 2: 5 : 10 can be written \( \frac{5}{10} \), which, as you know, reduces to \( \frac{1}{2} \).

Example 3: 12 : 4 equals \( \frac{12}{4} \), which reduces to \( \frac{3}{1} \).

A ratio, then, is a comparison of two things. If we are to compare things, we must be sure they are expressed in the same units.

We can compare 12 cups to 4 saucers. (Each is a count of individual things or units).

We can compare 3 inches to 18 inches.

We can compare 2 ounces to 8 ounces.

. . . . . . . . because the units are the same. BUT . . . . . . . .

We cannot compare 1 dozen cups to 4 saucers without first changing the 1 dozen to units (12), or changing the 4 saucers to a fractional part of a dozen (1/3).

We can compare dozens to dozens or units to units, but not units to dozens.

We can compare inches to inches, yards to yards, feet to feet; but not yards to inches or feet to yards.

PROCEDURE: While it is possible to talk about a ratio such as 50 : 100, we generally reduce the numbers to lowest terms.

\[ \frac{50}{100} \]

Look for the largest number that will divide evenly into both terms of the ratio.

10 seems to suit both sides of the ratio. Divide both sides by 10.

\[ \frac{50}{100} \div 10 = \frac{5}{10} \]

\[ \frac{5}{10} \]

5 into 5 = 1

5 into 10 = 2

Answer 1 : 2
Note that a ratio need not have any units. It is just a mathematical idea. If we compare 3 inches to 18 inches, we could write

3 inches : 18 inches

These are denominate numbers (see page 28). In order to simplify this expression, we can divide both quantities by 3 inches:

3 inches : 18 inches

\[
\frac{3 \text{ inches}}{3 \text{ inches}} : \frac{18 \text{ inches}}{3 \text{ inches}}
\]

\[
\frac{3}{6} \text{ inches} : \frac{18}{6} \text{ inches}
\]

\[
\frac{3}{6} \text{ inches} : \frac{6}{6} \text{ inches}
\]

\[
\frac{1}{2} \text{ inch} : 1 \text{ inch}
\]

We end up with a ratio of 1 : 6, just 1 to 6 — no units at all. So the ratio of 3 inches to 18 inches is 1 to 6. These are pure numbers, not denominate numbers.

In an election, you might have candidate A getting 4000 votes (approximately), and candidate B getting 3000 votes (approximately). What is the ratio of the votes?

4000 votes : 3000 votes

This may be simplified to

4 : 3.

This means just the relationship between the numbers 4 and 3. We may say that Mr. A won over Mr. B by a ratio of 4 to 3.

PREASSIGNMENT: Change to the simplest ratio.

1. 2 inches to 6 inches  
2. 9 lbs to 6 lbs
3. 3 : 12  
4. 6 : 16
5. 8 : 10  
6. 7 : 8

ASSIGNMENT A. Express these ratios in lowest terms:

1. 2 to 8  
6. 12 to 10
2. 3 to 15  
7. 15 : 45
3. 24 : 48  
8. 50¢ to 75¢
4. 9 to 12  
9. 20 to 100
5. 15 to 25  
10. 5 to 75

201

192
ASSIGNMENT B:
1. The ratio of 15 to 5 is the same as _to 1
2. The ratio of 21 to 3 is the same as _to 1
3. The ratio 8 to 6 is the same as _to 3.
4. The ratio 12 to 10 is the same as _to 5
5. The ratio 18 : 24 is the same as 3 to __

ASSIGNMENT C: Change to ratios in lowest terms:
1. 1 lb to 8 oz
2. 1 gal to 2 qts
3. 10 min to 1 hr
4. 1 gal to 1 pt
5. 2 ft to 8 in
6. 4 yds to 2 ft
7. $2.00 to 75¢
8. 50¢ to $3.00

ASSIGNMENT D: Express the following ratios as fractions reduced to lowest terms.
1. 9 to 12
2. 48 to 72
3. 16 to 48
4. 15 to 20
5. 13 to 52
6. $1.25 to 6.25
7. 30 to 60
8. 3 dimes to 2 quarters
9. 25 mins to 3 hr
10. 24 to 36

ASSIGNMENT E: Complete the ratio column in the chart on page 164.

Additional problems in ratio:

So far the problems with ratio have been simple. To summarize, we have:
1. Compared items and reduced them to lowest terms. 8¢ to 24¢ = 1 to 3
2. Changed items if they were in different units and then simplified.
   25¢ to $2 = 25¢ to 200¢ (or .25 to 2.00)
   = 1 to 8 or 1 : 8

Ratio can also help us solve certain other types of problems.
Example 1: Two business partners divide their profits in a 4 to 1 ratio. What is each partner's share if the business earned $2000 for the month?

The ratio is 4 to 1, which means one man gets four parts and one man gets one part. Together they get 5 parts.

Divide the 5 into the $2000 = $400

The first man, who gets 4 parts: $1600

The second man, who gets 1 part: $400

To check, total up both shares .............. $2000

Example 2: In a class of 20 students, the ratio of boys to girls is 3 to 1. How many boys are in the class?

The ratio is 3 to 1.

Add the 3 to the 1, to get 4 parts in all.

Divide: 4 into 20 = 5

Multiply the boys' part (3) by 5 = 15 — the number of boys

Multiply the girls' part (1) by 5 = 5 — the number of girls

To check, add: 20 — total number of students

ASSIGNMENT F:

1. Two business partners divide their profits in a 3 to 2 ratio. What is each partner's share if one month the profit came to $3000?

2. In a restaurant with 26 workers, 15 work part time and 11 work full time. Give the ratio of:
   a. The number of part-timers to full-timers.
   b. The number of part-timers to the full staff.

3. Two business partners divide their profits in a 3 to 5 ratio. Find each partner's share of a profit amounting to $10,000.
4. Three people went into the restaurant business and put up $30,000. The ratio of their investments was 3 to 2 to 1. How much cash did each put up?

5. A recipe for fish salad calls for 2 cups of celery, cut fine, and 2 cups of cooked fish, flaked. What is the ratio of celery to fish?

6. A woman and her daughter earn $320 per week. The ratio of their earnings is 5 to 3. How much does each earn per week?

7. A recipe for Thousand Island dressing calls for 3 quarts of mayonnaise and 3 cups of chili sauce. What is the ratio of chili sauce to mayonnaise?

8. The busboys in the Chesapeake Restaurant share the waiters' tips on a 1 to 2 basis. If the waiters collected $141.60 one evening, how much did the busboys receive?

9. For an oil-vinegar dressing, most recipes call for a 3 to 1 ratio of oil to vinegar. How much oil would be used in a dressing made with 2 cups of vinegar?

10. A weak brine for pickling beets was to be prepared with a 3:2 ratio of vinegar to water. To get 2½ quarts in all, how much of each ingredient would be needed?
UNIT VI – RATIO AND PROPORTION

Lesson 2

Proportion

Objectives: You will learn the meaning of proportion.
You will be able to complete proportion problems.
You will be able to set up a proportion to solve problems in the trade.

Related Information:

We use the concept of proportion in our everyday language without realizing we are expressing a mathematical relationship. We may speak of a young lady or young man as being well built or well proportioned. When we prepare a platter and put on different ingredients, the portions of each item have a definite relation to each other and to the whole. The well-prepared platter has the proper proportions.

Proportion is a short way of saying that two ratios are equal. Below are sketches of two people. Although B is taller than A, his arms and legs are in the same proportion.

\[
\begin{align*}
\frac{\text{Arms of A}}{\text{Height of A}} &= \frac{\text{Arms of B}}{\text{Height of B}} \\
\text{and} \quad \frac{\text{Legs of A}}{\text{Height of A}} &= \frac{\text{Legs of B}}{\text{Height of B}}
\end{align*}
\]

Below are sketches of two sets of cups and saucers. Are they in proportion?

Certainly not. Cup B is much larger in proportion to the size of its saucer than cup A.

\[
\begin{align*}
\frac{\text{Size of cup A}}{\text{Size of saucer A}} & \text{ does not equal } \frac{\text{Size of cup B}}{\text{Size of saucer B}}
\end{align*}
\]

In the above example we are not saying A cup is bad, or B cup is bad, but artistically we have developed a sense of proportion, and we make judgments about people and things based upon this sense.
While proportion is subject to artistic interpretation, it is also a very useful mathematical tool for working problems. We can use the concept in the trade to solve problems of enlarging or decreasing recipes.

Sometimes we even use proportion in math without realizing it.

Example: If you work 8 hours and received $12 in pay, what would you receive if you worked 4 hours?

You probably noticed that 4 is half of 8 and therefore you took half of $12 and came up with an answer of $6.

Not all problems are solved so readily, just by juggling a few numbers in your head. But all of this type and many others can be solved by a proportion. We set up two ratios that are equal to each other.

$$\frac{8 \text{ hours}}{12 \text{ dollars}} = \frac{4 \text{ hours}}{? \text{ dollars}}$$

Cross multiply: $12 \times 4 = 8 \times ?$

$$48 = 8 \times ?$$

$$\frac{48}{8} = ?$$

$6 = ?$

(We will explain the math process again later on in more detail)

Check: $$\frac{8 \text{ hours}}{12 \text{ dollars}} = \frac{4 \text{ hours}}{6 \text{ dollars}}$$

$$\frac{8}{12} = \frac{2}{3} \quad \frac{4}{6} = \frac{2}{3}$$

$$\frac{2}{3} = \frac{2}{3} \text{ is true}$$

This check tells us that we did the mathematical work correctly, but if we had made a mistake in setting up the original proportion, this check would not catch the error. In addition to checking the math, therefore, look back at your original problem and make sure that the answer makes sense!

There is more than one way to solve problems by proportions. For example, we might have set up this proportion for the problem above:

$$\frac{4 \text{ hours}}{8 \text{ hours}} = \frac{? \text{ dollars}}{12 \text{ dollars}}$$

or even $$\frac{8 \text{ hours}}{4 \text{ hours}} = \frac{12 \text{ dollars}}{? \text{ dollars}}$$

Any one of these proportions would have given us the same answer.
What you must do in setting up a proportion to solve a problem is make sure that the relationship between the two figures to the left of the equals sign is the same as the relationship to the right of the equals sign. Otherwise you might end up as we did with the cups, on the previous page — just plain wrong.

Remember our definition: Proportion is two ratios that are equal.

Proportion provides us with an easy way to enlarge or reduce a drawing. This technique may be useful in decorating the restaurant or shop and in related art. The new drawing will look like the old drawing because it has the same proportions. The ratio of height to width in the large drawing will be the same as the ratio of height to width in the small drawing. (See page 203.)

Now let's learn a little more about solving proportions.

Proportions can be written in three ways:

\[ \frac{1}{3} : \frac{4}{12} \quad \text{or} \quad 1:3 = 4:12 \quad \text{or} \quad \frac{1}{3} = \frac{4}{12} \]

They are read as follows:

"One is to three as four is to twelve."

A proportion has four terms:

\[ \frac{1}{3} = \frac{4}{12} \]

\[ \frac{1}{3} : \frac{4}{12} \]

The 1st and 4th terms, occupying the beginning and end positions of the proportional statement, are called the extremes. The 2nd and 3rd terms, being in the middle, are called the means.

In this case the extremes are the largest and smallest numbers (1 and 12). The means are the two middle-size numbers (3 and 4). The proportion would be just as correct if the means and the extremes were interchanged. Try it and see.

THE RULE: In a true proportion, the product of the means equals the product of the extremes.
PRE-ASSIGNMENT:

If the product of the means does NOT equal the product of the extremes, the proportion is not a true one. Which of these are true and which are not true proportions?

1. \(3 : 9 = 12 : 36\) \(\quad 3 \times 36 = 108\) \(\quad 9 \times 12 = 108\)
   \(\text{Answer: True}\)

2. \(2 : 7 = 8 : 28\)

3. \(3 : 20 = 6 : 40\)

ASSIGNMENT A:

1. \(1 : 6 = 5 : 30\)

2. \(3 : 8 = 1.5 : 4\)

3. \(3 : 5 = 4 : 8\)

4. \(3 : 9 = 5 : 15\)

5. \(4 : 3 = 8 : 6\)

ASSIGNMENT B: (True or not-true proportions):

1. \(1 : 2 = 5 : 10\)

2. \(7.5 : 3 = 5 : 2\)

3. \(5 : 8 = 2 : 3\)

4. \(2 : 7 = 6 : 21\)

5. \(2 : 5 = 10 : 25\)

6. Example: \(\frac{10}{15} = \frac{20}{30}\) \(10 \times 30 = 300\) \(20 \times 15 = 300\) \(\text{True}\)

7. \(\frac{2}{9} = \frac{10}{45}\)

8. \(\frac{27}{81} = \frac{1}{3}\)

9. \(\frac{2}{5} = \frac{5}{15}\)

10. \(\frac{3}{6} = \frac{10}{25}\)

In the above problems you were given all the numbers and had to decide whether or not they were true proportions.

Now you are going to learn how to solve a proportion problem when you do not know one of the numbers.

A proportion is an equation, and if you know all the parts of an equation except one, you can figure out the missing one. You can call the unknown or missing number \(x\) or \(N\). Then you solve the equation for \(x\) or \(N\).

Example: Solve for \(x\):

\[\frac{2}{5} = \frac{x}{15}\]
RULE: In a true proportion the product of the means equals the product of the extremes.

The means are 5 and x. Therefore we multiply $5 \times x$. We indicate the multiplication by just writing them next to each other: $5x$.

The extremes are 2 and 15. Therefore we multiply $2 \times 15$, which equals 30.

$$5x = 30$$  \hspace{1cm} \text{Now divide both sides by 5 so we can get just 1 times x.}

$$\frac{5x}{5} = \frac{30}{5}$$  \hspace{1cm} 5 \text{ goes into 5 once}

$$\frac{5x}{5} = \frac{30}{5}$$  \hspace{1cm} 5 \text{ goes into 30 six times}

Answer: \hspace{1cm} x = 6

Check in the original equation:

$$\frac{2}{3} = \frac{6}{15}$$  \hspace{1cm} 2 \times 15 = 30

$$\frac{5}{9} = \frac{x}{27}$$

Therefore this is a true proportion and the answer $x = 6$ is correct.

Note: It does not matter where the x is; solve the problem the same way.

PRE-ASSIGNMENT C: Solve for the missing number:

1. \( \frac{7}{8} = \frac{14}{x} \)

2. \( 15 : 24 = x : 8 \)

3. \( \frac{5}{9} = \frac{x}{27} \)

ASSIGNMENT C: Solve for the missing number:

1. \( \frac{6}{x} = \frac{2}{12} \)

2. \( \frac{6}{14} = \frac{x}{7} \)

3. \( \frac{x}{7} = \frac{8}{28} \)

4. \( \frac{6}{90} = \frac{x}{15} \)

5. \( \frac{x}{15} = \frac{12}{18} \)

6. \( \frac{5}{8} = \frac{25}{N} \)

7. \( \frac{1}{4} = \frac{N}{100} \)

209

200
8. \( \frac{3}{4} = \frac{12}{N} \)

9. \( \frac{x}{15} = \frac{4}{5} \)

10. \( \frac{15}{8} = \frac{x}{34} \)

11. \( \frac{15}{9} = \frac{x}{50} \)

12. \( \frac{12}{x} = \frac{4}{3} \)

13. \( 2 : 9 = 5 : x \)

14. \( 3 : 3 = 75 : x \)

**USING PROPORTION TO SOLVE TRADE PROBLEMS**

Example: John earns $2.00 per hour. How much will he earn in 8 hours?

**SOLUTION:** You can see that the ratio of John's pay to the number of hours he works remains constant. That is, if he works twice as long, he gets paid twice as much, and so on. We know how much he gets for working one hour. We want to know how much he gets for working 8 hours. We can do this problem by setting up a proportion where both ratios consist of the relationship of the number of hours to the number of dollars. We can make either the hours or the dollars the numerators — but we must make both ratios the same way.

\[
\frac{1 \text{ hour}}{2.00} = \frac{8 \text{ hours}}{x \text{ dollars}}
\]

\[1 \times x = 8 \times 2\]

\[x = 16\]

\[= \$16.00 \text{ for 8 hours}\]

Example: Joan earns $14.00 for 8 hours' work. How much will she earn in 16 hours?

**Solution:** Dollars to hours equals dollars to hours.

\[
\frac{\$14}{8 \text{ hrs}} = \frac{x \text{ dollars}}{16 \text{ hrs}}
\]

\[8 \times x = 14 \times 16\]

\[8x = 224\]

\[x = 28\]

\[= \$28.00 \text{ Answer}\]
Example: Change the following recipe: 10 oz of flour is used in a recipe for 12 people. Convert the recipe to serve 9 people.

\[
\frac{\text{ounces}}{\text{portions}} = \frac{\text{ounces}}{\text{portions}}
\]

\[
\frac{10}{12} = \frac{x}{9}
\]

\[
10 \times 9 = 12 \times x
\]

\[
90 = 12x
\]

\[
x = 7\frac{1}{2}
\]

Therefore 7½ oz should be used to prepare 9 portions.

ASSIGNMENT D:

1. A cafeteria sells for 40¢ an item that costs 25¢. At the same rate of markup, what would be the selling price of an article that costs 35¢?

2. A student is paid $3.00 for 2 hours' work. How much will he be paid for 9 hours' work?

3. In our recipe we need 40 lbs of meat for 100 persons. How many pounds would be needed for 75 people?

4. In our recipe we need 8 lbs of potatoes for 25 people. About how many pounds would be needed for 12 people?

5. In our recipe we need 5 gallons of water for a soup to feed 100 people. How much do we need to feed 25 people?

6. If 5 pounds of potatoes cost 60¢, how much will 3 lbs cost?

7. If one dozen stainless steel serving pieces costs $2.40, how much will six dozen cost?

8. If one dozen plastic serving bowls costs $9.00, how much will 6 bowls cost?

9. If 5 pounds of onions cost 59¢, how much will 12 pounds cost?

10. If flour costs $1.80 for 10 lbs, how much will ½ pound cost?
ASSIGNMENT E: Try enlarging or decreasing these patterns.

To enlarge, decide how large you want your fish.

Ours is 4" X 6", but we could have made it any size.

\( \frac{1}{2} " \) to 1" squares would have doubled the measurements.
(Ratio of 1 half to 2 halves gives a ratio of 1 : 2.)

\( \frac{1}{2} " \) to 2" squares would have quadrupled the measurements.
(Ratio of 1 half to 4 halves = 1 to 4.)

Our size for the squares is \( \frac{3}{4} " \).
The ratio of \( \frac{1}{2} " \) to \( \frac{3}{4} " \) is 2-fourths to 3-fourths. This gives us a ratio of 2:3.

The box lines help you determine where to draw the lines of the fish. The trick is to note where the fish lines cross the box lines.

"ALL THE FISH YOU CAN EAT TODAY"

\( \frac{1}{2} " \)-inch squares

Size of fish 2 1/2 \( \times 4 \)

Half-inch squares have been drawn to suit the size of the picture...could have been \( \frac{3}{4} " \) or \( \frac{1}{2} " \) or 1" squares.
ASSIGNMENT E: Converting recipes by the use of proportion.

You have had experience in converting recipes to different quantities --- both by the use of simple multiplication and by the use of fractions. Now you will practice converting them by setting up proportions. Do not hesitate to use reasonable approximations (as for spices). Also, use realistic units based on your own experience.

   Ingredients
   Lamb  5 lbs
   Tomatoes ¾” slices 40 pieces
   Mushroom caps 40 pieces
   Pearl onions 40 pieces
   Green pepper 40 pieces
   Marinade:
   Salad oil 2 pts
   Olive oil 1 pt
   Vinegar 12 oz
   Lemon juice 4 oz
   Garlic, chopped 2 T
   Salt 2 T
   Pepper 2 t
   Marjoram ½ t
   Thyme ½ t
   Oregano ½ t

2. Fried Chicken Maryland  Yield, 50 portions. Change to 65 portions.
   Ingredients
   Chickens (2½ to 2¾ lb ea) 25
   Bread flour 2 lb
   Salt and white pepper to taste
   Eggs, whole 6
   Milk 1 qt
   Bread crumbs 2 lbs
   Salad oil 1 qt
   Cream sauce 1 gal
   Tomato sauce 1 gal
   Bacon slices (crisp) 100
   Corn fritters 50
   Powdered sugar as needed
3. Broiled Halibut with Lobster-Newburg Sauce
   Ingredients | Yield 50 portions | Change to 75 portions
   Halibut, 6-7 oz boneless portions | 50 | 
   Boiled lobster meat | 3½ lbs | 
   Butter | 6 oz | 
   Paprika | 2 t | 
   Light cream sauce | 3 qt | 
   Dry sherry | 4 oz | 
   Salt | to taste | 
   Pepper | to taste | 
   Lemon juice | from ½ lemon | 
   Monosodium glutamate | 1 T | 

4. Roast Loin of Pork
   Ingredients | Yield 50 portions | Change to 35 portions
   Pork loins | approx 30 lbs | 
   Salt and pepper | to taste | 
   Rosemary | 2 t | 
   Mirepoix:
   Onions | 1 lb | 
   Celery | ½ lb | 
   Carrots | ½ lb | 
   Bread flour | 10 oz | 
   Chicken or beef stock | 5 qt | 

5. Hungarian Veal Goulash
   Ingredients | Yield 50 portions | Change to 90 portions
   Veal, boneless | 17 lbs | 
   Oil | 2 cups | 
   Onions | 6 lbs | 
   Hungarian paprika | ½ cup | 
   Bread flour | 1 lb | 
   Sachet bag:
   Caraway seeds | 
   Bay leaf | 
   Parsley stems | 
   Brown stock | 2 gal | 
   Tomato puree | 1 #2½ can | 
   Salt | to taste | 
   Sour cream | 1 qt |
Objective: You will gain an understanding of the methods of payment for workers in the food service industry.

Related Information:

People work for money or wages. Most people who work in a restaurant or other commercial food establishment will probably be paid according to one or a combination of the following methods:

1. Hourly worker — gets paid by the hour.
2. Salaried worker — gets paid a weekly salary.
3. Tips — given by the customer to the waiter or waitress.
   Or a combination . . . . .
4. A waitress may get an hourly wage plus tips.

STATE LAWS:

Most workers in food service are protected by State wage and hour laws, rather than Federal laws. These laws set a minimum hourly rate of pay. In New Jersey the minimum rate is $2.20 per hour, as of 1975.

The New Jersey wage and hour law also states that employees who work over 40 hours per week are to receive 1½ times their regular hourly wage for the hours in excess of 40.

Overtime work is very important to many workers for a number of reasons.

a. The worker works extra hours and brings home more money.
b. The worker gets a higher rate of pay for the hours he works overtime.

For many people who are looking for those little extra luxuries, overtime pay means an opportunity to earn money over and above the regular wages. You may get overtime on a regular basis or only when your place of work gets extra busy.

In addition, according to State Law:

a. You must get paid at least twice a month.
b. There should be a regular payday known to all employees.
c. If you get paid by check you must be able to cash the check without difficulty.
d. No deductions may be taken out of your pay except those authorized by the State or Federal government, or where you have authorized your employer to take out certain amounts for:
   Insurance
   Medical and surgical plans
   Retirement pension
The employer must also:

- Notify all employees as the time of hiring of their rate of pay and when payday is.
- Provide each employee with a statement of deductions.
- Keep records for employees of wages and hours.

Where waiters and waitresses are concerned (who receive tips), the employer does not have to pay the minimum wage. BUT the meals and/or tips added to the wage must equal at least the minimum wage of $2.20.

THE HOURLY WORKER

The hourly worker gets paid for every hour or part of an hour that he or she works. When you are hired, your boss or foreman will tell you how much you will earn per hour.

Some of you will punch time cards, others will sign in on cards or sheets. In many companies you will lose pay if you are over 3 minutes late.

Forty hours is considered the standard work week, and, as stated above, you must be paid overtime for the hours that you work over 40. That rate is called time and a half.

<table>
<thead>
<tr>
<th>$5</th>
<th>$5</th>
<th>+</th>
<th>$2.50</th>
</tr>
</thead>
</table>

Straight time

Time-and-a-half

<table>
<thead>
<tr>
<th>$5</th>
<th>+</th>
<th>$5</th>
</tr>
</thead>
</table>

Double time

If you have to work certain holidays which are not part of your regular schedule, you may be eligible for double-time pay. This is double your regular wage.

You can calculate your overtime pay by any one of three methods.
Method 1. DIVISION

Hourly rate: $2.00

Divide by 2 to find \( \frac{1}{2} \) of the hourly rate.

\[
\begin{array}{c}
1.00 \\
2) 2.00 \\
\hline
2.00
\end{array}
\]

Add the $1.00 to the $2.00:

\[
\begin{array}{c}
1.00 \\
2.00 \\
\hline
3.00 \text{ Time-and-a-half rate}
\end{array}
\]

Method 2. FRACTION

Hourly rate: $1.80

\[
1\frac{1}{2} \times \dfrac{1.80}{1} = \dfrac{3}{2} \times \dfrac{1.80}{1} = 3 \times \dfrac{1.80}{1} = \dfrac{2.70}{1} = 2.70 \text{ Time-and-a-half rate}
\]

Method 3. PERCENTAGE

Hourly rate: $2.60

\[
1\frac{1}{2} = 150\% = 1.50
\]

Multiply $2.60 \times 1.50

\[
\begin{array}{c}
2.60 \\
\times 1.50 \\
\hline
13.000 \\
260 \\
\hline
3.9000 \text{ Time-and-a-half rate: } $3.90
\end{array}
\]

WEEKLY WAGES

To calculate weekly wages: Multiply the hourly rate by the number of hours worked.

Hourly rate: $1.75 \times 40 \text{ hours} = $70.00
ASSIGNMENT

1. Compute the gross wages for the following workers:

<table>
<thead>
<tr>
<th>Name</th>
<th>Hourly rate</th>
<th>Hours worked</th>
<th>Gross wages</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. James Jones</td>
<td>$1.90</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>b. Linda Smith</td>
<td>$2.25</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>c. Alan Ricco</td>
<td>$1.85</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>d. John Flint</td>
<td>$2.70</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>e. Diane Nunez</td>
<td>$2.60</td>
<td>38</td>
<td></td>
</tr>
<tr>
<td>f. Susan Champino</td>
<td>$2.45</td>
<td>36</td>
<td></td>
</tr>
<tr>
<td>g. Fred Mannheim</td>
<td>$3.20</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>h. Fred Belski</td>
<td>$2.15</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>i. Dennis Lovel</td>
<td>$3.60</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>j. Jessie Wilson</td>
<td>$2.90</td>
<td>20</td>
<td></td>
</tr>
</tbody>
</table>

2. Total each person's hours for the week and figure out the gross pay for each one.

<table>
<thead>
<tr>
<th>Mon</th>
<th>Tues</th>
<th>Wed</th>
<th>Thurs</th>
<th>Fri</th>
<th>Sat</th>
<th>Total Hours</th>
<th>Rate</th>
<th>Gross</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>John Jones</td>
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<td>Tom Holtz</td>
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<td>Gary Flynn</td>
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<td>Helen Dixon</td>
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<td>$3.35</td>
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</table>

3. John Nocks worked 45 hours last week. How many hours did he work overtime?

4. Debbie Bass worked 48 hours last week. How many hours did she work overtime?

5. Richard Marino worked 52 hours last week. How many hours did he work overtime?

6. Calculate the overtime hourly rate on the following:

   $1.80  $2.20  $2.75  $3.20  $4.50

7. Calculate the overtime rate and the double time rate:

   $1.84  $1.96  $2.63  $3.15  $3.75
8. Total the hours on the following and separate the pay for the regular hours from the overtime hours:

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<th>Mon</th>
<th>Tues</th>
<th>Wed</th>
<th>Thurs</th>
<th>Fri</th>
<th>Sat</th>
<th>Sun</th>
<th>Total Hours</th>
<th>Regular Hours</th>
<th>OT Hours</th>
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<tbody>
<tr>
<td>J. Lukacs</td>
<td>8</td>
<td>8</td>
<td>7</td>
<td>8</td>
<td>8</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>R. Campos</td>
<td>9</td>
<td>9</td>
<td>9</td>
<td>9</td>
<td>9</td>
<td>0</td>
<td>0</td>
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<tr>
<td>J. Jackson</td>
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<td>8</td>
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<td>10</td>
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<td>8</td>
<td>0</td>
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<tr>
<td>R. Loller</td>
<td>8</td>
<td>7½</td>
<td>9½</td>
<td>9</td>
<td>6</td>
<td>8</td>
<td>0</td>
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9. Calculate the regular and overtime wages on the employees in problem 8.

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<tr>
<th></th>
<th>Rate</th>
<th>Regular</th>
<th>Overtime</th>
<th>Gross Pay</th>
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<tbody>
<tr>
<td>J. Lukacs</td>
<td>$2.40</td>
<td></td>
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<tr>
<td>R. Campos</td>
<td>$2.25</td>
<td></td>
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<tr>
<td>J. Jackson</td>
<td>$2.75</td>
<td></td>
<td></td>
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<tr>
<td>R. Loller</td>
<td>$2.64</td>
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</tbody>
</table>

10. Jerry Nelson earned $1.75 per hour. Assuming a 40-hour week, how much money did Jerry earn per week after getting a 15¢ hourly raise?

11. Jane Franks was earning $1.75 on her part-time job after school. She generally worked 16 hours a week. How much did she earn at $1.75? She was hoping for a $.25 raise in the hourly rate. What would that bring her pay to?

12. Kenneth worked 40 hours a week at $2.20 per hour. Calculate his weekly earnings, monthly earnings (assume 4 weeks), yearly earnings (52 weeks).

13. Calculate the gross pay on the following:

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<thead>
<tr>
<th></th>
<th>Hours</th>
<th>Pay</th>
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<tr>
<td>P. North</td>
<td>45</td>
<td>$3.75</td>
</tr>
<tr>
<td>T. Sullivan</td>
<td>48</td>
<td>$2.80</td>
</tr>
<tr>
<td>Name</td>
<td>Hours</td>
<td>Rate</td>
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<td>-------------</td>
<td>----------------</td>
<td>--------</td>
</tr>
<tr>
<td>R. Keith</td>
<td>44 hours</td>
<td>$4.50</td>
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<tr>
<td>D. Ernst</td>
<td>43½ hours</td>
<td>$3.50</td>
</tr>
<tr>
<td>R. Fischer</td>
<td>39 hours</td>
<td>$3.12</td>
</tr>
<tr>
<td>F. Lombardi</td>
<td>46 hours</td>
<td>$2.70</td>
</tr>
<tr>
<td>S. Rodriguez</td>
<td>40 hours reg, 8 at double time</td>
<td>$2.40</td>
</tr>
<tr>
<td>T. Houston</td>
<td>48 hours plus, 4 hours' double time</td>
<td>$3.65</td>
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</table>
Objective: You will learn how to read your pay check and record stub.

Related Information:

When most employees get paid, they receive a long form or stub which contains a record of their pay and their deductions, along with their pay. It is necessary to read and understand your pay stub to make certain your boss has paid you the correct amount of money.

What the words mean on the stub:

Gross pay: The total amount of money you have earned.

40 hours × $2.50 = $100.00

Net pay: What you actually get to take home and spend.

Gross pay - Deductions = Net pay
$100.00 - $29.20 = $70.80

Deductions: All the amount taken out (deducted or subtracted) from your pay. Some deductions are by law, like income taxes. Some require your approval, like savings bonds.

FICA, or Social security: (See the chapter on Social Security for further details.) Basically for your retirement.

Income tax: Money taken out of your pay for supporting the Federal government and all its programs.

Unemployment insurance: State insurance to pay you a weekly amount if you lose your job.

Blue Cross and Blue Shield, or other medical insurance: Hospital payments, surgical payments, and possibly other medical payments for you and your family if you are ill. You may pay it all, your boss may pay part, or he may pay all.

Pension: A company plan for retirement. Many of the larger companies have pension plans. You may contribute to the payments.

Union dues: Sometimes taken out of your pay; sometimes you pay the dues yourself.

Savings bond: A form of savings. You decide how much you want taken out of your pay and put into government bonds.

Some items above are taken out each week. Medical insurance may be taken out of your pay only once a month. Some companies pay each week, some pay every other week, and some pay twice a month.
DEDUCTIONS YOU PAY:

- Income Tax (All)
- Pension (All or part or none)
- Social Security (Half)
- Union Dues (All)
- Hospital-Medical (All or part or none)
- Unemployment Insurance (Part)

BOSS PAYS:

- Taxes on the Business (All)
UNIT VII — WAGES AND TAXES

Lesson 3

Objectives: You will learn the importance of tips in the earnings of the waiter or waitress.
You will learn how tips are computed.

Related Information:

In a previous unit, you learned how wages are computed and the importance of overtime. The waiter or waitress does not receive the minimum wage from the employer. The government, in setting up the minimum-wage laws to protect workers, took into account the fact that in some occupations workers earn considerable money through tips from customers. The government allows the employers in the restaurant business to pay less than the usual minimum wage for workers.

The minimum wage is determined by allowing for tips and for meals. The wage must be set so that the waiter or waitress must earn at least the statewide minimum wage when meal costs plus tips earned are added to the amount the employer pays. If the waiter or waitress does not earn at least the minimum wage altogether, the employer must raise his or her pay.

Good waiters and waitresses are worth much more than the minimum, and their tips can be considerable.

HOW TIPS ARE CALCULATED

There are no fixed amounts to tip a waiter or waitress. Most restaurant-goers follow an accepted standard. At present the standard is somewhere between 15% and 20% of the cost of the meal.

A good tip is recognition of good service and must be earned. If the customer were eating at home and wanted more bread, say, or butter, or a clean spoon, he or she could get up and get it. In a restaurant, the customer is completely dependent on the waiter or waitress. It is most annoying not to have your needs met. A good waitress knows when to bring more water, or catsup. She keeps an eye on the table and makes certain her customers' needs are met promptly.

The cost of the meal and the length of time you and your party occupy the table are also important factors. If you wish to talk after a meal, remember that you may be tying up the table and preventing the waitress from serving additional customers. You should make up for this in the size of the tip.
Take the total of the bill (less the tax)

Example: $8.40
20% of $8.40 \times .20
$1.6800

You could leave $1.50, $1.60, $1.70, $1.75, or more.

The amount you actually leave may depend upon the change left when you pay your bill.

ASSIGNMENT:

1. Compute a 15% tip on the following bills:
   a. $4.50
   b. $7.35
   c. $6.90
   d. $12.90
   e. $9.20

2. Compute a 20% tip on the following bills:
   a. $8.10
   b. $15.50
   c. $13.60
   d. $18.85
   e. $24.65
UNIT VII – WAGES AND TAXES

Lesson 4

Social Security

Introduction:

Taxes play an important role in everyone's life. You will pay taxes as a worker, and if you own your own business you will have to pay taxes on your profits.

Before you can make out your own income tax, you must learn about a number of things – social security, income tax forms, how tips are reported, etc. In this and the next two lessons we will talk about these things.

Objective:

You will learn how the social security program affects you.
You will learn how to compute your FICA deduction.

Related Information:

An employer (the boss) is required to make certain deductions from an employee's wages. These include deductions for income taxes, social security taxes, unemployment insurance, and any other deductions authorized by the employee.

![Social Security Card]

**APPLICATION FOR A SOCIAL SECURITY NUMBER**

Print in block or Dark Blue ink or Typewriter.

---

**Notice:** Whoever, with intent to falsify his or someone else's true identity, willfully furnishes or causes to be furnished false information in applying for a social security number, is subject to a fine of not more than $1,000 or imprisonment for up to 1 year, or both.

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Remember: Gross pay is everything you earn. Deductions are subtracted from your pay, and you take home what is left — called net pay. Before 1940, workers had only what little they could save for their old age, or in case of illness, or for their families in case of their death. Out of the Depression and a change in attitude as to the responsibility of government, the Congress passed the Federal Insurance Contribution Act, which is known officially as FICA (the abbreviation), or as we all know it, the Social Security Act. Payments to the social security fund were first collected back in 1937; changes in the law have been made many times and are still made from time to time by Congress.

Computing social security is basically a percent problem. The Government takes a certain percent of your weekly earnings. Your employer collects this (and also matches the amount out of his own business receipts). The rate remains the same for any particular year, but as your weekly earnings go higher, the amount deducted will go higher.

There is a limit on how much you can get from the social security fund when you retire. The program was not designed to make you rich. There is therefore a limit on how much a person has to pay into the fund each year. If this amount is reached in any year, your boss will stop taking out FICA.

** HOW TO COMPUTE YOUR OWN SOCIAL SECURITY TAX **

A person earns $86.00 a week (gross). How much will be deducted from his salary for social security tax? The rate as of 1975 was 5.85% of wages (up to $14,100 a year). So at this rate,

\[
5.85\% \text{ of } 86.00 = 0.0585 \times 86.00
\]

Answer $5.03

Rework this problem using the rate in effect now.

Answer:

** ASSIGNMENT A: **

Find the amount of the social security tax on each of the following wages at the current tax rate.

1. $86.70
2. $93.95
3. $97.60
4. $104.40
5. $126.30
FROM SOCIAL SECURITY NUMBER TO SOCIAL SECURITY BENEFITS

BEFORE YOU START WORKING
You Get a Social Security Number

WHILE YOU WORK
Your Employers Withhold Social Security Contributions—REPORT YOUR EARNINGS
Self-employed People Pay Their Own Contributions
and Report Their Own Earnings

AT RETIREMENT,
IN CASE OF DISABILITY
You File a Claim for Benefits

YOU, YOUR DEPENDENTS
RECEIVE MONTHLY BENEFITS

AT 65
You Become Eligible for Health Insurance

AT YOUR DEATH
Your Survivors Claim Benefits
Your Survivors Receive Benefits

SOCIAL SECURITY ADMINISTRATION

ESTABLISHES AN EARNINGS RECORD FOR YOU

RECORDS YOUR EARNINGS

COMPUTES THE AMOUNT OF YOUR BENEFIT;
AUTHORIZES TREASURY TO MAKE PAYMENT
TREASURY SENDS CHECKS

ARRANGES FOR PAYMENT OF HOSPITAL AND MEDICAL BILLS

AUTHORIZES TREASURY TO MAKE PAYMENT
TREASURY SENDS CHECKS
HOW TO COMPUTE THE SOCIAL SECURITY TAX THROUGH USE OF A TABLE

The Federal Government supplies employers with tables for determining the FICA tax that is to be withheld. Using these tables rather than computing the tax as described above saves many hours of labor. Your instructor will explain how to use the tables. Now check the problems given to you in the previous assignment by using the tables. Do you think you will get the exact amount? Why or why not?

It is a good idea to check your own social security record from time to time to make sure that your earnings have been reported correctly. This is especially true if you change your job frequently. You can check your record by sending in a postcard that you can get from your local social security office.

SELF EMPLOYED

When you work for someone else, you pay half the full social security rate and your boss pays the other half. But if you are your own boss, instead of paying double for yourself, the government allows the self-employed person (boss) to pay only 1½ times.

WHAT ARE YOUR BENEFITS?

We have spent most of the time so far discussing how much we pay, but what do we get out of this?

1. When you retire, you will collect monthly social security payments.

2. If you become disabled and cannot work, you will collect monthly payments.

3. If you should die before you retire, your dependents would get social security payments.

4. 80% of your hospital bills will be paid through medicare (after you pay a fixed amount, called the deductible) as soon as you reach 65.

5. You will be able to collect on your doctor bills also, if you sign up and pay a small amount each month — also from age 65 on.

6. And if that doesn’t work, your family will receive burial expenses for you.
HOW TO GET YOUR BENEFITS

To get social security payments for yourself and your family, you must first have credit for a certain amount of work under social security. *If you want to take out, you must have paid in to the fund.*

Social security credits are called "quarters of coverage." The year is divided into four parts (calendar quarters).

You can get social security credit for up to four quarters in a year. For an employee, a quarter of coverage means any calendar quarter in which he or she is paid at least $50.00.

If you work for yourself, you get four quarters of coverage for each year in which you have a net profit of at least $400.

If you are a teenager now, you will need at least 40 quarters of coverage at some time in your working career in order to be eligible for benefits upon retiring. (The requirement is different for those who get benefits because they are disabled; they need credit for 5 years of work in the 10 years just before becoming disabled.)

A worker who has met the employment requirements of the law may retire at age 65 or older and receive monthly retirement payments for the rest of his life. The amount he is entitled to at 65 is called his primary benefit, and it is based upon the average of his earnings during most of his working career.

Any worker may retire as soon as he or she reaches age 62, if he or she wishes. If he does, his monthly payments will be 80% of the primary benefit. For each month he waits after 62, his monthly payments go up.

Benefits are paid not only to a person who retires, but to his wife (or a dependent husband) when that person reaches 65 (or 62, at a smaller amount), and to any young or physically dependent children he may have. When a worker dies, whether or not he or she has retired, the widow (or dependent widower) collects payments as soon as he or she reaches 62 (or 60 for a widow, at a smaller amount). Even dependent parents, 62 or over, can collect benefits. If a worker dies leaving dependent children, his wife receives benefits (as well as the children) regardless of her age.

The social security fund also pays a lump sum upon the death of a worker, for funeral expenses.
A FEW POINTS TO KEEP IN MIND ABOUT SOCIAL SECURITY

1. Payments never come automatically. Someone has to apply for them. It may be the worker upon retirement or if disabled, or it may be a widow or dependent widower if the spouse dies. This person should contact the nearest social security office.

2. A person might be entitled to benefit payments on two accounts (for example, a widow who is eligible to collect on her own social security as well as on her late husband's). In such a case, only the larger of the two benefits will be paid.

3. A person who is collecting social security benefits may earn up to a certain amount (in 1975, it was $2520 a year) without having his social security payments reduced. If he is 72 or older, however, he may earn any amount without a penalty.

ASSIGNMENT B:

1. Name five deductions your boss might take out of your pay.

2. Which deductions must he take out of your pay?

3. Which do you take home, gross pay or net pay?

4. FICA is an abbreviation for:

5. What percent (rate) of your gross pay is taken out for FICA?

6. FICA is not deducted from gross earnings above

7. If you earned $125.00 last week, how much FICA would the boss have taken out of your pay?

8. Social Security deductions started in 1937 and the rate has always been the same. True False.

9. You can get a social security card from the

10. You may have more than one social security number. Yes No.

11. If you lose your social security card you must apply for a new number. True False.

12. Name five types of benefit payments from social security.

13. What is a quarter of coverage?

14. How many quarters of coverage will a teenager have to work to be eligible for FICA when he or she retires?
15. At what age can a worker retire and collect full benefits?

16. At what age can a worker retire and collect reduced benefits?

17. How do you get benefits from social security?

18. Can you work and still collect social security benefits?
You don't have to be retirement age to get social security. Take a young man like this. What happens to him if his father dies prematurely? How does his mother raise him?

Savings and insurance? Many families have them. But nearly every family has social security. And this year, social security is helping over three million children and their widowed mothers.

A young widow with two children, whose husband earned $100 a week on the average, for example, received $340.80 a month in survivors benefits.

And full-time students who are survivors or children of disabled or retired workers may collect benefits until they reach 22. Social security benefits now being paid to these students amount to more than the scholarships at all colleges and universities in the country.

If you think social security helps when you retire, you're right. But it's also something you can depend on now. For further information, contact any social security office.

Social security pays four benefits: survivors, disability, retirement, and Medicare.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE • Social Security Administration

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ASSIGNMENT C:

You will compute the net pay for six different workers, using the paycheck stub given after each problem.

1. Compute overtime pay at time and one-half.
2. Use "Gross Wages" as the basis for all deductions.
3. Look up the deduction for the Federal income tax on the chart on page 227.
4. Calculate the FICA tax at your current rate of tax.
5. Assume an unemployment-insurance tax of 1%.
6. Any other deduction should be named, with the amount, under "Other."

1. Brenda worked 40 hours last week at $2.50 an hour. In addition to the usual deductions, $1.50 was taken out for Blue Cross. Find her net pay.

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Net Pay: ____________________

2. Wayne worked 40 hours last week at $2.20 an hour.

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Net Pay: ____________________

233
3. Sally worked 48 hours at $3.40 an hour.

|-------------|------------|------------|----------|----------|-------------|-------------------|---------|-----|-------|

Net Pay: ____________________

4. Brian worked 45 hours at $3.75 an hour.

|-------------|------------|------------|----------|----------|-------------|-------------------|---------|-----|-------|

Net Pay: ____________________
5. Jean worked 45 hours at $4.75 an hour. She had extra deductions for union dues, $2.00, and for a savings bond, $6.25.

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Net Pay: __________________________

6. Phil worked 48 hours at $3.80 an hour.

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Net Pay: __________________________
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<tr>
<th>And the wages are—</th>
<th>Number of withholding exemptions claimed—</th>
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<tbody>
<tr>
<td>At least</td>
<td>But less than</td>
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<td>$20</td>
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UNIT VII – WAGES AND TAXES

Lesson 5  Income Taxes

Objective: You will learn some of the terms and forms used in figuring out income tax.

Related Information:

First of all, you should understand how the income-tax system works. Each week your boss withhold (deducts) a certain amount of income tax from your pay. The total withheld for the year will not be the exact amount you are required to pay for the year, but it should be very close. Before April 15 of the following year, you have to send the Internal Revenue Service (tax collector) a form that tells the exact amount of your tax for the year. If you have paid more than this amount in withholding taxes, the IRS will send you a refund; but if the deductions from your pay did not come to this amount, then you must send the balance to the IRS along with the form.

If by some chance you owe no tax at all but your boss withheld some of your pay for income taxes, then you should file a tax return to get a refund.

Each year the Federal government makes available to all schools information on how to fill out an income tax form. Changes take place from year to year, but certain basics remain the same. We will discuss the basics in this unit, leaving it up to your instructor to fill you in on the latest changes.

Every resident of the United States who had an income last year of $2050 if single (as of 1975) must report the amount of his or her income to the Internal Revenue Service. Married couples must report if their income was $2800 or more.

YOU MUST FILE A TAX FORM:

a. If you earned over the required amount ($2050 in 1975, if you were single).

b. If you earned less than the required amount but taxes were deducted from your pay. You will then get a refund.

c. If you received tips on which FICA was not taken out, regardless of the amount you earned.

d. If you earned $400 or more in your own business.

e. If you had gross income of $750 or more, had unearned income (such as interest payments), and can be claimed as a dependent by another taxpayer.

THE W-4 and W-4E FORMS

Your employer (boss) must know how much to take out of your pay for income tax. When you start a job, your employer has you fill out a W-4 form. It is called the Employee’s Withholding Allowance Certificate.
When you fill out the W-4 form, you indicate how many allowances (also called exemptions) you have. An allowance is a person who depends on you for money.

Allowances:
- Your wife
- Your children
- Parents
- Yourself

You can claim an allowance for someone who is dependent on you for money to live on. If your wife works and she claims herself, then you cannot claim her. If your children are over a certain age and working, you cannot claim them. If you are not providing aid for your parents, you cannot claim them.

You are taxed on the amount of money you earn, but the more allowances (dependents) you have, the less tax you pay. You are permitted to claim fewer allowances than you are entitled to (and more taxes will be deducted from your pay), but you cannot claim more.

Your W-4 form is kept in your employer's office. If the number of your allowances changes, you must ask to fill out a new form.

Changes may occur when:
- You get married,
- You have children,
- You help your parents.

HOW TO FILL OUT THE W-4 FORM (see page 230)

1. Print your full name.
2. Enter your social security number.
3. Enter your home address.
4. Enter city, state, and zip code.
5. Choose the allowances that fit your case (on upper portion of form).
6. Add up your allowances and enter the number on the form.
7. Date and sign the certificate.

THE W-4E FORM

Exemption From Withholding
(of Federal Income Tax)
For use by employees who incurred no tax liability in 1974 and anticipate no tax liability for 1975

<table>
<thead>
<tr>
<th>Type or print full name</th>
<th>Social Security Number</th>
<th>Expiration date (see instructions and enter date)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home address (Number and Street)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>City, State, and ZIP Code</td>
<td></td>
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</tr>
</tbody>
</table>

Employee.—File this certificate with your employer. Otherwise he must withhold Federal income tax from your wages.

Employee's certification.—Under penalties of perjury, I certify that I incurred no liability for Federal income tax for 1974 and that I anticipate that I will incur no liability for Federal income tax for 1975.

(Date)

Employer.—Keep this certificate with your records. This certificate may be used instead of Form W-4 by those employees qualified to claim the exemption.
Employee’s Withholding Allowance Certificate

The explanatory material below will help you determine your correct number of withholding allowances, and will indicate whether you should complete the new Form W-4 at the bottom of this page.

How Many Withholding Allowances May You Claim?

Please use the schedule below to determine the number of allowances you may claim for tax withholding purposes. In determining the number, keep in mind these points: If you are single and hold more than one job, you may not claim the same allowances with more than one employer at the same time; If you are married and both you and your wife or husband are employed, you may not claim the same allowances with your employers at the same time. A nonresident alien other than a resident of Canada, Mexico or Puerto Rico may claim only one personal allowance.

<table>
<thead>
<tr>
<th>Figure Your Total Withholding Allowances Below</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Allowance for yourself—enter 1</td>
</tr>
<tr>
<td>(b) Allowance for your wife (husband)—enter 1</td>
</tr>
<tr>
<td>(c) Allowance for your age—if 65 or over—enter 1</td>
</tr>
<tr>
<td>(d) Allowance for your wife’s (husband’s) age—if 65 or over—enter 1</td>
</tr>
<tr>
<td>(e) Allowance for blindness (yourself)—enter 1</td>
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<tr>
<td>(f) Allowance for blindness (wife or husband)—enter 1</td>
</tr>
<tr>
<td>(g) Allowance(s) for dependent(s)—you are entitled to claim an allowance for each dependent you will be able to claim on your Federal income tax return. Do not include yourself or your wife (husband)*</td>
</tr>
<tr>
<td>(h) Special withholding allowance—if you have only one job, and do not have a wife or husband who works—enter 1</td>
</tr>
<tr>
<td>(i) Total—add lines (a) through (h) above</td>
</tr>
<tr>
<td>If you do not plan to itemize deductions on your income tax return, enter the number shown on line (i) on line 1, Form W-4 below. Skip lines (j) and (k).</td>
</tr>
<tr>
<td>(j) Allowance(s) for itemized deductions—if you do plan to itemize deductions on your income tax return, enter the number from line 5 of worksheet on back.</td>
</tr>
<tr>
<td>(k) Total—add lines (j) and (k) above. Enter here and on line 1, Form W-4 below</td>
</tr>
</tbody>
</table>

*If you are in doubt as to whom you may claim as a dependent, see the instructions which came with your last Federal income tax return or call your local Internal Revenue Service office.

See Table and Worksheet on Back if You Plan to Itemize Your Deductions

Completing New Form W-4

If you find that you are entitled to one or more allowances in addition to those which you are now claiming, please increase your number of allowances by completing the form below and filing with your employer. If the number of allowances you previously claimed decreases, you must file a new Form W-4 within 10 days. (Should you expect to owe more tax than will be withheld, you may use the same form to increase your withholding by claiming fewer or “0” allowances on line 1 or by asking for additional withholding on line 2 or both.)

▼ Give the bottom part of this form to your employer; keep the upper part for your records and information ▼
If you did not earn enough money last year to pay taxes, and you don't expect to earn enough this year to pay taxes, you may ask to fill out the W-4E Form instead of the W-4. No taxes will be taken out of your pay if you fill out this form.

When you get a new job, you indicate the number of allowances by filling out the W-4 or W-4E form. You also give your boss your social security number so he can take out FICA for you. If you are in a job where you receive tips, you have something else to consider.

**TIPS**

The tips you receive are yours, but you must report them in order for your boss to take out the proper amount of social security and income tax from your pay. You do not have to pay income tax on your tips if they amount to less than $20 a month. The social security tax, however, must be paid on any amount you earn in tips up to the maximum amount indicated for the year.

In most places you will be expected to report your tips for the month by the 10th of the next month, in order for your boss to make the proper deductions for taxes and FICA. Other methods have been worked out, however, and you should check your tax guide for information on these.

To help you report your tips, the government provides a little booklet. This booklet contains forms 4070 and 4070A.

Form 4070A (see page 233) provides you with places to record the tips you take in each day of the month.

Form 4070 is used to report to your employer the total amount of your tips for the month.

YOU fill out form 4070A: it is used each day.

YOU fill out form 4070 once a month by taking the month's total from form 4070A.

**Examples:**

1. You work for Watson's Restaurant during the month and receive $75 in tips. Since your tips exceed $20 for the month, the entire $75 must be reported to your employer. He will deduct income tax and social security tax for the tips from your wages.

2. Your work for Watson's Restaurant during the month and receive $17 in tips. In that same month you work for Parkview Restaurant and get $14 in tips. Even though your tips amount to a total of $31, you are not required to report them to either employer, since you had less than $20 in tips in each job.
3. If you received $22 in tips from Watson's Restaurant and $14 in tips from Parkview Restaurant, you must report the $22 to Watson's Restaurant. You are not required to report the $14 to Parkview Restaurant.

4. If you received $22 in tips from Watson's Restaurant and $32 in tips from Parkview Restaurant, you must report both the $22 to Watson's Restaurant and the $32 to Parkview Restaurant.

Tip splitting: Only those tips you receive on your own behalf are counted. Where employees split tips (for example, where waiters give a portion of their tips to the busboys), each employee reports only his share to his employer.

Remember: You will have to pay a social security tax on all your tips (even though you do not pay income tax on tips of less than $20 for the month). This is to your advantage, because your social security benefits someday will be based on your total earnings, not just your taxable earnings. (See page 239)

Your employer does not have to match your social security payments on any of your tip income. He pays the FICA tax on only the wages that he pays you.

ASSIGNMENT: You earned the following tips for the month of January. Fill out form 4070A and form 4070.

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<td>1. closed</td>
<td>17. off</td>
<td>2. $7.50</td>
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<td>19. $4.50</td>
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<td>5. $6.25</td>
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<td>6. $7.10</td>
<td>21. $6.90</td>
<td>7. $6.30</td>
<td>22. $5.10</td>
<td>8. $6.95</td>
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<td>9. $8.00</td>
<td>23. $9.30</td>
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<td>11. $5.80</td>
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<td>12. $6.20</td>
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<td>29. $7.25</td>
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<td>30. $7.90</td>
<td>19. off</td>
<td>31. off</td>
<td>20. $7.90</td>
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24A

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THIS IS YOUR TIP BOOKLET. Under the front cover are your instructions.

Form 4070A, shown below, is your daily record of tips.

**EMPLOYEE'S DAILY RECORD OF TIPS (FORM 4070A)**

**AND REPORT OF TIPS TO EMPLOYER (FORM 4070)**

**DAILY RECORD OF TIPS**

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<th>EMPLOYER'S NAME</th>
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Form 4070A (1–66)

Form 4070, shown below, is filled out by you and turned in to your boss each month.

**EMPLOYEE'S REPORT ON TIPS**

**Social Security Number**

**Employee's name and address**

**Employer's name and address**

Month or shorter period in which tips were received

from ......................, 19........ to ......................, 19........ $  

Signature

Date

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UNIT VII – WAGES AND TAXES

Lesson 6

The Tax Form

Objective: You will learn what information has to be included on your tax form.

Related Information:

After the end of the year, each employer (boss) sends each employee (worker) two copies of the W-2 form, called the Wage and Tax Statement.

This is what it looks like:

You cannot fill out your tax form until you get your copy of this W-2 form.

It contains:

1. The amount of money withheld by the employer for your income tax. (You must know this to see whether you owe the government money or it owes you money.)

2. Your total earnings for the year. (You must know this to calculate your taxes.)

3. FICA (Social Security) How much you paid out for social security.

4. Any amount of reported tips that the employer did not deduct taxes for. (You will have to pay the taxes yourself.)

You will receive a W-2 form from each employer you worked for last year. You have to add them together to get the complete picture of your total earnings.
You must attach a copy of your W-2 form(s) to your income-tax form.
You keep one copy of each W-2 form for your own records.

Actually, four copies are made of each W-2 form:
- Your boss sends one to the Internal Revenue Service.
- Your boss keeps one.
- Your boss sends two to you. Then you send one to the IRS and you keep one for your own records.
- Your instructor will get copies of the latest income-tax form from the Internal Revenue Service, and the class will go over the form together.

PERSONAL EXEMPTIONS OR ALLOWANCES

Exemptions were discussed when we looked at the W-4 form.

In 1975 you were allowed a $750 deduction for each exemption (allowance) you claimed, including yourself. This amount changes from time to time.

DEDUCTIONS

There are different methods of claiming deductions. The more deductions you have, the less tax you will have to pay.

1. You do not have to pay any tax at all until you earn $2050 (as of 1975). This gives you a minimum standard deduction.

2. As your earnings go higher, you are entitled to use the normal standard deduction (15% of income as of 1975). Instead of listing each deductible item, you simply claim 15% of your income and save yourself a lot of work.

3. If you have deductible expenses that amount to over 15% of your income, you must list them separately ("itemize" them) in order to claim them.

4. Itemized (listed) deductions

Under this heading you can claim certain amounts contributed to:
- Charities
- Religious affiliation
- First aid and fire squads
- Boy Scouts, Girl Scouts
- Red Cross
- United Fund
- Cancer fund, Heart fund, other health agencies

Half of the cost of medical insurance that you paid is deductible.

Doctor and other medical and dental bills may be claimed, but only the part that is over 3% of your income.

Union dues are deductible.
Expenses for care of the children of working parents are deductible.

Restaurant workers can claim money for uniforms and shoes which can only be used on the job.

There are many other deductions also – taxes paid, interest paid, etc.

Many people pay these bills by check so they have a record at income tax time. The IRS can call you in at any time and question your deductions. You must have proof that you actually paid for these things.

The IRS includes instructions when it sends you your form. If you have problems that the instructions don’t cover, you can consult one of the many publications issued by the government or private companies on filling out your income tax form. You can look up questions on: exemptions, deductions, uniforms, and many, many more. The Federal Government publishes “Your Federal Income Tax.” It is available at no cost at most IRS offices.

In addition, your local office of the IRS will help you fill out your tax form at no charge. Or if you have just a question or two, there are toll-free numbers to call in all areas of the country.

If you lose your form, you can call your employer and he can make up a duplicate.

In filling out your income tax, you need the picture for the whole year. If you should get a new dependent (a baby) the last week of the year, you would get credit for an exemption for the whole year. This would almost certainly result in your getting a refund from the IRS.

As mentioned before, the government has made it possible for people earning less than $2050 a year (as of 1975) to fill out a W-4 E form. If they earned less than that the previous year and expect to earn less than that this year, they can fill out this special form and the boss will not withhold any taxes.

If you worked for more than one employer, they may each have taken out the proper amount of FICA, but together the deductions may have been over the maximum limit. You will then be entitled to a refund of the overpayment when you file your income-tax form.

Those who work for themselves, like a restaurant owner, must estimate (figure out as accurately as possible) their earnings for the year ahead and then pay one-quarter of this amount every 3 months. Then they “settle up” with the IRS by April 15 of the next year, just like wage-earners.

Wage- and salary-earners must also report extra income, such as interest from savings accounts or bonds, and dividends from stocks. You know that you must also include income from tips. Any other sources of income must also be reported – even winnings from a lottery or gambling.
ASSIGNMENT:

1. If you (a single person) earned over _______ last year, you must pay income taxes.

2. If you earned $800 last year, would you have to file an income tax return? ________

3. Do you have to report tips and pay on them? ________

4. Do you have to file a statement if your parents are filing? ________

5. How does your boss know how much to take out of your pay for tax? ________

6. Who are some tax allowances? ________

7. What is the difference between a W-4 and W-4E form? ________

8. When do you make changes in your W-4 form? ________

9. To whom do you report your tips? ________

10. If you earn less than _______ a month in tips, you do not have to report them.

11. Does your boss have to take out FICA on your tips? ________

12. What is the number of the form you use to record your tips on? ________

13. There are two, basic types of income tax forms. What numbers do they have? ________

14. When a husband and wife are both included on one tax form, it is called a _______ return.

15. What is the W-2 form? How many copies do you get? What do you do with them? ________

16. What information is on the W-2 form? ________
17. When you fill out the long form and itemize deductions, what are some of the deductions you can claim?

18. What do we mean by the term “standard deduction”?

19. What is an estimated tax form?

20. What is a dividend?

21. What is the profit you earn on a savings account called?

22. Do you have to report extra income on your return?

23. How much is each exemption (allowance) worth today?
Computation of Social Security Tax on Unreported Tip Income
(Under Federal Insurance Contributions Act)
Attach to Form 1040.

Name of person who received tip income (as shown on social security card)

Social security number

Names of employers (If more space needed, list on other side)

1 Total cash tips received in 1974 (Note: Include December 1973 tips reported to your employer from January 1, 1974, through January 10, 1974. Do not include December 1974 tips reported to your employer from January 1, 1975, through January 10, 1975). See Instruction D

2 Total cash tips reported to your employer in 1974

3 Balance (line 1 less line 2). Enter here and include in total on Form 1040, line 9

4 Total cash tips received but not reported to employer because less than $20 in a calendar month

5 Balance (line 3 less line 4). Enter here and in item D below

6 Largest amount of wages (including tips) subject to social security tax

7 Total “F.I.C.A. Wages” shown on Form W-2. Enter here and in item E, below (include “covered” wages received as an agricultural or household employee)

8 Balance (line 6 less line 7). If “zero,” do not complete the rest of this form or Schedule U below

9 Unreported tips subject to F.I.C.A. tax—line 5 or 8, whichever is smaller. Enter here and give details in items A(1) through A(5) below

10 Multiply the amount on line 9 by 5.85 percent. Enter here and on Form 1040, line 59

Important. The amounts reported on the form below are for your social security record. This record is used in figuring any benefits, based on your earnings payable to you, your dependents, and your survivors. Fill in each item accurately and completely.

SCHEDULE U
(Form 1040)
Department of the Treasury
Internal Revenue Service

U.S. Schedule of Unreported Tip Income
For crediting to your social security record

<table>
<thead>
<tr>
<th>Taxable tip income not reported to employer from line 9. See Instruction G.</th>
<th>Please Do Not Write in This Space</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Jan.–Feb.–Mar.</td>
<td>$</td>
</tr>
<tr>
<td>(2) April–May–June</td>
<td></td>
</tr>
<tr>
<td>(3) July–Aug.–Sept.</td>
<td></td>
</tr>
<tr>
<td>(5) Total of lines A(1)–A(4)</td>
<td>$</td>
</tr>
</tbody>
</table>

Occupation

Social security number of person named below

Print or type name of person who received tip income as shown on social security card

Address (number and street)

City, State, and ZIP code

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UNIT VIII – BUSINESS RECORDS

Lesson 1

Objective: You will learn how a businessman keeps track of how his business is making out.

Related Information:

Many small businesses fail because they are not operated efficiently. A businessman must know his costs, and in order to know them he must keep adequate records of what is going on.

We were introduced to some of these records when we discussed the costing of recipes and markup. The businessman must know how much to mark up in order to cover his costs and make a profit.

Before we get too far, let’s review some words we will have to use to discuss this subject:

1. Gross income: All the money taken in by the business (the cash-register receipts).

2. Expenses: All the money the businessman must pay out to keep in business. Here are some of the expenses:
   - Materials used in processing foods
   - Equipment, such as pots and pans
   - Machinery
   - Rent or property taxes (if he owns the property)
   - Heat — gas and/or oil
   - Electricity
   - Telephone
   - Materials used in cleaning
   - Lawyer or accountant
   - Printing for menus
   - Garbage disposal
   - Labor costs (pay to workers)
   - Repairs
   - Interest on money borrowed
   - City and state taxes

3. Net income: What he has left after subtracting his expenses from his gross income.

BASIC RECORDS

In this and the following lesson you will learn about some of these records. They include:
The balance sheet

A sheet containing information on what the company is worth at a particular time — the value of the restaurant, money in the bank, debts owed, etc., etc.

Profit and loss statement (or Income statement)

A sheet showing income and expenses over a period of time, usually a month.
# MONTHLY PROFIT AND LOSS STATEMENT

**Date:** September 30, 19-

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
<th>% of Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sales</strong></td>
<td>$20,000</td>
<td>100</td>
</tr>
<tr>
<td>Inventory-beginning of month</td>
<td>$2,000</td>
<td></td>
</tr>
<tr>
<td>Food purchases for month</td>
<td>$8,500</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$10,500</td>
<td></td>
</tr>
<tr>
<td>Less final inventory</td>
<td>$1,500</td>
<td>$9,000</td>
</tr>
<tr>
<td><strong>Gross Income</strong></td>
<td>$11,000</td>
<td>55</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
<th>% of Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salaries and Wages</td>
<td>$6,000</td>
<td>30</td>
</tr>
<tr>
<td>Rent</td>
<td>$1,400</td>
<td>7</td>
</tr>
<tr>
<td>Laundry</td>
<td>$200</td>
<td>1</td>
</tr>
<tr>
<td>Paper and cleaning supplies</td>
<td>$200</td>
<td>1</td>
</tr>
<tr>
<td>Utilities</td>
<td>$600</td>
<td>3</td>
</tr>
<tr>
<td>Replacements, repairs, and maintenance</td>
<td>$400</td>
<td>2</td>
</tr>
<tr>
<td>Depreciation</td>
<td>$400</td>
<td>2</td>
</tr>
<tr>
<td>Advertising</td>
<td>$100</td>
<td>0.5</td>
</tr>
<tr>
<td>Taxes &amp; Insurance</td>
<td>$400</td>
<td>2</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>$300</td>
<td>1.5</td>
</tr>
<tr>
<td><strong>Total Expenses</strong></td>
<td>$10,000</td>
<td>50</td>
</tr>
</tbody>
</table>

**Net Income (Profit)**: $1,000 5
The Profit and Loss Statement

This is usually computed for each month. It summarizes the business as follows:

- Sales (as shown on the register)
- Cost of food sold
- Gross income

Gross income
- All other operating expenses
- Net income or profit

How to read the profit and loss statement:

1. Sales. These came to $20,000 for the month. This represents 100%.

2. Food Costs:
   - On hand at beginning of the month $2000
   - Additional food purchased $8500
   - Inventory (what is left) at the end of the month $10500
   - Subtract what is left from total. $1500

   (The food cost of $9000 is 45% of the $20,000 in sales.)

3. Gross income: Subtract the food cost from the sales.

   $ 20,000
   - 9000
   $ 11,000 = gross income

4. Operating expenses: Add them all up. Total is $10,000.
   (The expenses amount to 50% of the sales.)

5. Net Income: Subtract the operating expenses from the gross income.

   $11,000
   - 10,000
   $ 1000 Net income or profit.

The profit of $1000 is 5% of the $20,000 of sales.

Of course, the boss's salary is included in the "Salaries and Wages" item, so, while the business made 5% on total sales, he also made his own salary to put in his pocket. We'd say that this businessman was doing rather well.
ASSIGNMENT:

1. Define the following words used on the monthly profit and loss statement:
   a. Sales
   b. Inventory
   c. Gross income
   d. Operating expenses
   e. Depreciation
   f. Miscellaneous
   g. Profit

2. Your food sales for the month were $18,450.00, your food costs $7,329.00. What was your gross income? If your operating expenses came to $10,105.00, what was your profit?

3. Prepare a balance sheet using the following information. (Set it up like the one on page 242.)

   Food sales       $ 33,180.24
   Food cost        $ 14,100.15

   Expenses
   Salaries and wages    $ 12,521.42
   Employees' meals      874.00
   Laundry               659.00
   Sundry supplies and expenses 346.08
   Repairs               117.25
   Heat, light, power, water, telephone 520.18
   Insurance             187.32
   Rent                  50.00
   Depreciation-furniture and fixtures 122.00
   Legal services        186.00
   Interest expense      90.00
   Payroll taxes         754.18
   Allowance for state and Federal taxes 750.00
   Miscellaneous         150.00

   Did the restaurant show a profit or a loss for the month? 

   How much was it?
Lesson 2

Objective: You will learn how an annual balance sheet shows the net worth of a business.

Related Information:

Balance sheets may be made up as often as needed, but they are always made up at least once a year. The end-of-year statement (annual report) shows the financial position of the business on that particular day. It is important for a businessman to know what his business is worth at the end of each year.

Terminology:

Assets: The things the company owns: goods, food supplies, machinery, etc.

Fixed assets: Those assets that cannot be moved: equipment, furniture, etc. They can be used over and over.

Depreciation: Loss in value as a fixed asset wears out or becomes old.

Liabilities: What the company owes: unpaid bills, loans.

Net worth: The amount remaining when you subtract liabilities from the assets.

\[
\text{Assets} - \text{Liabilities} = \text{Net worth}
\]

You will not be required to make an annual report, but you should be able to understand this report.
## ANNUAL REPORT

**December 31, 19**

### CURRENT ASSETS

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>$9,000</td>
</tr>
<tr>
<td>Food inventory</td>
<td>1,500</td>
</tr>
<tr>
<td>Other (Deposits with Public Utilities)</td>
<td>250</td>
</tr>
<tr>
<td><strong>Total Current Assets</strong></td>
<td><strong>$10,750</strong></td>
</tr>
</tbody>
</table>

### FIXED ASSETS

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large equipment</td>
<td>$25,000</td>
</tr>
<tr>
<td>Dining room fixtures</td>
<td>15,000</td>
</tr>
<tr>
<td>Small kitchen equipment</td>
<td>2,000</td>
</tr>
<tr>
<td>China, glass, silver, linens</td>
<td>2,500</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>2,000</td>
</tr>
<tr>
<td><strong>Total Fixed Assets</strong></td>
<td><strong>$46,500</strong></td>
</tr>
<tr>
<td><strong>Total Assets</strong></td>
<td><strong>$57,250</strong></td>
</tr>
</tbody>
</table>

### CURRENT LIABILITIES

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounts payable</td>
<td>$6,000</td>
</tr>
<tr>
<td>Installment accounts</td>
<td>$11,000</td>
</tr>
<tr>
<td><strong>Total Liabilities</strong></td>
<td><strong>$17,000</strong></td>
</tr>
</tbody>
</table>

### NET WORTH

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NET WORTH</strong></td>
<td><strong>$40,250</strong></td>
</tr>
</tbody>
</table>
ASSIGNMENT:

1. An inventory of fixed assets in the cafeteria showed these items:

<table>
<thead>
<tr>
<th>Number</th>
<th>Items</th>
<th>Value</th>
<th>Extension</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>Tables</td>
<td>$35.50 each</td>
<td></td>
</tr>
<tr>
<td>180</td>
<td>Chairs</td>
<td>12.00 each</td>
<td></td>
</tr>
<tr>
<td>40 doz</td>
<td>Glasses</td>
<td>$2.00/doz</td>
<td></td>
</tr>
<tr>
<td>30 doz</td>
<td>Cups and saucers</td>
<td>$6.70/doz</td>
<td></td>
</tr>
<tr>
<td>20 doz</td>
<td>Bowls</td>
<td>$9.05/doz</td>
<td></td>
</tr>
<tr>
<td>20 doz</td>
<td>Dishes, large (dinner)</td>
<td>$11.80/doz</td>
<td></td>
</tr>
<tr>
<td>30 doz</td>
<td>Dishes, medium</td>
<td>$8.80/doz</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Platters</td>
<td>2.00 each</td>
<td></td>
</tr>
<tr>
<td>30 doz</td>
<td>Knives</td>
<td>$4.00/doz</td>
<td></td>
</tr>
<tr>
<td>30 doz</td>
<td>Forks</td>
<td>$1.80/doz</td>
<td></td>
</tr>
<tr>
<td>42 doz</td>
<td>Teaspoons</td>
<td>$1.00/doz</td>
<td></td>
</tr>
<tr>
<td>22 doz</td>
<td>Tablespoons</td>
<td>$1.80/doz</td>
<td></td>
</tr>
<tr>
<td>14 doz</td>
<td>Trays</td>
<td>$14.40/doz</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Stoves</td>
<td>$800.00 each</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Deep fryer</td>
<td>$438.00</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Dishwasher</td>
<td>$1845.00</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Refrigerator</td>
<td>$1138.00</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Freezer</td>
<td>$1500.00</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Mixer</td>
<td>$509.00</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Slicer</td>
<td>$205.00</td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>Sugar servers</td>
<td>$7.20/doz</td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>Salt cellars</td>
<td>$2.40/doz</td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>Condiments</td>
<td>$3.50/doz</td>
<td></td>
</tr>
</tbody>
</table>

Total

2. Total up the fixed assets listed above.

3. Use the food-inventory list from the lesson on inventory (page 133) and determine the food inventory for a balance sheet or annual report.

4. Your total assets amounted to $15,975.00. Your liabilities $1,700.00. What is your net worth?
<table>
<thead>
<tr>
<th>Food Product</th>
<th>Tbsp.</th>
<th>Cup</th>
<th>Pint</th>
<th>Quart</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allspice</td>
<td>1/4 oz</td>
<td>4 ozs</td>
<td>8 ozs</td>
<td>1 lb</td>
</tr>
<tr>
<td>Apples, fresh, diced</td>
<td>8 ozs</td>
<td>1 lb</td>
<td>2 lbs</td>
<td></td>
</tr>
<tr>
<td>Bacon, raw, diced</td>
<td>8 ozs</td>
<td>1 lb</td>
<td>2 lbs</td>
<td></td>
</tr>
<tr>
<td>Bacon, cooked, diced</td>
<td>10½ oz</td>
<td>1 lb 6 ozs</td>
<td>2 lbs 12 ozs</td>
<td></td>
</tr>
<tr>
<td>Bananas, sliced</td>
<td>8 ozs</td>
<td>1 lb</td>
<td>2 lbs</td>
<td></td>
</tr>
<tr>
<td>Baking powder</td>
<td>1/2 oz</td>
<td>6 ozs</td>
<td>12 ozs</td>
<td>1 lb 8 ozs</td>
</tr>
<tr>
<td>Baking soda</td>
<td>1/2 oz</td>
<td>8 ozs</td>
<td>1 lb</td>
<td>2 lbs</td>
</tr>
<tr>
<td>Beef, cooked, diced</td>
<td>5½ oz</td>
<td>11 ozs</td>
<td>1 lb 6 ozs</td>
<td></td>
</tr>
<tr>
<td>Beef, raw, ground</td>
<td>8 ozs</td>
<td>1 lb</td>
<td>2 lbs</td>
<td></td>
</tr>
<tr>
<td>Barley</td>
<td>1/2 oz</td>
<td>8 ozs</td>
<td>1 lb</td>
<td>2 lbs</td>
</tr>
<tr>
<td>Bread crumbs, dry</td>
<td>1/4 oz</td>
<td>4½ ozs</td>
<td>9 ozs</td>
<td>1 lb 2 ozs</td>
</tr>
<tr>
<td>Bread crumbs, fresh</td>
<td>2 ozs</td>
<td>4 ozs</td>
<td>8 ozs</td>
<td></td>
</tr>
<tr>
<td>Butter</td>
<td>1/2 oz</td>
<td>8 ozs</td>
<td>1 lb</td>
<td>2 lbs</td>
</tr>
<tr>
<td>Cabbage, shredded</td>
<td>4 ozs</td>
<td>8 ozs</td>
<td>1 lb</td>
<td></td>
</tr>
<tr>
<td>Carrots, raw, diced</td>
<td>5 ozs</td>
<td>10 ozs</td>
<td>1 lb 4 ozs</td>
<td></td>
</tr>
<tr>
<td>Celery, raw, diced</td>
<td>4 ozs</td>
<td>8 ozs</td>
<td>1 lb</td>
<td></td>
</tr>
<tr>
<td>Cheese, diced</td>
<td>5½ oz</td>
<td>11 ozs</td>
<td>1 lb 6 ozs</td>
<td></td>
</tr>
<tr>
<td>Cheese, grated or shredded</td>
<td>1/4 oz</td>
<td>4 ozs</td>
<td>8 ozs</td>
<td>1 lb</td>
</tr>
<tr>
<td>Chocolate, grated</td>
<td>1/4 oz</td>
<td>4 ozs</td>
<td>8 ozs</td>
<td>1 lb</td>
</tr>
<tr>
<td>Chocolate, melted</td>
<td>1/2 oz</td>
<td>8 ozs</td>
<td>1 lb</td>
<td>1 lb</td>
</tr>
<tr>
<td>Cinnamon, ground</td>
<td>1/4 oz</td>
<td>3½ ozs</td>
<td>7 ozs</td>
<td>14 ozs</td>
</tr>
<tr>
<td>Cloves, ground</td>
<td>1/4 oz</td>
<td>4 ozs</td>
<td>8 ozs</td>
<td>1 lb</td>
</tr>
<tr>
<td>Cloves, whole</td>
<td>1/4 oz</td>
<td>3 ozs</td>
<td>6 ozs</td>
<td>12 ozs</td>
</tr>
<tr>
<td>Cocoa</td>
<td>1/4 oz</td>
<td>3½ ozs</td>
<td>7 ozs</td>
<td>14 ozs</td>
</tr>
<tr>
<td>Coconut, shredded, packed</td>
<td>1/4 oz</td>
<td>3½ ozs</td>
<td>7 ozs</td>
<td>14 ozs</td>
</tr>
<tr>
<td>Coffee, ground</td>
<td>1/4 oz</td>
<td>3 ozs</td>
<td>6 ozs</td>
<td>12 ozs</td>
</tr>
<tr>
<td>Cornmeal</td>
<td>1/3 oz</td>
<td>4½ ozs</td>
<td>9½ ozs</td>
<td>1 lb 3 ozs</td>
</tr>
<tr>
<td>Cornstarch</td>
<td>1/3 oz</td>
<td>5½ ozs</td>
<td>10½ ozs</td>
<td>1 lb 5 ozs</td>
</tr>
<tr>
<td>Corn syrup</td>
<td>3/4 oz</td>
<td>12 ozs</td>
<td>1 lb 8 ozs</td>
<td>3 lbs</td>
</tr>
<tr>
<td>Cracker crumbs</td>
<td>1/4 oz</td>
<td>4 ozs</td>
<td>8 ozs</td>
<td>1 lb</td>
</tr>
<tr>
<td>Cranberries, raw</td>
<td>4 ozs</td>
<td>8 ozs</td>
<td>1 lb</td>
<td></td>
</tr>
<tr>
<td>Currants, dried</td>
<td>5½ ozs</td>
<td>11 ozs</td>
<td>1 lb 6 ozs</td>
<td></td>
</tr>
<tr>
<td>Curry powder</td>
<td>1/4 oz</td>
<td>3½ ozs</td>
<td>11 ozs</td>
<td>1 lb 6 ozs</td>
</tr>
<tr>
<td>Dates, pitted</td>
<td>1/2 oz</td>
<td>8 ozs</td>
<td>1 lb</td>
<td>2 lbs</td>
</tr>
<tr>
<td>Egg whites</td>
<td>1/2 oz</td>
<td>8 ozs</td>
<td>1 lb</td>
<td>2 lbs</td>
</tr>
<tr>
<td>Eggs, whole</td>
<td>1/2 oz</td>
<td>8 ozs</td>
<td>1 lb</td>
<td>2 lbs</td>
</tr>
<tr>
<td>Egg yolks</td>
<td>1/2 oz</td>
<td>8 ozs</td>
<td>1 lb</td>
<td>2 lbs</td>
</tr>
<tr>
<td>Extracts</td>
<td>1/2 oz</td>
<td>8 ozs</td>
<td>1 lb</td>
<td>2 lbs</td>
</tr>
<tr>
<td>Flour, bread</td>
<td>1/3 oz</td>
<td>5 ozs</td>
<td>10 ozs</td>
<td>1 lb 4 ozs</td>
</tr>
<tr>
<td>Flour, pastry</td>
<td>1/3 oz</td>
<td>5 ozs</td>
<td>10 ozs</td>
<td>1 lb 4 ozs</td>
</tr>
<tr>
<td>Flour, cake</td>
<td>1/3 oz</td>
<td>4½ ozs</td>
<td>9½ ozs</td>
<td>1 lb 3 ozs</td>
</tr>
<tr>
<td>Gelatin, flavored</td>
<td>3/8 oz</td>
<td>6½ ozs</td>
<td>13 ozs</td>
<td>1 lb 10 ozs</td>
</tr>
<tr>
<td>Gelatin, plain</td>
<td>1/3 oz</td>
<td>5 ozs</td>
<td>10 ozs</td>
<td>1 lb 4 ozs</td>
</tr>
<tr>
<td>Food Product</td>
<td>Tbsp.</td>
<td>Cup</td>
<td>Pint</td>
<td>Quart</td>
</tr>
<tr>
<td>------------------------------</td>
<td>-------</td>
<td>------</td>
<td>------------</td>
<td>-----------</td>
</tr>
<tr>
<td>Ginger</td>
<td>1/4 oz</td>
<td>3/4 oz</td>
<td>6 1/2 ozs</td>
<td>13 ozs</td>
</tr>
<tr>
<td>Glucose</td>
<td>3/4 oz</td>
<td>12 ozs</td>
<td>1 lb 8 ozs</td>
<td>3 lbs</td>
</tr>
<tr>
<td>Green peppers, diced</td>
<td>1/4 oz</td>
<td>4 ozs</td>
<td>8 ozs</td>
<td>1 lb</td>
</tr>
<tr>
<td>Ham, cooked, diced</td>
<td>1/2 oz</td>
<td>8 ozs</td>
<td>1 lb</td>
<td>2 lbs</td>
</tr>
<tr>
<td>Horseradish, prepared</td>
<td>1/2 oz</td>
<td>8 ozs</td>
<td>1 lb</td>
<td>2 lbs</td>
</tr>
<tr>
<td>Jam</td>
<td>5/8 oz</td>
<td>10 ozs</td>
<td>1 lb 4 ozs</td>
<td>2 lbs 8 ozs</td>
</tr>
<tr>
<td>Lemon juice</td>
<td>1/2 oz</td>
<td>8 ozs</td>
<td>1 lb</td>
<td>2 lbs</td>
</tr>
<tr>
<td>Lemon rind</td>
<td>1/4 oz</td>
<td>4 ozs</td>
<td>8 ozs</td>
<td>1 lb</td>
</tr>
<tr>
<td>Mace</td>
<td>1/4 oz</td>
<td>3/4 oz</td>
<td>6 1/2 ozs</td>
<td>13 ozs</td>
</tr>
<tr>
<td>Mayonnaise</td>
<td>1/2 oz</td>
<td>8 ozs</td>
<td>1 lb</td>
<td>2 lbs</td>
</tr>
<tr>
<td>Milk, liquid</td>
<td>1/2 oz</td>
<td>8 ozs</td>
<td>1 lb</td>
<td>2 lbs</td>
</tr>
<tr>
<td>Milk, powdered</td>
<td>1/4 oz</td>
<td>4 1/2 ozs</td>
<td>9 ozs</td>
<td>1 lb 2 ozs</td>
</tr>
<tr>
<td>Molasses</td>
<td>3/4 oz</td>
<td>12 ozs</td>
<td>1 lb 8 ozs</td>
<td>3 lbs</td>
</tr>
<tr>
<td>Mustard, ground</td>
<td>1/4 oz</td>
<td>3 1/2 ozs</td>
<td>6 1/2 ozs</td>
<td>13 ozs</td>
</tr>
<tr>
<td>Mustard, prepared</td>
<td>1/4 oz</td>
<td>4 ozs</td>
<td>8 ozs</td>
<td>1 lb</td>
</tr>
<tr>
<td>Nutmegs</td>
<td>1/4 oz</td>
<td>4 ozs</td>
<td>8 ozs</td>
<td>1 lb</td>
</tr>
<tr>
<td>Nutmeg, ground</td>
<td>1/4 oz</td>
<td>4 1/2 ozs</td>
<td>8 1/2 ozs</td>
<td>1 lb 1 oz</td>
</tr>
<tr>
<td>Oats, rolled</td>
<td>1/4 oz</td>
<td>3 ozs</td>
<td>6 ozs</td>
<td>12 ozs</td>
</tr>
<tr>
<td>Oil, salad</td>
<td>1/2 oz</td>
<td>8 ozs</td>
<td>1 lb</td>
<td>2 lbs</td>
</tr>
<tr>
<td>Onions, chopped</td>
<td>1/3 oz</td>
<td>5 1/2 ozs</td>
<td>11 ozs</td>
<td>1 lb 6 ozs</td>
</tr>
<tr>
<td>Peaches, canned</td>
<td></td>
<td>8 ozs</td>
<td>1 lb</td>
<td>2 lbs</td>
</tr>
<tr>
<td>Peas, dry, split</td>
<td>1/2 oz</td>
<td>7 ozs</td>
<td>14 ozs</td>
<td>1 lb 12 ozs</td>
</tr>
<tr>
<td>Pickles, chopped</td>
<td>1/3 oz</td>
<td>5 1/2 ozs</td>
<td>10 1/2 ozs</td>
<td>1 lb 5 ozs</td>
</tr>
<tr>
<td>Pickle relish</td>
<td>1/3 oz</td>
<td>5 1/2 ozs</td>
<td>10 1/2 ozs</td>
<td>1 lb 5 ozs</td>
</tr>
<tr>
<td>Pineapple, diced</td>
<td>1/2 oz</td>
<td>8 ozs</td>
<td>1 lb</td>
<td>2 lbs</td>
</tr>
<tr>
<td>Pimentos, chopped</td>
<td>1/2 oz</td>
<td>7 ozs</td>
<td>14 ozs</td>
<td>1 lb 12 ozs</td>
</tr>
<tr>
<td>Potatoes, cooked, diced</td>
<td></td>
<td>6 1/2 ozs</td>
<td>13 ozs</td>
<td>1 lb 10 ozs</td>
</tr>
<tr>
<td>Prunes, dry</td>
<td></td>
<td>5 1/2 ozs</td>
<td>11 ozs</td>
<td>1 lb 6 ozs</td>
</tr>
<tr>
<td>Raisins, seedless</td>
<td>1/3 oz</td>
<td>5 1/2 ozs</td>
<td>10 1/2 ozs</td>
<td>1 lb 5 ozs</td>
</tr>
<tr>
<td>Rice, raw</td>
<td>1/2 oz</td>
<td>8 ozs</td>
<td>1 lb</td>
<td>2 lbs</td>
</tr>
<tr>
<td>Salmon, flaked</td>
<td></td>
<td>8 ozs</td>
<td>1 lb</td>
<td>2 lbs</td>
</tr>
<tr>
<td>Sage, ground</td>
<td>1/8 oz</td>
<td>2 1/2 ozs</td>
<td>2 1/2 ozs</td>
<td>5 ozs</td>
</tr>
<tr>
<td>Savory</td>
<td>1/8 oz</td>
<td>2 ozs</td>
<td>2 ozs</td>
<td></td>
</tr>
<tr>
<td>Salt</td>
<td>1/2 oz</td>
<td>8 ozs</td>
<td>1 lb</td>
<td>2 lbs</td>
</tr>
<tr>
<td>Shortening</td>
<td>1/2 oz</td>
<td>8 ozs</td>
<td>1 lb</td>
<td>2 lbs</td>
</tr>
<tr>
<td>Sugar, brown, packed</td>
<td>1/2 oz</td>
<td>8 ozs</td>
<td>1 lb</td>
<td>2 lbs</td>
</tr>
<tr>
<td>Sugar, granulated</td>
<td>1/2 oz</td>
<td>7 1/2 ozs</td>
<td>15 ozs</td>
<td>1 lb 14 ozs</td>
</tr>
<tr>
<td>Sugar, powdered</td>
<td>1/3 oz</td>
<td>4 1/2 ozs</td>
<td>9 1/2 ozs</td>
<td>1 lb 3 ozs</td>
</tr>
<tr>
<td>Tapioca, pearl</td>
<td>1/4 oz</td>
<td>4 ozs</td>
<td>8 ozs</td>
<td>1 lb</td>
</tr>
<tr>
<td>Tea</td>
<td>1/6 oz</td>
<td>2 1/2 ozs</td>
<td>5 ozs</td>
<td>10 ozs</td>
</tr>
<tr>
<td>Tomatoes</td>
<td>1/2 oz</td>
<td>8 ozs</td>
<td>1 lb</td>
<td>2 lbs</td>
</tr>
<tr>
<td>Tuna fish, flaked</td>
<td>1/2 oz</td>
<td>8 ozs</td>
<td>1 lb</td>
<td>2 lbs</td>
</tr>
<tr>
<td>Vanilla, imitation</td>
<td>1/2 oz</td>
<td>8 ozs</td>
<td>1 lb</td>
<td>2 lbs</td>
</tr>
<tr>
<td>Vinegar</td>
<td>1/2 oz</td>
<td>8 ozs</td>
<td>1 lb</td>
<td>2 lbs</td>
</tr>
<tr>
<td>Water</td>
<td>1/2 oz</td>
<td>8 ozs</td>
<td>1 lb</td>
<td>2 lbs</td>
</tr>
</tbody>
</table>