What Is This Module About?

This module will tell you all about the different estimation techniques and how you can apply them in your everyday life. Why do you think knowing how to estimate quantities is important?

You will learn all about this and more in this module.

This module is made up of two lessons:

Lesson 1—*Estimation in Everyday Life*

Lesson 2—*Estimating Quantities*

What Will You Learn From This Module?

After studying this module, you should be able to:

- use your estimation skills in working with different quantities used in everyday life;
- determine whether estimating a quantity is appropriate or not; and
- determine the accuracy of an estimate.

Let's See What You Already Know

Before you start studying this module, take this simple test first to find out how much you already know about the topics to be discussed.

A. Put a 4 in the blank before the number if estimation can be applied to the given situation and a 8 if it cannot.

_____ 1. How many pieces of fish are there in one kilo?

_____ 2. How many cups of rice should you cook if you are going to feed ten people knowing that one cup of rice is good for three people?

_____ 3. What time should you leave your house if you have to be at your office at eight o'clock in the morning?

_____ 4. If you earn ₱6500.00 per month, how much should your daily allowance be in order to save ₱500.00 every month?

_____ 5. Is it right to pay ₱100.00 for three socks that originally cost ₱35.00 each?

B. Write **True** in the corresponding blank if the estimate is accurate and **False** if it is not.

_____ 1. To cook one bar of gelatin, you need three cups of water. You will therefore need 3 ½ cups of water for 1 ½ bars of gelatin.

_____ 2. To buy one week's worth of groceries for a family of six costs ₱750.00. You will therefore need ₱500.00 for a family of four.

_____ 3. Two and one-fourth kilos of chicken costs ₱185.00 because two kilos costs ₱160.00.

_____ 4. A kilo of tomatoes with around 20 tomatoes per kilo costs ₱20.00. Each tomato therefore costs ₱0.75 each.

_____ 5. If it takes me 30 to 40 minutes to get to school in the morning without traffic, it will take me around 50 minutes to an hour to get home in the afternoon with some traffic.

Well, how was it? Do you think you fared well? Compare your answers with those in the *Answer Key* on pages 23 and 24 to find out.

If all your answers are correct, very good! You may still study the module to review what you already know. Who knows, you might learn a few more new things as well.

If you got a low score, don't feel bad. This only means that this module is for you. It will help you understand some important concepts that you can apply in your daily life. If you study this module carefully, you will learn the answers to all the items in the test and a lot more! Are you ready?

You may go now to the next page to begin Lesson 1.

Estimation in Everyday Life

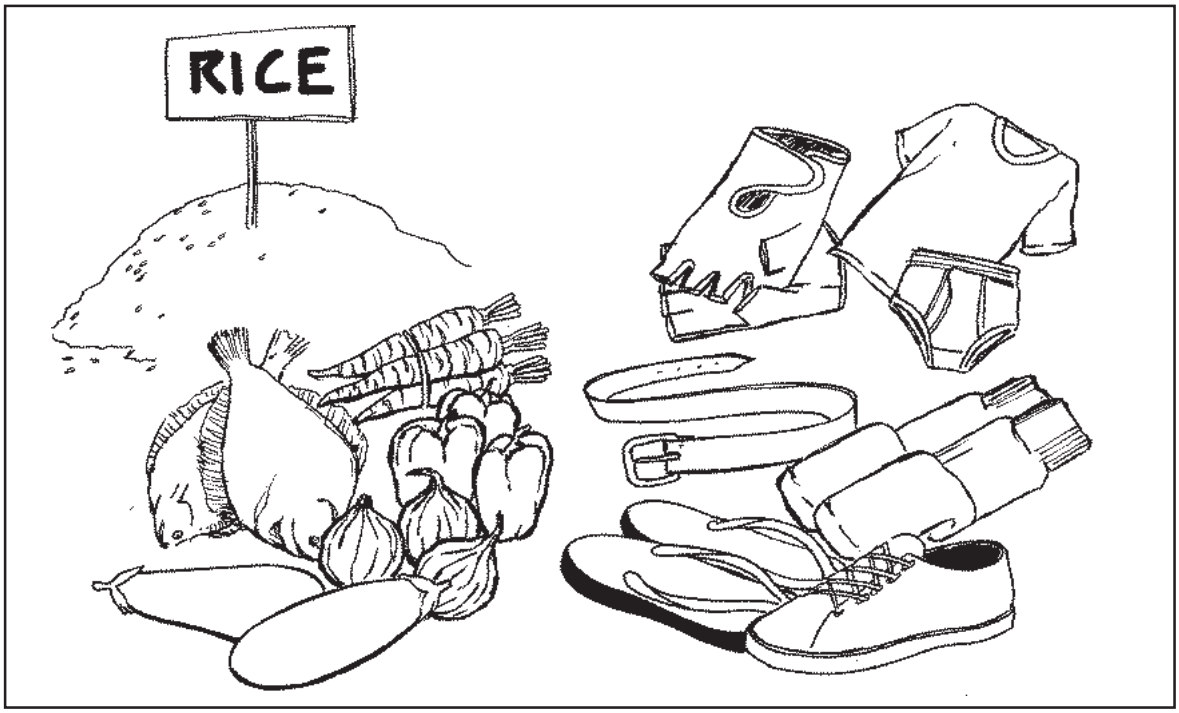
Do you have a fixed budget when shopping for your groceries? Have you ever experienced difficulty in sticking to your budget? Are you able to stick to it even without bringing a calculator when doing your actual shopping?

This lesson will help you in doing this and more. Are you ready? Let's start.

Let's Think About This

Martha is the wife of a carpenter. They have three children, so she has to budget her husband's earnings very strictly so they will have enough money to spend for their needs each month. The problem is, she always overspends on one necessity or another and they end up borrowing money from friends or other members of the family. What do you think she should do?

Martha should learn how to estimate the amounts they have to allot for each of their needs. She has to come up with estimated costs every month so they won't end up borrowing money each month.



This lesson can help her do just that. How? Read on to find out.

Let's Learn

To **estimate** means "to judge tentatively or approximately the value, worth or significance of something." The estimate you come up with can be based on your previous experiences.

Let's Think About This

Compare the sets of numbers below as to which in your opinion is easier to deal with.

Set A	Set B
7.5	8
9.99	10
5.1	5
0.99	1
101.01	101
11.11	11

The second set of numbers is definitely easier to deal with than the first. What do you call the numbers in the first set? These numbers are referred to as **decimals** or real numbers expressed in base 10. The numbers on the second column, on the other hand, are called **whole numbers** or nonnegative integers.

Notice that if you were asked to add the two sets of numbers, the second set would be easier to deal with. Why do you think so? The answer is quite simple. They are easier to add because you would have less numbers to deal with not to mention the fact that you won't have to consider the decimal place of each of the numbers.

For more emphasis, let us try adding the two sets of numbers and see what we come up with. Let us first add the numbers in Set A.

$$7.5 + 9.99 + 5.1 + 0.99 + 101.01 + 11.11 = 135.7$$

Now, let us add the numbers in Set B.

$$8 + 10 + 5 + 1 + 101 + 11 = 136$$

What do you notice about the sums of the numbers in both sets? Notice that if we round off the sum of the numbers in Set A to the nearest whole number we will get 136, the sum of the numbers in Set B.

The principle used in comparing the two sums is the same principle behind estimating quantities. Estimating the total cost of all our groceries, for example, without using a calculator would be easier to do if we round off the cost of each item to the nearest whole number.

Do you know how to round off decimals to the nearest whole number? If you do, then just read the following to review what you already know. If you do not, then read the following to find out how.

When the number to the nearest right of the decimal point is greater than or equal to 5, we round off the decimal to the next higher whole number as in:

1. $0.\overline{9}9 = 1$—since 9, the number to the nearest right of the decimal point is greater than 5, we round off 0 to the next higher whole number, that is, 1.
2. $7.\overline{6} = 8$—since 6 is greater than 5, we round off 7 to the next higher whole number, that is, 8.
3. $9.\overline{5}98 = 10$—since 5 is equal to 5, we round off 9 to the next higher whole number, that is, 10.

When the number to the nearest right of the decimal point, on the other hand, is less than 5, we just drop the numbers after the decimal point and retain the whole number as in:

1. $3.\overline{4} = 3$—since 4 is less than 5, we drop the number after the decimal point and retain the whole number, in this case, 3.
2. $5.\overline{2}9 = 5$—since 2 is less than 5, we drop the numbers after the decimal point and retain the whole number, in this case, 5.
3. $9.\overline{1}09 = 9$—since 1 is less than 5, we drop the numbers after the decimal point and retain the whole number, in this case, 9.

Let's Try This

Round off the following to the nearest whole numbers. Write your answers in the blanks before the numbers.

_____ 1. 22.5

_____ 2. 2.25

_____ 3. 30.2

_____ 4. 5.55

_____ 5. 99.95

_____ 6. 30.33

_____ 7. 8.86

_____ 8. 7.45

_____ 9. 100.01

_____10. 7.75

Compare your answers with those in the *Answer Key* on page 24. How well did you do?

Let's Think About This

How about if you decided to shop for a whole week's worth of food for meals? How would you estimate how much of each to buy based on how many you are in the family?

Say, for example, that your family can consume around 15 kilos of meat for seven days. How much of each kind of meat—pork, beef, chicken and fish—will you buy for variety? And finally, how much are you going to allot for each kind of meat you want to buy? Would it be 3 kilos of pork, 2 ½ kilos of chicken, 1 ¾ kilos of beef and 5 ½ kilos of fish?

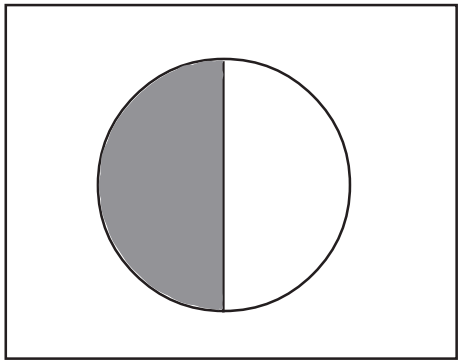
Let's Learn

Before we can answer what we are being asked in the previous activity, we have to learn how to round off fractions first to the nearest whole number. So, how do we go about this?

The first step is to transform the fraction into a decimal. This is easy. You just have to divide the **numerator,** the number above the line in a fraction, by the **denominator,** the number below the line. The answer that you will get is the decimal equivalent of the fraction. Let's take a look at some examples below. The computation below is done manually or you may use a calculator, if you have one.

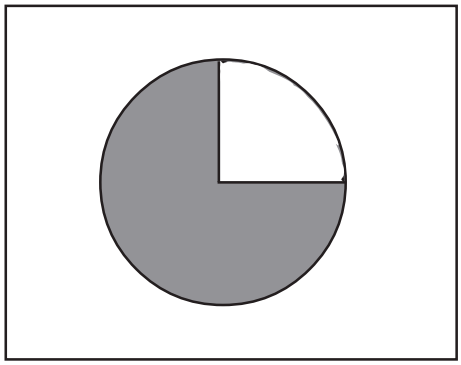
1. ½ = 1 ÷ 2 = 0.5

$$\begin{array}{r} 0.5 \\ 2\overline{)1.0} \\ \underline{10} \\ 0 \end{array}$$



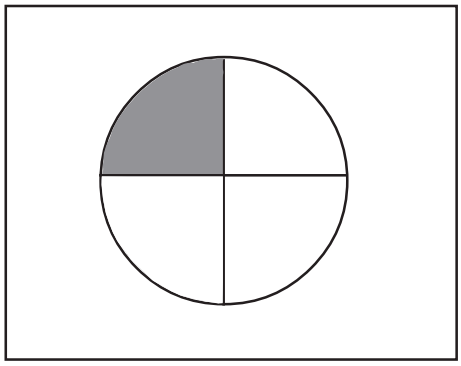
2. ¾ = 3 ÷ 4 = 0.75

$$\begin{array}{r} 0.75 \\ 4\overline{)3.00} \\ \underline{28} \\ 20 \\ \underline{20} \\ 0 \end{array}$$



3. ¼ = 1 ÷ 4 = 0.25

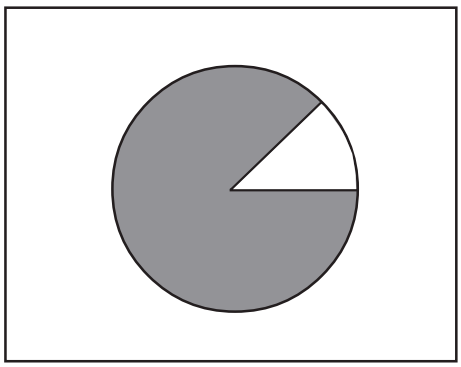
$$\begin{array}{r} 0.25 \\ 4\overline{)1.00} \\ \underline{8} \\ 20 \\ \underline{20} \\ 0 \end{array}$$



So, if we have, for example, the mixed number $7\frac{7}{8}$, and we are asked to round it off to the nearest whole number, we should convert the fraction, $\frac{7}{8}$, into decimal form first as in:

$\frac{7}{8} = 7 \div 8 = 0.875$

$$
\begin{array}{r}
0.875 \\
8\overline{)7.000} \\
\underline{64} \\
60 \\
\underline{56} \\
40
\end{array}
$$



Therefore, $7\frac{7}{8}$ is equal to 7.0875.

The next step is to round off the number to the nearest whole number in the same manner we did earlier. So we will have:

7.0875 = 7—since 0 is definitely less than 5, we drop the numbers to the right of the decimal point and retain the whole number, in this case, 7.

Let us have more practice in rounding off mixed numbers.

Round off the following mixed numbers to the nearest whole numbers.

1. $9\frac{9}{10}$

   - Convert the fraction part into a decimal: .9
   - Write the mixed number in its decimal form: 9.9
   - Look at the digit written right after the decimal point, that is, 9. Since 9 is greater than 5, rounding off to the nearest whole number then will give us the answer 10.
   - Therefore, $9\frac{9}{10}$ rounded off to the nearest whole number is 10.

2. $10\frac{5}{6}$

- Convert the fraction part into a decimal: 0.8333
- Write the mixed number in its decimal form: 10.8333
- Look at the digit written right after the decimal point, that is, 8. Since 8 is greater than 5, rounding off to the nearest whole number then will give us the number 11.
- Therefore, $10\frac{5}{6}$ rounded off to the nearest whole number is 11.

3. $756\frac{369}{500}$

- Convert the fraction part into a decimal: 0.738
- Write the mixed number in its decimal form: 756.738
- Look at the digit written right after the decimal point, that is, 7. Since 7 is greater than 5, rounding off to the nearest whole number then will give us the number 757.
- Therefore, $756\frac{369}{500}$ rounded off to the nearest whole number is 757.

Let's Try This

Round off the following mixed numbers to the nearest whole numbers. Write your answers in the blanks provided before the numbers.

_____ 1. 5 75/100

_____ 2. 7 1/3

_____ 3. 9 4/5

_____ 4. 1 2/3

_____ 5. 17 7/9

_____ 6. 465 7/8

_____ 7. 2 35/40

_____ 8. 45 16/14

_____ 9. 14 6/10

_____10. 35 7/4

Compare your answers with those in the *Answer Key* on page 25. How well did you do?

Let's Learn

When people are in a hurry to buy the things they need on a tight budget, they find it easier to do so by rounding off decimels into whole numbers and even whole numbers to the nearest tens, hundreds, thousands and so on. If a person, for example, wants to buy a pair of shoes and some clothes that he/she intends to wear for a special occasion on a tight budget, could he/she possibly estimate how much money he/she will need to buy the things he/she needs? If he/she, for instance, only has ₱2000 for the whole outfit and saw a pair of shoes at ₱899 and a set of clothes at ₱1435, would he/she be able to buy all of these?

How do we go about answering this question? It's easy. We just have to round off the given numbers to the nearest hundreds so we will have:

₱899 = ₱900

How did we get this answer? When rounding off to the nearest hundreds, we should look at the tens place and apply the same rule we applied in rounding off decimals. Since 90 is greater than 50, we round off the hundreds place to the next higher number, that is, 900. Thus the answer given above.

Then we will do the same with the other number so it will be easier for us to add the two given numbers as in:

₱1435 = ₱1400—since 35 is less than 50, we then retain the value of the number in the hundreds place and drop the numbers after it and we will get ₱1400.

So, if we get the sum of the two numbers it will be:

₱900 + 1400 = ₱2300

Now, wasn't that easier than getting the sum of ₱899 and ₱1435? Let's compare their sums:

₱899 + 1435 = ₱2334

Are they close to each other in value? Yes, they are because if we round off ₱2334 to the nearest hundreds, we will get the same answer, ₱2300.

Let's look at some more examples:

1. Round off 655 to the nearest tens.
    - Look at the number to the right of the tens place, that is, 5.
    - Since 5 is equal to one-half of 10, add 1 to 5 in the tens place so the number 5 becomes 6.
    - Drop 5 in the ones place and replace it with 0.
    - Therefore, 655 rounded off to the nearest tens is 660.
2. Round off 9876 to the nearest hundreds.
    - Look at the number to the right of the hundreds place, that is, 76.
    - Since 76 is more than one-half of 100, add 1 to 8 in the hundreds place so the number 8 becomes 9.
    - Drop 76 and replace the number with 00.
    - Therefore, 9876 rounded off to the nearest hundreds is 9900.
3. Round off 10287 to the nearest thousands.
    - Look at the number to the right of the thousands place, that is, 287.
    - Since 287 is less than one-half of 1000, you should just retain the number in the thousands place, that is, 0.
    - Drop 287 and replace the number with 000.
    - Therefore, 10287 rounded off to the nearest thousands is 10000.

Let's Try This

Round off the following numbers to the places indicated. Write your answers in the blanks before the numbers.

_____ 1. 999 (nearest thousands)

_____ 2. 324 (nearest hundreds)

_____ 3. 778 (nearest tens)

_____ 4. 908 (nearest hundreds)

_____ 5. 7453 (nearest thousands)

_____ 6. 567 (nearest hundreds)

_____ 7. 1028 (nearest tens)

_____ 8. 596 (nearest hundreds)

_____ 9. 9642 (nearest thousands)

_____ 10. 830 (nearest hundreds)

Compare your answers with those in the *Answer Key* on page 25. How well did you do?

Let's See What You Have Learned

Solve the following problems by applying what you have just learned.

1. Martha is planning to put up a *sari-sari* store but she doesn't know how much money she should withdraw from her savings as initial capital. She plans to buy the following for her store:

   2 packs of bubble gum @ ₱18.50 per pack

   4 packs of assorted candies @ ₱8.75 per pack

   20 bags of assorted chips @ ₱6.25 per bag

   50 bottles of assorted soft drinks @ ₱11.50 per bottle

   12 loaves of bread @ ₱5.75 per loaf

   5 packs of assorted cigarettes @ ₱22.50 per pack

   6 packs of assorted noodles @ ₱4.75 per pack

   6 packs of cooking oil @ ₱22.50 per pack

Estimate how much Martha should withdraw from the bank by rounding off the given prices to the nearest whole number. Show your solution in the space provided below.

2. Suppose your house is two rides away from the church. The first ride takes ten minutes if there is no traffic, which is usually the case. The second is also a ten-minute ride granting there is also no traffic, but that rarely happens. The mass you wish to attend starts at 9:00 a.m. What time should you leave your house then if you don't want to be late for the mass? Show your solution in the space provided below.

Compare your answers with those in the *Answer Key* on page 26. Did you get a perfect score? If you did, very good! You can now go to the next lesson. If you did not, review the parts of the lesson you made mistakes in before going to Lesson 2.

Let's Remember

- To **estimate** means "to judge tentatively or approximately the value, worth or significance of something."
- **Decimals** are real numbers expressed in base 10.
- **Whole numbers** are nonnegative integers.
- The **numerator** is the number above the line in a fraction while the number below the line is called the **denominator.**
- In order to make an accurate estimate, it is necessary to round off the given number/s to the nearest whole number/s.
- In rounding off mixed numbers, we follow these steps:
  - Convert the fraction part into decimal form.
  - Write the decimal form of the mixed number.
  - Look at the digit written right after the decimal point.
    - If the digit is less than 5, drop the numbers to the right of the decimal point and retain the whole number.
    - If the digit is equal to 5 or more, drop the numbers to the right of the decimal point and round off the whole number to the next higher number.
- Whole numbers can be rounded off to the nearest tens, hundreds, thousands, ten thousands, etc. Similarly, decimals can be rounded off to the nearest tenths, hundredths, thousandths, ten thousandths, etc.
- To round off a number to the nearest indicated place value, remember the following:
  - If the digits to be dropped from a number is less than one-half of the number representing the indicated place value (e.g., 450 in 1450 to be rounded off to the nearest thousands), just drop the numbers after the said place value (450) and replace them with zeros (000) retaining the number immediately to their left (1, thereby making the answer to the given example 1000, as in 1450 rounded off to the nearest thousands is equal to 1000).
  - If the digit to be dropped from a number is exactly one-half or more of the number representing the indicated place value (e.g., 580 in 2580 to be rounded off to the nearest hundreds), drop the numbers after the said place value (580) and replace them with zeros (000) adding 1 to the value of the number immediately to their left (2 + 1 = 3, thereby making the answer to the given example 3000, as in 2580 rounded off to the nearest thousands is equal to 3000).

Estimating Quantities

In the first lesson, you learned how to round off decimals and fractions to the nearest whole numbers and how to round off whole numbers to the indicated places. We said earlier that this knowledge can be used in estimating quantities. You also learned how this can be applied in solving some everyday life problems involving estimation.

This lesson will give you more exercises to work on so you can learn how to apply your estimation skills in business.

Let's Read

Read the following situation and find out how knowledge in estimating quantities can be used in one's business.

> Elena de Guzman helps her mother sell vegetables in the market. Elena's mother got sick one day so she was the only one left to run their business. She was having difficulty determining how much she should buy from her suppliers so that she could have enough to sell to her regular customers. She oftentimes buys too much and ends up with a lot of spoilage. There were also times when she tries to hard to avoid doing this that she ends up buying not enough goods to sell to her customers. What should she do?

The first thing she should consider is how many customers buy from her every day. She can do this by referring to her daily sales records. She should then get her average sales per day and note how much she sells each day. Then she can increase or decrease her supply as needed per day. This way she can lessen spoilage and avoid dissatisfying her customers.

If, for example, she is able to sell 6 kilos of onions, 1 kilo of garlic, 8 kilos of tomatoes, 8 kilos of potatoes and 5 kilos of carrots every weekday and 15 kilos of onions, 3 kilos of garlic, 15 kilos of tomatoes, 17 kilos of potatoes and 10 kilos of carrots every weekend. Then she should only buy this much plus a little more in case she has other customers aside from her regular ones. This way she would have enough to sell to all her customers, not just the regular ones.

After reading the situation on the previous page, you now know how important and useful knowing how to estimate quantities is in doing business.

Let's Try This

So, how much of each kind of vegetable should Elena buy every weekday to satisfy all her customers? every weekend?

Write your answers below.

Every Weekday	**Every Weekend**
_____ kilos of onions	_____ kilos of onions
_____ kilos of garlic	_____ kilos of garlic
_____ kilos of tomatoes	_____ kilos of tomatoes
_____ kilos of potatoes	_____ kilos of potatoes
_____ kilos of carrots	_____ kilos of carrots

Compare your answers with those in the *Answer Key* on page 26. How well did you do?

Let's Study and Analyze

Now, let us try applying the knowledge we just gained in computing profits. Let us take Nena's situation as an example. Let us compute how much profit she can gain if she is able to sell all the goods she buys every day.

From the *Answer Key,* we learned that Nena has to buy at least 8 kilos of onions, 3 kilos of garlic, 10 kilos of tomatoes, 10 kilos of potatoes and 7 kilos of carrots every weekday and 19 kilos of onions, 7 kilos of garlic, 19 kilos of tomatoes, 21 kilos of potatoes and 14 kilos of carrots. Why? Because her sales approximately double from weekdays to weekends, the amount of goods she needs to add from weekdays (2 kilos for every kind of good) to weekends (4 kilos for every kind of good) should increase as much.

Nena buys the following vegetables at their indicated prices:

Item	Amount per Kilo	Amount to Be Bought Every Weekday	Total Price Every Weekday
Onions	₱45.00	8 kilos	₱360.00
Garlic	90.00	3	270.00
Tomatoes	35.00	10	350.00
Potatoes	40.00	10	400.00
Carrots	22.00	7	154.00

=

After finding out how much each kind of vegetable costs, you are now ready to estimate how much Nena should sell each kind of vegetable to gain profits just enough to keep her business going and to support her needs.

Let us help her out.

Generally, a 20% profit is enough for a seller. So, if she buys a kilo of onions at ₱45.00, she can sell it at:

₱45.00 × 0.2 = ₱9.00

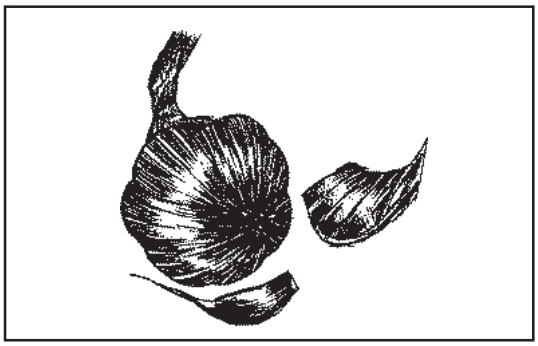
₱45.00 + 9.00 = ₱54.00

Let’s try a few more examples.

Nena should sell the following at these prices:

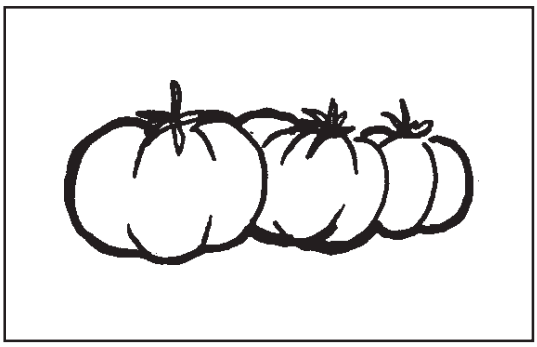
Garlic — ₱90.00 × 0.2 = ₱18.00

₱90.00 + 18.00 = ₱108.00



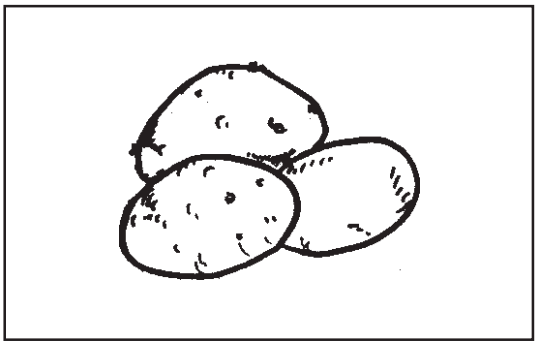
Tomatoes — ₱35.00 × 0.2 = ₱7.00

₱35.00 + 7.00 = ₱42.00



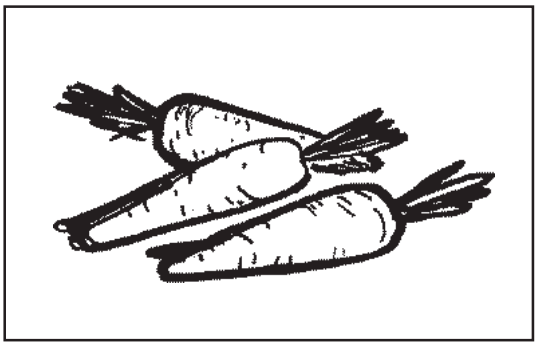
Potatoes — ₱40.00 × 0.2 = ₱8.00

₱40.00 + 8.00 = ₱48.00



Carrots — ₱22.00 × 0.2 = ₱4.40

₱22.00 + 4.40 = ₱26.40



If she wants to know how much her estimated profit will be, how would she go about it?

Let us make an estimate of the profit per kilo of each of the items as computed earlier by rounding them off to the nearest multiple of 5 as shown in the table below.

Items	Computed Profit/Kilo at 20% of Buying Price	Esti Rou Near	
Onions	₱ 45 × 0.2 = ₱ 9.00		=
Garlic	90 × 0.2 = 18.00		
Tomatoes	35 × 0.2 = 7.00		
Potatoes	40 × 0.2 = 8.00		
Carrots	22 × 0.2 = 4.40		
Totals	₱ 46.00		=

Comparing the totals, notice that they are almost the same. We can even say that the rounded off amount is an accurate estimate.

Now, why is this important?

It is so because if we use estimates instead of the exact amounts, it would be easier to compute how much profit you can gain thereby knowing if your business or source of livelihood is doing well or not.

Let's See What You Have Learned

Use the table of profit per kilo above and the table on page 16 to get the number of kilos to be purchased every weekday and every weekend. Compare the total prices indicated in the table, both the computed and estimated profits Nena would be able to get every weekday and every weekend. You may use the table below to show your answers.

Items	Computed Profit/Kilo × Number of Kilos Per Weekday	Estimated Profit/Kilo × Number of Kilos Per Weekday	
Onions			
Garlic			
Tomatoes			
Potatoes			
Carrots			
Totals			

Compare your answers with those in the *Answer Key* on page 27. How well did you do?

Let's Remember

- Knowledge about estimation is important in our daily lives especially when dealing with our businesses or sources of livelihood.
- In order to make an accurate estimate of the value of goods or profit, round them off to the nearest multiple of 5, for, example, for easier computation.

Well, this is the end of the module! Congratulations for finishing it. Did you like it? Did you learn anything useful from it? A summary of its main points is given below to help you remember them better.

Let's Sum Up

This module tells us that:

- To **estimate** means "to judge tentatively or approximately the value, worth or significance of something."
- **Decimals** are real numbers expressed in base 10.
- **Whole numbers** are nonnegative integers.
- The **numerator** is the number above the line in a fraction while the number below the line is called the **denominator.**
- In order to make an accurate estimate, it is necessary to round off the given number/s to the nearest whole number/s.
- In rounding off mixed numbers, we follow these steps:
  - Convert the fraction part into decimal form.
  - Write the decimal form of the mixed number.
  - Look at the digit written right after the decimal point.
    - If the digit is less than 5, drop the numbers to the right of the decimal point and retain the whole number.
    - If the digit is equal to 5 or more, drop the numbers to the right of the decimal point and round off the whole number to the next higher number.
- Whole numbers can be rounded off to the nearest tens, hundreds, thousands, ten thousands, etc. Similarly, decimals can be rounded off to the nearest tenths, hundredths, thousandths, ten thousandths, etc.

- To round off a number to the nearest indicated place value, remember the following:
    - If the digits to be dropped from a number is less than one-half of the number representing the indicated place value (e.g., 450 in 1450 to be rounded off to the nearest thousands), just drop the numbers after the said place value (450) and replace them with zeros (000) retaining the number immediately to their left (1, thereby making the answer to the given example 1000, as in 1450 rounded off to the nearest thousands is equal to 1000).
    - If the digit to be dropped from a number is exactly one-half or more of the number representing the indicated place value (e.g., 580 in 2580 to be rounded off to the nearest hundreds), drop the numbers after the said place value (580) and replace them with zeros (000) adding 1 to the value of the number immediately to their left (2 + 1 = 3, thereby making the answer to the given example 3000, as in 2580 rounded off to the nearest thousands is equal to 3000).
- Knowledge about estimation is important in our daily lives especially when dealing with our businesses or sources of livelihood.
- In order to make an accurate estimate of the value of goods or profit, round them off to the nearest multiple of 5, for, example, for easier computation.

What Have You Learned?

Think of a business you want to engage in in the future then prepare an estimate of all the costs you might incur in starting this business. Then project how much profit you can make if you are going to charge a 20% markup on the goods you plan to sell.

Afterward, show your work to your Instructional Manager for some feedback.

Answer Key

A. Let's See What You Already Know *(pages 2–3)*

A. 1. 4

2. 4

3. 4

4. 4

5. 4

B. 1. False— $1\,\text{bar of gelatin} = 3\,\text{cups of water}$

$1\frac{1}{2}\,\text{bars of gelatin} = x\,\text{cups of water}$

$$\frac{1\,\text{bar of gelatin}}{3\,\text{cups of water}} = \frac{1\frac{1}{2}\,\text{bars of gelatin}}{x\,\text{cups of water}}$$

$$1\,\text{bar of gelatin}\,(x\,\text{cups of water}) = 1\frac{1}{2}\,\text{bars of gelatin}\,(3\,\text{cups of water})$$

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

$$x = 4\frac{1}{2}\,\text{cups of water}$$

2. True—6 members = P750.00

4 members = = x pesos

$$\frac{6\,\text{members}}{₱750.00} = \frac{4\,\text{members}}{x}$$

$$6x = 4(₱750.00)$$

$$\frac{6x}{6} = \frac{₱3000.00}{6}$$

$$x = ₱500.00$$

3. False—2 ¼ kilos of chicken = x
   2 kilos of chicken = ₱160.00

$$\frac{2 \text{ kilos}}{160} = \frac{2\frac{1}{4} \text{ kilos}}{x}$$
$$2x = 2\frac{1}{4}(160)$$
$$\frac{2x}{2} = \frac{₱360}{2}$$
$$x = ₱180$$

Therefore, $2\frac{1}{4}$ kilos = ₱185 is not an accurate estimation.

4. False—20 tomatoes = ₱20.00
   1 tomato = x pesos

$$\frac{20 \text{ tomatoes}}{₱20.00} = \frac{1 \text{ tomato}}{x}$$
$$20x = 1(₱20.00)$$
$$\frac{20x}{20} = \frac{₱20.00}{20}$$
$$x = ₱1.00$$

5. True—by estimation, this is quite logical even without computing the outcome.

B. Lesson 1

Let's Try This (page 7)

1. 23
2. 2
3. 30
4. 6
5. 100
6. 30
7. 9
8. 7
9. 100
10. 8

Let's Try This (page 11)

1.	5 75/100	=	5.75	=	6		
2.	7 1/3	=	7.33	=	7		
3.	9 4/5	=	9.8	=	10		
4.	1 2/3	=	1.67	=	2		
5.	17 7/9	=	17.78	=	18		
6.	465 7/8	=	465.88	=	466		
7.	2 35/40	=	2.88	=	3		
8.	45 16/14	=	45 + 1.14	=	46.14	=	46
9.	14 6/10	=	14.6	=	15		
10.	35 7/4	=	35 + 1.75	=	36.75	=	37

Let's Try This (page 13)

1. 1000 – add 1 to the digit 9 in the hundreds place, since 900 is more than one-half of 1000. Drop the number 90 and replace it with 00.
2. 300 – retain the digit 3 in the hundreds place since 24 is less than one-half of 100. Drop the number 24 and replace it with 00.
3. 780 – add 1 to the digit 7 in the tens place, since 8 is more than one-half of 10. Drop the number 8 and replace it with 0.
4. 900 – retain the digit 9 in the hundreds place, since 8 is less than one-half of 100. Drop the number 8 and replace it with 00.
5. 7000 – retain digit 7 in the thousands place, since 453 is less than one-half of 1000. Drop the number 453 and replace it with 000.
6. 600 – add 1 to the digit 5 in the hundreds place since 67 is more than one-half of 100. Drop 67 and replace it with 00.
7. 1030 – add 1 to the digit 3 in the tens place, since 8 is more than one-half of 10.
8. 600 – add 1 to the digit 5 in the hundreds place, since 96 is more than one-half of 100. Drop the number 96 and replace it with 00.
9. 10000– add 1 to the digit 9 in the thousands place, since 642 is more than one-half of 1000. Drop the number 642 and replace it with 000.
10. 800 – retain the digit 8 in the hundreds place, since 30 is less than one-half of 100. Drop the number 30 and replace it with 00.

Let's See What You Have Learned (pages 13–14)

1. Solution:

Bubble gum—₱18.50	≈	₱19.00 × 2	=	₱ 38.00
Assorted candies—₱8.75	≈	9.00 × 4	=	36.00
Assorted chips—₱6.25	≈	6.00 × 20	=	140.00
Assorted soft drinks—₱11.50	≈	12.00 × 50	=	600.00
Bread—₱5.75	≈	6.00 × 2	=	12.00
Assorted cigarettes—₱22.50	≈	23 .00 × 5	=	115.00
Assorted noodles—₱4.75	≈	5.00 × 6	=	30.00
Cooking oil—₱22.50	≈	23 .00 × 6	=	138.00
				₱1089.00

₱1089.00 ≈ ₱1100.00

Martha should therefore withdraw ₱1200 to cover all her expenses aside from the fact that you can only withdraw by the hundreds from banks.

2. Solution: If it takes you around 20 minutes for you to get to the church without traffic, then you should leave the house at least 40 minutes before 9:00 a.m. to get to the church on time. So you should then leave your house by 8:20 a.m.

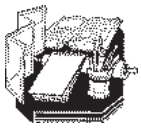
C. Lesson 2

Let's Try This (page 17)

Every Weekday	**Every Weekend**
8 kilos of onions	19 kilos of onions
3 kilos of garlic	7 kilos of garlic
10 kilos of tomatoes	19 kilos of tomatoes
10 kilos of potatoes	21 kilos of potatoes
7 kilos of carrots	14 kilos of carrots

Let's See What You Have Learned (page 20)

Items	Computed Profit/Kilo × Number of Kilos Per Weekday	Estimated Profit/Kilo × Number of Kilos Per Weekday	Com Profi Numbe Per W			
Onions	₱9 × 8 k = ₱72	₱10 × 8 k = ₱80	₱9 × 19 k	=	=	=
Garlic	₱18 × 3 k = ₱54	₱20 × 3 k = ₱60	₱18 × 7 k	=	=	=
Tomatoes	₱7 × 10 k = ₱70	₱5 × 10 k = ₱50	₱7 × 19 k	=	=	=
Potatoes	₱8 × 10 k = ₱80	₱10 × 10 k = ₱100	₱8 × 21 k	=	=	=
Carrots	₱4.40 × 7 k = ₱30.80	₱5 × 7 k = ₱35	₱4.40 × 1 ₱61.60		=	=
Totals	₱306.80	₱325		=		=



References

Kearns, Thomas. *Elementary Algebra.* New York: McGraw-Hill Co., Ltd., 1980.

Orate, Ofelia. *Experiencing Mathematics I.* Quezon City: Marren Publishing House, Inc., 1995.

Oronce, Orlando. *Mathematics: Concepts, Structures and Methods II.* Quezon City: Rex Printing Co., Inc., 1996.

Problem Solving in Algebra. Manila: National Bookstore, 1990.