What Is This Module About?

This is Part Two of *Measuring Weight*. In Part One, you were introduced to the metric and English systems of measurement. You learned to read weighing scales and were introduced to the units of weight used in each system. You performed several exercises involving the conversion of one unit to another within the same system. The exercises also gave you the chance to apply your knowledge of weight measurement to some practical everyday problems.

Since there are two systems of measurement, it is important for you to learn both. It is particularly important for you to know how to convert metric units of weight to English units and vice versa. This is what you will learn in Part Two.

In Part Two, you will also use your knowledge of weight measurement to develop an important skill, namely that of handling money. Many of the goods that we buy are priced based on their weight. Thus, you should know something about weight measurement for you to be able to buy wisely.

There are two lessons in Part Two, namely:

Lesson 1 – *Different Units of Weight*

Lesson 2 – *Getting the Best Price*

What Will You Learn From This Module?

After studying Part Two, you should be able to:

♦   convert metric units of weight to English units and vice versa; and

♦   use your knowledge of weight measurement to be able to handle money in a practical way.

It will be very helpful if you take down some notes as you go through the lessons in this module. Afterwards, if you need to review some items, you can always go back to your notes.

🧑 Let's See What You Already Know

Before you start with Lesson 1, try to answer the following questions. They will help you find out what you already know about the subject matter.

Encircle the letter of the correct answer.

1. How many pounds are there in 1 kilo?

    a.   2.2
    b.   22
    c.   28.35
    d.   283.5

2. How many grams are there in 1 ounce?

    a.   2.2
    b.   22
    c.   28.35
    d.   283.5

3. Which is heavier, 1 kilogram or 2 pounds?

    a.   1 kilogram
    b.   2 pounds
    c.   They are equivalent.

4. Which is as heavy as 4 pounds?

    a.   2 kilograms
    b.   1,814 grams
    c.   0.8 kilogram
    d.   16 grams

5. If a kilo of rice costs ₱21, how much would 7 kilos cost?

    a.   ₱ (7 × 21)
    b.   ₱ 147
    c.   ₱ 97
    d.   Both (a) and (b).

6. If 50 kilos of cement costs ₱180, how much would 15 kilos cost?

    a.   ₱ 18
    b.   ₱ 36
    c.   ₱ 54
    d.   ₱ 72

Read the paragraph below, then answer Questions 7–9 below.

Mrs. Mucho has eight children. To keep soiled clothes from piling up, she and her eldest daughter have to do the laundry every single day. Their dependable laundry powder costs ₱40 for every 400-gram pack. A 1.5 kilo pack costs ₱110.

7. If Mrs. Mucho buys a 400-gram pack, the cost of the laundry powder per gram is:

a. ₱ 1.00
b. ₱ 0.01
c. ₱10.00
d. ₱ 0.10

8. If Mrs. Mucho buys a 1.5-kilo pack, the cost of the laundry powder per gram is:

a. ₱ 0.70
b. ₱70.00
c. ₱ 0.07
d. ₱ 7.00

9. Which of the two packs is better priced?

a. the 400-gram pack
b. the 1.5-kilo pack
c. Neither pack is well priced.

Well, how was it? Do you think you fared well? Compare your answers with those in the *Answer Key* on pages 28–30 to find out.

If all your answers are correct, very good! This shows that you already know much about the topic. 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 goes to show that this module is for you. It will help you understand 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 now go to the next page to begin Lesson 1.

Different Units of Weight

In the Philippines, the metric system is more often used for weight measurement than the English system. However, the English system is occasionally used so it is still worth studying. Other countries also prefer to use the English system. A useful skill that you can learn is converting units of weight in the metric system to units of weight in the English system and vice versa. This is what Lesson 1 is all about.

After studying this lesson, you should be able to:

♦ convert a unit of weight in the metric system to one in the English system and vice versa; and

♦ compare the weights of objects and persons using different systems of measurement.

Let's Learn

Fill in the blanks to show the equivalent metric and English units of weight.

1 g _ _ _	=	0.035 ounce
1 g_ _ _	=	0.0022 pound
1 k_ _ _	=	2.2 pounds
1 m _ _ _ _ _ ton	=	1.1 tons
1 o_ _ _ _	=	28.35 grams
1 p_ _ _ _	=	453.59 grams
1 p_ _ _ _	=	0.4536 kilos
1 t _ _	=	907.2 kilos
1 t _ _	=	0.907 metric ton

pound   *kilos*   *metric ton*

gram   *ton*   *ounce*

Well, that was not difficult, was it? After filling in the blanks above, did you manage to get the following?

1 gram	=	0.035 ounce
1 gram	=	0.0022 pound
1 kilo	=	2.2 pounds

1 metric ton	=	1.1 tons
1 ounce	=	28.35 grams
1 pound	=	453.59 grams
1 pound	=	0.4536 kilo
1 ton	=	907.2 kilos
1 ton	=	0.907 metric ton

Now you can compare quantities measured in different systems by using these equivalents. You can picture how big or small a unit in one system is in terms of another unit in another system.

Let's Try This

Try your hand at comparing units of weight in the metric and English systems. Complete each of the following sentences by underlining the correct word in the parentheses. You can refer to the equivalents given in the last section to help you out.

1. One gram is (lighter, heavier) than one ounce.

2. One pound is (lighter, heavier) than one kilo.

3. One kilo is about (twice, half) as heavy as one pound.

4. One ton is (heavier, lighter) than one metric ton.

Compare your answers with those in the *Answer Key* on page 30.

Let's Learn

Now that you have an idea of the equivalent units of measurement in the metric and English systems, you are ready to learn how to convert them. In Part One of *Measuring Weight*, you converted smaller units to bigger units in the same system of measurement and vice versa. How did you do that? You did it either through the unit factor method, or by multiplying or dividing the given units by a certain number.

Converting a unit of weight in the metric system to a unit in the English system and vice versa involves similar procedures. The unit factor method has been discussed at length in Part One. You may wish to review or explore that method before proceeding.

Just to help you recall it, the following example has been worked out for you.

Let's try converting 14 kilos to pounds.

You know that 1 kilo = 2.2 lbs from the equivalents previously given.

So, the unit factor is $\dfrac{2.2 \text{ lbs.}}{1 \text{ kilo}}$.

Computing,

$$14 \text{ kilos} \left(\frac{2.2 \text{ lbs.}}{1 \text{ kilo}} \right)$$

$$= \frac{14 \cancel{\text{ kilos}} \times 2.2 \text{ lbs.}}{1 \cancel{\text{ kilo}}}$$

$$= \frac{30.8 \text{ lbs.}}{1}$$

$$= 30.8 \text{ lbs.}$$

Therefore, 14 kilos = 30.8 pounds.

In this lesson, you will be introduced to **conversion factors**. As its name suggests, a conversion factor makes the conversion of units from one system to another easier.

Check out the table below.

CONVERSION TABLE		
Metric to English:		
grams ⟶ ounces	—	grams $\times$ 0.035
grams ⟶ pounds	—	grams $\times$ 0.002
kilos ⟶ pounds	—	kilos $\times$ 2.2
metric tons ⟶ tons	—	metric tons $\times$ 1.1
English to Metric:		
ounces ⟶ grams	—	ounces $\times$ 28.4
pounds ⟶ grams	—	pounds $\times$ 453.6
pounds ⟶ kilos	—	pounds $\times$ 0.45
tons ⟶ metric tons	—	tons $\times$ 0.9

The number that you multiply with the given quantity to convert it to another unit is called a **conversion factor**. To show you how conversion factors work, some examples have been worked out for you:

1. How do you convert 63 pounds to kilos?

   To convert pounds to kilos, the conversion factor used is 0.45.

   $$63 \times 0.45 = 28.35$$

   Thus, 63 pounds = 28.35 kilos.

2. How do you convert 4.7 metric tons to tons?

   To convert metric tons to tons, the conversion factor used is 1.1.

   $$4.7 \times 1.1 = 5.17$$

   Thus, 4.7 metric tons = 5.17 tons.

Do you know why you need to learn how to convert one unit of weight to another? In Part One, you learned how to convert a unit of weight to another unit within the same system. Here in Part Two, you will learn how to convert one unit of weight to another unit in a different system. Either way, you convert units of weight to other units to make it easier for you to compare the weights of objects or persons.

Think about this. You are in the health center and you overhear one mother boast that her baby weighed 9 pounds at birth. Then you hear a second mother say that her baby weighed 4 kilos at birth. Which mother has the heavier baby and thus has the right to boast?

The weights of the two babies are difficult to compare, aren't they? Why? Because one weight is in pounds, while the other one is in kilograms. So, before you can compare the two babies, you have to convert the weight of one baby to the unit the other baby's weight is in.

Let us say that you prefer to use kilos.

The first baby weighs 9 pounds. This is equivalent to 4.05 kilos. Why? According to the Conversion Table (see page 6), to change pounds to kilos, you must multiply the number of pounds by 0.45:

$$9 \times 0.45 = 4.05$$
$$9 \text{ lbs.} = 4.05 \text{ kilos}$$

The second baby weighs 4 kilos. Therefore, the baby weighing 9 pounds or 4.05 kilos is heavier than the baby weighing 4 kilos. The difference in weight is only very small. Therefore, we can say that the babies have almost the same weight.

Let's See What You Have Learned

Try working out some everyday problems using your knowledge of unit conversion. Use the boxes provided for your solutions. Also refer to the Conversion Table on page 6 for you to solve the problems.

1. Andrea weighs herself every time she celebrates her birthday. Last year, she weighed 65 kilos. When she celebrated her birthday this year, she weighed 125 pounds. How much weight in pounds did Andrea lose?

2. Marc needs 5 pounds of cement to have the wall of his room repaired. Marc knows that his uncle has some cement left over from the construction of his house. Instead of going to the hardware, Marc goes to his uncle to ask for some cement. His uncle has some cement and a weighing scale calibrated to measure weight in kilos. How much cement should Marc ask for?

3. Compare these weights by writing < (less than), > (greater than) or = (equal to) in the blanks.

    a. 2 ounces   _____   56.8 grams

    b. 2 kilos   _____   1 pound

    c. 3 metric tons   _____   1 ton

    d. 8 lbs. 3 oz.   _____   4 kilos

    e. 7.5 kilos   _____   15 pounds

Compare your answers with those in the *Answer Key* on pages 31–33. If your answers are correct, great! If you made some mistakes, review the parts of the lesson you didn't understand.

This is the end of Lesson 1. Before you go to the last lesson of this module, let us summarize what you have learned so far.

Let's Remember

♦   Units of weight measurement in the metric system can be converted to units in the English system and vice versa. This is done by either using the unit factor method discussed in Part One or multiplying the given number of units by a conversion factor.

♦   It is easier to compare the weights of objects if they are all in the same unit of measurement.

In Lesson 2, you will find out how you can use the things you have learned here in your everyday life.

Getting the Best Price

Are you aware that in many cases, weight and cost are directly related? For instance, many grocery items are priced according to their weight. The heavier a product or the more contents it has, the more expensive it is.

In this lesson, you will learn how to save money by being able to distinguish which products cost less but have more contents.

At the end of this lesson, you should be able to:

♦   compute for the cost of goods based on their weight; and

♦   compare the prices of goods based on their weight by computing their unit prices.

Let's Think About This

Remember the story of Frances' trip to the market? You read all about it in Part One of this module. You may remember that Frances bought various amounts of potatoes, carrots and celery from Aling Divina. How did she calculate the amount she had to pay? Let's go over part of the dialogue again.

Aling Lucing: Let's ask Aling Divina how much we owe her so things will be clearer to you.

Aling Divina: Let's see. One kilo of potatoes is ₱60. One kilo of carrots is ₱90, so 1/2 kilo is ₱45….

Frances: One-half kilo?

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Aling Lucing:	You see, there are 1,000 grams in 1 kilo. So the 500 grams of carrots that you are buying is 1/2 kilo. One kilo costs ₱90, so 1/2 kilo costs 1/2 of ₱90. That's ₱45.
Frances:	I think I'm beginning to understand. How much is 1 kilo of celery, Aling Divina?
Aling Divina:	Only ₱120, Frances.
Frances:	I bought 100 grams of celery. If there are 1,000 grams in a kilo, 100 grams is 1/10 of a kilo.
Aling Lucing:	That's right. You should also know that 100 grams is one *guhit*. Many of the goods we buy from the wet market can be measured in guhit, like meat, fish and vegetables.
Frances:	So… one guhit of celery should also be 1/10 of a kilo. One guhit of celery should be 1/10 of ₱120. That's ₱12!
Aling Lucing:	Learning fast, aren't you?
Frances:	₱60 for the potatoes, ₱45 for the carrots and ₱12 for the celery. That's a total of ₱117.
Aling Divina:	That's right, Frances.

Did you understand how Frances worked out the cost of each item she wished to buy? Did she compute for the cost of each item correctly? Let's check and see.

First of all, not all goods can be bought by whole kilos. For example, Frances bought only 500 grams or 1/2 kilo of carrots, and 100 grams or 1/10 kilo of celery. You may also want to buy a chicken that weighs 1.2 kilos or a big jackfruit that weighs 3.4 kilos.

Next, you should also keep in mind that the prices of most food items in the market are in **pesos per unit of weight.** For example, the goods that Frances bought were all priced in pesos per kilo.

Now, **how do you compute for the cost of items whether their weights are in whole kilos or not?** Here is a systematic way of doing it.

> *Step 1.* Convert the unit of weight of the goods you want to buy to the unit used to price the goods.

Frances wanted to buy 500 grams of carrots. Aling Divina priced her carrots by the kilo. Thus, Frances converted 500 grams to kilos.

Do you remember how this is done?

$$500 \text{ g}\left(\frac{1 \text{ kilo}}{1,000 \text{ g}}\right) = \frac{500 \text{ g} \times 1 \text{ kilo}}{1,000 \text{ g}}$$

$$= \frac{500 \text{ kilo}}{1,000}$$

$$= 0.5 \text{ kilo}$$

Thus, 500 g = 0.5 kilo.

Step 2. Multiply the number of units in Step 1 by the unit price of the goods. The unit price gives you the price or cost of one unit of the goods.

Aling Divina sold carrots by the kilo. The unit price of carrots is its price or cost for every kilo. This is ₱90 per kilo.

To compute the cost of the carrots, Frances multiplied 0.5 kilo by ₱90 per kilo:

$$0.5 \text{ kilo} \left(\frac{₱90}{1 \text{ kilo}} \right)$$

$$= \frac{0.5 \ \cancel{\text{kilo}} \times ₱90}{1 \ \cancel{\text{kilo}}}$$

$$= \frac{₱45}{1}$$

$$= ₱45$$

Therefore, the cost of 1/2 kilo of carrots is ₱45.

We know now that Frances correctly computed the cost of the carrots.

To help you understand these computations better, let us work out the cost of the celery that Frances bought.

Step 1. *Convert the unit of weight of the celery to the unit used to price it.*

Frances wanted 100 grams of celery. Aling Divina priced celery at ₱120 per kilo. Thus, Frances had to convert 100 grams to kilos.

You will remember how this is done:

$$100 \text{ grams} \left(\frac{1 \text{ kilo}}{1,000 \text{ grams}} \right)$$

$$= \frac{100 \ \cancel{g} \times 1 \text{ kilo}}{1,000 \ \cancel{g}}$$

$$= \frac{100 \, \text{kilo}}{1,000} = 0.1 \, \text{kilo}$$

Thus, $100 \text{g} = 0.1 \, \text{kilo}$.

Step 2. *Multiply the number of units in Step 1 by the unit price of the celery. The unit price gives you the price or cost of one unit of the celery.*

Aling Divina sold celery at ₱120 per kilo. We say that the unit price of celery is ₱120 per kilo (or ₱120 per one kilo).

To compute the cost of the celery, Frances multiplied 0.1 kilo by ₱120 per kilo:

$$0.1 \, \text{kilo} \left(\frac{₱120}{1 \, \text{kilo}} \right)$$
$$= \frac{0.1 \, \cancel{\text{kilo}} \times ₱120}{1 \, \cancel{\text{kilo}}}$$
$$= \frac{₱12}{1}$$
$$= ₱12$$

Therefore, the cost of 0.1 kilo of celery is ₱12.

So, now we know that Frances correctly computed the cost of the carrots and celery that she bought.

Is it now clear to you how you can compute for the cost of goods based on their weight? This is a very useful skill so you must make sure that you get enough practice. Doing the following activity is a good start. Later, when you buy some items that are sold based on their weight, this skill can come in handy.

Let's Solve This Problem

This is a shopping list made by a housewife who is planning to cook some pansit for her daughter's birthday. It gives you the quantities of the ingredients that she needs and their unit prices. Compute the total cost of her purchases by completing the table on the next page. You can do your computations on any blank sheet of paper or in a notebook.

INGREDIENT	AMOUNT NEEDED	UNIT PRICE
Garlic	100 grams	₱ 60/kilo
Onion	100 grams	₱ 65/kilo
Carrots	600 grams	₱ 90/kilo
Cabbage	1.5 kilos	₱ 95/kilo
Chicken meat	800 grams	₱ 85/kilo
Chicken liver	200 grams	₱ 85/kilo
Noodles	3 pounds	₱ 70/kilo
TOTAL COST		

After completing the table, check your answers using the *Answer Key* on pages 33–35.

If you were able to complete the table correctly, that's excellent! You will find it easier now to work out your own food budget. If you made some mistakes, try to work out your solutions again to find out where you went wrong. Remember, practice makes perfect!

The next activity will help you find ways to save money by comparing the prices of goods based on their weights.

Let's Read

This is a tale of two brands of laundry powder – *Silaw* and *Puti*. For a long time, Silaw was *numero uno* to many housewives. You see, Silaw is rather cheap. A pack of Silaw costs only ₱45. Even during tough times, soiled clothes need not go unwashed. Silaw boasts of excellent cleaning power. It also claims to be biodegradable, which means that its chemical components break down after use, making it safe for the environment.
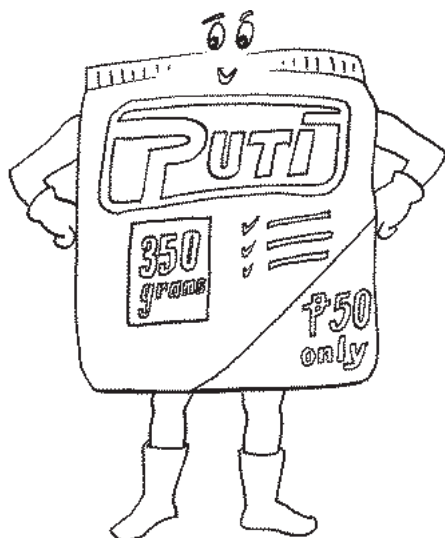
Enter Puti. This new brand of laundry powder also claims excellent cleaning power and biodegradability. The TV advertisement even calls it the new numero uno among housewives. What shocks many is its claim that it is cheaper than Silaw. A pack of Puti costs ₱50.

If a pack of Silaw costs ₱45 and a pack of Puti costs ₱50, how can Puti be cheaper? Think about this for a while before reading on. Let the pictures of the two brands help you figure things out.

Let's Try This

A good consumer does not accept everything the advertisements say. He/She finds out for himself/herself how true the claims are. He/She compares brands before deciding which one to buy.

After being a Silaw fan for a long time, you hear of Puti. Compare their characteristics by completing the table below.

CHARACTERISTICS	SILAW	
Does it have excellent cleaning power?		
Is it biodegradable?		
How much does one pack cost?		
How much does one pack weigh?		

Now, answer the following questions:

1. In what ways are Silaw and Puti similar?

    _____
    _____
    _____

2. In what ways are Silaw and Puti different?

    _____
    _____
    _____

Compare your answers with those in the *Answer Key* on page 35.

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Let's Learn

We all want to make sure that we spend our money wisely. When you are deciding which brand to buy, for example, what do you keep in mind? That's right, you think of quality and price. You go for top quality at the lowest possible price.

In the table that you have just completed, there are four characteristics that you may study in deciding whether to buy Silaw or Puti laundry powder. The first two characteristics, namely, cleaning power and biodegradability, have something to do with product quality. Cleaning power is probably the most important characteristic of a laundry detergent. Then, it is good for the environment if we decide to use biodegradable laundry detergents.

Let us say that both Silaw and Puti are equally good in terms of cleaning power and biodegradability. We can now concentrate on our main question: **which brand offers the better price?**

The next two characteristics in the table that you completed will help you answer this question. These are the costs and weights of the products. Let's look at that part of the table again.

	SILAW	PUTI
COST PER PACK	₱ 45	₱ 50
WEIGHT PER PACK	250g	350g

By just looking at the cost per pack, you might say that Silaw laundry powder is cheaper than Puti laundry powder. But, look at the weight of one pack. Do the two brands have equal weights? Is one pack of Silaw as heavy as one pack of Puti?

No, the two brands do not have the same weight. One pack of Puti is heavier than one pack of Silaw. Since they have different weights, you cannot compare their prices. Why? You pay ₱45 for 250 grams of Silaw. Then, although you pay a higher price for Puti (₱50), you also get a heavier pack (350 grams).
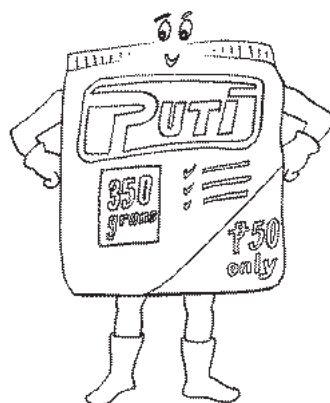
How then can you tell for sure which brand offers the better price? What is the best way to compare the two brands?

To tell for sure which brand gives you better value for your money, compare their unit prices.

Unit prices were introduced to you in Lesson 1. Do you remember what a unit price is? A **unit price** is the cost of one unit of weight of the goods that you are buying.

Both Silaw and Puti are sold in grams. The unit price of one brand gives you the cost of one gram of that brand. The brand with the lower cost for each gram is the better-priced brand.

Let us see how this works for Silaw and Puti.

To compute for the unit price of laundry powder, you must divide the cost of one pack by its weight.

1.   The unit cost of Silaw is computed below:

$$\text{unit cost }_{\text{Silaw}} = \frac{\text{cost of one pack}}{\text{weight of one pack}}$$
$$= \frac{₱45}{250 \text{ g}}$$
$$= ₱0.18/\text{g}$$

The unit cost of Silaw is ₱0.18 or 18 centavos per gram.

2.   The unit cost of Puti is also computed below:

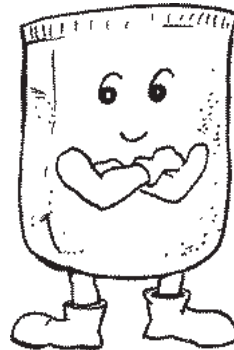$$\text{unit cost }_{\text{Puti}} = \frac{\text{cost of one pack}}{\text{weight of one pack}}$$
$$= \frac{₱50}{350 \text{ g}}$$
$$= ₱0.14/\text{g}$$

The unit cost of Puti is ₱0.14 or 14 centavos per gram.

Can you now tell which brand offers the better price? The brand with the better price is Puti. One gram of Puti costs only ₱0.14 (or 14 centavos) while one gram of Silaw costs ₱0.18 (or 18 centavos). Puti is cheaper than Silaw by ₱0.04 (₱0.18 minus ₱0.14) per gram.
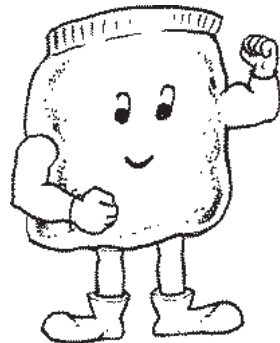
PUTI	SILAW
1 gram	1 gram
₱0.14	₱0.18

Computing unit prices is a very useful skill when you have to compare different brands of one product. This may happen when there is a new brand that claims to be cheaper, as in the example above. There are also bargains where the price of one brand is lowered while the prices of other brands remain the same. You would wish to find out if you are really getting a bargain. You can do this by comparing the unit price of the brand on sale with that of the brand with the regular price.

Let's Study and Analyze

1. Use the information given in the table below to compute for the unit price of four brands of flour:

BRAND	COST PER PACK	WEIGHT PER PACK
Hari Nah	₱25	500 g
Good Mix	₱40	2 lbs
Puriflour	₱38	2 lbs
Best Bake	₱35	500 g

Use the space below to show your solution:

After completing the table, list down the brands of flour from the cheapest to the most expensive:

a. _____

b. _____

c. _____

d. _____

2. Supremo is an expensive brand of coffee. A 750-gram bottle sells for ₱230. Makes Sense is a cheaper brand. A 600-gram bottle sells for only ₱120. During its anniversary sale, a supermarket sold Supremo at a bargain price of ₱180. Makes Sense was sold at its regular price. Did Supremo become cheaper than Makes Sense after being put on bargain?

Check your answers using the *Answer Key* on pages 35–37.

Well, do you now appreciate the importance of being able to compare the prices of products correctly?

You will learn more about comparing prices and buying wisely in the next activity. Read on!

Let's Read

It is a hot summer afternoon and Elena wants to make some *halo-halo* for the family. She checks her kitchen to see if she has all the ingredients she needs. She is delighted to find out that she has *kaong, gulaman, pinipig,* ube, sweetened *jackfruit*, milk and ice. But what about sugar?

That is not a problem. Elena runs to a neighborhood *sari-sari* store and buys a 200-gram pack of sugar for ₱12. She serves halo-halo to her family and everybody is happy.

While cleaning her kitchen, she remembers buying a kilo of sugar from the same store not too long ago. The kilo of sugar cost ₱50. She is sure that the prices of rice and sugar have not gone up. If a kilo costs ₱50, then 200 grams should cost only ₱10. But today, she paid ₱12. Why?

Let's Think About This

Elena believes that she should have paid only ₱10 for the 200 grams of sugar that she bought. Do you agree? Why? Think about this and write down your answers below.

_____
_____
_____
_____

Compare your answers with those in the *Answer Key* on page 37.

Let's Learn

Elena knows that the price of sugar is ₱50 per kilo. If she wants to buy 200 grams of sugar, what will be the cost?

To compute the cost of 200 grams of sugar, use the method that you learned for computing the cost of an item based on its weight.

Converting 200 grams to kilos,

200 grams = ? kilos

$$200\,g\left(\frac{1\,kilo}{1{,}000\,g}\right) = \frac{200\,g \times 1\,kilo}{1{,}000\,g}$$

$$\frac{200\,kilo}{1{,}000} = 0.2\,kilo$$

Thus, 200 grams = 0.2 kilo

Computing for the cost of 200 grams of sugar,

$$0.2\,kilo\left(\frac{₱50}{1\,kilo}\right)$$

$$= \frac{0.2\,kilo \times ₱50}{1\,kilo}$$

$$= \frac{₱10}{1}$$

$$= ₱10 \text{ for } 0.2\,kilo, \text{ or } ₱10 \text{ for } 200 \text{ grams}$$

Based on our computations, 200 grams of sugar should cost only ₱10. This is why Elena believed that she should have paid only ₱10, instead of ₱12.

For her to understand why she had to pay more, she should put herself in the place of the sari-sari store owner. The store owner buys sugar in packs of one kilo each. However, some of his customers would not want to buy one-kilo packs all the time. Elena, for example, bought only 200 grams on her recent purchase.

To suit his goods to the needs of his customers, the store owner repacks some of the one-kilo packs of sugar. One kilo can be repacked to five 200-gram packs. This way, he is able to sell sugar in amounts preferred by his customers.

To repack the sugar, the store owner needs to buy small plastic bags. He also has to spend extra time and effort on the task. In other words, this repacking activity has an **additional cost** to him. For him to earn from selling these smaller packs of sugar, he has to sell them at a price higher than ₱10. In this case, he sells them for ₱12.

Now, Elena is just like any other customer. She wants to get goods at lower prices. She wants to save. She thinks of how she can do this....

If she buys a one-kilo pack of sugar, she would have to pay ₱50.

If she buys five 200-gram packs of sugar (which is equivalent to 1,000 grams or 1 kilo), she would have to pay ₱12 × 5, which is ₱60. This is ₱10 more expensive than buying a one-kilo pack of sugar. She may also have to go to the store five times if she buys the packs as she needs them.

Therefore, if Elena buys a one-kilo pack of sugar, she saves ₱10. This is called **bulk buying**. You buy a big quantity of an item that you use often instead of buying it

frequently in smaller quantities. Just like Elena, you may be able to save money this way. This is the meaning of the expression "cheaper by the bulk."

You can follow these steps to find out if an item is cheaper by the bulk:

> ***Step 1***.   Find out how much the item costs when bought in a bigger pack.

The bigger pack in our example weighs one kilo. The cost of a one-kilo pack of sugar is ₱ 50.

> ***Step 2***.   Find out the cost of the good when bought in smaller packs, whose total weight is equivalent to the weight of the bigger pack.

The smaller pack in our example weighs 200 grams. Five 200-gram packs of sugar is equivalent to 1,000 grams or 1 kilo, the weight of the bigger pack.

Now, the cost of five 200-gram packs of sugar is:

$$5 \text{ packs} \left(\frac{₱12}{1 \text{ pack}} \right)$$
$$= \frac{5 \text{ packs} \times ₱12}{1 \text{ pack}}$$
$$= \frac{₱60}{1}$$
$$= ₱60$$

Five 200-gram packs of sugar cost ₱60.

> ***Step 3***.   If the cost of the bigger pack is lower, then the item is cheaper by the bulk.

The cost of the bigger pack is ₱50.

The cost of 5 smaller packs equivalent to the weight of the bigger pack is ₱60.

Since the cost of the bigger pack is cheaper, sugar in our example is cheaper by the bulk.

There is another way to find out if buying by the bulk is cheaper. Do you know what this other method is? It is the computation of **unit prices**. You can compute the unit price of sugar if you buy a one-kilo pack, and the unit price of sugar if you buy a 200-gram pack.

Let's try that out.

If Elena buys a one-kilo pack of sugar, its price per gram would be:

$$\frac{₱50}{1,000 \text{ gram}} = ₱0.05/\text{gram or 5 centavos per gram}$$

Now, if she buys a 200-gram pack of sugar, its price per gram would be:

$$\frac{₱12}{200 \text{ gram}} = ₱0.06/\text{gram or 6 centavos per gram}$$

Using unit prices, you learn that buying the one-kilo pack is cheaper and more practical than buying the 200-gram pack.

Are goods always cheaper by the bulk? With what you have learned in this lesson, you can find out for yourself if the goods you want to buy are cheaper by the bulk.

Let's See What You Have Learned

Solve the following problems. Show your solutions in the boxes provided.

1. Vic buys rice by the kilo from the wet market. A kilo of rice costs ₱20. One day, a wholesaler offers to deliver a sack of rice to his house. It costs ₱870 and weighs 48 kilos. If Vic can afford it, will he save money by buying the sack of rice?

2. Rocky owns a restaurant that serves good beef dishes. He buys beef by the kilo from the meat stall located near his restaurant. A kilo of beef costs ₱180. His friend, who owns a few heads of cattle, had one of the cows butchered. He offered to sell 15 kilos to Rocky for ₱2,250. If Rocky can properly store that much meat, should he buy from his friend?

3.   Oscar owns a stand that serves drinks and snacks to taxi, jeep and tricycle drivers. Every day, he buys one 250-gram pack of juice mix for ₱19. The price of a one-kilo pack of juice mix is ₱62. Will it be cheaper for Oscar if he buys juice mix by the bulk?

Check your answers using the *Answer Key* on pages 37–38.

If all your answers are correct, very good! If you made some mistakes, review the parts of the lesson which you didn't understand.

You can see that by buying in bulk you can save money. Before you decide to do so, however, you must make sure that you will be able to safely store the items until you are ready to use them. If for example you buy meat or vegetables in bulk but are unable to refrigerate or store them properly, they may spoil and you will have to throw them away without using them. This will end up costing you more than if you had just bought what you could consume right away.

Well, you made it! This is the end of Lesson 2 and of the entire module on measuring weight. I hope that you were able to learn many practical lessons here. Let us take a while to summarize the most important points.

Let's Remember

- To compute for the cost of goods based on their weight:

    Step 1.   Convert the unit of weight of the item to the unit used to price it.

    Step 2.   Multiply the number of units in Step1 by the unit price of the item. The unit price gives you the price or cost of one unit of the item.

- To find out which among several quantities (or brands) of goods gives the best value for your money, compare their unit prices. The quantity (or brand) with the lowest unit price is the best buy. This is how to compute for a unit price:

$$\text{unit price} = \frac{\text{cost of one pack of goods}}{\text{weight of one pack}}$$

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♦ To find out if an item is cheaper when bought by the bulk, apply any of these two methods:

a. Compare the unit price of the bigger quantity with the unit price of the smaller quantity.

b. Follow these steps:

Step 1. Find out how much the item costs when bought in a bigger pack.

Step 2. Find out the cost of the item when bought in smaller packs whose total weight is equivalent to the weight of the bigger pack.

Step 3. If the cost of the bigger pack is lower, then the item is cheaper when bought by the bulk.

We have covered quite a number of topics in Part Two. Before you take the post-test, carefully read the module summary on the next page. It will help you put together the things that you have learned.

Let's Sum Up

♦ To convert units of weight from one system of measurement to another, you can use the unit factor method. You can also use conversion factors. You merely multiply the given quantity by a conversion factor to convert a quantity to another unit.

♦ Many of the goods that we buy are priced according to their weight. To compute for the cost of goods based on their weight:

Step 1. Convert the unit of weight of the item to the unit used to price it.

Step 2. Multiply the number of units in *Step1* by the unit price of the goods. The unit price gives you the price or cost of one unit of the goods.

♦ You can use your knowledge of weight measurement to compare the prices of goods. To find out which among several quantities (or brands) of one item is cheapest, compare their unit prices. The quantity (or brand) with the lowest unit price is the cheapest.

This is how to compute for the unit price:

$$\text{price} = \frac{\text{cost of one pack of the goods}}{\text{weight of one pack}}$$

♦ To find out if an item is cheaper when bought by the bulk, any of these two methods may be used:

1. Compare the unit price of the bigger quantity and the unit price of the smaller quantity.

2. Follow these steps:

   Step 1. Find out how much the item costs when bought in a bigger pack.

   Step 2. Find out the cost of the item when bought in smaller packs whose total weight is equivalent to the weight of the bigger pack.

   Step 3. If the cost of the bigger pack is lower, then the item is cheaper by the bulk.

Now that you have gone over the module summary, you can find out how much you have learned from this module by taking the following test.

? What Have You Learned?

Answer the following questions. Show your solutions in the boxes provided.

1. Which is greater, 65 pounds or 27 kilograms?

2. Which is greater, 50 grams or 2 ounces?

3. Bong harvested 22 kilos of Baguio beans. A vegetable dealer is offering him ₱11 per kilo for his harvest. How much would Bong get if he agrees to sell his harvest?

4. Weng raised some backyard chickens. When she was ready to sell them, they weighed 14 pounds altogether. A middleman wants to buy them for ₱65 a kilo. How much would Weng get if she agrees to sell her chickens?

5. I am fond of Tsoko cookies. I often buy a 500-gram pack of Tsoko cookies for ₱134. The last time I went to the supermarket, I saw a new brand of cookies, Choecoe. Choecoe costs ₱156 per pound. Would I get a better price if I shift to Choecoe?

6. Rose runs the office canteen. When meetings are conducted in the office, the canteen is asked to serve coffee and snacks. The price of a 250-gram bottle of instant coffee is ₱320. The price of a 50-gram bottle is ₱70. Will it be cheaper for Rose and the canteen if they buy coffee by the bulk?

Check your answers using the *Answer Key* on pages 38–41.

How did you fare? If you got:

6   Excellent! You really learned a lot!

4–5   Good! Just study those parts of the module that you did not understand very well.

0–3   You have to carefully study Part Two of the module *Measuring Weight* again.

Answer Key

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

1. **(a)** There are 2.2 pounds in 1 kilo.

2. **(c)** There are 28.35 grams in 1 ounce.

3. **(a)**

   You are given two quantities — 1 kilogram and 2 pounds.
   Then, you are asked to tell which of them is heavier.

   Solution:

   To be able to compare two quantities, both of them should be in the same unit. Try converting 1 kilogram to pounds so both quantities will be in pounds:

   $$1 \text{ kilo} = 2.2 \text{ lbs.}$$

   $$2.2 \text{ lbs.} > 2 \text{ lbs.}, \quad \text{OR} \quad 2.2 \text{ lbs. is heavier than 2 lbs.}$$

   Therefore, a kilogram is heavier than 2 pounds.

4. **(b)**

   You are given a specific weight — 4 pounds. You are asked to choose which of the given weights is as heavy as 4 pounds.

   Solution:

   This is the same as choosing which of the given weights is equivalent to 4 pounds. The choices are in kilograms and grams. You have to convert 4 pounds to kilograms and grams before you can make comparisons.

   Converting 4 pounds to kilograms: $4 \times 0.4536 = 1.8144$, or 1.8 kilos

   Converting 4 pounds to grams: $4 \times 453.6 = 1{,}814$ grams

5. **(d)**

   You are given the information that 1 kilo of rice costs ₱21. You are asked how much 7 kilos would cost.

   Solution:

   To compute the cost of 7 kilos of rice, you multiply 7 kilos by the price of rice per kilo:

   $$7 \times 21 = 147$$

   Therefore, 7 kilos of rice costs ₱147.

6. **(c)**

You are given the information that 50 kilos of cement costs ₱ 180. You are asked how much 15 kilos of cement would cost.

Solution:

The first thing that you should do is find out how much 1 kilo of cement costs. You can do this by dividing ₱ 180 by 50 kilos:

$$
\begin{array}{r}
3.6 \\
50\overline{)180.0} \\
\underline{150} \\
300 \\
\underline{300} \\
0
\end{array}
$$

So now you know that 1 kilo of cement costs ₱ 3.60.

The next thing to do is find out how much 15 kilos of cement costs. You can do this by multiplying ₱ 3.60 by 15:

$$3.60 \times 15 = 54$$

Therefore, 15 kilos of cement costs ₱ 54.

7. **(d)**

You have to find out the cost of the laundry powder per gram in a 400-gram pack.

Solution:

To do this, divide the cost of one pack by the weight of one pack in grams:

$$\frac{\text{cost of one pack}}{\text{weight of one pack}} = \frac{₱\,40}{400\,\text{g}} = ₱\,0.10/\text{g}$$

Thus, the cost of the laundry powder per gram is ₱ 0.10/g or 10 centavos per gram.

8. **(c)**

You have to find out the cost of the laundry powder per gram, in a 1.5-kilo pack.

Solution:

Since you are after the cost per gram, you have to convert 1.5 kilos to grams.

$$1.5 \text{ kilos} \left(\frac{1,000 \text{ g}}{1 \text{ kilo}} \right)$$

$$= \frac{1.5 \text{ kilos} \times 1,000 \text{ g}}{1 \text{ kilo}}$$

$$= \frac{1,500 \text{ g}}{1}$$

$$= 1,500 \text{ g}$$

$$1.5 \text{ kilos} = 1,500 \text{g}$$

Now that you have the weight of the pack in grams, you can compute the cost of the laundry powder per gram. To do this, divide the cost of one pack by the weight of one pack in grams.

$$\frac{\text{cost of one pack}}{\text{weight of one pack}} = \frac{₱110}{1,500 \text{ g}} = ₱0.0733/\text{g} = ₱0.07/\text{g}$$

Thus, the cost of laundry powder per gram is ₱0.0733 or about 7 centavos per gram.

9. **(b)**

Since the 1.5-kilo pack has a lower price per gram (₱0.07/gram) than the 400-gram pack (₱0.10/gram), the former has the better price.

B. Lesson 1

Let's Try This (page 5)

The completed sentences should read as follows:

1. One gram is *lighter* than one ounce.

   You know that there are 28.35 grams in 1 ounce. Since you need 28.35 grams to make up 1 ounce, one gram must be lighter than one ounce.

2. One pound is *lighter* than one kilo.

   You know that there are 2.2 pounds in 1 kilo. Since you need 2.2 pounds to make up 1 kilo, one pound must be lighter than one kilo.

3. One kilo is about *twice* as heavy as 1 pound.

   You know that there are 2.2 pounds in 1 kilo. This means that 1 kilo is about 2 times as heavy as 1 pound.

4. One ton is *lighter* than one metric ton.

   You know that there are 1.1 tons in one metric ton. This makes the ton lighter than the metric ton.

Let's See What You Have Learned (pages 7–8)

1. You are given the following information:

    On her last birthday, Andrea weighed 65 kilos.

    On her birthday this year, she weighed 125 pounds.

    You are asked to find out how much weight in pounds Andrea lost.

    Solution:

    To find out how much weight Andrea lost, you have to subtract her weight this year, 125 pounds, from her weight last year, 65 kilos. For you to be able to do this, both quantities have to be in the same unit. Since the final answer should be in pounds, convert 65 kilos to pounds:

    65 kilos = **?** lbs.

    Applying the conversion factor, 2.2, for converting kilos to pounds:

    $$65 \times 2.2 = 143$$

    $$65 \text{ kilos} = 143 \text{ lbs.}$$

    Now you can rewrite your problem as follows:

    $$
    \begin{array}{r}
    65 \text{ kilos} \\
    \underline{-125 \text{ lbs.}}
    \end{array}
    \longrightarrow
    \begin{array}{r}
    143 \text{ lbs.} \\
    \underline{-125 \text{ lbs.}} \\
    18 \text{ lbs.}
    \end{array}
    $$

    Therefore, Andrea lost 18 pounds.

2. You are given the following information:

    Marc needs 5 pounds of cement.

    The weighing scale available to his uncle who can give him some cement is calibrated to measure weight in kilos.

    You are asked how much cement Marc should ask for.

    Solution:

    Marc should ask for 5 pounds of cement from his uncle. However, since his uncle's scale is in kilos, he has to convert 5 pounds to kilos. This way, he can tell his uncle exactly how much he needs.

    5 lbs. = **?** kilos

    To convert pounds to kilos, multiply them by 0.45.

    $$5 \times 0.45 = 2.25$$

    $$5 \text{ lbs.} = 2.25 \text{ kilos}$$

    Therefore, Marc should ask for 2.25 kilos of cement from his uncle.

3. You are asked to compare two quantities, then tell whether they are equal or if one is greater or less than the other. Before you can compare two quantities, they should be in the same unit. For these problems, you need to convert units of weight from one system to another. You should consult the Conversion Table on page 6 for the correct conversion factors to use.

 a. 2 oz. _____ 56.8 grams

  To convert ounces to grams, multiply ounces by 28.4.

$$2 \times 28.4 = 56.8$$

$$2 \text{ oz.} = 56.8 \text{ g.}$$

  Therefore, 2 oz. = 56.8 g.

 b. 2 kilos _____ 1 pound

  To convert kilos to pounds, multiply kilos by 2.2.

$$2 \times 2.2 = 4.4$$

$$2 \text{ kilos} = 4.4 \text{ lbs.}$$

$$4.4 \text{ lbs.} > 1 \text{ lb.}$$

  Therefore, 2 kilos > 1 lb.

 c. 3 metric tons _____ 1 ton

  To convert metric tons to tons, multiply metric tons by 1.1.
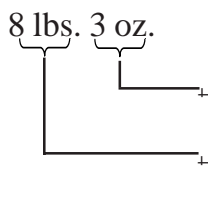
  $3 \times 1.1 = 3.3$

  3 metric tons = 3.3 tons

  3.3 tons > 1 ton

  Therefore, 3 metric tons > 1 ton.

 d. 8 lbs. 3 oz. _____ 4 kilos

  Try converting pounds and ounces to kilos. The conversion factor available is for changing pounds to kilos, not pounds *and* ounces to kilos. So, first, you have to convert 8 lbs. 3 oz. to pounds:

  8 lbs. 3 oz.

     ↳ You have to convert this part to pounds.

     ↳ This part is already in pounds so you don't need to convert it.

To convert 3 ounces to pounds:

$$\frac{3}{16} = 0.1875 \qquad \text{(since 1 lb} = 16 \text{ oz)}$$

$$3 \text{ oz.} = 0.1875 \text{ lb.}$$

Then, you add 0.1875 lb. to 8 lbs.

$$8 \text{ lbs.} + 0.1875 \text{ lb.} = 8.1875 \text{ lbs.}$$

Now you know that 8 lbs. 3 oz. = 8.1875 lbs.

You can thus convert 8.1875 pounds to kilos by multiplying the pounds by 0.45.

$$8.1875 \times 0.45 = 3.684375 \approx 3.68 \text{ kilos}$$

$$3.68 \text{ kilos} < 4 \text{ kilos}$$

Therefore, 8 lbs. 3 oz. < 4 kilos.

e.   7.5 kilos _____ 15 pounds

To convert kilos to pounds, multiply the kilos by 2.2.

$$7.5 \times 2.2 = 16.5$$

$$7.5 \text{ kilos} = 16.5 \text{ lbs.}$$

$$16.5 \text{ lbs.} > 15 \text{ lbs.}$$

Therefore, 7.5 kilos > 15 lbs.

C. Lesson 2

Let's Solve This Problem (pages 12–13)

First, you will note that garlic, onion, carrots, chicken meat and chicken liver are all in grams. Their prices are in pesos per kilo. To compute for the cost of these ingredients, you have to convert them first to kilos. You do this by dividing the number of grams by 1,000:

Garlic and onion, 100 grams each: $\dfrac{100}{1,000} = 0.10 \text{ kg}$

Carrots, 600 grams: $\dfrac{600}{1,000} = 0.60 \text{ kg}$

Chicken meat, 800 grams: $\dfrac{800}{1,000} = 0.80 \text{ kg}$

Chicken liver, 200 grams: $$\frac{200}{1,000} = 0.20\,\text{kg}$$

The cabbage is already in kilos (1.5 kilos) so you don't have to convert its weight anymore.

The noodles are in pounds so you have to convert 3 pounds to kilos:

$$3 \times 0.45 = 1.35$$

$$3 \text{ lbs.} = 1.35 \text{ kilos}$$

The weights of all the ingredients are now in kilos. The next step is to compute for the cost of each ingredient by multiplying the number of kilos by the unit price (or the price per kilo):

Garlic: 0.10 × ₱ 60 = ₱   6.00

Onion: 0.10 × ₱ 65 = ₱   6.50

Carrots: 0.60 × ₱ 90 = ₱   5.40

Cabbage: 1.5   × ₱ 95 = ₱ 142.50

Chicken meat: 0.80 × ₱ 85 = ₱   68.00

Chicken liver: 0.20 × ₱ 85 = ₱   17.00

Noodles: 1.35 × ₱ 70 = ₱   94.50

Finally, you can solve for the total cost by simply adding the cost of all the ingredients:

Garlic: ₱   6.00

Onion: 6.50

Carrots: 5.40

Cabbage: 142.50

Chicken meat: 68.00

Chicken liver: 17.00

Noodles: 94.50
                    _____

                     ₱ 339.90

Your table should look like this:

INGREDIENT	AMOUNT NEEDED		UNIT PR
Garlic	100	grams	₱ 60/kilo
Onion	100	grams	₱ 65/kilo
Carrots	600	grams	₱ 90/kilo
Cabbage	1.5	kilos	₱ 95/kilo
Chicken meat	800	grams	₱ 85/kilo
Chicken liver	200	grams	₱ 85/kilo
Noodles	3	pounds	₱ 70/kilo
TOTAL COST			

Let's Try This (page 14)

The completed table should look like this:

CHARACTERISTICS
Does it have excellent cleaning power?
Is it biodegradable?
How much does one pack cost?
How much does one pack weigh?

1. Silaw and Puti both have excellent cleaning power and are biodegradable.

2. They are both sold in grams. However, Silaw costs ₱45 per 250-gram pack while Puti costs ₱50 per 350-gram pack.

Let's Study and Analyze (pages 17–18)

1. The unit prices can be computed by dividing the cost per pack by the weight per pack. Note, however, that the weights are in different units. You have to convert them to the same unit so comparisons can be made.

    Let us convert all the units to grams. Hari Nah and Best Bake are already in grams. A pack of Good Mix and Puriflour each weighs 2 pounds. To convert 2 pounds to grams:

    $$2 \times 453.6 = 907.2 \quad \text{(using conversion unit of 453.6)}$$

    $$2 \text{ lbs} = 907.2 \text{ g}$$

    The unit prices for the four brands of flour can now be computed:

    $$\text{unit price}_{\text{Hari Nah}} = \frac{₱25}{500 \text{ g}} = ₱0.05/\text{gram}$$

    $$\text{unit price}_{\text{Good Mix}} = \frac{₱40}{907.2 \text{ g}} = ₱0.044/\text{gram}$$

$$\text{unit price}_{\text{Puriflour}} \quad = \quad \frac{₱38}{907.2 \text{ g}} = ₱0.042/\text{gram}$$

$$\text{unit price}_{\text{Best Bake}} \quad = \quad \frac{₱35}{500 \text{ g}} = ₱0.07/\text{gram}$$

The completed table should thus look like this:

BRAND	COST PER PACK	WEIGHT PER	
Hari Nah	₱ 25	500 g	=
Good Mix	₱ 40	2 lbs. (907.2	=
Puriflour	₱ 38	2 lbs. (907.2	=
Best Bake	₱ 35	500 g	=

The following is a list of the four brands of flour arranged from the cheapest to the most expensive:

    a.   Puriflour

    b.   Good Mix

    c.   Hari Nah

    d.   Best Bake

2.   You were given the following information:

BRAND	PRICE PER PACK (BEFORE BARGAIN)	PRICE PER PACK (BARGAIN PRICE
Supremo	₱ 230	₱ 180
Makes Sense	₱ 120	₱ 120

You are asked if Supremo gives better value than Makes Sense after being put on bargain.

Solution:

Notice once again that the two brands that you are comparing are sold in packs of different weights. The correct way to compare them is to compare their unit prices before and when Supremo was placed on bargain:

Before the bargain:

$$\text{unit price}_{\text{Supremo}} \quad = \quad \frac{₱230}{750 \text{ g}} = ₱0.31/\text{g}$$

$$\text{unit price}_{\text{Makes Sense}} = \frac{₱120}{600\text{ g}} = ₱0.20\text{/g}$$

Before the bargain, Supremo was the more expensive brand.

After the bargain:

$$\text{unit price}_{\text{Supremo}} = \frac{₱180}{750\text{ g}} = ₱0.24\text{/g}$$

$\text{unit price}_{\text{Makes Sense}} = ₱0.20\text{/g}$ (The unit price of Makes Sense remains the same since it was not put on bargain.)

Supremo still turned out more expensive even when put on bargain. However, its price difference with Makes Sense became less.

Let's Think About This (page 19)

Here is a sample answer to the question:

If one kilo of sugar costs ₱50, then it seems reasonable to assume that 200 grams will cost ₱10. However, before I come to a conclusion, I need to know more. As a customer, I think ₱10 should be the price of a 200-gram pack of sugar.

I have to find out more about how store owners put prices on the goods they sell. After I do this and I know enough, then I will decide whether ₱12 is a fair price.

Let's See What You Have Learned (pages 22–23)

1. You are given the following information:

   Vic usually buys rice at ₱20 per kilo in the wet market. He is offered a sack of rice that weighs 48 kilos for ₱870 by a wholesaler. You are asked if it is cheaper for Vic to buy by the bulk.

   Solution:

   To buy rice by the bulk means to purchase the sack instead of buying a kilo at a time. It is cheaper to buy by the bulk if the unit price of the sack of rice is cheaper than the unit price of the kilo of rice. Let's see if this is so:

   $$\text{unit price}_{\text{sack of rice}} = \frac{₱870}{48\text{ kg}} = ₱18.125\text{/kg}$$

   $$\text{unit price}_{\text{kilo of rice}} = \frac{₱20}{1\text{ kg}} = ₱20\text{/kg}$$

   Comparing the unit costs, ₱18.125 is cheaper than ₱20. Therefore, it is cheaper for Vic to buy by the bulk.

2. You are given the following information:

Rocky usually buys beef at ₱180 per kilo from the meat stall. His friend offered him 15 kilos of beef for ₱2,250. You are asked if Rocky should buy from his friend.

Solution:

To find out which source of beef is cheaper, you have to compare their unit prices:

$$\text{unit price}_{\text{beef from meat stall}} = \frac{₱180}{1 \text{ kg}} = ₱180/\text{kg}$$

$$\text{unit price}_{\text{beef from friend}} = \frac{₱2,250}{15 \text{ kg}} = ₱150/\text{kg}$$

Therefore, the cheaper source of beef for Rocky would be his friend. He should buy meat from him.

3. You are given the following information:

Oscar usually buys juice mix in the following quantities: 250-gram packs at ₱19 each or one-kilo packs for ₱62 each.

You are asked if it would be cheaper for Oscar to buy juice mix by the bulk.

Solution:

This is once again a cheaper-by-the-bulk problem. Let us try solving it using the other method.

a. The bigger pack (1 kilo or 1,000 grams) costs ₱62.
    The smaller pack (250 grams) costs ₱19.

b. Four smaller packs (with a combined weight of 1,000 g or 1 kilo) is equivalent to one big pack. The cost of 4 smaller packs is ₱76 (4 × ₱19).

c. We see that ₱76 (4 smaller packs) is more expensive than ₱62 (the bigger 1-kilo pack). It would then be cheaper for Oscar to buy the 1-kilo pack. Thus, it would be cheaper for him to buy by the bulk.

D. What Have You Learned? *(pages 26–27)*

1. You are given two quantities — 65 pounds and 27 kilos.

You are asked which of the two quantities is greater.

Solution:

To be able to compare two quantities, they should be in the same unit.

Try converting 65 pounds to kilos. According to the Conversion Table on page 6, the conversion factor you should use is 0.45.

$$65 \times 0.45 = 29.25$$

$$65 \text{ lbs.} = 29.25 \text{ kilos.}$$

$$29.25 \text{ kilos} > 27 \text{ kilos}$$

Therefore, 65 pounds is heavier than 27 kilos.

2. You are given two quantities — 50 grams and 2 ounces.

    You are asked which of the two quantities is greater.

    Solution:

    To be able to compare two quantities, they should be in the same unit. Try converting 50 grams to ounces. According to the Conversion Table, the conversion factor you should use is 0.035.

    $$50 \times 0.035 = 1.75$$

    $$50 \text{ g.} = 1.75 \text{ oz.}$$

    $$1.75 \text{ oz.} < 2 \text{ oz.}$$

    Therefore, 2 ounces is greater than 50 grams.

3. You are given the following information:

    Bong harvested 22 kilos of Baguio beans.

    A vegetable dealer is offering him ₱11 per kilo for his harvest.

    You have to find out how much Bong would get if he agrees to sell his harvest.

    Solution:

    To find out how much Bong would be paid if he sells his harvest to the vegetable dealer, you should multiply the quantity of his harvest (22 kilos) by the price offered per kilo:

    $$22 \text{ kilos} \left(\frac{₱11}{\text{kilo}} \right)$$
    $$= \frac{22 \text{ kilos} \times ₱11}{1 \text{ kilo}}$$
    $$= \frac{₱242}{1}$$
    $$= ₱242$$

    Bong would get ₱242 if he agrees to sell his harvest to the vegetable dealer.

4. You are given the following information:

Weng is ready to sell chickens that weigh 14 pounds altogether.

A middleman is buying them for ₱65 per kilo.

You are asked to find out how much Weng would get if she agrees to sell her chickens.

Solution:

The weight of Weng's chickens is in pounds. The price offered is in pesos per kilo. You have to convert the weight of her chickens to kilos.

According to the Conversion Table, the conversion factor you should use is 0.45.

$$14 \times 0.45 = 6.3$$

$$14 \text{ lbs.} = 6.3 \text{ kilos}$$

Then, to compute how much Weng would receive if she sells the chickens to the middleman, you should multiply the weight of her chickens (6.3 kilos) by the price per kilo:

$$6.3 \text{ kilos} \left(\frac{₱65}{\text{kilo}} \right)$$
$$= \frac{6.3 \, \cancel{\text{kilos}} \times ₱65}{1 \, \cancel{\text{kilo}}}$$
$$= \frac{₱409.50}{1}$$
$$= ₱409.50$$

Weng would get ₱409.50 if she sells her chickens to the middleman.

5. You are given this information:

I usually buy Tsoko cookies at ₱134 per 500-gram pack.

I am thinking of buying a one-pound pack of Choecoe cookies for ₱156.

You are asked to find out if I would get a better price if I shift to Choecoe.

Solution:

To find out which brand of cookies has the better price, you should compare their unit prices. However, since they are in different units of weight, you should have them in the same unit first.

You know that there are 453.6 grams in 1 pound. So, 1 pack of Choecoe weighs 453.6 grams. You can then compute for the unit prices:

$$\text{unit price}_{\text{Tsoko}} = \frac{₱134}{500 \text{ g}} = ₱0.268/\text{gram}$$

$$\text{unit price}_{\text{Choecoe}} = \frac{₱156}{453.6 \text{ g}} = ₱0.344/\text{gram}$$

Therefore, Tsoko has the lower and better price.

6. You are given the following information:

The price of one 250-gram bottle of instant coffee is ₱320.

The price of one 50-gram bottle of instant coffee is ₱70.

You are asked if it would be cheaper for Rose to buy by the bulk.

Solution:

First, the bigger pack is the 250-gram bottle. The smaller pack is the 50-gram bottle.

Next, you have to find out how many of the smaller packs (or how many 50-gram bottles) will be equivalent in weight to the bigger pack (250 grams). You simply have to divide the weight of the bigger pack by the weight of the smaller pack:

$$\frac{250}{50} = 5$$

Thus, the equivalent of one 250-gram bottle is five 50-gram bottles.

Finally, you should compare the following prices:

◆ Price of one 250-gram bottle = ₱320

◆ Price of five 50-gram bottles = $5 \times ₱70 = ₱350$

Since the price of the bigger pack is less, instant coffee is cheaper by the bulk.

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