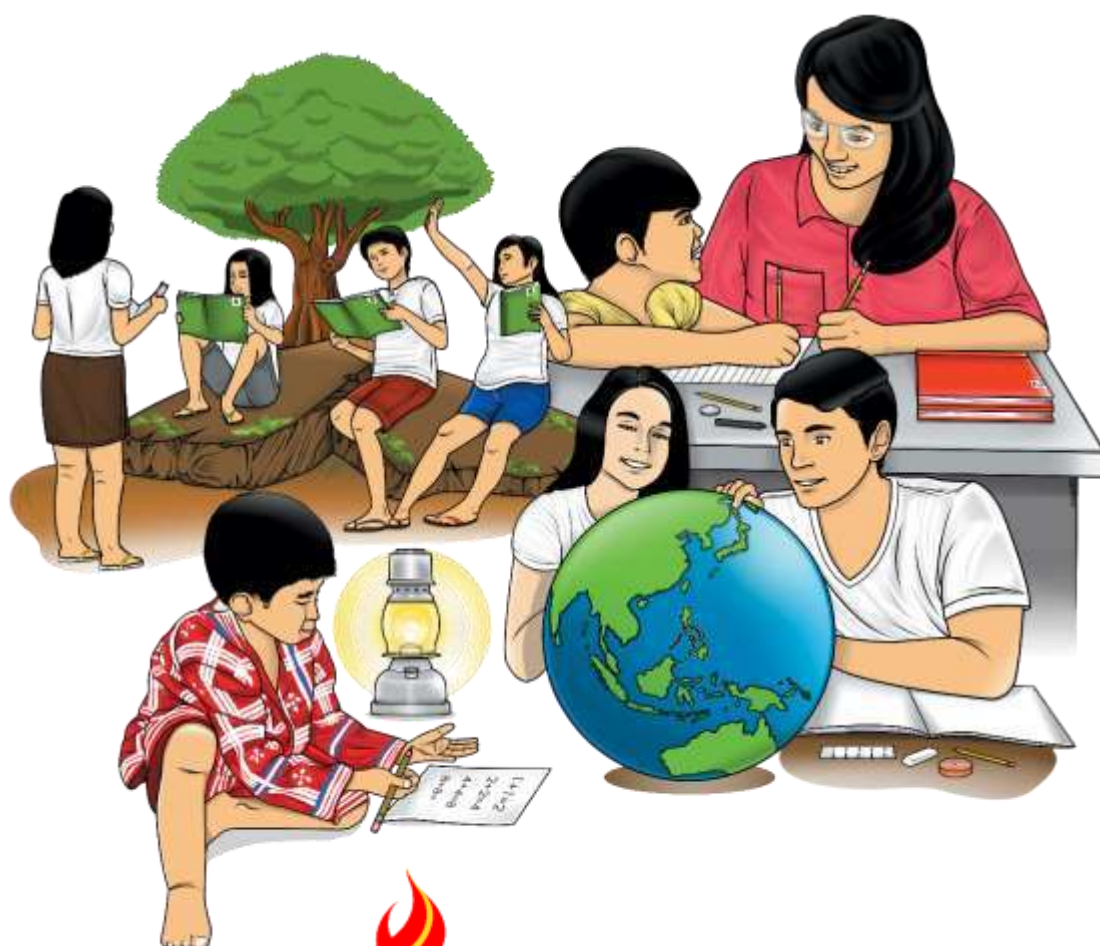


Mathematics

Quarter 2 – Module 2: *Solving Problems Involving Conversion of Units*



Mathematics – Grade 7
Alternative Delivery Mode
Quarter 2 – Module 2: Solving Problems Involving Conversion of Units
First Edition, 2020

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Published by the Department of Education
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Undersecretary: Diosdado M. San Antonio

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Printed in the Philippines by Department of Education – SOCCSKSARGEN Region

Department of Education – Region XII

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Mathematics

Quarter 2 – Module 2: Solving Problems Involving Conversion of Units

Introductory Message

This Self-Learning Module (SLM) is prepared so that you, our dear learners, can continue your studies and learn while at home. Activities, questions, directions, exercises, and discussions are carefully stated for you to understand each lesson.

Each SLM is composed of different parts. Each part shall guide you step-by-step as you discover and understand the lesson prepared for you.

Pre-tests are provided to measure your prior knowledge on lessons in each SLM. This will tell you if you need to proceed on completing this module or if you need to ask your facilitator or your teacher's assistance for better understanding of the lesson. At the end of each module, you need to answer the post-test to self-check your learning. Answer keys are provided for each activity and test. We trust that you will be honest in using these.

In addition to the material in the main text, Notes to the Teacher are also provided to our facilitators and parents for strategies and reminders on how they can best help you on your home-based learning.

Please use this module with care. Do not put unnecessary marks on any part of this SLM. Use a separate sheet of paper in answering the exercises and tests. And read the instructions carefully before performing each task.

If you have any questions in using this SLM or any difficulty in answering the tasks in this module, do not hesitate to consult your teacher or facilitator.

Thank you.



What I Need to Know

This module was designed and written with you in mind. It is here to help you master Solving Problems Involving Conversion of Units. The scope of this module permits it to be used in many different learning situations. The language used recognizes the diverse vocabulary level of students. The lessons are arranged to follow the standard sequence of the course. But the order in which you read them can be changed to correspond with the textbook you are now using.

This module is divided into three (3) subtopics, namely:

- Conversion of Measurement from Metric System unit to another Metric System unit and English System unit to another English System unit.
- Conversion of Measurement from Metric System unit to English System unit and vice versa
- Solving Problems Involving Conversion of Units

After going through this module, you are expected to:

1. convert metric unit to another metric unit (M7ME-IIb-1);
2. convert English system unit to another English system unit (M7ME-IIb-1);
3. convert metric unit to English system unit and vice versa (M7ME-IIb-1); and
4. solve problems involving conversion of units(M7ME-IIb-2).



What I Know

Let us check what you already know about this lesson!

Multiple choice. Read each item carefully. Choose the letter of the best answer and write it on a separate sheet of paper.

1. Convert 36 inches into feet.
A. 3.5 ft
B. 3 ft
C. 2.5 ft
D. 2 ft
2. Convert 27 m³ into cm³.
A. 27, 000 cm³
B. 27, 000, 000 cm³
C. 27, 000, 000, 000 cm³
D. D. 27, 000, 000, 000, 000 cm³

3. Convert 30.5 cm to inches.
 - A. 49.105 inches
 - B. 12.008 inches
 - C. 77.47 inches
 - D. 18.94 inches
4. Convert 7.8 yd to ft.
 - A. 23.4 ft
 - B. 23.8 ft
 - C. 24.3 ft
 - D. 28.3 ft
5. Convert 821 grains to pounds.
 - A. 1.2 lb
 - B. 0.12 lb
 - C. 0.012 lb
 - D. 0.0012 lb
6. Convert 89.89 °F to ° C.
 - A. 32.89 ° C
 - B. 32.16 ° C
 - C. 93.80 ° C
 - D. 41.20 ° C
7. Convert 3 m³ to ft³
 - A. 109.53 ft³
 - B. 105.93 ft³
 - C. 159 ft³
 - D. 195 ft³
8. You had trip to UAE by September where the temperature reaches 52 °C. What is this temperature in Kelvin Scale?
 - A. 235
 - B. 325
 - C. 532
 - D. 253
9. A boy ran a distance of 6.2 kilometers. How many meters did he run?
 - A. 6,200 meters
 - B. 620 meters
 - C. 0.0062 meters
 - D. 0.00062 meters
10. Jose traveled a distance of 126 kilometers in $2\frac{1}{2}$ hours. How many meters did Jose travel?
 - A. 12,600 meters
 - B. 0.126 meters
 - C. 126,000 meters
 - D. 0.00126 meters
11. A man is buying a lot which measures 7,860 square meters. How many hectares of land is he buying?
 - A. 78,600 hectares
 - B. 0.7860 hectare

- C. 786,000hectare
D. 0.07860 hectare
12. Mrs. Dela Cruz is selling a piece of land which measures 3.81 hectares. If the selling price is P2,500 per square meter, how much will she receive from the sale of her land? A. P 95, 250,000
B. P 952,500,000
C. P 9,525,000
D. P 9,525,000,000
13. A tablespoon of syrup is about 10 mL. How many Liters of syrup can a tablespoon hold? A. 10,000L
B. 0.01L
C. 1,000L
D. 0.001L
14. A bridge can support a mass of 2.8 tons. How many kilograms of weight can the bridge support? A. 28,000 kilograms
B. 0.00028 kilograms
C. 2,800 kilograms
D. 0.0028 kilograms
15. The flight time from Manila to General Santos City is 2 hours and 40 minutes. If the plane leaves Manila at 1:30 PM, at what time will it arrive in General Santos City? A. 4:00 PM
B. 3:10 PM
C. 4:10 PM
D. 3:00 PM

Lesson**1****Solving Problems Involving
Conversion of Units**

In this lesson, you will learn how to solve problems involving conversion of units and its prerequisite skill which is the conversion of measurements from one unit to another in both Metric and English systems. Since these systems are widely used in our community, a good grasp of the concept will help you to be more accurate in solving these problems.

***What's In*****Activity 1.**

Instruction: Measure and record your height and other two of your family members in meters. Convert it into feet (ft) and inches (in) and into centimeters (cm). Copy the table below in a separate sheet of paper for your answer. Show your solution.

| Names | Meters (m) | Feet (ft) & Inches (in) | Centimeter (cm) |
|--------------|-----------------------|--|----------------------------|
| 1. | | | |
| 2. | | | |
| 3. | | | |

Questions:

1. How many centimeters taller or shorter are you from the shortest family member indicated in your table?
2. What is the height difference between you and one of the family members in terms of meters, inches, and centimeters?
3. Do you know now how to convert meter and inches to centimeters? How did you convert it?



What's New

Activity 2. Measure Me!

1. Get 2 containers of water.
2. Fill the first container with 1 liter of water.
3. Get a measuring cup.
4. Transfer the water from the first container to the second container using the measuring cup.
5. Record how many cups is 1 liter of water.

Questions:

1. How many cups is 1 liter of water?
2. Give a mathematical statement using the data you gather.
3. Do you have difficulty in performing the activity? Why?



What is It

To be able to solve problems similar to the given activity, we need to practice the skill of converting measurements from one unit to another.

CONVERSION OF MEASUREMENTS FROM ONE UNIT TO ANOTHER

Conversion of units is the conversion between different units of measurement for the same quantity, typically through multiplicative conversion factors. **Conversion Factor** is a number used to change one set of units to another, either by multiplying or dividing. This involves the **English System** which is based on a non-universal way of measuring by means of human body parts or other instrument and the **Metric System** which is based on a decimal system.

The conversion could be from same system: English System to English System or Metric System to Metric System. It could also be from English System to Metric System and vice versa.

The table of conversion is needed to convert one unit to another unit.

MEASURES (ENGLISH, METRIC AND EQUIVALENT)

| Units of Length in English System | Units of Length in the Metric System | System to System Conversions for Length |
|---|---|--|
| 1 foot(ft) = 12 inches (in) 1 yard (yd) = 3 feet (ft) 1 yard (yd) =36 inches (in) 1 mile (mi) = 5,280 feet (ft) | 1, 000 millimeter (mm) = 1 meter 100 centimeters (cm) = 1meter 10 decimeter (dm) = 1 meter 1 dekameter (dam) = 10 meters 1 hectometer (hm) = 100 meters 1 kilometer (km) = 1000 meters | 1 in = 2.54 cm 1 meter \approx 3. 28 ft 1 foot \approx 0.30 m 1 yard \approx 0.91 m 1 km \approx 0.62 mi |
| Units of Mass in English System | Units of Mass in the Metric System | System to System Conversions for Mass |
| 1 ounces (oz) = 437.5 grains 1 pound (lb) = 16 ounces (oz) 1 ton (T) = 2, 000 lb | 1 gram (g) = 1, 000 milligram (mg) 1 gram (g) = 100 centigram (cg) 1 kilogram (kg)= 1000 grams (g) 1 metric ton (t) = 1, 000 kg | 1 oz \approx 28.3 g 1 lb \approx 0.45 kg |

| Units of Area in English System | Units of Area in the Metric System | System to System Conversions for Area |
|--|---|--|
| $1 \text{ ft}^2 = 144 \text{ in}^2$ $1 \text{ yd}^2 = 9 \text{ ft}^2$ $1 \text{ acre} = 43,560 \text{ ft}^2$ $1 \text{ mi}^2 = 640 \text{ acres}$ | $1 \text{ cm}^2 = 100 \text{ mm}^2$ $1 \text{ dm}^2 = 100 \text{ cm}^2$ $1 \text{ m}^2 = 100 \text{ dm}^2$ $1 \text{ are (a)} = 100 \text{ m}^2$ $1 \text{ hectare (ha)} = 100 \text{ a}$ $100 \text{ hectares (ha)} = 1 \text{ km}^2$ | $1 \text{ in}^2 \approx 6.45 \text{ cm}^2$ $1 \text{ m}^2 \approx 1.196 \text{ yd}^2$ $1 \text{ ha} \approx 2.47 \text{ acres}$ |
| Units of Volume in English System | Units of Volume in the Metric System | System to System Conversions for Volume |
| $1 \text{ ft}^3 = 1,728 \text{ in}^3$ $1 \text{ yd}^3 = 27 \text{ ft}^3$ $1 \text{ cord} = 128 \text{ ft}^3$ | $1 \text{ cc} = 1 \text{ cm}^3$ $1 \text{ mL} = 1 \text{ cm}^3$ $1 \text{ L} = 1,000 \text{ mL}$ $1 \text{ hL} = 100 \text{ L}$ $1 \text{ kL} = 1,000 \text{ L}$ | $1 \text{ in}^3 \approx 16.39 \text{ mL}$ $1 \text{ liter} \approx 1.06 \text{ qt}$ $1 \text{ gallon} \approx 3.79 \text{ liters}$ $1 \text{ m}^3 \approx 35.31 \text{ ft}^3$ $1 \text{ quart} \approx 0.95 \text{ L}$ |

| Units of Fluid Volume in English System | Units of Time in Both System | System to System Conversions for Temperature |
|---|---|--|
| 1 tablespoon (T) = 3 teaspoons (tsp) 1 fluid ounce (fl oz) = 2T 1 cup (c) = 8 fl oz 1 pint (pt) = 2 c 1 quart (qt) = 2 pt 1 gallon (gal) = 4 qt 1 gal = 128 fl oz 1 barrel = 42 gallon | 1 millisecond=1000 microseconds 1 second = 1000 millisecond 1 minute = 60 seconds 1 hour = 60 minutes 1 day ≈ 24 hours (hrs) 1 month ≈ 30 days 1 year ≈ 365 days 1 banking year = 360 days 1 decade = 10 years 1 score = 20 years 1 millennium = 1, 000 years | $^{\circ}\text{F} \rightarrow ^{\circ}\text{C}$ $^{\circ}\text{C} = \frac{5}{9} (^{\circ}\text{F} - 32)$ $^{\circ}\text{C} \rightarrow ^{\circ}\text{F}$ $^{\circ}\text{F} = \frac{9}{5} ^{\circ}\text{C} + 32$ $^{\circ}\text{K} \rightarrow ^{\circ}\text{C}$ $^{\circ}\text{K} = ^{\circ}\text{C} + 273$ |

METRIC PREFIXES

| Giga (G) | Mega (M) | Kilo (k) | Hecto (h) | Deka (da, D) | Gram(g) Meter(m) Liter(L) | Deci (d) | Centi (c) | Milli (m) | Micro (μ) | Nano (n) |
|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|---------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| 10⁹ | 10⁶ | 10³ | 10² | 10¹ | 1 | 10⁻¹ | 10⁻² | 10⁻³ | 10⁻⁶ | 10⁻⁹ |

How to Convert A Unit of Measurement to Another Unit

1. Compare the two units.
2. Find the conversion factors that gives the appropriate ratio to the given unit.
3. Write the conversion as a fraction, where the denominator is in the same unit as the given unit.
4. Write a multiplication problem with the original number and the fraction
5. Cancel out similar units that appears on the numerator and denominator.
6. Solve.

Illustrative Examples

1. Conversion of length

1.a. Convert 108 inches into feet.

Given: 108 inches

12 inches = 1 ft **Conversion factor**

$$\frac{1 \text{ ft}}{12 \text{ in}};$$

Write the conversion as a fraction

$$108 \text{ in} \times \frac{1 \text{ ft}}{12 \text{ in}};$$

Write a multiplication problem with the original number and the fraction.

$$108 \cancel{\text{ in}} \times \frac{1 \text{ ft}}{12 \cancel{\text{ in}}};$$

Cancel out similar units that appears on the numerator and denominator

$$\frac{108 \text{ ft}}{12} = 9 \text{ ft}$$

Solve.

1.b. Convert 39 decimeters into millimeters.

Given: 39 dm

$$10 \text{ dm} = 1 \text{ m};$$

conversion factor dm to m.

$$1 \text{ m} = 1000 \text{ mm};$$

conversion factor m to dm.

$$\frac{1 \text{ m}}{10 \text{ dm}} \text{ and } \frac{1000 \text{ mm}}{1 \text{ m}};$$

Write the conversion as a fraction.

$$39 \text{ dm} \times \frac{1 \text{ m}}{10 \text{ dm}} \times \frac{1000 \text{ mm}}{1 \text{ m}};$$

Write a multiplication problem with the original number and the fraction.

$$39 \cancel{\text{ dm}} \times \frac{1 \cancel{\text{ m}}}{10 \cancel{\text{ dm}}} \times \frac{1000 \cancel{\text{ mm}}}{1 \cancel{\text{ m}}};$$

Cancel out similar units that appears on the numerator and denominator.

$$\frac{39.000 \text{ mm}}{10} = 3900 \text{ mm};$$

Solve.

1.c. Convert 18.9 miles into meters.

$$\textbf{Solution:} \quad 18.9 \cancel{\text{ mi}} \times \frac{1 \cancel{\text{ km}}}{0.62 \cancel{\text{ mi}}} \times \frac{1000 \text{ m}}{1 \cancel{\text{ km}}} \approx \frac{18,900 \text{ m}}{0.62} \approx 30,483.87 \text{ m}$$

2. Conversion of mass

2.a. Convert 7.2 pounds into ounces.

$$\textbf{Solution:} \quad 7.2 \cancel{\text{lb}} \times \frac{16 \text{ oz}}{1 \cancel{\text{lb}}} = 115.2 \text{ oz}$$

2.b. Convert 3.5 kilogram into grams.

$$\textbf{Solution:} \quad 3.5 \cancel{\text{kg}} \times \frac{1000 \text{ g}}{1 \cancel{\text{kg}}} = 3500 \text{ g}$$

2.c. Convert 11.3 grams into pounds.

$$\textbf{Solution:} \quad 11.3 \cancel{\text{g}} \times \frac{1 \cancel{\text{oz}}}{28.3 \cancel{\text{g}}} \times \frac{1 \text{ lb}}{16 \cancel{\text{oz}}} \approx \frac{11.3 \text{ lb}}{452.8} \approx 0.025 \text{ lb}$$

3. Conversion of area

3.a. Convert 1.7 acre to square yard.

$$\textbf{Solution:} \quad 1.7 \cancel{\text{acre}} \times \frac{43,560 \cancel{\text{ft}^2}}{1 \cancel{\text{acre}}} \times \frac{1 \text{ yd}^2}{9 \cancel{\text{ft}^2}} = \frac{74,052 \text{ yd}^2}{9} = 8,228 \text{ yd}^2$$

3.b. Convert 1.2 hectare to square meter.

$$\textbf{Solution:} \quad 1.2 \cancel{\text{ha}} \times \frac{100 \cancel{\text{a}}}{1 \cancel{\text{ha}}} \times \frac{100 \text{ m}^2}{1 \cancel{\text{a}}} = 12,000 \text{ m}^2$$

3.c. Convert 3 square meters to square yards.

$$\textbf{Solution:} \quad 3 \cancel{\text{m}^2} \times \frac{1.196 \text{ yd}^2}{1 \cancel{\text{m}^2}} \approx \frac{3.588 \text{ yd}^2}{1} \approx 3.588 \text{ yd}^2$$

4. Conversion of volume

4.a. Convert 2.4 cubic yard to cubic feet.

$$\textbf{Solution:} \quad 2.4 \cancel{\text{yd}^3} \times \frac{27 \text{ ft}^3}{1 \cancel{\text{yd}^3}} = 64.8 \text{ ft}^3$$

4.b. Convert 7,200 cubic centimeter to liter.

$$\textbf{Solution:} \quad 7,200 \cancel{\text{cm}^3} \times \frac{1 \cancel{\text{mL}}}{1 \cancel{\text{cm}^3}} \times \frac{1 \text{ L}}{1,000 \cancel{\text{mL}}} = \frac{7,200 \text{ L}}{1,000} = 7.2 \text{ L}$$

4.c. Convert 5 gallons to liter.

$$\textbf{Solution:} \quad 5 \cancel{\text{gallons}} \times \frac{3.7 \text{ L}}{1 \cancel{\text{gallon}}} \approx 18.95 \text{ L}$$

5. Conversion of fluid volume

Convert 3 cups to tablespoons.

$$\textbf{Solution:} \quad 3 \cancel{\text{c}} \times \frac{8 \cancel{\text{fl oz}}}{1 \cancel{\text{c}}} \times \frac{2 \text{ tbsp}}{1 \cancel{\text{fl oz}}} = 48 \text{ tbsp}$$

6. Conversion of time

Convert $\frac{1}{2}$ month to hours.

$$\textbf{Solution:} \quad 0.5 \cancel{\text{month}} \times \frac{30 \cancel{\text{days}}}{1 \cancel{\text{month}}} \times \frac{24 \text{ hrs}}{1 \cancel{\text{day}}} \approx 360 \text{ hrs}$$

7. Conversion of temperature

Convert 60 °F to °C.

$$\textbf{Solution:} \quad ^\circ\text{C} = \frac{5}{9} (^\circ\text{F} - 32)$$

$$^\circ\text{C} = \frac{5}{9} (60 - 32)$$

$$^\circ\text{C} = \frac{5}{9} (28)$$

$$^\circ\text{C} = \frac{140}{9} \approx 15.56$$

SOLVING PROBLEMS INVOLVING CONVERSION OF UNITS OF MEASURE

Knowledge of measurement and problem-solving strategies are necessary in solving routine and nonroutine word problems. Many problems can be solved using arithmetic or algebraic processes. There are problems, however, that can be solved by simply drawing a diagram.

Example 1. There is a jar on the cabinet by the refrigerator. If Keona pours 114 ounces of water into the jar three times to fill it, how many quarts of water does it take to fill the jar?

Solution:

$$114 \times 3 = 342 \quad \text{ounces of water in 3 jars}$$

$$342 \text{ ounces} = \underline{\hspace{2cm}} \text{ quarts}$$

To convert ounces to quarts, we need the following equivalents:

$$8 \text{ oz} = 1 \text{ cup}$$

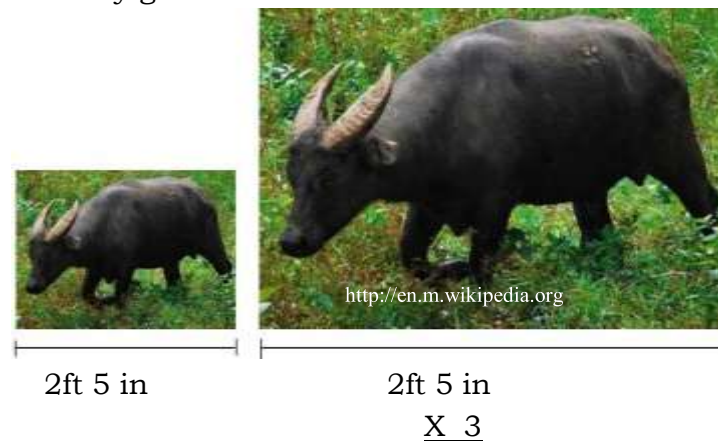
$$2 \text{ c} = 1 \text{ pt}$$

$$2 \text{ pt} = 1 \text{ qt}$$

$$\text{Thus, } 342 \text{ oz} \times \frac{1 \text{ c}}{8 \text{ oz}} \times \frac{1 \text{ pt}}{2 \text{ c}} \times \frac{1 \text{ qt}}{2 \text{ pt}} = \frac{342 \text{ qt}}{32} = \mathbf{10.69 \text{ qt.}}$$

Therefore, it takes 10.69 quarts of water to fill the three jars.

Example 2. A tamaraw calf was 2 foot 5 inches long. Fully grown, it is 3 times as long. How long is the fully grown tamaraw?



Solution: First, we multiply each unit by 5.

$$(2\text{ft } 5\text{in}) (3) = 6\text{ft } 15\text{in}$$

To convert 15 inches to feet, we multiply the inches by the conversion factor.

$$6\text{ft } 15\text{in} = 6\text{ft} + (15\text{in} \times (\frac{1\text{ft}}{12\text{in}}))$$

$$= 6\text{ft} + 1\text{ft} + 3\text{in} = \mathbf{7\text{ft}}$$

3 in.

Example 3. How much water, in cubic centimeters, can a cubical water tank hold if it has an edge of 3 meters?

Solution 1: (using a conversion factor)

$$\text{i. Volume} = e^3 = (3\text{m})^3 = 27\text{m}^3$$

$$\text{ii. } 27\text{m}^3 \times \frac{100\text{cm}^3}{1\text{m}^3} = 27,000,000 \text{ cm}^3$$

Solution 2:

$$\text{i. } 3\text{m} \times \frac{100\text{cm}^3}{1\text{m}^3} = 300 \text{ cm}$$

$$\text{ii. Volume} = e^3 = (300\text{cm})^3 = 27,000,000 \text{ cm}^3$$

Example 4. Joel is using a bed which is 2 meters long and 1.3 meters wide. What is the size of the bed in square centimeters?

Step 1:

$$\text{Area} = l \times w$$

$$\text{Area} = 2 \text{ m} \times 1.3 \text{ m}$$

$$\text{Area} = 2.6$$

Step 2:

$$\text{Area} = 2.6 \text{ m}^2 \times \frac{100 \text{ dm}^2}{1 \text{ m}^2} \times \frac{100 \text{ cm}^2}{1 \text{ dm}^2} = 26,000 \text{ cm}^2$$

Example 5. A forwarding company charges ₱1,100 for the first 20 kg and ₱60 for each succeeding 2 kg for freight sent to Europe. How much do you need to pay for a box weighing 88 lb?

Solution:

Step 1:

$$88 \text{ lb} \times \frac{0.45 \text{ kg}}{1 \text{ lb}} = 39.6 \text{ kg}$$

Step 2:

$$39.6 \text{ kg} - 20 \text{ kg} = 19.6 \text{ kg}$$

Step 3:

$$\frac{19.6 \text{ kg}}{2 \text{ kg}} \times 60 = ₱588$$

Step 4:

$$20 \text{ kg} = ₱1,100$$

$$19.6 \text{ kg} = ₱588$$

$$₱1,688$$

Conclusion:

Therefore, the company pays ₱1,688 for 88 lb of box.



What's More

Activity 3.

Convert the following to the indicated measurement:

- | | | | |
|---------------------------|-------------------------|-------------------------|----------------|
| 1. 86 km | = _____ dam | 9. 6, 600 min | = _____ hr |
| 2. 2 mi | = _____ in | 10. 415° °F | = _____ °C |
| 3. 20 in | = _____ cm | 11. 130 °C | = _____ °F |
| 4. 25.1 gal | = _____ L | 12. 2.3 gallon | = _____ qt |
| 5. 45 acre | = _____ km ² | 13. 632 ft ³ | = _____ cord |
| 6. 67.33 qt | = _____ gal | 14. 5.1 lb | = _____ grains |
| 7. 90. 67 km ² | = _____ ha | 15. 1,800 oz | = _____ kg |
| 8. 6 days | = _____ s | | |

Activity 4. Word Problems

Solve the given word problems below and show all necessary solutions.

1. A man with the flu has a temperature of 102°F. What is his temperature on the Celsius scale?
2. The engine in a car has a 12 L displacement. What is the displacement in cubic inches?
3. A family decides to put tiles in the entryway of their home. The entryway has an area of 6 square meters. If each tile is 5 centimeters by 5 centimeters, how many tiles will it take to cover the entryway?



What I Have Learned

Fill in the missing word in the blank. Choose the correct answer from the box.

| | | | |
|--------------------|------------|----------|----------------------------|
| units | conversion | factor | Knowledge of measurement |
| conversion of unit | | similar | problem-solving strategies |
| fraction | | original | |

1. _____ is the conversion between different units of measurement for the same quantity, typically through multiplicative conversion factors.

To convert units of measurement to another, we must:

2. Compare the two _____.
3. Find the _____ that gives the appropriate ratio to the given unit.
4. Write the conversion as a _____, where the denominator is in the same unit as the given unit.
5. Write a multiplication problem with the _____ number and the fraction.
6. Cancel out _____ units that appears on the numerator and denominator. Solve.
7. _____ and _____ are necessary in solving routine and nonroutine word problems. Though many problems can be solved using arithmetic or algebraic processes, some problems can be solved by simply drawing a diagram.

Summary:

- When converting measurements from one unit to another, it is very important that we know the table of conversion because this will serve as our reference.
- There are measurements that have no direct conversion in the table, so we should know the easiest conversion factor to start with.
- The mastery of prerequisite knowledge and skills in conversion is necessary in solving problems involving conversion of units with the different strategies in problem solving.



What I Can Do

- A. Convert the following measurement in each given problem. Show your solution on a separate sheet.

- _____ 1. A football field is 100 yards long. How long is the football field in inches?
- _____ 2. The most common ceiling height in houses is 8 feet. How many yards is this?
- _____ 3. What is the capacity (volume) in pints of a 1-gallon container of milk?
- _____ 4. A sport car has a 2.2 liters engine. What is the displacement (volume) of the engine in milliliter?
- _____ 5. A basin contains 670 cubic milliliters of water. How many Liters of water is in the basin?

- B. Read and understand the given situation and use your learning on solving problems involving units of measure to solve the given problems. Show your complete solution on a separate sheet.

- 1. A three - layer cake weighs half a kilogram per layer. In each layer, the cake is decorated with icing which weighs 100 g. A candle which weighs 250 g is added. What is the total weight in kilogram of the fully decorated cake?
- 2. A landscaper is putting in a brick patio. The area of the patio is 110 square meters. If the bricks measure 10 cm by 20 cm, how many bricks will it take to make the patio?



Assessment

Multiple Choice. Read each item carefully. Choose the letter of the correct answer and write it on a separate sheet of paper.

1. Which of the following temperature is warmer?
 - A. 20 °F
 - B. 10 °C
 - C. 150 °K
 - D. They are the same
2. Convert 27 m³ into cm³.
 - A. 27, 000 cm³
 - B. 27, 000, 000 cm³
 - C. 27, 000, 000, 000 cm³
 - D. 27, 000, 000, 000, 000 cm³
3. Convert 8 meters into inches.
 - A. 619.314 in
 - B. 961.314 in
 - C. 314.961 in
 - D. 413.961 in
4. Which of the following is equal to 10 yards?
 - A. 360 inches
 - B. 51 ft
 - C. 10 m
 - D. 1500 cm
5. You had trip to Japan last September where the temperature reaches 52 °C. What is this temperature in Kelvin?
 - A. 235
 - B. 325
 - C. 532
 - D. 253
6. The teacher asked the students to convert 7 pounds to kg. Maria answered 3.18 kg, Jose answered 3. 19 kg, and Tess answered 3.1 kg. Who got the correct answer?
 - A. Maria
 - B. Jose
 - C. Tess
 - D. None of them

7. Four Cyclist joined the 10 km bicycle race of Barangay Masagana. The cyclist arrived with the following total time:
- Cyclist A** – 1 hr, 6 minutes and 30 seconds
 - Cyclist B** – 68 minutes and 128 seconds
 - Cyclist C** – 66 minutes and 34 seconds
 - Cyclist D** – 65 minutes and 85 seconds
- Who among the cyclist arrived first?
- A. Cyclist A
 - B. Cyclist B
 - C. Cyclist C
 - D. Cyclist D
8. Two friends, Arman and Ethan, run in marathons. Arman finished a 21kilometer marathon in Gen. Santos City while Ethan finished a 15-mile marathon in California. Who between the two ran a longer distance? By how many meters?
- A. Arman by 3,000 m more
 - B. Ethan by 3, 000 m more
 - C. Arman by 2,500 m more
 - D. Ethan by 2,500 m more
9. Karen wants to fence her square garden which has a side of 20 feet, with two rows of barb wire. The store sold barb wire by the meter at ₱12 per meter. How much money will Karen need to buy the barb wire she needs?
- A. ₱ 855.00
 - B. ₱ 585.00
 - C. ₱ 588.00
 - D. ₱ 885.00
10. A chocolate box in a form of a triangular prism has a base of 3 cm and a height of 4.5 cm and the box's height is 25 cm. What is the volume of the box into cubic inches?
- A. 10.296 in³
 - B. 12.091 in³
 - C. 9.109 in³
 - D. 11.872 in³
11. How many hectares is a piece of land which is 576 meters long and 450 meters wide?
- A. 25.29 ha
 - B. 29.52 ha
 - C. 25.92 ha
 - D. 29.25 ha

12. How much water in cubic centimeters, can a cubical water tank hold if it has an edge of 3 meters?
- A. 27, 000, 000 cm^3
 - B. 27, 000 cm^3
 - C. 270, 000, 000 cm^3
 - D. 27, 000, 000, 000 cm^3
13. How many months are there in 10 decades?
- A. 120
 - B. 1,200
 - C. 10,000
 - D. 12,000
14. When Jose weighed his balikbayan box, its weight was 34 kg. When he got to the airport, he found out that the airplane charged ₱ 25 for each lb in excess of the free baggage allowance of 50lb. How much will Jose pay for the excess weight?
- A. ₱ 260
 - B. ₱ 620
 - C. ₱ 630
 - D. ₱ 360
15. Maria was preparing the oven to bake brownies. The recipe's direction was to pre heat the oven to 350 $^{\circ}\text{F}$ but her oven thermometer was in $^{\circ}\text{C}$. What should be the thermometer reading before Maria puts the baking pan full of the brownie mix in oven?
- A. 176.67 $^{\circ}\text{C}$
 - B. 167.67 $^{\circ}\text{C}$
 - C. 176.76 $^{\circ}\text{C}$
 - D. 167.76 $^{\circ}\text{C}$



Additional Activities

These activities are given to enrich your knowledge about the lesson that you have learned in this module.

Direction:

Read carefully and understand the given situation. Solve each given problem. Show your complete solution.

1. A student averaged 45 miles per hour on a trip. What was the student's speed in feet per second?
2. Baking recipe requires an oven sitting of 380 °F. What is this temperature in degree Celsius?
3. Jaycee makes a square garden with the measure of 15 yd. on one side. What is the perimeter of the square garden in feet?
4. Kath weighs 115 lbs. while Sarah weighs 49.55 kg. Who is heavier between them? By how much?
5. A cylindrical water tank has a diameter of 4 feet and height of 7 feet while a water tank shaped like a rectangular prism has a length of 1 meter, a width of 2 meters and a height of 2 meters. Which of the two tanks can hold more water? By how many cubic meters?



Answer Key

| | | |
|--|---|---|
| What I Know 1.B 2.B 3.B 4.A 5.B 6.B 7.B 8.B 9.A 10.C 11.B 12.A 13.B 14.C 15.C | What's More <i>Activity 3</i> 1 8,600 dam 2 126, 720 in 3 50. 8 cm 4 95.129L 5 0.1821 L 6 16.8325 gal 7 9067 ha 8 518, 400 s 9 110 hrs 10 212.78 °C 11 266 °F 12 9.2 qt 13 4.938 cord 14 35, 700 grains 15 50.94 | Activity 4 1. 38.9°C 2. 732.154 in 3. 2,400 tiles |
| What I Have Learned 1. Conversion of Units 2. Factor 3. Multiply 4. Similar Knowledge of measurement, problem solving strategies | What I can do 1. 3,600 in 2. 2.67 yards 3. 8 pints 4. 2,200 mL 5. 0.00067 L Assessment 1. B 2. B 3. C 4. A 5. B 6. A 7. D 8. B | Additional Activities 1. 66 ft/s 2. 193.33 3. 180 ft 4. Kath, 2.2 kg or 4.89 lb 5. The rectangular water tank can hold 1.5 m more than the cylindrical tank |

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