6

DepED
DEPARTMENT OF EDUCATION

MATHEMATICS

Quarter 1 – Module 2:
New Normal Math

What I Need to Know

At the end of this module, the learner will be able to:

- Multiply simple fractions by another simple fraction or by a mixed fractions.
- - Multiply mixed fraction by another mixed fraction
- -Change mixed fraction to simple fraction

This module discusses multiplication of simple fractions and mixed fractions. It will develop your skills in multiplying fractions. Most importantly, this module provides you different techniques in multiplying simple fractions and mixed fractions that in order to help you to become confident in doing the activities.

Discussions and steps were included. Enrichment activities are designed to aid your mastery of the lesson.

How to learn from this module?

This is your guide for the proper use of the module:

1. Read the items in the module carefully.
2. Follow the directions as you read the materials.
3. Answer the questions that you encounter. As you go through the module, you will find help to answer these questions. Sometimes, the answers are found at the end of the module for immediate feedback.
4. To be successful in undertaking this module, you must be patient and diligent in doing suggested tasks.
5. Take your time to study and learn.

ENJOY LEARNING!

What I Know

A. Find the product of the following problems. Simplify your answer.

1. $\frac{4}{5} \times \frac{2}{5} =$

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

3. $3\frac{3}{5} \times \frac{3}{6} =$

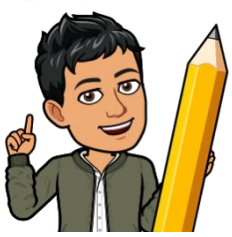
4. $3\frac{3}{6} \times 5\frac{1}{7} =$

5. $4\frac{2}{3} \times 2\frac{5}{6} =$

B. Solve the following problems using appropriate strategy or tools.

1. Rayver can build $4\frac{)}{*}$ of his robot toy collection for 1 hour. How many robots can he build in $1\frac{+}{,}$ hr?

2. A long jump competition was held at Barangay Mathalino. John Mark jumped $\frac{+}{,}$ of 6 $\frac{,}{*}$ meters of the field. How far did John Mark jump?



Lesson 1

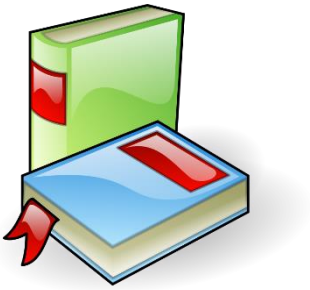
At the end of this lesson, you are expected to:

- multiply simple fractions and mixed fractions.

Introduction:

Multiplication of Fractions ***(Communication)***

To multiply a simple fraction by another simple fraction, write the product of the numerators over the product of the denominators. Simplify if possible.



To multiply fractions involving mixed fractions, rename the mixed fraction as simple fraction then continue it by following the steps above.

What's In

A. Change the following mixed fractions to simple fractions.

1. $8\frac{2}{5}$
2. $16\frac{2}{3}$
3. $15\frac{3}{4}$
4. $10\frac{2}{\ }$
5. $20\frac{\ }{\ }$

B. Reduce the following fraction to lowest terms.

1. $\frac{15}{20}$
2. $\frac{25}{50}$
3. $\frac{18}{54}$
4. $\frac{26}{34}$

5. $\frac{80}{90}$

What's New *(Communication)*

1. How do we multiply fractions?

*We multiply by means of numerator by numerator and denominator by denominator.

Simple Fraction by simple fraction

$$\frac{2}{5} \times \frac{3}{7} = \frac{2 \times 3}{5 \times 7} = \boxed{\frac{6}{35}}$$

Since, the answer does not have common factor it means it is in the lowest term.

$$\frac{10}{12} \times \frac{2}{6} = \frac{10 \times 2}{12 \times 6} = \frac{20}{72}$$

By this time, the answer have a common factor so we need to find the GCF and use it to lowest term your answer, look on what I did.

GCF

20 = 1, 2,4,5,10,20
72 = 1,2,3,4,6,8,9,12,18,24,36,72
Common factors: 1,2,4
GCF = 4

$$\frac{20}{72} \div \frac{4}{4} = \boxed{\frac{5}{18}}$$

Simple fraction by mixed fraction

$$\frac{5}{7} \times 3\frac{1}{9}$$

Note: Change first the mixed fraction to simple fraction by multiplying the whole number to the denominator and add it to the numerator write the sum above the denominator.

$$\frac{5}{7} \times \frac{28}{9} = \frac{5 \times 28}{7 \times 9} = \frac{140}{63}$$

Since, the product is improper fraction we have to change it to mixed fraction. How? Just divide. The quotient becomes the whole number while the remainder will be the numerator, then the divisor is the denominator. Look what I have done?

63 140

$$\begin{array}{r|l} & \mathbf{2} \\ \hline \mathbf{63} & \mathbf{140} \\ & \mathbf{-126} \\ \hline & 14 \end{array}$$

so, it becomes

$2\frac{\mathbf{14}}{\mathbf{63}}$ reduce the fraction In lowest term

GCF
14 = 1, 2, 7, 14
63 = 1, 3, 7, 9, 21,63
Common factors: 1,7
GCF = 7

$$2\frac{14}{63} \div \frac{7}{7} = \boxed{2\frac{2}{9}}$$

Mixed fraction by simple fraction

$$4\frac{1}{3} \times \frac{2}{5}$$

$$\frac{13}{3} \times \frac{2}{5} = \frac{13 \times 2}{3 \times 5} = \frac{26}{15}$$

To change mixed fraction to simple fractions just refer what we have done above.

Since, the product is improper fraction we have to change it to mixed fraction. How? Just divide. The quotient becomes the whole number while the remainder will be the numerator, then divisor is the denominator. Look what I have done?

$$\begin{array}{r|l} & 1 \\ 15 & 26 \\ & -15 \\ \hline & 11 \end{array}$$

so, it becomes

$$1\frac{11}{15}$$

$$\boxed{1\frac{11}{15}}$$

Since, the answer does not have common factor it means it is in the lowest term.

Mixed fraction by mixed fraction

$$2\frac{1}{2} \times 6\frac{1}{4}$$

$$\frac{5}{2} \times \frac{25}{4} = \frac{5 \times 25}{2 \times 4} = \frac{125}{8}$$

Note: Change first the mixed fraction to simple fraction by multiplying the whole number to the denominator and add it to the numerator write the sum above the denominator.

$$\begin{array}{r|l} & 15 \\ 8 & 125 \\ & -8 \\ \hline & 45 \\ & -40 \\ \hline & 5 \end{array}$$

so, it becomes

$$15\frac{5}{8}$$

Since, the product is improper fraction we have to change it to mixed fraction. How? Just divide, the quotient becomes the whole number while the remainder will be the numerator, then divisor is the denominator. Look what I have done?

$$\boxed{15\frac{5}{8}}$$

Since, the answer does not have common factor it means it is in the lowest term.

What is It

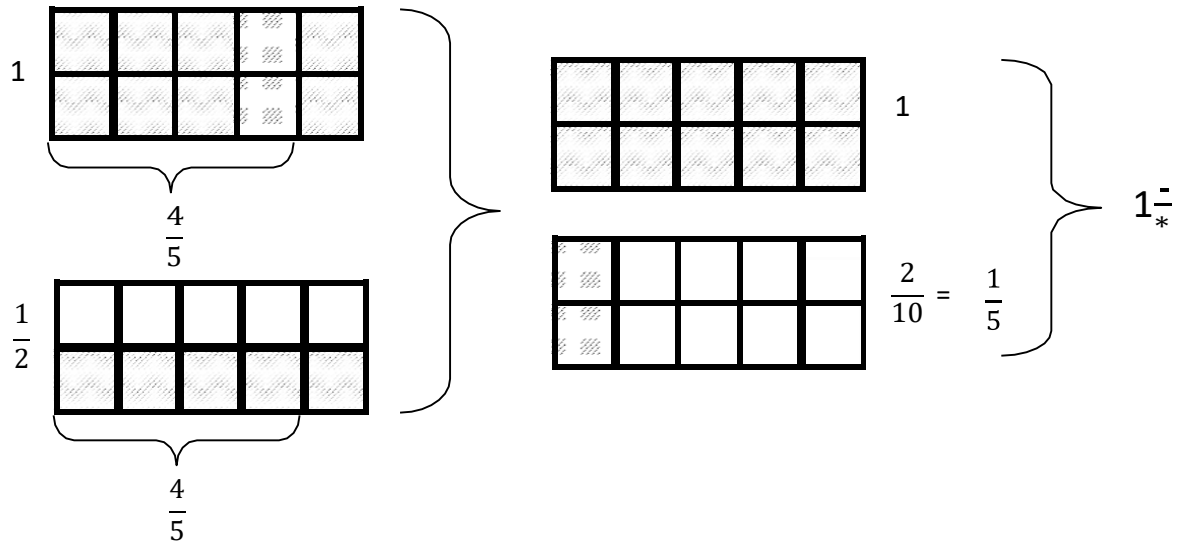
2. Study the word problem.

"Mr. Peñaflor has a small garden plot in his place. Since he can't go out and go to work because of the ECQ due to COVID19, he decided to plant his own vegetables on his garden plot with $\frac{4}{5}$ meters long and $1\frac{1}{2}$ meter wide. He wanted to know how big is his garden because he planned to share some of his harvest to his neighbours. Let us help him find the area of his plot?"

Answer the following:

a. What is asked in the problem? ***The area of the plot***
b. What are the given facts?
What is the length of the plot? $\frac{4}{5}$ **meters long**
What is the width of the plot? $1\frac{1}{2}$ **meter wide**
c. What operation will you use to solve the problem? **Multiplication** *Since it is finding the area*
d. What kind of fractions are to be multiplied? ***Mixed fraction & simple fraction***
e. How will you get the answer? ***Multiply mixed fraction with simple fraction***
f. What character trait did Mr. Penaflor exhibit in the problem? **Generous**
g. Why do you say so?
h. If you were Mr. Penaflor would you do the same?

Block Model



The area of the garden plot is $\mathbf{1\frac{1}{5}}$ square meter.

Abstract / Computation ***(Critical Thinking)***

Change the mixed fraction to simple fraction

$$1\frac{1}{2} = \frac{2 \times 1 + 1}{2} = \frac{3}{2}$$

Let's do the computation.

$$\frac{3}{2} \times \frac{8}{10} = \frac{3 \times 8}{2 \times 10} = \frac{24}{20} = 1\frac{4}{20} \div \frac{4}{4} = 1\frac{1}{5}$$

The area of the garden plot is $1\frac{1}{5}$ square meter.

You can also compute it using cancellation. Since both are divisible by 2. Remember in cancellation it should be one numerator and one denominator only.

$$\frac{3}{\cancel{2}_{1}} \times \frac{\cancel{8}^{2}}{10} = \frac{3 \times 2}{1 \times 5} = \frac{6}{5} = 1\frac{1}{5}$$

3. Try another one.

Chef Jan Kristian thinks how he can help the community regarding the COVID19 pandemic which resulted to a community quarantine. He then made bread for front liners. He used $3\frac{3}{5}$ *cups of flour to make a small loaf of bread. A medium-sized loaf requires* $1\frac{1}{4}$ *times that amount. How much flour did he use in the medium-sized loaf?*

Find the amount of flour used in the medium-sized of loaf.

Change the mixed fraction to simple fraction

$$3\frac{3}{5} = \frac{5 \times 3 + 3}{5} = \frac{18}{5}$$

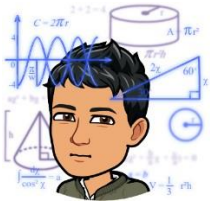
$$1\frac{1}{4} = \frac{4 \times 1 + 1}{4} =$$

$$\frac{18}{5} \times \frac{5}{4} = \frac{18 \times 5}{5 \times 4} = \frac{90}{20} = 4\frac{10}{20} \div \frac{10}{10} = 4\frac{1}{2}$$

You can also compute it using cancellation. Remember in cancellation it should be one numerator and one denominator only.

$$\frac{\cancel{18}^{9}}{\cancel{5}_{1}} \times \frac{5}{\cancel{4}_{2}} = \frac{9 \times 1}{1 \times 2} = \frac{9}{2} = 4\frac{1}{2}$$

Chef Jan Kristian needed $4\frac{1}{2}$ cups of flour for a medium-sized loaf.



What's More

Activity #1 *(Critical Thinking)*

Multiply the following fractions.

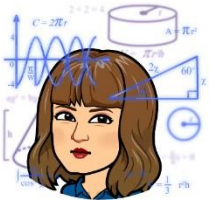
1. $\frac{-}{+} \times \frac{-}{*} =$

2. $6\frac{\pm}{,} \times \frac{\pm}{*} =$

3. $\frac{\lambda}{*} \times 3\frac{\pm}{,} =$

4. $10\frac{\pm}{,} \times 2\frac{-}{+} =$

5. $4\frac{-}{+} \times 5\frac{\pm}{,} =$

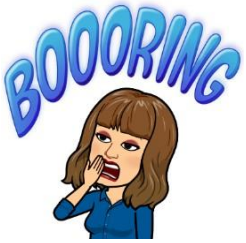


Activity #2 *(Creativity and Collaboration)*

Solve the equation using illustration (block model), you can do it with your family inside your house. (Use bond paper or sheet of your ol notebooks)

$$\frac{-}{+} \text{ of } 2\frac{-}{,} = N$$

What can you say about the activity? (Encircle how you feel)



Activity #3 *(Critical Thinking)*

Solve the following. Write the answer in simplest form, whenever possible.

1. Multiply $2\frac{}{}$ by $3\frac{}{}$.

2. What is $3\frac{}{}$ of $2\frac{}{}$?

3. Find the product of $1\frac{}{}$ and $4\frac{}{}$.

What I Have Learned

To multiply mixed fraction and simple fraction, change all the fractions to simple fractions. Multiply the numerator by numerator and the denominator by the denominator. Reduce the product to lowest term whenever possible.

To change mixed fraction to simple fraction

$$a\frac{b}{c} = \frac{c\ x\ a + b}{c}$$

To multiply fractions

$$\frac{a}{b} \times \frac{c}{d} = \frac{a\ x\ c}{b\ x\ d}$$

What I Can Do *(Critical thinking)*

For her father's birthday, Jeanna wishes to bake $3\frac{}{}$ pans of baked macaroni. However, her small oven can bake one pan only for $1\frac{}{}$ hours. How many hours will it take Jeanna to bake $3\frac{}{}$ pans of baked macaroni?

Assessment

Answer the questions below. Write the answer in simplest form, whenever possible.

1) What is the product of 5 and 3?

2) What is 1 x 1?

3) If you multiply 2 and 3, what will you get?

4) Find the value of N in the statement: 3 x 5 = N

5) If 2 and 3 are multiplied, the product is _____.

Additional Activities

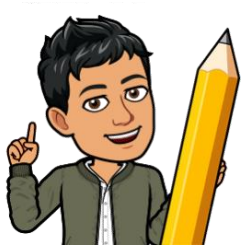
Complete the table by finding the product of the horizontal by vertical.

X	$\frac{1}{2}$	$4\frac{}{}$	$3\frac{*}{}$
$\frac{2}{3}$			
$2\frac{}{*}$			

If you want to watch videos about multiplication of fractions visit the links:

https://www.youtube.com/watch?v=5tv4vRNQqHk

https://www.mathantics.com/lesson/multiplying-fractions



Lesson 2

At the end of this lesson, you are expected to:

Solves routine and non-routine problems involving multiplication without or with addition or subtraction of fractions and mixed fractions using appropriate problem solving strategies and tools

Introduction:

Solving routine and non-routine problems

In solving a problem, you have to analyze it very carefully. Then plan for your solution and and check. There are many strategies used to solve a problem like using working backwards, Problem Solving Maps (PSM), abstract or solution and block model. You may use any of these strategies that you find easier to do, however you need to remember that not all strategies are applicable to the problem.

What's In

A. Find the product of the following.

1. $\frac{}{} \times \frac{}{} =$
2. $1\frac{}{} \times \frac{}{} =$
3. $2\frac{}{} \times 5\frac{}{} =$

B. What are the different strategies in solving word problem? Can you cite one and explain how it is done?

What's New

To solve word problems involving multiplication of fractions you may use the different strategies below:

1. AGOMSA (Asked, Given, Operation, Mathematical Sentence, Solution, Answer) - provides a step to solve a problem. It is also a good strategy in analyzing the problem.
2. Block Model – a representation of the problem using illustration. It uses bars or rectangular regions to help you visualize concepts or manipulate problem situation.
3. Problem Solving Maps (PSM) – it is a solution map. It shows a logical analysis of the way one might arrive from the given data to the solution of the problem. There are three maps: Example Conclusion Map; Multi-Rule Map; and Math Breaker Map.

What is It

(Communication, Critical Thinking, Character)

1. Study the word problem.

In Barangay Mathalino, Mrs. Maria Escobio wanted to share her blessing with the barangay workers, so she baked breads for them, she used ¾ of her 2 kilograms wheat flour. How much wheat flour was used?

Answer the following:

a. What is **asked** in the problem? ***The amount of wheat flour used.***

b. What are the **given** facts?

What is the amount used in baking a bread? ¾

How many kilograms is the available wheat flour? $2\frac{1}{3}$ **kilograms**

c. What **operation** will you use to solve the problem? **Multiplication** ***Since it is finding the area***

additional questions

- What kind of fractions are to be multiplied? ***simple fraction & mixed fraction***
- How will you get the answer? ***Multiply simple fraction with mixed fraction***

d. What is the **mathematical sentence**? ¾ x $2\frac{1}{3}$ **= N**

e. Show the **solution** to the problem.

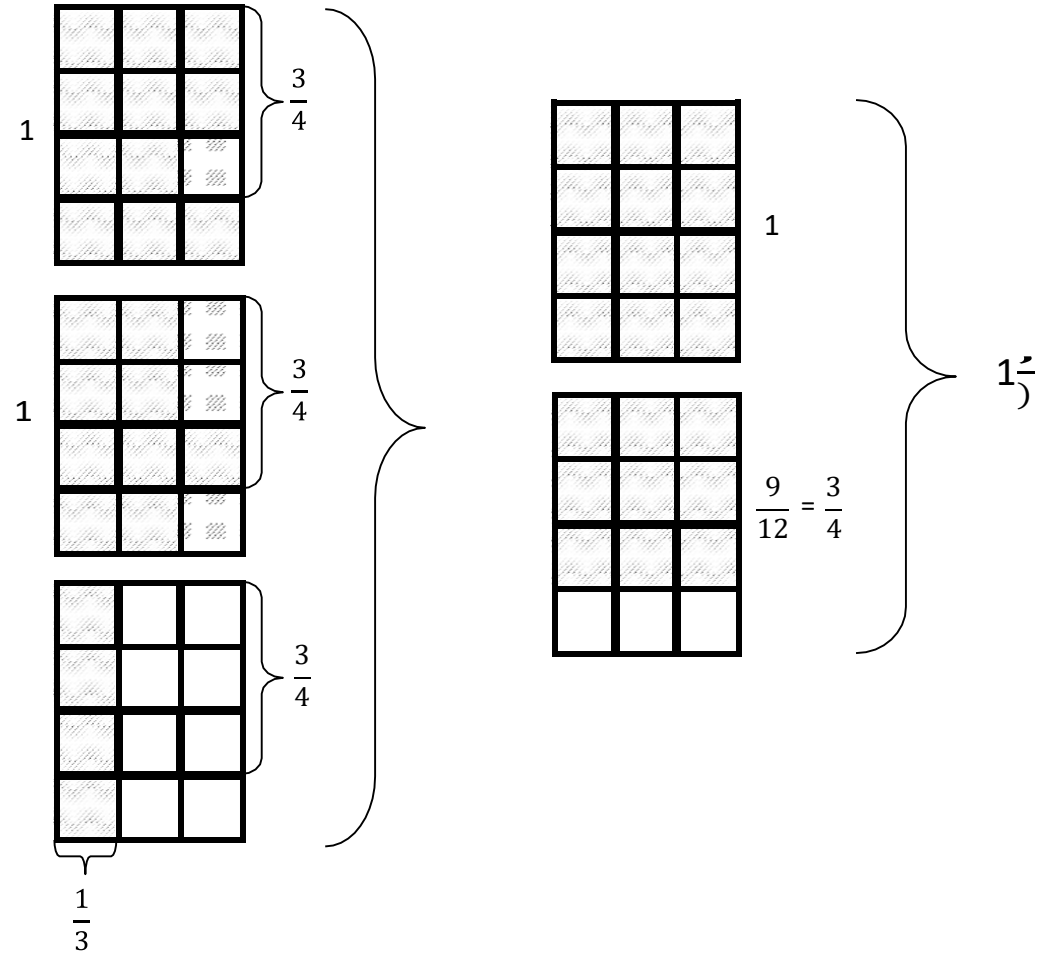
$$1\frac{3}{4} \times \frac{7}{3} = \frac{1 \times 7}{4 \times 1} = \frac{7}{4} = 1\frac{3}{4}$$

f. Complete the **answer**.

Ms. Rachel Escobio used 1 ¾ kilograms of wheat flour.

f. What trait did Mrs. Maria Escobio exhibit in the problem?
g. Why do you say so?
h. If you were Mrs. Maria Escobio would you do the same?

Solve using Block Model



Mrs. Maria Escobio used 1 1/2 kilograms of wheat flour.

Solve using Problem Solving Map (Multi-Rule Map)

In Barangay Mathalino, Mrs. Maria Escobio wanted to share her blessing with the barangay workers, so she baked breads for them, she used 1 1/2 of her 2 1/2 kilograms wheat flour. How much wheat flour was used?

1 1/2 and 2 1/2

1 1/2 x 2 1/2 = N

$1\frac{3}{4} \times \frac{7}{3} = \frac{1 \times 7}{4 \times 1} = \frac{7}{4} = 1\frac{3}{4}$

Mrs. Maria Escobio used 1 1/2 kilograms of wheat flour.

Identify the given

Give the mathematical sentence

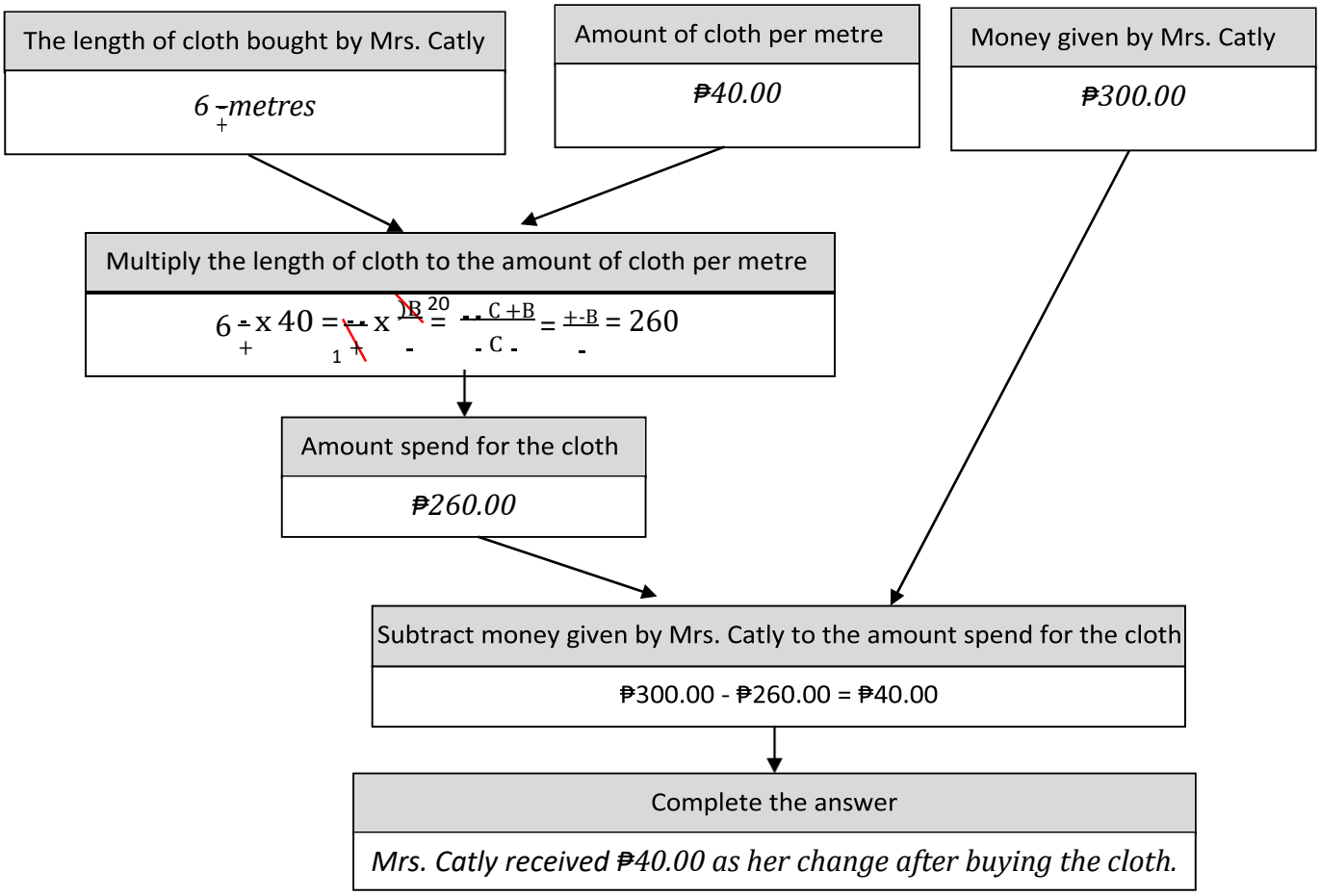
Solution

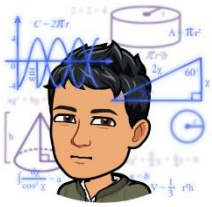
Complete answer

***2.* Second word problem.** (*Critical Thinking)*

One way to prevent and slow down the transmission of COVID19 is to wear face mask. Mrs. Catly, an H.E. teacher wanted to make face mask for her students so she bought $6\frac{-}{+}$ *metres of cloth at ₱ 40.00. How much change did she receive from three hundred pesos?*

Let us solve it using Problem Solving Maps – Math Breaker Map (PSM-MBM)



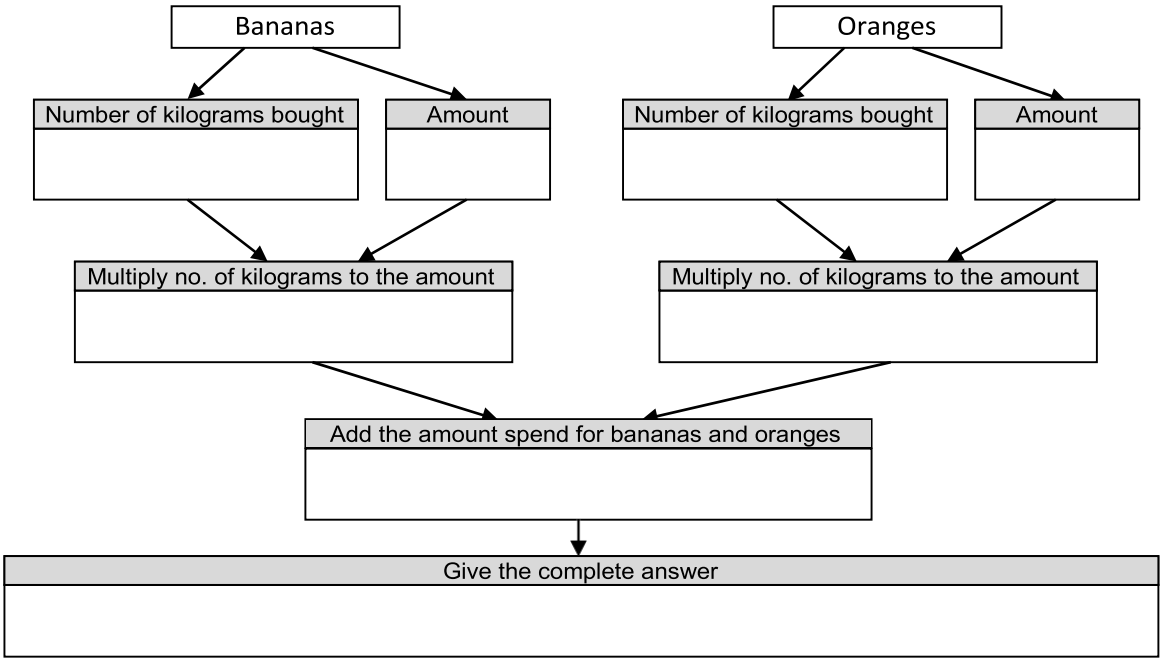


What's More

Activity #1 *(Communication and Critical Thinking)*

Solve the problem below by supplying the map on the next page.

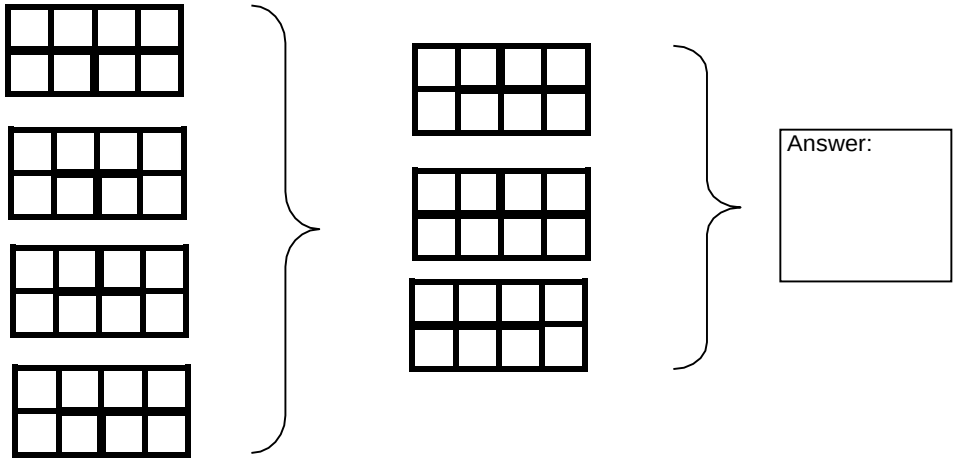
During the ECQ many people buy fruits because it helps improve the immune system. Some of the fruits that they buy are bananas and oranges. Bananas are sold at ₱60.00 per kilogram and oranges at ₱80.00 per kilogram. Mrs. Soriano bought $3\frac{+}{}$ kilograms of bananas and $3\frac{-}{}$ kilograms of oranges. How much is the amount of fruits she paid?



Activity #2 *(Communication, creativity and Critical Thinking)*

Solve the problem below using block model.

Due to COVID19, Yohan cannot go outside the house so he looked for something that will make himself busy. He saw his yoyo and played with it. The string of his yoyo is 3/4 of his height. If Yohan's height is 3 ½ feet. How long was the string on his yoyo?



Activity #3 *(Critical Thinking, Creativity and Collaboration)*

Solve the problems below using any appropriate strategy you can ask the help of any family member inside the house.

1. Ma. Kristina has ₱400.00 to buy goods at the market. She bought 1 kilograms of bangus at ₱180 per kg. How much money did she still have for other goods?
2. Kuya Melvin has a 10 yards of plastic cover, he used of it in installing a plastic shield between the teacher and the student applicants during the enrolment . How many yards of plastic cover was used?
3. Rachel used DepEd Commons for 2 hours last Monday. Then the following day, her mother told her to use it again and she spent of the time compared to last Monday. How many hours did she use the following day?

What I Have Learned

To solve routine and non-routine problems involving multiplication without or with addition or subtraction of fractions and mixed fractions we may used different strategies like:

- AGOMSA (Asked, Given, Operation, Mathematical sentence, Solution and Answer)
- Block model using bars and rectangular regions
- Problem Solving Maps – using a map as a guide for solving the problem.

What I Can Do *(Communication, Critical Thinking and Creativity)*

Solve the problem using any appropriate strategy.

Mrs. Miram went to the market to buy goods. She bought 1 kilograms of pork for her special *sinigang*. If a kilogram of pork is ₱220.00, how much is her change for a ₱500-bill?

Assessment *(Critical thinking and Creativity)*

Solve the following problems using any appropriate strategy or tools on it.

1. A rectangular lot is 4 metre by 3 . What is the area of the lot?
2. A fire truck consumes a litre of diesel in 5 km. How far can it travel with 3

litres of diesel?

3. Valeriano Family has 5 ± litres of mineral water in their jug. If they consumed ⁄ of it, how much mineral water was left in the jug?

Additional Activities

Create a word problem involving multiplication of fractions with or without addition and/or subtraction of fractions. Your word problem must be depend on the present scenario in your home and answer it after.

POST TEST

A. Find the product of the following. Simplify your answer.

1. $\frac{3}{7} \times \frac{1}{7} =$
2. $\frac{2}{5} \times 3\frac{2}{3} =$
3. $2\frac{1}{6} \times \frac{4}{9} =$
4. $2\frac{5}{6} \times 4\frac{1}{2} =$
5. $3\frac{2}{5} \times 3\frac{1}{3} =$

B. Solve the following problems use appropriate strategy or tools on it.

1. Akisha was asked by her mother to cook rice. They have 4 - kilograms of rice and she cooked - of it. How many kilograms were cooked by Akisha?
2. Clyde Kirstein has $12\frac{1}{3}$ ft of yarn. She used 1/5 of it to stitch the side of her notebook. How many feet were used in the notebook?

NAME: _____ **GRADE:**____ **SECTION:**_____**SCORE:**_____
Name of Teacher:_____**School:**_____
Objective: Solves Routine Problems Involving Multiplication Code:M6NS–Ib–92.2
With or Without Addition and/or Subtraction of fractions
Learning Content: Solving word-problem that involves a single operation. The tool used in dealing the problem requires breaking down steps into sub – steps.

Directions: Read and understand the problem below. Provide the missing step/information/data on the space provided below each instruction.

Mr. Liad repaired a tricycle in 2 $\frac{1}{2}$ hours. He spent $\frac{2}{5}$ of the time greasing the wheels. How many hours did it take him to grease the wheels?

Part of the given hours greasing the wheels	No. of hours repairing the tricycle
1)	2)

Math Rule

Rename mixed number as improper fraction

Multiply the fractions.
3)

Write the final answer.
4)

.

NAME:_____GRADE:_____SECTION:_____SCORE: _____

Name of Teacher:_____SCHOOL: _____

Objective: Solves non-routine problems involving multiplication without or with addition or subtraction of fractions and mixed fractions**. M6NS-Ic-92.2**

Learning Content: Solving non-routine problems using illustration or block model approach.

Read:

Balloon Vendor

A vendor had 108 balloons. He sold $\frac{\div}{+}$ of them in the morning and $\frac{\div}{+}$ of the remaining in the afternoon. He promised to sell the balloons left unsold the next day to support his family. If he sold the balloons for Php10 each, how much did the vendor earned during the day?

picturesof.net

Analyze:

1. What does the vendor sell? _____
2. How much is each balloon? _____
3. What fraction of the balloon was sold in the morning? _____
4. How many balloons were sold in the afternoon? Show the solution using Block Model Approach to prove your answer?

5. How much did the vendor earn during the day? Show the solution using multiplication of fractions to prove your answer.

KEY TO CORRECTION: MODULE 2

What I Know

A.

1. $\frac{=}{+^{*}}$
2. $\frac{+}{-}$
3. $1\frac{)}{*}$
4. 18
5. $13\ \frac{+}{?}$

B.

1. Rayver can build 8 robots.
2. John Mark jumped $4\ \frac{\pm}{*}$ metres.

LESSON 1

What's In

A.

1. $\frac{)\pm}{*}$
2. $\frac{*B}{}$
3. $\frac{}{)}$
4. $\frac{}{}$
5. $\frac{}{}$

B.

1. $\frac{}{)}$
2. $\frac{}{+}$
3. $\frac{}{}$
4. $\frac{}{.>}$
5. $\frac{\equiv}{?}$

What I Can Do

Jeanna took $4\frac{\pm}{}$ in having baked macaroni.

Assessment

1. $17\frac{}{+}$
2. $2\frac{^{*}}{=}$
3. 9
4. 20
5. $7\frac{}{+}$

What's More

Activity #1 Activity #2

1. $\frac{}{.B}$ Output (Block Model)
2. $2\frac{\pm}{}$ Activity #3
3. $2\frac{)}{*}$ 1. $8\frac{\pm}{*}$
4. $26\frac{\pm}{}$ 2. $6\frac{)}{*}$
5. $13\frac{\pm}{?}$ 3. $6\frac{\pm}{*}$

Additional Activities

x	$1\frac{}{2}$	$4\frac{3}{7}$	$3\frac{5}{8}$
$\frac{2}{3}$	$\frac{1}{3}$	$2\frac{20}{21}$	$2\frac{5}{12}$
$2\frac{4}{5}$	$1\frac{2}{5}$	$12\frac{2}{5}$	$10\frac{3}{20}$

PSM: **Code:M6NS–Ib–92.2**

1. $\frac{}{}$
2. $2\frac{}{}$
3. $\frac{}{)}$
4. $\frac{}{)}$ *hours*

4.

108 balloons

54 $\frac{1}{2}$ sold in the morning

54 remaining

27 $\frac{1}{2}$ sold in the afternoon

27 remaining

5. Php 810 - earned during the day

RBW: **M6NS-Ic-92.2- Balloon Vendor**

1. balloons
2. Php10
3. $\frac{}{+}$ of 108 balloons

LESSON 2

What I Can Do

Mrs. Miram change is ₱225.00.

What's In

A.

1. $\frac{=}{+.}$

2. $\frac{--}{+B}$

3. 12

B.

1. Answers may very

What's More

Activity #1

Number of kilograms bought	Amount	Number of kilograms bought	Amount
$3\frac{2}{3}$	₱60.00	$3\frac{1}{4}$	₱80.00
Multiply no. of kilograms to the amount		Multiply no. of kilograms to the amount	
₱220.00		₱260.00	

Add the amount spend for bananas and oranges

₱480.00

Give the complete answer

Mrs. Soriano paid ₱480.00 for the bananas and oranges bought.

Activity #2

Presentation of the answers may vary.

Activity #3

1. Ma. Kristina still have ₱160.00 for other goods.
2. Kuya Melvin used 8 yards of plastic cover.
3. Rachel spend $1\frac{-}{+}$ hour during that time.

Assessment

1. The area of the rectangular lot is $15\frac{-}{>}$ square metres.
2. The fire truck can travel $18\frac{\geq}{.B}$ kms.
3. Valeriano family have $2\frac{-}{=}$ litres of mineral water left in the jug.

What I Know

A.

1. $\frac{-}{)?}$
2. $1\frac{\geq}{.*}$
3. $1\frac{+-}{+>}$
4. $12\frac{-}{)}$
5. $11\frac{-}{-}$

B.

1. Akisha cook $\frac{-}{)}$ kgs of rice.
2. Clyde Kirstein used $2\frac{>}{.*}$ ft. of yarn.

1.