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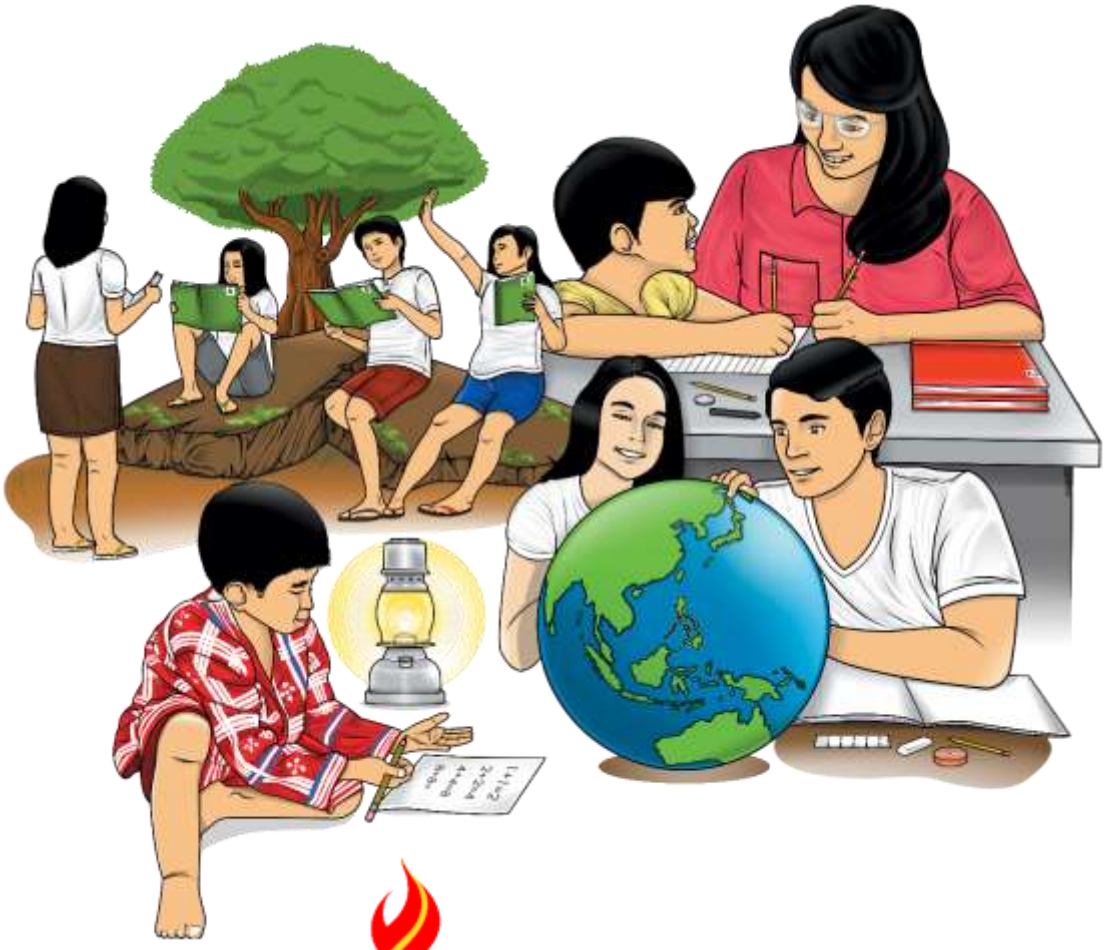
Mathematics

Quarter 1 – Module 12: Mental Multiplication on Proper Fractions



ALTERNATIVE DELIVERY MODE
ADM

Mathematics – Grade 5
Alternative Delivery Mode
Quarter 1 – Module 12: Mental Multiplication on Proper Fractions
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Mathematics

Quarter 1 – Module 12: Mental Multiplication on Proper Fractions

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Introductory Message

For the Facilitator:

Welcome to the Mathematics Grade 5 Alternative Delivery Mode (ADM) Module 12 on Mental Multiplication on Proper Fractions with denominators up to 10!

This module was collaboratively designed, developed and reviewed by educators both from public and private institutions to assist you, the teacher or facilitator in helping the learners to meet the standards set by the K to 12 Curriculum while overcoming their personal, social, and economic constraints in schooling.

This learning resource hopes to engage the learners into guided and independent learning activities at their own pace and time. Furthermore, this also aims to help learners acquire the needed 21st century skills while taking into consideration their needs and circumstances.

In addition to the material in the main text, you will also see this box in the body of the module:

Notes to the Teacher

This contains helpful tips or strategies that will help you in guiding the learners.

As a Facilitator, you are expected to orient the learners on how to use this module. You also need to keep track of the learners' progress while allowing them to manage their own learning. Furthermore, you are expected to encourage and assist the learners as they do the tasks included in the module.

For the Learner:

Welcome to the Mathematics 5 Alternative Delivery Mode (ADM) Module 12 on Mental Multiplication on Proper Fractions with denominators up to 10!

This module was designed to provide you with fun and meaningful opportunities for guided and independent learning at your own pace and time. You will be enabled to process the contents of the learning resource while being an active learner.

This module has the following parts and corresponding icons:

 ***What I Need to Know***	This will give you an idea of the skills or competencies you are expected to learn in the module.
 ***What I Know***	This part is composed of a 10-item activity to check what you already know about the lesson to take. If you get all the answers correct (100%) you may decide to skip this module.
 ***What's In***	This is a brief drill or review to help you link the current lesson with the previous one.
 ***What's New***	In this portion, the new lesson will be introduced to you in various ways: a story, a song, a poem, a problem opener, an activity, or a situation.
 ***What is It***	This section provides a brief discussion of the lesson. This aims to help you discover and understand new concepts and skills.
 ***What's More***	This comprises activities for independent practice to solidify your understanding and skills of the topic. You may check the answers to the exercises using the Answer Key at the end of the module.
 ***What I Have Learned***	This includes questions or fill in the blank sentence/paragraph to process what you learned from the lesson.
 ***What I Can Do***	This section provides an activity that will help you transfer your new knowledge or skill in real-life situations or concerns.
 ***Assessment***	This is another 10-item task that aims to evaluate your level of mastery in achieving the learning competency.

 ***Additional Activities***	In this portion, another activity will be given to you to enrich your knowledge or skill of the lesson learned.
 ***Answer Key***	This contains answers to all activities in the module.

At the end of this module you will also find:

References	This is a list of all sources used in developing this module.

The following are some reminders in using this module:

1. Use the module with care. Do not put unnecessary mark/s on any part of the module. Use a separate sheet of paper in answering the exercises.
2. Don't forget to answer *What I Know* before moving on to the other activities included in the module.
3. Read the instructions carefully before doing each task.
4. Observe honesty and integrity in doing the tasks and checking your answers.
5. Finish the task at hand before proceeding to the next.
6. Return this module to your teacher/facilitator once you are through with it.

If you encounter any difficulty in answering the tasks in this module, do not hesitate to consult your teacher or facilitator. Always bear in mind that you are not alone.

We hope that through this material, you will experience meaningful learning and gain a deep understanding of the relevant competencies. You can do it!

What I Need to Know

Hi, Mathletes!

In this module, you will be performing mathematical calculations in your head without the use of paper and pen, as well as any computational gadgets like a calculator or an abacus. Your understanding of multiplying fractions mentally with denominators up to 10is very helpful in your daily living. You can easily perform estimation in buying groceries, sharpens your proportional thinking in baking cookies or any sweets. Your brain actually works faster and sharper when it is trained to perform calculations mentally.

When you finish up this module, you will be able to:

- multiply proper fractions mentally with denominators up to 10.

What I Know

Take your time to recall previous lessons and answer the test below.

Directions: Multiply the following fractions mentally. Then reduce your answers to the lowest terms. Write the correct answer on your answer sheet.

1) What is the product of $\frac{1}{4}$ and $\frac{2}{3}$?

A. $\frac{1}{6}$ B. $\frac{3}{8}$ C. $\frac{3}{4}$ D. 6

2) In $\frac{2}{3} \times \frac{1}{2} = N$, what is N?

A. $\frac{1}{3}$ B. $\frac{2}{6}$ C. $\frac{3}{4}$ D. 3

3) What is the answer if you multiply $\frac{3}{4}$ and $\frac{1}{3}$?

A. 4 B. $\frac{4}{9}$ C. $\frac{1}{12}$ D. $\frac{1}{4}$

4) What answer do we get if we multiply $\frac{3}{5}$ and $\frac{2}{4}$?

A. $\frac{3}{10}$ B. $\frac{5}{9}$ C. $\frac{6}{5}$ D. $\frac{6}{20}$

5) What is $\frac{1}{8}$ of $\frac{4}{5}$?

A. $\frac{5}{32}$ B. $\frac{5}{24}$ C. $\frac{4}{40}$ D. $\frac{1}{10}$

6) What will be the answer of $\frac{2}{4} \times \frac{9}{10}$?

A. $\frac{9}{40}$ B. $\frac{9}{20}$ C. $\frac{3}{20}$ D. $\frac{3}{40}$

7) What is the value of N in $\frac{3}{4} \times \frac{1}{5} = N$?

A. $\frac{1}{10}$ B. $\frac{1}{20}$ C. $\frac{3}{20}$ D. $\frac{3}{40}$

8) In $\frac{3}{5} \times \frac{1}{9}$, the product is _____.

A. $\frac{1}{20}$ B. $\frac{1}{15}$ C. $\frac{1}{10}$ D. $\frac{1}{5}$

9) What is $\frac{2}{6}$ kg of a $\frac{5}{10}$ kg of sugar?

A. $\frac{1}{4}$ B. $\frac{1}{5}$ C. $\frac{1}{6}$ D. $\frac{1}{7}$

10) Ricky used $\frac{2}{7}$ liters of the $\frac{3}{6}$ liters of gas in the tank, find the product.

A. $\frac{1}{5}$ B. $\frac{1}{6}$ C. $\frac{1}{7}$ D. $\frac{1}{8}$

Lesson 1 Mental Multiplication on Proper Fractions

What's In

To multiply a fraction by another fraction, multiply the numerators and the denominators then simplify the product whenever possible.

If we need to find the part of a whole or a fractional part of a whole number, we simply multiply the whole number by the numerator of the fraction and divide it by the denominator of the fraction.

An example is given below for you to study carefully.

What is $\frac{1}{4}$ of 24?

Solution:

$\frac{1}{4}$ of 24 means $\frac{1}{4}$ x 24.

$\frac{1}{4}$ x 24= $\frac{24}{4}$ = 6

Other Method:

$\frac{1}{4}$ x 24 = $\frac{1}{\cancel{4}_{1}}$ x $\frac{\cancel{24}^{6}}{1}$

$= \frac{1 \, x \, 6}{1 \, x \, 1} = \frac{6}{1} = 6$

Directions: Find the product of each item below. Reduce the product to the lowest term if necessary. The first one is done for you.

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

2) 6 x $\frac{2}{4}$

3) $\frac{3}{5}$ x $\frac{2}{3}$

4) $\frac{3}{8}$ x $\frac{5}{6}$

5) $\frac{4}{5}$ x 10

6) $\frac{1}{5}$ x 20

What's New

Situation:

Anna is helping her mother to make "chocolate moron". According to the recipe, $\frac{9}{20}$ oz of sugar is needed to make 6 "chocolate morons". Anna's mother instructed her to use only $\frac{2}{3}$ of the sugar to make it healthier. How much sugar should Anna use?

What Is It

It was quick and easy for Anna to determine the correct amount of sugar to use for the recipe. Do you wonder why and how Anna did it? The task above requires your knowledge on multiplication of fractions. And it becomes easier and faster if you know how to multiply fractions mentally.

How to do it?

Here are some techniques to train your mind to multiply fractions mentally.

- **Cancel Anything that Divides to One** – the best thing about fractions is that you can find plenty of opportunities to cancel. (Brett Berry, THE NO NONSENSE)

$$\frac{4}{3} \times \frac{\cancel{5}^{1}}{\cancel{5}_{1}}$$

Example:

- **Multiplying a fraction by its reciprocal results to 1**

Example: 1) $\frac{1}{3} \times 3 = \frac{1}{3} \times \frac{3}{1} = \frac{3}{3} = 1$

2) $5\ x\ \frac{1}{5} = \frac{5}{1} x \frac{1}{5} = \frac{5}{5} = 1$

3) $\frac{3}{5} x \frac{5}{3} = \frac{15}{15} = 1$

- **Multiply Fractions Straight Across** (Brett Berry, THE NO NONSENSE)

Example: 1) $\frac{2}{3} x \frac{1}{5} = \frac{2\ x\ 1}{3\ x\ 5} = \frac{2}{15}$

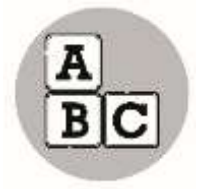
2) $\frac{3}{5} x \frac{2}{7} = \frac{3\ x\ 2}{5\ x\ 7} = \frac{6}{35}$

3) $\frac{2}{3} x \frac{4}{9} = \frac{2\ x\ 4}{3\ x\ 9} = \frac{8}{27}$

- **Cancel common factors appearing in the numerators and denominators** of any of the two fractions being multiplied even before multiplying.
-

Example: 1) $\frac{\cancel{4}^{1}}{\cancel{9}_{3}} \times \frac{3}{\cancel{8}_{2}} = \frac{4}{3} \times \frac{\cancel{3}^{1}}{8} = \frac{1 x 1}{3 x 2} = \frac{1}{6}$

2) $\frac{\cancel{5}^{1}}{\cancel{8}_{2}} \times \frac{\cancel{4}^{1}}{\cancel{10}_{2}} = \frac{1 x 1}{2 x 2} = \frac{1}{4}$



What's More

Directions: Multiply the following fractions. In your Activity Notebook, write **T** on the blank if the number sentence is correct and **F** if it is not.

1) $\frac{2}{3} \text{ x } \frac{4}{5} = \frac{8}{15}$

2) $\frac{1}{2} \text{ x } \frac{2}{3} = \frac{1}{3}$

3) $\frac{3}{4} \text{ x } \frac{2}{3} = \frac{5}{7}$

4) $\frac{5}{7} \text{ x } \frac{7}{8} = \frac{4}{9}$

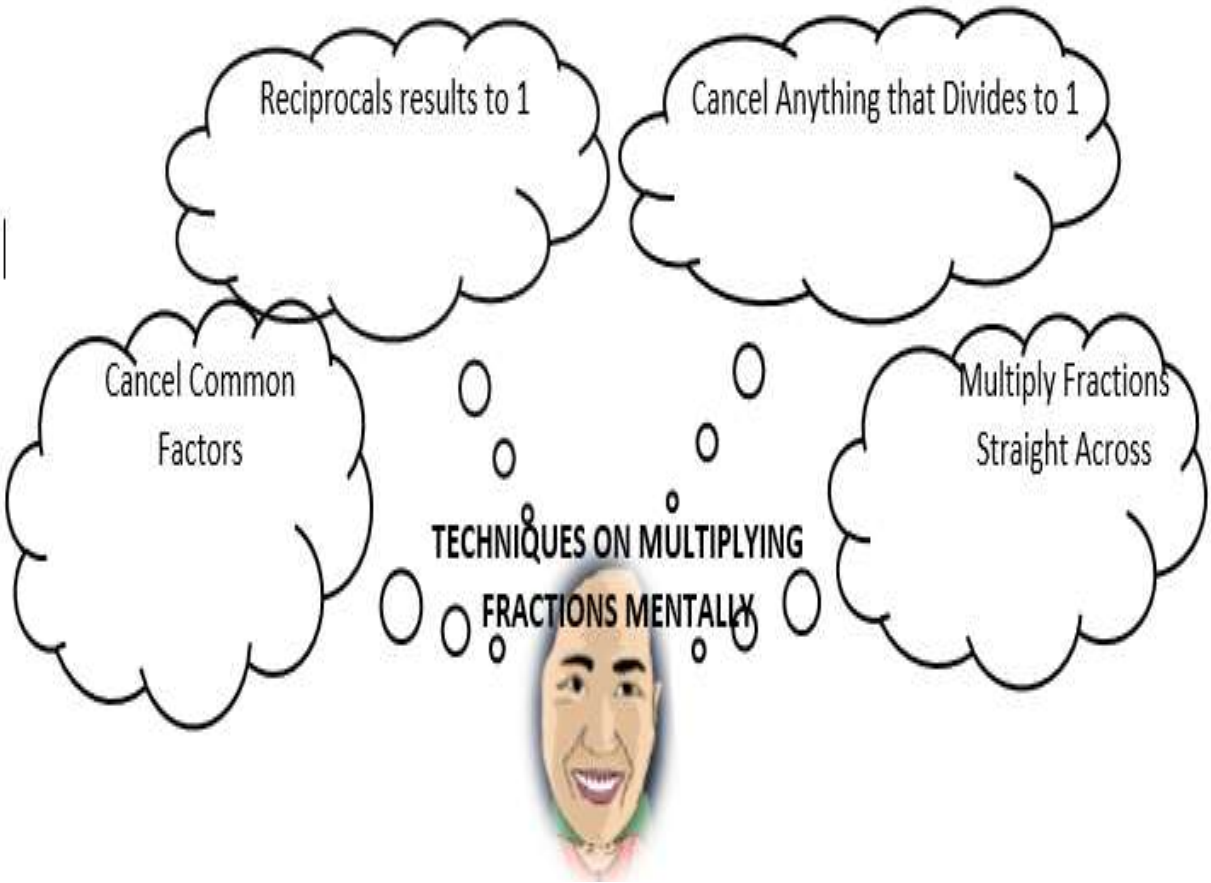
5) $\frac{7}{10} \text{ x } \frac{1}{5} = \frac{7}{50}$

What I Have Learned

Directions: Determine the most appropriate technique to use in multiplying the fractions below. Place them inside the oval callout they belong.

$\frac{7}{8} x \frac{10}{10}$ $\frac{3}{4} x \frac{5}{7}$

$\frac{2}{9} x \frac{9}{2}$ $\frac{3}{10} x \frac{5}{6}$



What I Can Do

Guessing Game!

Directions: Multiply each proper fraction through mental computation. Match the proper fractions in Column A with their products in Column B, as fast as you can. The first one is done for you. Write your answer on a separate sheet of paper.

Column A		**Column B**	
1)	$\frac{1}{3}$ **x** $\frac{2}{5}$ **= ?**	A.	$\frac{1}{8}$
2)	$\frac{1}{3}$ **x** $\frac{1}{8}$ **= ?**	B.	$\frac{1}{5}$
3)	$\frac{2}{3}$ **x** $\frac{1}{6}$ **= ?**	C.	$\frac{2}{15}$
4)	$\frac{1}{2}$ **x** $\frac{1}{4}$ **= ?**	D.	$\frac{1}{7}$
5)	$\frac{2}{7}$ **x** $\frac{1}{2}$ **= ?**	E.	$\frac{1}{24}$
6)	$\frac{2}{5}$ **x** $\frac{1}{2}$ **= ?**	F.	$\frac{1}{9}$
		G.	$\frac{2}{9}$

Assessment

A. **Directions:** Multiply the following proper fraction mentally. Choose the answer from the box below.

1) $\frac{2}{3} \times \frac{4}{6} = \frac{\square}{\square}$ **3)** $\frac{5}{6} \times \frac{2}{10} = \frac{\square}{\square}$ **5)** $\frac{3}{6} \times \frac{7}{9} = \frac{\square}{\square}$

2) $\frac{6}{7} \times \frac{2}{9} = \frac{\square}{\square}$ **4)** $\frac{4}{7} \times \frac{3}{8} = \frac{\square}{\square}$

$\frac{7}{18}$		$\frac{4}{21}$		$\frac{3}{14}$
$\frac{5}{8}$	$\frac{1}{6}$	$\frac{4}{9}$	$\frac{3}{11}$	

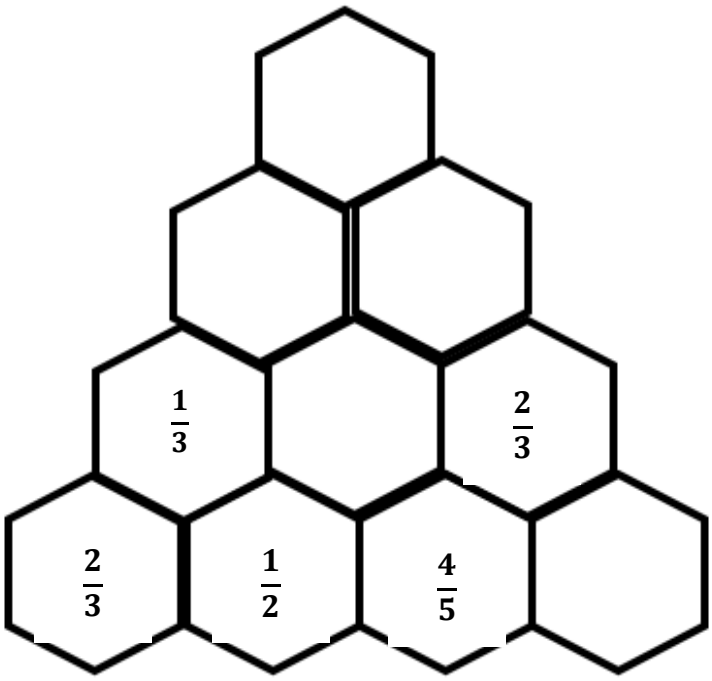
B. **Directions:** Find the product of the following fractions. Give your answers in its simplest form.

1) $\frac{4}{5} \times \frac{3}{4}$	**6)** $\frac{2}{5} \times \frac{1}{2}$
2) $\frac{2}{8} \times \frac{6}{10}$	**7)** $\frac{3}{4} \times \frac{2}{3}$
3) $\frac{5}{9} \times \frac{3}{7}$	**8)** $\frac{3}{5} x \frac{3}{2}$
4) $\frac{9}{10} \times \frac{2}{6}$	**9)** $\frac{4}{10} \times \frac{3}{6}$
5) $\frac{6}{7} \times \frac{4}{6}$	**10)** $\frac{2}{6} \times \frac{3}{10}$

Additional Activities

Need more practice?

Directions: Use what you know about multiplication of fractions to solve the puzzle below. To solve this puzzle, each fraction must be equal to the product of the two fractions below.



Answer Key

What I have learned

ASSESSMENT (A)

1. $\frac{4}{9}$
2. $\frac{9}{21}$
3. $\frac{4}{6}$
4. $\frac{1}{14}$
5. $\frac{3}{18}$

WHAT'S MORE

1. T
2. T
3. F
4. F
5. T

WHAT'S IN

1. $\frac{1}{2}$
2. 3
3. $\frac{2}{5}$
4. $\frac{5}{16}$
5. 8
6. 4

ASSESSMEN

T (B)

1. $\frac{3}{5}$
2. $\frac{3}{20}$
3. $\frac{5}{21}$
4. $\frac{3}{10}$
5. $\frac{4}{7}$
6. 1/5
7. ½
8. 9/10
9. 1/5

WHAT CAN I DO

1. C
2. E
3. F
4. A
5. D
6. B

WHAT I KNOW

1. A
2. A
3. D
4. A
5. D
6. B
7. C
8. B
9. C
10. C

ADDITIONAL ACTIVITIES

Reference

- Ursua, A. C. and A. P. Lumbre. 2016. *21st Century Mathletes Textbook*. Quezon City: Vibal Group, Inc.
https://medium.com/i-math/the-no-nonsense-straightforward-da76a4849ec

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