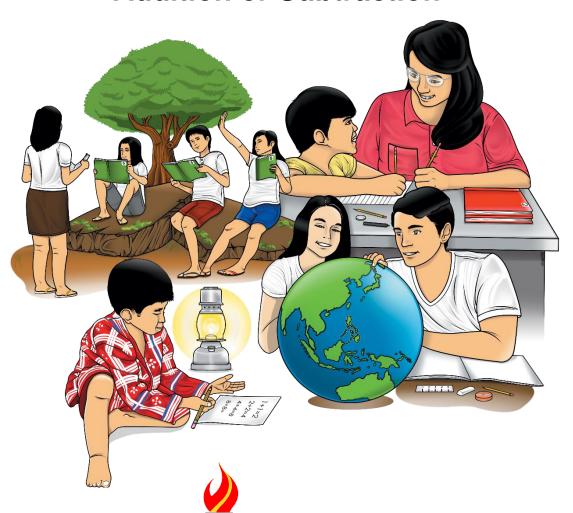




# **Mathematics**

Quarter 1 – Module 9: Solving Multi-step Problems Involving Multiplication and Addition or Subtraction



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Mathematics - Grade 4 Alternative Delivery Mode

Quarter 1 - Module 9: Solving Multi-step Problems Involving Multiplication

and Addition or Subtraction

First Edition, 2020

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# **Mathematics**

Quarter 1 – Module 9: Solving Multi-step Problems Involving Multiplication and Addition or Subtraction



### **Introductory Message**

For the facilitator:

Welcome to Mathematics Grade 4 Alternative Delivery Mode (ADM) Module on Solving Multistep Problems Involving Multiplication and Addition or Subtraction!

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 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 4 Alternative Delivery Mode (ADM) Module on Solving Multistep Problems Involving Multiplication and Addition or Subtraction!

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:

Answer Key

I his modu	lie 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 includes an activity that aims 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.
G P	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.
2	What is It	This section provides a brief discussion of the lesson. This aims to help you discover and understand new concepts and skills.
A BC	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 blank sentence/paragraph to be filled in to process what you learned from the lesson.
20	What I Can Do	This section provides an activity which will help you transfer your new knowledge or skill into real life situations or concerns.
	Assessment	This is a task which aims to evaluate your level of mastery in achieving the learning competency.
O	Additional Activities	In this portion, another activity will be given to you

learned.

module.

to enrich your knowledge or skill of the lesson

This contains answers to all activities in the

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 instruction 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 deep understanding of the relevant competencies. You can do it!



Good day learner! You have learned from the previous module how to solve routine and non-routine problems involving multiplication. In this module, you will encounter more challenging problems: multi-step and problems with hidden questions. Please take time in using this module to learn more. Enjoy solving!

At the end of this module, you will be able to solve multi-step routine and non-routine problems involving multiplication and addition or subtraction using appropriate problem solving strategies and tools.



### What I Know

- A. Solve each problem and choose the letter of the correct solution.
  - 1. Marjorie has a daily snack allowance of ₱30. She buys two pieces of *Lumpiang Toge* at ₱12 each and saves the rest. How much is her daily savings?

2. Mrs. Cruz has a cellphone load retail store. She adds ₱3 as her profit for every ₱30 and ₱20 load. How much is her total sales and profit if 4 customers purchased cellphone load worth ₱30 each and 3 customers purchased ₱20 each?

A. 
$$\Rightarrow 30 \times 4 = \Rightarrow 120$$
  
 $\Rightarrow 20 \times 3 = \Rightarrow 60$   
 $\Rightarrow 120 + \Rightarrow 60 = \Rightarrow 180$ 

B. 
$$(\mathbb{P}30+3) \times 4 = \mathbb{P}132$$
  
 $(\mathbb{P}20+3) \times 3 = \mathbb{P}69$   
 $\mathbb{P}132 + \mathbb{P}69 = \mathbb{P}201$   
 $(4+3) \times \mathbb{P}3 = \mathbb{P}21$ 

3. Mang Roque harvested 12 500 ears of corn from each of the 12 plots of his farm while Mang Romy harvested 8 540 ears of corn from each of the 18 plots of his farm. Who harvested more ears of corn?

B. 
$$12 \times 18 = 216$$
$$12500 - 8540 = 6660$$
Mang Roque harvested more ears of corn than Mang Romy

4. Vito can make 123 hangers in 5 days while David can make 210 hangers in 10 days. Who makes more hangers in 10 days?

5. Jennifer's mother can sew 15 pairs of short pants in a day, while Rita can sew 12 pairs a day. How many more pairs of short pants can Jennifer's mother sew in 5 days as compared to Rita?

A. 
$$\begin{vmatrix} 15 - 12 = 3 \\ 3 \times 15 = 45 \\ 45 - 3 = 42 \end{vmatrix}$$

C. 
$$\begin{vmatrix} 15 + 12 = 27 \\ 27 - 5 = 22 \\ 27 - 22 = 5 \end{vmatrix}$$

- B. Read and solve the following problems.
  - 6. Filemon caught 5 kilos of fish. He sold his catch at ₱180 a kilo. After receiving the payment, he saved ₱100. How much money can be used for the expenses?
  - 7. Each of the five sections of Grade 4 has 30 pupils. If 12 Grade 4 pupils transferred to other schools, how many Grade 4 pupils did not transfer?
  - 8. One box of bottled water contains 24 bottles. If there are 21 boxes with one box having only 4 bottles left, how many bottles are there in all supposing that all other boxes still have 24 bottles each?
  - 9. At the beginning of school, all Grade Five pupils are issued with 5 books. At the end of the school year, only 64 pupils completely returned the books. How many books are not yet returned if there are 84 grade five pupils?
  - 10. Loi went to the market and bought 4 kilos of rice at ₱40 a kilo and 2 kilos of fish at ₱220 a kilo. How much did she spend in all?

Are you done answering? If yes, time to check. Please go to page 16 for the *Answer Key*.





Do you remember how to solve one-step word problems?

In solving one-step routine word problems, follow the Four-step Plan: **Understand, Plan, Solve, and Check and Look Back**.

If the problem is non-routine, analyze the problem very well and make illustrations if possible. One-step word problem can be solved using only one operation.

Solve the following problems. Choose the letter that corresponds to your answer.

- 1. The manager of a poultry farm pays each of his workers ₱270 a day. How much does he pay for 15 workers in a day?
  - a. ₱4 050
- b. ₱285
- c. ₱4 500
- d. ₱255
- 2. A leading bag manufacturer can produce at an average, 375 bags an hour. At this rate, how many bags can it produce in 24 hours?
  - a. 900
- b. 9 000
- c. 399
- d. 351
- 3. One square table can sit four persons with one person occupying each side. How many persons can sit if four tables are placed end to end?
  - a. 8
- b. 10
- c. 16
- d. 32

Are you done answering? If yes, time to check. Please go to page 16 for the *Answer Key*.





Do you have pets? How do you take care of them? What are the uses of animals to us?

### Read the problem.

During weekends, Edwin helps his father in their farm by taking care of the animals like ducks, chickens, cows, and goats. Edwin and his father collected 4 trays of duck eggs and 12 trays of chicken eggs. If each tray contains 30 eggs, how many eggs are there in all?



This is an example of a multi-step routine problem. Routine problem solving are useful for daily living.

Try answering the given problem.



### What is It

Let us see if we have the same answer.

To analyze and solve the problem, you can use these steps:

### A. UNDERSTAND

- 1. Read and understand the problem.
- 2. Know **what is asked** in the problem.

  The total number of eggs (duck and chicken eggs combined)
- 3. Know the hidden information.

  The number of duck eggs in 4 trays

  The number of chicken eggs in 12 trays
- 4. Find the necessary information.

### The given facts are:

Four (4) trays of duck eggs are collected 12 trays of chicken eggs are collected There are 30 eggs in each tray

### B. PLAN

- 1. Determine the **operations** to be used. **MULTIPLICATION** and **ADDITION**
- 2. Write the number sentences for the hidden information.  $4 \times 30 = d(duck \ eggs)$   $12 \times 30 = c \ (chicken \ eggs)$

Write the number sentence for the final answer.

 $(4 \times 3) + (12 \times 30) = n$  (total number of eggs collected)

#### C. SOLVE

Solve using the operations.

There are 120 duck eggs.

There are 360 chicken eggs.

The total collected eggs is 480.

For final solution:

#### D. CHECK AND LOOK BACK

See if your answer makes sense. State the complete answer.

Edwin and his father collected 480 duck and chicken eggs in all.

This is how to solve a multi-step routine problem. How about solving multi-step non-routine problems? Go on with the next example. Study the example and ask questions if necessary.

Routine problems are those which can be easily interpreted and solved while non-routine problems are more challenging because the solutions are not immediately clear. Both problems can be solved in multiple ways.

One-step problems can be solved with only one operation, while multi-step problems need two or more operations in order to be solved.

### Study this problem.

Marlon is a pet lover. He has 5 pets composed of birds and cats. If there are 14 legs in all, how many birds are there? How many are cats?

You can solve the problem using different strategies like *listing*, making a table, guess and check or using pictorial representations.

Multi-step non-routine problem solving develops reasoning power. This kind of problem needs a deep and clear analysis and understanding.

### **Strategy 1: Listing**

Birds Cats 2 legs 4 legs 2 legs 4 legs

Each bird has 2 legs and each cat has 4 legs.

2 legs

**Strategy 2: Making a Table** 

	Birds	Cats	Total
Number of Pets	3	2	5
Number of Legs	6	8	14

Strategy 3: Guess and Check

First Guess: 4 birds and 1 cat

 $4 \times 2(legs) + 1 \times 4(legs) = 12 legs (WRONG GUESS)$ 

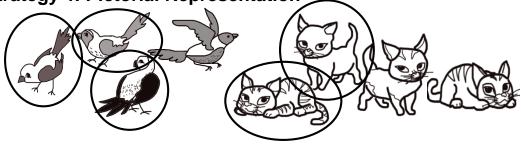
Second Guess: 2 birds and 3 cats

 $2 \times 2(legs) + 3 \times 4(legs) = 16 legs (WRONG GUESS)$ 

Third Guess: 3 birds and 2 cats

 $3 \times 2(legs) + 2 \times 4(legs) = 14 legs (CORRECT GUESS)$ 

**Strategy 4: Pictorial Representation** 



Therefore, Marlon has 3 birds and 2 cats.

Now, you have learned to solve multi-step non-routine problems. This time you are now ready for the activities. LET'S GO!



### What's More

A. Solve the problem below by answering the following questions

Aldrin has 8 boxes of crayons. Each box contains 24 crayons. If he gave 26 crayons to his friend, how many crayons were left?

What is asked in the problem?
What is the hidden information?
What are the given facts?
What are the operations to be used?
What is the number sentence?
What is the final answer?

B. Solve the problem below. Show your solutions and state the final answer.

There are 53 electric posts along a straight highway. The first post is in the town of Mabini and the last post is in the town of Matiwasay. If each post is 50 meters away from the next, how far are the 2 towns from each other?

Solution/Illustration	
Final Answer:	

Are you done answering? If yes, time to check. Please go to page 16 for the *Answer Key*.



#### Assessment 1

Solve the following problems. Show your solutions.

1. In an office, there are two rooms. In the small room, there are 4 seats in each row. In the big room, there are 7 seats in each row. If each room has 4 rows of seats, how many seats are there in all?

SOLUTIONS:	
FINAL ANSWER:	
Edwin rides on a jeenney to deliver a tray of chicken ea	

2. Edwin rides on a jeepney to deliver a tray of chicken eggs to a customer. The jeepney fare is ₱10 for the first four kilometers and ₱2 for each succeeding kilometer. How much will Edwin pay for his 8-kilometer ride?

SOLUTION/ILLUSTRATION:	

FINAL ANSWER:

Are you done answering? If yes, time to check. Please go to page 16 for the *Answer Key*.



### **Activity 2**

Use the table to answer the following questions.

- 1. How much will two sets of female uniform and a school bag cost?
- 2. Mrs. Feliciano bought one set of male uniform, a tumbler and pencil case. How much did she spend?

Back to School SALE!

Female Uniform : ₱210
Male Uniform : ₱160
School Bag : ₱200
Tumbler : ₱85
Pencil Case : ₱40

3. Aling Ofelia bought one set of female and male uniforms, two school bags, two tumblers and two pencil cases for her children. How much change did she receive from her ₱1 500?

Are you done answering? If yes, time to check. Please go to page 16 for the *Answer Key*.



#### **Assessment 2**

Solve the following problems. Use any strategy to solve.

- 1. A grocery store offers a discount of ₱5 for each pack of chocolate drinks. If Sarah bought 10 packs at ₱85 per pack (discount not yet applied), how much change will she receive from her ₱1000?
- 2. Find the value of the word QUARANTINE by using the letter values below. Use multiplication and addition for your solutions.

AEIOU	BCD	FGH	JKLMN	PQRST	VWXYZ
100	10	20	30	40	50

3. There are 60 minutes in one hour. How many minutes have already been spent by a worker who has worked for 9 hours and 30 minutes?

Are you done answering? If yes, time to check. Please go to page 16 for the *Answer Key*.





### What I Have Learned

How do you solve multi-step routine and non-routine word problems involving multiplication and addition or subtraction using appropriate strategies and tools?

### Compute to solve the problem.

To solve multi-step routine word problems involving multiplication and addition or subtraction using appropriate strategies and tools, follow these steps:

#### **UNDERSTAND**

- Know what is asked in the problem.
- Know the hidden information.
- Know what the given factsare.

#### **PLAN**

- Determine the operations to be used.
- Write the number sentence.

#### **SOLVE**

Show the solutions.

#### **CHECK AND LOOK BACK**

- Check your answer
- State the complete answer.

Multi-step non-routine problems can be solved by drawing a picture, using a number line, making a table, guess and check, and other pictorial representations.



### What I Can Do

Solve the following problems. Choose the letter of the correct answer.

- 1. Bino and his twin sister, Vina, went to a beach to gather some shells for their school project. Bino has 3 bags with 30 shells each and Vina has 2 bags with 25 shells each. How many shells do they have in all?
  - A. 125 shells

C. 140

B. 165 shells

D. 110

- 2. Mr. Dechavez has pigs and ducks in his farm. He counted 5 heads and 16 feet. How many pigs are there? How many ducks are there?
  - A. 2 pigs and 3 ducks

C. 1 pig and 4 ducks

B. 3 pigs and 2 ducks

D. 4 pigs and 1 duck

- 3. The Grade 4 pupils of Maligaya Elementary School went on a field trip. Six buses were filled with 46 pupils each. However, 18 pupils traveled in cars. How many pupils in all joined the field trip?
  - A. 249 pupils

C. 284

B. 276 pupils

D. 294

Are you done answering? If ves, time to check. Please go to page 16 for the **Answer Key**.





### Assessment

Read, analyze, and then solve each problem.

- 1. Linda has 12 boxes of paper plates. Each box contains 36 paper plates. She used 173 paper plates for the snacks of the participants in a training. How many paper plates were left unused?
- 2. Mary Ann does 124 sit-ups a day for 6 days while Paul Jake does 152 sit-ups a day for 4 days. Who does more sit-ups?
- 3. There are motorcycles and tricycles parked along the road. There are 5 vehicles and 12 wheels in all. How many motorcycles are there? How many tricycles are there?
- 4. A certain water refilling station refills four-gallon jug at ₱30 for delivery or ₱25 for pick-up. What is the total payment for 10 deliveries and 21 pick-ups?

- 5. A PisoNet Café offers 3 minute internet surfing for only ₱1 and printing for ₱2 per page. If the café collected ₱589for the internet surfing and printed 800 pages, how much will be the total sales?
- 6. Harold posted a picture of his mother's birthday celebration on Facebook at 6:00 pm. After two hours, he saw different reactions of his post, so he counted them. There are 35 likes, 40 love, and 20 wow reactions. And in the next morning, when he checked his post, he noticed that all the reactions are doubled. How many reactions are there in all?
- 7. A grocery store strictly observes social distancing of one meter for their customers paying at the cashier. What is the total distance from the first paying customer to the last customer if there are 20 customers in a straight line?
- 8. Florida is cooking *leche flan*. She mixes 8 eggs and 2 cans of condensed milk for one *Leche Flan*. How many eggs and cans of condensed milk are needed if she will cook 24 *leche flans?*
- 9. Mrs. Montes bought a washing machine at ₱6 540 and two DVD players at ₱850 each. How much will she need to pay?
- 10. Lilibeth bought 100 pieces of apples at ₱12 each and sells them at ₱15 each. How much will she gain if all the apples are sold?

Are you done answering? If yes, time to check. Please go to page 16 for the *Answer Key*.





Solve the following problems.

- 1. Bernie is saving money for a sports bag worth ₱585. He has been saving ₱30 a day for ten days. How much more does he need to save to be able to buy the sports bag?
- 2. Lolo Jose has a farm with 10 mango trees, 8 pigs, 22 chickens, and 2 *carabaos*. How many animal feet are there in all in his farm?
- 3. A pile of₱20-peso bills is consecutively numbered from BU349374 to BU349689. What is the t 14 peso value of the bills?
- 4. In a school, there are 10 classrooms. If each of the two classrooms has 38 chairs and the remaining classrooms have 45 chairs each, how many chairs are there in all?
- 5. Gheric has six shapes composed of triangles and squares. If there are 20 corners in all, how many triangles are there? How many squares are there?
- 6. Printer A prints 155 copies in one hour, while Printer B prints 134 copies in one hour. If the two printers are simultaneously used for 4 hours, how many copies are printed in all?

Are you done answering? If yes, time to check. Please go to page 16 for the *Answer Key*.



CONGRATULATIONS! You are doing very well.

See you in the next module.

### (ff-8 29geq) 3ROM 8'TAHW

- The total number of crayons. 1. The number of crayons left.
- 8 boxes of crayons
- 26 crayons given to his friend 24 crayons in each box
- 4. Multiplication and Subtraction
- n = 82 (45 x 8) .č
- 6. 24 x 8 = 192
- 185 26 = 166
- Aldrin has 166 crayons left.
- 53 1 = 52 electric post
- apart from each other. The two towns are 2 600 meters  $m 000 S = m 00 \times S0$

#### I insmesseseA

- 82 = 4 x 7 91 = 4×4 moon gid moor llem2
- 19 + 28 = 44

014

### There are 44 seats in all.

# Edwin will pay P18 for his 8-km ride.

10. ₱600

## (6-1 zegsq) WONN (TAHW

9. 100 books ٦. 8. 484 bottles Э .ε sliquq 861.7 2 В 008 4 . 9

### (4 agaq) NI 2 TAHW

- 8 2. ٦.

.Ĉ

8 .ε

#### ADDITIONAL ACTIVITIES (pages 14 & 15)

- pe able to buy the sports bag. He needs to save ₱285 more to
- There are 84 animal feet in his .2
- rarm.
- is ₱6 320 (including BU349689) The total peso value of the bills .ε
- .6 There are 436 chairs in all. ٠,
- There are 2 squares in all. There are 4 triangles in all.
- The two printers printed 1156
- cobies in all. .9

#### WHATI CAN DO (pages 12 & 13)

- Э ٦.
- 2. В
- а .ε

### ASSESSMENT (pages 13 & 14)

- There are 259 unused paper
- Mary Ann has more sit-ups (744) .2
- There are 3 motorcycles and .ε
- 2 tricycles.
- 4. The total payment is ₱825
- 5. The total sales is ₱2 189
- There are a total of 190 reactions.
- The total distance is 19 meters.

- 8. 192 eggs and 48 cans of
- condensed milk are needed
- 9. Mrs. Montes needs to pay ₱8 240
- 10. Lilibeth will gain ₱300.

### Activity 2

- 982≢ 7 0Z9<del>d</del>
- 08⊅∉ 3.

### Z fnemssessA

.2

- ₽500
- UAAIE: 100 x 5 = 500 Solutions:
- 40 × 3 = 150 GRT:
- 200 + 150 + 90 = 980 $30 \times 5 = 60$ -NN
- sətunim 078 3.



## Answer Key

Score	upda	ite: What I Know, What's More Activity 1and Assessment
	10	WOW! GREAT JOB!
	7-9	VERY NICE!
	5-6	NICE!
	3-4	OOOPPPS! Let us review and go over with the test again.
	0-2	Don't worry. Take time to go over the lesson again. Do not be shy to ask help from your teacher or facilitator.
		Have fun!
Score Can D		ite: What's In, What's More Activity 2, Assessment 2, What I
	3	WOW! EXCELLENT JOB!
	0	The next activity will be easy for you.
	2	NICE!
	0-1	It is fine. Take time to go back to the lesson, review, and ask questions as necessary before doing the next activity.  Have fun!
Score	upda	te: What 's More Activity 1 (A)
	6	WOW! GREAT JOB!
	4-5	NICE!
	0-3	Don't worry. Your teacher will be happy to help you. Do not be shy to ask questions. Have fun!
Score	upda	ite: What's More Assessment 1 and Additional Activities
	4	WOW! EXCELLENT JOB! The next activity will be easy for you.
	3	NICE!
	0-2	It is fine. Take time to go back to the lesson, review, and ask questions as necessary before doing the next activity. Have fun!
Rubric	s: W	hat 's More Activity 1 (B)
	4 5	Solution/Illustration is correct and final answer is correctly stated.
		Solution/Illustration is not clear but the final answer is correctly stated.
	2 5	Solution/ Illustration is wrong but the final answer is correctly stated.
	1 8	Solution/Illustration is wrong and the final answer is not clearly stated.
		Solution/Illustration and final answer are wrong.

## References

K to 12 Mathematics Curriculum Guide, August 2016.

Tabilang, A. et. al. (2015). *Mathematics: Learner's Material*, Pasig City: Lexicon Press.

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