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Mathematics

Quarter 1 – Module 5: Performing a Series of Operations Using PMDAS or GMDAS

ALTERNATIVE DELIVERY MODE
ADM

Mathematics – Grade 5
Alternative Delivery Mode
Quarter 1 – Module 5: Performing a Series of Operations Using PMDAS or GMDAS

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Quarter 1 – Module 5: Performing a Series of Operations Using PMDAS or GMDAS

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Introductory Message

For the Facilitator:

Welcome to the Math Grade 5 Alternative Delivery Mode (ADM) Module 5 specifically on Performing series of operations applying the Parentheses, Multiplication, Division, Addition, Subtraction (PMDAS) or Grouping, Multiplication, Division, Addition, Subtraction (GMDAS) correctly.

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 5 on Performing a Series of Operations Using PMDAS or GMDAS!

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 have 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 instruction/s 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.

Should 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!

What I Need to Know

In this module, you are going to perform a series of more than two operations on whole numbers applying the Parentheses, Multiplication, Division, Addition, Subtraction (PMDAS), or Grouping, Multiplication, Division, Addition, Subtraction (GMDAS) rule correctly.

After going through this module, you are expected to:

- state, explain and interpret the PMDAS or GMDAS rule; and
- apply PMDAS or GMDAS rule in simplifying numbers with a series of operations.

What I Know

Directions**:** Simplify the expressions below. Write the letter of the correct answer on your notebook.

1) 40 ÷ 2 x 4 + 6 = ____
A. 11 B. 20 C. 46 D. 86

2) (15 – 6) + (4 – 1) x 24 = ____
A. 81 B. 91 C. 151 D. 288

3) (2 x 30) + (90 ÷ 2) = ____
A. 95 B. 105 C. 115 D. 125

4) 3 x [3+2 x (10 - 3)] = ____
A. 51 B. 77 C. 79 D. 105

5)12 + 3 x [4 + (9 – 8) – 2] = ____
A. 21 B. 27 C. 45 D. 63

6) 18 ÷ 6 x 4 – 3 + 6 = ____
A. 3 B. 11 C. 15 D. 20

7) 14 – 8 + 3 + 8 x 24 ÷ 8 = ____
A. 27 B. 33 C. 37 D. 43

8) 4 x 5 + (14 + 8) – 36 ÷ 6 = ____
A. 36 B. 56 C. 86 D. 95

9) (28 ÷ 4) + 3 + (10 – 8) x 5 = ____
A. 20 B. 51 C. 60 D. 77

10) (17 – 7) x 6 + 2 + 56 - 8 = ____
A. 21 B. 63 C. 66 D. 110

Lesson 1 Performing a Series of Operations Using PMDAS or GMDAS

What's In

You may recall, the rules on order of operations by performing the expressions given below.

1) 4 + 6- 9 =
2) 13-5 x 2 + 3=
3) 45 ÷ 5 -10 ÷ 5 =
4) 15 – 5 + 2 =
5) 7 x 6 + (64 ÷8) =

What's New

Did you know that there is a rule that can help us when solving a series of operations? The rule is called **PMDAS,** which stands for **P**arentheses, **M**ultiplication, **D**ivision, **A**ddition, and **S**ubtraction. It may also be called GMDAS when other **G**rouping symbols are used.

The PMDAS or GMDAS rule tells us that in simplifying expressions involving a series of operations, we first simplify all operations inside the **Parentheses** (**( )**) or other **Grouping Symbols** like braces ({ }) and brackets (**[ ]**). Second, perform Multiplication or Division, whichever comes first from left to right. Third, do the Addition or Subtraction, whichever comes first from left to right also.

Study this example. What should be the correct answer to this one?

(10 ÷ 2 x 5) x (14 + 6 – 4) + 2

What Is It

The sample numerical expression above involves a series of operations, we will apply PMDAS or GMDAS rule in simplifying this expression. We start from the expression inside the parentheses and these are:

(10 ÷ 2 x 5) and **(14 + 6 – 4)**

Since there are also operations inside the parentheses, we will also apply PMDAS or GMDAS rule, thus we have:

(10 ÷ 2 x 5**)** x **(14 + 6** – 4**)** + 2	Simplify the operations inside the parentheses. Divide 10 by 2, and Add 14 and 6.
= (5 x 5) x **(20 – 4)** + 2	Multiply 5 by 5 and Subtract 4 from 20.

When the operations inside the parentheses have already been simplified, we can already remove the parentheses. Thus, we have:

= 25 x 16 + 2

The operations that remains are multiplication and addition. Using PMDAS, we will simplify the expression **from left to right.**

Simplifying further, the rules says, multiplication should be done first before addition; thus, we have:

= 25 x 16 + 2	Multiply 25 by 16.
= 400 + 2	Then, add 400 and 2.
= 402	

So, **(10 ÷ 2 x 5) x (14 + 6 – 4) + 2** is equal to **402.**

Consider this another example:

20 + (10 – 15 ÷ 3) x 3

In simplifying this expression, we start from the expression inside the parentheses, that is

(10 – 15 ÷ 3)

Applying the PMDAS or GMDAS rule, division must be done first before subtraction, thus we have:

20 + **(**10 – **15 ÷ 3)** x 3	Divide 15 by 3.
= 20 + (10 – 5) x 3	

To eliminate the parentheses, we have to perform the operation inside, thus we have:

20 + **(10 – 5)** x 3	Subtract 5 from 10.
= 20 + 5 x 3	

To simplify further, we need to apply the PMDAS or GMDAS rule, in which multiplication should be done first before subtraction, thus we have:

20 + **5 x 3**	Multiply 5 by 3.
=20 + 15	Then, Add 20 and 15.
= 35	

So, **20 + (10 – 15 ÷ 3) x 3** is equal to **35**

Study the following additional examples.

Find: ***10 + 2 – 5 + 3***

The operations are addition and subtraction. Using PMDAS, we will simplify the expression **from left to right.**

10 + 2 – 5 + 3	Add 10 and 2.
= 12 – 5 + 3	Subtract 5 from 12.
= 7 + 3	Add 7 and 3.
= 10	

So, ***10 + 2 – 5 + 3*** is equal to **10.**
Find: ***(8 × 5 + 15) ÷ 5 – 6***

(8 × 5 **+** 15***)*** ÷ *5* – 6	Solve the expression inside the parentheses. Multiply 8 and 5 first.
=(40 + 15) ÷ *5* – 6	Add 40 and 15.
= 55 ÷ *5* – 6	Divide 55 by 5.
= 11 – 6	Then, Subtract 6 from 11
= 5	

So, ***(8 × 5 + 15) ÷ 5 – 6*** is equal to **5.**

What's More

Independent Activity 1

Directions: Fill in the blanks to complete each solution. The first item is done for you to serve as a guide.

1. [(12 – 3) + (18 ÷ 6) x 3]
= **9** + 3 x 3
= **9** + **9**
= **18**

2. (7 x 9) – 3 + 8
= __ – 3 + 8
= __ + 8
= ___

3. 18 – (12 ÷ 6) +7
= 18 – __ + 7
= __ + 7
= ___

4. 7 – 5 + 8 x (16 ÷ 4)
= 7 – 5 + 8 x __
= 7 – 5 + __
= 2 + __

5. (10 x 6) ÷ (9 - 3 + 6)
= 60 ÷ (9 - 3 + 6)
= 60 ÷ (__ + 6)
= 60 ÷ __

Independent Activity 2

Directions: Put ☺ if the numerical expression is simplified correctly and put ☹ if the numerical expression is solved incorrectly.

___1) 15 – 3 + 20 ÷ 5 × 3
= 15 – 3 + 4 x 3
= 15 – 3 + 12
= 12 – 12
= 0

___2) (6 × 6) – 9 + 8
= 36 – 9 + 8
= 36 – 17
= 19

___3) 22 – 15 ÷ 7 + 10
= 7 ÷ 7 + 10
= 1 + 10
= 11

____4) (4 × 6 ÷ 3) – 7 + 7
= (24 ÷ 3) – 7 + 7
= 8 – 7 + 7
=1 + 7
= 8

____5) 25 ÷ 5 × 4 – 15 + 12
= 25 ÷ 20 – 15 + 12
= 25 ÷ 5 + 12
= 5 + 12
= 17

Independent Activity 3

Directions: In column A are numerical expressions and their corresponding answers are written in column B. Write the letter that corresponds to the correct answer on a separate sheet of paper.

A	**B**
___ 1) 6 + (9 ÷ 3 x 4)	A. 9
___ 2) 3 x [(9 + 15) ÷ 8]	B. 35
___ 3) 4 x [18 ÷ 2 x (10 – 8)]	C 10
___ 4) (15 – 6) + (4 – 1) x 8	D. 18
___ 5) 2 x [3 + 2 x (10 - 9)]	E. 72
	F. 71

What I Have Learned

Supply the missing term in the blank.

In performing a series of operations on whole numbers involving more than two operations using the **(PMDAS) or (GMDAS)** rule, you must;

First, perform all operations inside the (1) _____ or (2) _____ symbol, provided that you will multiply or divide first, whichever comes first, from left to right before adding or subtracting, whichever comes first, from left to right;

Second, perform all (3) _____ and (4) _____, whichever comes first from left to right; and

Third, perform all (5) _____ and (6) _____, whichever comes first from left to right.

What I Can Do

A. Directions: Perform the operations. Choose the correct answers in the P/GMDAS card. Write your answer in your activity notebook.

P	/G	M	D	A	S
4	**18**	**20**	**56**	**64**	**28**

1) (9 – 2) + (3 × 7)

2) (18 + 14) ÷ (6 + 2)

3) (36 ÷ 6 + 4 × 4 – 2)

4) (36 – 6) + 3 × 9 + 7

5) 4 × (35 – 25) + 16

B. Directions: Below are incomplete expressions. Complete them by finding the missing numbers from the numbers provided in the lower box. Write your answer in your activity notebook.

1) 70 ÷ __ + 5 + 4 – 3 = 16
2) (6 x __ + 2) - 25 = 13
3) 3 x (4 + 4) – __ = 20
4) 5 x 3 + 25 ÷ __ = 20
5) __ ÷ 2 – 3 + 2 x 2 = 6

7 4 5 6 10 12

Assessment

Directions**:** Solve the expressions given below applying PMDAS and GMDAS rules. Write your answer on a separate sheet of paper.

1) 60 x 3 ÷ 4 + 5 = ____

A. 50 B. 65 C. 75 D. 180

2) (14 – 6) + (3 – 1) x 24 = ____

A. 34 B. 56 C. 111 D. 240

3) (3 x 30) + (100 ÷ 5) = ____

A. 90 B. 185 C. 110 D. 140

4) 2 x [3+2 x (10 - 3)] = ____

A. 70 B. 35 C. 34 D. 40

5) 11 + 3 x [4 + (9 – 8) – 2] = ____

A. 45 B. 20 C. 27 D. 63

6) 18 ÷ 6 x 4 – 3 + 6 = ____

A. 15 B. 11 C. 3 D. 20

7) 14 – 8 + 3 + 8 x 24 ÷ 8 = ____

A. 27 B. 33 C. 43 D. 37

8) 4 x 5 + (14 + 8) – 36 ÷ 6 = ____

A. 56 B. 95 C. 36 D. 86

9) (28 ÷ 4) + 3 + (10 – 8) x 5 = ____

A. 20 B. 60 C. 51 D. 77

10) (17 – 7) x 6 + 2 + 56 – 8 = ____

A. 66 B. 21 C. 110 D. 63

Additional Activities

Directions: Solve each expression. Write ☺ if the expression is correct and write ☹ if the expression is incorrect. Write your answer in your Math Activity notebook.

5) 20 ÷ 2 x 3 – 8 = 22

4) 10 + 30 ÷ 2 x 3 = 75

3) 12 + 4 x 6 ÷ 8 = 12

2) 35 ÷ 5 x 7 – 9 + 9 = 49

1) 9 x 3 – 50 ÷ 5 + 15 = 32

Answer Key

What's In

1. 10-9= 1
2. 16-10= 6
3. 9-2 = 7
4. 15 – 7= 8
5. 42 + 8 =50

What's More

Independent Activity 1

1. 9,9,9,18
2. 63,60,68
3. 2,16,23
4. 32,32,34
5. 6,12,5

What I have Learned

1. parenthesis
2. grouping symbol (can be interchanged)
3. multiplication
4. division (can be interchanged)
5. addition
6. subtraction

What's More

Independent Activity 3

1. d
2. a
3. e
4. b
5. c

Assessment

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

What's More

Independent Activity 2

1. ☹
2. 😠
3. 😠
4. ☹
5. 😠

Additional Activities

1. ☹
2. ☹
3. 😠
4. 😠
5. ☹

What I Can Do

	A.		B.
1.	S – 28	1.	7
2.	P – 4	2.	6
3.	M – 20	3.	4
4.	A – 64	4.	5
5.	D – 56	5.	10

What I Know

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

References

Ursua, Alvin C. and Angeline P. Lumbre. 2016. *21st Century Mathletes Textbook*. Quezon City: Vibal Group Inc.

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