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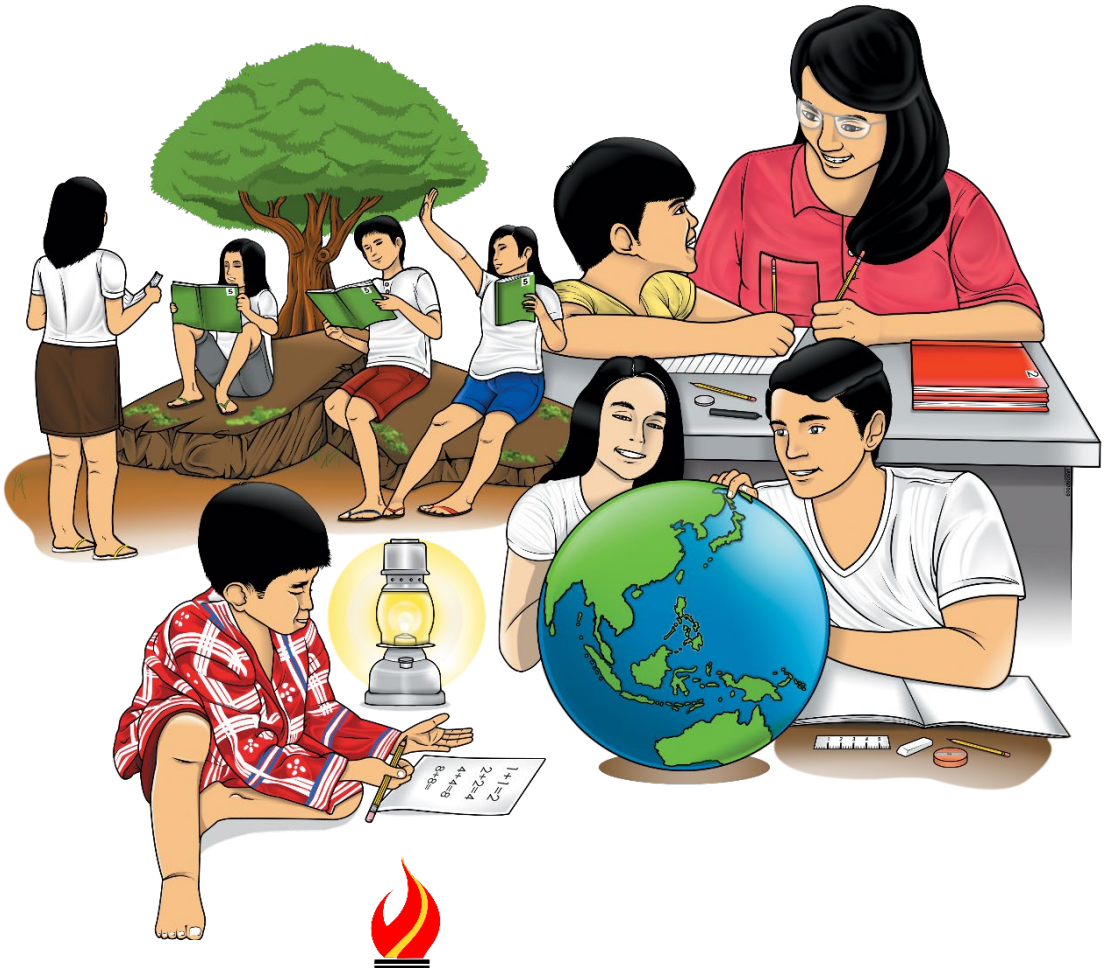
Mathematics

Quarter 2 – Module 3:
Properties of Multiplication



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Mathematics

Quarter 2 – Module 3:
Properties of Multiplication

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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 on describing one's drawing about the narratives listened to through composition. The scope of this module permits it to be used in many different learning situations. The language used recognizes your diverse vocabulary backgrounds. 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 Mathematics Grade 3 learning materials you are using.

After going through this module, you are expected to:

- illustrate the properties of multiplication in relevant situations (commutative property, distributive property or associative property).

Enjoy your journey. Good luck!

What I Know

Choose the letter of the correct answer. Write your answers on a separate sheet of paper.

1. What is the missing factor in 7 x 8 = ___ x 7?
   a. 10 c. 8
   b. 7 d. 6

2. What property of multiplication is illustrated in 9 x 7 = 7 x 9?
   a. Identity Property
   b. Commutative Property
   c. Distributive Property
   d. Associative Property

3. What is the missing factor in 2 x (10 + 8) = (2 x __) + (2 x 8)?
   a. 10 c. 8
   b. 7 d. 2

4. What property of multiplication is being illustrated:
   3 x (9 x 2) = (3 x 9) x 2?
   a. Identity Property
   b. Commutative Property
   c. Distributive Property
   d. Associative Property

5. Which of the following illustrates Distributive Property?
   a. 3 x (4 + 7) = (3 x 4) + (3 x 7)
   b. 3 x 4 = 4 x 3
   c. (3 x 4) x 7 = 3 x (4 x 7)
   d. 3 x (4 x 7) = 3 x (4 + 7)

Lesson 1 Illustrates the Properties of Multiplication in Relevant Situations

In the previous lesson you learn how to multiply numbers by visualizing multiplication sentence into groups or sets of objects. You also learn the basic multiplication facts in multiplying numbers through 0 to 10.

In this module, you will learn the properties of multiplication; commutative, distributive and associative.

What's In

Direction: Choose the letter of the correct answer. Use separate sheet for your answer.

1. What is the addition equation for 7 x 5 = n?
   a. 7+7+7+7+7+7+7 = n
   b. 5+5+5+5+5 = n
   c. 7+7+7+7+7 = n
   d. 5+5+5+5+7+7+7 = n
2. If 7 x 5 = 35, then 5 x 7 = ____.
   a. 35 b. 40 c. 30 d. 12
3. Write the missing factor: 6 x 3 = 3 x ___
   a. 2 b. 3 c. 6 d. 9
4. Given 14 x 2 = 28, then (10 x 2) + (4 x 2) = ___.
   a. 20 + 6 = 26
   b. 20 + 8 = 28
   c. 12 + 6 = 18
   d. 12 + 8 = 20
5. Given 3 x (2 x 5) = 3 x 10 = 30, then (3 x 2) x 5 = _____.
   a. 6 x 5 = 30
   b. 5 x 5 = 25
   c. 6 x 10 = 60
   d. 6 + 5 = 11

What's New

Read the problem below.

Andy and Loida work in a bakery shop. Andy has to prepare an order from a customer of **6 trays with 5 cupcakes per tray**. On the other hand, Loida has accepted an order from another customer of **5 trays with 6 cupcakes per tray**. Who has more cupcakes to prepare?

1. What order does Andy have to prepare?
   Answer: ___ trays of ___ cupcakes per tray.
2. What order does Loida have to prepare?
   Answer: ___ trays of ___ cupcakes per tray.
3. What is the multiplication sentence for Andy's work?
   Answer: ____ x ____ = n
4. What is the multiplication sentence for Loida's work?
5. Answer: ____ x ____ = n What is the product?

   Andy: (multiplication sentence) ____ x ____ = ____
   (repeated addition)___+___+___+___+___ +___ = _____

   Loida: (multiplication sentence) ____ x ____ = ____
   (repeated addition)____+____+____+____+____ = _____

   Answer to the problem question:

   _____

   _____

What is It

In our problem in Activity 1, if you answered that Andy and Loida have the same number of cupcakes to prepare then you are correct!

The multiplication phrases "5 x 6" and "6 x 5" are both equal to 30. This illustrates the Commutative Property of Multiplication.

In this lesson we will discuss the three Properties of Multiplication:

A. Commutative Property

This property indicates that changing the order of factors does not change or affect the product.

Example: 5 x 6 = 6 x 5

B. Distributive Property

Multiplying the sum of two or more addends by a number will give the same result as multiplying each addend individually by the number and then adding the products together.

Distributive property is helpful in multiplying numbers especially if one of the factors is a 2-digit number.
Example: 13 x 2 =?

Step 1. Write the 2-digit number in expanded form.

13 x 2 = (10 + 3) x 2

Step 2. Distribute the multiplier over addition.

(10 + 3) x 2 = (10 x 2) + (3 x 2)

Step 3. Add the partial products to get the final answer.

(10 x 2) + (3 x 2) = 20 + 6 = 26

Another Example: 17 x 4 =?

Solution:	17 x 4 = (10 + 7) x 4	Expanded form
	= (10 x 4) + (7 x 4)	Distributive property
	= 40 + 28	Adding partial products
	= 68	Product

C. Associative Property

This property states that when three numbers are multiplied, the product is the same regardless of the grouping of the factors.

Example: (2 x 4) x 6 = 2 x (4 x 6)

To multiply three 1-digit numbers using associative property.

a. Multiply first the factors enclosed in parentheses.
b. Multiply the remaining factors.

Example: Apply the associative property to multiply 2 x 4 x 6.

Solution:

Step 1. Enclose the two factors to be multiplied first.

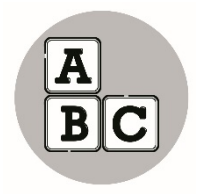
(2 x 4) x 6 or 2 x (4 x 6)

Step 2. Multiply first the factors enclosed in parentheses.

(2 x 4) x 6 = 8 x 6 2 x (4 x 6) = 2 x 24

Step 3. Multiply the remaining factors.

8 x 6 = 48 2 x 24 = 48



What's More

Match the properties found in the box to each item below that illustrates its meaning. Write the letter of the correct answer in a separate sheet.

A. Commutative Property
B. Distributive Property
C. Associative Property

____1. 5 x (6 x 7) = (5 x 6) x 7
____2. 8 x 2 = 2 x 8
____3. (10 + 8) x 7 = (10 x 7) + (8 x 7)
____4. (2 x 5) + (2 x 7) = (5 + 7) x 2
____5. 28 x 30 = 30 x 28
____6. 2 groups of 10 is equal to 10 groups of 2
____7. 15 x 9 = (10 + 5) x 9 = (10 x 9) + (5 x 9)
____8. (5 x 20) x 2 = 5 x (20 x 2)
____9. 3 x (4 x 5) = (3 x 4) x 5
____10. 6 x (7 x 3) = 6 x 21

What I Have Learned

Three Properties of Multiplication:

1. Commutative Property:

   $a \times b = b \times a$

   This property indicates that changing the order of factors does not change or affect the product.

2. Distributive Property:

   $(a + b) \times c = (a \times c) + (b \times c)$

   Multiplying the sum of two or more addends by a number will give the same result as multiplying each addend individually by the number and then adding the products together.

3. Associative Property:

   $a \times (b \times c) = (a \times b) \times c$

   This property states that when three numbers are multiplied, the product is the same regardless of the grouping of the factors.

What I Can Do

Complete each multiplication sentence to illustrate the given Property of Multiplication.

1.	8 x 9	=	_____	(commutative)
2.	_____	=	3 x (4 x 9)	(associative)
3.	(7 + 8) x 9	=	_____	(distributive)
4.	(4 x 5) x 8	=	_____	(associative)
5.	_____	=	(3 x 6) + (3 x 2)	(distributive)

Assessment

Choose the letter of the correct answer. Write your answers on a separate sheet of paper.

1. Using Commutative Property, complete the equation:

   9 x 10 = _____?

   a. 10 + 9
   b. 9 + 10
   c. 9 x (9 + 1)
   d. 10 x 9

2. What property of multiplication is illustrated in 9 x 7 = 7 x 9?

   a. Identity Property
   b. Commutative Property
   c. Distributive Property
   d. Associative Property

3. Using Distributive Property, which of the following completes the multiplication sentence: 2 x (10 + 8) = _____?

   a. (2 x 10) + (10 x 8)
   b. (2 x 10) + (10 x 2)
   c. (2 x 10) + (2 x 8)
   d. (2 + 10) x (2 + 8)

4. What property of multiplication is being illustrated:

   3 x (9 x 2) = (3 x 9) x 2?

   a. Identity Property c. Distributive Property

   b. Commutative Property d. Associative Property

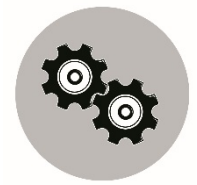
5. Which of the following illustrates Distributive Property?

   a. 6 x (7 + 8) = (6 x 7) + (6 x 8)

   b. 2 x 4 = 4 x 2

   c. (5 x 4) x 7 = 5 x (4 x 7)

   d. 3 x (4 + 7) = 3 + (4 x 7)



Additional Activities

Write the possible factors of the given product applying the properties of multiplication then state the property applied.

a. 20 = _____ x ____ = _____ x _____

   Property Used: _____

b. 25 = (_____ + _____) x ____

   = (_____ x _____) + (_____ x _____)

   = _____ + _____

   = _____

   Property Used: _____

c. 50 = _____ x _____ x _____

   = (_____x _____)x _____

   = _____ x _____

   = _____

   Property Used: _____

Answer Key

What's New

1. 6 trays of 5 cupcakes
2. 5 trays of 6 cupcakes
3. 5 x 6 = n
4. 6 x 5 = n
5. Andy: **5** x **6** = 30

   5+5+5+5+5 +5 = 30

   Loida: **6** x 5 = 30

   6+6+6+6+6 = 30

Andy and Loida has to prepare the same number of cupcakes which is 30.

What I Know

1. C
2. B
3. A
4. D
5. A

What's More

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

What's In

1. C
2. A
3. C
4. B
5. A

Additional Activities

a. *Open answer*
   Commutative Property
b. *Open answer*
   Distributive Property
c. *Open answer*
   Associative Property

Assessment

1. D
2. B
3. C
4. D
5. A

What I Can Do

1. 9 x 8
2. (3 x)4 x 9
3. (9 x 7) + (9 x 8)
4. 4 x (5 x 8)
5. 3 x (6 + 2)

References

Lesson Guide in Elementary Mathematics Grade 3.202-203.(s.l.): (s.n.).

Mathematics Teacher's Guide Grade 3. 131-134.(s.l.): (s.n.).

Mathematics Kagamitan ng Mag-aaral: Sinugbuanong Binisaya.122-124.(s.l.): (s.n.).

"Lesson 27". Mathematics: Teacher's Guide. 134-137.(s.l.): (s.n.).

Mathematics: Learner's Guide.125-127.(s.l.): (s.n.).

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