3

Mathematics
Quarter 2 – Module 4a:
Multiplying 2- to 3- Digit Numbers by 1-digit Numbers

ALTERNATIVE DELIVERY MODE
ADM

Mathematics – Grade 3
Alternative Delivery Mode
Quarter 2 – Module 4a: Multiplying 2-to 3- Digit Numbers by 1-digit Numbers
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3

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Multiplying 2-to 3-Digit Numbers by 1-digit Numbers

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 multiplying numbers. 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 Grade 3 Mathematics learning materials you are using.

After going through this module, you are expected to:

Multiply 2-3 Digit Numbers by [1]-Digit Numbers without or with Regrouping **(M3NS-IIc-43.1)**

Enjoy your journey. Good luck!

What I Know

Activity 1

Direction:

Give the product of the following.

1. 91	2. 832	3. 96
X 2	x 4	x 2

4. 340	5. 712
X 8	x 7

Lesson	Multiply 2-3 Digit Numbers
1	by 1-Digit Numbers without or with Regrouping

The children like you are fond of counting and multiplying numbers that could help you in day-to-day activities in your home or in school. In this module, you will learn how to multiply 2-3 Digit Numbers with 1-Digit Number without or with Regrouping.

What's In

Activity 2

Remember: The associative property of multiplication says that the way in which factors are grouped in a multiplication problem does not change the product.

Directions:

Apply the associative property of multiplication and find the product.

1.   (3 x 2) x 4 = 3 x (2 x 4)

     _____ x 4 = 3 x _____

             ____ = ____

2.   (4 x 6) x 3 = 4 x (6 x 3)

     _____ x 3 = 4 x _____

             ____ = ____

2

Which of the items above you find it easy to solve? Why?

Which item you find it difficult? Why?

Is it easy to solve problem in mathematics? Why?

What's New

In Activity 2, we are given two items on multiplication. As you go through the solution applying associative property of multiplication, observe that item no. 1 is easier to solve than item no. 2 because the first item only includes multiplying 1-digit number by 1-digit number while second item involves 2-digit numbers multiplied to 1-digit numbers.

Let us take a look at the solution:

1. (3 x 2) x 4 = 3 x (2 x 4)

    $\underline{6}$ x 4 = 3 x $\underline{8}$ multiplying 1-digit numbers

    $\underline{24}$ = $\underline{24}$

2. (4 x 6) x 3 = 4 x (6 x 3)

    $\underline{24}$ x 3 = 4 x $\underline{18}$ In here, we multiply 2-digit numbers by
                                    1-digit numbers

How to multiply 2-digit numbers by 1-digit numbers?

Remember that multiplication is a repeated addition. This process is still useful in multiplying larger numbers but takes a long process. However, it would be easy to visualize repeated addition of 2-digit numbers if it is in multiples of ten. Therefore, our goal is to convert the 2-digit numbers into multiples of 10 as shown below.

3

Going back to our solution we need to multiply; <u>24</u> x 3 and 4 x <u>18</u>.

Step 1. Expand the 2-digit number into its addition form with multiples of 10.   24 = 20 + 4 ,   18 = 10 + 8

Step 2. Apply Distributive Property of Multiplication

$\qquad$ (20 + 4) x 3 $\qquad$ = $\qquad$ 4 x (10 + 8) $\qquad$ expanded form

$\qquad$ (20 x 3) + (4 x 3) = (4 x 10) + (4 x 8) $\quad$ distributive property

$\qquad\qquad$ <u>60</u> + 12 = <u>40</u> + 32 $\qquad\qquad$ by repeated addition

$\qquad\qquad\qquad$ 72 = 72

Activity 3

Direction:

Multiply the following using the Distributive Property of multiplication.

1. 35 x 4

2. 14 x 6

3. 22 x 5

4. 2 x 89

5. 3 x 72

What is It

As mentioned, the process of multiplying numbers using Distributive Property and repeated addition is considered as long method especially if large numbers are involved like 3-digit numbers. This time, you will learn the basic rules of multiplying 2- to 3-digit numbers by 1-digit number without or with regrouping.

Recall this!

Multiplicand – is the number to be multiplied by another **number**

Multiplier – is the number that multiplies

Product – **is** the answer or result of multiplication process

```
    51  →      multiplicand
x    2  →       multiplier
1  0  2  →     product
```

hundreds	tens	ones
1	0	2

Multiplying Without Regrouping

Just like addition and subtraction, it is easy to multiply large numbers by aligning them in vertical column. When you observe that as you multiply the 1-digit number to each digit on the right of the leftmost digit of the multiplicand and its result is *less than 10* then the process of multiplication needs no regrouping.

Here are the steps in *multiplying 2- to 3-digit numbers by 1-digit numbers without regrouping:*

5

Example: 341 x 2 =?

Step 1. Arrange the two numbers vertically with the multiplicand
Place above the multiplier. 3 4 1
                                           x   2

Step 2. Multiply the 1-digit multiplier to each digit of the multiplicand
from right to left starting from ones place then to the tens place and
extend up to the hundreds place.

3 4 **1**   - **1** is the digit of the multiplicand in ones place

x   **2**   - **2** is the multiplier in ones place to be multiplied to the
                      multiplicand 1 in ones place

    2   - align **2** as the product in ones place

3 **4** 1   - 4 is the digit of the multiplicand in tens place

X   **2**   - 2 is the multiplier in tens place to be multiplied
                         to the multiplicand 4 in tens place

  8 2   - align 8 as the product in tens place

3 4 1   - 3 is the digit of the multiplicand in the hundreds
                     place

x   **2**   - 2 is the multiplier in hundreds place to the
                      multiplicand 3 in hundreds place

6 8 2   - align 6 as the product in the hundreds
                     place

Therefore: **341 x 2 = 682**.

6

Another Example: 83 x 3 = ?

Step 1. Arrange the two numbers vertically
$$\begin{array}{r} 83 \\ \underline{\times \ 3} \end{array}$$

Step 2. Multiply the multiplier in ones place then to the tens place.

$$\begin{array}{r} 8\,3 \\ \underline{\times \ \ \ 3} \\ 9 \end{array}$$

Multiply the multiplier in ones place

$$\begin{array}{r} 8\,3 \\ \underline{\times \ \ \ 3} \\ 2\,4\,9 \end{array}$$

Therefore: **83 x 3 = 249**.

Multiplying with Regrouping

In cases that as you multiply the 1-digit number to each digit on the right of the leftmost digit of the multiplicand and its result is *greater than 10* then the process of multiplication needs regrouping.

Here are the steps in *multiplying 2-digit number by 1-digit number with regrouping:*

Example: 45 x 3 = ?
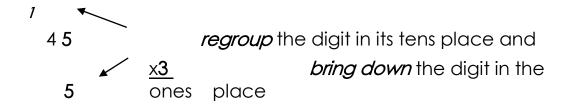
Step 1. Arrange the two numbers vertically.
$$\begin{array}{r} 45 \\ \underline{\times \ 3} \end{array}$$

Step 2. Multiply the multiplier to the digit in ones place.
Since the product is in 2-digit number, apply regrouping.

7

```
  1
   4 5                 *regroup* the digit in its tens place and
        x3             *bring down* the digit in the
   5            ones   place
```

Step 3. Multiply the multiplier to the digit in the tens place. Add the regrouped digit to its product.

```
        1
         4 5   (4 x 3) + 1 = 12 + 1 = 13
      x     3
        1 3 5
```

Therefore: **45 x 3 = 135.**

Here is an example of *multiplying 3-digit number by 1-digit number with regrouping:*

Example: 746 x 8 = ?

Step 1. Arrange the two numbers vertically.   746
                                                      x 8

Step 2. Multiply the multiplier to the digit in ones place.
                    6 x 8 = 48

```
   4
                        *Regroup*  the digit in the tens place 74
   6
    x 8                 *bring down* the digit in the ones place
    8
```

Step 3. Multiply the multiplier to the digit in tens place. *4 x 8 = 32*

Get the sum of the regrouped digit and the product.

```
  3 4        32 + 4 = 36
7 4 6        Bring down the digit 6 of the sum in the tens column.
x    8       regroup the digit 3 of the sum in the hundreds
  6 8        column.
```

Step 4. Multiply the multiplier to the digit in hundreds place.

```
  3 4        (7 x 8) = 56
7 4 6         Add the regrouped digit to the product.
x      8     56 + 3 = 59
5 9 6 8
```

Therefore: **746 x 8 = 5 968**.

What's More

Activity 4

Direction:

A. Multiply 2- to-3-digit numbers without regrouping and find the product.

1. 33	2. 21	3. 54	4. 62	5. 82
x 2	x 4	x 2	x 4	x 3

9

B. Multiply 2-3 digit numbers with regrouping and find the product.

6 . 281	7. 58	8. 88	9.123	10 .427
X5	x4	x4	x 6	x 2

What I Have Learned

How do we multiply 2-to 3-digit numbers by 1-digit numbers without or with regrouping?

In multiplying 2- to 3-digit numbers by 1-digit number without or with regrouping:

Step 1. Arrange the two numbers vertically with the multiplicand place above the multiplier.

Step 2. Multiply the 1-digit multiplier to each digit of the multiplicand from right to left starting from ones place then to the tens place and extend up to the hundreds place if exist.

When the product upon multiplying each pair of digits is a 2-digit number, apply regrouping. *To regroup* follow these steps:

a. bring down the digit in the ones place of the product and carry over its digit in the tens place

b. multiply again the multiplier to the next digit of the multiplicand then add the regrouped digit

10

What I Can Do

Directions:

Solve the following word problems given below and show your solution on another sheet of papers.

1. Tagbinonga Elementary School Pupils received 48 boxes of toys from the DTI - Konsumo Mati during their outreach program.

    Each box had 4 assorted toys. How many toys were there in all?

2. A wall clock costs ₱128. How much is the cost of 3 clocks?

3. Nico sells 402 *puto maya* in the market. How much will Nico earn if his puto maya costs ₱4 each?

4. Jean has 3 baskets of grapes. There are 476 grapes on each basket. How many grapes does Liza have altogether?

5. Christopher bought 2 boxes of books at a yard sale. If each box had 24 books how many books did he buy?

Assessment

Direction:

Multiply the following numbers with or without regrouping and find the product.

1. 234
    x 2

2. 93
    x 3

3. 87
    x 7

4. 4 x 123

5. 5 x 678

11

Additional Activities

Write the numbers for X and Y that when multiplied are equal to the given product. Choose the pair of numbers from the boxes X and Y.

1.)   168   2.) 2,898   3.) 603

X=_____   X=_____   X=_____

Y=_____   Y=_____   Y=_____

Box X   Box Y

31		40	1	2	3
	21			4	
201		42	5		8
	33	322	9		0

Answer Key

Additional Activity

1. X = 42
   Y = 4

2. X =322
   Y= 9

3. X = 201
   Y = 3

Assessment

1. 468
2. 186
3. 609
4. 492
5. 3 390

What I Can Do

1. 96 toys
2. ₱ 384
3. ₱1,608
4. 1,428 grapes
5. 48 books

What's More

1. 66
2. 2 884
3. 522
4. 3 395
5. 1 146

What's New

1. 35×4
   $= (30 + 5) \times 4$
   $= (30 \times 4) + (5 \times 4)$
   $= 120 + 20$
   $= 140$

2. 14×6
   $= (10 + 4) \times 6$
   $= (10 \times 6) + (4 \times 6)$
   $= 60 + 24$
   $= 84$

3. 22×5
   $= (20 + 2) \times 5$
   $= (20 \times 5) + (2 \times 5)$
   $= 100 + 10$
   $= 110$

4. 2×89
   $= 2 \times (80 + 9)$
   $= (2 \times 80) + (2 \times 9)$
   $= 160 + 18$
   $= 178$

5. 3×72
   $= 3 \times (70 + 2)$
   $= (3 \times 70) + (3 \times 2)$
   $= 210 + 6$
   $= 216$

What's More

1. 66
2. 2 884
3. 522
4. 3 395
5. 1 146

References

https://www.onlinemathlearning.com/multiplication-
        wordproblems.html

K-12 Learner's Material in Math Grade 3

K-12 Teacher's Guide in Math Grade 3