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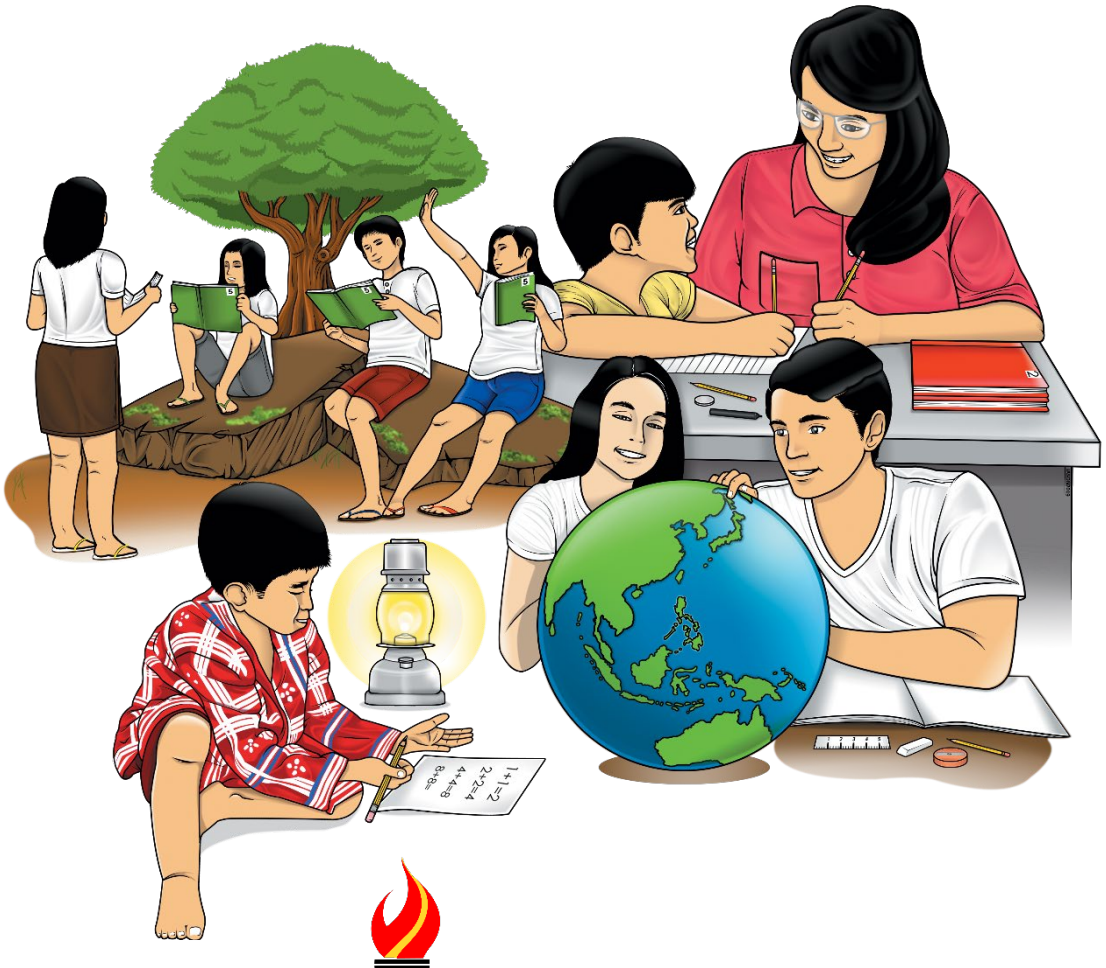
Mathematics

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



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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 yo

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

Give the product of the following.

1. 91
   x 2

2. 832
   x 4

3. 96
   x 2

4. 340
   x 8

5. 712
   x 7

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

What's In

Activity 1

Applying the associative property of multiplication 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 _____

   ____ = ____

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

Which item you find it difficult? Why?

What's New

In Activity 1, 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 number multiplied to 1-digit numbers.
Let us take a look at their solution:

1. $(3 \times 2) \times 4 = 3 \times (2 \times 4)$
   $6 \times 4 = 3 \times 8$ multiplying 1-digit numbers
   $24 = 24$

2. $(4 \times 6) \times 3 = 4 \times (6 \times 3)$
   $24 \times 3 = 4 \times 18$ In here, we multiply 2-digit number by 1-digit number.

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

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 multiple of ten. Therefore, our goal is to convert the 2-digit number into multiples of 10 as shown below.

Going back to our solution we need to multiply; **24×3** and **4×18**.

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

$(20 + 4) \times 3 = 4 \times (10 + 8)$ expanded form
$(20 \times 3) + (4 \times 3) = (4 \times 10) + (4 \times 8)$ distributive property
$60 + 12 = 40 + 32$ by repeated addition
$72 = 72$

Activity 2

Multiply 2-digit number by 1-digit number by Distributive Property.

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 – the number that is to be multiplied by another

Multiplier – one that multiplies

Product – the answer or result of multiplication process

```
  5 1  ──►  multiplicand
x   2  ──►  multiplier
-------
1 0 2  ──►  product
```

hundreds	tens	ones
1	0	2

Multiplying Without Regrouping

Just like addition and subtraction, it would be 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 number without regrouping:*

Example: 341 x 2 = ?

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

```
 341
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 if exist.

```
 3 4 1     - 1 is the digit of the multiplicand in ones place
x    2     - multiply in ones place
     2     - align product in ones place

 3 4 1     - 4 is the digit of the multiplicand in tens place
x    2     - multiply in tens place
   8 2     - place the product in the tens place

 3 4 1     - 3 is the digit in the hundreds place
x    2     - multiply in hundreds place
 6 8 2     - place the product in the hundreds place
```

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

Another Example: 83 x 3 = ?

Step 1. Arrange the two numbers vertically

$$\begin{array}{r} 83 \\ \times\ 3 \\ \hline \end{array}$$

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

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

Multiply the multiplier in ones place

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

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.

$$\begin{array}{r} 45 \\ \times\ 3 \\ \hline \end{array}$$

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

$$\begin{array}{r} \mathbf{1} \\ 4\,\mathbf{5} \\ \times\ \ \mathbf{3} \\ \hline \mathbf{5} \end{array}$$

carry over the digit in its tens place and
bring down the digit in the 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.

```
   4
 7 4 6
x   8
-------
   8
```

6 x 8 = 48

carry over the digit in the tens place and

bring down the digit in the ones place

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.

*32 + 4 = **36***

Bring down the digit **6** of the sum in the tens column.

Carry over the digit **3** of the sum in the hundreds column.

```
   3 4
 7 4 6
x   8
-------
 6 8
```

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

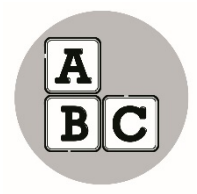
(7 x 8) = 56

Add the regrouped digit to the product.

*56 + 3 = **59***

```
   3 4
 7 4 6
x    8
---------
5 9 6 8
```

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



What's More

Activity 3

Find the product.

1.	2.	3.	4.	5.
33	721	58	679	382
x 2	x 4	x 9	x 5	x 3

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

What I Can Do

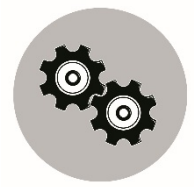
Solve the following problems.

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 earns if his sales are sold out at ₱4 each?
4. Liza has 3 baskets of grapes. There are 476 grapes on each basket. How many grapes does Liza have altogether?
5. John bought two boxes of books at a yard sale. If each box had twenty-four books how many books did he buy?

Assessment

Multiply.

1. 234 x 2
2. 93 x 3
3. 87 x 7
4. 4 x 123
5. 5 x 678



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
X=_____
Y=_____

2.) 2,898
X=_____
Y=_____

3.) 603
X=_____
Y=_____

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

Answer Key

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

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

Assessment

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

Additional Activity

1. X = 42
   Y = 4

2. X = 322
   Y = 9

3. X = 201
   Y = 3

References

https://www.onlinemathlearning.com/multiplication-word-problems.html

K-12 Learner's Material in Math Grade 3

K-12 Teacher's Guide in Math Grade 3

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