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Mathematics

Quarter 2 – Module 4(b): Multiplying 2-Digit Numbers by 2- Digit Numbers

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Quarter 2 – Module 4b: Multiplying 2-Digit Numbers by 2-Digit Numbers
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Mathematics

Quarter 1 – Module 4(b): Multiplying 2-Digit Numbers by 2- 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 you.

What I Need to Know

This module was designed and written with you in mind. It is here to help you comprehend multiplication using 2-digit numbers by 2-digit numbers without regrouping. 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:

- identify the process in multiplying 2-digit numbers by 2-digit numbers without or with regrouping;
- multiply 2-digit numbers by 2-digit numbers without or with regrouping; and
- solve problems applying the methods in multiplying 2-digit numbers by 2-digit numbers without or with regrouping.

Enjoy your journey. Good luck!

What I Know

Directions: Answer the following questions by writing the correct letter in a separate sheet of paper.

1. If 79 is multiplied by 43, we get____.
   a. 3 397 b. 3 396 c. 3 966 d. 3 279

2. How do you multiply 2-digit numbers by 2-digit numbers?
   a. Multiply the 2-digit multiplicand by the ones and add the partial products to get the final product.
   b. Multiply the 2-digit multiplicand by the ones and tens of the multiplier then add the partial products to get the final product.
   c. Multiply the 2-digit multiplicand by the ones and tens of the multiplier.
   d. Multiply the 2-digit multiplicand by the tens of the multiplier only.

3. Solve this: 54 x 26 = ___.
   a. 80 b. 1,404 c. 4,404 d. 1,504

4. Find the product of this mathematical sentence. 21 x 14 =_____.

   a. 249 b. 429 c. 924 d. 294

5. 68 x 19 is equal to_____.
   a. 1 292 b. 1 192 c. 1 229 d. 1 242

Lesson 1 Multiplies 2-digit Numbers by 2-digit Numbers without or with Regrouping

Have you been in a situation where you were in a hurry in calculating how much you would pay in the sari-sari store; and Manang tindera is also in a mind competition with you on who is going to finish the calculation first and most definitely gets the correct answer? Or in a situation where you need to budget your money to buy the pieces that complement your budget? This lesson is all about that- Multiplying 2-digit numbers with 2 digit numbers without regrouping. May it be buying, budgeting, arranging, and all other related multiplication scenarios this could help you. So, the next time you are in a grocery store, try competing with the cashier in computing exact amount you should pay, but do it privately or he/she might find you weird.

What's In

You are tasked to do the activity below.

Directions: You may ask any member of your family or your friends to play this game. All you need is a dice and any object that will serve as your main piece to move across the puzzle. Take turns rolling a die. Move that number of spaces and solve the multiplication problem. If correct, stay on that space. If incorrect, go back to your previous space. First player to reach the finishing box wins!

START

9 x 2=

4 x 9=

3 x 4=

Bonus! Move 2 boxes ahead

2 x 8=

3x 5=

4 x 2=

5 x 2=

3 x 0=

9 x 8=

7 x 8=

6 x 6=

CRASH! Go back 3 boxes

5 x 7=

3 x 8=

5x 8=

8 x 8=

5 x 5=

4 x 4=

6x 5=

CRASH! Go back 3 boxes

7x 3=

4x 8=

4x 6=

5 x 9=

9 x 4=

6 x 0=

6x 8=

FINISH

Notes to the Teacher

To make this module interactive and at the same time make the learner enjoy solving Math problems, you may suggest to the learner to play the game with his/her friends or family members. Note that the more, the merrier! This activity is best performed in a group to maintain individual focus and to provide a much-organized comprehension check. The learner may also play it alone and may refer to the answer key.

Be sure that the learner masters the multiplication table from 1 to 10 and can multiply 2–3-digit numbers by a 1-digit number with regrouping.

Multiplication is fun and challenging especially when the digits are getting higher, so to make things more interesting, the learners are given at least 2 minutes to solve their problem. If player A is not able to answer in the given time, then player B will take turn and player A will wait until it will be his/her turn if he/she will still be answering the same problem he/she left off. Regularly check each group and make sure they are not being coached when they are answering. Have fun!

What's New

Activity 1

Problem:

Mang Kanor harvested mangoes and they are to be distributed to local barangays. There are thirty-three (33) mangoes in a box. How many mangoes are there in twelve (12) boxes?

Let us help Mang Kanor arrange the boxes.

- What fruit did Mang Kanor harvest?

  _____

  _____

- What did Mang Kanor do with the mangoes?

  _____

  _____

- How many mangoes are there in a box?

  _____

  _____

- How many mangoes are there all in all?

  _____

  _____

- How did you find the answer?

  _____

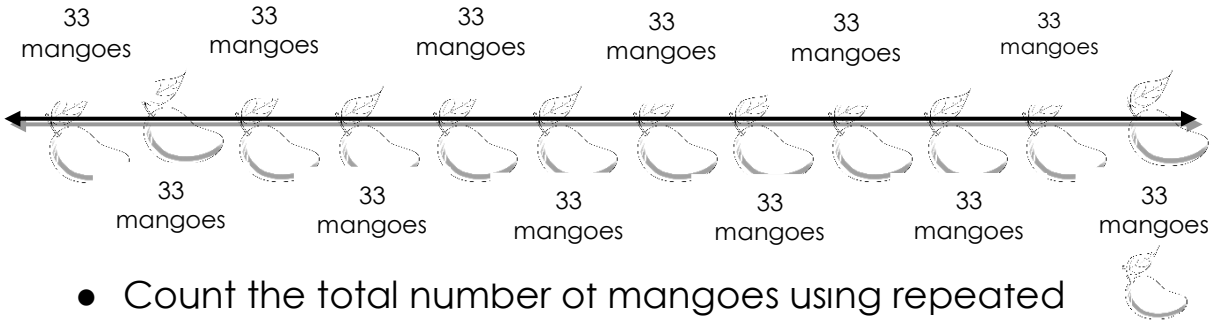
  _____

What is It

In solving the problem, you may find the answer using the three methods: Repeated Addition, Distributive Property of Multiplication, and Short Cut Method of Multiplication.

Method 1: Repeated Addition Using Number Line

- Based on the problem, into how many equal parts should we divide the number line to show 12 boxes?
- How many mangoes were there in each box?
- Draw a number line and try to divide the number line into 12 equal parts.



- Count the total number ot mangoes using repeated addition. 33+33+33+33+33+33+33+33+33+33+33+33= **396**

Therefore, there are three hundred ninety-six (396) mangoes.

Method 2: Distributive Property of Multiplication Over Addition

Another way in finding the answer of the problem is using the Distributive Property of Multiplication.

Follow the steps shown below.

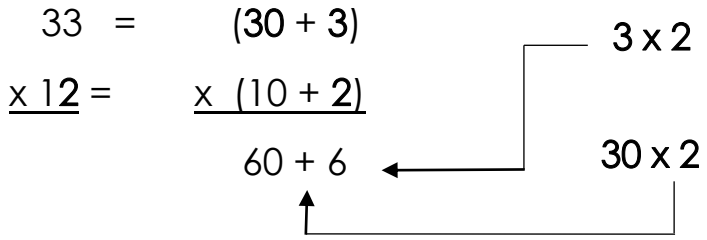
Step 1:

Express the factors in expanded form with multiples of 10.

33	→	multiplicand	(30 + 3)
x 12	→	multiplier	(10 + 2)

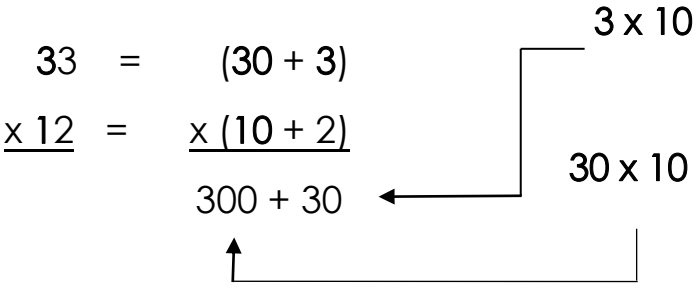
Step 2:

Arrange vertically and multiply the digit in the ones place in the multiplier to all the digits in the multiplicand.



Step 3:

Multiply the value in the tens place in the multiplier.



Step 4:

Add the partial products.

$$\begin{array}{rcl} 33 & = & (30 + 3) \\ \underline{\times\ 12} & = & \underline{(10 + 2)} \\ & & 60 + 6 \longrightarrow \textit{partial product in Step 2} \\ & + & \underline{300 + 30} \longrightarrow \textit{partial product in Step 3} \end{array}$$

360 + 36 = **396 mangoes** *(final product)*

Method 3: Multiplication using the short method.

Step 1:

Write the factors vertically.

$$\begin{array}{r} 3\ 3 \\ \times\quad 1\ 2 \\ \hline \end{array}$$

Relate what you had done using the distributive property of multiplication in doing the short method.

Step 2:

Multiply the multiplicand by the ones in the multiplier. Regroup if necessary. Write the product with its rightmost digit aligned in the ones column.

Multiply by ones: **3 3** ⟶ 3 3

$$\begin{array}{rcl} \underline{\times\ 1\ \mathbf{2}} & & \underline{\times\ 2} \\ 6\ 6 & \longleftarrow & 6\ 6 \end{array}$$

Step 3:

Multiply the multiplicand by the tens in the multiplier. Write the product with its rightmost digit aligned in the tens column.

Multiply by tens:

$$\begin{array}{r} 33 \\ \times\ 12 \\ \hline 66 \\ 33 \end{array} \longrightarrow \begin{array}{r} 33 \\ \times\ 1 \\ \hline 33 \\ | \end{array}$$

Step 4:

Add the two partial products.

$$\begin{array}{r} 33 \\ \times\ 12 \\ \hline 66 \\ +\ 33 \\ \hline 396 \end{array}$$

Partial products

Final product

There are 396 mangoes in 12 boxes.

Here is an example of multiplying using the short method *with regrouping*:

Example: Multiply 32 by 56.

Step 1:

Write the factors vertically.

$$\begin{array}{r} 32 \\ \times\ 56 \\ \hline \end{array}$$

Step 2:

Multiply the multiplicand by the ones in the multiplier. Regroup if necessary. Write the product with its rightmost digit aligned in the ones column.

Multiply by ones:

1 ⟶ *regrouping*

32	⟶	32
x **56**		x 6
192	⟵	**192**

Step 3:

Multiply the multiplicand by the tens in the multiplier. Regroup if necessary. Write the product with its rightmost digit aligned in the tens column.

Multiply by tens:

1 ⟶ *regrouping*

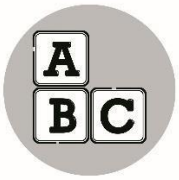
32	32
x **56**	x 5
192	160
160	

Step 4:

Add the two partial products.

32	
x 56	
192	⎫ Partial products
+160	⎭
1792	⟶ Final products

Answer: **32 x 56** = **1792**



What's More

Activity 2

Give the product using the three methods of solving 2-digit numbers by 2-digit numbers without or with regrouping. Write your answer in a separate sheet of paper.

Given	Using Repeated Addition	Using Distributive Property of Multiplication	Using the Shortcut Method of Multiplication
42 x 13			
34 x 14			

- Which solution or method do you think is easier to use in finding the product?

  _____

  _____

- How did you multiply 2-digit numbers by 2-digit numbers?

  _____

  _____

Activity 3

Write the missing number.

1.
$$\begin{array}{r} 65 \\ \times\ 43 \\ \hline 195 \\ +\ 260 \\ \hline \square\square\square\square \end{array}$$

2.
$$\begin{array}{r} 28 \\ \times\ 62 \\ \hline 56 \\ +\ 168 \\ \hline \square\square\square\square \end{array}$$

3.
$$\begin{array}{r} 25 \\ \times\ 53 \\ \hline 75 \\ +\ \square\square\square \\ \hline \square\square\square\square \end{array}$$

4.
$$\begin{array}{r} 34 \\ \times\ 47 \\ \hline 23\square \\ +\ \square 3\square \\ \hline \square\square\square\square \end{array}$$

What I Have Learned

The following are the steps in multiplying 2-digit numbers by 2-digit numbers:

- First, multiply the 2-digit multiplicand by the ones of the multiplier. Regroup if necessary. Write the first partial product with its rightmost digit aligned in the ones column.
- Second, multiply the multiplicand by tens of the multiplier.

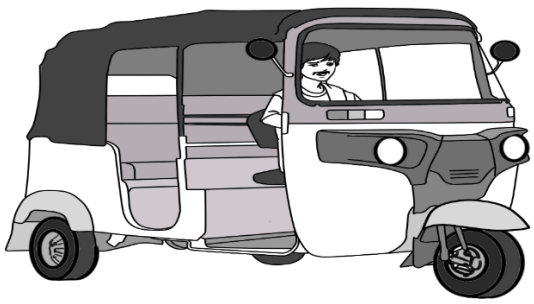
  Regroup if necessary. Write the second partial product with its rightmost digit aligned in the tens column. Third, add the partial products to get the final product.

What I Can Do

Activity 4

Solve the problems below on a separate sheet of paper.

1. Teacher Shereyl rides *Bao-bao* in going to school. Her transportation fare to the driver is 25 pesos per trip from the terminal going to Buso Elementary School. How much is her total fare to the *Bao-bao* driver after 28 trips? Show your solution.



2. During the cleaning campaign for the Mati Bay, 24 trucks of garbage were collected. If each truck contains 48 sacks of garbage, how many sacks of garbage were collected in all? Show your solution.

Assessment

Multiple Choice. Choose the letter of the correct answer. Write the chosen letter on a separate sheet of paper.

1. How do you multiply 2-digit numbers by 2-digit numbers?
   a. Multiply the 2-digit multiplicand by the ones and add the partial products to get the final product.
   b. Multiply the 2-digit multiplicand by the ones and tens of the multiplier then add the partial products to get the final product.
   c. Multiply the 2-digit multiplicand by the ones and tens of the multiplier.
   d. Multiply the 2-digit multiplicand by the tens of the multiplier only.
2. Mika makes 30 packs of lemon. If each pack contains 13 pieces of lemon, how many pieces of lemon does Mika need all in all?

   a. 390 b. 380 c. 340 d. 320

3. In Mati City, 12 mango seedlings are packed in a box for delivery to Davao City. How many seedlings are in 44 boxes?

   a. 528 b. 628 c. 728 d. 428

4. If 93 is multiplied by 72 we get__.

   a. 6 969 b. 6 796 c. 6 876 d. 6 696

5. Find the product using Short Cut Method. Show your solution.

   2 4
   x 6 3

Additional Activities

Activity 5

Complete the chart. Multiply the number of fruits per basket by the number of baskets. Write your answer on a separate sheet of paper.

Number of Basket	Number of Fruits Per Basket			
	35 Mangoes	68 Atis	98 Guavas	23 Papayas
25 baskets				
42 baskets				
50 baskets				
61 baskets				
19 baskets				

Answer Key

Additional Activities

Number of Baskets	Fruits and Number per Basket			
	Mangoes	Guavas	Papayas	
	35	98	23	
25 baskets	875	2450	575	
42 baskets	1470	4116	966	
50 baskets	1750	4900	1150	
61 baskets	2135	5978	1403	
19 baskets	665	1862	437	

Assessment

1. B
2. A
3. A
4. D
5. 1 512

What's In

9X2= 18
4X9= 36
3X4= 12
2X8= 16
3X5= 15

4X2=8
5X2=10
3X0=0
9X8=72
7X8=56

6X6=36
5X7=35
3X8= 24
5X8= 40
8X8= 64

5X5=25
4X4=16
6X5=30
7X3=21
4X8=32

4X6=24
5X9=45
9X4=36
6X0=0
6X8=48

What I Can Do

Activity 4

1. 700
2. 1,152

What's More

Activity 2

1. 546
2. 476

Activity 3

1. 2,795
2. 1 736
3.

4.

What I Know

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

What's New

1. Mango harvested mangoes and it is to be distributed to local barangays
2. 33
3. 396
4. *Open answer*

References

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