

Strategies
To
Achieve
Mathematics
Success

Name _____



TABLE OF CONTENTS

Multiplication

Lesson 1	Multiplication Properties	4
Lesson 2	Multiply Mentally	14
Lesson 3	Multiply by 1-Digit Numbers	24
Lesson 4	Multiply by 2-Digit Numbers	34

Division

Lesson 5	Relate Division to Multiplication	44
Lesson 6	Divide Without Regrouping	54
Lesson 7	Divide with Regrouping	64

Fractions

Lesson 8	Equivalent Fractions	74
Lesson 9	Simplify Fractions	84

Decimals

Lesson 10	Decimal Place Value	94
Lesson 11	Compare and Order Decimals	104
Lesson 12	Relate Decimals to Fractions	114

Plane Geometry

Lesson 13	Angles	124
------------------	------------------	-----

Linear Measurement and Area

Lesson 14	Understand Area	134
Lesson 15	Area of Rectangles	144

Graphs

Lesson 16	Line Plots	154
------------------	----------------------	-----

Additional Lessons

Lesson 17	Multiply 3-Digit Numbers	166
Lesson 18	1-Digit Divisors	176
Lesson 19	Add and Subtract Like Fractions	186

Lesson 4 MULTIPLY BY 2-DIGIT NUMBERS

PART ONE: Learn About Multiplying Two 2-Digit Numbers



How can you use place value to multiply two 2-digit numbers?

Explore

You can use **place value** to multiply a 1-digit number by a 2-digit number.

How can you use place value to multiply two 2-digit numbers?

$$\begin{array}{r}
 56 \\
 \times 8 \\
 \hline
 48 \leftarrow \text{Multiply the ones. } 8 \times 6 \\
 + 400 \leftarrow \text{Multiply the tens. } 8 \times 50 \\
 \hline
 448 \leftarrow \text{Add } \mathbf{\text{partial products}}.
 \end{array}$$

Think

Find 31×24 .

$$31 = \underline{3} \text{ tens and } \underline{1} \text{ one, or } \underline{30} + \underline{1}$$

$$24 = \underline{2} \text{ tens and } \underline{4} \text{ ones, or } \underline{20} + \underline{4}$$

Connect

To find 31×24 , you can use these steps:

1. Multiply the ones and tens in 31 by the ones in 24.

$$\begin{array}{r}
 31 \\
 \times 24 \\
 \hline
 4 \leftarrow 4 \times 1 \\
 120 \leftarrow 4 \times 30
 \end{array}$$

2. Multiply the ones and tens in 31 by the tens in 24.

$$\begin{array}{r}
 31 \\
 \times 24 \\
 \hline
 4 \leftarrow 4 \times 1 \\
 120 \leftarrow 4 \times 30 \\
 20 \leftarrow 20 \times 1 \\
 600 \leftarrow 20 \times 30
 \end{array}$$

3. Add the partial products.

$$\begin{array}{r}
 31 \\
 \times 24 \\
 \hline
 4 \\
 120 \\
 20 \\
 + 600 \\
 \hline
 744
 \end{array}
 \left. \begin{array}{l} \\ \\ \\ \end{array} \right\} \text{partial products}$$

The **product** of 31×24 is 744.

Let's Talk

When you multiply a 2-digit number by a 2-digit number, there are 4 partial products. Why do you think this is so?



Fill in the blanks. Solve the problem.

In Jack's class, there are 23 boxes of crayons. There are 36 crayons in each box. How many crayons are there in all?

$$23 \times 36 = \blacksquare$$

■ Multiply the ones and tens in _____ by the ones in _____.

$$\begin{array}{r} 36 \\ \times 23 \\ \hline \end{array}$$

$\square\square \leftarrow 3 \times 6$
 $\square\square \leftarrow 3 \times 30$

■ Multiply the ones and tens in _____ by the tens in _____.

$$\begin{array}{r} 36 \\ \times 23 \\ \hline 18 \\ 90 \\ \hline \end{array}$$

$\square\square\square \leftarrow 20 \times 6$
 $\square\square\square \leftarrow 20 \times 30$

■ Add the partial products.

$$\begin{array}{r} 36 \\ \times 23 \\ \hline 18 \\ 90 \\ 120 \\ +600 \\ \hline \square\square\square \end{array}$$

Solution: There are _____ crayons in all.



Now, use what you know to solve this problem.

- There are 13 bagels in a baker's dozen. How many bagels are there in 48 baker's dozens?
 (A) 264 (C) 552
 (B) 524 (D) 624

There are 2 digits in 23 and 2 digits in 36. $2 \times 2 = 4$. So, there will be 4 partial products.





How can you find the product of two 2-digit numbers more quickly?

Explore

You know a quick way to multiply a 2-digit number by a 1-digit number.

- Multiply the ones. $4 \times 7 = 28$
Regroup the 28 as 2 tens 8 ones.
 Write 8 in the ones place.

$$\begin{array}{r} 2 \leftarrow \text{regrouped tens} \\ 57 \\ \times 4 \\ \hline 228 \end{array}$$

- Multiply the tens. $4 \times 5 \text{ tens} = 20 \text{ tens}$
 Add the 2 regrouped tens.
 Write 22 in the hundreds place and tens place of the product.

What is a quick way to multiply a 2-digit number by a 2-digit number?

Think

Find 26×53 .

Write 26 as tens and ones. $26 = \underline{20} + \underline{6}$

Write 53 as tens and ones. $53 = \underline{50} + \underline{3}$

Connect

To find 26×53 , you can use these steps:

- Multiply 6×53 .
 $6 \times 3 = 18 \rightarrow$ Regroup 18 as 1 ten 8 ones.
 Write 8 ones.
 Write the regrouped 1 ten.
 $6 \times 50 = 300 \rightarrow$ Add 30 tens and the
 1 regrouped ten.
 Write 31 tens.

$$\begin{array}{r} 1 \leftarrow \text{regrouped ten} \\ 53 \\ \times 26 \\ \hline 318 \leftarrow 6 \times 53 \end{array}$$

- Multiply 20×53 .
 $20 \times 3 = 60 \rightarrow$ Write 60 below 318.
 $20 \times 50 = 1,000 \rightarrow$ Write 10 hundreds.

$$\begin{array}{r} 53 \\ \times 26 \\ \hline 318 \leftarrow 6 \times 53 \\ + 1,060 \leftarrow 20 \times 53 \\ \hline 1,378 \end{array}$$

- Add the partial products.

The product of 26×53 is 1,378.

Let's Talk

Explain how you could use the problem 30×50 to check that your answer to 26×53 makes sense.



Think It Through

Fill in the blanks. Solve the problem.

A farm stand sells 25 eggs in one basket. There are 28 baskets for sale. How many eggs are for sale in all?

$$28 \times 25 = \square$$

■ Think of 25 as _____ tens and _____ ones.

Think of 28 as _____ tens and _____ ones.

■ Multiply 8×25 .

$$\begin{array}{r}
 \square \\
 25 \\
 \times 28 \\
 \hline
 \square\square\square
 \end{array}$$

← Write the regrouped ten(s).

← Write the partial product.

■ Multiply 20 by _____.

$$\begin{array}{r}
 \square \\
 4 \\
 25 \\
 \times 28 \\
 \hline
 200 \\
 \square\square\square
 \end{array}$$

← Cross out the old regrouped ten(s).
Write the new regrouped ten.

← Write the partial product.

■ Add the partial products.

$$\begin{array}{r}
 1 \\
 * \\
 25 \\
 \times 28 \\
 \hline
 200 \\
 +500 \\
 \hline
 \square\square\square
 \end{array}$$

Solution: There are _____ eggs.

Your Turn

Now, use what you know to solve this problem.

2. Some jets can travel 95 miles in a single minute!
How far could that kind of jet travel in 25 minutes?

$$\begin{array}{r}
 95 \\
 \times 25 \\
 \hline
 \end{array}
 \quad \text{_____ miles}$$

You regroup in the first partial product. Then you regroup again in the second partial product. Be sure to cross out the first regrouping so that you add the right number.



PART THREE: Choose the Right Answer

Solve the problem. Then read why each answer choice is correct or not correct.

Solve

Mario put 37 shells in each of 26 boxes.
How many shells did Mario put in the boxes in all?

$$\begin{array}{r} 37 \\ \times 26 \\ \hline \end{array}$$

- Ⓐ 296
- Ⓑ 922
- Ⓒ 962
- Ⓓ 976

Check

Check to see if you chose the correct answer.

$$\begin{array}{r} 1 \\ * \\ 37 \\ \times 26 \\ \hline 222 \\ + 740 \\ \hline 962 \end{array}$$

$$\text{Multiply } 6 \times 37. \quad 6 \times 37 = 222$$

$$\text{Multiply } 20 \times 37. \quad 20 \times 37 = 740$$

$$\text{Add partial products. } 222 + 740 = 962$$

So, the correct answer is Ⓒ.

Why are the other answer choices not correct?

Ⓐ 296	37 should be multiplied by 20, not 2.
Ⓑ 922	When finding 6×37 , the regrouped 4 tens should have been added to the product.
Ⓓ 976	The product of 6×7 is 42, not 56.



- Multiply the ones and tens in the top number by the ones in the bottom number. Then multiply the ones and tens in the top number by the tens in the bottom number.
- Don't forget to add any regrouped tens.
- Cross out the first regrouped tens after you add them to the partial product. That way you won't add them twice.
- Add the partial products.

3.

$$\begin{array}{r} 31 \\ \times 28 \\ \hline \end{array}$$

- (A) 248
(B) 310
(C) 668
(D) 868

4. Matthew practiced his trumpet for 26 minutes each day for 18 days. How many minutes did Matthew practice in all?

$$\begin{array}{r} 26 \\ \times 18 \\ \hline \end{array}$$

- (A) 234 minutes
(B) 428 minutes
(C) 468 minutes
(D) 868 minutes

5.

$$\begin{array}{r} 32 \\ \times 19 \\ \hline \end{array}$$

- (A) 320
(B) 508
(C) 598
(D) 608

6. Marcell is giving out fliers about a school concert. He gives 35 fliers to each store in town. There are 44 stores in town. How many fliers did Marcell give out in all?

$$\begin{array}{r} 35 \\ \times 44 \\ \hline \end{array}$$

- (A) 1,320
(B) 1,540
(C) 1,640
(D) 1,760

Study the model. It is a good example of a written answer.

Student Model

Show

A vet has 29 containers of dog food. Each container has 53 ounces of dog food. How many ounces of dog food does the vet have in all?

Use pictures, words, or numbers to show your work.

$$\begin{array}{r} ^2 \\ 53 \\ \times 29 \\ \hline 477 \\ + 1,060 \\ \hline 1,537 \end{array}$$

Solution: 1,537 ounces

Explain

Explain how you got your answer.

First, I multiplied the ones in 29 by 53: $9 \times 53 = 477$.

Then I multiplied the tens in 29 by 53: $20 \times 53 = 1,060$.

Last, I added the partial products to get the product:

$477 + 1,060 = 1,537$.

The student shows each step.

The student correctly answers the question asked.

The student gives important details about how to find the product.

The student uses the math words *multiply*, *ones*, *tens*, and *partial products*.



Solve the problem. Use what you learned from the model.

7. There are 46 rows in a concert hall. Each row has 63 seats. How many seats are there in all?

Use pictures, words, or numbers to show your work.



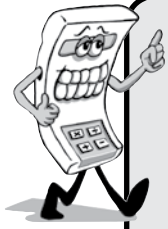
CHECKLIST

Did you . . .

- show each step?
- answer the question asked?
- give important details?
- use math words?

Solution: _____ seats

Explain how you got your answer.



As you solve problems with multiplication, remember to:

- multiply the tens and ones in one number by the tens and ones in the other number.
- add the regrouped numbers.
- add the partial products.

Solve each problem.

8.
$$\begin{array}{r} 42 \\ \times 29 \\ \hline \end{array}$$

- (A) 462
- (B) 798
- (C) 1,218
- (D) 1,318

9. There are 36 inches in one yard. How many inches are there in 32 yards?

$$\begin{array}{r} 36 \\ \times 32 \\ \hline \end{array}$$

- (A) 180 inches
- (B) 1,052 inches
- (C) 1,142 inches
- (D) 1,152 inches

10.
$$\begin{array}{r} 23 \\ \times 36 \\ \hline \end{array}$$

- (A) 207
- (B) 828
- (C) 834
- (D) 928

11. There are 28 people at a play. Each person paid \$35 for a ticket. How much money did the people pay in all?

$$\begin{array}{r} 35 \\ \times 28 \\ \hline \end{array}$$

- (A) \$350
- (B) \$840
- (C) \$970
- (D) \$980

12.
$$\begin{array}{r} 64 \\ \times 61 \\ \hline \end{array}$$

- Ⓐ 1,504
- Ⓑ 3,704
- Ⓒ 3,784
- Ⓓ 3,904

13. $57 \times 28 = \blacksquare$

- Ⓐ 1,596
- Ⓑ 1,605
- Ⓒ 1,646
- Ⓓ 1,696

14. There are 47 classes at Josiah’s elementary school. Each class has 23 students in it. How many students are in the school in all?

_____ students

15. At a store, there are 38 packages of ribbon. Each package has 54 ribbons in it. How many ribbons are there in all?

Use pictures, words, or numbers to show your work.

Solution: _____ ribbons

Explain how you got your answer.
