

Name _____

Multiply with Regrouping

Essential Question How can you use regrouping to multiply 2-digit numbers?



Number and Operations in Base Ten—4.NBT.B.5 Also 4.OA.A.3

MATHEMATICAL PRACTICES
MP2, MP7, MP8

Unlock the Problem

By 1914, Henry Ford had streamlined his assembly line to make a Model T Ford car in 93 minutes. How many minutes did it take to make 25 Model Ts?



▲ The first production Model T Ford was assembled on October 1, 1908.

Use place value and regrouping.

Multiply. 93×25 Estimate. $90 \times 30 =$ _____

THINK

RECORD

STEP 1

- Think of 93 as 9 tens and 3 ones.
- Multiply 25 by 3 ones.

$$\begin{array}{r} 1 \\ 25 \\ \times 93 \\ \hline \end{array} \leftarrow 3 \times 25$$

STEP 2

- Multiply 25 by 9 tens.

$$\begin{array}{r} 4 \\ 1 \\ 25 \\ \times 93 \\ \hline 75 \\ \hline \end{array} \leftarrow 90 \times 25$$

STEP 3

- Add the partial products.

$$\begin{array}{r} 4 \\ 1 \\ 25 \\ \times 93 \\ \hline 75 \\ 2,250 \\ \hline \end{array}$$

So, 93×25 is 2,325. Since _____ is close to the estimate of _____, the answer is reasonable.



MATHEMATICAL PRACTICES 8

Use Repeated Reasoning
Why do you get the same answer whether you multiply 93×25 or 25×93 ?

Different Ways to Multiply You can use different ways to multiply and still get the correct answer. Shawn and Patty both solved 67×40 correctly, but they used different ways.

Look at Shawn's paper.

$$\begin{array}{r} 60 \times 40 = 2,400 \\ 7 \times 40 = 280 \\ 2,400 + 280 = 2,680 \end{array}$$

So, Shawn's answer is $67 \times 40 = 2,680$.

Look at Patty's paper.

$$\begin{array}{r} 2 \\ 67 \\ \times 40 \\ \hline 00 \\ + 2,680 \\ \hline 2,680 \end{array}$$

So, Patty also found $67 \times 40 = 2,680$.

1. What method did Shawn use to solve the problem?

2. What method did Patty use to solve the problem?

Share and Show



1. Look at the problem. Complete the sentences.

Multiply _____ and _____ to get 0.

Multiply _____ and _____ to get 1,620.

Add the partial products.

$0 + 1,620 =$ _____

$$\begin{array}{r} 4 \\ 27 \\ \times 60 \\ \hline 0 \\ + 1,620 \\ \hline \end{array}$$

Name _____

Estimate. Then find the product.

2. Estimate: _____

$$\begin{array}{r} 68 \\ \times 53 \\ \hline \end{array}$$

3. Estimate: _____

$$\begin{array}{r} 61 \\ \times 54 \\ \hline \end{array}$$

4. Estimate: _____

$$\begin{array}{r} 90 \\ \times 27 \\ \hline \end{array}$$

**Math
Talk**

MATHEMATICAL PRACTICES 8

Generalize Why can you omit zeros of the first partial product when you multiply 20×34 ?

On Your Own

Estimate. Then find the product.

5. Estimate: _____

$$\begin{array}{r} 30 \\ \times 47 \\ \hline \end{array}$$

6. Estimate: _____

$$\begin{array}{r} 78 \\ \times 56 \\ \hline \end{array}$$

7. Estimate: _____

$$\begin{array}{r} 27 \\ \times 25 \\ \hline \end{array}$$

Practice: Copy and Solve Estimate. Then find the product.

8. 34×65

9. $42 \times \$13$

10. 60×17

11. 62×45

12. $57 \times \$98$

MATHEMATICAL PRACTICE 7

Look for a Pattern Algebra Write a rule for the pattern.

Use your rule to find the unknown numbers.

13.

Hours	<i>h</i>	5	10	15	20	25
Minutes	<i>m</i>	300	600	900		

Rule: _____

14. **GO DEEPER** Owners of a summer camp are buying new cots for their cabins. There are 16 cabins. Each cabin needs 6 cots. Each cot costs \$92. How much will the new cots cost?

15. **GO DEEPER** A theater has 28 rows of 38 seats downstairs and 14 rows of 26 seats upstairs. How many seats does the theater have?

Unlock the Problem

16. **THINK SMARTER** Machine A can label 11 bottles in 1 minute. Machine B can label 12 bottles in 1 minute. How many bottles can both machines label in 15 minutes?

- a. What do you need to know? _____

- b. What numbers will you use? _____
- c. Tell why you might use more than one operation to solve the problem.



- d. Solve the problem.

So, both machines can label _____ bottles
in _____ minutes.

17. **MATHEMATICAL PRACTICE 1** **Make Sense of Problems**
A toy company makes wooden blocks. A carton holds 85 blocks. How many blocks can 19 cartons hold?
- _____

18. **GO DEEPER** A company is packing cartons of candles. Each carton can hold 75 candles. So far, 50 cartons have been packed, but only 30 cartons have been loaded on a truck. How many more candles are left to load on the truck?
- _____

Personal Math Trainer

19. **THINK SMARTER +** Mr. Garcia's class raised money for a field trip to the zoo. There are 23 students in his class. The cost of the trip will be \$17 for each student. What is the cost for all the students? Explain how you found your answer.

Name _____

Multiply with Regrouping



COMMON CORE STANDARD—4.NBT.B.5
Use place value understanding and properties of operations to perform multi-digit arithmetic.

Estimate. Then find the product.

1. Estimate: 2,700

$$\begin{array}{r} 2 \\ \uparrow \\ 87 \\ \times 32 \\ \hline 174 \\ + 2,610 \\ \hline 2,784 \end{array}$$

Think: 87 is close to 90 and 32 is close to 30.

$$90 \times 30 = 2,700$$

2. Estimate: _____

$$\begin{array}{r} 73 \\ \times 28 \\ \hline \end{array}$$

3. Estimate: _____

$$\begin{array}{r} 48 \\ \times 38 \\ \hline \end{array}$$

4. Estimate: _____

$$\begin{array}{r} 59 \\ \times 52 \\ \hline \end{array}$$

Problem Solving



- Baseballs come in cartons of 84 baseballs. A team orders 18 cartons of baseballs. How many baseballs does the team order?
- There are 16 tables in the school lunch room. Each table can seat 22 students. How many students can be seated at lunch at one time?

7. **WRITE** *Math* Write about which method you prefer to use to multiply two 2-digit numbers—regrouping, partial products, or breaking apart a model. Explain why.

Lesson Check (4.NBT.B.5)

1. The art teacher has 48 boxes of crayons. There are 64 crayons in each box. How many crayons does the teacher have?

2. A basketball team scored an average of 52 points in each of 15 games. Based on the average, how many points did the team score in all?

Spiral Review (4.OA.A.1, 4.OA.A.2, 4.OA.A.3, 4.NBT.B.5)

3. One Saturday, an orchard sold 83 bags of apples. There are 27 apples in each bag. How many apples were sold?

4. Hannah has a grid of squares that has 12 rows with 15 squares in each row. She colors 5 rows of 8 squares in the middle of the grid blue. She colors the rest of the squares red. How many squares does Hannah color red?

5. Gabriella has 4 times as many erasers as Leona. Leona has 8 erasers. How many erasers does Gabriella have?

6. Phil has 3 times as many rocks as Peter. Together, they have 48 rocks. How many more rocks does Phil have than Peter?
