Choose a Multiplication Method

Essential Question How can you find and record products of two 2-digit numbers?

Common Core **Number and Operations in Base Ten—4.NBT.B.5**
MATHEMATICAL PRACTICES
MP2, MP3, MP8

🔑 Unlock the Problem (Real World)

Did you know using math can help prevent you from getting a sunburn?

The time it takes to burn without sunscreen multiplied by the SPF, or sun protection factor, is the time you can stay in the sun safely with sunscreen.

If today's UV index is 8, Erin will burn in 15 minutes without sunscreen. If Erin puts on lotion with an SPF of 25, how long will she be protected?

- Underline the sentence that tells you how to find the answer.
- Circle the numbers you need to use. What operation will you use?

  _____

🔒 One Way Use partial products to find 15 × 25.

$$\begin{array}{r} 25 \\ \times\ 15 \\ \hline \end{array}$$

☐ ← 10 × 2 tens = 20 tens

☐ ← 10 × 5 ones = 50 ones

☐ ← 5 × 2 tens = 10 tens

+ ☐ ← 5 × 5 ones = 25 ones

☐ ← Add.

✏️ **Draw a picture to check your work.**

▲ Sunscreen helps to prevent sunburn.

Math Talk MATHEMATICAL PRACTICES ⑥

Explain how it was easier to find the product using partial products.

🔑 **Another Way** Use regrouping to find 15 × 25.

Estimate. 20 × 20 = _____

STEP 1

Think of 15 as 1 ten 5 ones.
Multiply 25 by 5 ones, or 5.

$$\begin{array}{r} \overset{2}{25} \\ \times\ 15 \\ \hline \boxed{} \end{array}$$ ← 5 × 25

STEP 2

Multiply 25 by 1 ten, or 10.

$$\begin{array}{r} \overset{2}{25} \\ \times\ 15 \\ \hline 125 \\ \boxed{} \end{array}$$ ← 10 × 25

STEP 3

Add the partial products.

$$\begin{array}{r} \overset{2}{25} \\ \times\ 15 \\ \hline 125 \\ +\ 250 \\ \hline \boxed{} \end{array}$$

Try This! **Multiply. 57 × $43**

Estimate. 57 × $43

Use partial products.

				$	4	3
			×		5	7

Use regrouping.

				$	4	3
			×		5	7

1. How do you know your answer is reasonable?

_____

_____

2. Look at the partial products and regrouping methods above. How
are the partial products 2,000 and 150 related to 2,150?

_____

How are the partial products 280 and 21 related to 301?

_____

Name

1. Find the product.

			5	4	
	×		2	9	

Math Talk MATHEMATICAL PRACTICES ⑧

Draw Conclusions Why do you begin with the ones place when you use the regrouping method to multiply?

Estimate. Then choose a method to find the product.

2. Estimate: _____
$$36 \times 14$$

3. Estimate: _____
$$63 \times 42$$

✓**4.** Estimate: _____
$$84 \times 53$$

✓**5.** Estimate: _____
$$71 \times 13$$

On Your Own

Practice: Copy and Solve Estimate. Find the product.

6. $29 \times \$82$

7. 57×79

8. 80×27

9. $32 \times \$75$

10. 55×48

11. $19 \times \$82$

12. $25 \times \$25$

13. 41×98

MATHEMATICAL PRACTICE ⑦ Identify Relationships **Algebra** Use mental math to find the number.

14. $30 \times 14 = 420$, so $30 \times 15 =$ _____.

15. $25 \times 12 = 300$, so $25 \times$ _____ $= 350$.

16. **MATHEMATICAL PRACTICE ⑥** The town conservation manager bought 16 maple trees for $26 each. She paid with five $100 bills. How much change will the manager receive? **Explain**.

_____

_____

17. **GO DEEPER** Each of 25 students in Group A read for 45 minutes. Each of 21 students in Group B read for 48 minutes. Which group read for more minutes? Explain.

_____

🔑 Unlock the Problem Real World

18. *THINK SMARTER* Martin collects stamps. He counted 48 pages in his collector's album. The first 20 pages each have 35 stamps in 5 rows. The rest of the pages each have 54 stamps. How many stamps does Martin have in his album?

a. What do you need to know? _____

_____

b. How will you use multiplication to find the number of stamps? _____

_____

c. Tell why you might use addition and subtraction to help solve the problem.

_____

_____

d. Show the steps to solve the problem.

e. Complete the sentences.

Martin has a total of _____ stamps on the first 20 pages.

There are _____ more pages after the first 20 pages in Martin's album.

There are _____ stamps on the rest of the pages.

There are _____ stamps in the album.

19. *THINK SMARTER* Select the expressions that have the same product as 35×17. Mark all that apply.

○ $(30 \times 10) + (30 \times 7) + (5 \times 10) + (5 \times 7)$ ○ $(30 \times 17) + (5 \times 17)$

○ $(35 \times 30) + (35 \times 5) + (35 \times 10) + (35 \times 7)$ ○ $(35 \times 10) + (35 \times 7)$

○ $(35 \times 10) + (30 \times 10) + (5 \times 10) + (5 \times 7)$ ○ $(35 \times 30) + (35 \times 5)$

Choose a Multiplication Method

Estimate. Then choose a method to find the product.

1. Estimate: __1,200__

$$
\begin{array}{r}
31 \\
\times\ 43 \\
\hline
93 \\
+\ 1,240 \\
\hline
1,333
\end{array}
$$

2. Estimate: _____

$$
\begin{array}{r}
67 \\
\times\ 85 \\
\hline
\end{array}
$$

3. Estimate: _____

$$
\begin{array}{r}
68 \\
\times\ 38 \\
\hline
\end{array}
$$

4. Estimate: _____

$$
\begin{array}{r}
95 \\
\times\ 17 \\
\hline
\end{array}
$$

5. Estimate: _____

$$
\begin{array}{r}
49 \\
\times\ 54 \\
\hline
\end{array}
$$

6. Estimate: _____

$$
\begin{array}{r}
91 \\
\times\ 26 \\
\hline
\end{array}
$$

7. Estimate: _____

$$
\begin{array}{r}
82 \\
\times\ 19 \\
\hline
\end{array}
$$

Problem Solving · Real World

8. A movie theatre has 26 rows of seats. There are 18 seats in each row. How many seats are there?

_____

9. Each class at Briarwood Elementary collected at least 54 cans of food during the food drive. If there are 29 classes in the school, what was the least number of cans collected?

_____

10. **WRITE** *Math* How is multiplication using partial products different from multiplication using regrouping? How are they similar?

_____

_____

_____
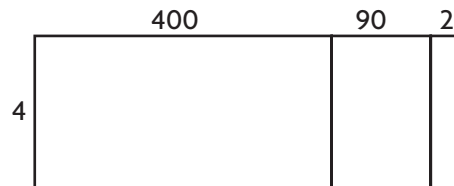
Lesson Check (4.NBT.B.5)

1. A choir needs new robes for each of its 46 singers. Each robe costs $32. What will be the total cost for all 46 robes?

2. A wall on the side of a building is made up of 52 rows of bricks with 44 bricks in each row. How many bricks make up the wall?

Spiral Review (4.NBT.B.4, 4.NBT.B.5)

3. Write an expression that shows how to multiply 4×362 using place value and expanded form.

4. Use the model below. What is the product 4×492?

	400	90	2
4			

5. What is the sum $13,094 + 259,728$?

6. During the 2008–2009 season, there were 801,372 people who attended the home hockey games in Philadelphia. There were 609,907 people who attended the home hockey games in Phoenix. How much greater was the home attendance in Philadelphia than in Phoenix that season?

FOR MORE PRACTICE GO TO THE Personal Math Trainer