

Name _____

Multiply by Tens

One section of seating at an arena has 40 rows. Each row has 30 seats. How many seats in all are in that section?

Multiply. 30×40

Step 1 Think of each factor as a multiple of 10 and as a repeated addition.

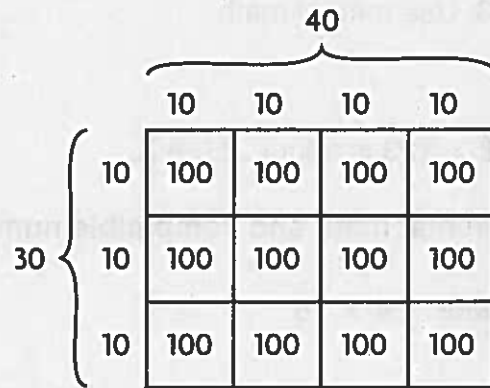
$$40 = \underline{4} \times \underline{10} \text{ or } \underline{10} + \underline{10} + \underline{10} + \underline{10}$$

$$30 = \underline{3} \times \underline{10} \text{ or } \underline{10} + \underline{10} + \underline{10}$$

Step 2 Draw a diagram to show the multiplication.

Step 3 Each small square in the diagram shows 10×10 , or 100. Count the squares.

There are 12 squares of 100.



Step 4 Use patterns and mental math to find 12×100 .

$$12 \times 1 = \underline{12}$$

$$12 \times 10 = \underline{120}$$

$$12 \times 100 = \underline{1,200}$$

There are 1,200 seats in that section.

Choose a method. Then find the product.

1. $20 \times 90 =$ _____ 2. $40 \times 40 =$ _____ 3. $60 \times 70 =$ _____

4. $50 \times 30 =$ _____ 5. $80 \times 60 =$ _____ 6. $90 \times 40 =$ _____

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Estimate Products

You can use rounding and compatible numbers to estimate products.

Use mental math and rounding to estimate the product.

Estimate. $62 \times \$23$

Step 1 Round each factor to the nearest ten.

62 rounds to 60.
\$23 rounds to \$20.

Step 2 Rewrite the problem using the rounded numbers.

$60 \times \$20$

Step 3 Use mental math.

$6 \times \$2 = \12
 $6 \times \$20 = \120
 $60 \times \$20 = \$1,200$

So, $62 \times \$23$ is about \$1,200.

Use mental math and compatible numbers to estimate the product.

Estimate. 24×78

Step 1 Use compatible numbers. 25×80

Step 2 Use $25 \times 4 = 100$ to help find 25×8 .
 $25 \times 8 = 200$

Step 3 Since 80 has 1 zero, write 1 zero to the right of the product.

24×78
↓ ↓
 $25 \times 80 = 2,000$

So, 24×78 is about 2,000.

Estimate the product. Choose a method.

1. 78×21

2. $59 \times \$46$

3. 81×33

4. 67×21

5. $88 \times \$42$

6. 51×36

7. 73×73

8. $99 \times \$44$

9. 92×19

10. 26×37

11. 89×18

12. 58×59

Name _____

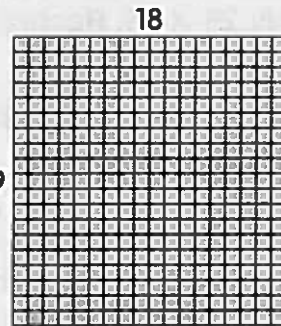
Area Models and Partial Products

You can use area models to multiply 2-digit numbers by 2-digit numbers.

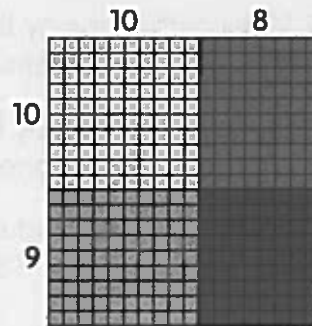
Use the model and partial products to solve.

Draw a rectangle to find 19×18 .

The rectangle is 19 units long and 18 units wide.



Step 1 Break apart the factors into tens and ones.
Divide the area model into four smaller rectangles to show the factors.



Step 2 Find the products for each of the smaller rectangles.

$$10 \times 10 = 100 \quad 10 \times 8 = 80 \quad 9 \times 10 = 90 \quad 9 \times 8 = 72$$

Step 3 Find the sum of the products. $100 + 80 + 90 + 72 = 342$

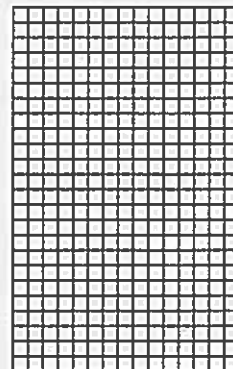
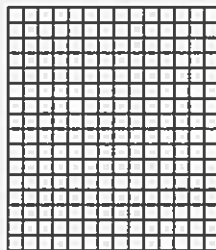
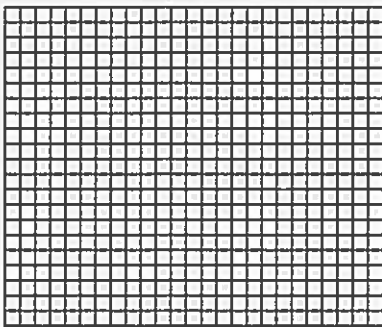
So, $19 \times 18 = 342$.

Draw a model to represent the product. Then record the product.

1. 21×25

2. 16×14

3. 24×15



Name _____

Multiply Using Partial Products

Multiply 25×43 . Record the product.

Think: I can use partial products to find 25×43 .

Step 1 Multiply the tens by the tens.
 20×4 tens = 80 tens, or 800.



	tens	ones
	4	3
×	2	5
	8	0
	0	0

Step 2 Multiply the ones by the tens.
 20×3 ones = 60 ones, or 60.



	6	0
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Step 3 Multiply the tens by the ones.
 5×4 tens = 20 tens, or 200.



	2	0	0
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Step 4 Multiply the ones by the ones.
 5×3 ones = 15 ones, or 15.



+	1	5
	—	—

Step 5 Add the partial products.
 $800 + 60 + 200 + 15 = 1,075$.



	1,0	7	5
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So, $25 \times 43 = \underline{1,075}$.

Record the product.

1.
$$\begin{array}{r} 25 \\ \times 62 \\ \hline \end{array}$$

2.
$$\begin{array}{r} 59 \\ \times 38 \\ \hline \end{array}$$

3.
$$\begin{array}{r} 85 \\ \times 72 \\ \hline \end{array}$$

4.
$$\begin{array}{r} 46 \\ \times 52 \\ \hline \end{array}$$

5.
$$\begin{array}{r} 76 \\ \times 23 \\ \hline \end{array}$$

6.
$$\begin{array}{r} 38 \\ \times 95 \\ \hline \end{array}$$

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Multiply with Regrouping

Estimate. Then use regrouping to find 28×43 .

Step 1 Round to estimate the product. $30 \times 40 = 1,200$

Step 2 Think: $28 = 2$ tens 8 ones.
 Multiply 43 by 8 ones.
 $8 \times 3 = 24$. Record the 4. Write the regrouped 2 above the tens place.
 $8 \times 40 = 320$. Add the regrouped tens: $320 + 20 = 340$.

$$\begin{array}{r} 2 \\ 43 \\ \times 28 \\ \hline 344 \end{array} \longleftarrow 8 \times 43$$

Step 3 Multiply 43 by 2 tens.
 $20 \times 3 = 60$ and $20 \times 40 = 800$.
 Record 860 below 344.

$$\begin{array}{r} 2 \\ 43 \\ \times 28 \\ \hline 344 \\ 860 \\ \hline 1,204 \end{array} \longleftarrow 20 \times 43$$

Step 4 Add the partial products.

$$1,204 \longleftarrow 344 + 860$$

So, $28 \times 43 = \underline{1,204}$. 1,204 is close to 1,200. The answer is reasonable.

Estimate. Then find the product.

1. Estimate: _____

2. Estimate: _____

3. Estimate: _____

$$\begin{array}{r} 36 \\ \times 12 \\ \hline \end{array}$$

$$\begin{array}{r} 43 \\ \times 29 \\ \hline \end{array}$$

$$\begin{array}{r} 51 \\ \times 47 \\ \hline \end{array}$$

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Choose a Multiplication Method

Estimate. Then use regrouping to find 47×89 .

$$\begin{array}{r} 89 \\ \times 47 \\ \hline \end{array}$$

Step 1 Estimate the product.

$$50 \times 90 = 4,500$$

Step 2 Multiply the 9 ones by the 7 ones. Regroup the 63 ones as 6 tens 3 ones.

$$\begin{array}{r} 6 \\ 89 \\ \times 47 \\ \hline 3 \end{array}$$

Step 3 Multiply the 8 tens, or 80, by the 7 ones, or 7. Add the regrouped tens. Regroup the 62 tens as 6 hundreds 2 tens.

$$\begin{array}{r} 6 \\ 89 \\ \times 47 \\ \hline 623 \end{array}$$

Step 4 Multiply the 9 ones by the 4 tens, or 40. Regroup the 36 tens as 3 hundreds 6 tens.

$$\begin{array}{r} 3 \\ 89 \\ \times 47 \\ \hline 623 \\ 60 \end{array}$$

Step 5 Multiply the 8 tens, or 80, by the 4 tens, or 40. Add the regrouped tens. Regroup the 35 hundreds as 3 thousands 5 hundreds.

$$\begin{array}{r} 3 \\ 89 \\ \times 47 \\ \hline 623 \\ 3,560 \end{array}$$

Step 6 Add the partial products.

$$\begin{array}{r} 3 \\ 89 \\ \times 47 \\ \hline 623 \\ + 3,560 \\ \hline 4,183 \end{array}$$

So, $47 \times 89 = 4,183$. Since 4,183 is close to the estimate of 4,500, it is reasonable.

Estimate. Then choose a method to find the product.

1. Estimate: _____ 2. Estimate: _____ 3. Estimate: _____ 4. Estimate: _____

$$\begin{array}{r} 76 \\ \times 31 \\ \hline \end{array}$$

$$\begin{array}{r} 24 \\ \times 35 \\ \hline \end{array}$$

$$\begin{array}{r} 14 \\ \times 28 \\ \hline \end{array}$$

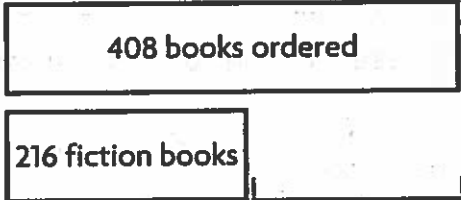
$$\begin{array}{r} 64 \\ \times 56 \\ \hline \end{array}$$

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Problem Solving • Multiply

2-Digit Numbers

A library ordered 17 cases with 24 books in each case. In 12 of the cases, 18 books were fiction books. The rest of the books were nonfiction. How many nonfiction books did the library order?

Read the Problem	Solve the Problem
<p>What do I need to find?</p> <p>I need to find <u>how many nonfiction books</u> were ordered.</p>	<ul style="list-style-type: none"> First, find the total number of books ordered. $17 \times 24 = 408$ books ordered Next, find the number of fiction books. $12 \times 18 = 216$ fiction books
<p>What information do I need to use?</p> <p><u>17</u> cases of <u>24</u> books each were ordered.</p> <p>In <u>12</u> cases, <u>18</u> books were fiction books.</p>	<ul style="list-style-type: none"> Last, draw a bar model. I need to subtract. <div style="text-align: center;">  </div>
<p>How will I use the information?</p> <p>I can find the <u>total number of books ordered</u> and the <u>number of fiction books ordered</u>.</p> <p>Then I can draw a bar model to compare the <u>total number of books</u> to the <u>number of fiction books</u>.</p>	<p>$408 - 216 = 192$</p> <p>So, the library ordered <u>192</u> nonfiction books.</p>

- A grocer ordered 32 cases with 28 small cans of fruit in each case. The grocer also ordered 24 cases with 18 large cans of fruit in each case. How many more small cans of fruit did the grocer order?

- Rebecca rode her bike 16 miles each day for 30 days. Michael rode his bike 25 miles for 28 days. Who rode farther? How much farther?
