

Name _____

Algebra • Multiplication Comparisons

Tara has 3 times as many soccer medals as Greg. Greg has 4 soccer medals. How many soccer medals does Tara have?

Step 1 Draw a model.

Greg ○○○○

Tara ○○○○ ○○○○ ○○○○

Step 2 Use the model to write an equation.

$n = \underline{3} \times \underline{4}$ **Think:** n is how many soccer medals Tara has.

Step 3 Solve the equation.

$n = \underline{12}$

So, Tara has 12 soccer medals.

Draw a model and write an equation.

1. 4 times as many as 7 is 28.

2. 16 is 8 times as many as 2.

3. 3 times as many as 6 is 18.

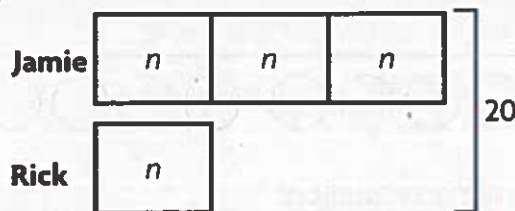
4. 10 is 2 times as many as 5.

Name _____

Algebra • Comparison Problems

Jamie has 3 times as many baseball cards as Rick. Together, they have 20 baseball cards. How many cards does Jamie have?

Step 1 Draw a box with the letter n in it to show that Rick has an unknown number of cards. Jamie has 3 times as many cards as Rick, so draw three identical boxes to represent Jamie's cards.



Step 2 Use the model to write an equation.

Think: There are 4 equal bars. The number in each bar is represented by n .

There are a total of 20 cards. So, $4 \times n = 20$.

Step 3 Solve the equation to find the value of n .

Think: 4 times what number is 20?

Since $4 \times 5 = 20$, the value of n is 5.

Rick has 5 cards.

Step 4 Find how many cards Jamie has.

Think: Jamie has 3 times as many cards as Rick.

So, Jamie has $3 \times 5 = 15$ baseball cards.

Draw a model. Write an equation and solve.

- Maddie has 2 times as many stickers on her notebook as Meg. Together, they have 15 stickers. How many stickers are on Maddie's notebook?
- How many more stickers are on Maddie's notebook than on Meg's notebook?

Name _____

Multiply Tens, Hundreds, and Thousands

You can use a pattern to multiply with tens, hundreds, and thousands.

Count the number of zeros in the factors.

$$4 \times 6 = 24 \quad \leftarrow \text{basic fact}$$

$$4 \times 60 = 240 \quad \leftarrow \text{When you multiply by tens, the last digit in the product is 0.}$$

$$4 \times 600 = 2,400 \quad \leftarrow \text{When you multiply by hundreds, the last two digits in the product are 0.}$$

$$4 \times 6,000 = 24,000 \quad \leftarrow \text{When you multiply by thousands, the last three digits in the product are 0.}$$

When the basic fact has a zero in the product, there will be an extra zero in the final product:

$$5 \times 4 = 20, \text{ so } 5 \times 4,000 = 20,000$$

Complete the pattern.

1. $9 \times 2 = 18$

$9 \times 20 = \underline{\hspace{2cm}}$

$9 \times 200 = \underline{\hspace{2cm}}$

$9 \times 2,000 = \underline{\hspace{2cm}}$

2. $8 \times 4 = 32$

$8 \times 40 = \underline{\hspace{2cm}}$

$8 \times 400 = \underline{\hspace{2cm}}$

$8 \times 4,000 = \underline{\hspace{2cm}}$

3. $6 \times 6 = 36$

$6 \times 60 = \underline{\hspace{2cm}}$

$6 \times 600 = \underline{\hspace{2cm}}$

$6 \times 6,000 = \underline{\hspace{2cm}}$

4. $4 \times 7 = 28$

$4 \times 70 = \underline{\hspace{2cm}}$

$4 \times 700 = \underline{\hspace{2cm}}$

$4 \times 7,000 = \underline{\hspace{2cm}}$

Find the product.

5. $7 \times 300 = 7 \times \underline{\hspace{1cm}}$ hundreds 6. $5 \times 8,000 = 5 \times \underline{\hspace{1cm}}$ thousands

$= \underline{\hspace{1cm}}$ hundreds

$= \underline{\hspace{1cm}}$

$= \underline{\hspace{1cm}}$ thousands

$= \underline{\hspace{1cm}}$

Name _____

Estimate Products

You can use rounding to estimate products.

Round the greater factor. Then use mental math to estimate the product.

6×95

Step 1 Round 95 to the nearest hundred.

95 rounds to 100.

Step 2 Use patterns and mental math.

$6 \times 1 = 6$

$6 \times 10 = 60$

$6 \times 100 = 600$

Find two numbers the exact answer is between.

7×759

Step 1 Estimate by rounding to the lesser hundred.

7×759



$7 \times 700 = 4,900$

Think: $7 \times 7 = 49$

$7 \times 70 = 490$

$7 \times 700 = 4,900$

Step 2 Estimate by rounding to the greater hundred.

7×759



$7 \times 800 = 5,600$

Think: $7 \times 8 = 56$

$7 \times 80 = 560$

$7 \times 800 = 5,600$

So, the product is between 4,900 and 5,600.

Estimate the product by rounding.

1. 6×316

2. 5×29

3. 4×703

Estimate the product by finding two numbers the exact answer is between.

4. 3×558

5. 7×252

6. 8×361

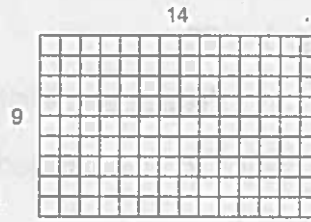
Name _____

Multiply Using the Distributive Property

You can use rectangular models to multiply 2-digit numbers by 1-digit numbers.

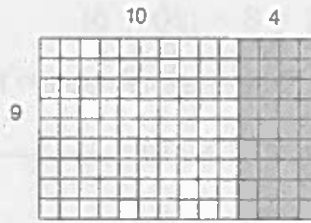
Find 9×14 .

Step 1 Draw a 9 by 14 rectangle on grid paper.



Step 2 Use the Distributive Property and products you know to break apart the model into two smaller rectangles.

Think: $14 = 10 + 4$.



Step 3 Find the product each smaller rectangle represents.

$$9 \times 10 = 90$$

$$9 \times 4 = 36$$

Step 4 Find the sum of the products.

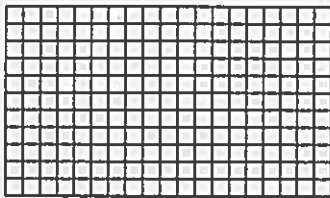
$$90 + 36 = 126$$

So, $9 \times 14 = 126$.

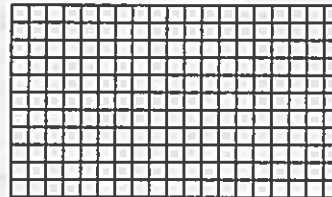
Model the product on the grid.

Record the product.

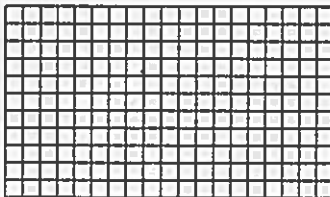
1. 3×13



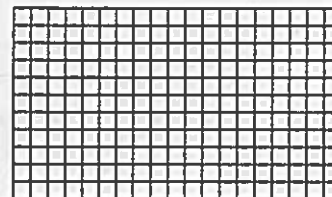
2. 6×16



3. 5×17



4. 4×14



Name _____

Multiply Using Expanded Form

You can use expanded form or a model to find products.

Multiply. 3×26

Think and Write

Step 1 Write 26 in expanded form.

$$26 = 20 + 6$$

$$3 \times 26 = 3 \times (20 + 6)$$

Step 2 Use the Distributive Property.

$$3 \times 26 = (3 \times 20) + (\underline{3} \times \underline{6})$$

Step 3 Multiply the tens. Multiply the ones.

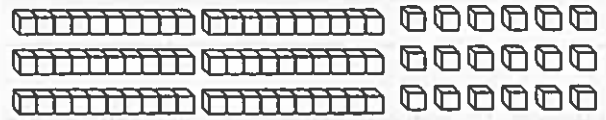
$$\begin{aligned} 3 \times 26 &= (3 \times 20) + (3 \times 6) \\ &= \underline{60} + \underline{18} \end{aligned} \quad \begin{array}{r} 60 \\ +18 \\ \hline 78 \end{array}$$

Step 4 Add the partial products.

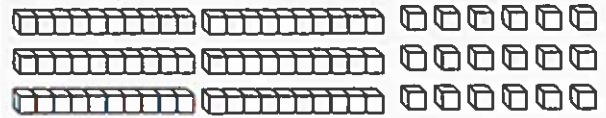
So, $3 \times 26 = \underline{78}$

Use a Model

Step 1 Show 3 groups of 26.



Step 2 Break the model into tens and ones.



(3 × 2 tens)

(3 × 6 ones)

$$(3 \times 20)$$

$$(3 \times 6)$$

$$\underline{60}$$

$$\underline{18}$$

Step 3 Add to find the total product.

$$\underline{60} + \underline{18} = \underline{78}$$

Record the product. Use expanded form to help.

1. $6 \times 14 = \underline{\hspace{2cm}}$

2. $4 \times 52 = \underline{\hspace{2cm}}$

3. $5 \times 162 = \underline{\hspace{2cm}}$

4. $3 \times 279 = \underline{\hspace{2cm}}$

Name _____

Multiply Using Partial Products

Use partial products to multiply.

Multiply. $7 \times \$332$

Step 1 Estimate the product.

332 rounds to 300 ; $7 \times \$300 = \underline{\$2,100}$.

Step 2 Multiply the 3 hundreds, or 300, by 7.

$$\begin{array}{r} \$332 \\ \times 7 \\ \hline \end{array}$$

or

$$\begin{array}{r} \$300 \\ \times 7 \\ \hline \$2,100 \end{array}$$

Step 3 Multiply the 3 tens, or 30, by 7.

$$\begin{array}{r} \$332 \\ \times 7 \\ \hline \end{array}$$

or

$$\begin{array}{r} \$30 \\ \times 7 \\ \hline \$210 \end{array}$$

Step 4 Multiply the 2 ones, or 2, by 7.

$$\begin{array}{r} \$332 \\ \times 7 \\ \hline \end{array}$$

or

$$\begin{array}{r} \$2 \\ \times 7 \\ \hline \$14 \end{array}$$

Step 5 Add the partial products.

$\$2,100 + \$210 + \$14 = \underline{\$2,324}$

So, $7 \times \$332 = \$2,324$. Since $\$2,324$ is close to the estimate of $\$2,100$, it is reasonable.

Estimate. Then record the product.

1. Estimate: _____

$$\begin{array}{r} 181 \\ \times 2 \\ \hline \end{array}$$

2. Estimate: _____

$$\begin{array}{r} 156 \\ \times 4 \\ \hline \end{array}$$

3. Estimate: _____

$$\begin{array}{r} \$210 \\ \times 5 \\ \hline \end{array}$$

4. Estimate: _____

$$\begin{array}{r} 303 \\ \times 6 \\ \hline \end{array}$$

5. Estimate: _____

$$\begin{array}{r} \$427 \\ \times 2 \\ \hline \end{array}$$

6. Estimate: _____

$$\begin{array}{r} \$367 \\ \times 5 \\ \hline \end{array}$$

Name _____

Multiply Using Mental Math

<p>Use addition to break apart the larger factor.</p> <p>Find 8×214.</p> <p>Think: $214 = 200 + 14$</p> $8 \times 214 = (8 \times 200) + (8 \times 14)$ $= \underline{1,600} + \underline{112}$ $= \underline{1,712}$	<p>Use subtraction to break apart the larger factor.</p> <p>Find 6×298.</p> <p>Think: $298 = 300 - 2$</p> $6 \times 298 = (6 \times 300) - (6 \times 2)$ $= \underline{1,800} - \underline{12}$ $= \underline{1,788}$
<p>Use halving and doubling.</p> <p>Find 14×50.</p> <p>Think: 14 can be evenly divided by 2.</p> $14 \div 2 = \underline{7}$ $7 \times 50 = \underline{350}$ $2 \times 350 = \underline{700}$	<p>When multiplying more than two numbers, use the Commutative Property to change the order of the factors.</p> <p>Find $2 \times 9 \times 50$.</p> <p>Think: $2 \times 50 = \underline{100}$</p> $2 \times 9 \times 50 = 2 \times \underline{50} \times 9$ $= \underline{100} \times 9$ $= \underline{900}$

Find the product. Tell which strategy you used.

1. $5 \times 7 \times 20$

2. 6×321

3. 86×50

4. 9×399

Name _____

Problem Solving • Multistep Multiplication Problems

Use the strategy *draw a diagram* to solve a multistep multiplication problem.

Amy planted 8 rows with 18 tulips in each row. In each of the 4 middle rows, there are 4 red tulips. All of the other tulips are yellow. How many of the tulips are yellow tulips?

Read the Problem	Solve the Problem
<p>What do I need to find?</p> <p>I need to find the total number of <u>yellow</u> tulips.</p>	<p>I drew a diagram for each color of tulip.</p> <div style="text-align: center;"> </div>
<p>What information do I need to use?</p> <p>There are <u>8</u> rows of tulips with <u>18</u> tulips in each row.</p> <p>There are <u>4</u> rows of tulips with <u>4</u> red tulips in each row.</p>	
<p>How will I use the information?</p> <p>I can <u>multiply</u> to find the total number of tulips and the number of red tulips.</p> <p>Then I can <u>subtract</u> to find the number of yellow tulips.</p>	

Next, I found the number in each section.

All Tulips	Red Tulips
$8 \times 18 = 144$	$4 \times 4 = 16$

Last, I subtracted the number of red tulips from the total number of tulips.

$$\underline{144} - \underline{16} = \underline{128}$$

So, there are 128 yellow tulips.

1. A car dealer has 8 rows of cars with 16 cars in each row. In each of the first 3 rows, 6 are used cars. The rest of the cars are new cars. How many new cars does the dealer have?

2. An orchard has 4 rows of apple trees with 12 trees in each row. There are also 6 rows of pear trees with 15 trees in each row. How many apple and pear trees are in the orchard?

Name _____

Multiply 2-Digit Numbers with Regrouping

Use place value to multiply with regrouping.

Multiply. 7×63

Step 1 Estimate the product.

$$7 \times 60 = 420$$

Step 2 Multiply the ones. Regroup 21 ones as 2 tens 1 one. Record the 1 one below the ones column and the 2 tens above the tens column.

$$\begin{array}{r} 2 \\ 63 \\ \times 7 \\ \hline 1 \end{array}$$

$$7 \times 3 \text{ ones} = 21 \text{ ones}$$

Step 3 Multiply the tens. Then, add the regrouped tens. Record the tens.

$$\begin{array}{r} 2 \\ 63 \\ \times 7 \\ \hline 441 \end{array}$$

44 tens = 4 hundreds
4 tens

$$7 \times 6 \text{ tens} = 42 \text{ tens}$$

Add the 2 regrouped tens.

$$42 \text{ tens} + 2 \text{ tens} = 44 \text{ tens}$$

So, $7 \times 63 = 441$. Since 441 is close to the estimate of 420, it is reasonable.

Estimate. Then record the product.

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

$$\begin{array}{r} 42 \\ \times 6 \\ \hline \end{array}$$

$$\begin{array}{r} \$98 \\ \times 6 \\ \hline \end{array}$$

$$\begin{array}{r} 37 \\ \times 8 \\ \hline \end{array}$$

$$\begin{array}{r} \$54 \\ \times 9 \\ \hline \end{array}$$

5. Estimate: _____ 6. Estimate: _____ 7. Estimate: _____ 8. Estimate: _____

$$\begin{array}{r} 37 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 93 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 86 \\ \times 9 \\ \hline \end{array}$$

$$\begin{array}{r} 59 \\ \times 7 \\ \hline \end{array}$$

Name _____

Multiply 3-Digit and 4-Digit Numbers with Regrouping

When you multiply 3-digit and 4-digit numbers, you may need to regroup.

Estimate. Then find the product.

$$\begin{array}{r} \$1,324 \\ \times \quad 7 \\ \hline \end{array}$$

Step 1 Estimate the product.

$\$1,324$ rounds to $\$1,000$; $\$1,000 \times 7 = \$7,000$.

Step 2 Multiply the 4 ones by 7.

Regroup the 28 ones as 2 tens 8 ones.

$$\begin{array}{r} 1,324 \\ \times \quad 7 \\ \hline 8 \end{array}$$

Step 3 Multiply the 2 tens by 7.

Add the regrouped tens.

Regroup the 16 tens as 1 hundred 6 tens.

$$\begin{array}{r} 1,324 \\ \times \quad 7 \\ \hline 68 \end{array}$$

Step 4 Multiply the 3 hundreds by 7.

Add the regrouped hundred.

Regroup the 22 hundreds as 2 thousands 2 hundreds.

$$\begin{array}{r} 1,324 \\ \times \quad 7 \\ \hline 268 \end{array}$$

Step 5 Multiply the 1 thousand by 7.

Add the regrouped thousands.

$$\begin{array}{r} 1,324 \\ \times \quad 7 \\ \hline 9,268 \end{array}$$

So, $7 \times \$1,324 = \$9,268$.

Since $\$9,268$ is close to the estimate of $\$7,000$, the answer is reasonable.

Estimate. Then find the product.

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

$$\begin{array}{r} 3,184 \\ \times \quad 2 \\ \hline \end{array}$$

$$\begin{array}{r} \$828 \\ \times \quad 4 \\ \hline \end{array}$$

$$\begin{array}{r} 2,637 \\ \times \quad 5 \\ \hline \end{array}$$

$$\begin{array}{r} \$6,900 \\ \times \quad 7 \\ \hline \end{array}$$

Name _____

Algebra • Solve Multistep Problems Using Equations

The **Order of Operations** is a special set of rules which gives the order in which calculations are done in an expression. First, multiply and divide from left to right. Then, add and subtract from left to right.

Use the order of operations to find the value of n .

$$6 \times 26 + 3 \times 45 - 11 = n$$

Step 1 Circle the first multiplication expression in the equation.

$$(6 \times 26) + 3 \times 45 - 11 = n$$

Step 2 Multiply 6×26 .

$$\underline{156} + 3 \times 45 - 11 = n$$

Step 3 Circle the next multiplication expression in the equation.

$$156 + (3 \times 45) - 11 = n$$

Step 4 Multiply 3×45 .

$$156 + \underline{135} - 11 = n$$

Step 5 There are no more multiplication or division expressions. Circle the first addition expression in the equation.

$$(156 + 135) - 11 = n$$

Step 6 Add $156 + 135$.

$$\underline{291} - 11 = n$$

Step 7 Subtract $291 - 11$.

$$\underline{280} = n$$

Find the value of n .

1. $5 \times 43 + 9 \times 24 + 25 = n$

$$\underline{\hspace{2cm}} = n$$

2. $7 \times 29 + 4 \times 46 - 56 = n$

$$\underline{\hspace{2cm}} = n$$