

# Multiplying Multi-Digit Numbers

Complete the multiplication sentences.  
Split and complete area models as checks.

- 1 The product is between 12,000 and 48,000.  
Neither factor has a zero in the ones place.

$$\square\square\square \times \square\square = \square$$



- 2 The product is between 16,000 and 40,000.  
Neither factor has a zero in the ones place.

$$\square\square\square \times \square\square = \square$$



- 3 The product is between 36,000 and 63,000.  
Neither factor has a zero in the ones place.

$$\square\square\square \times \square\square = \square$$



# Writing Vertical Records

If you round one of the factors up to the next ten, you can adjust later by subtracting.

Example:  $42 \times 68$

$$42 \times 70 = 2,940$$

$$42 \times 68 = 2,940 - (2 \times 42)$$

$$= 2,940 - 84$$

$$= 2,856$$

Try these!

1

$$58 \times 25 = \underline{\hspace{2cm}}$$

2

$$23 \times 49 = \underline{\hspace{2cm}}$$

3

$$38 \times 48 = \underline{\hspace{2cm}}$$

4

$$64 \times 78 = \underline{\hspace{2cm}}$$

5

$$49 \times 62 = \underline{\hspace{2cm}}$$

6

$$19 \times 92 = \underline{\hspace{2cm}}$$

# Writing Shorter Records

Complete the puzzles and records.

**1**

	×				123
48					

$$\begin{array}{r}
 123 \\
 \times 48 \\
 \hline
 \end{array}$$

**2**

	×				168
46					

$$\begin{array}{r}
 168 \\
 \times 46 \\
 \hline
 \end{array}$$

**3**

	×				204
30					
9					1,836

$$\begin{array}{r}
 204 \\
 \times \square \\
 \hline
 \end{array}$$

# Using Square Number Differences

Find pairs of matching shorthand expressions and write them at the beginning of the table rows. Fill in numbers to prove that the expressions are equivalent. Make  $n$  a 2-digit number at least twice in each table.

$n^2 + 4$	$(n + 2) \times (n - 2)$	$(n - 1) \times (n + 1)$
$(n + 4) \times (n - 4)$	$n^2 - 1$	$n^2 - 2$
$n^2 + 1$	$n^2 - 4$	$n^2 - 16$

**1**

$n$					

**2**

$n$					

**3**

$n$					

# Multiplying Large Numbers

In each record, write the factors for each partial product.

**1**

1 4 3
× 2 2
2 0 0 0
8 0 0
6 0
2 0 0
8 0
6
3, 1 4 6


**2**

2 0 9
× 4 8
7 2
0
1 6 0 0
3 6 0
0
8 0 0 0
10, 0 3 2


**3**

1 6 7
× 3 8
1 3 3 6
5 0 1 0
6, 3 4 6


**4**

2 3 5
× 4 2
8 4 0 0
1 2 6 0
2 1 0
9, 8 7 0
