# Multi-Digit Multiplication

Explore ideas and representations

**Name** _____ **Date** _____ **Score** _____ / 8

**QUICK REVIEW**

Break a factor into place-value parts. $23 \times 14 = 23 \times 10 + 23 \times 4 = 230 + 92 = 322$. For $302 \times 6$, include the zero tens: $300 \times 6 + 2 \times 6 = 1{,}812$.

**Worked example**

Use partial products to find $46 \times 23$.

1. $23 = 20 + 3$.
2. $46 \times 20 = 920$ and $46 \times 3 = 138$.
3. $920 + 138 = 1058$; check $1058 \div 23 = 46$.

**Answer:** $1058$.

## Practice Problems

Show your thinking.

**1.** Find $324 \times 6$ using place-value parts.

**2.** Find $47 \times 32$ with partial products.

**3.** Calculate $2{,}068 \times 4$.

**4.** An array has $58$ columns and $24$ rows. How many cells?

**5.** Correct: $34 \times 20 = 68$.

**6.** $24 \times \square = 720$. Find the missing whole-number factor.

**7.** Label the partial areas for a $42$ by $16$ rectangle and find its area.

| | 10 | 6 |
|---|---|---|
| 42 | ☐ | ☐ |

**8.** Will $6$ boxes of $148$ crayons provide at least $900$ crayons?

# Answer Key

1. $1944$.
2. $1504$.
3. $8272$.
4. $1392$.
5. $680$.
6. $30$.
7. $672$ square units.
8. No; $888$ crayons, $12$ short.

## Step-by-Step Solutions

Follow each calculation, then check your own work.

### Problem 1

1. $324 = 300 + 24$.
2. $300 \times 6 = 1800$ and $24 \times 6 = 144$.
3. $1800 + 144 = 1944$; check $1944 \div 6 = 324$.

### Problem 2

1. $32 = 30 + 2$.
2. $47 \times 30 = 1410$ and $47 \times 2 = 94$.
3. $1410 + 94 = 1504$; check $1504 \div 32 = 47$.

### Problem 3

1. $2068 = 2000 + 68$.
2. $2000 \times 4 = 8000$ and $68 \times 4 = 272$.
3. $8000 + 272 = 8272$; check $8272 \div 4 = 2068$.

### Problem 4

1. $24 = 20 + 4$.
2. $58 \times 20 = 1160$ and $58 \times 4 = 232$.
3. $1160 + 232 = 1392$; check $1392 \div 24 = 58$.

### Problem 5

1. $20 = 2 \times 10$.
2. $34 \times 2 = 68$.
3. $68 \times 10 = 680$; the tens factor must stay.

### Problem 6

1. $24 \times 3 = 72$.
2. Ten times $72$ is $720$, so the factor is $3 \times 10 = 30$.
3. $24 \times 30 = 720$ checks it.

### Problem 7

1. $16 = 10 + 6$.
2. $42 \times 10 = 420$ and $42 \times 6 = 252$.
3. $420 + 252 = 672$; check $672 \div 16 = 42$.

### Problem 8

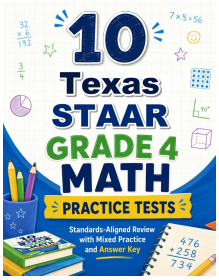
1. $6 \times 100 = 600$ and $6 \times 48 = 288$.
2. $600 + 288 = 888$ crayons.
3. $900 - 888 = 12$ crayons are missing.

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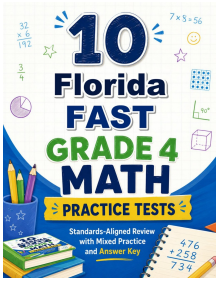

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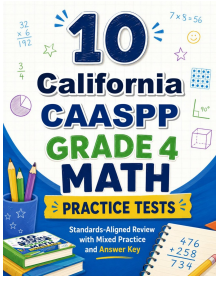

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