Multiplying Multi-Digit Whole Numbers

Multiplying Multi-Digit Whole Numbers: Models and Computation

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QUICK REVIEW

Multiply each place, then add partial products. For 132×24, $132 \times 20 = 2640$ and $132 \times 4 = 528$, so $2640 + 528 = 3168$. The 2 in 24 means 20, not 2.

Worked example

Multiply 128×23 using partial products.

1. Break the second factor into $20 + 3$.
2. Partial products: $128 \times 20 = 2560$ and $128 \times 3 = 384$.
3. Add: $2560 + 384 = 2944$.

Answer: 2944.

Practice Problems

Show your thinking.

1. Multiply 143×26 using partial products.

2. A rectangle has side lengths 218 cm and 34 cm. Split the 34 cm side into tens and ones and find its area.

3. A hall has 124 seats in each of 18 rows. How many seats are there?

4. The tens partial product for 306×27 is 6120. Find the missing ones partial product and the total.

5. Is 175×42 greater than 7300? Compute the difference.

6. A student finds 263×31 by adding $789 + 263$. Identify the place-value error and correct it.

7. Multiply 427×16 using partial products.

8. Complete the missing factor: $\square \times 45 = 6210$. Show a multiplication check.

Answer Key

1. 3718.
2. 7412 cm^2.
3. 2232.
4. Ones partial product 2142; total 8262.
5. Yes; by 50.
6. 8153.
7. 6832.
8. 138.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. Break the second factor into $20 + 6$.
2. Partial products: $143 \times 20 = 2860$ and $143 \times 6 = 858$.
3. Add: $2860 + 858 = 3718$.

Problem 2

1. Break the second factor into $30 + 4$.
2. Partial products: $218 \times 30 = 6540$ and $218 \times 4 = 872$.
3. Add: $6540 + 872 = 7412$.

Problem 3

1. Break the second factor into $10 + 8$.
2. Partial products: $124 \times 10 = 1240$ and $124 \times 8 = 992$.
3. Add: $1240 + 992 = 2232$.

Problem 4

1. Break the second factor into $20 + 7$.
2. Partial products: $306 \times 20 = 6120$ and $306 \times 7 = 2142$.
3. Add: $6120 + 2142 = 8262$.

Problem 5

1. Break the second factor into $40 + 2$.
2. Partial products: $175 \times 40 = 7000$ and $175 \times 2 = 350$.
3. Add: $7000 + 350 = 7350$.
4. $7350 - (7300) = 50$.

Problem 6

1. Break the second factor into $30 + 1$.
2. Partial products: $263 \times 30 = 7890$ and $263 \times 1 = 263$.
3. Add: $7890 + 263 = 8153$.

Problem 7

1. Break the second factor into $10 + 6$.
2. Partial products: $427 \times 10 = 4270$ and $427 \times 6 = 2562$.
3. Add: $4270 + 2562 = 6832$.

Problem 8

1. Undo the known factor: $6210 \div 45 = 138$; now verify that candidate with partial products.
2. Break the second factor into $40 + 5$.
3. Partial products: $138 \times 40 = 5520$ and $138 \times 5 = 690$.
4. Add: $5520 + 690 = 6210$.

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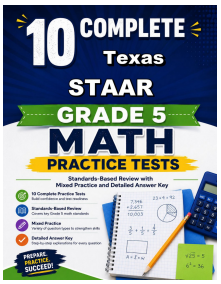

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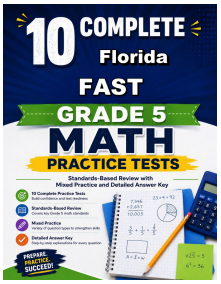

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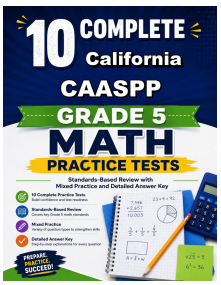

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