Multiplying Multi-Digit Whole Numbers

Multiplying Multi-Digit Whole Numbers: Apply, Compare, and Design

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

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 132×23 using partial products.

1. Break the second factor into $20 + 3$.
2. Partial products: $132 \times 20 = 2640$ and $132 \times 3 = 396$.
3. Add: $2640 + 396 = 3036$.
Answer: 3036.

Practice Problems

Show your thinking.

1. A shelf plan has 36 rows of 128 books. Will it hold 4596 books? Find the spare capacity.

2. Design equal rows of 225 tiles using exactly 6300 tiles. Find the row count and verify.

3. Plan A has 45 boxes of 164 markers. Plan B has 44 such boxes plus 172 loose markers. Which has more, and by how many?

4. Each of 24 classes receives 312 sheets. A supply has 7563 sheets. How many sheets remain?

5. A hall has 236 seats in each of 17 rows. How many seats are there?

6. A club orders 62 kits with 154 pieces each. An invoice lists 9648 pieces. How many pieces too many does it list?

7. A rectangle has side lengths 185 cm and 48 cm. Split the 48 cm side into tens and ones and find its area.

8. A shelf plan has 19 rows of 273 books. Will it hold 5175 books? Find the spare capacity.

Answer Key

1. Yes; 12 spare places.
2. 28 rows; $28 \times 225 = 6300$.
3. Plan B has 8 more markers.
4. 75 sheets remain.
5. 4012.
6. 100 pieces too many.
7. 8880 cm^2.
8. Yes; 12 spare places.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. Break the second factor into $30 + 6$.
2. Partial products: $128 \times 30 = 3840$ and $128 \times 6 = 768$.
3. Add: $3840 + 768 = 4608$.
4. $4608 - 4596 = 12$ places.

Problem 2

1. Let r be the row count. Each row has 225 tiles, so $225r = 6300$ and $r = 6300 \div 225$.
2. Use 20 rows first: $225 \times 20 = 4500$. This leaves $6300 - 4500 = 1800$ tiles.
3. The remaining rows number $1800 \div 225 = 8$; check $225 \times 8 = 1800$.
4. Add the row counts: $20 + 8 = 28$. Thus $6300 \div 225 = 28$, and $28 \times 225 = 6300$ verifies the plan.

Problem 3

1. Break the second factor into $40 + 5$.
2. Partial products: $164 \times 40 = 6560$ and $164 \times 5 = 820$.
3. Add: $6560 + 820 = 7380$.
4. B has $7216 + 172 = 7388$ markers; $7388 - 7380 = 8$.

Problem 4

1. Break the second factor into $20 + 4$.
2. Partial products: $312 \times 20 = 6240$ and $312 \times 4 = 1248$.
3. Add: $6240 + 1248 = 7488$.
4. $7563 - 7488 = 75$ sheets.

Problem 5

1. Break the second factor into $10 + 7$.
2. Partial products: $236 \times 10 = 2360$ and $236 \times 7 = 1652$.
3. Add: $2360 + 1652 = 4012$.

Problem 6

1. Break the second factor into $60 + 2$.
2. Partial products: $154 \times 60 = 9240$ and $154 \times 2 = 308$.
3. Add: $9240 + 308 = 9548$.
4. $9648 - 9548 = 100$ pieces.

Problem 7

1. Break the second factor into $40 + 8$.
2. Partial products: $185 \times 40 = 7400$ and $185 \times 8 = 1480$.
3. Add: $7400 + 1480 = 8880$.

Problem 8

1. Break the second factor into $10 + 9$.
2. Partial products: $273 \times 10 = 2730$ and $273 \times 9 = 2457$.
3. Add: $2730 + 2457 = 5187$.
4. $5187 - 5175 = 12$ places.

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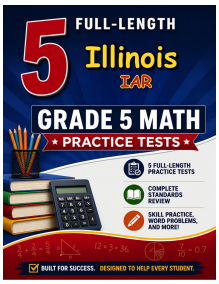

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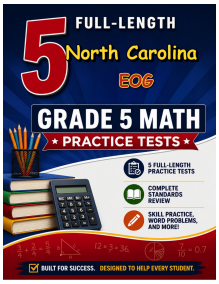

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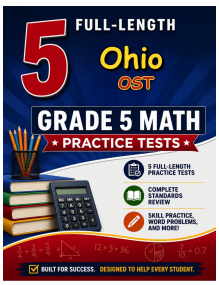

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