

Area
Model

FOIL

Multiplication Strategies

{for two-digit by two-digit problems}



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Lattice

Double
& half

4th Grade

Common Core Standard Met:

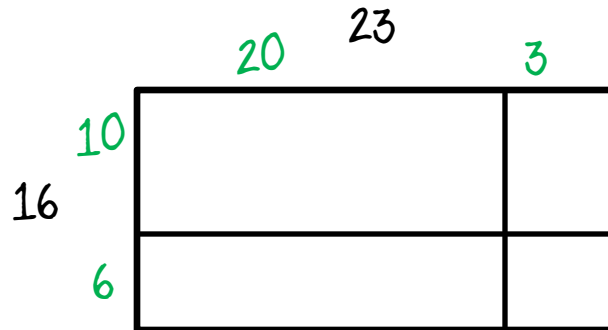
✧ 4.NBT.5 - Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.



Area Model

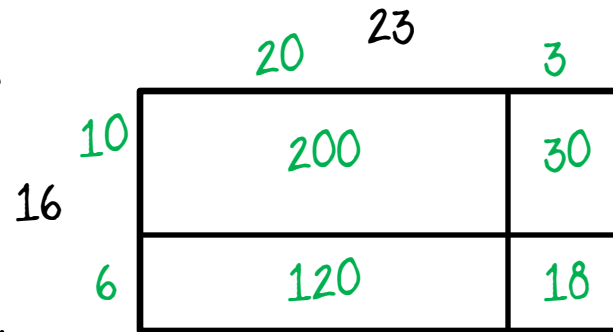
$$16 \times 23$$

- ✧ Start by drawing an array and breaking each number into a simpler form.



- ✧ Multiply to find partial products.

$$16 \times 23 = (10 \times 20) + (10 \times 3) + (6 \times 20) + (6 \times 3)$$



- ✧ Add all partial products together.

$$16 \times 23 = 200 + 30 + 120 + 18$$

$$16 \times 23 = 368$$

FOIL

(First, Outer, Inner, Last)

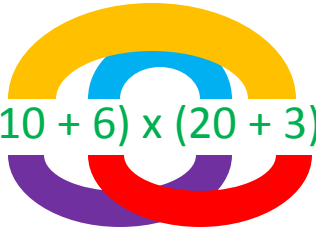
$$16 \times 23$$

✧ Start by writing the problem in expanded form.

$$16 \times 23 = (10 + 6) \times (20 + 3)$$

✧ Find partial products by multiplying the **first** numbers, **outer** numbers, **inner** numbers, and **last** numbers.

$$16 \times 23 = (10 + 6) \times (20 + 3)$$



$$16 \times 23 = (10 \times 20) + (10 \times 3) + (6 \times 20) + (6 \times 3)$$

✧ Add all partial products together.

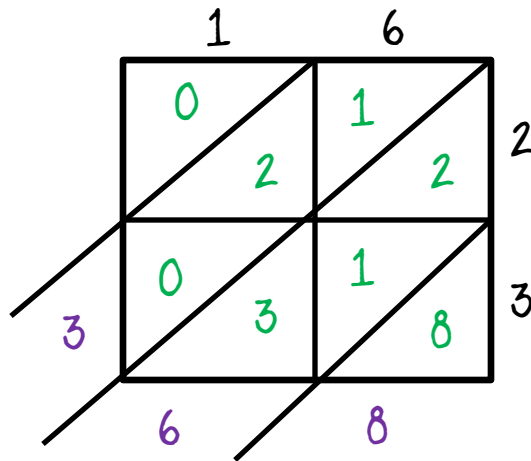
$$16 \times 23 = 200 + 30 + 120 + 18$$

$$16 \times 23 = 368$$

Lattice

16x23

- Start by creating a grid with digits on top and right hand side.



- Find the products of each box on grid and write the product on either side of diagonal (if the product is single digit, write a zero first).
- Add diagonally placing the sums on the outside of the box (this is where the final product will appear). $16 \times 23 = 368$

Double & Half

$$16 \times 23$$

✧ Note: This method can only be used if one number is even.

✧ Start by cutting one number in half and doubling the other number.

$$16 \div 2 = 8$$

$$23 \times 2 = 46$$

✧ Multiply these new numbers more easily.

$$46 \times 8 = (40 \times 8) + (6 \times 8)$$

$$46 \times 8 = 320 + 48$$

$$46 \times 8 = 368 \quad \text{therefore} \quad 16 \times 23 = 368$$



Student
Practice
Pages

Name _____

$$16 \times 23$$

Directions: Show how to solve the problem using each strategy.

Area Model

FOIL

Lattice

Double & Half

Name _____

$$35 \times 24$$

Directions: Show how to solve the problem using each strategy.

Area Model

FOIL

Lattice

Double & Half

Name _____

$$25 \times 22$$

Directions: Show how to solve the problem using each strategy.

Area Model

FOIL

Lattice

Double & Half

Name _____

$$18 \times 32$$

Directions: Show how to solve the problem using each strategy.

Area Model

FOIL

Lattice

Double & Half



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