Grade 4

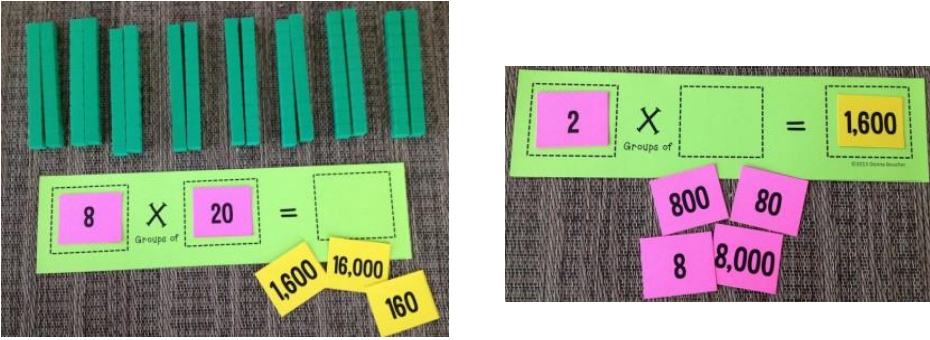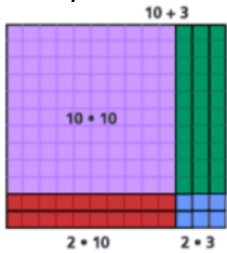# Using Place Value to Multiply Multi-Digit Numbers
Check out the "Parent Quick Smarts" video for this unit by using this link: https://goo.gl/4oooc1

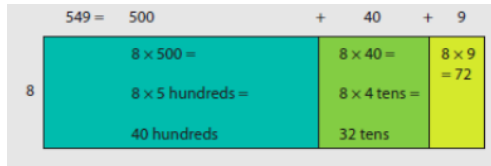| Overarching Student Learning Goals In this unit, your child will work to build an understanding of the following:	Resources/Tasks to support your child at home.
Multiply 1-digit factors by multiples of 10, 100, and 1000. Students use their understanding of basic facts (multiplying by the digits 1 to 9) to multiply benchmark numbers (50, 300, 4,000, etc.). Base ten blocks can be used to explore this understanding. Then discuss patterns they notice. 	• Roll a Dice to determine the two basic facts. Roll again to determine how many zeroes go behind each of the factors. Using basic facts to determine the product of the original factors. Then determine how the basic fact will relate to the action product. *Example: I roll a 2 and a 7. Then I roll a 2 and a 2. My problem is 200 x 700. The basic of 2 and 7 is 14. Because I'm multiplying 200 x 700, I will need to add 4 zeroes behind the basic fact. The answer is 200 x 700 = 140,000.* • Khan Academy: Multiply 1 digit numbers by Multiples of 10, 100, and 1000 https://goo.gl/85tPuk

Explaining their reasoning using pictures, numbers and words. Making connections between the different models and equations.
 	
Students create different representations of a multiplication situation. Then students make connections between the model, pictures and equation.
 	
Example Equation: *12 x 16 = 192*
 	
	• As your child is solving different multiplication problems, have them use at least 2 strategies (base ten model, array model, partial products box model, partial products or place value multiplication. Ask questions such as:
	   o How do the 2 strategies relate?
	   o How does your model relate to the problem?
	   o Where do you see the area model in the partial products box model?
	
	• Khan Academy: Multiplying with Area Model 16 x 27 https://goo.gl/mbgoKw
	• Khan Academy: More Ways to Multiply https://goo.gl/8Pp6AA

For more information on the learning goals and your child's progress, please contact your child's teacher.
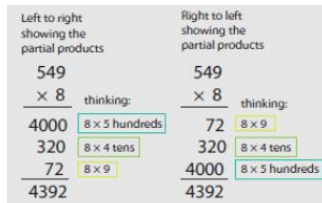
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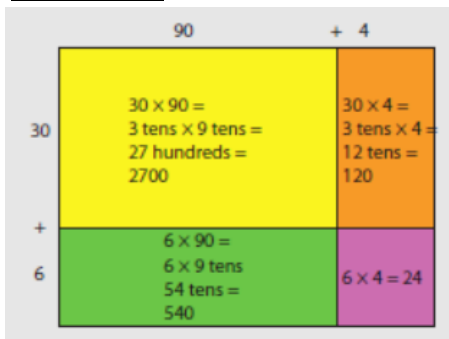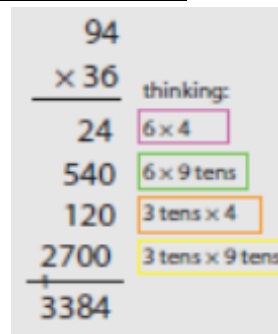|	
Using place value models to understand multi-digit multiplication with up to 4-digit by 1-digit factors. *(Note: Students are NOT expected to use the standard algorithm fluently in 4th grade)* Example(s): 8 x 549 Area Model 549 = 500 + 40 + 9 8 | 8 × 500 = / 8 × 5 hundreds = / 40 hundreds | 8 × 40 = / 8 × 4 tens = / 32 tens | 8 × 9 = 72 Partial Products Left to right showing the partial products 549 × 8 thinking: 4000 8 × 5 hundreds 320 8 × 4 tens 72 8 × 9 4392 Right to left showing the partial products 549 × 8 thinking: 72 8 × 9 320 8 × 4 tens 4000 8 × 5 hundreds 4392 Distributive Property 8 x 549 (8 x 500) + (8 x 40) + (8 x 9) 4,000 + 320 + 72 = 4,392	• Using a deck of cards, create a 2-digit by 1-digit number. Choose another card for your 1-digit number. Find the product of the two factors by using an area model and then partial products. Continue with 3-digit by 1-digit, 4-digit by 1-digit problems also. Record the new problem as a distributive property equation. • Khan Academy: Multiplying with the Area Model 6 x 7,981 https://goo.gl/ZxZ7Hs
Using place value models to understand multi-digit multiplication with 2-digit by 2-digit factors. *(Note: Students are NOT expected to understand and fluently use the standard algorithm in 4th grade)* Example(s): 94 x 36 Area Model 90 + 4 30 | 30 × 90 = / 3 tens × 9 tens = / 27 hundreds = / 2700 | 30 × 4 = / 3 tens × 4 = / 12 tens = / 120 + 6 | 6 × 90 = / 6 × 9 tens / 54 tens = / 540 | 6 × 4 = 24 Partial Products 94 × 36 thinking: 24 6 × 4 540 6 × 9 tens 120 3 tens × 4 2700 3 tens × 9 tens 3384 Distributive Property 94 x 36 (90 x 30) + (90 x 6) + (4 x 30) + (4 x 6) 2,700 + 540 + 120 + 24 = 3,384	• Using a deck of cards, create a 2-digit by 2-digit number. Find the product of the two factors by using an area model and then partial products. Record the new problem as a distributive property equation. • Khan Academy: Multiplying with the Distributive Property https://goo.gl/eRo89p

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