3–15 Name _____ Date _____

Challenge

Zero Patterns

Patterns with zeros can help you multiply tens and hundreds quickly and easily. Start with the product of two 1-digit numbers. Then compare the number of *additional* zeros on both sides of the equal sign. Look at the patterns below.

$3 \times 4 = 12$		$5 \times 6 = 30$	
$3 \times 4\mathbf{0} = 12\mathbf{0}$	• 1 zero	$5 \times 6\mathbf{0} = 30\mathbf{0}$	• 1 zero
$3 \times 4\mathbf{00} = 1{,}2\mathbf{00}$	• 2 zeros	$5 \times 6\mathbf{00} = 3{,}0\mathbf{00}$	• 2 zeros
$3\mathbf{0} \times 4\mathbf{0} = 1{,}2\mathbf{00}$	• 2 zeros	$5\mathbf{0} \times 6\mathbf{0} = 3{,}0\mathbf{00}$	• 2 zeros
$3\mathbf{0} \times 4\mathbf{00} = 12{,}\mathbf{000}$	• 3 zeros	$5\mathbf{0} \times 6\mathbf{00} = 30{,}\mathbf{000}$	• 3 zeros

You can also start with the product of a 1-digit number and a 2-digit number.

$4 \times 21 = 82$	
$4 \times 21\mathbf{0} = 82\mathbf{0}$	• 1 zero
$4\mathbf{0} \times 21\mathbf{0} = 8{,}2\mathbf{00}$	• 2 zeros

Multiply. When you can, use mental math.

1. $8 \times 600 =$ _____
2. $7 \times 500 =$ _____
3. $9 \times 800 =$ _____
4. $60 \times 400 =$ _____
5. $50 \times 300 =$ _____
6. $800 \times 5 =$ _____
7. $20 \times 700 =$ _____
8. $300 \times 30 =$ _____
9. $42 \times 500 =$ _____
10. $38 \times 900 =$ _____
11. $800 \times 45 =$ _____
12. $700 \times 62 =$ _____

13. **Extend It** When will there be more zeros in the product than there are in the multipliers?

_____

_____

_____

_____

3–15 Name _____ Date _____

Challenge

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$3 \times 4 = 12$		$5 \times 6 = 30$	
$3 \times 4\mathbf{0} = 12\mathbf{0}$	• 1 zero	$5 \times 6\mathbf{0} = 30\mathbf{0}$	• 1 zero
$3 \times 4\mathbf{00} = 1{,}2\mathbf{00}$	• 2 zeros	$5 \times 6\mathbf{00} = 3{,}0\mathbf{00}$	• 2 zeros
$3\mathbf{0} \times 4\mathbf{0} = 1{,}2\mathbf{00}$	• 2 zeros	$5\mathbf{0} \times 6\mathbf{0} = 3{,}0\mathbf{00}$	• 2 zeros
$3\mathbf{0} \times 4\mathbf{00} = 12{,}\mathbf{000}$	• 3 zeros	$5\mathbf{0} \times 6\mathbf{00} = 30{,}\mathbf{000}$	• 3 zeros

You can also start with the product of a 1-digit number and a 2-digit number.

$4 \times 21 = 82$	
$4 \times 21\mathbf{0} = 82\mathbf{0}$	• 1 zero
$4\mathbf{0} \times 21\mathbf{0} = 8{,}2\mathbf{00}$	• 2 zeros

Multiply. When you can, use mental math.

1. $8 \times 600 =$ 4,800
2. $7 \times 500 =$ 3,500
3. $9 \times 800 =$ 7,200
4. $60 \times 400 =$ 24,000
5. $50 \times 300 =$ 15,000
6. $800 \times 5 =$ 4,000
7. $20 \times 700 =$ 14,000
8. $300 \times 30 =$ 9,000
9. $42 \times 500 =$ 21,000
10. $38 \times 900 =$ 34,200
11. $800 \times 45 =$ 36,000
12. $700 \times 62 =$ 43,400

13. **Extend It** When will there be more zeros in the product than there are in the multipliers?

Sample answer: There will be one more zero in the product when the product of the non-zero digits has a zero in the ones place. Example: 800 × 5 = 40 with 2 more zeros because you are multiplying by hundreds.