

# NBT.5 Multi-Digit Multiplication

Goal: I will be able to multiply multi-digit whole numbers in 3 ways and identify errors in all 3 methods.

## Vocab

- ① factor: numbers being multiplied
- ② product: answer to multiplication problem
- ③ partial product: numbers add to get final product

# 4th Grade Review

Is 4,000 a reasonable estimate for the product of  $\underline{312} \times \underline{9}$ ? Why or why not?

No, 4,000 is not a reasonable estimate.

$$\underline{300} \times 9 = 2,700$$

$$\underline{300} \times \underline{10} = 3,000$$

real/actual answer between or near these 2 estimates

$$\begin{array}{r} \textcircled{+1} \textcircled{+1} \\ 312 \\ \times \quad 9 \\ \hline 2,808 \end{array}$$

## Steps to Success for Standard Algorithm

- Multiply the bottom ones digit by the top ones digit.  
--Write ones digit below and carry any tens digit to top of next place value.
- Multiply bottom ones digit by the top tens digit, and add any digit that was carried.  
--Write ones digit below and carry any tens digit to top of next place value.
- Multiply bottom ones digit by the top hundreds digit, and add any digit that was carried.  
--Write ones digit below and carry any tens digit to top of next place value.
- Repeat same process if there is a thousands digit in the top.
- Cross out what you carried, cross out what you multiplied by, and add a zero below the partial product in the ones place if more than one digit in the bottom number. *in ones bottom digit ones*
- Multiply the bottom tens digit by the top ones, tens, hundreds, and thousands digit.  
--Write ones digit below and carry any tens digit to top of next place value.
- Repeat cross out process and adding zeros to partial product if need to multiply by bottom hundreds digit. *step 5*
- Add the partial products making sure all are aligned by place value.

$$\begin{array}{r}
 \begin{array}{cccc}
 \textcircled{+1} & \textcircled{+1} & & \\
 \textcircled{\times} & \textcircled{\times} & & \\
 4 & 3 & 5 & 2 \\
 \hline
 2 & & & \\
 \hline
 \end{array} \\
 + \begin{array}{cccc}
 1 & 3 & 0 & 5 & 6 \\
 8 & 7 & 0 & 4 & 0 \\
 \hline
 100,096
 \end{array}
 \end{array}$$

# Practice Problems

	<del>(+)</del> <del>(+)</del> 7	<del>(+)</del> <del>(+)</del> 5	<del>(+)</del> <del>(+)</del> 6
(+)	1	5	2
+	2	6	0
2	4	1	2

	5	<del>(+)</del> <del>(+)</del> 1	<del>(+)</del> <del>(+)</del> 3	4
x	3	0	8	0
+	0	2	6	8
1	3	3	4	8