

Perform operations with multi-digit whole numbers and with decimals to hundredths (Standards 5.NBT.5–7).

**Standard 5.NBT.6** Find **whole-number** quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

**Key Elements:**

When using 2-digit divisors, Estimation becomes relevant and necessary. Even if students round appropriately, the resulting estimate may need to be adjusted.

**Division Models**

Below is a visual representation of the 3 methods 5th graders may use to solve division problems.

- Place Value Sections- This method is the most concrete of the 3 methods. It shows that we are finding an unknown factor when we divide. Decide how many zeros there will be in the multiplier for the first section. We know that 7 cannot go into three, but it can go into 35, so we will start dividing above the 5 in the hundreds place. We place 2 zeros as placeholders in the tens and ones place. 7 times 500 is 3500 so that is the first answer in the partial products. When you subtract that from 3,822, you get 322. Students then build a new section to the right using 322. The pattern then starts over again. All of the quotients above the sections add up to the total answer.

An airplane travels the same distance every day. It travels 3,822 miles in a week. How far does the airplane travel each day?

**Place Value Sections**

500  
7  $\begin{array}{r} 3,822 \\ -3,500 \\ \hline 322 \end{array}$  Build a new section with each leftover amount.

500 + 40  
7  $\begin{array}{r} 3,822 \quad 322 \\ -3,500 \quad -280 \\ \hline 322 \quad 42 \end{array}$

500 + 40 + 6 = 546  
7  $\begin{array}{r} 3,822 \quad 322 \quad 42 \\ -3,500 \quad -280 \quad -42 \\ \hline 322 \quad 42 \end{array}$

- Expanded Notation- This method is similar to the place value sections, but the quotients are placed above instead of boxed sections. This is a great method to use when connecting to the standard algorithm.

**Expanded Notation**

$\begin{array}{r} 500 \\ 7 \overline{) 3,822} \\ \underline{-3,500} \\ 322 \end{array}$ <p>← Show the zeros in the multipliers.</p>	$\begin{array}{r} 40 \\ 500 \\ 7 \overline{) 3,822} \\ \underline{-3,500} \\ 322 \\ \underline{-280} \\ 42 \end{array}$	$\begin{array}{r} 6 \\ 40 \\ 500 \\ 7 \overline{) 3,822} \\ \underline{-3,500} \\ 322 \\ \underline{-280} \\ 42 \\ \underline{-42} \end{array}$ <p style="text-align: right;">} 546</p>
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- **Digit by Digit**- The standard algorithm, Use this only after mastery of the previous methods.

An airplane travels the same distance every day. It travels 3,822 miles in a week. How far does the airplane travel each day?

**Place Value Sections**

$\begin{array}{r} 500 \\ 7 \overline{) 3,822} \\ \underline{-3,500} \\ 322 \end{array}$ <p>Build a new section with each leftover amount.</p>	$\begin{array}{r} 500 + 40 \\ 7 \overline{) 3,822 \quad 322} \\ \underline{-3,500 \quad -280} \\ 322 \quad 42 \end{array}$	$\begin{array}{r} 500 + 40 + 6 = 546 \\ 7 \overline{) 3,822 \quad 322 \quad 42} \\ \underline{-3,500 \quad -280 \quad -42} \\ 322 \quad 42 \end{array}$
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**Expanded Notation**

$\begin{array}{r} 500 \\ 7 \overline{) 3,822} \\ \underline{-3,500} \\ 322 \end{array}$ <p>← Show the zeros in the multipliers.</p>	$\begin{array}{r} 40 \\ 500 \\ 7 \overline{) 3,822} \\ \underline{-3,500} \\ 322 \\ \underline{-280} \\ 42 \end{array}$	$\begin{array}{r} 6 \\ 40 \\ 500 \\ 7 \overline{) 3,822} \\ \underline{-3,500} \\ 322 \\ \underline{-280} \\ 42 \\ \underline{-42} \end{array}$ <p style="text-align: right;">} 546</p>
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**Digit-by-Digit**

$\begin{array}{r} 5 \\ 7 \overline{) 3,822} \\ \underline{35} \\ 32 \end{array}$ <p>← Put in only one digit at a time.</p>	$\begin{array}{r} 54 \\ 7 \overline{) 3,822} \\ \underline{35} \\ 32 \\ \underline{28} \\ 42 \end{array}$	$\begin{array}{r} 546 \\ 7 \overline{) 3,822} \\ \underline{35} \\ 32 \\ \underline{28} \\ 42 \\ \underline{42} \end{array}$
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## Videos from Learn Zillion

[Division using an Array](#)

[Division using an Area Model](#)

## More Resources

[Division Practice Activity](#)