



Common Core Math Newsletter

5th Grade Unit 3: Place Value and Division

In this unit, students will use place value understanding, properties of operations, and the relationship with multiplication to divide whole numbers with up to 4 digit dividends. Students will illustrate and explain the calculations by using equations, arrays and area models. Students will also write and interpret numerical expressions involving all four operations.

Standards

5.OA.2

- Write numerical expressions
- Interpret numerical expressions without evaluating them [e.g. twice the sum of 4 and 6 is $2 \times (4 + 6)$ and recognize without calculating that $5 \times (321 + 456)$ is five times larger than $321 + 456$]

5.NBT.6

- Find whole number quotients with 4 digit dividends and 2 digit divisors
- Using strategies based on place value
- Using strategies based on properties of operations
- Using strategies based on the relationship of multiplications with division

Vocabulary

expressions mathematical phrase that can contain numbers, variables (such as a or b) and operators (such as \times , $,$, $+$, $-$, \div) [e.g. $3a \times (20 \div 4)$]

order of operations rule used to clarify which procedures should be performed first in a mathematical expression e.g.

1. complete operations in parentheses
2. complete exponent calculations
3. complete multiplication and division from left to right
4. Complete addition and subtraction from left to right

$$10^2 + 5 \times (6 - 2) \div 10 - 3 =$$

step 1: $6 - 2$ is 4

step 2: 10^2 is 100

$$100 + 5 \times 4 \div 10 - 3$$

step 3: 5×4 is 20 and $20 \div 10$ is 2

$$100 + 2 - 3$$

step 4: $100 + 2$ is 102 and $102 - 3$ is 99

the answer is 99

5th Grade Common Core Math

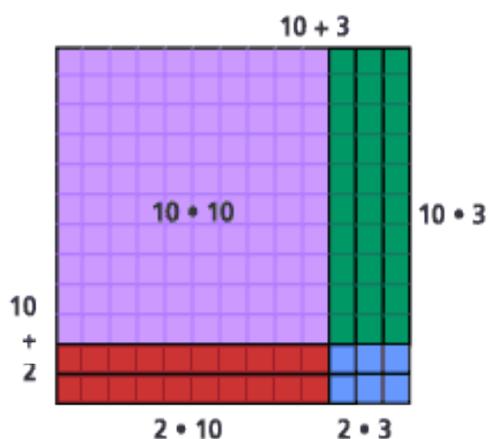
Unit 3: Place Value and Division

Vocabulary (cont'd.)

rectangular array an arrangement of objects into rows and columns
(example: 20 pencils arranged in 4 rows of 5 pencils each)



area models



$$\begin{array}{r}
 13 \\
 \cdot 12 \\
 \hline
 6 = 2 \cdot 3 \\
 20 = 2 \cdot 10 \\
 30 = 10 \cdot 3 \\
 \hline
 100 = 10 \cdot 10 \\
 156
 \end{array}$$

$$13 \times 12 = 156$$

product the answer to a multiplication problem

dividend the number in division that is being divided

divisor the number that divides another number, the *dividend*

quotient the answer to a division problem

remainder an amount left over when one number is divided by another number (example: $16 \div 3 = 5 \text{ R}1$, the remainder is 1)

$$\begin{array}{r}
 \text{quotient} \rightarrow 5 \\
 \text{divisor} \rightarrow 3 \overline{) 16} \\
 \text{dividend} \nearrow 15 \\
 \hline
 \text{remainder} \rightarrow 1
 \end{array}$$

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partial
products

Partial Products		Area Model
$\begin{array}{r} 324 \\ \times 6 \\ \hline 24 \\ 120 \\ \hline 1,800 \\ 1,944 \end{array}$	$300 + 20 + 4$ 6×4 6×20 6×300	$\begin{array}{r} \times \quad 300 \quad 20 \quad 4 \\ 6 \quad \boxed{1,800} \quad \boxed{120} \quad \boxed{24} \\ \hline 1,800 + 120 + 24 = 1,944 \end{array}$

partial
quotients

$\begin{array}{r} 815649 \\ -4000 \rightarrow 500 \times 8 \\ \hline 1649 \\ -1600 \rightarrow 200 \times 8 \\ \hline 49 \\ -40 \rightarrow 5 \times 8 \\ \hline 9 \\ -8 \rightarrow 1 \times 8 \\ \hline 1 \end{array}$	$1 \times 8 = 8$ $2 \times 8 = 16$ $5 \times 8 = 40$ $10 \times 8 = 80$ $20 \times 8 = 160$ $50 \times 8 = 400$ $100 \times 8 = 800$ $200 \times 8 = 1600$ $500 \times 8 = 4000$ $1000 \times 8 = 8000$
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Additional Resources

[IXL.com Topics:](#)

- Addition and Subtraction
- Multiplication
- Division
- Algebra

LearnZillion.com Videos:

- <https://learnzillion.com/lessons/3208-represent-a-real-world-situation-as-a-numerical-expression>
 - Quick Code LZ3208
- <https://learnzillion.com/lessons/552-use-an-area-model-for-division-of-4-digit-dividends-by-2-digit-divisors>
 - Quick Code LZ552
- <https://learnzillion.com/lessons/21>
 - Quick Code LZ21

Be sure to look to the left of the video to see other lessons on the standard.