

Number and Operations in Base Ten

Domain Overview

GRADE 3

In Grade 3 students use place value to extend previous work in addition and subtraction to 1,000. They use number line models to develop an understanding of rounding numbers. They build on multiplication facts and understanding to multiply one-digit numbers times multiples of 10.

GRADE 4

Fourth graders extend their work with place value to add and subtract multi-digit numbers using an efficient algorithm. They use strategies based on properties and place value to multiply and divide multi-digit numbers.

GRADE 5

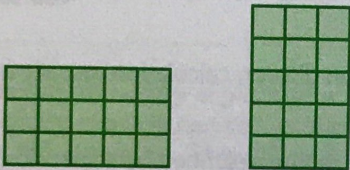
Fifth graders extend their work with place value to include decimal numbers to the thousandths place. They use efficient algorithms to multiply multi-digit whole numbers. They begin to divide whole numbers with two-digit divisors. They extend their understanding of whole number operations to adding, subtraction, multiplying, and dividing decimals to hundredths.

This domain is not taught in isolation from the Operations and Algebraic Thinking domain. Students work across domains to develop a deep understanding of addition and subtraction by focusing on the instructional shift of rigor, that is, developing conceptual understanding, building skill and fluency, and applying all four operations in problem contexts.

SUGGESTED MATERIALS FOR THIS DOMAIN

| 3 | 4 | 5 | |
|---|---|---|--|
| ✓ | ✓ | ✓ | Objects for counting, such as beans, linking cubes, two-color counter chips, coins |
| ✓ | ✓ | ✓ | Straws or coffee stirrers and small rubber bands |
| ✓ | ✓ | ✓ | Number lines |
| ✓ | ✓ | ✓ | Digit cards |
| ✓ | ✓ | ✓ | Base-ten blocks (Reproducible 4) |

KEY VOCABULARY

| 3 | 4 | 5 | |
|---|---|---|---|
| ✓ | ✓ | ✓ | algorithm a step-by-step procedure used to calculate an answer |
| ✓ | ✓ | ✓ | area model a concrete model for multiplication or division made up of a rectangle. The length and width represent the factors, and the area represents the product. |
| | | |  <div style="display: flex; justify-content: space-around; margin-top: 5px;"> 3×5 5×3 </div> |
| ✓ | ✓ | ✓ | benchmark a number or numbers that help to estimate a value. Sample benchmarks include 10, 100, 0, $\frac{1}{2}$, 1. |
| ✓ | ✓ | ✓ | compare to identify similarities or differences among numbers in order to determine which of two numbers is larger, smaller, or if they are equal in value |
| | ✓ | ✓ | compatible numbers numbers that are close in value to the actual numbers in an expression, which make it easy to do mental arithmetic Example: To divide $37 \div 7$ start by thinking of $36 \div 6$ or $35 \div 7$ |
| ✓ | ✓ | ✓ | decimal number a number based on 10 and powers of ten |
| ✓ | ✓ | ✓ | dividend in division, the number being divided, product |
| ✓ | ✓ | ✓ | divisor in division, the number that divides another number factor |
| ✓ | ✓ | ✓ | estimate to make an approximation or calculate using closer but easier numbers |
| ✓ | ✓ | ✓ | expanded form a way of writing numbers that shows place value, expanded notation $300 + 20 + 7 + 0.8 = 327.8$ $(3 \times 100) + (2 \times 10) + (7 \times 1) + (8 \times 0.1) = 327.8$ |

(Continued)

KEY VOCABULARY

3

4

5

✓

exponent the small number placed to the upper right of a number indicating how many times the base number is multiplied by itself

2^4 2 is the base number, 4 is the exponent

$2^4 = 2 \times 2 \times 2 \times 2 = 32$

✓

exponential notation a shortened way to represent a number using an exponent

✓

✓

✓

factor one of the numbers multiplied to find a product

✓

✓

factor pair a pair of numbers that when multiplied give a product; for example, 1, 15, and 3, 5 are factor pairs for 15

✓

✓

✓

fluency having efficient, flexible, and accurate ways to calculate

✓

hundredth one part when a whole is divided into 100 equal parts

✓

✓

✓

midpoint a point that divides a line segment into halves

✓

✓

multiple the result of multiplying a whole number by other whole numbers
multiples of 5 are 0, 5, 10, 15, 20, 25, 30 . . .

✓

✓

partial product a part of the product in multiplication calculation, usually based on place value and the distributive property

✓

✓

partial quotient a part of the quotient in division calculation, usually based on place value and the distributive property

✓

✓

✓

pattern a set of numbers or objects that can be described by a specific rule

✓

✓

✓

place value the value of a digit depending on its place in a number

✓

power exponent, the number of times a base number is multiplied by itself

✓

✓

✓

product the result when two numbers are multiplied

✓

✓

✓

quotient the result when two numbers are divided; the missing factor

✓

✓

✓

remainder the amount left over after dividing a number

✓

✓

✓

round to change a number to a less exact number that is more convenient for computation

✓

✓

✓

strategy a plan to find an answer or solve a problem that makes sense

✓

✓

tenth one part when one whole is divided into ten equal parts

✓

thousandth one part when one whole is divided into one thousand equal parts