Mathematics - Numbers & Operations in Base Ten Domain (K – 5)

Kindergarten: Numbers & Operations in Base Ten (NBT)

Work with numbers 11-19 to gain foundations for place value

- **K.NBT.1.** Compose and decompose numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (such as 18 = 10 + 8); understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.

NGA Center for Best Practices (NGA Center), Council of Chief State School Officers (CCSSO). (2012). *Mathematics: Kindergarten: Numbers & Operations in Base Ten.* Retrieved August 29, 2012, from Common Core State Standards Initiative: http://corestandards.org/

Grade 1: Numbers & Operations in Base Ten (NBT)

Extend the counting sequence

- **1.NBT.1.** Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.

Understand place value

- **1.NBT.2.** Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases:
  - 10 can be thought of as a bundle of ten ones — called a "ten."
  - The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones.
  - The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).
- **1.NBT.3.** Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >, =, and <.

Use place value understanding and properties of operations to add and subtract

- **1.NBT.4.** Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.
- **1.NBT.5.** Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.
- **1.NBT.6.** Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90 (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

NGA Center for Best Practices (NGA Center), Council of Chief State School Officers (CCSSO). (2012). *Mathematics: Grade 1: Numbers & Operations in Base Ten*. Retrieved August 29, 2012, from Common Core State Standards Initiative: http://corestandards.org/

Grade 2: Numbers & Operations in Base Ten (NBT)

Understand place value

- **2.NBT.1.** Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases:
  - 100 can be thought of as a bundle of ten tens — called a "hundred."
  - The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones).
- **2.NBT.2.** Count within 1000; skip-count by 5s, 10s, and 100s.
- **2.NBT.3.** Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.
- **2.NBT.4.** Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using >, =, and < symbols to record the results of comparisons.

Use place value understanding and properties of operations to add and subtract

- **2.NBT.5.** Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.
- **2.NBT.6.** Add up to four two-digit numbers using strategies based on place value and properties of operations.
- **2.NBT.7.** Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.
- **2.NBT.8.** Mentally add 10 or 100 to a given number 100–900, and mentally subtract 10 or 100 from a given number 100–900.
- **2.NBT.9.** Explain why addition and subtraction strategies work, using place value and the properties of operations.[1]

[1] Explanations may be supported by drawings or objects.

NGA Center for Best Practices (NGA Center), Council of Chief State School Officers (CCSSO). (2012). *Mathematics: Grade 2: Numbers & Operations in Base Ten*. Retrieved August 29, 2012, from Common Core State Standards Initiative: http://corestandards.org/

Grade 3: Numbers & Operations in Base Ten (NBT)

Use place value understanding and properties of operations to perform multi-digit arithmetic[2]

- **3.NBT.1.** Use place value understanding to round whole numbers to the nearest 10 or 100.
- **3.NBT.2.** Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.
- **3.NBT.3.** Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., 9 × 80, 5 × 60) using strategies based on place value and properties of operations.

[2] A range of algorithms may be used.

NGA Center for Best Practices (NGA Center), Council of Chief State School Officers (CCSSO). (2012). *Mathematics: Grade 3: Numbers & Operations in Base Ten*. Retrieved August 29, 2012, from Common Core State Standards Initiative: http://corestandards.org/

Grade 4: Numbers & Operations in Base Ten[3] (NBT)

Generalize place value understanding for multi-digit whole numbers

- **4.NBT.1.** Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. *For example, recognize that 700 ÷ 70 = 10 by applying concepts of place value and division.*
- **4.NBT.2.** Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.
- **4.NBT.3.** Use place value understanding to round multi-digit whole numbers to any place.

Use place value understanding and properties of operations to perform multi-digit arithmetic

- **4.NBT.4.** Fluently add and subtract multi-digit whole numbers using the standard algorithm.
- **4.NBT.5**. Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.
- **4.NBT.6.** Find whole-number quotients and remainders with up to four-digit dividends and one-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.

[3] Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000.

NGA Center for Best Practices (NGA Center), Council of Chief State School Officers (CCSSO). (2012). *Mathematics: Grade 4: Numbers & Operations in Base Ten*. Retrieved August 29, 2012, from Common Core State Standards Initiative: http://corestandards.org/

Grade 5: Numbers & Operations in Base Ten (NBT)

Understand the place value system

- **5.NBT.1.** Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.
- **5.NBT.2.** Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.
- **5.NBT.3.** Read, write, and compare decimals to thousandths.
    - Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., 347.392 = 3 × 100 + 4 × 10 + 7 × 1 + 3 × (1/10) + 9 × (1/100) + 2 × (1/1000).
    - Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.
- **5.NBT.4.** Use place value understanding to round decimals to any place.

Perform operations with multi-digit whole numbers and with decimals to hundredths

- **5.NBT.5.** Fluently multiply multi-digit whole numbers using the standard algorithm.
- **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.
- **5.NBT.7.** Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

NGA Center for Best Practices (NGA Center), Council of Chief State School Officers (CCSSO). (2012). *Mathematics: Grade 5: Numbers & Operations in Base Ten*. Retrieved August 29, 2012, from Common Core State Standards Initiative: http://corestandards.org/