SAU 50
Grade 4
Mathematics
Operations and Algebraic Thinking
Numbers and Operations in Base 10

Operations: use properties of operations to perform multi-digit arithmetic with whole numbers.

Algebraic Thinking: generate and analyze patterns.

SAU 50 District Competency:

Students will independently use their learning to solve "how much" and "how many" problems using a variety of mathematical strategies with precision and reasonableness.

Essential Questions

- What does base ten actually mean?
- Why is place value so important?
- How are the 4 different operations related and how can I use them?

Acquisition

Students will demonstrate the following to meet the standards.

- I can interpret a multiplication equation as a comparison, i.e., interpret $35 = 5 \times 7$ as a statement that 35 is 5 times as many as 7 and 7 times as many as 5.
- I can compare quantities by thinking "10 times as large" is necessary to compare the place value of the digits, e.g., 70 is 10 times as large as 7.
- I can solve word problems using the four operations with the use of drawings and equations with a symbol for unknown numbers.
- I can interpret remainders.
- I can assess the reasonableness of answers using mental computation and estimation strategies including rounding.
- I can find all factor pairs for a whole number in the range 1-100 and recognize that a whole number is a multiple of each of its factors.
- I can find the multiples of a given one-digit whole number in the range 1-100.
- I can determine whether a given whole number in the range 1-100 is prime or composite.
- I can generate and complete a number or shape pattern that follows a given rule.

- I can explain features of the pattern.
- I can move between place values by multiplying or dividing using powers of ten.
- I can read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. I can compare two multi-digit numbers using >, =, and < symbols to record the results of comparisons.
- I can use place value understanding to round multi-digit whole numbers to one million.
- I can use standard algorithms to fluently add and subtract multi-digit whole numbers.
- I can multiply multi-digit whole numbers--four by one, and two by two by using strategies based on place value and the properties of operations.
- I can illustrate and explain multiplication and division by using equations, rectangular arrays, and/or area models.
- I can 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.

Standards

NH College and Career Ready Standards

Key to Standard Notation:

4.OA.1: 4 *(grade level)* **OA** *(domain: Operations and Algebraic Thinking)* **NBT** *(domain: Numbers and Operations in Base 10)* **1** *(number of the standard)*

Operations and Algebraic Thinking
Use the four operations with whole numbers to solve problems.
4.OA.1: Interpret a multiplication equation as a comparison, e.g., interpret $35 = 5 \times 7$ as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.
4.OA.2: Multiply or divide to solve word problems involving multiplicative comparison, by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.
4.OA.3: posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

Gain familiarity with factors and multiples.
4.OA.4: Find all factor pairs for a whole number in the range 1-100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1-100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1-100 is prime or composite.

Generate and analyze patterns.
4.OA.5: Generate a number or shape pattern that follows a given rule. Identify apparent features

of the pattern that were not explicit in the rule itself.

Numbers and Operations in Base Ten
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.
4.NBT.2: Read and write multi-digit whole number 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.

New Hampshire College and Career Ready Standards

References:

National Governors Association Center for Best Practices, Council of Chief State School Officers. (2010). *Common Core Standards for Mathematics* (United States, National Governors Association Center for Best Practices, Council of Chief State School Officers). Retrieved August 10, 2016, from http://www.corestandards.org/assets/CCSSI_Math%20Standards.pdf