Mathematics
Unit 4: Number Sense

Essential Understandings	▪ There are various ways to represent a number.
Essential Questions	▪ How can area, length and set models be used to represent fractions, mixed numbers and decimals? ▪ How can area, length and set models be used to solve computation problems using fractions, mixed numbers and decimals? ▪ How does one add, subtract, multiply and divide fractions, mixed numbers and decimals? ▪ What properties can be used in mental math? ▪ What do the terms commutative, associative, and distributive mean in and outside of math? ▪ How do the commutative, associative, and distributive properties make computation more efficient? ▪ What is the Order of Operations? ▪ How does one divide and multiply with decimals to the thousandths place? ▪ How can picture and word models be represented using ratios in part-part and part-whole relationships? ▪ How does one determine the part-to-whole relationships in ratios written as fractions, decimals and percents? ▪ What is an integer? ▪ How does one model an integer using manipulatives or pictures? ▪ How are integers added and subtracted? ▪ How does one determine the appropriate operations(s) needed to solve a word problem? ▪ How are percents modeled with pictures and manipulatives? ▪ How does one write percents as decimals to the hundredths place and as fractions with hundredths in the denominator? ▪ How is estimation used to determine the reasonableness of the answer to a word problem?

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Essential Knowledge	▪ Area, length and set models are 3 different ways to visually represent fractions, mixed numbers and decimals. ▪ Operations with fractions, mixed numbers or decimals, can be modeled with area, length or set models. ▪ There are various strategies that can be used to multiply and divide decimals. ▪ The associative, commutative, and distributive properties are each used in computation and mental math. ▪ Order of Operations is the rule for evaluating expressions. ▪ Looking for key words and drawing pictures/models are the strategies used to determine the appropriate operations in a word problem. ▪ Compatible numbers are used to estimate answers. ▪ Fractions, decimals and percents contain part-to-whole ratio relationships. ▪ Integers are positive and negative whole numbers. ▪ Integers can be modeled using manipulatives and pictures. ▪ Integers can be added and subtracted using manipulatives, pictures and formal rules. ▪ Percents can be modeled using pictures and manipulatives. ▪ Percents can be written as decimals to the hundredths place and as fractions with hundredths in the denominator.
Vocabulary	▪ <u>Terms</u>: ○ numerical expression, evaluate, exponent, base, exponential notation, powers, perfect square, base ten, under and overestimate, compatible numbers, equivalent ratios, rate, unit rate, discount, tip, sales tax, repeating decimal, terminating decimal, reciprocal, proportion

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Essential Skills	▪ Identify prime numbers and composites between 1 and 100. (R, A) ▪ Use factor trees to write composite numbers as products of primes using exponents if needed. (I, R, A) ▪ Describe or illustrate the meaning of exponential notation as repeated multiplication. (I, R, A) ▪ Determine the value of the Least Common Multiple and Greatest Common Factor of two numbers up to 144. (R, A) ▪ Convert simple fractions with denominators of 2, 3, 4, 5, 10 to decimal form. (R, A) ▪ Order decimals/fractions with denominators of 2, 3, 4, 5, 10, 100 on a number line. (R, A) ▪ Represent fractions and decimals including mixed numbers with area, set and length models. (I, R) ▪ Represent operations with numbers expressed as fractions and as decimals including mixed numbers using area, length, and set models. (I, R) ▪ Add, subtract, multiply, and divide numbers expressed as fractions, mixed numbers, and decimals (with single digit divisor to the thousandths place). (I, R) ▪ Determine appropriate operations before solving one and two-step word problems. (I, R, A) ▪ Set up and accurately solve one-step problems using all operations on fractions and decimals (I, R) and involving addition and subtraction of integers. (I) ▪ Write ratios from picture and word models using part-to-part and part-to-whole relationships. (I, R) ▪ Explain the part-whole relationships of ratios written as fractions, decimals, and percents. (I, R) ▪ Express relative quantities as percentages and as decimals and fractions with common denominators (of 2, 3, 4, 5, 10) using models, explanations, and other representations. (I, R, A) ▪ Express whole numbers using exponents and find the values of powers. (I) ▪ Use the correct order of operations with whole numbers including exponents (I) and parentheses. (I, R, A) ▪ Apply associative, commutative, and distributive properties to mental math arithmetic. (I, R, A)

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Related Maine Learning Results	A. Number A1.Students use factors and multiples. a. Identify prime numbers and composite numbers and use their properties to solve problems. b. Use the property that every integer greater than 1 is a prime or can be written as a unique product of prime numbers. c. Interpret and use exponential notation as repeated multiplication. NECAP M(N&0)-6-3 d. Find the least common multiple and greatest common factor of two numbers. A2.Students express fractions greater than 0 as decimals and compare positive numbers that are written as fractions and decimals and place them on the number line. A4.Students understand how to express relative quantities as percentages and as decimals and fractions. a. Use ratios to describe relationships between quantities. a. Use decimals, fractions, and percentages to express relative quantities. a. Interpret relative quantities expressed as decimals, fractions, and percentages A5.Students multiply and divide decimals with up to three decimal a. places by tens, hundreds, and thousands.
NECAP	NECAP Number and Operations M (N & O) 6-2 M (N & O) 6-4 Accurately solves problems involving...addition or subtraction of integers. Applies the conventions of Order of Operations without parentheses.