Mathematics
Unit 1: Algebra Concepts

Essential Understandings	▪ Patterns are found in many forms. ▪ Writing and evaluating algebraic expressions and solving equations is the foundation for all algebra study.
Essential Questions	▪ What is a numerical expression? ▪ What is an algebraic expression? ▪ How does one evaluate numerical and algebraic expressions, including those with fractions and decimals? ▪ What is the difference between the terms evaluate and solve? ▪ How can numerical and algebraic expressions be used to represent given word problems (including geometry problems)? ▪ How does one solve an equation in the forms of $x \pm b = c$, ▪ $ax = c$, and $ax \pm b = c$? ▪ How does one recognize that an equation is in linear form ($y=kx$ or $y =mx + b$)? ▪ How does one tell from a table of values (without graphing) that the data is linear?
Essential Knowledge	▪ To evaluate a numerical expression means to follow the Order of Operations. ▪ A numerical expression only contains numbers and operations (3 + 6), while an algebraic expression also includes a variable(s) (5n). ▪ To evaluate an algebraic expression means to replace the variable(s) with given values and then follow the Order of Operations. ▪ An algebraic expression can be used to represent a word problem when a variable represents the unknown. ▪ To solve an algebraic equation involves following a logical, sequential process in order to isolate the variable. ▪ Linear equations are written as $y= kx$ or $y=mx + b$ form. ▪ In a table of values, if the ratios made between the x differences and the y differences are constant, those ordered pairs will form a line when graphed.
Vocabulary	▪ Terms: ○ solution, algebraic equation, inverse operations, isolate (the variable)

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Essential Skills	▪ Create and evaluate algebraic expressions using whole numbers. (I) ▪ Create and evaluate algebraic expressions using simple fractions and decimals (ruler fractions up to 10ths.) (I) ▪ Apply expression skills to word problems and geometry. (I, R) ▪ Evaluate linear algebraic expressions with one variable (I, R) and with more than one variable (I). ▪ Evaluate expressions within an equation by substituting values for the variable. (I, R) ▪ Solve equations of the form $ax \pm b = c$. (I) ▪ Recognize from a table or graph whether a relationship has a constant rate of change (I). ▪ Describe a variety of slopes in linear relationships (faster, slower, greater or smaller). (I) ▪ Use tables, formulas, diagrams, and graphs to analyze relationships between quantities. (I)
Related Maine Learning Results	D. Algebra Symbols and Expressions D1.Students create and evaluate simple expressions. a. Create and evaluate expressions using whole numbers. Create and evaluate expressions using positive fractions and decimals. Equations and Inequalities D2.Students recognize and solve problems involving linear equations and recognize examples and non-examples of linear equations. a. Solve equations of the form $ax \pm b = c$. b. Recognize from a table whether a relationship has a constant rate of change. Functions and Relations D3.Students use formulas, diagrams, and graphs to analyze relationships between quantities. a. Use tables, formulas, and graphs to analyze constant difference (additive) relationships. b. Use tables formulas, and graphs to analyze constant ratio (multiplicative) relationships.

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NECAP	NECAP Functions and Algebra M (F & A) 6-2 Demonstrate conceptual understanding of linear relationships (y = kx; y = mx + b)… M (F & A) 6-3 …evaluating an expression within an expression… …evaluating linear algebraic expressions (including those with more than one variable… …using letters to represent unknown quantities to write linear algebraic expressions…