# Mathematics
## Unit 1: Algebra Concepts

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| **Essential Understandings** | ▪ Patterns can be found in many forms. |
| **Essential Questions** | ▪ How do patterns change?<br>▪ What is a variable?<br>▪ How does one solve for unknowns?<br>▪ How can one check one's answers?<br>▪ What is the commutative property? |
| **Essential Knowledge** | ▪ Patterns change by a constant or varying amount.<br>▪ Lists, tables and diagrams can be used to solve problems.<br>▪ A variable is a symbol or letter used to represent or model quantity.<br>▪ Number patterns and relationships can be represented using variables.<br>▪ The inverse relationship between addition and subtraction can be used to solve and check problems.<br>▪ The inverse relationship between multiplication and division can be used to solve and check problems.<br>▪ The commutative property states that numbers can be added or multiplied in any order. |
| **Vocabulary** | ▪ <u>Terms</u>:<br>   o constant and varying amounts, algebraic expression, evaluate |
| **Essential Skills** | ▪ Recognize and explain patterns that change by a constant or varying amount.  (I, R)<br>▪ Use tables, rules, diagrams, and patterns to represent the relationship between quantities and to extend sequences.  (I, R)<br>▪ Identify and write the missing addend and/or subtrahend with sums to 1000.  (R, A)<br>▪ Identify and write the missing factor, dividend, or divisor.  (R)<br>▪ Use symbols or letters (variables) to represent or model quantity.  (R)<br>▪ Create and use organized lists, tables, or diagrams to solve problems.  (R, A)<br>▪ Use the inverse relationships between addition and subtraction and between multiplication and division to check and solve problems.  (R, A)<br>▪ Recognize and show how the commutative property only applies to addition and multiplication.  (I, R)<br>▪ Use algebraic expressions to complete an input/output table.  (I, R) |

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| **Related Maine Learning Results** | D. Algebra<br>  Symbols and Expressions<br>  D1.Students create and evaluate simple expressions in the context of numbers and operations.<br>    a. Create and evaluate expressions with no more than two variables.<br>    b. Create and evaluate expressions with no more than two variables<br>  Equations and Inequalities<br>  D2.Students find the unknown in simple equations in the context of numbers and operations such as:<br>  $3 \times b = 12$<br>  $3 + 4 = x + 5$<br>  $6 \times 5 = 3 \times [\ ]$<br>  Functions and Relations<br>  D3.Students use tables, rules, diagrams, and patterns to represent the relationship between quantities and to extend sequences. |
| **NECAP** | NECAP<br>  Functions and Algebra<br>  M (N & O) 4-3<br>    Demonstrates conceptual understanding of mathematical operations by describing or illustrating the relationship between repeated subtraction and division (no remainder); the inverse relationship between multiplication and division of whole numbers; or the addition or subtraction of positive fractional numbers with like denominators using models, number lines, or explanations. |