Mathematics
Unit 1: Algebra Concepts

Essential Understandings	▪ Patterns can be found in many forms.
Essential Questions	▪ What is a geometric pattern? ▪ How can a pattern be used to make a prediction? ▪ How does one solve for unknowns? ▪ How can one check one's answers? ▪ What is the commutative property?
Essential Knowledge	▪ A geometric pattern is a sequence in which the ratio between successive terms is the same (i.e., 1, 2, 4, 8, etc.). ▪ One can make generalizations from patterns. ▪ Patterns can be used to solve problems. ▪ Number patterns and relationships can be represented using variables. ▪ Lists, tables and diagrams can be used to solve problems ▪ Equivalent expressions can help with computation. ▪ The commutative property states that numbers can be added or multiplied in any order. ▪ The inverse relationship between addition and subtraction can be used to solve and check problems. ▪ The inverse relationship between multiplication and division can be used to solve and check problems.
Vocabulary	▪ <u>Terms</u>: ○ factor, geometric pattern, variable, diagram, missing factor
Essential Skills	▪ Create, describe, explain and extend number and geometric patterns. (I, R, A) ▪ Identify and write the missing addend or subtrahend with sums to 1000. (I, R) ▪ Identify and write the missing factor, dividend, or divisor. (I) ▪ Use symbols or letters (variables) to represent or model quantity. (I) ▪ Create and use organized lists, tables, or diagrams to solve problems. (I, R) ▪ Use equivalent expressions to aid computations (i.e., 43 + 56 is the same as 40 + 3 + 50 + 6. (I, R) ▪ Use the inverse relationships between addition and subtraction and between multiplication and division to solve and check problems. (I, R) ▪ Recognize and show how the commutative property applies to addition and multiplication. (I, R, A) ▪ Complete simple input/output tables. (I, R, A)

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Related Maine Learning Results	D. Algebra Symbols and Expressions D1.Students use equivalent expressions to aid computation such as knowing that 43 + 56 is the same as 40 + 3 + 50 + 6. Equations and Inequalities D2.Students find the unknown in simple equations (or open sentences) in the context of numbers and operations as described in Standard 2:1 Number for this grade level such as: 3 + 5 = [ ] + 3 3 + 9 = [ ] + 10 [ ] + ( ) = 10. Functions and Relations D3.Students understand arithmetic relationships between addition and subtraction and between multiplication and division and the commutative laws of multiplication and addition to solve problems. a. Use the inverse relationships between addition and subtraction and between multiplication and division and the commutative laws of multiplication and addition to solve problems. b. Be able to show that for whole numbers subtraction and division are not commutative and show that multiplication and addition are commutative. D4.Students create, describe, explain, and extend patterns with numbers and geometric objects.