Core Content for Assessment: Algebraic Thinking

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End of Primary	4th Grade	5th Grade	6th Grade	7th Grade	8th Grade	11th Grade
Patterns, Relations, and Functions						
MA-EP-5.1.1 Students will extend simple patterns (e.g., 2,4,6,8,…;◊Δ◊Δ…).	**MA-04-5.1.1** Students will extend patterns (e.g., 108, 208, 308, 408,…;■●●▲■●●▲…) from real world and/or mathematical situations; compare simple patterns (e.g., numbers, pictures, words; e.g., ▲■▲■▲■; ▲●●▲●●); and describe rules for simple number patterns (e.g., 1, 3, 5, 7, …; 5, 10, 15, 20, …; 30, 27, 24, 21, …).	**MA-05-5.1.1** Students will extend patterns or describe rules for patterns (e.g., numbers, pictures, tables, words) from real-world or mathematical situations.	**MA-06-5.1.1** Students will extend and describe rules for patterns from real-world and/or mathematical problems.	**MA-07-5.1.1** Students will extend and describe rules for patterns from real-world and/or mathematical problems.		**MA-H11-5.1.1** Students will identify and apply multiple representations (tables, graphs, equations) of functions (linear, quadratic, absolute value, exponential) to solve real-world or mathematical problems.
MA-EP-5.1.2 Students will describe functions (input-output) through pictures and words.	**MA-04-5.1.2** Students will describe functions (input-output) through pictures, tables, and words; and will analyze functions, from a table, based on real-world and/or mathematical situations.	**MA-05-5.1.2** Students will describe functions (input-output) through pictures, tables, or words, and will construct tables to analyze functions based on real-world or mathematical situations.	**MA-06-5.1.2** Students will create tables for functions and will apply the tables to solve real-world problems.	**MA-07-5.1.2** Students will represent, analyze, and generalize functions with tables, graphs, and words, and will apply the functions to solve real-world problems.	**MA-08-5.1.2** Students will represent, analyze, and generalize functions with tables, graphs, words, and algebraic expressions, and will apply the functions to solve real-world problems.	**MA-H11-5.1.2** Students will: • determine if a relation is a function; • Determine the domain and range of a function (linear and quadratic); • Determine the slope and intercepts of a linear function; • Determine the maximum, minimum, and intercepts of quadratic function; and • Evaluate a function written in function notation for a specified rational number.
				MA-07-5.1.3 Students will explain how the change in one quantity affects the change in another quantity (e.g., in tables or graphs).	**MA-08-5.1.3** Students will explain how the change in one variable affects the change in another variable (e.g., if rate remains constant, an increase in time results in an increase in distance).	**MA-H11-5.1.3** Students will identify the changes and explain how changes in parameters affect graphs of functions (linear, quadratic, absolute value, exponential) (e.g., compare $y=x^2$, $y=2x^2$, $y=(x-4)^2$, and $y=x^2+3$).
Variables, Expressions, and Operations						
		MA-05-5.2.1 Students will model verbal descriptions of real-world situations using a variable or a missing value.	**MA-06-5.2.1** Students will substitute values for variables (up to two different variables) and evaluate algebraic expressions.	**MA-07-5.2.1** Students will substitute values for variables (up to three different variables) and evaluate algebraic expressions.	**MA-08-5.2.1** Students will evaluate and simplify algebraic expressions applying the order of operations.	**MA-H11-5.2.1** Students will apply order of operations, real number properties (identity, inverse, commutative, associative, distributive, closure), and rules of exponents (integer) to simplify algebraic expressions.
						MA-H11-5.2.2 Students will: • add, subtract, and multiply polynomial expressions; • will factor polynomial expressions using the greatest common monomial factor; and • will factor quadratic polynomials of the form ax^2+bx+c, when a=1 and b and c are integers.
						MA-H11-5.2.3 Students will add, subtract, multiply, and divide simple rational expressions with monomial first-degree denominators and integer numerators (e.g., $\frac{3}{5x}+\frac{4}{3y}$; $\frac{9}{2a}-\frac{7}{4b}$; $\frac{3}{-5x}\times\frac{-4}{7y}$; $\frac{5}{2c}\div\frac{9}{-11d}$), and will express the results in simplified form.
Equations and Inequalities						
MA-EP-5.3.1 Students will represent real-world situations with simple number sentences (equations and inequalities) with a missing value (e.g., 2 +[ ] =7, [ ]< 6), and apply number sentences to solve real-world problems.	**MA-04-5.3.1** Students will represent real-world situations with simple number sentences (equations and inequalities) with a variable or a missing value (e.g., 4 = 7 – [ ], N + 5>14, ½ + N = 1), and apply number sentences to solve real world problems.	**MA-05-5.3.1** Students will model real-world situations with simple number sentences (equations and inequalities) with a variable or missing value (e.g., 4 = 2 x N, [ ] +5>14) and apply number sentences to solve real-world problems.	**MA-06-5.3.1** Students will model and solve real-world problems with simple equations and inequalities (e.g., 8x=4, x+2>5).	**MA-07-5.3.1** Students will model and solve real-world problems with one- or two-step equations or inequalities (e.g., 2x+1=9, 3x+3<9). (Statements and solutions use only non-negative numbers.)	**MA-08-5.3.1** Students will model and solve real-world problems with one- or two-step equations or inequalities (e.g., 4x+2=22, x-4<-60).	**MA-H11-5.3.1** Students will model or solve first degree, single variable equations and inequalities, including absolute value, in real-world situations, and will graph the solutions on a number line.
						MA-H11-5.3.2 Students will model or solve first degree, two-variable equations and inequalities in real-world problems, and will graph the solutions on a coordinate plane.
						MA-H11-5.3.3 Students will model and graph systems of linear equations (two equations in two variables) and apply the system to solve and interpret real-world problems. **MA-H11-5.3.4** Students will solve quadratic equations from real world or mathematical situations.