

ALGEBRA I-A MATH LEARNING PROGRESSIONS

How are these progressions organized?
By Strand - colors as designated below.

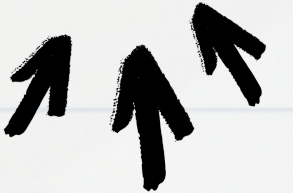
**Algebraic
Reasoning**

Functions

**Financial
Literacy**

**Data Analysis &
Probability**

[Click here for the B1G-M
\(B.E.S.T. Instructional Guide for Mathematics\)
document available on Turnkey.](#)



These categories are directly outlined in the following documents from the Florida Department of Education:

[Test Item Specifications](#)
[Test Design Summary and Blueprint](#)

(click links above to view these documents)

Algebraic Reasoning

MA.912.AR.1.1 Identify and interpret parts of an equation or expression that represent a quantity in terms of a mathematical or real-world context, including viewing one or more of its parts as a single entity.

MARZANO TAXONOMY LEVEL: Primary Taxonomy Level: Comprehension Level (Integrating)

LEARNING PROGRESSION:

ENRICHMENT: Identified Taxonomy Level: Analysis

- I CAN compare and contrast how different parts of equations or expressions represent quantities across various real-world contexts, and explain how viewing parts as single entities changes the interpretation of the mathematical relationship.

STANDARD DECONSTRUCTED: Identified Taxonomy Level: Comprehension

- I CAN identify and interpret parts of an equation or expression that represent a quantity in terms of a mathematical or real-world context, including viewing one or more of its parts as a single entity.

FOUNDATIONAL SKILLS: Identified Taxonomy Level: Retrieval

- I CAN recall the components of algebraic expressions (terms, coefficients, variables, constants, operations).
- I CAN recognize the parts of an equation (expressions on both sides, equal sign).
- I CAN identify terms, factors, and coefficients in expressions.
- I CAN recognize operations (addition, subtraction, multiplication, division, exponents) in expressions.
- I CAN recall vocabulary related to expressions (sum, difference, product, quotient).
- I CAN identify grouping symbols (parentheses, brackets, braces) that indicate a single entity.
- I CAN recognize variables and constants in context.
- I CAN recall that expressions can represent quantities in real-world situations.

Algebraic Reasoning

MA.912.AR.1.2 Rearrange equations or formulas to isolate a quantity of interest.

MARZANO TAXONOMY LEVEL: Primary Taxonomy Level: Retrieval Level (Executing)

LEARNING PROGRESSION:

ENRICHMENT: Identified Taxonomy Level: Comprehension

- I CAN explain why specific steps are necessary when rearranging equations or formulas to isolate a quantity of interest, and describe the relationship between the original and rearranged forms in terms of mathematical equivalence.

STANDARD DECONSTRUCTED: Identified Taxonomy Level: Retrieval

- I CAN rearrange equations or formulas to isolate a quantity of interest.

FOUNDATIONAL SKILLS: Identified Taxonomy Level: Retrieval

- I CAN recall the properties of equality (addition, subtraction, multiplication, division).
- I CAN recognize equations and formulas with multiple variables.
- I CAN identify the variable or quantity to be isolated.
- I CAN execute the procedure of applying inverse operations.
- I CAN execute the procedure of using the distributive property.
- I CAN execute the procedure of combining like terms.
- I CAN execute the procedure of moving terms from one side of an equation to the other.
- I CAN execute the procedure of solving multi-step equations for a variable.
- I CAN recognize when a variable has been successfully isolated.

Algebraic Reasoning

MA.912.AR.2.1 Given a real-world context, write and solve one-variable multi-step linear equations.

MARZANO TAXONOMY LEVEL: Primary Taxonomy Level: Knowledge Utilization Level (Problem Solving)

LEARNING PROGRESSION:

ENRICHMENT: Identified Taxonomy Level: Knowledge Utilization

- I CAN investigate multiple real-world scenarios to construct and defend arguments about which situations can be modeled with linear equations, and explain the limitations of linear models in various contexts.

STANDARD DECONSTRUCTED: Identified Taxonomy Level: Knowledge Utilization

- I CAN write and solve one-variable multi-step linear equations given a real-world context.

FOUNDATIONAL SKILLS: Identified Taxonomy Level: Retrieval

- I CAN recall the properties of equality (addition, subtraction, multiplication, division).
- I CAN recognize linear equations in one variable.
- I CAN identify the unknown quantity in a real-world problem.
- I CAN execute the procedure of translating verbal phrases into algebraic expressions.
- I CAN execute the procedure of solving multi-step equations.
- I CAN execute the procedure of applying the distributive property.
- I CAN execute the procedure of combining like terms.
- I CAN execute the procedure of moving variables to one side of an equation.
- I CAN interpret the solution in the context of the real-world problem.
- I CAN recognize key words that indicate operations (sum, difference, product, quotient, more than, less than).

Algebraic Reasoning

MA.912.AR.2.2 Write a linear two-variable equation to represent relationships between quantities from a graph, a written description or a table of values within a mathematical or real-world context.

MARZANO TAXONOMY LEVEL: Primary Taxonomy Level: Comprehension Level (Symbolizing)

LEARNING PROGRESSION:

ENRICHMENT: Identified Taxonomy Level: Analysis

- I CAN compare and contrast linear equations written from different representations (graphs, tables, written descriptions) to explain how the same relationship can be identified and expressed differently, and determine which representation provides the most efficient path to writing the equation.

STANDARD DECONSTRUCTED: Identified Taxonomy Level: Comprehension

- I CAN write a linear two-variable equation to represent relationships between quantities from a graph, a written description or a table of values within a mathematical or real-world context.

FOUNDATIONAL SKILLS: Identified Taxonomy Level: Retrieval

- I CAN recall the slope-intercept form of a linear equation ($y = mx + b$).
- I CAN recall the standard form of a linear equation ($Ax + By = C$).
- I CAN recognize linear relationships in graphs, tables, and written descriptions.
- I CAN execute the procedure of determining slope from a graph, table, or two points.
- I CAN identify the y-intercept from a graph or table.
- I CAN execute the procedure of calculating slope using the formula $m = (y_2 - y_1)/(x_2 - x_1)$.
- I CAN identify the independent and dependent variables in a context.
- I CAN recognize key vocabulary in written descriptions that indicates rate of change and initial value.
- I CAN execute the procedure of substituting values into slope-intercept form.

Algebraic Reasoning

MA.912.AR.2.3 Write a linear two-variable equation for a line that is parallel or perpendicular to a given line and goes through a given point.

MARZANO TAXONOMY LEVEL: Primary Taxonomy Level: Comprehension Level (Integrating)

LEARNING PROGRESSION:

ENRICHMENT: Identified Taxonomy Level: Analysis

- I CAN analyze multiple examples of parallel and perpendicular lines to form general conclusions about the algebraic and geometric relationships between their slopes, and create principles that explain why these relationships always hold true.

STANDARD DECONSTRUCTED: Identified Taxonomy Level: Comprehension

- I CAN write a linear two-variable equation for a line that is parallel or perpendicular to a given line and goes through a given point.

FOUNDATIONAL SKILLS: Identified Taxonomy Level: Retrieval

- I CAN recall the slope-intercept form of a linear equation ($y = mx + b$).
- I CAN recall the point-slope form of a linear equation ($y - y_1 = m(x - x_1)$).
- I CAN recall that parallel lines have the same slope.
- I CAN recall that perpendicular lines have slopes that are negative reciprocals.
- I CAN execute the procedure of identifying the slope from a given equation.
- I CAN execute the procedure of finding the negative reciprocal of a number.
- I CAN execute the procedure of substituting a point and slope into point-slope form.
- I CAN execute the procedure of converting between point-slope form and slope-intercept form.
- I CAN recognize ordered pairs and identify x and y coordinates.

Algebraic Reasoning

MA.912.AR.2.4 Given a table, equation or written description of a linear function, graph that function, and determine and interpret its key features.

MARZANO TAXONOMY LEVEL: Primary Taxonomy Level: Comprehension Level (Symbolizing); Secondary Taxonomy Level: Comprehension Level (Integrating)

LEARNING PROGRESSION:

ENRICHMENT: Identified Taxonomy Level: Analysis

- I CAN critique another student's graph of a linear function and their interpretation of key features, identify any errors in graphing or reasoning, and explain how the key features relate to the mathematical or real-world context.

STANDARD DECONSTRUCTED: Identified Taxonomy Level: Comprehension

- I CAN graph that function, and determine and interpret its key features given a table, equation or written description of a linear function.

FOUNDATIONAL SKILLS: Identified Taxonomy Level: Retrieval

- I CAN recall the key features of linear functions (slope, y-intercept, x-intercept, domain, range, rate of change).
- I CAN recognize linear functions in various forms (slope-intercept, standard form, point-slope form).
- I CAN execute the procedure of plotting points on a coordinate plane.
- I CAN execute the procedure of determining slope from an equation, table, or written description.
- I CAN identify the y-intercept from an equation, table, or graph.
- I CAN execute the procedure of finding the x-intercept by setting $y = 0$.
- I CAN execute the procedure of creating a table of values from an equation or description.
- I CAN recognize the independent and dependent variables in context.
- I CAN recall that domain and range for linear functions are typically all real numbers (unless restricted by context).

Algebraic Reasoning

MA.912.AR.2.5 Solve and graph mathematical and real-world problems that are modeled with linear functions. Interpret key features and determine constraints in terms of the context.

MARZANO TAXONOMY LEVEL: Primary Taxonomy Level: Knowledge Utilization Level (Problem Solving); Secondary Taxonomy Level: Comprehension Level (Integrating)

LEARNING PROGRESSION:

ENRICHMENT: Identified Taxonomy Level: Knowledge Utilization

- I CAN evaluate multiple linear function models for a given real-world situation, determine which model and constraints are most appropriate based on the context, and justify my strategic decisions using mathematical reasoning.

STANDARD DECONSTRUCTED: Identified Taxonomy Level: Knowledge Utilization and Comprehension

- I CAN solve and graph mathematical and real-world problems that are modeled with linear functions, interpret key features and determine constraints in terms of the context.

FOUNDATIONAL SKILLS: Identified Taxonomy Level: Retrieval

- I CAN recall the key features of linear functions (slope, intercepts, domain, range, rate of change).
- I CAN recognize linear functions in various forms and representations.
- I CAN execute the procedure of graphing linear functions from equations, tables, or descriptions.
- I CAN execute the procedure of writing linear equations from real-world contexts.
- I CAN identify constraints in real-world contexts (restrictions on domain and range).
- I CAN recognize when values must be non-negative, whole numbers, or within specific intervals.
- I CAN execute the procedure of solving linear equations.
- I CAN interpret slope and intercepts in the context of real-world problems.
- I CAN recognize the independent and dependent variables in context.

Algebraic Reasoning

MA.912.AR.2.6 Given a mathematical or real-world context, write and solve one-variable linear inequalities, including compound inequalities. Represent solutions algebraically or graphically.

MARZANO TAXONOMY LEVEL: Primary Taxonomy Level: Knowledge Utilization Level (Problem Solving); Secondary Taxonomy Level: Comprehension Level (Symbolizing)

LEARNING PROGRESSION:

ENRICHMENT: Identified Taxonomy Level: Knowledge Utilization

- I CAN investigate real-world scenarios involving constraints and limitations to construct arguments about when compound inequalities versus simple inequalities are necessary, and explain how the solution sets reflect the contextual requirements.

STANDARD DECONSTRUCTED: Identified Taxonomy Level: Knowledge Utilization and Comprehension

- I CAN write and solve one-variable linear inequalities, including compound inequalities, and represent solutions algebraically or graphically given a mathematical or real-world context.

FOUNDATIONAL SKILLS: Identified Taxonomy Level: Retrieval

- I CAN recall the inequality symbols ($<$, $>$, $\leq$, $\geq$) and their meanings.
- I CAN recognize linear inequalities and compound inequalities.
- I CAN recall the properties of inequality (addition, subtraction, multiplication, division).
- I CAN recall that multiplying or dividing by a negative number reverses the inequality symbol.
- I CAN execute the procedure of solving one-variable linear inequalities.
- I CAN execute the procedure of solving compound inequalities (and/or statements).
- I CAN execute the procedure of graphing solutions on a number line (open/closed circles, shading).
- I CAN execute the procedure of writing solutions in interval notation or set notation.
- I CAN identify key words in context that indicate inequalities (at least, at most, minimum, maximum, no more than, no less than).
- I CAN interpret inequality solutions in the context of real-world problems.

Algebraic Reasoning

MA.912.AR.2.7 Write two-variable linear inequalities to represent relationships between quantities from a graph or a written description within a mathematical or real-world context.

MARZANO TAXONOMY LEVEL: Primary Taxonomy Level: Comprehension Level (Symbolizing)

LEARNING PROGRESSION:

ENRICHMENT: Identified Taxonomy Level: Analysis

- I CAN compare and contrast two-variable linear inequalities written from different representations (graphs and written descriptions) to explain how the same constraint can be expressed differently, and determine which inequality symbols are appropriate based on boundary line characteristics and shading.

STANDARD DECONSTRUCTED: Identified Taxonomy Level: Comprehension

- I CAN write two-variable linear inequalities to represent relationships between quantities from a graph or a written description within a mathematical or real-world context.

FOUNDATIONAL SKILLS: Identified Taxonomy Level: Retrieval

- I CAN recall the inequality symbols ($<$, $>$, $\leq$, $\geq$) and their meanings.
- I CAN recognize linear inequalities in two variables.
- I CAN recall the forms of linear equations (slope-intercept form, standard form).
- I CAN identify the boundary line from a graph of an inequality.
- I CAN recognize when a boundary line is solid ($\leq$ or $\geq$) or dashed ($<$, $>$).
- I CAN identify which region is shaded to determine the inequality symbol.
- I CAN execute the procedure of determining the slope and y-intercept from a graph.
- I CAN recognize key words in written descriptions that indicate inequalities (at least, at most, no more than, no less than, maximum, minimum).
- I CAN identify the independent and dependent variables in context.

Algebraic Reasoning

MA.912.AR.2.8 Given a mathematical or real-world context, graph the solution set to a two-variable linear inequality.

MARZANO TAXONOMY LEVEL: Primary Taxonomy Level: Comprehension Level (Symbolizing)

LEARNING PROGRESSION:

ENRICHMENT: Identified Taxonomy Level: Analysis

- I CAN critique another student's graph of a two-variable linear inequality, identify errors in their boundary line, line type (solid or dashed), or shading, and explain how to correct the mistakes based on the inequality and context.

STANDARD DECONSTRUCTED: Identified Taxonomy Level: Comprehension

- I CAN graph the solution set to a two-variable linear inequality given a mathematical or real-world context.

FOUNDATIONAL SKILLS: Identified Taxonomy Level: Retrieval

- I CAN recall the inequality symbols ($<$, $>$, $\leq$, $\geq$) and their meanings.
- I CAN recognize two-variable linear inequalities.
- I CAN execute the procedure of graphing a linear equation (boundary line).
- I CAN recall that $\leq$ or $\geq$ inequalities have solid boundary lines.
- I CAN recall that $<$ or $>$ inequalities have dashed boundary lines.
- I CAN execute the procedure of determining which region to shade by testing a point.
- I CAN identify the slope and y-intercept from an inequality in slope-intercept form.
- I CAN execute the procedure of shading above the line ($y >$ or $y \geq$) or below the line ($y <$ or $y \leq$).
- I CAN recognize constraints in real-world contexts that may limit the solution set.
- I CAN interpret the meaning of the shaded region in context.

Algebraic Reasoning

MA.912.AR.4.1 Given a mathematical or real-world context, write and solve one-variable absolute value equations.

MARZANO TAXONOMY LEVEL: Primary Taxonomy Level: Knowledge Utilization Level (Problem Solving)

LEARNING PROGRESSION:

ENRICHMENT: Identified Taxonomy Level: Knowledge Utilization

- I CAN investigate why absolute value equations can have two solutions, one solution, or no solution, and construct an argument that explains the conditions under which each case occurs, using both algebraic and graphical reasoning.

STANDARD DECONSTRUCTED: Identified Taxonomy Level: Knowledge Utilization

- I CAN write and solve one-variable absolute value equations given a mathematical or real-world context.

FOUNDATIONAL SKILLS: Identified Taxonomy Level: Retrieval

- I CAN recall the definition of absolute value (distance from zero on a number line).
- I CAN recognize absolute value equations and their notation $|x|$.
- I CAN recall that $|x| = a$ means $x = a$ or $x = -a$ (when $a \geq 0$).
- I CAN execute the procedure of isolating the absolute value expression.
- I CAN execute the procedure of setting up two separate equations (positive and negative cases).
- I CAN execute the procedure of solving linear equations.
- I CAN recognize when an absolute value equation has no solution (when $|x| = \text{negative number}$).
- I CAN recognize when an absolute value equation has one solution (when $|x| = 0$).
- I CAN identify key information in real-world contexts that involve distance or deviation from a value.
- I CAN interpret solutions in the context of real-world problems.

Algebraic Reasoning

MA.912.AR.4.3 Given a table, equation or written description of an absolute value function, graph that function and determine its key features.

MARZANO TAXONOMY LEVEL: Primary Taxonomy Level: Comprehension Level (Symbolizing)

LEARNING PROGRESSION:

ENRICHMENT: Identified Taxonomy Level: Analysis

- I CAN compare and contrast absolute value functions with linear and quadratic functions to explain how transformations affect their key features differently, and determine which function type is most appropriate for modeling different real-world situations.

STANDARD DECONSTRUCTED: Identified Taxonomy Level: Comprehension

- I CAN graph that function and determine its key features given a table, equation or written description of an absolute value function.

FOUNDATIONAL SKILLS: Identified Taxonomy Level: Retrieval

- I CAN recall the key features of absolute value functions (vertex, axis of symmetry, x-intercepts/zeros, y-intercept, domain, range, maximum/minimum, slope of each piece).
- I CAN recognize absolute value functions in various forms ($f(x) = a|x - h| + k$).
- I CAN execute the procedure of plotting points on a coordinate plane.
- I CAN execute the procedure of identifying the vertex from an equation (h, k) or table.
- I CAN identify the axis of symmetry ($x = h$).
- I CAN execute the procedure of finding x-intercepts by setting $y = 0$.
- I CAN identify the y-intercept from an equation or table.
- I CAN execute the procedure of creating a table of values from an equation or description.
- I CAN recognize the V-shape characteristic of absolute value graphs.
- I CAN identify when the graph opens upward ($a > 0$) or downward ($a < 0$).
- I CAN recognize the domain (all real numbers) and range of absolute value functions.

Algebraic Reasoning

MA.912.AR.9.1 Given a mathematical or real-world context, write and solve a system of two-variable linear equations algebraically or graphically.

MARZANO TAXONOMY LEVEL: Primary Taxonomy Level: Knowledge Utilization Level (Problem Solving); Secondary Taxonomy Level: Comprehension Level (Symbolizing)

LEARNING PROGRESSION:

ENRICHMENT: Identified Taxonomy Level: Knowledge Utilization Level (Decision Making)

- I CAN evaluate multiple methods for solving systems of linear equations (graphing, substitution, elimination), determine which method is most efficient for a given system and context, and justify my strategic choice with mathematical reasoning.

STANDARD DECONSTRUCTED: Identified Taxonomy Level: Knowledge Utilization (Problem Solving) with Comprehension (Symbolizing)

- I CAN write and solve a system of two-variable linear equations algebraically or graphically given a mathematical or real-world context.

FOUNDATIONAL SKILLS: Identified Taxonomy Level: Retrieval

- I CAN recall what a system of linear equations is.
- I CAN recognize linear equations in two variables.
- I CAN execute the procedure of translating real-world contexts into linear equations.
- I CAN execute the procedure of solving systems by graphing.
- I CAN execute the procedure of solving systems using substitution.
- I CAN execute the procedure of solving systems using elimination (addition/subtraction method).
- I CAN execute the procedure of graphing linear equations on the same coordinate plane.
- I CAN identify the point of intersection as the solution to a system.
- I CAN recognize when a system has one solution, no solution, or infinitely many solutions.
- I CAN interpret solutions in the context of real-world problems.
- I CAN identify the independent and dependent variables in context.

Algebraic Reasoning

MA.912.AR.9.4 Graph the solution set of a system of two-variable linear inequalities.

MARZANO TAXONOMY LEVEL: Primary Taxonomy Level: Comprehension Level (Symbolizing)

LEARNING PROGRESSION:

ENRICHMENT: Identified Taxonomy Level: Analysis

- I CAN critique another student's graph of a system of two-variable linear inequalities, identify errors in their boundary lines, line types (solid or dashed), or shading, and explain how to determine the correct solution region where all inequalities are satisfied simultaneously.

STANDARD DECONSTRUCTED: Identified Taxonomy Level: Comprehension

- I CAN graph the solution set of a system of two-variable linear inequalities.

FOUNDATIONAL SKILLS: Identified Taxonomy Level: Retrieval

- I CAN recall what a system of linear inequalities is.
- I CAN recognize two-variable linear inequalities.
- I CAN execute the procedure of graphing a single two-variable linear inequality.
- I CAN recall that $\leq$ or $\geq$ inequalities have solid boundary lines.
- I CAN recall that $<$ or $>$ inequalities have dashed boundary lines.
- I CAN execute the procedure of determining which region to shade for each inequality.
- I CAN execute the procedure of graphing multiple linear equations on the same coordinate plane.
- I CAN identify the solution region where the shaded areas overlap (intersection).
- I CAN execute the procedure of testing points to verify the solution region.
- I CAN recognize when a system has no solution (no overlapping region).

Algebraic Reasoning

MA.912.AR.9.6 Given a real-world context, represent constraints as systems of linear equations or inequalities. Interpret solutions to problems as viable or non-viable options.

MARZANO TAXONOMY LEVEL: Primary Taxonomy Level: Knowledge Utilization Level (Problem Solving); Secondary Taxonomy Level: Comprehension Level (Integrating)

LEARNING PROGRESSION:

ENRICHMENT: Identified Taxonomy Level: Knowledge Utilization Level (Decision Making)

- I CAN evaluate multiple constraint scenarios in real-world contexts to determine optimal solutions within the feasible region, assess trade-offs between competing constraints, and justify strategic decisions using mathematical and contextual reasoning.

STANDARD DECONSTRUCTED: Identified Taxonomy Level: Knowledge Utilization (Problem Solving) with Comprehension (Integrating)

- I CAN represent constraints as systems of linear equations or inequalities and interpret solutions to problems as viable or non-viable options given a real-world context.

FOUNDATIONAL SKILLS: Identified Taxonomy Level: Retrieval

- I CAN recall what constraints are in mathematical contexts (limitations, restrictions, requirements).
- I CAN recognize when to use equations versus inequalities to represent constraints.
- I CAN execute the procedure of translating real-world constraints into linear equations or inequalities.
- I CAN execute the procedure of writing systems of linear equations or inequalities.
- I CAN execute the procedure of solving systems algebraically or graphically.
- I CAN identify the solution set or feasible region of a system.
- I CAN recognize contextual restrictions (non-negative values, whole numbers, maximum/minimum limits).
- I CAN interpret whether a solution makes sense in the context of the problem.
- I CAN identify viable solutions (solutions that satisfy all constraints and context requirements).
- I CAN identify non-viable solutions (solutions that may be mathematically correct but contextually impossible).

Functions

MA.912.F.1.1 Given an equation or graph that defines a function, classify the function type. Given an input-output table, determine a function type that could represent it.

MARZANO TAXONOMY LEVEL: Primary Taxonomy Level: Analysis Level (Matching)

LEARNING PROGRESSION:

ENRICHMENT: Identified Taxonomy Level: Analysis

- I CAN analyze multiple functions across various representations to form general conclusions about the unique characteristics that distinguish each function type (linear, quadratic, exponential, absolute value), and create principles for identifying function types in any representation.

STANDARD DECONSTRUCTED: Identified Taxonomy Level: Analysis

- I CAN classify the function type given an equation or graph that defines a function, and determine a function type that could represent it given an input-output table.

FOUNDATIONAL SKILLS: Identified Taxonomy Level: Retrieval

- I CAN recall the characteristics of linear functions (constant rate of change, straight line, form $y = mx + b$).
- I CAN recall the characteristics of quadratic functions (parabola, form $y = ax^2 + bx + c$, constant second differences).
- I CAN recall the characteristics of exponential functions (constant ratio, curved graph, form $y = a \cdot b^x$).
- I CAN recall the characteristics of absolute value functions (V-shape, form $y = a|x - h| + k$).
- I CAN recognize the shapes of different function types on graphs.
- I CAN execute the procedure of calculating first differences in tables.
- I CAN execute the procedure of calculating second differences in tables.
- I CAN execute the procedure of calculating ratios between consecutive outputs in tables.
- I CAN identify the degree of polynomials in equations.
- I CAN recognize special notation and operations in equations (absolute value bars, exponents on variables).

Functions

MA.912.F.1.2 Given a function represented in function notation, evaluate the function for an MA.912.F.1.2 input in its domain. For a real-world context, interpret the output.

MARZANO TAXONOMY LEVEL: Primary Taxonomy Level: Retrieval Level (Executing); Secondary Taxonomy Level: Comprehension Level (Integrating)

LEARNING PROGRESSION:

ENRICHMENT: Identified Taxonomy Level: Comprehension

- I CAN explain the relationship between the input and output of a function in real-world contexts, and describe how function notation represents the dependency between variables and what the evaluated output reveals about the situation.

STANDARD DECONSTRUCTED: Identified Taxonomy Level: Retrieval and Comprehension

- I CAN evaluate the function for an input in its domain and interpret the output for a real-world context given a function represented in function notation.

FOUNDATIONAL SKILLS: Identified Taxonomy Level: Retrieval

- I CAN recall what function notation means ($f(x)$ represents the output when x is the input).
- I CAN recognize function notation and identify the function name, input variable, and expression.
- I CAN identify the input value to be substituted into the function.
- I CAN execute the procedure of substituting a value for the variable in a function.
- I CAN execute the procedure of evaluating expressions using order of operations.
- I CAN execute the procedure of simplifying expressions with various operations (exponents, absolute value, radicals).
- I CAN recognize the domain of a function (valid input values).
- I CAN identify the independent variable (input) and dependent variable (output) in context.
- I CAN interpret the meaning of input and output values in real-world situations.

Functions

MA.912.F.1.3 Calculate and interpret the average rate of change of a real-world situation represented graphically, algebraically or in a table over a specified interval.

MARZANO TAXONOMY LEVEL: Primary Taxonomy Level: Comprehension Level (Integrating); Secondary Taxonomy Level: Retrieval Level (Executing)

LEARNING PROGRESSION:

ENRICHMENT: Identified Taxonomy Level: Analysis

- I CAN compare and contrast the average rates of change over different intervals of the same function or across different functions to explain what the rates reveal about the behavior of the function, and determine which intervals show the greatest or least change in real-world contexts.

STANDARD DECONSTRUCTED: Identified Taxonomy Level: Comprehension and Retrieval

- I CAN calculate and interpret the average rate of change of a real-world situation represented graphically, algebraically or in a table over a specified interval.

FOUNDATIONAL SKILLS: Identified Taxonomy Level: Retrieval

- I CAN recall the formula for average rate of change: $(f(b) - f(a))/(b - a)$ or $(y_2 - y_1)/(x_2 - x_1)$.
- I CAN recognize that average rate of change represents slope over an interval.
- I CAN identify the endpoints of a specified interval.
- I CAN execute the procedure of finding function values at given inputs from a graph, table, or equation.
- I CAN execute the procedure of substituting values into an equation to evaluate the function.
- I CAN execute the procedure of subtracting to find change in output and change in input.
- I CAN execute the procedure of dividing to calculate the rate.
- I CAN recognize ordered pairs and identify coordinates from graphs or tables.
- I CAN interpret the meaning of rate of change in real-world contexts (speed, cost per item, growth rate).
- I CAN identify units of measurement for rate of change in context.

Functions

MA.912.F.1.5 Compare key features of linear functions each represented algebraically, graphically, in tables or written descriptions.

MARZANO TAXONOMY LEVEL: Primary Taxonomy Level: Analysis Level (Matching)

LEARNING PROGRESSION:

ENRICHMENT: Identified Taxonomy Level: Analysis

- I CAN analyze multiple linear functions represented in various forms to form general conclusions about how key features relate across representations, and create principles that explain when certain representations make specific features more or less apparent.

STANDARD DECONSTRUCTED: Identified Taxonomy Level: Analysis

- I CAN compare key features of linear functions each represented algebraically, graphically, in tables or written descriptions.

FOUNDATIONAL SKILLS: Identified Taxonomy Level: Retrieval

- I CAN recall the key features of linear functions (slope, y-intercept, x-intercept, domain, range, rate of change, increasing/decreasing).
- I CAN recognize linear functions in various representations (equations, graphs, tables, written descriptions).
- I CAN execute the procedure of determining slope from an equation, graph, table, or description.
- I CAN identify the y-intercept from an equation, graph, table, or description.
- I CAN execute the procedure of finding x-intercepts from equations, graphs, or tables.
- I CAN identify the domain and range of linear functions.
- I CAN recognize whether a linear function is increasing (positive slope) or decreasing (negative slope).
- I CAN execute the procedure of converting between different representations of linear functions.
- I CAN recognize when two linear functions have the same or different key features.

Functions

MA.912.F.1.8 Determine whether a linear, quadratic or exponential function best models a given real-world situation.

MARZANO TAXONOMY LEVEL: Primary Taxonomy Level: Knowledge Utilization Level (Decision Making)

LEARNING PROGRESSION:

ENRICHMENT: Identified Taxonomy Level: Knowledge Utilization

- I CAN investigate multiple real-world situations to construct arguments about why certain function types are better models than others, and develop criteria for evaluating the goodness of fit between function types and contextual characteristics.

STANDARD DECONSTRUCTED: Identified Taxonomy Level: Knowledge Utilization

- I CAN determine whether a linear, quadratic or exponential function best models a given real-world situation.

FOUNDATIONAL SKILLS: Identified Taxonomy Level: Retrieval

- I CAN recall the characteristics of linear functions (constant rate of change, additive growth).
- I CAN recall the characteristics of quadratic functions (parabolic shape, maximum/minimum values, symmetric growth/decay).
- I CAN recall the characteristics of exponential functions (constant ratio, multiplicative growth/decay, rapid increase/decrease).
- I CAN recognize real-world contexts that involve constant rates (linear: steady speed, hourly wages, constant change).
- I CAN recognize real-world contexts that involve projectile motion or optimization (quadratic: area problems, height of thrown objects).
- I CAN recognize real-world contexts that involve repeated multiplication (exponential: population growth, compound interest, radioactive decay).
- I CAN identify patterns in data that suggest function types (constant differences, constant second differences, constant ratios).
- I CAN recognize key vocabulary that indicates function types (per, each, doubles, triples, maximum, minimum, peak).

Functions

MA.912.F.2.1 Identify the effect on the graph or table of a given function after replacing $f(x)$ by $f(x) + k$, $kf(x)$, $f(kx)$ and $f(x + k)$ for specific values of k .

MARZANO TAXONOMY LEVEL: Primary Taxonomy Level: Analysis Level (Matching)

LEARNING PROGRESSION:

ENRICHMENT: Identified Taxonomy Level: Analysis

- I CAN analyze multiple examples of function transformations to form general principles about how each type of transformation (vertical/horizontal shifts, vertical/horizontal stretches and compressions) affects the graph and table values, and predict the effects of combined transformations.

STANDARD DECONSTRUCTED: Identified Taxonomy Level: Analysis

- I CAN identify the effect on the graph or table of a given function after replacing $f(x)$ by $f(x) + k$, $kf(x)$, $f(kx)$ and $f(x + k)$ for specific values of k .

FOUNDATIONAL SKILLS: Identified Taxonomy Level: Retrieval

- I CAN recall that $f(x) + k$ represents a vertical shift (up if $k > 0$, down if $k < 0$).
- I CAN recall that $kf(x)$ represents a vertical stretch (if $|k| > 1$) or compression (if $0 < |k| < 1$), and reflection over x-axis (if $k < 0$).
- I CAN recall that $f(kx)$ represents a horizontal compression (if $|k| > 1$) or stretch (if $0 < |k| < 1$), and reflection over y-axis (if $k < 0$).
- I CAN recall that $f(x + k)$ represents a horizontal shift (left if $k > 0$, right if $k < 0$).
- I CAN recognize parent functions and their basic shapes.
- I CAN identify key features of functions (vertex, intercepts, asymptotes) before and after transformations.
- I CAN execute the procedure of evaluating transformed functions for specific input values.
- I CAN recognize how coordinates change under different transformations.

Financial Literacy

MA.912.FL.3.2 Solve real-world problems involving simple, compound and continuously compounded interest.

MARZANO TAXONOMY LEVEL: Primary Taxonomy Level: Knowledge Utilization Level (Problem Solving)

LEARNING PROGRESSION:

ENRICHMENT: Identified Taxonomy Level: Knowledge Utilization

- I CAN evaluate different investment or loan scenarios involving simple, compound, and continuously compounded interest to determine which option yields the best financial outcome, and justify my strategic choice using mathematical calculations and contextual reasoning.

STANDARD DECONSTRUCTED: Identified Taxonomy Level: Knowledge Utilization

- I CAN solve real-world problems involving simple, compound and continuously compounded interest.

FOUNDATIONAL SKILLS: Identified Taxonomy Level: Retrieval

- I CAN recall the simple interest formula: $I = Prt$ or $A = P(1 + rt)$.
- I CAN recall the compound interest formula: $A = P(1 + r/n)^{nt}$.
- I CAN recall the continuously compounded interest formula: $A = Pe^{rt}$.
- I CAN identify the variables in interest formulas (P = principal, r = rate, t = time, n = compounding periods, A = amount, I = interest earned).
- I CAN execute the procedure of converting percentages to decimals.
- I CAN execute the procedure of substituting values into formulas.
- I CAN execute the procedure of evaluating expressions with exponents.
- I CAN execute the procedure of solving equations for unknown variables.
- I CAN recognize different compounding periods (annually, semi-annually, quarterly, monthly, daily).
- I CAN interpret solutions in the context of financial problems.

Financial Literacy

MA.912.FL.3.4 Explain the relationship between simple interest and linear growth. Explain the relationship between compound interest and exponential growth and the relationship between continuously compounded interest and exponential growth.

MARZANO TAXONOMY LEVEL: Primary Taxonomy Level: Comprehension Level (Integrating)

LEARNING PROGRESSION:

ENRICHMENT: Identified Taxonomy Level: Analysis

- I CAN compare and contrast simple interest, compound interest, and continuously compounded interest by analyzing their growth patterns over time using graphs, tables, and equations, and explain why exponential growth eventually surpasses linear growth regardless of initial rates.

STANDARD DECONSTRUCTED: Identified Taxonomy Level: Comprehension

- I CAN explain the relationship between simple interest and linear growth, explain the relationship between compound interest and exponential growth, and explain the relationship between continuously compounded interest and exponential growth.

FOUNDATIONAL SKILLS: Identified Taxonomy Level: Retrieval

- I CAN recall the simple interest formula: $A = P(1 + rt)$ or $A = P + Prt$.
- I CAN recall the compound interest formula: $A = P(1 + r/n)^{nt}$.
- I CAN recall the continuously compounded interest formula: $A = Pe^{rt}$.
- I CAN recall the characteristics of linear functions (constant rate of change, additive growth).
- I CAN recall the characteristics of exponential functions (constant ratio, multiplicative growth).
- I CAN recognize that simple interest adds the same amount each period.
- I CAN recognize that compound interest multiplies by the same factor each period.
- I CAN identify the form of linear functions ($y = mx + b$).
- I CAN identify the form of exponential functions ($y = a \cdot b^x$).
- I CAN recognize patterns in tables showing linear versus exponential growth.

Data Analysis and Probability

MA.912.DP.1.3 Explain the difference between correlation and causation in the contexts of both numerical and categorical data.

MARZANO TAXONOMY LEVEL: Primary Taxonomy Level: Comprehension Level (Integrating)

LEARNING PROGRESSION:

ENRICHMENT: Identified Taxonomy Level: Analysis

- I CAN analyze multiple real-world scenarios involving relationships between variables to distinguish between correlation and causation, identify confounding variables or lurking factors, and explain why correlation does not imply causation using evidence from both numerical and categorical data contexts.

STANDARD DECONSTRUCTED: Identified Taxonomy Level: Comprehension

- I CAN explain the difference between correlation and causation in the contexts of both numerical and categorical data.

FOUNDATIONAL SKILLS: Identified Taxonomy Level: Retrieval

- I CAN recall the definition of correlation (a relationship or association between two variables).
- I CAN recall the definition of causation (one variable directly causes a change in another variable).
- I CAN recognize that correlation does not imply causation.
- I CAN recall the definition of numerical data (quantitative, measurable).
- I CAN recall the definition of categorical data (qualitative, grouped by categories).
- I CAN identify examples of correlation in numerical data (scatter plots showing relationships).
- I CAN identify examples of correlation in categorical data (two-way tables showing associations).
- I CAN recognize confounding variables (third variables that affect both variables in question).
- I CAN identify examples where correlation exists without causation.
- I CAN recognize key vocabulary (association, relationship, cause-and-effect, lurking variable).

Data Analysis and Probability

MA.912.DP.2.4 Fit a linear function to bivariate numerical data that suggests a linear association and interpret the slope and y -intercept of the model. Use the model to solve real-world problems in terms of the context of the data.

MARZANO TAXONOMY LEVEL: Primary Taxonomy Level: Knowledge Utilization Level (Problem Solving); Secondary Taxonomy Level: Comprehension Level (Integrating)

LEARNING PROGRESSION:

ENRICHMENT: Identified Taxonomy Level: Knowledge Utilization Level (Decision Making)

- I CAN evaluate the appropriateness and accuracy of a linear model for a given data set by analyzing residuals and correlation strength, determine whether predictions made from the model are reliable within and beyond the data range, and justify the validity of using the model for real-world decision-making.

STANDARD DECONSTRUCTED: Identified Taxonomy Level: Knowledge Utilization (Problem Solving) with Comprehension (Integrating)

- I CAN fit a linear function to bivariate numerical data that suggests a linear association and interpret the slope and y -intercept of the model, and use the model to solve real-world problems in terms of the context of the data.

FOUNDATIONAL SKILLS: Identified Taxonomy Level: Retrieval

- I CAN recall the slope-intercept form of a linear equation ($y = mx + b$).
- I CAN recognize bivariate numerical data and linear associations in scatter plots.
- I CAN execute the procedure of fitting a line of best fit to data (informally or using technology).
- I CAN execute the procedure of determining the slope and y -intercept from a linear model.
- I CAN recall that slope represents the rate of change in context.
- I CAN recall that y -intercept represents the starting value or initial amount in context.
- I CAN execute the procedure of substituting values into a linear equation to make predictions.
- I CAN interpret the meaning of slope and y -intercept in real-world contexts.
- I CAN recognize the difference between interpolation (within data range) and extrapolation (beyond data range).
- I CAN identify the independent and dependent variables in context.

Data Analysis and Probability

MA.912.DP.2.6 Given a scatter plot with a line of fit and residuals, determine the strength and direction of the correlation. Interpret strength and direction within a real-world context.

MARZANO TAXONOMY LEVEL: Primary Taxonomy Level: Comprehension Level (Integrating)

LEARNING PROGRESSION:

ENRICHMENT: Identified Taxonomy Level: Analysis Level (Matching)

- I CAN compare and contrast multiple scatter plots with different correlation strengths and directions to explain how residual patterns, data clustering, and line fit relate to correlation strength, and determine which relationships are strong enough to make reliable predictions in real-world contexts.

STANDARD DECONSTRUCTED: Identified Taxonomy Level: Comprehension (Integrating)

- I CAN determine the strength and direction of the correlation and interpret strength and direction within a real-world context given a scatter plot with a line of fit and residuals.

FOUNDATIONAL SKILLS: Identified Taxonomy Level: Retrieval

- I CAN recall the definition of correlation (a relationship between two variables).
- I CAN recall the types of correlation direction (positive, negative, no correlation).
- I CAN recall the types of correlation strength (strong, moderate, weak).
- I CAN recognize positive correlation (as x increases, y increases).
- I CAN recognize negative correlation (as x increases, y decreases).
- I CAN recognize no correlation (no clear pattern).
- I CAN identify strong correlation (data points close to the line of fit, small residuals).
- I CAN identify weak correlation (data points far from the line of fit, large residuals).
- I CAN recognize that residuals help assess how well the line fits the data.
- I CAN interpret correlation strength and direction in real-world contexts.
- I CAN recall that correlation does not imply causation.