

FLORIDA STANDARDS TO BOOK CORRELATION

After a standard is introduced, it is revisited many times in subsequent activities, lessons, and exercises.

Florida Standards (MAFS.912)

Conceptual Category: Number and Quantity

Domain: The Real Number System

- N-RN.1.1** Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents.
- **Section 6.3** Radicals and Rational Exponents
- N-RN.1.2** Rewrite expressions involving radicals and rational exponents using the properties of exponents.
- **Section 6.2** Properties of Exponents
 - **Section 6.3** Radicals and Rational Exponents
 - **Section 10.2** Solving Square Root Equations
 - **Section 10.3** The Pythagorean Theorem
 - **Section 10.4** Using the Pythagorean Theorem
- N-RN.2.3** Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.
- **Extension 6.1** Real Number Operations

Domain: Quantities

- N-Q.1.1** Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.
Found throughout. For example:
- **Section 1.4** Rewriting Equations and Formulas
 - **Section 2.1** Graphing Linear Equations
 - **Extension 6.4** Solving Exponential Equations
- N-Q.1.2** Define appropriate quantities for the purpose of descriptive modeling.
Found throughout. For example:
- **Section 1.1** Solving Simple Equations
 - **Section 3.2** Solving Inequalities Using Addition or Subtraction
 - **Section 4.5** Systems of Linear Inequalities
- N-Q.1.3** Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
Found throughout. For example:
- **Section 10.2** Solving Square Root Equations
 - **Section 12.5** Scatter Plots and Lines of Fit

Conceptual Category: Algebra

Domain: Seeing Structure in Expressions

- A-SSE.1.1** Interpret expressions that represent a quantity in terms of its context.
- Interpret parts of an expression, such as terms, factors, and coefficients.
 - Section 6.5** Exponential Growth
 - Section 6.6** Exponential Decay
 - Section 7.1** Polynomials
 - Interpret complicated expressions by viewing one or more of their parts as a single entity.
 - Section 6.5** Exponential Growth
 - Section 6.6** Exponential Decay
- A-SSE.1.2** Use the structure of an expression to identify ways to rewrite it.
- Section 7.6** Factoring Polynomials Using the GCF
 - Section 7.7** Factoring $x^2 + bx + c$
 - Section 7.8** Factoring $ax^2 + bx + c$
 - Section 7.9** Factoring Special Products
 - Extension 7.9** Factoring Polynomials Completely
 - Section 11.3** Simplifying Rational Expressions
 - Section 11.4** Multiplying and Dividing Rational Expressions
 - Section 11.5** Dividing Polynomials
 - Section 11.6** Adding and Subtracting Rational Expressions
- A-SSE.2.3** Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.
- Factor a quadratic expression to reveal the zeros of the function it defines.
 - Section 7.6** Factoring Polynomials Using the GCF
 - Section 7.7** Factoring $x^2 + bx + c$
 - Section 7.8** Factoring $ax^2 + bx + c$
 - Section 7.9** Factoring Special Products
 - Extension 7.9** Factoring Polynomials Completely
 - Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.
 - Section 9.3** Solving Quadratic Equations by Completing the Square
 - Lesson 2** Finding Maximum and Minimum Values of Quadratic Functions
 - Use the properties of exponents to transform expressions for exponential functions.
 - Section 6.4** Exponential Functions
 - Extension 6.4** Solving Exponential Equations
 - Section 6.5** Exponential Growth
 - Section 6.6** Exponential Decay

Domain: Arithmetic with Polynomials and Rational Expressions

A-APR.1.1 Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.

- **Section 7.2** Adding and Subtracting Polynomials
- **Section 7.3** Multiplying Polynomials
- **Section 7.4** Special Products of Polynomials

A-APR.2.3 Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.

- **Lesson 1** Zeros of Quadratic and Cubic Functions

Domain: Creating Equations

A-CED.1.1 Create equations and inequalities in one variable and use them to solve problems. *Include equations arising from linear and quadratic functions, and simple rational, absolute value, and exponential functions.*

- **Section 1.1** Solving Simple Equations
- **Section 1.2** Solving Multi-Step Equations
- **Section 1.3** Solving Equations with Variables on Both Sides
- **Extension 1.3** Solving Absolute Value Equations
- **Section 3.1** Writing and Graphing Inequalities
- **Section 3.2** Solving Inequalities Using Addition or Subtraction
- **Section 3.3** Solving Inequalities Using Multiplication or Division
- **Section 3.4** Solving Multi-Step Inequalities
- **Extension 3.4** Solving Compound Inequalities
- **Extension 6.4** Solving Exponential Equations
- **Section 9.1** Solving Quadratic Equations by Graphing
- **Section 11.7** Solving Rational Equations

A-CED.1.2 Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.

- **Section 2.1** Graphing Linear Equations
- **Section 2.3** Graphing Linear Equations in Slope-Intercept Form
- **Section 2.4** Graphing Linear Equations in Standard Form
- **Section 2.5** Writing Equations in Slope-Intercept Form
- **Section 2.6** Writing Equations in Point-Slope Form
- **Extension 2.6** Writing Equations of Parallel and Perpendicular Lines
- **Section 2.7** Solving Real-Life Problems
- **Section 6.4** Exponential Functions
- **Section 8.1** Graphing $y = ax^2$
- **Section 10.1** Graphing Square Root Functions
- **Section 11.2** Graphing Rational Functions
- **Extension 11.2** Inverse of a Function

A-CED.1.3 Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context.

- **Section 2.5** Writing Equations in Slope-Intercept Form
- **Section 3.1** Writing and Graphing Inequalities
- **Section 3.2** Solving Inequalities Using Addition or Subtraction
- **Section 3.3** Solving Inequalities Using Multiplication or Division
- **Section 3.4** Solving Multi-Step Inequalities
- **Extension 3.4** Solving Compound Inequalities
- **Section 4.1** Solving Systems of Linear Equations by Graphing
- **Section 4.2** Solving Systems of Linear Equations by Substitution
- **Section 4.3** Solving Systems of Linear Equations by Elimination
- **Section 4.4** Solving Special Systems of Linear Equations
- **Extension 4.4** Solving Linear Equations by Graphing
- **Section 4.5** Systems of Linear Inequalities

A-CED.1.4 Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.

- **Section 1.4** Rewriting Equations and Formulas

Domain: Reasoning with Equations and Inequalities

A-REI.1.1 Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.

- **Section 1.1** Solving Simple Equations
- **Section 1.2** Solving Multi-Step Equations
- **Section 1.3** Solving Equations with Variables on Both Sides
- **Extension 1.3** Solving Absolute Value Equations

A-REI.2.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

- **Section 1.1** Solving Simple Equations
- **Section 1.2** Solving Multi-Step Equations
- **Section 1.3** Solving Equations with Variables on Both Sides
- **Extension 1.3** Solving Absolute Value Equations
- **Section 3.2** Solving Inequalities Using Addition or Subtraction
- **Section 3.3** Solving Inequalities Using Multiplication or Division
- **Section 3.4** Solving Multi-Step Inequalities
- **Extension 3.4** Solving Compound Inequalities
- **Extension 6.4** Solving Exponential Equations

A-REI.2.4 Solve quadratic equations in one variable.

- Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x - p)^2 = q$ that has the same solutions. Derive the quadratic formula from this form.
 - **Section 9.3** Solving Quadratic Equations by Completing the Square
 - **Extension 9.4** Choosing a Solution Method

b. Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions [and write them as $a \pm bi$ for real numbers a and b]*.

- **Section 7.5** Solving Polynomial Equations in Factored Form
- **Section 7.6** Factoring Polynomials Using the GCF
- **Section 7.7** Factoring $x^2 + bx + c$
- **Section 7.8** Factoring $ax^2 + bx + c$
- **Section 7.9** Factoring Special Products
- **Extension 7.9** Factoring Polynomials Completely
- **Section 9.1** Solving Quadratic Equations by Graphing
- **Section 9.2** Solving Quadratic Equations Using Square Roots
- **Section 9.3** Solving Quadratic Equations by Completing the Square
- **Section 9.4** Solving Quadratic Equations Using the Quadratic Formula
- **Extension 9.4** Choosing a Solution Method

A-REI.3.5 Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.

- **Section 4.3** Solving Systems of Linear Equations by Elimination

A-REI.3.6 Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.

- **Section 4.1** Solving Systems of Linear Equations by Graphing
- **Section 4.2** Solving Systems of Linear Equations by Substitution
- **Section 4.3** Solving Systems of Linear Equations by Elimination
- **Section 4.4** Solving Special Systems of Linear Equations
- **Extension 4.4** Solving Linear Equations by Graphing

A-REI.3.7 Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically.

- **Section 9.5** Solving Systems of Linear and Quadratic Equations

A-REI.4.10 Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).

- **Section 2.1** Graphing Linear Equations
- **Section 2.3** Graphing Linear Equations in Slope-Intercept Form
- **Section 2.4** Graphing Linear Equations in Standard Form
- **Section 2.6** Writing Equations in Point-Slope Form
- **Extension 2.6** Writing Equations of Parallel and Perpendicular Lines
- **Section 6.4** Exponential Functions
- **Section 8.1** Graphing $y = ax^2$
- **Section 10.1** Graphing Square Root Functions
- **Section 11.1** Direct and Inverse Variation
- **Section 11.2** Graphing Rational Functions

* Items in brackets are not required until Algebra II.

A-REI.4.11 Explain why the x -coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, [polynomial, rational, absolute value,] exponential, [and logarithmic functions].

- **Section 4.4** Solving Special Systems of Linear Equations
- **Extension 4.4** Solving Linear Equations by Graphing
- **Extension 6.4** Solving Exponential Equations
- **Section 9.1** Solving Quadratic Equations by Graphing
- **Section 9.5** Solving Systems of Linear and Quadratic Equations

A-REI.4.12 Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.

- **Section 3.5** Graphing Linear Inequalities in Two Variables
- **Section 4.5** Systems of Linear Inequalities

Conceptual Category: Functions

Domain: Interpreting Functions

F-IF.1.1 Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then $f(x)$ denotes the output of f corresponding to the input x . The graph of f is the graph of the equation $y = f(x)$.

- **Section 5.1** Domain and Range of a Function
- **Extension 5.1** Relations and Functions
- **Section 5.2** Discrete and Continuous Domains
- **Section 5.4** Function Notation

F-IF.1.2 Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.

- **Section 5.4** Function Notation

F-IF.1.3 Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers.

- **Section 5.6** Arithmetic Sequences
- **Section 6.7** Geometric Sequences
- **Extension 6.7** Recursively Defined Sequences

F-IF.2.4 For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship.

Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; [and periodicity].

- **Section 2.2** Slope of a Line
- **Extension 2.2** Slopes of Parallel and Perpendicular Lines
- **Section 2.3** Graphing Linear Equations in Slope-Intercept Form

- **Section 2.4** Graphing Linear Equations in Standard Form
 - **Section 2.5** Writing Equations in Slope-Intercept Form
 - **Section 2.6** Writing Equations in Point-Slope Form
 - **Extension 2.6** Writing Equations of Parallel and Perpendicular Lines
 - **Section 2.7** Solving Real-Life Problems
 - **Section 5.3** Linear Function Patterns
 - **Section 5.5** Comparing Linear and Nonlinear Functions
 - **Section 8.1** Graphing $y = ax^2$
 - **Section 8.2** Focus of a Parabola
 - **Section 8.3** Graphing $y = ax^2 + c$
 - **Section 8.4** Graphing $y = ax^2 + bx + c$
 - **Extension 8.4** Graphing $y = a(x - h)^2 + k$
 - **Section 8.5** Comparing Linear, Exponential, and Quadratic Functions
 - **Extension 8.5** Comparing Graphs of Functions
 - **Section 10.1** Graphing Square Root Functions
- F-IF.2.5** Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.
- **Section 5.1** Domain and Range of a Function
 - **Extension 5.1** Relations and Functions
 - **Section 5.2** Discrete and Continuous Domains
- F-IF.2.6** Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.
- **Section 2.2** Slope of a Line
 - **Extension 2.2** Slopes of Parallel and Perpendicular Lines
 - **Section 2.6** Writing Equations in Point-Slope Form
 - **Extension 2.6** Writing Equations of Parallel and Perpendicular Lines
 - **Section 8.5** Comparing Linear, Exponential, and Quadratic Functions
 - **Extension 8.5** Comparing Graphs of Functions
- F-IF.3.7** Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.
- a. Graph linear and quadratic functions and show intercepts, maxima, and minima.
 - **Section 2.3** Graphing Linear Equations in Slope-Intercept Form
 - **Section 8.4** Graphing $y = ax^2 + bx + c$
 - **Extension 8.4** Graphing $y = a(x - h)^2 + k$
 - **Section 8.5** Comparing Linear, Exponential, and Quadratic Functions
 - **Extension 8.5** Comparing Graphs of Functions
 - b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.
 - **Extension 5.4** Special Functions
 - **Section 10.1** Graphing Square Root Functions
 - **Lesson 3** Cube Root Functions
 - e. Graph exponential [and logarithmic] functions, showing intercepts and end behavior, [and trigonometric functions, showing period, midline, and amplitude, and using phase shift].
 - **Section 6.4** Exponential Functions
 - **Section 6.5** Exponential Growth
 - **Section 6.6** Exponential Decay

- F-IF.3.8** Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.
- Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.
 - Section 9.3** Solving Quadratic Equations by Completing the Square
 - Use the properties of exponents to interpret expressions for exponential functions.
 - Section 6.4** Exponential Functions
 - Section 6.5** Exponential Growth
 - Section 6.6** Exponential Decay
- F-IF.3.9** Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).
- Section 5.4** Function Notation
 - Section 6.5** Exponential Growth

Domain: Building Functions

- F-BF.1.1** Write a function that describes a relationship between two quantities.
- Determine an explicit expression, a recursive process, or steps for calculation from a context.
Found throughout. For example:
 - Section 2.5** Writing Equations in Slope-Intercept Form
 - Section 2.7** Solving Real-Life Problems
 - Section 5.3** Linear Function Patterns
 - Section 6.5** Exponential Growth
 - Section 6.6** Exponential Decay
 - Combine standard function types using arithmetic operations.
 - Section 6.5** Exponential Growth
- F-BF.1.2** Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.
- Section 5.6** Arithmetic Sequences
 - Section 6.7** Geometric Sequences
 - Extension 6.7** Recursively Defined Sequences
- F-BF.2.3** Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $kf(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. [Include recognizing even and odd functions from their graphs and algebraic expressions for them.]
- Section 5.4** Function Notation
 - Section 6.4** Exponential Functions
 - Section 8.1** Graphing $y = ax^2$
 - Section 8.3** Graphing $y = ax^2 + c$
 - Section 8.4** Graphing $y = ax^2 + bx + c$
 - Extension 8.4** Graphing $y = a(x - h)^2 + k$
 - Lesson 3** Cube Root Functions

F-BF.2.4 Find inverse functions.

- a. Solve an equation of the form $f(x) = c$ for a simple function f that has an inverse and write an expression for the inverse.
- **Extension 11.2** Inverse of a Function

Domain: Linear, Quadratic, and Exponential Models

F-LE.1.1 Distinguish between situations that can be modeled with linear functions and with exponential functions.

- a. Prove that linear functions grow by equal differences over equal intervals; and that exponential functions grow by equal factors over equal intervals.
- **Section 6.4** Exponential Functions
- b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.
- **Section 5.5** Comparing Linear and Nonlinear Functions
- c. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.
- **Section 6.5** Exponential Growth
 - **Section 6.6** Exponential Decay

F-LE.1.2 Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).

- **Section 2.7** Solving Real-Life Problems
- **Section 5.3** Linear Function Patterns
- **Section 5.6** Arithmetic Sequences
- **Section 6.4** Exponential Functions
- **Section 6.7** Geometric Sequences
- **Extension 6.7** Recursively Defined Sequences

F-LE.1.3 Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, [or (more generally) as a polynomial function].

- **Section 8.5** Comparing Linear, Exponential, and Quadratic Functions
- **Extension 8.5** Comparing Graphs of Functions

F-LE.1.5 Interpret the parameters in a linear or exponential function in terms of a context.

- **Section 2.3** Graphing Linear Equations in Slope-Intercept Form
- **Section 6.4** Exponential Functions

Conceptual Category: Statistics and Probability

Domain: Interpreting Categorical and Quantitative Data

S-ID.1.1 Represent data with plots on the real number line (dot plots, histograms, and box plots).

- **Section 12.1** Measures of Central Tendency
- **Section 12.3** Box-and-Whisker Plots
- **Section 12.4** Shapes of Distributions
- **Section 12.8** Choosing a Data Display

- S-ID.1.2** Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.
- **Section 12.1** Measures of Central Tendency
 - **Section 12.2** Measures of Dispersion
 - **Section 12.3** Box-and-Whisker Plots
 - **Section 12.4** Shapes of Distributions
- S-ID.1.3** Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).
- **Section 12.1** Measures of Central Tendency
 - **Section 12.2** Measures of Dispersion
 - **Section 12.3** Box-and-Whisker Plots
 - **Section 12.4** Shapes of Distributions
- S-ID.2.5** Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.
- **Section 12.7** Two-Way Tables
- S-ID.2.6** Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.
- a. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. *Use given functions or choose a function suggested by the context. Emphasize linear and exponential models.*
 - **Section 12.5** Scatter Plots and Lines of Fit
 - b. Informally assess the fit of a function by plotting and analyzing residuals.
 - **Section 12.6** Analyzing Lines of Fit
 - c. Fit a linear function for a scatter plot that suggests a linear association.
 - **Section 12.5** Scatter Plots and Lines of Fit
- S-ID.3.7** Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.
- **Section 12.5** Scatter Plots and Lines of Fit
 - **Section 12.6** Analyzing Lines of Fit
- S-ID.3.8** Compute (using technology) and interpret the correlation coefficient of a linear fit.
- **Section 12.6** Analyzing Lines of Fit
- S-ID.3.9** Distinguish between correlation and causation.
- **Section 12.6** Analyzing Lines of Fit