2019-2020

Grade 8 Algebra 1 Mississippi College- and Career-Readiness Standards for Mathematics RCSD Quarter 1 (enVision)		
Standard	Topic	
8.NS.1 Understand informally that every number has a decimal expansion; the rational numbers are those with decimal expansions that terminate in 0's or eventually repeat. Know that other numbers are called irrational.	1-1, 1-2	
8.NS.2 Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., π^2). *For example, by truncating the decimal expansion of √2 shows that √2 is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.*	1-3	
8.EE.2 Use square roots and cube roots to represent solutions to equations of the form (x) squared=p and (x) cubed=p, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that the square root of 2 is irrational.	1-4, 1-5	
8.EE.5 Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. *For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.*	2-5	
8.G.6 Explain a proof of the Pythagorean Theorem and its converse.	7-1, 7-2	
8.G.7 Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.	7-1 , 7-2 , 7-3	
8.G.8 Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.	7-4	
N-Q.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.	1-4	
N-Q.2 Define appropriate quantities for the purpose of descriptive modeling.	1-3	
N-Q.3 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.	6-3	
N-RN.3 Explain why the sum or product of two rational numbers is rational; the sum of a rational number and an irrational number is irrational; and the product of a nonzero rational number and an irrational number is irrational.	1-1	
8.EE.7 Solve linear equations in one variable. a. Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form x=a, a=a, or a=b results (where a and b are different numbers). b. Solve linear equations and inequalities with rational number coefficients, including those whose solutions require expanding expressions using the distributive property and collecting like terms. **	2-1, 2-2 2-3, 2-4, ** A7: Topic 6	
8.F.4 Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x,y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.	3-4, 4-2	
A-SSE.1 Interpret expressions that represent a quantity in terms of its context.★ a. Interpret parts of an expression, such as terms, factors, and coefficients.	1a: 7-5, 7-6, 7-7	Linear Equations & Inequalities

b. Interpret complicated expressions by viewing one or more of their parts as a single entity. *For example, interpret $P(1+r)^n$ as the product of P and a factor not depending on P.*	1b: 6-3, 7-5, 7-6, 7-7	
A-CED.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 and exponential functions.*★	1-2, 1-3, 1-4, 1-5, 1-6, 1-7, 9-1, 9-4, 9-6	
A-CED.2 Create equations in two variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.★	2-1, 2-2, 2-3, 2-4, 6-3, 8-1, 9-1	Linear
A-CED.4 Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. *For example, rearrange Ohm's law V = IR to highlight resistance R.*★	1-4	
A-REI.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.	1-2, 1-3	
A-REI.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.	1-2, 1-3, 1-5, 1-6	
A-REI.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, quadratic, absolute value, and exponential functions.★	9-1, 9-7	Linear

** insert lesson about inequalities **(Accelerated 7 book Topic 6)**

★These standards are specific modeling standards.

Optional Standard(s): N.RN.2

Grade 8 Algebra 1 Mississippi College- and Career-Readiness Standards for Mathematics **RCSD Quarter 2 (enVision)**	

Standard	Topic	
8.F.1 Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.	3-1 3-2	
8.F.3 Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. *For example, the function* $A = s^2$ *giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4), and (3,9), which are not on a straight line.*	3-3 4-2	
8.F.4 Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x,y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.	3-4 4-2	
8.F.5 Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.	3-5 3-6	
8.SP.1 Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.	4-1	
8.SP.2 Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line.	4-2	
8.SP.3 Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. *For example, in a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height.*	4-3	
F-IF.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)*.	3-1, 3-2	Linear
F-IF.2 Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.	3-2, 8-4	Linear
F-IF.3 Recognize that sequences are functions whose domain is a subset of the integers.	3-4, 6-4	
F-IF.5 Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. *For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.*★	3-2, 3-3, 6-2, 10-3	Linear
F-IF.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 functions (linear and quadratic) and show intercepts, maxima, and minima. b. Graph square root and piecewise-defined functions, including absolute value functions.	3-3, 8-2	Linear
F-LE.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).★	2-2, 3-2, 3-4, 6-3, 6-4	

F-BF.3 Identify the effect on the graph of replacing *f(x)* by *f(x) + k*, *k f(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.*	3-4, 6-4	
S-ID.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, quadratic, and exponential models.*[6] b. Informally assess the fit of a function by plotting and analyzing residuals. c. Fit a linear function for a scatter plot that suggests a linear association.	6a: 3-5, 3-6, 8-4 6b: 3-6, 8-4 6c: 3-5, 3-6	
S-ID.7 Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.★	2-1, 2-2, 2-3, 3-5	
S-ID.8 Compute (using technology) and interpret the correlation coefficient of a linear fit.★	3-6	
S-ID.9 Distinguish between correlation and causation.★	3-6	
8.F.2 Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.	3-3 3-4	
8.G.3 Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.	6-1, 6-2 6-3, 6-4 6-5, 6-6 6-7	
F-IF.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.*★	5-1, 5-2, 5-3, 6-2, 6-5, 8-3, 10-1, 10-2, 10-3, 10-4	
F-IF.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.★	5-1, 5-2, 5-3, 6-2, 8-1, 10-1, 10-2, 10-4	
F-IF.7 Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.★ b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.	3-3, 8-2	
F-IF.9 Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.*	5-4, 6-5, 8-3	
F-BF.1 Write a function that describes a relationship between two quantities.★ a. Determine an explicit expression or steps for calculation from a context.	3-3, 3-4, 6-2, 8-4	
8.EE.8 Analyze and solve pairs of simultaneous linear equations. a. Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously.	5-1 5-2 5-3 5-4	

b. Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. *For example, 3x + 2y = 5 and 3x + 2y =6 have no solution because 3x + 2y cannot simultaneously be 5 and 6.* c. Solve real-world and mathematical problems leading to two linear equations in two variables*. For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair.*		
A-REI.5 Given a system of two equations in two variables, show and explain why the sum of equivalent forms of the equations produces the same solution as the original system.	4-3	
A-REI.6 Solve systems of linear equations algebraically, exactly, and graphically, while focusing on pairs of linear equations in two variables.	4-1, 4-2	
A-REI.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.	4-4, 4-5	
A-CED.2 Create equations in two variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.★	2-1, 2-2, 2-3, 2-4, 6-3, 8-1, 9-1	
A-CED.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. *For example, represent inequalities describing nutritional and cost constraints on combinations of different foods*.★	1-5, 1-6, 2-3, 4-2, 4-3, 4-4, 4-5	

★These standards are specific modeling standards.

Grade 8 Algebra 1 Mississippi College- and Career-Readiness Standards for Mathematics **RCSD Quarter 3 (enVision)**		
Standard	Topic	
8.EE.1 Know and apply the properties of integer exponents to generate equivalent numerical expressions. *For example,* $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$.	1-6 1-7	
F-IF.3 Recognize that sequences are functions whose domain is a subset of the integers.	3-4, 6-4	Geometric

F-IF.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.*★	5-1, 5-2, 5-3, 6-2, 6-5, 8-3, 10-1, 10-2, 10-3, 10-4	Exponential
F-IF.5 Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. *For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.*★	3-2, 3-3, 6-2, 10-3	Exponential
F-IF.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.★	5-1, 5-2, 5-3, 6-2, 8-1, 10-1, 10-2, 10-4	Exponential
F-IF.9 Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.*	5-4, 6-5, 8-3	
F-LE.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. b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another. c. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.	1a: 6-2 1b: 3-4 1c: 6-3	
F-LE.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).★	2-2, 3-2, 3-4, 6-3, 6-4	
F-LE.5 Interpret the parameters in a linear or exponential function in terms of a context.	6-3	
F-BF.1 Write a function that describes a relationship between two quantities.★ a. Determine an explicit expression or steps for calculation from a context.	3-3, 3-4, 6-2, 8-4	
A-CED.2 Create equations in two variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.★	2-1, 2-2, 2-3, 2-4, 6-3, 8-1, 9-1	
A-SSE.1 Interpret expressions that represent a quantity in terms of its context.★ a. Interpret parts of an expression, such as terms, factors, and coefficients. b. Interpret complicated expressions by viewing one or more of their parts as a single entity. *For example, interpret $P(1+r)^n$ as the product of P and a factor not depending on P.*	1a: 7-5, 7-6, 7-7 1b: 6-3, 7-5, 7-6, 7-7	
A-SSE.3 Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.★ c. Use the properties of exponents to transform expressions for exponential functions. *For example the expression 1.15^t can be rewritten as $(1.15^{1/12})^{12t} \approx 1.01212^t$ to reveal the approximate equivalent monthly interest rate if the annual rate is 15%.*	6-3	
A-APR.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.	7-1, 7-2, 7-3, 7-4	
A-SSE.1 Interpret expressions that represent a quantity in terms of its context.★	1a: 7-5, 7-6, 7-7	

a. Interpret parts of an expression, such as terms, factors, and coefficients. b. Interpret complicated expressions by viewing one or more of their parts as a single entity. *For example, interpret $P(1+r)^n$ as the product of P and a factor not depending on P.*	1b: 6-3, 7-5, 7-6, 7-7	
A-SSE.2 Use the structure of an expression to identify ways to rewrite it. *For example, see $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$.*	7-4, 7-7, 9-4	
8.F.2 Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.		
A-CED.2 Create equations in two variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.★	2-1, 2-2, 2-3, 2-4, 6-3, 8-1, 9-1	
F-IF.2 Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.	3-2, 8-4	
F-IF.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.*★	5-1, 5-2, 5-3, 6-2, 6-5, 8-3, 10-1, 10-2, 10-3, 10-4	
F-IF.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 functions (linear and quadratic) and show intercepts, maxima, and minima. b. Graph square root and piecewise-defined functions, including absolute value functions.	3-3, 8-2	
F-IF.8 Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. a. 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.	8-3	
F-IF.9 Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.*	5-4, 6-5, 8-3	
F-BF.3 Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k\,f(x)$, $f(kx)$, 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.*	3-4, 6-4	
S-ID.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, quadratic, and exponential models.*[6] b. Informally assess the fit of a function by plotting and analyzing residuals. c. Fit a linear function for a scatter plot that suggests a linear association.	6a: 3-5, 3-6, 8-4 6b: 3-6, 8-4 6c: 3-5, 3-6	

A-REI.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).	2-1, 2-2, 2-3, 9-1	

★These standards are specific modeling standards.

Optional Standard(s): N-RN.2

F-LE.3

Grade 8 Algebra 1 Mississippi College- and Career-Readiness Standards for Mathematics RCSD Quarter 4 (enVision)		
Standard	Topic	
A-CED.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 and exponential functions.*★	1-2, 1-3, 1-4, 1-5, 1-6, 1-7, 9-1, 9-4, 9-6	
A-CED.2 Create equations in two variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.★	2-1, 2-2, 2-3, 2-4, 6-3, 8-1, 9-1	
A-REI.4 Solve quadratic equations in one variable. a. 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. 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.	4a: 9-5, 9-6 4b: 9-1, 9-2, 9-4, 9-6	

A-REI.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, quadratic, absolute value, and exponential functions.★	9-1, 9-7	
A-SSE.2 Use the structure of an expression to identify ways to rewrite it. *For example, see* $x^4 – y^4$ *as* $(x^2)^2 – (y^2)^2$*, thus recognizing it as a difference of squares that can be factored as* $(x^2 – y^2)(x^2 + y^2)$.	7-4, 7-7, 9-4	
A-SSE.3 Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.★ a. Factor a quadratic expression to reveal the zeros of the function it defines. b. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines. c. Use the properties of exponents to transform expressions for exponential functions. *For example the expression* 1.15^t *can be rewritten as* $(1.15^{1/12})^{12t} \approx 1.01212^t$ *to reveal the approximate equivalent monthly interest rate if the annual rate is 15%.*	6-3	
A-APR.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 (limit to 1st- and 2nd-degree polynomials).	9-2	
8.SP.4 Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables.	4-4 4-5	
S-ID.1 Represent and analyze data with plots on the real number line (dot plots, histograms, and box plots).★	11-1, 11-2	
S-ID.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.★	11-2, 11-3, 11-4	
S-ID.3 Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).★	11-2, 11-3, 11-4	
S-ID.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.★	11-5	

★These standards are specific modeling standards.

Optional Standard(s): A-REI.7