**WAYNE LOCAL SCHOOLS**

**ALGEBRA 1** **PACING GUIDE DESK REFERENCE 2nd QUARTER**

| Unit | Standards | Lessons | Textbook Correlation |
|---|---|---|---|
| 4<br>Part 2 | **N.Q.1**<br>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.<br>**N.Q.2**<br>Define appropriate quantities for the purpose of descriptive modeling.<br>**A.REI.10**<br>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).<br>**A.SSE.1**<br>Interpret expressions that represent a quantity in terms of its context.*<br>**A.SSE.1.a**<br>Interpret parts of an expression, such as terms, factors, and coefficients.<br>**A.SSE.1.b**<br>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.*<br>**A.CED.1**<br>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.*<br>**F.IF.1**<br>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, | 4 lessons<br>8 days<br>1 test | 4-4<br>4-5<br>4-6 (2 days)<br>4-7 (2 days) |

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| | 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)*.<br>**F.IF.2**<br>Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.<br>**F.IF.3**<br>Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. *For example, the Fibonacci sequence is defined recursively by f(0) = f(1) = 1, f(n+1) = f(n) + f(n-1) for n ≥ 1.*<br>**F.IF.5**<br>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.**<br>**F.BF.1**<br>Write a function that describes a relationship between two quantities.*<br>**F.BF.1.a**<br>Determine an explicit expression, a recursive process, or steps for calculation from a context.<br>**F.BF.2**<br>Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.*<br>**F.LE.2**<br>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). | | |
| 5 | **N.Q.2**<br>Define appropriate quantities for the purpose of descriptive modeling.<br>**A.CED.2** | 8 lessons<br>16 days<br>1 quiz<br>1 test | 5-1<br>5-2<br>5-3 (2 days)<br>5-4 (2 days) |

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| | Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.<br>**A.SSE.1**<br>Interpret expressions that represent a quantity in terms of its context.*<br>**A.SSE.1.a**<br>Interpret parts of an expression, such as terms, factors, and coefficients.<br>**A.SSE.2**<br>Use the structure of an expression to identify ways to rewrite it. *For example, see x4 – y4 as (x2)2 – (y2)2, thus recognizing it as a difference of squares that can be factored as (x2 – y2)(x2 + y2).*<br>**F.IF.4**<br>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.<br>*Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.**<br>**F.IF.6**<br>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.*<br>**F.IF.7**<br>Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases<br>**F.IF.7.a**<br>Graph linear and quadratic functions and show intercepts, maxima, and minima.<br>**F.LE.1.b**<br>Distinguish between situations that can be modeled with linear functions and with exponential functions. | | Quiz<br>5-5 (2 days)<br>5-6<br>5-7<br>5-8 (2 days) |

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| | Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.<br>**F.LE.5**<br>Interpret the parameters in a linear or exponential function in terms of a context.<br>**G.GPE.5**<br>Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).<br>**S.ID.6**<br>Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.<br>**S.ID.6.a**<br>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<br>**S.ID.6.c**<br>Fit a linear function for a scatter plot that suggests a linear association.<br>**S.ID.7**<br>Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.<br>**S.ID.8**<br>Compute (using technology) and interpret the correlation coefficient of a linear fit.<br>**S.ID.9**<br>Distinguish between correlation and causation. | | |
| 6 | **N.Q.2**<br>Define appropriate quantities for the purpose of descriptive modeling.<br>**N.Q.3**<br>Choose a level of accuracy appropriate to limitations on measurement when reporting quantities<br>**A.CED.3** | 6 lessons<br>11 days<br>1 test | 6-1<br>6-2 (2 days)<br>6-3 (2 days)<br>6-4<br>6-5 (2 days)<br>6-6 |

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| | Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.<br>**A.REI.5**<br>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.<br>**A.REI.6**<br>Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.<br>**A.REI.12**<br>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. | | |
| 7 | **N.RN.1**<br>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. *For example, we define 5*1/3 *to be the cube root of 5 because we want (5*1/3*)*3 *= 5(*1/3*)*3 *to hold, so (5*1/3*)*3 *must equal 5.*<br>**N.RN.2**<br>Rewrite expressions involving radicals and rational exponents using the properties of exponents.<br>**A.CED.2**<br>Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.<br>**A.SSE.1**<br>Interpret expressions that represent a quantity in terms of its context.*<br>**A.SSE.1.b** | 5 lessons<br>7 days<br>1 test (quiz?) | 7-1&2<br>7-3&4<br>7-5<br>7-6<br>7-7 |

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| | 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.*<br>**A.SSE.3**<br>Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.*<br>**A.SSE.3.c**<br>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 ≈ *1.012*12t *to reveal the approximate equivalent monthly interest rate if the annual rate is 15%.*<br>**F.IF.4**<br>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.<br>*Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.**<br>**F.IF.5**<br>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.**<br>**F.IF.7.e**<br>Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.*<br>Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.<br>**F.IF.8** | | |

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| | Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.<br>**F.IF.8.b**<br>Use the properties of exponents to interpret expressions for exponential functions. *For example, identify percent rate of change in functions such as y = (1.02)*t*, y = (0.97)*t*, y = (1.01)*12t*, y = (1.2)*t/10*, and classify them as representing exponential growth or decay.*<br>**F.LE.1.c**<br>Distinguish between situations that can be modeled with linear functions and with exponential functions.<br>Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.<br>**F.LE.2**<br>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).<br>**F.LE.5**<br>Interpret the parameters in a linear or exponential function in terms of a context. | | |

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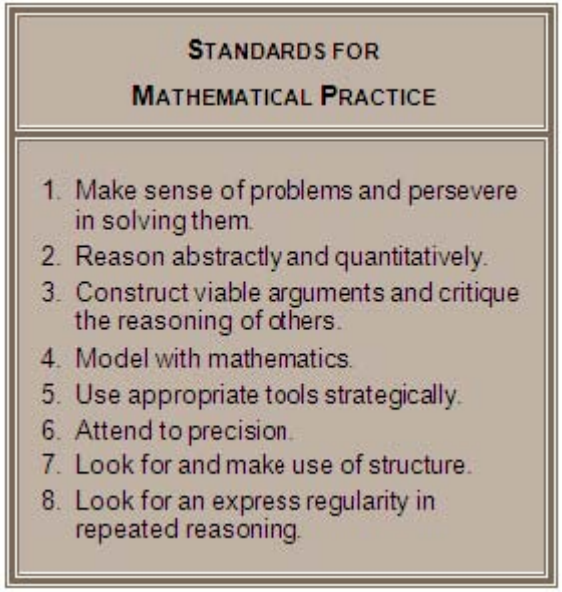


**Unit 4: An Introduction to Functions**

I can represent mathematical relationships using graphs.
I can identify and represent patterns that describe linear functions.
I can identify and represent patterns that describe nonlinear functions.
I can graph equations that represent functions.
I can write equations that represent functions.
I can determine whether a relation is a function.
I can find domain and range and use function notation.
I can identify and extend patterns in sequences.
I can represent arithmetic sequences using function notation.

**Unit 5: Linear Functions**

I can find rates of change from tables.
I can find slope.
I can write and graph an equation of a direct variation.
I can write and graph linear equations using slope-intercept form.

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I can write and graph linear equations using point-slope form.
I can graph linear equations using intercepts.
I can write linear equations in standard form.
I can determine whether lines are parallel, perpendicular, or neither.
I can write equations of parallel lines and perpendicular lines.
I can write an equation of a trend line and of a line of best fit.
I can use a trend line and a line of best fit to make predictions.
I can graph an absolute value function.
I can translate the graph of an absolute value function.

**Unit 6: Systems of Equations and Inequalities**
I can solve systems of equations by graphing.
I can analyze special systems.
I can solve systems of equations using substitution.
I can solve systems by adding or subtracting to eliminate a variable.
I can choose the best method for solving a system of linear equations.
I can graph linear inequalities in two variables.
I can use linear inequalities when modeling real-world situations.
I can solve systems of linear inequalities by graphing.
I can model real-world situations using systems of linear inequalities.

**Unit 7: Exponents and Exponential Functions**
I can simplify expressions involving zero and negative exponents.
I can multiply powers with the same base.
I can raise a power to a power.
I can raise a product to a power.
I can divide powers with the same base.
I can raise a quotient to a power.
I can rewrite expressions involving radicals and rational exponents.
I can evaluate and graph exponential functions.
I can model exponential growth and decay.