Cabarrus County Schools

8th Grade Math I Curriculum Map

Scope and Sequence for 8th Grade Math 1					
Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
Equations and Introduction to Functions	**Linear Functions**	**Introduction to Exponential Functions**	**Introduction to Quadratic Functions and Equations**	**Systems of Equations and Inequalities**	**Descriptive Statistics**
5 Weeks	6 Weeks	6 Weeks	6 Weeks	5 weeks	3 weeks
North Carolina Essential Standards for 8th Grade Math 1					
Week of Inspirational Math Jo Boaler website Youcubed Week 3 6-8 Suggestions: Building Shapes One Cut Geometry Framing Rectangles Polyup **NC.8.EE.7** NC.M1.A-SSE.1a NC.M1.A-REI.3 NC.M1.A-REI.1 NC.M1.A.REI.12 NC.M1.A-CED.1 NC.M1.A-CED.4 **NC.8.F.1** NC.M1.F-IF.1 NC.M1.F-IF.2	**NC.8.F.2** **NC.8.F.3** **NC.8.F.4** **NC.8.F.5** NC.M1.A-SSE.1a NC.M1.A-SSE.1b NC.M1.A-CED.1 NC.M1.A-REI.12 NC.M1.A-CED.2 NC.M1.F-BF.1a NC.M1.A-REI.10 NC.M1.A-REI.11 NC.M1.G-GPE.5 NC.M1.F-IF.3 NC.M1.F-BF.2 NC.M1.A-REI.1 NC.M1.F-LE.5 NC.M1.F-IF.5 NC.M1.S-ID.9 NC.M1.F-IF.7	**NC.8.EE.1** NC.M1.N-RN.2 NC.M1.F-IF.3 NC.M1.F-BF.2 NC.M1.F-IF.2 NC.M1.F-IF.4 NC.M1.A-CED.1 NC.M1.A-CED.2 NC.M1.A-REI.10 NC.M1.F-IF.6 NC.M1.F-LE.5 NC.M1.F-LE.1 NC.M1.F-IF.5 NC.M1.F-IF.7 NC.M1.F-IF.8b NC.M1.F-LE.3 NC.M1.A-SSE.1a NC.M1.F-IF.9 NC.M1.A-REI.11	NC.M1.A-APR.1 NC.M1.A-SSE.1a NC.M1.A-SSE.1b NC.M1.F-IF.7 NC.M1.F-IF.9 NC.M1.F-LE.3 NC.M1.F-IF.6 NC.M1.F-IF.8a NC.M1. A-REI.10 NC.M1.F-IF.2 NC.M1.A-CED.2 NC.M1.A-CED.1 NC.M1.A-SSE.3 NC.M1.A-REI.4 NC.M1.A-APR.3 NC.M1.A-REI.1 NC.M1.A-REI.11 NC.M1.F-IF.4 NC.M1.A-APR.1 NC.M1.A-SSE.1b	**NC.8.EE.8** NC.M1.A-CED.3 NC.M1.A-REI.5 NC.M1.A-REI.6 NC.M1.A-REI.11 NC.M1.A-REI.12	NC.M1.S-ID.1 NC.M1.S-ID.2 NC.M1.S-ID.3

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NC.M1.F-IF.4 NC.M1.F-IF.6	NC.M1.F-IF.9 **NC.8.SP.1** **NC.8.SP.2** **NC.8.SP.3** NC.M1.S-ID.6b NC.M1.S-ID.6a NC.M1.S-ID.7 NC.M1.S-ID.8 **NC.8.G.8** NC.M1.G-GPE.6 NC.M1.G-GPE.4	NC.M1.F-BF.1a NC.M1.F-BF.1b NC.M1.S-ID.6c	NC.M1.F-BF.1b NC.M1.F-IF.5 NC.M1.A-REI.11 NC.M1.F-IF.7 NC.M1.S-ID.8		

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Incorporated Standards				
	A.REI.10 A.REI.11 A.CED.1 A.CED.2	N.RN.2 F.IF.1	F.BF.1 8.G.7 8.G.8 (Pythagorean Theorem with Polynomials)	

Common Core State Standards for 8th Grade

(Only those standards included in 8th Math I are listed.)

EXPRESSIONS AND EQUATIONS

Work with radicals and integer exponents.

NC.8.EE.1 Develop and apply the properties of integer exponents to generate equivalent numerical expressions.

Analyze and solve linear equations and inequalities.

NC.8.EE.7 Solve real-world and mathematical problems by writing and solving equations and inequalities in one variable.

- Recognize linear equations in one variable as having one solution, infinitely many solutions, or no solutions.
- Solve linear equations and inequalities including multi-step equations and inequalities with the same variable on both sides.

Analyze and solve pairs of simultaneous linear equations.

NC.8.EE.8 Analyze and solve a system of two linear equations in two variables in slope-intercept form.

- Understand that solutions to a system of two linear equations correspond to the points of intersection of their graphs because the point of intersection satisfies both equations simultaneously.
- Solve real-world and mathematical problems leading to systems of linear equations by graphing the equations. Solve simple cases by inspection.

FUNCTIONS

Define, evaluate, and compare functions.

NC.8.F.1 Understand that a function is a rule that assigns to each input exactly one output.

- Recognize functions when graphed as the set of ordered pairs consisting of an input and exactly one corresponding output.
- Recognize functions given a table of values or a set of ordered pairs.

NC.8.F.2 Compare properties of two linear functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).

NC.8.F.3 Identify linear functions from tables, equations, and graphs.

Use functions to model relationships between quantities.

NC.8.F.4 Analyze functions that model linear relationships.

- Understand that a linear relationship can be generalized by y=mx+b.
- Write an equation in slope-intercept form to model a linear relationship by determining the rate of change and the initial value, given at least two (x, y) values or a graph.
- Construct a graph of a linear relationship given an equation in slope-intercept form.
- Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of the slope and y-intercept of its graph or a table of values.

NC.8.F.5 Qualitatively analyze the functional relationship between two quantities.

- Analyze a graph determining where the function is increasing or decreasing; linear or non-linear.
- Sketch a graph that exhibits the qualitative features of a real-world function.

GEOMETRY

Understand and apply the Pythagorean Theorem.

NC.8.G.8 Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.

STATISTICS AND PROBABILITY

Investigate patterns of association in bivariate data.

NC.8.SP.1 Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Investigate and describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.

NC.8.SP.2 Model the relationship between bivariate quantitative data to:

- Informally fit a straight line for a scatter plot that suggests a linear association.
- Informally assess the model fit by judging the closeness of the data points to the line.

NC.8.SP.3 Use the equation of a linear model to solve problems in the context of bivariate quantitative data, interpreting the slope and y-intercept.

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NC Standard Course of Study for North Carolina Math I
THE REAL NUMBER SYSTEM N-RN
Extend the properties of exponents to rational exponents.
NC.M1.N-RN.2 Rewrite algebraic expressions with integer exponents using the property of exponents.
SEEING STRUCTURE IN EXPRESSIONS A-SSE
Interpret the structure of expressions.
NC.M1.A-SSE.1 Interpret expressions that represent a quantity in terms of its context. a. Identify and interpret parts of a linear, exponential, or quadratic expression including terms, factors, coefficients, and exponents b. Interpret a linear, exponential, or quadratic expression made of multiple part as a combination of entities to give meaning to an expression.
NC.M1.A-SSE.3 Write an equivalent form of a quadratic expression, $ax^2 + bx + c$, where a is an integer, by factoring to reveal the solutions of the equation or the zeros of the function the expression defines.
ARITHMETIC WITH POLYNOMIALS & RATIONAL EXPRESSIONS A-APR
Perform arithmetic operations on polynomials.
NC.M1.A-APR.1 Build an understanding that operations with polynomials are comparable to operations with integers by adding and subtracting quadratic expressions and by adding, subtracting, and multiplying linear expressions.
NC.M1.A-APR.3 Understand the relationships among the factors of a quadratic expression, the solutions of a quadratic equation, and the zeros of a quadratic function.
CREATING EQUATIONS A-CED
Create equations that describe numbers or relationships.
NC.M1.A-CED.1 Create equations and inequalities in one variable that represent linear, exponential, and quadratic relationships and use them to solve problems.
NC.M1.A-CED.2 Create and graph equations in two variables to represent linear, exponential, and quadratic relationships between

quantities.

NC.M1.A-CED.3 Create systems of linear equations and inequalities to model situations in context.

NC.M1.A-CED.4 Solve for a quantity of interest in formulas used in science and mathematics using the same reasoning as in solving equations.

REASONING WITH EQUATIONS & INEQUALITIES A-REI

Understand solving equations as a process of reasoning and explain the reasoning.

NC.M1.A-REI.1 Justify a chosen solution method and each step of the solving process for linear and quadratic equations using the mathematical reasoning.

NC.M1.A-REI.3 Solve linear equations and inequalities in one variable.

NC.M1.A-REI.4 Solve for real solutions of quadratic equations in one variable by taking square roots and factoring.

Solve systems of equations.

NC.M1.A-REI.5 Explain why replacing one equation in a system of linear equations by the sum of that equation and a multiple of the other produces a system with the same solutions.

NC.M1.A-REI.6 Use tables, graphs, or algebraic methods (substitution and elimination) to find approximate or exact solutions to systems of linear equations and interpret solutions in terms of a context.

Represent and solve equations and inequalities graphically.

NC.M1.A-REI.10 Understand that the graph of a two variable equation represents the set of all solutions to the equation.

NC.M1.A-REI.11 Build an understanding of why the x-coordinates of the points where the graphs of two Understand that the graph of a two variable equation represents the set of all solutions to the equation linear, exponential, and/or quadratic equations $y=f(x)$ and $y=g(x)$ intersect are the solutions of the equation $f(x)=g(x)$ and approximate solutions using graphing technology or successive approximations with a table of values.

NC.M1.A-REI.12 Represent the solutions of a linear inequality or a system of linear inequalities graphically as a region of the plane.

INTERPRETING FUNCTIONS F-IF

Understand the concept of a function and use function notation.

NC.M1.F-IF.1 Build an understanding 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 by recognizing that:

a. 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*.
b. The graph of *f* is the graph of the equation *y = f(x)*.

NC.M1.F-IF.2 Use function notation to evaluate linear, quadratic, and exponential functions for inputs in their domains, and interpret statements that use function notation in terms of a context.

NC.M1.F-IF.3 Recognize that recursively and explicitly defined sequences are functions whose domains is a subset of the integers, the terms of an arithmetic sequence are a subset of the range of a linear function, and the terms of a geometric sequence are a subset of the range of an exponential function.

Interpret functions that arise in applications in terms of the context.

NC.M1.F-IF.4 Interpret key features of graphs, tables, and verbal descriptions in context to describe functions that arise in applications relating two quantities, including: intercepts; intervals where the function in increasing, decreasing, positive, or negative; and maximums and minimums.

NC.M1.F-IF.5 Interpret a function in terms of the context by relating its domain and range to its graph and, where applicable, to the quantitative relationship it describes.

NC.M1.F-IF.6 Calculate and interpret the average rate of change over a specified interval for a function presented numerically, graphically, and/or symbolically.

NC.M1.F-IF.7 Analyze linear, exponential, and quadratic functions by generating different representations, by hand in simple cases and using technology for more complicated cases, to show key features, including: domain and range; rate of change; intercepts; intervals where the function is increasing, decreasing, positive, or negative; maximums and minimums; and end behavior.

NC.M1.F-IF.8 Use equivalent expressions to reveal and explain different properties of a function

a. Rewrite a quadratic function to reveal and explain different key features of the function
b. Interpret and explain growth and decay rates for an exponential function.

NC.M1.F-IF.9 Compare key features of two functions (linear, quadratic, or exponential) each with a different representation

(symbolically, graphically, numerically in tables, or by verbal descriptions).

BUILDING FUNCTIONS F-BF

Build a function that models a relationship between two quantities.

NC.M1.F-BF.1 Write a function that describes a relationship between two quantities.

a. Build linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two ordered pairs (including reading these from a table).
b. Build a function that models a relationship between two quantities by combining linear, exponential, or quadratic functions with addition and subtraction or two linear functions with multiplication.

NC.M1.F-BF.2 Translate between explicit and recursive forms of arithmetic and geometric sequences and use both to model situations.

LINEAR, QUADRATIC, & EXPONENTIAL MODELS F-LE

Construct and compare linear, quadratic, and exponential models and solve problems.

NC.M1.F-LE.1 Identify situations that can modeled with linear and exponential functions, and justify the most appropriate model for a situation based on the rate of change over equal intervals.

NC.M1.F-LE.3 Compare the end behavior of linear, exponential, and quadratic functions using graphs and tables to show that a quantity increasing exponentially eventually exceeds a quantity increasing linearly or quadratically.

NC.M1.F-LE.5 Interpret the parameters a and b in a linear function $f(x)=ax+b$ or an exponential function $f(x) = ab^x$ in terms of context.

EXPRESSING GEOMETRIC PROPERTIES WITH EQUATIONS G-GPE

Use coordinates to prove simple geometric theorems algebraically.

NC.M1.G-GPE.4 Use coordinates to solve geometric problems involving polygons algebraically.

a. Use coordinates to compute perimeters of polygons and areas of triangles and rectangles.
b. Use coordinates to verify algebraically that a given set of points produces a particular type of triangle or quadrilateral.

NC.M1.G-GPE.5 Use coordinates to prove the slope criteria for parallel and perpendicular lines and use them to solve problems.

a. Determine if two lines are parallel, perpendicular, or neither.
b. Find the equation of a line parallel or perpendicular to a given line that passes through a given point.

NC.M1.G-GPE.6 Use coordinates to find the midpoint or endpoint of a line segment.

INTERPRETING CATEGORICAL & QUANTITATIVE DATA S-ID

Summarize, represent, and interpret data on a single count or measurement variable.

NC.M1.S-ID.1 Use technology to represent data with plots on the real number line (histograms, and box plots).

NC.M1.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. Interpret differences in shape, center, and spread in the context of the data sets.

NC.M1.S-ID.3 Examine the effects of extreme data points (outliers) on shape, center, and/or spread.

NC.M1.S-ID.6 Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.

a. Fit a least squares regression line to linear data using technology. Use the fitted function to solve problems.
b. Assess the fit of a linear function by analyzing residuals.
c. Fit a function to exponential data using technology. Use the fitted function to solve problems.

Interpret linear models.

NC.M1.S-ID.7 Interpret in context the rate of change and the intercept of a linear model. Use the linear model to interpolate and extrapolate predicated values. Assess the validity of a predicted value.

NC.M1.S-ID.8 Analyze patterns and describe relationships between two variables in context. Using technology, determine the correlation coefficient of bivariate data and interpret it as a measure of strength and direction of a linear relationship. Use a scatter plot, correlation coefficient, and a residual plot to determine the appropriateness of using a linear function to model a relationship between two variables.

NC.M1.S-ID 9 Distinguish between association and causation.