Curriculum Map Year 7 -Maths

Topic Name	Term	Content / skills developed with link to NC / exam board subject content (if applicable)	Reflection on previous learning	Progress to future learning	Global Citizenship links	Qatar National Identity links
Analysing and displaying data	1	- Compare two simple distributions using appropriate measures - Calculate the mean from a simple frequency table - Compare two distributions given summary statistics - Recognise when it is appropriate to use mean, median or mode - Use two way tables for discrete data - Make inferences about data through extracting information from a two way table - Construct and interpret pie charts and line graphs - Use questionnaire responses to complete a data collection sheet - Construct and interpret compound and dual (comparative) bar charts - Interpret and / or compare bar graphs and frequency diagrams which are misleading - Construct a simple frequency table with equal class intervals for continuous data - Be able to use > or < correctly between two positive decimals. Decimals should be to 4 or 5 significant figures. - Be able to use > or < correctly between two negative decimals. Decimals should be to 2 or 3 significant figures.	- Line graphs - Dual bar charts - Read and interpret pie charts - Pie charts with percentages - Drawing pie charts - Finding the mean	This will give them a strong understanding of the purpose of data collection and how to effectively read data.	PRIDE values Prepare for challenge. Developing skills for the future	**Sustainability**: self esteem and participation **Sustainability**: responsibility and creativity

		• Construct a frequency table with given equal class intervals for continuous data (boundary data given) • Construct a frequency diagram from a grouped frequency table • Find the modal class of a set of continuous data • Construct line graphs for time series • Construct and interpret scatter graphs • Identify which graphs are the most useful in the context of the problem • Use correlation to describe relations between sets of data • Draw and use a line a best fit to estimate a missing value				
Number skills	1	• Find factor pairs using any whole number • Find the HCF or LCM of 2 numbers less than 20 • Multiply and divide negative integers by a positive integer • Add and subtract integers – positive and negative integers • Add and subtract negative integers from positive and negative integers • Multiply and divide integers – positive and negative integers • Multiply and divide negative integers by a negative integer • Use index notation for squares and cubes and for positive integer powers of 10 • Know all the squares of numbers less than 16 and be able to find the square root given the square number • Give the positive and negative square root of a square number	• Numbers to 10,000,000- reading, writing, comparing, ordering • Comparing and ordering any integers • Rounding any integer • Times tables • Odd and even numbers • Square numbers	This will give them a strong foundation on basic number skills which is required when in comes to the application of symbols as well as other real life context.	PRIDE values Prepare for challenge. Developing skills for the future	**Sustainability**: self esteem and participation **Sustainability**: responsibility and creativity

		- Extend mental calculations to squares and square roots - Be able to estimate square roots of non square numbers less than 100 - Mentally be able to calculate the squares of numbers less than 16 multiplied by a multiple of ten (e.g. 0.2, 300, 0.400) - Divide three-digit by two-digit whole numbers - Using rounding to the nearest 10 or a nice number (e.g. 62 to 63 when dividing by 9 etc.) - Use mental strategies for multiplication – doubling and halving strategies - Checking by an inverse operation (questions other than four rules, e.g. square roots checked with squaring) - Be able to estimate answers to calculations involving 2 or more operations and BIDMAS - Use index notation for small integer powers (e.g. $3 \times 2^3 = 24$) - Extend mental calculations to cubes and cube roots - Extend calculations to cubes and cube roots using mental methods and a calculator when appropriate - Be able to find square roots by factorising - Be able to find cube roots by factorising - Be able to use mental strategies to solve word problems set in context using square roots and cubes roots mentally - be able to work with calculations where the brackets are squared or square rooted			

		- Combine laws of arithmetic for brackets with mental calculations of cubes and squares - Combine laws of arithmetic for brackets with mental calculations of square roots - Combine laws of arithmetic for brackets with mental calculations of cube roots and square roots - Understand which part of an expression is raised to a power by knowing the difference between $3 \times (7 + 8)2$ and $32 \times (7 + 8)$ and $(3 \times (7 + 8))2$				
Equations, functions and formulae	1+2	- Simplify simple expressions by collecting like terms - Understand the difference between 2n and n² - Know that expressions involving repeated multiplication can be written as n, n2, n3 - Simplify simple expressions involving powers but not brackets, by collecting like terms - Construct expressions from worded description, using addition, subtraction and multiplication - Construct expressions from worded description, using all 4 basic operations - Express simple functions in symbols - Know that the contents of brackets are evaluated first when using algebra - Know that multiplication and division are carried out before addition and subtraction - Substitute positive integers into expressions involving small powers	- Form expressions - Substitution - Formula - Form equations - Solving step 1 equations - Solving step 2 equations - Finding pairs of values - Solving problems with two unknowns.	Key skills can be applied to future topics such as expand on algebraic concepts, solving linear equations and inequalities, quadratic equations and graphing functions.	PRIDE values Prepare for challenge. Developing skills for the future	**Sustainability**: self esteem and participation **Sustainability**: responsibility and creativity

			• Evaluate an expression by substituting a positive value into the expression x2 • Use the distributive law to take out numerical common factors • Multiply a single term over a bracket • Add, subtract, multiply and divide integers – extend to the distributive law a(b + c) • Substitute positive integers into simple formulae expressed in words • Substitute integers into more complex formulae expressed in letter symbols • Substitute positive integers into simple formulae expressed in letter symbols • Substitute integers into more complex formulae (involving brackets and more than one operation) expressed in letter symbols • Substitute positive and negative integers into simple formulae • Identify the unknowns in a formula and a function • Derive formulae expressed in letter symbols • Understand the different role of letter symbols in formulae and functions • Derive complex algebraic expressions and formulae				
Fractions	2		• Use a diagram to compare two or more simple fractions • use < and > to compare fractions with same denominator, or unit fractions with different denominators • Simplify fractions by cancelling all common factors	• Equivalent fractions and simplifying • Equivalent fractions on an umber line	Key skills can be applied to future topics including algebraic fractions, surds, quadratic formula etc	PRIDE values Prepare for challenge. Developing skills for the future	**Sustainability**: self esteem and participation **Sustainability**: responsibility and creativity

		- Express one number as a fraction of another. The numbers should be very simple (halves, quarters, thirds) - Use fraction notation to express a smaller whole number as a fraction of a larger one - Begin to add and subtract simple fractions and those with simple common denominators - Add fractions by writing with a common denominator, where the denominators are 12 or less, where the answer is less than 1 - Understand that when two positive fractions are added the answer is larger than either of the original two fractions - Subtract fractions by writing with a common denominator, where the denominators are less than 12 and the first fraction is larger than the second - Understand that when two positive fractions are subtracted the answer is less than the first fraction but may still be larger than the second - Add and subtract simple fractions with denominators of any size - Check addition or subtraction of fractions with an inverse calculation - Add and subtract up to 3 fractions mixing both addition and subtraction into the calculation, with denominators less than or equal to 12 and the using the LCM denominator in the calculation – the answer can be a mixed number - Extend the possible fractions that can be used in mental	- Comparing and ordering fractions - Adding and subtracting fractions - Adding mixed numbers - Subtracting mixed numbers - Multi- step problems - Multiplying fractions by integers - Multiply fractions by fractions - Divide a fraction by an integer - Fractions of amounts - Fractions of amounts-finding the whole.			

			calculations by using halving and doubling strategies • Calculate simple fractions of quantities and measurements (whole number answers) • Calculate fractions of quantities and measurements (fraction answers) • Multiply a fraction by an integer • Multiply an integer by a fraction • Understand the effect of multiplying a positive number by a fraction less than 1 • Recall known facts including fraction to decimal conversions • Recall of equivalent fractions and decimals and percentage including for fractions that are greater than 1 • Use division to convert a fraction to a decimal • Use halving and doubling strategies on fractions to find decimal equivalents of other fractions • Interpret division as a multiplicative inverse. Know that 1 divided by 1/4 is the same as 1 × 4 • Divide an integer by a fraction • Understand the effect of dividing a positive number by a fraction less than 1 • Multiply a fraction by a fraction (without cancelling) • Cancel common factors before multiplying fractions • Divide a fraction by a fraction • Add mixed number fractions without common denominators, where the fraction parts add up to more than 1 • Be able to enter time as a mixed number into a calculator			

			• Subtract mixed number fractions when the fractional part of the first fraction is all that is required for the calculation to take place • Subtract mixed number fractions where the whole number part of the first fraction needs to be broken down to complete the calculation • Multiply a fraction by a mixed number • Divide a mixed number by a fraction				
Angles and shapes	2+3		• Solve simple geometrical problems showing reasoning • Recognise and use vertically opposite angles • Identify alternate angles • Identify corresponding angles • Identify alternate and corresponding angles on the same diagram • Calculate angles in a triangle • Solve geometric problems using side and angle properties of equilateral and isosceles triangles • Understand a proof that the sum of the angles of a triangle is 180 degrees • Understand a proof that the exterior angle of a triangle is equal to the sum of the two interior opposite angles • Identify all the symmetries of 2D shapes • Identify and begin to use angle, side and symmetry properties of quadrilaterals • Find co-ordinates of points determined by geometric information • Classify quadrilaterals by their geometric properties	• Measuring and classifying angles • Calculating angles • Vertically opposite angles • Angles in a triangle • Angles in quadrilaterals • Angles in polygons • Circles-radius, diameter, circumference • Drawing shapes accurately, • Nets of 3D shapes	Key skills can be applied to future topics circle theorems, trigonometry, Pythagoras etc	PRIDE values Prepare for challenge. Developing skills for the future	**Sustainability**: self esteem and participation **Sustainability**: responsibility and creativity

		• Understand a proof that the sum of the angles of a quadrilateral is 360 degrees • Explain how to find the sums of the interior and exterior angles of quadrilaterals, pentagons and hexagons • Calculate the interior and exterior angles of regular polygons • Use the interior and exterior angles of regular and irregular polygons				
Decimals	3	• Order positive decimals as a list with the smallest on the left. Decimals should be to 4 or 5 significant figures • Order negative decimals as a list with the smallest on the left • Order positive decimals with the largest on the left. Decimals should be to 4 or 5 significant figures • Order negative decimals as a list with the smallest on the left. Decimals should be to 2 or 3 significant figures • Order negative decimals with the largest on the left. Decimals should be to 2 or 3 significant figures • Use > or < correctly between two positive decimals. Decimals should be to 4 or 5 significant figures. • Use > or < correctly between two negative decimals. Decimals should be to 2 or 3 significant figures • Round numbers to two or three decimal places • Write numbers as a decimal number of millions or thousands e.g. 23 600 000 as 23.6 million	• Decimal and fraction equivalents • Fractions as division • Understanding what percentage are • Converting fractions to percentages • Finding equivalent fractions, decimal and percentages; • Ordering fractions, decimals and percentages •	Decimals serve as a foundation for understanding more complex arithmetic operations involving fractions, percentages, and ratios. Students can apply decimal skills extensively in algebraic expressions, equations, and geometric calculations.	PRIDE values Prepare for challenge. Developing skills for the future	**Sustainability**: self esteem and participation **Sustainability**: responsibility and creativity

		- Round to an appropriate number of decimal places after calculations, e.g. money problems after division, perimeter when using the pi key and a radius in cm etc. - Work with numbers rounded to whole numbers or to 1 or two decimal places to estimate solutions, e.g. average populations of cities under certain effects. - Add and subtract more than two integers or decimals with up to two decimal places, but with varying numbers of significant figures and using a mixture of operations within the calculation - Use standard column procedures to add and subtract integers and decimals of any size, including a mixture of large and small numbers with differing numbers of decimal places - Subtract integers and decimals with up to two decimal places, but with varying numbers of significant figures - Extend written methods to U.t × U - Multiply and divide decimals with one or two places by single-digit whole numbers - Use mental strategies for multiplication - partitioning two 2 digit numbers where one number includes a decimal (both numbers have two significant figures) - Multiply integers and decimals including by decimals such as 0.6 and 0.06, 0.t × 0.t or 0.t × 0.0h, 0.0h × 0.t and 0.0h × 0.0h				

		- Multiply and divide by decimals, dividing by transforming to division by an integer - Understand the effect of multiplying a positive number by a decimal less than 1 - Use mental strategies for multiplication of decimals - doubling and halving strategies - Understand where to position the decimal point by considering equivalent calculations which are given - Use knowledge of place value to calculate the product of two decimals where one or both are less than 1 and at least one has two digits other than zero - Multiply any number by 0.1 and 0.01 - Know there are different ways of finding an approximate answer - Divide integers and decimals including by decimals such as 0.6 and 0.06 divisions related to 0.t × 0.t or 0.t × 0.0h, 0.0h × 0.t and 0.0h × 0.0h - Use knowledge of place value to calculate the division of two decimals where both are less than 1 and at least the first has two digits other than zero - Multiply and divide by decimals, dividing by transforming to division by an integer - Divide £.p by a two digit number to give £.p - Multiply and divide decimals with one or two places by single-digit whole numbers - Divide decimals with one or two places by single-digit whole numbers				

		- Understand that dividing by 0.1 or 0.01 are equivalent to dividing by 1/10th or 1/100th or multiplying by 10 or 100 - Divide any number by 0.1 and 0.01 - Know there are different ways of finding an approximate answer - Recall of equivalent fractions, decimals and percentage including for fractions that are greater than 1. Match across all 3 types, and need to be simple fractions (1/2, 1/4, 1/5, 1/10) - Use the equivalence of fractions, decimals and percentages to compare proportions - Find equivalent fractions, decimals and percentages where percentages end in 0.5 - Use strategies for finding equivalent fractions, decimals and percentages involving decimal percentages and decimals greater 0 - Order fractions by converting them to decimals or otherwise - Simplify converted terminating decimal to fraction convert a terminating decimal to a fraction and simplify the fraction - Write terminating decimals as fractions - Interpret rounded off recurring decimals displayed on a calculator as fractions – 2/3, 1/6, 1 2/3, 1 1/6 - Convert terminating decimals to fractions really means like 0.745 = 745/1000, not 0.5 = 1/2 - Extend the percentage calculation strategies with jottings to find any percentage			

		- Express one given number as a percentage of another - Find the outcome of a given percentage increase - Find the outcome of a given percentage decrease - Use a unitary method - Have strategies for calculating fractions and decimals of a given number				
Equations	4	- Solve simple linear equations with integer coefficients, of the form $ax = b$ or $x +/- b = c$ e.g. $2x = 18$, $x + 7 = 12$ or $x - 3 = 15$ - Solve simple two-step linear equations with integer coefficients, of the form $ax + b = c$ e.g. $3x + 7 = 25$ - Substitute integers into formulae to give equations and solve - Solve linear equations of the form $ax +/- b = cx +/- d$ - Solve equations of the form $a(x +/- b) = c(x +/- d)$ [a or c can be 1] - Find a positive and negative square root as a solution of an equation involving x^2 - Construct and solve equations of the form $a(x +/- b) = c(x +/- d)$ [a or c can be 1] - Use systematic trial and improvement to find the approximate solution to one decimal place of equations such as $x^3 + x = 50$	- expressions - Substitution - Formula - Form equations - Solving step 1 equations - Solving step 2 equations - Finding pairs of values - Solving problems with two unknowns.	Mastering equations from Year 7 serves as a springboard for advanced topics. Students progress to systems of equations, quadratic equations, and polynomial equations.	PRIDE values Prepare for challenge. Developing skills for the future	**Sustainability**: self esteem and participation **Sustainability**: responsibility and creativity
Multiplicative reasoning	4	- Reduce a ratio to its simplest form - Reduce a three part ratio to its simplest form by cancelling - Simplify a ratio expressed in fractions or decimals		Mastery of multiplicative reasoning enhances problem-solving skills and facilitates mathematical	PRIDE values Prepare for challenge.	**Sustainability**: self esteem and participation **Sustainability**: responsibility and creativity

		• Convert between larger area measures to smaller ones (e.g. cm² to mm²) • Increase the knowledge of standard metric units to include tonne, hectare • Simplify a ratio expressed in different units • Compare ratios by changing them to the form 1:m or m:1 • Divide a quantity into two parts in a given ratio, where ratio given in ratio notation • Divide a quantity into more than 2 parts in a given ratio • Write ratios as fractions, percentages • Understand the relationship between ratio and proportion (convert proportions to ratios) • Solve word problems involving direct proportion • Use the unitary method to solve simple word problems involving ratio and direct proportion • Relate the language of ratios and the associated calculations to the arithmetic of fractions and to linear functions		fluency across disciplines. This works as groundwork for advanced mathematical concepts which includes topics such as algebraic expressions, equations, and inequalities, geometric transformations and similarity, as well as applications in finance, physics, and engineering.	Developing skills for the future	
Perimeter, area and volume	5	• Find the area of triangles by counting i.e. adding full and partial squares • Use a formula to calculate the area of triangles • Deduce a formula for the area of a triangle • Use a formula to calculate the area of parallelograms • Deduce and use the formula for the area of a parallelogram • Deduce a formula for the area of a trapezium	• Shapes with the same area • Area and perimeter-counting squares • Area and perimeter - rectilinear shapes • Area of triangles • Area of parallelograms	Mastering perimeter, area, and establishes a basis for mathematical concepts which include using formulas for calculating areas and volumes of shapes, applying basic algebraic principles to solve	PRIDE values Prepare for challenge. Developing skills for the future	**Sustainability**: self esteem and participation **Sustainability**: responsibility and creativity

		- Calculate the area of more complex shapes made from rectangles - Calculate the perimeter and area of shapes made from rectangles - Calculate areas of compound shapes made from rectangles and triangles - Know and use geometric properties of cuboids - Identify more complex nets of 3D shapes including irregular polyhedra - Know and use geometric properties of shapes made from cuboids - Know and use the formula for the volume of a cuboid - Calculate volumes of shapes made from cuboids, for lengths given as whole numbers - Calculate the surface area of cubes, without a net - Use nets to calculate the surface area of simple cuboids - Calculate the surface area of simple cuboids (without use of nets) - Calculate surface areas of shapes made from cuboids, for lengths given as whole numbers - Convert cm3 to ml and litres and vice versa - Convert between area measures (e.g. mm² to cm², cm² to m², and vice versa) - Convert between volume measures (e.g. mm³ to cm³, cm³ to m³, and vice versa) - Know rough metric equivalents of imperial measures in daily use (feet, miles, pounds, pints, gallons)	- Volume-counting cubes - Volume of a cuboid	geometric problems, and exploring real-world applications in fields like construction and geometry	

| Sequences and graphs | 5 | Understand the infinite nature of a set of integers Know that an arithmetic sequence is generated by a starting number a, then adding a constant number d Generate terms of a linear sequence using term to term using positive or negative integers Find a term given its position in a sequences like 10th number in 4× table is 40 (one operation on n) Recognise geometric sequences and other sequences that arise. Begin to use a linear expression to describe the nth term in a one-step arithmetic sequence Generate terms of a linear sequence using position to term with positive integers using the nth term. Begin to use linear expressions to describe the nth term in a two step arithmetic sequence (e.g nth term is 3n + 1 or 2n – 3) Generate terms of a linear sequence using position to term with negative integers Begin to use formal algebra to describe the nth term in an arithmetic sequence Generate and describe integer sequences such as powers of 2 and growing rectangles Generate terms from a complex practical context (e.g maximum crossing for a given number of lines) Predict how the sequence will continue and test for several more terms. | 1 step function machines 2 step function machines | This will lead to non linear patterns. | PRIDE values

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		- Find the term-to-term rule for geometric sequences and continue to the next few terms - Read x and y co-ordinates in all four quadrants - Plot a coordinate in all four quadrants - Know how to find the midpoint of a line segment - Recognise straight line graphs parallel to x or y axis - Find the midpoint of a horizontal or vertical line segment AB, using coordinates of these points (no diagrams) - Find the midpoint of a diagonal line segment AB using the coordinate of these points (no diagrams) - Plot a graph of a simple linear function in the first quadrant. - Compare graphs of simple functions - Generate four quadrant coordinate pairs of simple linear functions - In tables of functions compare changes in y with corresponding changes in x and how this relates to the function - Plot and recognise graphs of y = x and y = –x - Plot the graphs of simple linear functions in the form y = mx + c in four quadrants				
Introduction to standard form	5	- Write numbers greater than 10 in standard form - Write number less than 10 in standard form - Order numbers written in standard form	- Numbers to 10,000,000- reading, writing, comparing, ordering	Doing arithmetic using standard form. Calculating in standard form using a calculator.	PRIDE values Prepare for challenge. Developing skills for the future	**Sustainability**: self esteem and participation **Sustainability**: responsibility and creativity

			• Comparing and ordering any integers • Rounding any integer • Powers of 10			