



Cardinal Newman School: Medium Term Plan Maths Year 8

Year 8		Half Term 1.1			
Topics/ Skills	Prior Learning:	Next Steps:	National Curriculum links:	Key Words/ Vocabulary:	Mathswatch videos:
Numeracy: <ul style="list-style-type: none"> - To use clear written methods for addition and subtraction of integers and decimals, including money - To develop clear written methods for multiplication of integers and decimals - To develop a clear written method for division for integers and decimals - To Calculate using the order of operations (BIDMAS) 	KS2: Multiplication and Division of decimals by an integer Y7 Summer 3.1 Decimals and Rounding	Y9 Autumn 1.1 Decimals and Fractions Y9 Autumn 1.1 Number and Indices	<ul style="list-style-type: none"> • understand and use place value for decimals, measures and integers of any size • use the four operations, including formal written methods, applied to integers, decimals • use conventional notation for the priority of operations, including brackets, powers, roots and reciprocals 	<ul style="list-style-type: none"> - Integer - Decimal - BIDMAS - Addition - Subtraction - Multiplication - Division 	N13a N13b N14a N14b N15a N15b N16 N20 N28a N28b N29a N29b N40a N40b
Factors, Multiples and Primes: <ul style="list-style-type: none"> - To systematically list factors and multiples of integers - To find the HCF and LCM through listing, include worded LCM - To express a number as a product of prime factors - To use prime factors to find HCF and LCM 	KS2: Listing of factors and multiples	Y9 Autumn 1.1 Number and Indices	<ul style="list-style-type: none"> • use the concepts and vocabulary of prime numbers, factors (or divisors), multiples, common factors, common multiples, highest common factor, lowest common multiple, prime factorisation, including using product notation and the unique factorisation property 	<ul style="list-style-type: none"> - Factor - Multiple - Highest Common Factor - Lowest Common Multiple - Prime - Prime Factor 	N10 N11 N30a N30b N31a N31b
Pitstop: Numeracy & Factors, Multiples, Primes					
Algebraic Manipulation: <ul style="list-style-type: none"> - To substitute into formulae - To collect like terms to simplify expressions - To expand single brackets 	Y7 Autumn 1.2 Algebraic Manipulation	Y9 Autumn 1.1 Algebra	<ul style="list-style-type: none"> • use and interpret algebraic notation • substitute numerical values into formulae and expressions, including scientific formulae 	<ul style="list-style-type: none"> - Substitute - Formula - Expand - Factorise 	A6 A7a A7b A8



<ul style="list-style-type: none"> - To factorise algebraic expressions - To expand then simplify two single brackets - To expand a pair of brackets 			<ul style="list-style-type: none"> • understand and use the concepts and vocabulary of expressions, equations, ..., terms and factors • simplify and manipulate algebraic expressions to maintain equivalence by: collecting like terms, multiplying a single term over a bracket, taking out common factors, expanding products of two or more binomials 	<ul style="list-style-type: none"> - Simplify - Expression - Quadratic 	<p>A9 A10 A18</p>
<p>Rounding:</p> <ul style="list-style-type: none"> - To round to nearest whole, ten or hundred, or thousand - To round to a given number of decimal places - To round to significant figures - To estimate results of calculations by rounding numbers to appropriate values - To write Error Intervals 	Y7 Summer 3.1 Decimals and Rounding	KS4 Number	<ul style="list-style-type: none"> • round numbers and measures to an appropriate degree of accuracy [for example, to a number of decimal places or significant figures] • use approximation through rounding to estimate answers and calculate possible resulting errors expressed using inequality notation 	<ul style="list-style-type: none"> - Round - Decimal Place - Significant Figure - Estimate - Error Interval 	<p>N27a N27b N38 N43a N43b</p>
<p>Fractions:</p> <ul style="list-style-type: none"> - To simplify fractions and convert between equivalent fractions - To use the four operations with fractions (including mixed numbers) - To find a fraction of an amount 	Y7 Spring 2.2 Fractions	Y9 Autumn 1.1 Decimals and Fractions	<ul style="list-style-type: none"> • use the four operations, including formal written methods, applied to ... proper and improper fractions, and mixed numbers • interpret fractions ... as operators 	<ul style="list-style-type: none"> - Fraction - Simplify - Equivalent - Mixed Number - Improper Fraction 	<p>N23b N23c N33 N34 N35 N36 N41 N42a N42b</p>
Pitstop: Algebra, Rounding, Fractions					
<p>Ratio:</p> <ul style="list-style-type: none"> - To know how to use ratio notation and simplify ratio. - To convert between fractions and ratio - To write ratios in the form $l:n$ and $n:l$ 	Y7 Autumn 1.1 Ratio	Y9 Spring 2.1 Ratio and Proportion	<ul style="list-style-type: none"> • use ratio notation, including reduction to simplest form • divide a given quantity into two parts in a given part:part or part:whole ratio; 	<ul style="list-style-type: none"> - Ratio - Simplify - Part - Difference - Convert 	<p>R1a R1b R5a R5b</p>



<ul style="list-style-type: none"> - To divide a given quantity into two or more parts - To solve ratio problems given one part - To solve ratio problems given the difference between parts 			<p>express the division of a quantity into two parts as a ratio</p> <ul style="list-style-type: none"> • understand that a multiplicative relationship between two quantities can be expressed as a ratio or a fraction • relate the language of ratios and the associated calculations to the arithmetic of fractions and to linear functions 		
Year 8			Half Term 1.2		
Topics/ Skills	Prior Learning:	Next Steps:	National Curriculum links:	Key Words/ Vocabulary:	Mathswatch videos:
Indices: <ul style="list-style-type: none"> - To know the different types of numbers including Squares, Cubes and Roots - To use the index laws to simplify expressions - To understand and calculate negative indices (Sets 1-2) 	KS2: Squares and Cubes of a number Y7 Autumn 1.2 Algebraic Manipulation	Y9 Autumn 1.1 Number and Indices	<ul style="list-style-type: none"> • use integer powers and associated real roots (square, cube and higher), recognise powers of 2, 3, 4, 5 and distinguish between exact representations of roots and their decimal approximations 	<ul style="list-style-type: none"> - Square - Cube - Power - Root - Indices 	N25 A7a
Pitstop: Ratio & Indices					
Sequences: <ul style="list-style-type: none"> - To explore arithmetic and geometric sequences - To be able to generate a sequence given the nth term - To find the nth term of a linear sequence. - To solve sequences problems (pattern sequences etc) 	Y7 Spring 2.2 Sequences	Y9 Autumn 1.1 Sequences	<ul style="list-style-type: none"> • generate terms of a sequence from either a term-to-term or a position-to-term rule • recognise arithmetic sequences and find the nth term • recognise geometric sequences and appreciate other sequences that arise. 	<ul style="list-style-type: none"> - Sequence - Generate - Arithmetic - Geometric - Nth term - Linear 	A11b A11c A22 N12
Autumn Assessment					
Solving Equations: <ul style="list-style-type: none"> - To solve one and two-step equations - To solve equations with variables on both sides - To form and solve equations from worded problems 	Y7 Autumn 1.2 Solving Equations	Y9 Spring 2.1 Equations	<ul style="list-style-type: none"> • use algebraic methods to solve linear equations in one variable (including all forms that require rearrangement) • model situations or procedures by translating them into algebraic expressions or formulae 	<ul style="list-style-type: none"> - Solve - Equation - Variable - Form 	A12 A17 A19a A19b



Pitstop: Sequences & Solving Equations

<p>Volume:</p> <ul style="list-style-type: none"> - To review area of 2D shapes - To calculate the volume of a cuboid - To calculate volume of prisms - To calculate the volume of cylinders 	<p>KS2: Volume of a cuboid</p> <p>Y7 Spring 2.1 Area and Perimeter</p>	<p>Y9 Autumn 1.2 Area and Volume</p>	<ul style="list-style-type: none"> • derive and apply formulae to calculate and solve problems involving: perimeter and area of triangles, parallelograms, trapezia, volume of cuboids (including cubes) and other prisms (including cylinders) 	<ul style="list-style-type: none"> - Area - Parallelogram - Trapezium - Volume - Cuboid - Prism - Cylinder 	<p>G20a G20b G20c G20d G21a G22b G25a</p>
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Year 8

Half Term 2.1

Topics/ Skills	Prior Learning:	Next Steps:	National Curriculum links:	Key Words/ Vocabulary:	Mathswatch videos:
<p>Pythagoras' Theorem:</p> <ul style="list-style-type: none"> - To find the hypotenuse using Pythagoras' Theorem - To find a shorter side using Pythagoras' Theorem - To find the length of a line segment using Pythagoras Theorem (Sets 1-2) 	<p>Knowledge of shape from KS2 and Y7</p>	<p>Y9 Summer 3.1 Pythagoras Theorem</p> <p>Y9 Summer 3.1 Trigonometry</p>	<ul style="list-style-type: none"> • use Pythagoras' Theorem ... to solve problems involving right-angled triangles 	<ul style="list-style-type: none"> - Triangle - Hypotenuse - Pythagoras' Theorem - Line segment 	<p>G30</p>

Pitstop: Volume & Pythagoras

<p>Graphs:</p> <ul style="list-style-type: none"> - To read and plot coordinates in four quadrants - To plot and recognise the graphs of vertical and horizontal lines - To plot linear graphs using a table of values - To find the gradient of a line on a graph - To find the equation of a line on a graph 	<p>Y7 Spring 2.1 Graphs</p>	<p>Y9 Summer 3.1 Graphs</p>	<ul style="list-style-type: none"> • work with coordinates in all four quadrants • recognise, sketch and produce graphs of linear ... functions of one variable with appropriate scaling, using equations in x and y and the Cartesian plane • interpret mathematical relationships both algebraically and graphically • reduce a given linear equation in two variables to the standard form $y = mx + c$; calculate and interpret gradients and intercepts of graphs of such linear equations numerically, graphically and algebraically 	<ul style="list-style-type: none"> - Coordinate - Linear - Vertical - Horizontal - Gradient - y-intercept - Equation 	<p>A1b A5 A14a A14b A14c</p>
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<p>Transformations:</p> <ul style="list-style-type: none"> - To describe translations using column vectors - To perform translations on a coordinate grid - To understand scale factors - To enlarge shapes from a given centre of enlargement - To describe enlargements from a given centre 	<p>Y7 Spring 2.1 Transformations</p> <p>Y8: Graphs</p>	<p>Y9 Summer 3.1 Transformations</p>	<ul style="list-style-type: none"> • identify properties of, and describe the results of, translations... applied to given figures • construct similar shapes by enlargement, with and without coordinate grids 	<ul style="list-style-type: none"> - Translation - Column vector - Scale Factor - Enlargement - Centre - Describe 	<p>G5 G28</p>
Pitstop: Graphs & Transformations					
<p>Percentages (Calculator):</p> <ul style="list-style-type: none"> - To find percentages of amounts (using a calculator) - To increase or decrease an amount by a percentage - To calculate percentage change - To calculate simple interest 	<p>Y7 Summer 3.1 Percentages (Non-Calc)</p> <p>Y7 Autumn 1.1 Calculator Skills</p>	<p>Y9 Spring 2.2 Percentages</p>	<ul style="list-style-type: none"> • define percentage as 'number of parts per hundred', interpret percentages and percentage changes as a fraction or a decimal, interpret these multiplicatively, express one quantity as a percentage of another, compare two quantities using percentages, and work with percentages greater than 100% • interpret ... percentages as operators • solve problems involving percentage change, including: percentage increase, decrease ... and simple interest in financial mathematics 	<ul style="list-style-type: none"> - Fraction - Decimal - Percentage - Increase - Decrease - Profit - Loss - Simple Interest 	<p>N24b N39b R7 R9a</p>
Year 8		Half Term 2.2			
Topics/ Skills	Prior Learning:	Next Steps:	National Curriculum links:	Key Words/ Vocabulary:	Mathswatch videos:
<p>Probability:</p> <ul style="list-style-type: none"> - To list outcomes systematically and understand probability scale - To calculate probabilities, including using rules of mutually exclusive events - To interpret and use sample space diagrams - To calculate expected frequency - To find probability from a 2-way table 	<p>Y7 Summer 3.1 Probability</p>	<p>KS4 Probability</p>	<ul style="list-style-type: none"> • record, describe and analyse the frequency of outcomes of simple probability experiments involving randomness, fairness, equally and unequally likely outcomes, using appropriate language and the 0-1 probability scale 	<ul style="list-style-type: none"> - Probability - Likely - Unlikely - Certain - Impossible - Mutually exclusive 	<p>P1 P2a P2b P3 P4 P5 P7</p>



			<ul style="list-style-type: none"> understand that the probabilities of all possible outcomes sum to 1 generate theoretical sample spaces for single and combined events with equally likely, mutually exclusive outcomes and use these to calculate theoretical probabilities. 	<ul style="list-style-type: none"> Expected Frequency Sample space diagram 2-way table 	
Pitstop: Percentages & Probability					
Spring Assessment					
<p>Standard Form:</p> <ul style="list-style-type: none"> To review simplification of indices To convert numbers between whole numbers and standard form and vice versa To convert between decimal numbers and standard form using negative indices To add and subtract in Standard Form To multiply and divide in Standard Form 	Y8 Indices	Y9 Summer 3.1 Standard Form	<ul style="list-style-type: none"> interpret and compare numbers in standard form $A \times 10^n$ $-1 \leq A < 10$, where n is a positive or negative integer or zero 	<ul style="list-style-type: none"> Indices Standard Form Decimal 	N45a N45b
<p>Angles:</p> <ul style="list-style-type: none"> To know the angle rules including angles on a line, at a point and in a triangle. To calculate angles in isosceles and equilateral triangles To calculate the sum of interior angles in a polygon To calculate exterior angles in regular polygons To discover the rules of angles in parallel lines 	Y7 Autumn 1.1 Angles	Y9 Autumn 1.1 Angles	<ul style="list-style-type: none"> describe, sketch and draw using conventional terms and notations: points, lines, parallel lines, perpendicular lines, right angles, regular polygons, and other polygons that are reflectively and rotationally symmetric use the standard conventions for labelling the sides and angles of triangle ABC derive and illustrate properties of triangles, quadrilaterals, circles, and other plane figures [for example, equal lengths and angles] using appropriate language and technologies 	<ul style="list-style-type: none"> Angle Isosceles Equilateral Scalene Quadrilateral Polygon Interior Exterior Parallel Corresponding Alternate Co-interior 	G13 G14 G16 G17 G18 G19



			<ul style="list-style-type: none"> • apply the properties of angles at a point, angles at a point on a straight line, vertically opposite angles • understand and use the relationship between parallel lines and alternate and corresponding angles • derive and use the sum of angles in a triangle and use it to deduce the angle sum in any polygon, and to derive properties of regular polygons 	
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Pitstop: Standard Form & Angles

Year 8	Half Term 3.1
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Topics/ Skills	Prior Learning:	Next Steps:	National Curriculum links:	Key Words/ Vocabulary:	Mathswatch videos:
<p>Charts and Diagrams:</p> <ul style="list-style-type: none"> - To construct and interpret bar charts - To draw and interpret compound and dual bar charts - To construct pie charts - To interpret pie charts - To plot scatter graphs and discuss correlation including lines of best fit - To use a line of best fit to estimate results - To complete and interpret Venn Diagrams, including understanding set notation 	Y7 Spring 2.2 Charts and Diagrams	Y9 Autumn 1.2 Charts and Diagrams Y9 Summer 3.2 Data Representation	<ul style="list-style-type: none"> • describe, interpret and compare observed distributions of a single variable through: appropriate graphical representation involving discrete, continuous and grouped data • construct and interpret appropriate tables, charts, and diagrams, including ..., bar charts, pie charts, and pictograms for categorical data, and vertical line (or bar) charts for ungrouped and grouped numerical data • describe simple mathematical relationships between two variables (bivariate data) in observational and experimental contexts and illustrate using scatter graphs. • enumerate sets and unions/intersections of sets systematically, using tables, grids and Venn diagrams 	<ul style="list-style-type: none"> - Bar Chart - Dual Bar Chart - Compound Bar Chart - Pie Chart - Scatter Graph - Line of best fit - Correlation - Venn Diagram - Intersection - Union - Complement 	S2a S2b S8 S9 P6



<p>Averages:</p> <ul style="list-style-type: none"> - To review calculating the Mode, Median, Mean and Range from a list - To find the mean and mode from a frequency table - To find the median and range from a frequency table 	<p>Y7 Summer 3.2 Averages</p>	<p>Y9 Spring 2.2 Averages</p>	<ul style="list-style-type: none"> • describe, interpret and compare observed distributions of a single variable through appropriate measures of central tendency (mean, mode, median) and spread (range, consideration of outliers) • construct and interpret appropriate tables, charts, and diagrams, including frequency tables 	<ul style="list-style-type: none"> - Mode - Median - Mean - Range - Frequency Table 	<p>S3 S6 S7 S10a</p>
Pitstop: Charts and Diagrams & Averages					
<p>Rearranging Formulae:</p> <ul style="list-style-type: none"> - To review solving equations - To rearrange simple formulae - To rearrange formulae, including ones with brackets and fractions - To rearrange formula including the use of factorisation (Sets 1-2) 	<p>Y8 Algebraic Manipulation</p> <p>Y8 Solving Equations</p>	<p>Y9 Spring 2.1 Equations</p> <p>Y9 Summer 3.2 Simultaneous Equations</p> <p>KS4: Further rearrangement involving algebraic fractions</p>	<ul style="list-style-type: none"> • understand and use standard mathematical formulae; rearrange formulae to change the subject 	<ul style="list-style-type: none"> - Equation - Factorise - Formula - Rearrange - Subject 	<p>A13a A13b</p>
<p>Inequalities:</p> <ul style="list-style-type: none"> - To solve simple inequalities - To solve inequalities with unknowns on both sides - To draw and interpret inequalities on number lines - To find integer solutions to inequalities - To form and solve inequalities from worded problems (Sets 1-2) 	<p>Y8 Solving Equations</p>	<p>Y9 Spring 2.1 Inequalities</p>	<ul style="list-style-type: none"> • understand and use the concepts and vocabulary of expressions, equations, inequalities, terms and factors • model situations or procedures by translating them into algebraic expressions or formulae 	<ul style="list-style-type: none"> - Inequality - Solve - Integer - Number Line 	<p>A20a A20b</p>
Pitstop: Rearranging Formulae & Inequalities					
Year 8		Half Term 3.2			



Topics/ Skills	Prior Learning:	Next Steps:	National Curriculum links:	Key Words/ Vocabulary:	Mathswatch videos:
Measures: <ul style="list-style-type: none"> - To convert between metric units of length - To convert between metric units of area and volume - To convert between units of time and to calculate speed - To calculate time and distance - To calculate density , volume and mass - To calculate force, pressure, and area (sets 1-2) 	Y7 Summer 3.2 Measures	Y9 Spring 2.1 Measures	<ul style="list-style-type: none"> • use standard units of mass, length, time, money and other measures, including with decimal quantities • change freely between related standard units [for example time, length, area, volume/capacity, mass] • use compound units such as speed, unit pricing and density to solve problems. 	<ul style="list-style-type: none"> - Metric - Unit - Length - Area - Volume - Speed - Distance - Time - Density - Mass - Force - Pressure 	N7a N7b R11a R11b
Summer Assessment					
Constructions and Loci: <ul style="list-style-type: none"> - To construct angles and special types of triangles - To construct angle and line bisectors - To construct a perpendicular from a point to a line - To know how to construct simple loci - To use map scales to find real life distances - To prove congruence in triangles using ASA, SSS and RHS. 	Y7 Autumn 1.1 Angles Y8 Angles	KS4 Constructions and Further Loci	<ul style="list-style-type: none"> • derive and use the standard ruler and compass constructions (perpendicular bisector of a line segment, constructing a perpendicular to a given line from/at a given point, bisecting a given angle); recognise and use the perpendicular distance from a point to a line as the shortest distance to the line • to know and use the criteria for congruence of triangles • identify and construct congruent triangles, and construct similar shapes by enlargement, with and without coordinate grids • draw and measure line segments and angles in geometric figures, including interpreting scale drawings 	<ul style="list-style-type: none"> - Compasses - Bisector - Perpendicular - Loci - Scale - Congruence 	G26a G26b G26c G27 G31 R6
Pitstop: Measures & Constructions and Loci					



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