

# NORTHERN LEADERS TRUST LEARNING JOURNEY - Maths



	Term 1		Term 2		Term 3	
Year 7	Algebraic Thinking	Place value and proportion	Line and Angles	Directed Numbers and Fractional Thinking	Application of Number	Reasoning with Number
<b>HPA</b>	<p><u>HPA:</u> <b>Algebra:</b> Arithmetic sequences Geometric sequences Test conjectures about patterns and relationships Graphs of linear functions Interpret algebraic notation Solve linear equations</p> <p><b>Number:</b> Estimation Rounding to significant figures</p>	<p><u>HPA:</u> <b>Number:</b> Standard Form Comparing numbers using inequality notation Median and Range Ordering positive and negative integers, decimals and fractions Convert between fractions, decimals and percentages, including recurring decimals Comparing using percentages</p>	<p><u>HPA:</u> <b>Geometry:</b> Use the correct notation for labelling lines and angles Classify angles Draw and measure angles up to 360 degrees Identify perpendicular and parallel lines Solve problems involving angles in triangles and quadrilaterals Identify polygons up to a decagon Construct polygons Investigate angles in parallel lines</p>	<p><u>HPA:</u> <b>Number:</b> Add and subtract directed numbers Multiply and divide directed numbers Understand square roots of positive numbers Explore powers and roots Add and subtract mixed numbers</p> <p><b>Algebra:</b> Solve two step equations Add and subtract algebraic fractions</p>	<p><u>HPA:</u> <b>Number:</b> Addition and subtraction of decimals Solving problems in context Financial maths problems Solve problems with timetables Draw and interpret frequency trees Adding and subtracting numbers in standard form Multiply by 0.1 and 0.01 Solve problems involving area including trapezia</p>	<p><u>HPA:</u> <b>Statistics:</b> Interpret and create Venn diagrams Understand and use the complement of a set Solve problems involving probability</p> <p><b>Number:</b> Find the HCF and LCM Write a number as a product of its prime factors Use a Venn diagram to calculate HCF and LCM</p>
	Term 1		Term 2		Term 3	
Year 7	Algebraic Thinking	Place value and proportion	Line and Angles	Directed Numbers and Fractional Thinking	Application of Number	Reasoning with Number
<b>MPA</b>	<p><u>MPA:</u> <b>Algebra:</b> Numerical sequences Diagrammatic representations of sequences</p>	<p><u>MPA:</u> <b>Number:</b> Place value including decimals Median and Range</p>	<p><u>MPA:</u> <b>Geometry:</b> Use the correct notation for labelling angles</p>	<p><u>MPA:</u> <b>Number:</b> Order directed numbers Convert between mixed numbers and improper fractions</p>	<p><u>MPA:</u> <b>Number:</b> Addition and subtraction of integers and decimals Interpret a frequency tree</p>	<p><u>MPA:</u> <b>Statistics:</b> Understand and use set notation Understand and use union of sets</p>

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	<p>Recognise arithmetic sequences Recognise geometric sequences Use algebraic notation Solve one and two step linear equations</p> <p><b>Number:</b> Rounding to decimal places and 1 significant figure Estimations</p>	<p>Ordering positive and negative integers and decimals Convert between fractions, decimals and percentages Calculating percentages</p>	<p>Measure and draw an angle up to 180 degrees Recognise different quadrilaterals Construct triangles using SSS, SAS and ASA Calculate the angles in triangles and quadrilaterals</p>	<p>Add and subtract unit fractions with different denominators</p> <p><b>Algebra:</b> Solve two step equations Use fractions in algebraic contexts</p>	<p>Multiply and divide by integers and decimals by powers of 10 Solve problems involving area of rectangles and triangles</p>	<p>Generate sample spaces for single events</p> <p><b>Number:</b> Identify prime numbers Identify common factors and multiples</p>
	<b>Term 1</b>		<b>Term 2</b>		<b>Term 3</b>	
<b>Year 7</b>	<b>Algebraic Thinking</b>	<b>Place value and proportion</b>	<b>Line and Angles</b>	<b>Directed Numbers and Fractional Thinking</b>	<b>Application of Number</b>	<b>Reasoning with Number</b>
<b>LPA</b>	<p><u>LPA:</u> <b>Algebra:</b> Numerical sequences Patterns in sequences Recognise algebraic notation Solve one and two step linear equations</p> <p><b>Number:</b> Rounding to the nearest integer Estimations involving integers</p>	<p><u>LPA:</u> <b>Number:</b> Using number lines Place value Median and Range Ordering positive and negative integers Convert between fractions, decimals and percentages Percentages of an amount</p>	<p><u>LPA:</u> <b>Geometry:</b> Use the correct notation for labelling a line Measure an angle up to 180 degrees Recognise different triangles and quadrilaterals Construct triangles using SSS Calculate angles at a point</p>	<p><u>LPA:</u> <b>Number:</b> Understand directed numbers To recognise a fraction in a diagram Add and subtract unit fractions with the same denominator</p> <p><b>Algebra:</b> Solve one step equations</p>	<p><u>LPA:</u> <b>Number:</b> Properties of addition and subtraction Interpret a timetable Understand and use multiples Calculate the area of a rectangle</p>	<p><u>LPA:</u> <b>Statistics:</b> Identify and represent sets Know and use the vocabulary of probability Calculate the probability of a single event</p> <p><b>Number:</b> Find and use multiples Identify factors</p>

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	Term 1		Term 2		Term 3	
Year 8	Proportional Reasoning	Representation	Algebraic Techniques	Developing Number	Angles and Area	Data Handling
<b>HPA</b>	<p><u>HPA:</u> <b>Number:</b> Scale diagrams Maps Dividing a ratio Direct and Inverse Proportion Multiple and divide decimals Calculations involving positive and negative mixed numbers</p>	<p><u>HPA:</u> <b>Algebra:</b> Equation of a line Mid-point of a line Length of a line segment Quadratic functions Substitution into formulae</p> <p><b>Statistics:</b> Frequency diagrams Pie charts Grouped data Scatter graphs</p> <p><b>Probability:</b> Sample space diagrams Mutually exclusive outcomes</p>	<p><u>HPA:</u> <b>Algebra:</b> Collecting like terms including quadratic Expanding binomials Solve linear equations up to unknowns on both sides Solve and interpret inequalities Find the nth term of an arithmetic sequence Recognise geometric sequences Work with indices including calculating powers</p>	<p><u>HPA:</u> <b>Number:</b> Convert between fractions and decimals Percentage change Operations with fractions Interpret and compare numbers in standard form Negative and fractional indices Round numbers to a given number of significant figures Estimation Error intervals using inequalities</p>	<p><u>HPA:</u> <b>Geometry:</b> Angle reasoning Alternate and corresponding angles Angle proof Angles in a polygon Construct a triangle Area of a circle Area of composite shapes Describe and draw a reflection</p>	<p><u>HPA:</u> <b>Statistics:</b> Working with continuous and grouped data Draw and interpret pie charts Calculate averages including range and outliers</p>
	Term 1		Term 2		Term 3	
Year 8	Proportional Reasoning	Representation	Algebraic Techniques	Developing Number	Angles and Area	Data Handling
<b>MPA</b>	<p><u>MPA:</u> <b>Number:</b> Scale factors Simplifying a ratio Writing a ratio as a fraction</p>	<p><u>MPA:</u> <b>Algebra:</b> Straight Line graphs Recognise quadratic functions</p>	<p><u>MPA:</u> <b>Algebra:</b> Collecting like terms in two or more variables Expanding single brackets</p>	<p><u>MPA:</u> <b>Number:</b> Identify fractions and corresponding decimals</p>	<p><u>MPA:</u> <b>Geometry:</b> Angle properties Recognise angles on parallel lines Angles in a triangle</p>	<p><u>MPA:</u> <b>Statistics:</b> Working with discrete and continuous data</p>

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	Dividing a ratio Direct Proportion Multiple and divide decimals Calculations involving mixed numbers	Substitution into expressions  <b>Statistics:</b> Frequency diagrams Pie charts Bar charts  <b>Probability:</b> Probability scales Equally likely outcomes	Solve 3 step linear equations Recognise and solve inequalities Find the nth term of an arithmetic sequence Interpret and use the index laws	Percentage of another Write a number in standard form Round to decimal places Estimation	Solve problems involving perimeter an area of triangles, parallelograms and trapezia Area of a circle Draw a reflection	Draw and interpret frequency tables and bar charts Calculate averages; mean, median and mode
	<b>Term 1</b>		<b>Term 2</b>		<b>Term 3</b>	
<b>Year 8</b>	<b>Proportional Reasoning</b>	<b>Representation</b>	<b>Algebraic Techniques</b>	<b>Developing Number</b>	<b>Angles and Area</b>	<b>Data Handling</b>
<b>LPA</b>	<u>LPA:</u> <b>Number:</b> Use scale diagrams Write a ratio Divide a ratio involving integers Multiple and divide decimals by an integer Calculations involving unit fractions	<u>LPA:</u> <b>Algebra:</b> Lines parallel to the axis Substitute into 1 and 2 variable expressions  <b>Statistics:</b> Pictograms Bar Charts  <b>Probability:</b> Probability scale using words	<u>LPA:</u> <b>Algebra:</b> Collecting like terms in one variable Expanding single brackets Solve 2 step linear equations Recognise and interpret inequalities Recognise arithmetic sequences Recognise and use the index laws	<u>LPA:</u> <b>Number:</b> Recognise fractions Define percentages Recognise a number wrote in standard form Round to the nearest integer Estimation	<u>LPA:</u> <b>Geometry:</b> Angles at a point and on a straight line Recognise parallel lines Angles in a triangle Perimeter and area of triangles and parallelograms Recognise the formula for the area of a circle Recognise a line of symmetry	<u>LPA:</u> <b>Statistics:</b> Working with discrete data Draw and interpret pictograms Calculate the mode, median and range

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	Term 1		Term 2		Term 3	
Year 9	Reasoning with Algebra	Constructing in 2D and 3D	Reasoning with Number	Reasoning with Geometry	Reasoning with Proportion	Representations
HPA	<p><u>HPA:</u> <b>Algebra:</b> Interpreting <math>y=mx+c</math> Linear and quadratics functions Approximate solutions to simultaneous linear equations Direct and inverse proportion Changing the subject Solve linear equations involving rearrangement including inequalities Expanding two or more binomials Pascals triangle</p>	<p><u>HPA:</u> <b>Geometry:</b> Volume of 3D shapes including a cylinder Loci Constructing polygons Congruency</p>	<p><u>HPA:</u> <b>Number:</b> Four operations for integers, decimals and mixed numbers HCF and LCM using prime factors Standard form Reverse percentages Repeated percentage change Simple interest Solve problems in financial maths</p>	<p><u>HPA:</u> <b>Geometry:</b> Constructions using a compass Angle properties including alternate and corresponding angles Describe results of translations, rotations and reflections Pythagoras' Theorem Congruency Simple proofs Interpret mathematical relationships geometrically and algebraically</p>	<p><u>HPA:</u> <b>Geometry:</b> Similar shapes Congruency Pythagoras' Theorem and trigonometric ratios in similar triangles</p> <p><b>Proportion:</b> Solve ratio problems Direct and inverse proportion Compound units – speed and density problems</p>	<p><u>HPA:</u> <b>Probability:</b> Probability experiments Venn diagrams Sample space diagrams Mutually exclusive outcomes</p> <p><b>Algebra:</b> Quadratic functions Non-linear functions Estimate values using quadratic graphs Approximate solutions Simultaneous equations graphically</p>
	Term 1		Term 2		Term 3	
Year 9	Reasoning with Algebra	Constructing in 2D and 3D	Reasoning with Number	Reasoning with Geometry	Reasoning with Proportion	Representations
MPA	<p><u>MPA:</u> <b>Algebra:</b> Identify the gradient and y-intercept from the equation of a straight line in the form <math>y=mx+c</math></p>	<p><u>MPA:</u> <b>Geometry:</b> Volume of prisms Compass constructions Notation for angles and lines</p>	<p><u>MPA:</u> <b>Number:</b> Four operations for integers, decimals and proper fractions HCF and LCM Percentages of an amount</p>	<p><u>MPA:</u> <b>Geometry:</b> Constructions using a compass Angle properties including parallel lines</p>	<p><u>MPA:</u> <b>Geometry:</b> Similar shapes Angle facts Pythagoras' Theorem and Trigonometric ratios in similar triangles</p>	<p><u>MPA:</u> <b>Probability:</b> Probability experiments Venn diagrams Sample space diagrams</p>

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	Linear functions and simple quadratic functions Estimate values of y given x for a linear and quadratic graphs Linear equations Expanding two binomials		Percentage change Percentage increase and decrease Simple interest	Describe results of translations, rotations and reflections Pythagoras' Theorem Simple proofs	<b>Proportion:</b> Sharing a quantity on a given ratio Direct and inverse proportion Compound units	<b>Algebra:</b> Quadratic functions Estimate values using quadratic graphs Approximate solutions Simultaneous equations graphically
	<b>Term 1</b>		<b>Term 2</b>		<b>Term 3</b>	
<b>Year 9</b>	<b>Reasoning with Algebra</b>	<b>Constructing in 2D and 3D</b>	<b>Reasoning with Number</b>	<b>Reasoning with Geometry</b>	<b>Reasoning with Proportion</b>	<b>Representations</b>
<b>LPA</b>	<u>LPA:</u> <b>Algebra:</b> Recognising $y=mx+c$ Linear functions Expanding single brackets	<u>LPA:</u> <b>Geometry:</b> Recognise 2D shapes Perimeter of 2D shapes Labelling sides and angles	<u>LPA:</u> <b>Number:</b> Four operations for integers and decimals HCF and LCM Percentages of an amount Percentage increase and decrease of multiples of 10%	<u>LPA:</u> <b>Geometry:</b> Describe, sketch and draw parallel lines, perpendicular lines and right angles Angle properties of angles at a point and on a straight line Recognise translations, rotations and reflections Pythagoras' Theorem	<u>LPA:</u> <b>Geometry:</b> Enlargement on a coordinate grid Angle facts Introduction to trigonometry  <b>Proportion:</b> Write and interpret a ratio Recognise and solve direct proportion problems Calculate speed Unit conversions including time	<u>LPA:</u> <b>Probability:</b> Simple probability experiments Probability outcomes sum to 1 Sample space diagrams for equally likely events  <b>Algebra:</b> Recognise a quadratic graph Sketch a quadratic function using a table of values Linear graphs to calculate missing values

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	Term 1		Term 2		Term 3	
Year 10	Indices and Roots Non-Calculator Methods Expanding and Factorising	Gradients and Lines Equations and Inequalities Trigonometry	Number and Sequences Ratios and Fractions Simultaneous Equations	Probability Transforming and constructing	Angles and Bearings Percentages and Interest Working with Circles	Changing the Subject Collecting, representing and interpreting data
HPA	<p><u>HPA:</u> <b>Number:</b> Estimate powers and roots of any given positive number Calculate with roots, integer and fractional indices Apply laws of indices Calculations in standard form Calculations involving fractions and surds Convert a recurring decimal into a fraction Calculations with bounds</p> <p><b>Algebra:</b> Simplify an algebraic expression including surds and algebraic fractions</p>	<p><u>HPA:</u> <b>Algebra:</b> Derive and solve equations Sketch and interpret linear functions Factorise quadratic equations of the forms <math>x^2 + bx + c</math> Solve quadratic equations Solve linear and quadratic inequalities and represent using set notation Plot and interpret graphs Parallel and perpendicular lines Approximate solutions to a linear/quadratic graph Finding the equation of a line</p> <p><b>Geometry:</b> Apply Pythagoras' and trigonometric</p>	<p><u>HPA:</u> <b>Number:</b> Work with HCF and LCM Recognise and use sequences including quadratic, geometric including surds Find the nth term of a quadratic sequence Calculations involving ratio</p> <p><b>Algebra:</b> Derive and solve simultaneous equations linear and quadratics Recognise and interpret graphs of linear and quadratic functions</p>	<p><u>HPA:</u> <b>Probability:</b> Predict outcomes using theoretical probabilities Independent and dependent events using tree diagrams and Venn diagrams</p> <p><b>Geometry:</b> Similar shapes Interpret and use fractional and negative scale factors for enlargement Use congruency and similarity in shapes</p>	<p><u>HPA:</u> <b>Geometry:</b> Interpret and use bearings including Pythagoras and Trigonometry Calculate arc length and sector area Calculate volume and surface area of spheres, pyramids, cones and composite solids Recognise and apply the standard circle theorems</p> <p><b>Number:</b> Calculations with percentages including percentage change Compound and simple interest Iterative processes</p>	<p><u>HPA:</u> <b>Algebra:</b> Solve linear inequalities Solve problems involving proofs Derive an equation including two simultaneous equations Find approximate solutions using iteration</p> <p><b>Data:</b> Construct and interpret tables, including pie charts Calculate averages including consideration of outliers Histograms with unequal class widths Cumulative frequency Box plots Quartiles and inter-quartile range</p>

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		ratios in two and three dimensional Know and use the exact values Apply the sine rule and cosine rule Area of a non-right-angled triangle				
	<b>Term 1</b>		<b>Term 2</b>		<b>Term 3</b>	
<b>Year 10</b>	<b>Indices and Roots Non-Calculator Methods Expanding and Factorising</b>	<b>Gradients and Lines Equations and Inequalities Trigonometry</b>	<b>Number and Sequences Ratios and Fractions Simultaneous Equations</b>	<b>Probability Transforming and constructing</b>	<b>Angles and Bearings Percentages and Interest Working with Circles</b>	<b>Changing the Subject Collecting, representing and interpreting data</b>
<b>MPA</b>	<p><u>MPA:</u> <b>Number:</b> Square and cube numbers Calculate with roots and integer and indices Apply laws of indices Recognise and use standard form Calculations with fractions Limits of accuracy</p> <p><b>Algebra:</b> Simplify an algebraic expression</p>	<p><u>MPA:</u> <b>Algebra:</b> Derive and solve equations Sketch and interpret linear functions Solve linear inequalities and represent the solution on a number line Plot graphs Parallel lines Approximate solutions to a linear/linear graph Finding the equation of a line</p>	<p><u>MPA:</u> <b>Number:</b> Work with HCF and LCM Describe and continue sequences Recognise arithmetic and geometric sequences Calculations with ratio</p> <p><b>Algebra:</b> Derive and solve equations Solve two simultaneous equations</p>	<p><u>MPA:</u> <b>Probability:</b> Predict outcomes using theoretical probabilities Independent and dependent events using tree diagrams</p> <p><b>Geometry:</b> Similar shapes Interpret and use fractional scale factors for enlargement</p>	<p><u>MPA:</u> <b>Geometry:</b> Interpret and use bearings Calculate arc length and sector area Calculate volume and surface area of spheres, pyramids and cones Recognise the standard circle theorems</p> <p><b>Number:</b> Calculations with percentages including percentage change</p>	<p><u>MPA:</u> <b>Algebra:</b> Solve linear inequalities Derive an equation Recognise equations and identities</p> <p><b>Data:</b> Construct and interpret tables including pie charts and frequency tables Calculate averages Interpret and analyse distributions</p>

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		<b>Geometry:</b> Apply trigonometric ratios Know the exact values	Recognise and interpret graphs of linear and quadratic functions		Compound and simple interest	
	<b>Term 1</b>		<b>Term 2</b>		<b>Term 3</b>	
<b>Year 10</b>	<b>Indices and Roots</b> <b>Non-Calculator Methods</b> <b>Expanding and Factorising</b>	<b>Gradients and Lines</b> <b>Equations and Inequalities</b> <b>Trigonometry</b>	<b>Number and Sequences</b> <b>Ratios and Fractions</b> <b>Simultaneous Equations</b>	<b>Probability</b> <b>Transforming and constructing</b>	<b>Angles and Bearings</b> <b>Percentages and Interest</b> <b>Working with Circles</b>	<b>Changing the Subject</b> <b>Collecting, representing and interpreting data</b>
<b>LPA</b>	<b>LPA:</b> <b>Number:</b> Square and cube numbers Calculate with roots Recognise the index laws Write a number in standard form Calculations with fractions Rounding  <b>Algebra:</b> Simplify an algebraic expression	<b>LPA:</b> <b>Algebra:</b> Derive and solve equations Recognise graphs of linear functions Solve linear inequalities and represent on a number line Plot graphs Parallel lines Understand $y=mx+c$  <b>Geometry:</b> Introduction to trigonometric ratios Recognise the exact values	<b>LPA:</b> <b>Number:</b> Identify factors and multiples Describe sequences Use ratio notation  <b>Algebra:</b> Manipulate an algebraic expression Solve an equation Solve two simultaneous equations with common coefficients Recognise and interpret graphs of linear functions	<b>LPA:</b> <b>Probability:</b> Mutually exclusive outcomes Independent events using tree diagrams  <b>Geometry:</b> Similar shapes Interpret and use integer scale factors for enlargement	<b>LPA:</b> <b>Geometry:</b> Interpret and use bearings Identify circle properties Calculate circumference and area of a circle Calculate volume and surface area of spheres and cones  <b>Number:</b> Calculations with percentages	<b>LPA:</b> <b>Algebra:</b> Solve linear inequalities Recognise equations and identities Derive an equation  <b>Data:</b> Frequency Tables Bar Charts Pie Charts Pictograms Calculate averages Compare distributions

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	Term 1		Term 2		Term 3	
<b>Year 11</b>	<b>Higher</b> Properties of shapes Solving Equations and Inequalities I Proportional Reasoning	<b>Higher</b> Algebraic Proficiency: Tinkering Analysing Statistics Solving Equations and inequalities II	<b>Higher</b> Algebraic Proficiency: Visualising Mathematical Movement II	<b>Higher</b>		
	Trigonometry in two dimensional and three dimensional Pythagoras' Theorem in two dimensional and three dimensional Solving and sketching quadratics Solve problems involving direct and inverse proportion	Functions Non-linear simultaneous equations including circle Histograms with unequal class intervals	Exponential graphs Graphs of trigonometric functions Transformation of graphs Solve problems involving rates of change Vector geometry	Revision		
<b>Year 11</b>	<b>Foundation</b> Calculating Solving Equations and Inequalities I Mathematical Movement Algebraic Proficiency Proportional Reasoning	<b>Foundation</b> Pattern sniffing, calculating space, exploring fractions, decimals and percentages	<b>Foundation</b> Solving Equations and Inequalities II Algebraic Proficiency: Visualising Analysing Statistics Mathematical Movement	<b>Foundation</b>		
	Index laws Transforming shapes Solve equations Direct and inverse proportion	Sequences Volume and surface area of complex shapes Compound percentages	Solving quadratic equations Approximating solutions from a quadratic curve Vectors Sampling	Revision		

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	Term 1		Term 2		Term 3	
<b>Year 12</b>	Algebraic Expressions, Quadratics, Straight Line Graphs and Binomial Expansion, Circles and Algebraic Methods	Equations and Inequalities, Trigonometric Ratios, Data collection and Measures of Location and Spread	Graphs and Transformations, Representations of data and Trigonometric identities and equations	Differentiation and Integration, Correlation, Probability, Modelling Mechanics and Constant Acceleration	Vectors, Hypothesis Testing, Exponentials and Logarithms, Forces and Motion and Variable Acceleration	Algebraic Methods, Radians, Functions and Graphs
<b>Year 13</b>	Trigonometric Functions, Normal Distribution and Moments	Trigonometry and Modelling, Parametric Equations, Forces and Frictions, Regression and Projectiles	Differentiation, Conditional Probability, Applications of Forces	Integration, Sequences and Series, Further Kinematics, Binomial Expansion	Revision	