



# EducationPerfect

## Maths - NSW Stage 5.3 Syllabus

Education Perfect Maths is a comprehensive online learning and assessment resource. Designed by teachers and written by our in-house team of maths experts, our content aligns to the NSW Syllabus and covers key mathematical concepts and key skills. It includes a variety of vibrant and engaging curriculum informed content that is tailored to suit your schools' Maths programme from upper primary through to senior secondary. Content features handwriting recognition software and line by line marking designed to give students accurate and informative feedback on their answers. Students are provided with contextual, competitive activities designed to positively impact motivation and learning outcomes. Students are engaged in multiple learning events, including our Education Perfect Maths Championships and other maths themed events throughout the year. Further, our comprehensive assessment platform provides a range of assessment opportunities, including flexible formative assessments, pre and post testing, summative assessment options, as well as NAPLAN practice tests.

This table connects the content provided by Education Perfect to the NSW Syllabus.

Number and Algebra	
<b>Ratios and Rates</b> ( <a href="#">MA5.3-4NA</a> ) Draws, interprets and analyses graphs of physical phenomena.	
Education Perfect Lessons	Curriculum Point
Direct Proportion: Direct Proportion Inverse Proportion: Introduction to Inverse Proportion Applying Inverse Proportion Proportional Graphs: Introduction to Graphs Analysing Graphs Rates: Constant Rates Reading Constant Rates Drawing Constant Rates Variable Rates Rates of Change Analysing Rates of Change	Solve problems involving direct proportion; explore the relationship between graphs and equations corresponding to simple rate problems (ACMNA208)

<b>Algebraic Techniques</b> ( <a href="#">MA5.3-5NA</a> )	
Selects and applies appropriate algebraic techniques to operate with algebraic expressions.	
<b>Education Perfect Lessons</b>	<b>Curriculum Point</b>
Algebraic Fractions: Adding Algebraic Fractions Subtracting Algebraic Fractions	Add and subtract algebraic fractions with numerical denominators, including those with binomial numerators
Expanding Binomial Products	Expand binomial products using a variety of strategies (ACMNA233)
Factorising Quadratic Expressions: Factorisation by Grouping Factorising Quadratic Trinomials Factorising Perfect Squares Factorising Differences of Two Squares Factorising by Completing the Square	Factorise monic and non-monic quadratic expressions (ACMNA269)
<b>Surds and Indices</b> ( <a href="#">MA5.3-6NA</a> )	
Performs operations with surds and indices.	
<b>Education Perfect Lessons</b>	<b>Curriculum Point</b>
Rational and Irrational Numbers: Real Numbers Surds: Introduction to Surds Multiplying and Dividing Surds Simplifying Surds Adding and Subtracting Surds Index Laws and Fractional Powers Expanding Surds Conjugate and Perfect Square Surds Rationalising Denominators Problem Solving: Applications of Surds	Define rational and irrational numbers and perform operations with surds and fractional indices (ACMNA264)
<b>Equations</b> ( <a href="#">MA5.3-7NA</a> )	
Solves complex linear, quadratic, simple cubic and simultaneous equations, and rearranges literal equations.	
<b>Education Perfect Lessons</b>	<b>Curriculum Point</b>
Content Not Yet Built	Solve complex linear equations involving algebraic fractions
Quadratic Equations: Monic Factorisation Non-Monic Factorisation Solving Monic Quadratic Equations Solving Non-Monic Quadratic Equations The Quadratic Formula	Solve a wide range of quadratic equations derived from a variety of contexts (ACMNA269)

Writing Quadratic Equations	
Content Not Yet Built	Solve simple cubic equations
Using Formulas: Using Formulas Rearranging and Solving Equations from Formulas	Rearrange literal equations
Simultaneous Equations: Non-Linear Simultaneous Equations	Solve simultaneous equations, where one equation is non-linear, using algebraic and graphical techniques, including the use of digital technologies
<b>Linear Relationships (MA5.3-8NA)</b> Uses formulas to find midpoint, gradient and distance on the Cartesian plane, and applies standard forms of the equation of a straight line.	
<b>Education Perfect Lessons</b>	<b>Curriculum Point</b>
Midpoint, Gradient and Distance: Gradient of a Line Segment Midpoint of a Line Segment Applications of Coordinate Geometry: Gradient Applications of Coordinate Geometry: Midpoint	Find the midpoint and gradient of a line segment (interval) on the Cartesian plane (ACMNA294)
Midpoint, Gradient and Distance: Distance and Pythagoras' Theorem Applications of Coordinate Geometry: Distance	Find the distance between two points located on the Cartesian plane (ACMNA214)
Midpoint, Gradient and Distance: Line Segments on Cartesian Planes Linear Graphs and Equations: Plotting Linear Graphs Drawing Linear Graphs Using the Gradient Graphing Using Technology - Casio Calculators Linear Patterns and Rules Determining Linear Rules Horizontal and Vertical Lines	Sketch linear graphs using the coordinates of two points (ACMNA215)
Linear Graphs and Equations: Rearranging and Solving Equations	Solve problems using various standard forms of the equation of a straight line
Parallel and Perpendicular Lines: Parallel Lines Perpendicular Lines	Solve problems involving parallel and perpendicular lines (ACMNA238)

<b>Non-Linear Relationships (MA5.3-9NA)</b> Sketches and interprets a variety of non-linear relationships.	
<b>Education Perfect Lessons</b>	<b>Curriculum Point</b>
Non-Linear Graphs: Transforming Parabolas - Translation Transforming Parabolas - Dilation and Reflection Transforming Circles Exponential Graphs Applications of Non-Linear Graphs	Describe, interpret and sketch parabolas, hyperbolas, circles and exponential functions and their transformations (ACMNA267)
Polynomial Graphs: Features of Polynomial Graphs Features of Graphs - Roots Parabolas Transforming Parabolas Multiple Transformations of Parabolas Cubics Cubic Transformations Quartics Non-Polynomial Graphs: Circle Graphs Exponential Graphs Hyperbola Graphs Hyperbola Graph Transformations	Describe, interpret and sketch cubics, other curves and their transformations
<b>Polynomials (MA5.3-10NA)</b> Recognises, describes and sketches polynomials, and applies the factor and remainder theorems to solve problems.	
<b>Education Perfect Lessons</b>	<b>Curriculum Point</b>
Polynomials: Introduction to Polynomials Evaluating Polynomials Adding, Subtracting and Multiplying Polynomials Dividing Polynomials The Remainder Theorem The Factor Theorem Factorising Cubic Polynomials Factorising Quartic Polynomials	Investigate the concept of a polynomial and apply the factor and remainder theorems to solve problems (ACMNA266)
Content Not Yet Built	Apply an understanding of polynomials to sketch a range of curves and describe the features of these curves from their equation (ACMNA268)

**Logarithms** ([MA5.3-11NA](#))

Uses the definition of a logarithm to establish and apply the laws of logarithms.

Education Perfect Lessons	Curriculum Point
Logarithms: Introduction to Logarithms Deriving the Laws of Logarithms Using the Laws of Logarithms Combining Log Laws	Use the definition of a logarithm to establish and apply the laws of logarithms (ACMNA265)
Solving Exponentials Equations	Solve simple exponential equations (ACMNA270)

**Functions and Other Graphs** ([MA5.3-12NA](#))

Uses function notation to describe and sketch functions.

Education Perfect Lessons	Curriculum Point
Introduction to Functions Function Notation Inverse Functions and Transformations	Describe, interpret and sketch functions

**Measurement and Geometry****Area and Surface Area** ([MA5.3-13MG](#))

Applies formulas to find the surface areas of right pyramids, right cones, spheres and related composite solids.

Education Perfect Lessons	Curriculum Point
Surface Areas of Prisms Surface Area of Cylinders Surface Area of Complex Solids Finding the Height of Right Pyramids Surface Area of Right Pyramids Surface Area of Right Cones Surface Area of Spheres Surface Area of Composite Solids	Solve problems involving the surface areas of right pyramids, right cones, spheres and related composite solids (ACMMG271)

**Volume** ([MA5.3-14MG](#))

Applies formulas to find the volumes of right pyramids, right cones, spheres and related composite solids.

Education Perfect Lessons	Curriculum Point
Volume of Right Pyramids Volume of Right Cones Volume of Spheres Volume of Composite Solids	Solve problems involving the volumes of right pyramids, right cones, spheres and related composite solids (ACMMG271)

**Trigonometry and Pythagoras' Theorem** ([MA5.3-15MG](#))

Applies Pythagoras' theorem, trigonometric relationships, the sine rule, the cosine rule and the area rule to solve problems, including problems involving three dimensions.

Education Perfect Lessons	Curriculum Point
Pythagoras' Theorem and Trigonometry in 3D: Pythagoras' Theorem in 3D Trigonometry in 3D Solving Problems Involving Right Angled Triangles in 3D	Apply Pythagoras' theorem and trigonometry to solve three-dimensional problems in right-angled triangles (ACMMG276)
Defining and Graphing Trig Functions: The Unit Circle and Radians Understanding and Graphing Sine Understanding and Graphing Cosine Understanding and Graphing Tangent Comparing Trigonometric Functions	Use the unit circle to define trigonometric functions, and graph them, with and without the use of digital technologies (ACMMG274)
Solving Simple Trigonometric Equations: Special Triangles: 30-60-90 Special Triangles: 45-45-90	Solve simple trigonometric equations (ACMMG275)
Trigonometric and Triangular Rules Sine Rule Cosine Rule	Establish the sine, cosine and area rules for any triangle and solve related problems (ACMMG273)

**Properties of Geometrical Figures** ([MA5.3-16MG](#))

Proves triangles are similar, and uses formal geometric reasoning to establish properties of triangles and quadrilaterals.

Education Perfect Lessons	Curriculum Point
Proofs: Introduction to Proofs and Logic Angle Proofs Parallelogram and Rhombus Proofs Rectangle and Square Proofs	Formulate proofs involving congruent triangles and angle properties (ACMMG243)
Geometric Reasoning: Scaling and Measurement Showing Congruence Showing Similarity	Apply logical reasoning, including the use of congruence and similarity, to proofs and numerical exercises involving plane shapes (ACMMG244)

**Circle Geometry** ([MA5.3-17MG](#))

Applies deductive reasoning to prove circle theorems and to solve related problems.

Education Perfect Lessons	Curriculum Point
Angles Theorems for Circles: Central Angle Theorem Proof: Central Angle Theorem Angles Subtended by the Same Arc	Prove and apply angle and chord properties of circles (ACMMG272)

<p>Thales' Theorem: Angles in a Semicircle          Proving Thales' Theorem          Cyclic Quadrilaterals          Chord Properties:          Equal Length Chord Properties          Perpendicular Bisector to Chords</p>	
<p>Chord Properties:          Tangents, Secants and the Alternate Segment Theorem          Intersecting Chords, Secants and Tangents</p>	<p>Prove and apply tangent and secant properties of circles</p>

**Statistics and Probability**

**Single Variable Data Analysis** ([MA5.3-18SP](#))  
 Uses standard deviation to analyse data.

<b>Education Perfect Lessons</b>	<b>Curriculum Point</b>
<p>Introduction to Standard Deviation            Calculating Standard Deviation            Calculating Standard Deviation Using Technology            Investigating the Standard Deviation            Using the Standard Deviation to Compare Data Sets            Comparing the Measures of Spread</p>	<p>Calculate and interpret the mean and standard deviation of data and use these to compare data sets (ACMSP278)</p>

**Bivariate Data Analysis** ([MA5.3-19SP](#))  
 investigates the relationship between numerical variables using lines of best fit, and explores how data is used to inform decision-making processes.

<b>Education Perfect Lessons</b>	<b>Curriculum Point</b>
<p>Bivariate Data:            Introduction to Bivariate Data            Scatterplots            Analysing Scatterplots            Lines of Best Fit:            Introduction to Lines of Best Fit            Finding Equations of Lines of Best Fit            Finding the Line of Best Fit using Technology (CASIO)            Using Lines of Best Fit to Make Predictions            Using the Equation to Make Predictions            Using Lines of Best Fit</p>	<p>Use information technologies to investigate bivariate numerical data sets; where appropriate, students use a straight line to describe the relationship, allowing for variation (ACMSP279)</p>
<p>Investigating Studies:            What is Sampling?</p>	<p>Investigate reports of studies in digital media and elsewhere for information on</p>

Types of Sampling: Probability Sampling  
Types of Sampling: Non-Probability Sampling  
Sampling Errors  
Analysing Sampling in Reports  
Misleading reports  
Statistics in Organisations

their planning and implementation  
(ACMSP277)