

Year 9
Mathematics Standard
Program

Home Schooling

2026

Rationale

Mathematical ideas have evolved and continue to develop across cultures and have been practised in Australia by Aboriginal and Torres Strait Islander Peoples for thousands of years. Through the study of mathematics, students apply their knowledge and skills to deepen their understanding of the world.

Mathematics is a reasoning and creative activity, integral to scientific and technological advances across many fields of endeavour. The symbolic nature of mathematics provides a powerful and precise means of communication.

Making connections across mathematical concepts and other subject areas enhances students' ability to understand the purpose of learning mathematics and to develop a deeper conceptual understanding. This helps students to recognise the role of mathematics in solving problems in the world around them, applying their understanding to familiar and unfamiliar situations.

By studying mathematics, students develop essential numeracy skills and fluency, while nurturing the ability to think logically, critically and creatively. They learn about patterns and reason about relationships, creating opportunities to generalise their solutions and to solve non-routine problems.

When students enjoy learning mathematics, they develop a positive self-concept and become self-motivated learners through active participation in appropriately challenging tasks. This can enhance their resilience in solving mathematical problems relevant to further education and their everyday lives.

Source: <https://curriculum.nsw.edu.au/learning-areas/mathematics/mathematics-k-10-2022/rationale>

Aim

The aim of Mathematics K–10 is to enable students to become confident users of mathematics, learning and applying the language of mathematics to communicate efficiently and effectively. They develop an increasingly sophisticated understanding of mathematical concepts and a fluency with mathematical processes that helps them to interpret and solve problems. Students make connections within mathematics and connect mathematical concepts with the world around them. They learn to understand and appreciate how mathematics is a relevant part of their lives.

Source: <https://curriculum.nsw.edu.au/learning-areas/mathematics/mathematics-k-10-2022/aim>

Outcomes	Registration
MAO-WM-01 Working mathematically develops understanding and fluency in mathematics through exploring and connecting mathematical concepts, choosing and applying mathematical techniques to solve problems, and communicating their thinking and reasoning coherently and clearly	
MA5-FIN-C-01 solves financial problems involving simple interest, earning money and spending money	
MA5-FIN-C-02 solves financial problems involving compound interest and depreciation	
MA5-ALG-C-01 simplifies algebraic fractions with numerical denominators and expands algebraic expressions	
MA5-RAT-P-01 identifies and solves problems involving direct and inverse variation and their graphical representations (<i>Path: Stn, Adv</i>)	
MA5-RAT-P-02 analyses and constructs graphs relating to rates of change (<i>Path: Stn, Adv</i>)	
MA5-IND-C-01 simplifies algebraic expressions involving positive-integer and zero indices, and establishes the meaning of negative indices for numerical bases	
MA5-EQU-C-01 solves linear equations of up to 3 steps, limited to one algebraic fraction	

MA5-LIN-C-01 determines the midpoint, gradient and length of an interval, and graphs linear relationships, with and without digital tools	
MA5-LIN-C-02 graphs and interprets linear relationships using the gradient/slope-intercept form	
MA5-NLI-C-01 identifies connections between algebraic and graphical representations of quadratic and exponential relationships in various contexts	
MA5-NLI-C-02 identifies and compares features of parabolas and exponential curves in various contexts	
MA5-MAG-C-01 solves measurement problems by using scientific notation to represent numbers and rounding to a given number of significant figures	
MA5-TRG-C-01 applies trigonometric ratios to solve right-angled triangle problems	
MA5-TRG-C-02 applies trigonometry to solve problems, including bearings and angles of elevation and depression	
MA5-TRG-P-01 applies Pythagoras' theorem and trigonometry to solve 3-dimensional problems and applies the sine, cosine and area rules to solve 2-dimensional problems, including bearings (<i>Path: Stn, Adv</i>)	

MA5-ARE-C-01 solves problems involving the surface area of right prisms and practical problems involving the area of composite shapes and solids	
MA5-ARE-P-01 applies knowledge of the surface area of right pyramids and cones, spheres and composite solids to solve problems (<i>Path: Stn, Adv</i>)	
MA5-VOL-C-01 solves problems involving the volume of composite solids consisting of right prisms and cylinders	
MA5-VOL-P-01 applies knowledge of the volume of right pyramids, cones and spheres to solve problems involving related composite solids (<i>Path: Stn, Adv</i>)	
MA5-GEO-C-01 identifies and applies the properties of similar figures and scale drawings to solve problems	
MA5-NET-P-01 solves problems involving the characteristics of graphs/networks, planar graphs and Eulerian trails and circuits (<i>Path: Stn</i>)	
MA5-DAT-C-01 compares and analyses datasets using summary statistics and graphical representations	
MA5-DAT-C-02 displays and interprets datasets involving bivariate data	

MA5-DAT-P-01 plans, conducts and reviews a statistical inquiry into a question of interest (<i>Path: Stn, Adv</i>)	
MA5-PRO-C-01 solves problems involving probabilities in multistage chance experiments and simulations	

Learning Program

Chapter 1: Integers, decimals, fractions, ratios and rates	
Topics	Registration and Completion
Warm-up Quiz	
1A Adding and subtracting positive and negative integers	
1B Multiplying and dividing positive and negative integers	
1C Decimal places and significance (core)	
1D Rational numbers and irrational numbers	
1E Adding and subtracting fractions	
Progress quiz	
1F Multiplying and dividing fractions	
1G Ratios	
1H Rates	
Maths@Work: Cooks and chefs	
Working mathematically: Painting makeover	
Puzzles and challenges	
Chapter summary	
Chapter checklist with success criteria	
Chapter review	

Chapter 2: Financial mathematics	
Topics	Registration and Completion
Warm-up quiz	
2A Percentages, fractions and decimals	
2B Applying percentages	
2C Percentage increase and decrease	
2D Profits and discounts	
2E Income (Core	
Progress quiz	
2F Taxation (Core)	
2G Simple interest (Core)	
2H Applications of simple interest (Core)	
Maths@Work: Online cake-decorating business	
Working mathematically: Saving for a holiday	
Puzzles and challenges	
Chapter summary	
Chapter checklist with success criteria	
Chapter review	

Chapter 3: Expressions and equations	
Topics	Registration and Completion
Warm-up quiz	
3A Algebraic expressions	
3B Adding and subtracting algebraic expressions	
3C Multiplying and dividing algebraic expressions	
3D Expanding algebraic expressions (Core)	
3E Linear equations with a pronumeral on one side	
3F Linear equations involving fractions (Core)	
Progress quiz	
3G Linear equations involving brackets (Core)	
3H Equations with pronumerals on both sides (Core)	
3I Using linear equations to solve problems (Core)	
3J Using formulas (Core)	
Maths@Work: Plumber	
Working mathematically: Theme parks	
Puzzles and challenges	
Chapter summary	
Chapter checklist with success criteria	
Chapter review	

Chapter 4: Right-angled triangles	
Topics	Registration and Completion
Warm-up quiz	
4A Exploring Pythagoras' theorem	
4B Finding the length of the hypotenuse	
4C Finding the lengths of the shorter sides	
4D Using Pythagoras' theorem to solve two-dimensional problems	
4E Introducing the trigonometric ratios (Core)	
4F Finding unknown sides (Core)	
Progress quiz	
4G Solving for the denominator (Core)	
4H Finding unknown angles (Core)	
4I Using trigonometry to solve problems (Core)	
Maths@Work: Carpenter	
Working mathematically: Viewing angle	
Puzzles and challenges	
Chapter summary	
Chapter checklist with success criteria	
Chapter review	

Chapter 5: Linear relationships	
Topics	Registration and Completion
Warm-up quiz	
5A Points and lines on the Cartesian plane (Core)	
5B The x-intercept and y-intercept (Core)	
5C Graphing straight lines using intercepts	
5D Lines with only one intercept (Core)	
5E Gradient from rise and run (Core)	
5F Gradient and direct variation (Core)	
5G Gradient–intercept form (Core)	
Progress quiz	
5H Finding the equation of a line using $y = mx + c$ (Core)	
5I Midpoint and length of a line segment from diagrams (Core)	
5J Linear relationships in real-life contexts (Core)	
Maths@Work: Trading in foreign currencies	
Working mathematically: Running in a triathlon	
Puzzles and challenges	
Chapter summary	
Chapter checklist with success criteria	
Chapter review	

Chapter 6: Length, area, surface area and volume	
Topics	Registration and Completion
Warm-up quiz	
6A Length and perimeter	
6B Circumference of circles and perimeter of sectors	
6C Area of quadrilaterals and triangles	
6D Area of circles	
6E Perimeter and area of composite shapes (Core)	
6F Surface area of prisms (Core)	
Progress quiz	
6G Surface area of cylinders (Core)	
6H Volume of prisms (Core)	
6I Volume of cylinders (Core)	
Maths@Work: Vegetable and fruit growers	
Working mathematically: Pressing a new road	
Puzzles and challenges	
Chapter summary	
Chapter checklist with success criteria	
Chapter review	

Chapter 7: Indices	
Topics	Registration and Completion
Warm-up quiz	
7A Index notation (Core)	
7B Index laws for multiplying and dividing (Core)	
7C The zero index and power of a power (Core)	
7D Index laws extended (Core)	
7E Negative indices (Core)	
Progress quiz	
7F Scientific notation (Core)	
7G Scientific notation using significant figures (Core)	
Maths@Work: Lab technician	
Working mathematically: Rabbits and hares	
Puzzles and challenges	
Chapter summary	
Chapter checklist with success criteria	
Chapter review	

Chapter 8: Properties of geometrical figures	
Topics	Registration and Completion
Warm-up quiz	
8A Angles and triangles	
8B Parallel lines	
8C Quadrilaterals	
8D Polygons	
Progress quiz	
8E Enlargement and similar figures (Core)	
8F Applying scale factor to similar triangles (Core)	
Maths@Work: Animator	
Working mathematically: Ocean ironman	
Puzzles and challenges	
Chapter summary	
Chapter checklist with success criteria	
Chapter review	

Chapter 9: Quadratic expressions and algebraic fractions	
Topics	Registration and Completion
Warm-up quiz	
9A Reviewing algebra	
9B Expanding binomial products (Core)	
9C Expanding perfect squares (Core)	
9D Difference of two squares (Core)	
9E Using HCF to factorise algebraic expressions	
Progress quiz	
9F Simplifying algebraic fractions: multiplication and division (Core)	
9G Simplifying algebraic fractions: addition and subtraction (Core)	
Maths@Work: Automotive technology	
Working mathematically: Square castle moats	
Puzzles and challenges	
Chapter summary	
Chapter checklist with success criteria	
Chapter review	

Chapter 10: Probability and data analysis	
Topics	Registration and Completion
Warm-up quiz	
10A Probability review	
10B Venn diagrams and two-way tables	
10C Using arrays for two-step experiments (Core)	
10D Using tree diagrams (Core)	
10E Using relative frequencies to estimate probabilities (Core)	
10F Mean, median, mode and range	
Progress quiz	
10G Interpreting data from tables and graphs (Core)	
10H Stem-and-leaf plots (Core)	
10I Grouping data into classes (Core)	
Maths@Work: Personal trainer	
Working mathematically: The missing data	
Puzzles and challenges	
Chapter summary	
Chapter checklist with success criteria	
Chapter review	