Highlighted Australian Mathematics Curriculum for Grades 5-10

Introduction

The Australian Mathematics Curriculum provides a comprehensive framework for mathematics education across all states and territories. While there is a national curriculum, some states (particularly NSW and Victoria) have their own variations that maintain the core principles while adapting to local educational contexts.

The curriculum is structured around three content strands and four proficiency strands (known as "Working Mathematically" processes), creating a balanced approach to mathematical learning that emphasizes both knowledge acquisition and skill development.

Curriculum Structure

Content Strands

- **Number and Algebra**: Developing number sense, algebraic thinking, and mathematical relationships
- **Measurement and Geometry**: Understanding spatial concepts, measurement principles, and geometric reasoning
- **Statistics and Probability**: Collecting, analyzing, and interpreting data, and understanding chance

Proficiency Strands (Working Mathematically)

- **Understanding**: Building robust knowledge of adaptable and transferable mathematical concepts
- **Fluency**: Developing skills in choosing appropriate procedures and executing them accurately and efficiently
- **Problem Solving**: Making choices, interpreting, formulating, modeling, and investigating mathematical situations
- **Reasoning**: Developing logical thought processes including analyzing, proving, evaluating, explaining, and generalizing

Grade-Level Curriculum Highlights

Year 5 Mathematics

Number and Algebra

- Identify and work with factors and multiples of whole numbers
- Apply estimation and rounding strategies to calculations
- Solve multiplication problems with large numbers and division problems with remainders
- Compare and order common fractions and locate them on number lines
- Extend decimal understanding to thousandths
- Create simple financial plans and budgets
- Develop pattern recognition with fractions and decimals

Measurement and Geometry

- Calculate perimeter and area of rectangles
- Determine volume and capacity of rectangular prisms
- Convert between 12 and 24-hour time formats
- Use grid references and directional language for location
- Identify and create transformations of shapes

Statistics and Probability

- Construct appropriate data displays for different data sets
- Interpret and compare various data representations
- List outcomes of chance experiments
- Recognize that probabilities range from 0 to 1

Year 6 Mathematics

Number and Algebra

- Identify properties of prime, composite, square, and triangular numbers
- Work with decimals to thousandths place
- Add and subtract fractions with related denominators
- Find fractions and percentages of quantities
- Explore the use of brackets and order of operations
- Introduce variables and algebraic expressions

Measurement and Geometry

- Convert between common metric units of length, mass, and capacity
- Connect decimal representations to the metric system
- Solve problems involving length, area, and perimeter
- Interpret and use timetables
- Construct simple prisms and pyramids
- Investigate combinations of transformations

Statistics and Probability

- Interpret and compare a range of data displays
- Analyze secondary data presented in media
- Describe probabilities using fractions, decimals, and percentages
- Conduct chance experiments with both small and large numbers of trials

Year 7 Mathematics

Number and Algebra

- Work with index notation and represent numbers using indices
- Compare, order, and calculate with positive and negative integers
- Develop operations with fractions including addition, subtraction, multiplication, and division
- Connect fractions, decimals, and percentages
- Solve problems involving ratios and rates
- Create algebraic expressions and substitute values
- Apply the distributive law to expand algebraic expressions

Measurement and Geometry

- Establish formulas for areas of rectangles, triangles, and parallelograms
- Calculate volumes of rectangular prisms
- Classify triangles and quadrilaterals by their properties
- Identify line and rotational symmetries
- Draw different views of three-dimensional objects
- Use coordinates to describe transformations

Statistics and Probability

- Calculate mean, median, mode, and range for data sets
- Construct and compare stem-and-leaf plots and dot plots
- Describe and interpret data distributions

- Construct sample spaces for single-step experiments
- Assign probabilities to the outcomes of events

Year 8 Mathematics

Number and Algebra

- Apply index laws with numerical expressions
- Perform operations with rational numbers and integers
- Investigate terminating and recurring decimals
- Explore irrational numbers
- Solve problems involving percentages, profit and loss
- Work with ratios and rates in realistic contexts
- Plot linear relationships on the Cartesian plane
- Solve linear equations using algebraic and graphical techniques

Measurement and Geometry

- Calculate perimeters and areas of parallelograms, rhombuses, and kites
- Investigate the relationship between features of circles
- Develop formulas for volumes of various prisms and cylinders
- Define congruence of plane shapes using transformations
- Establish properties of quadrilaterals using congruent triangles
- Develop logical arguments to prove geometric properties

Statistics and Probability

- Explore techniques for collecting representative data
- Investigate the effect of outliers on measures of central tendency
- Explore the variation of means and proportions in random samples
- Identify complementary events and calculate the sum of probabilities
- Use Venn diagrams and two-way tables to calculate probabilities
- Represent events using "and", "or", and "not" statements

Year 9 Mathematics

Number and Algebra

- Apply index laws to variables and numerical expressions
- Express numbers in scientific notation
- Solve problems involving direct proportion and simple interest
- Expand and factorize algebraic expressions
- Find distance between two points on the Cartesian plane

- Calculate midpoint and gradient of line segments
- Graph linear and simple non-linear relations
- Solve problems involving parallel and perpendicular lines

Measurement and Geometry

- Calculate areas of composite shapes
- Determine surface area and volume of cylinders and right prisms
- Investigate very small and very large time scales and intervals
- Apply similarity relationships to solve problems
- Use trigonometry to solve right-angled triangle problems
- Prove and apply angle and chord properties of circles

Statistics and Probability

- Construct and interpret back-to-back stem-and-leaf plots and histograms
- Compare data displays using mean, median, and range
- Calculate relative frequencies to estimate probabilities
- Analyze statistical reports in digital media
- Identify different sampling methods and evaluate their effectiveness
- Investigate two-step chance experiments

Year 10 Mathematics

Number and Algebra

- Define rational and irrational numbers
- Apply index laws and use logarithms
- Factorize monic and non-monic quadratic expressions
- Solve quadratic equations using a variety of methods
- Solve linear equations involving simple algebraic fractions
- Solve linear inequalities and graph their solutions
- Work with simultaneous equations
- Connect algebraic and graphical representations of relations

Measurement and Geometry

- Formulate proofs involving congruent triangles and angle properties
- Apply logical reasoning to geometric problems
- Calculate surface area and volume for a range of solids
- Apply Pythagoras' theorem and trigonometry to 3D problems
- Establish the sine, cosine, and area rules for any triangle
- Use the unit circle to define trigonometric functions

- Graph sine, cosine, and tangent functions

Statistics and Probability

- Describe results of two- and three-step chance experiments
- Investigate conditional probability and independence
- Determine quartiles and interquartile range
- Construct and interpret box plots
- Compare data distributions using appropriate displays
- Use scatter plots to investigate relationships between variables
- Evaluate statistical reports in the media

Year 10A (Advanced) Additional Content

Number and Algebra

- Investigate the relationship between exponential and logarithmic functions
- Solve simple exponential equations
- Apply set theory to solve problems
- Investigate functions and their inverses
- Apply factor and remainder theorems to polynomial expressions
- Solve problems involving linear and quadratic inequalities

Measurement and Geometry

- Prove and apply angle and chord properties of circles
- Use the unit circle to define trigonometric functions and graph them
- Solve trigonometric equations
- Apply Pythagoras' theorem and trigonometry to 3D problems
- Establish and use the sine, cosine, and area rules for any triangle

Statistics and Probability

- Calculate and interpret standard deviation
- Use digital technology to investigate bivariate numerical data
- Investigate the relationship between variables using lines of best fit
- Evaluate statistical reports in terms of planning and implementation

State-Specific Variations

New South Wales (NSW)

- Uses the NSW Mathematics K-10 Syllabus, which incorporates the Australian Curriculum
- Organizes content into Number and Algebra, Measurement and Space, and Statistics and Probability
- Embeds Working Mathematically processes throughout all content areas
- Structures K-6 content into Parts A and B to provide flexibility in teaching and learning programs
- Emphasizes making connections between related content areas

Victoria

- Follows the Victorian Curriculum F-10, largely aligned with the Australian Curriculum
- Uses "Levels" rather than "Years" (Level 5 corresponds to Year 5, etc.)
- Maintains the same three content strands as the national curriculum
- Places additional emphasis on connecting mathematical concepts across strands
- Provides detailed achievement standards for each level

Popular Online Learning Platforms

Several high-quality online platforms support the Australian Mathematics Curriculum for grades 5-10:

Mathletics

- Award-winning program fully aligned with Australian curriculum
- Interactive activities, games, and assessments
- Adaptive learning pathways that adjust to student progress

MathsOnline

- Video lessons with step-by-step explanations
- Interactive exercises and worksheets
- Comprehensive coverage of Australian curriculum

Maths Pathway

- Personalized learning model for Years 5-10
- Combines online learning with teacher-led instruction
- Data-driven approach to identify and address learning gaps

Mathspace

- Step-by-step feedback on working out
- Adaptive learning technology
- Teacher dashboard with detailed analytics

reSolve Maths

- Free teaching sequences developed by the Australian Academy of Science
- Focus on problem-solving and mathematical reasoning
- Classroom-ready resources aligned to Australian Curriculum

These platforms provide valuable supplementary resources for students, teachers, and parents, offering interactive learning experiences that reinforce classroom instruction and support individual learning needs.