# The Australian Curriculum
## Mathematics

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**AUSTRALIAN CURRICULUM, ASSESSMENT AND REPORTING AUTHORITY**

# Mathematics

## Year 8

The proficiency strands **understanding, fluency, problem-solving** and **reasoning** are an integral part of mathematics content across the three content strands: number and algebra, measurement and geometry, and statistics and probability. The proficiencies reinforce the significance of working mathematically within the content and describe how the content is explored or developed. They provide the language to build in the developmental aspects of the learning of mathematics. The achievement standards reflect the content and encompass the proficiencies.

At this year level:

- **understanding** includes describing patterns involving indices and recurring decimals, identifying commonalities between operations with algebra and arithmetic, connecting rules for linear relations with their graphs, explaining the purpose of statistical measures and explaining measurements of perimeter and area
- **fluency** includes calculating accurately with simple decimals, indices and integers; recognising equivalence of common decimals and fractions including recurring decimals; factorising and simplifying basic algebraic expressions and evaluating perimeters and areas of common shapes and volumes of three-dimensional objects
- **problem-solving** includes formulating and modelling practical situations involving ratios, profit and loss, areas and perimeters of common shapes and using two-way tables and Venn diagrams to calculate probabilities
- **reasoning** includes justifying the result of a calculation or estimation as reasonable, deriving probability from its complement, using congruence to deduce properties of triangles, finding estimates of means and proportions of populations.

## Year 8 Content Descriptions

| Number and Algebra | Measurement and Geometry | Statistics and Probability |
|---|---|---|
| Number and place value | Using units of measurement | Chance |
| Use index notation with numbers to establish the index laws with positive integral indices and the zero index (ACMNA182) | Choose appropriate units of measurement for area and volume and convert from one unit to another (ACMMG195) | Identify complementary events and use the sum of probabilities to solve problems (ACMSP204) |
| Carry out the four operations with rational numbers and integers, using efficient mental and written strategies and appropriate digital technologies (ACMNA183) | Find perimeters and areas of parallelograms, trapeziums, rhombuses and kites (ACMMG196) | Describe events using language of 'at least', exclusive 'or' (A or B but not both), inclusive 'or' (A or B or both) and 'and'. (ACMSP205) |
| Real numbers | Investigate the relationship between features of circles such as circumference, area, radius and diameter. Use formulas to solve problems involving circumference and area (ACMMG197) | Represent events in two-way tables and Venn diagrams and solve related problems (ACMSP292) |
| Investigate terminating and recurring decimals (ACMNA184) | | Data representation and interpretation |

Investigate the concept of irrational numbers, including π (ACMNA186)

Solve problems involving the use of percentages, including percentage increases and decreases, with and without digital technologies (ACMNA187)

Solve a range of problems involving rates and ratios, with and without digital technologies (ACMNA188)

### Money and financial mathematics

Solve problems involving profit and loss, with and without digital technologies (ACMNA189)

### Patterns and algebra

Extend and apply the distributive law to the expansion of algebraic expressions (ACMNA190)

Factorise algebraic expressions by identifying numerical factors (ACMNA191)

Simplify algebraic expressions involving the four operations (ACMNA192)

### Linear and non-linear relationships

Plot linear relationships on the Cartesian plane with and without the use of digital technologies (ACMNA193)

Develop formulas for volumes of rectangular and triangular prisms and prisms in general. Use formulas to solve problems involving volume (ACMMG198)

Solve problems involving duration, including using 12- and 24-hour time within a single time zone (ACMMG199)

### Geometric reasoning

Define congruence of plane shapes using transformations (ACMMG200)

Develop the conditions for congruence of triangles (ACMMG201)

Establish properties of quadrilaterals using congruent triangles and angle properties, and solve related numerical problems using reasoning (ACMMG202)

Investigate techniques for collecting data, including census, sampling and observation (ACMSP284)

Explore the practicalities and implications of obtaining data through sampling using a variety of investigative processes (ACMSP206)

Explore the variation of means and proportions of random samples drawn from the same population (ACMSP293)

Investigate the effect of individual data values, including outliers, on the mean and median (ACMSP207)

Solve linear equations using
algebraic and graphical techniques.
Verify solutions by substitution
(ACMNA194)