Mathematics v8.1

Year 8 Syllabus

Year Level Description

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.

| Number and Algebra | Measurement and Geometry | Statistics and Probability |

NUMBER AND PLACE VALUE

Use index notation with numbers to establish the index laws with positive integral indices and the zero index (ACMNA182)

- ➕ Numeracy

Carry out the four operations with rational numbers and integers, using efficient mental and written strategies and appropriate digital technologies (ACMNA183)

- ➕ Numeracy
- ⠸ Information and Communication Technology (ICT) capability

REAL NUMBERS

Investigate terminating and recurring decimals (ACMNA184)

- ➕ Numeracy

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

- ➕ Numeracy

Solve problems involving the use of percentages, including percentage

USING UNITS OF MEASUREMENT

Choose appropriate units of measurement for area and volume and convert from one unit to another (ACMMG195)

- ➕ Numeracy

Find perimeters and areas of parallelograms, trapeziums, rhombuses and kites (ACMMG196)

- ➕ Numeracy

Investigate the relationship between features of circles such as circumference, area, radius and diameter. Use formulas to solve problems involving circumference and area (ACMMG197)

- 📄 Literacy
- ➕ Numeracy

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

- 📄 Literacy
- ➕ Numeracy

CHANCE

Identify complementary events and use the sum of probabilities to solve problems (ACMSP204)

- 📄 Literacy
- ➕ Numeracy
- 🎯 Critical and creative thinking

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)

- 📄 Literacy
- ➕ Numeracy

Represent events in two-way tables and Venn diagrams and solve related problems (ACMSP292)

- 📄 Literacy
- ➕ Numeracy
- 🎯 Critical and creative thinking

DATA REPRESENTATION AND INTERPRETATION

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

increases and decreases, with and without digital technologies (ACMNA187)

- Literacy
- Numeracy
- Information and Communication Technology (ICT) capability
- Critical and creative thinking

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

- Literacy
- Numeracy
- Information and Communication Technology (ICT) capability
- Critical and creative thinking

MONEY AND FINANCIAL MATHEMATICS

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

- Literacy
- Numeracy
- Information and

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

- Literacy
- Numeracy
- Critical and creative thinking

GEOMETRIC REASONING

Define congruence of plane shapes using transformations (ACMMG200)

- Literacy
- Numeracy

Develop the conditions for congruence of triangles (ACMMG201)

- Numeracy

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

- Literacy
- Numeracy
- Critical and creative thinking

- Literacy
- Numeracy

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

- Literacy
- Numeracy
- Critical and creative thinking

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

- Literacy
- Numeracy
- Critical and creative thinking

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

- Literacy
- Numeracy
- Critical and creative thinking

Communication Technology
(ICT) capability

C Critical and creative
thinking

PATTERNS AND ALGEBRA

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

▦ Numeracy

Factorise algebraic
expressions by identifying
numerical factors
(ACMNA191)

▦ Numeracy

Simplify algebraic
expressions involving the
four operations
(ACMNA192)

▦ Numeracy

LINEAR AND NON-LINEAR
RELATIONSHIPS

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

▦ Numeracy

⁘ Information and

Communication Technology (ICT) capability

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

➕➖✖️ Numeracy

🎯 Critical and creative thinking