



Year 8 Mathematics

Subject Overview:

By the end of Year 8, students solve everyday problems involving rates, ratios and percentages. They recognise index laws and apply them to whole numbers. They describe rational and irrational numbers. Students solve problems involving profit and loss. They make connections between expanding and factorising algebraic expressions. Students solve problems relating to the volume of prisms. They make sense of time duration in real applications. They identify conditions for the congruence of triangles and deduce the properties of quadrilaterals. Students model authentic situations with two-way tables and Venn diagrams. They choose appropriate language to describe events and experiments. They explain issues related to the collection of data and the effect of outliers on means and medians in that data.

Students use efficient mental and written strategies to carry out the four operations with integers. They simplify a variety of algebraic expressions. They solve linear equations and graph linear relationships on the Cartesian plane. Students convert between units of measurement for area and volume. They perform calculations to determine perimeter and area of parallelograms, rhombuses and kites. They name the features of circles and calculate the areas and circumferences of circles. Students determine complementary events and calculate the sum of probabilities.

Resources

Students use a variety of traditional & IT based resources for learning activities, homework and assessment tasks. These include a textbook written for the Australian Curriculum, dynamic geometry software, interactive algebra software, spreadsheets and an on-line mathematics learning system.

Assessment

Students complete written tests, mathematical investigations (with and without technology) and computer based tasks.

Programs for the Mathematically Talented

Students who display the ability to perform at levels above the norm are actively encouraged and supported to fulfil their potential. Accelerated and extended programs are readily available and immediately implemented.

Topics	Content Descriptors
Number	<ul style="list-style-type: none">Use index notation with numbers to establish the index laws with positive integral indices and the zero indexCarry out the four operations with rational numbers and integers, using efficient mental and written strategies and appropriate digital technologies
Real numbers	<ul style="list-style-type: none">Investigate terminating and recurring decimalsInvestigate the concept of irrational numbers, including π
Geometric reasoning	<ul style="list-style-type: none">Define congruence of plane shapes using transformationsDevelop the conditions for congruence of trianglesEstablish properties of quadrilaterals using congruent triangles and angle properties, and solve related numerical problems using reasoning
Financial mathematics	<ul style="list-style-type: none">Solve problems involving the use of percentages, including percentage increases and decreasesSolve problems involving profit and loss
Algebra	<ul style="list-style-type: none">Extend and apply the distributive law to the expansion of algebraic expressionsFactorise algebraic expressions by identifying numerical factorsSimplify algebraic expressions involving the four operationsSolve linear equations using algebraic and graphical techniques. Verify solutions by substitution
Linear relationships	<ul style="list-style-type: none">Plot linear relationships on the Cartesian plane with and without the use of digital technologiesSolve linear equations using algebraic and graphical techniques. Verify solutions by substitution
Measurement	<ul style="list-style-type: none">Choose appropriate units of measurement for area and volume and convert from one unit to anotherFind perimeters and areas of parallelograms, trapeziums, rhombuses and kitesInvestigate the relationship between features of circles such as circumference, area, radius and diameter. Use formulas to solve problems involving circumference and areaDevelop the formulas for volumes of rectangular and triangular prisms and prisms in general. Use formulas to solve problems involving volumeSolve problems involving duration, including using 12- and 24-hour time within a single time zone
Statistics	<ul style="list-style-type: none">Investigate techniques for collecting data, including census, sampling and observationExplore the practicalities and implications of obtaining data through sampling using a variety of investigative processesExplore the variation of means and proportions of random samples drawn from the same populationInvestigate the effect of individual data values, including outliers, on the mean and median
Probability	<ul style="list-style-type: none">Identify complementary events and use the sum of probabilities to solve problemsDescribe events using language of 'at least', exclusive 'or', inclusive 'or' and 'and'.Represent events in two-way tables and Venn diagrams and solve related problems