

Stage 4

Number and Algebra

Computation with Integers

| Content Descriptor | Lesson Names |
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| Apply the associative, commutative and distributive laws to aid mental and written computation | <ul style="list-style-type: none"> • The Associative Law • The Commutative Law • The Distributive Law • Using the Distributive Law |
| Compare, order, add and subtract integers | <ul style="list-style-type: none"> • Comparing & Ordering Integers • Negative Integers • Positive Integers • Adding Negative Numbers • Subtracting Negative Numbers |
| Carry out the four operations with rational numbers and integers, using efficient mental and written strategies and appropriate digital technologies | <ul style="list-style-type: none"> • Addition • Subtraction • Integers • Negative Integer Addition and Subtraction • Multiplication • Division • Long Division • Negative Integer Multiplication and Division • Order of Operations |

Fractions, Decimals and Percentages

| Content Descriptor | Lesson Names |
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| Compare fractions using equivalence; locate and represent positive and negative fractions and mixed numerals on a number line | <ul style="list-style-type: none"> • Comparing Fractions • Comparing Fractions with the Same Denominator • Equivalent Fractions • Fraction Basics • Fraction Walls • Fractions and Number Lines • Mixed Numbers |
| Solve problems involving addition and subtraction of fractions, including those with unrelated denominators | <ul style="list-style-type: none"> • Adding Fractions with a Different Denominator • Adding Fractions with the Same Denominator • Adding Mixed Fractions with the Same Denominator • Subtracting Fractions with a Different Denominator |

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| | <ul style="list-style-type: none"> Subtracting Fractions with the Same Denominator Subtracting Mixed Fractions with a Different Denominator Subtracting Mixed Fractions with the Same Denominator |
| Multiply and divide fractions and decimals using efficient written strategies and digital technologies | <ul style="list-style-type: none"> Dividing Fractions Dividing Fractions by Simplifying Multiplying Fractions Numerically Multiplying Fractions Using Models Multiplying Decimals Dividing Decimals |
| Express one quantity as a fraction of another, with and without the use of digital technologies | <ul style="list-style-type: none"> Using Fractions - Food Using Fractions - Money Using Fractions - Space |
| Round decimals to a specified number of decimal places | <ul style="list-style-type: none"> Rounding to Decimal Places |
| Investigate terminating and recurring decimals | <ul style="list-style-type: none"> Terminating Decimals and Rounding Recurring Decimals |
| Connect fractions, decimals and percentages and carry out simple conversions | <ul style="list-style-type: none"> Converting Between Fractions and Decimals Converting Between Percentages and Fractions: Simplifying Fractions |
| Investigate the concept of irrational numbers, including π | <ul style="list-style-type: none"> Irrational Numbers |
| Find percentages of quantities and express one quantity as a percentage of another, with and without the use of digital technologies | <ul style="list-style-type: none"> Introduction to Percentages Using Percentages |
| Solve problems involving the use of percentages, including percentage increases and decreases, with and without the use of digital technologies | <ul style="list-style-type: none"> Using Percentages Percentages and Money Percentages and Populations Calculating Percentage Discounts Discounts |

Financial Mathematics

| Content Descriptor | Lesson Names |
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| Investigate and calculate the Goods and Services Tax (GST), with and without the use of digital technologies | <ul style="list-style-type: none"> Goods and Services Tax |
| Investigate and calculate 'best buys', with and without the use of digital technologies | <ul style="list-style-type: none"> Cost per Item Best Buys Using Unit Costs When a Best Buy isn't the Best Option |
| Solve problems involving profit and loss, with and without the use of digital technologies | <ul style="list-style-type: none"> Profit and Loss Calculating Profit and Loss |

Ratios and Rates

| Content Descriptor | Lesson Names |
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| Recognise and solve problems involving simple ratios | <ul style="list-style-type: none"> Ratios |
| Solve a range of problems involving ratios and rates, with and without the use of digital technologies | <ul style="list-style-type: none"> Applying Ratios and Rate |
| Investigate, interpret and analyse graphs from authentic data | <ul style="list-style-type: none"> Analysing Linear Graphs Analysing Travel Graphs Plotting and Reading Travel Graphs Water Evaporation Graphs |

Algebraic Techniques 1

| Content Descriptor | Lesson Names |
|---|--|
| Introduce the concept of variables as a way of representing numbers using letters | <ul style="list-style-type: none"> Welcome to Algebra Arithmetic in Algebra Substitution |
| Extend and apply the laws and properties of arithmetic to algebraic terms and expressions | <ul style="list-style-type: none"> Simplifying Addition in Algebra Simplifying Subtraction in Algebra Simplifying Multiplication in Algebra Simplifying Addition in Algebra Translating Between Authentic Situations and Algebraic Expressions Translating Between Word Descriptions and Algebraic Expressions |
| Simplify algebraic expressions involving the four operations | <ul style="list-style-type: none"> Order of Operations in Algebra Order of Operations in Algebraic Equations Simplifying Addition in Algebra Simplifying Subtraction in Algebra Simplifying Multiplication in Algebra Simplifying Addition in Algebra |

Algebraic Techniques 2

| Content Descriptor | Lesson Names |
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| Create algebraic expressions and evaluate them by substituting a given value for each variable | <ul style="list-style-type: none"> Substitution Substitution in Algebraic Expressions Evaluating Algebraic Expressions Finding Formulas Using Formulas |
| Extend and apply the distributive law to the expansion of algebraic expressions | <ul style="list-style-type: none"> Expanding I Expanding II |
| Factorise algebraic expressions by identifying numerical factors | <ul style="list-style-type: none"> Introduction to Factorising Greatest Common Divisor (Highest Common |

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| | Factor) <ul style="list-style-type: none"> Factorising Algebraic Expressions Factorising Algebraic Expressions with Powers |
| Factorise algebraic expressions by identifying algebraic factors | <ul style="list-style-type: none"> Factorising Algebraic Expressions Factorising Algebraic Expressions with Powers |

Indices

| Content Descriptor | Lesson Names |
|--|---|
| Investigate index notation and represent whole numbers as products of powers of prime numbers | <ul style="list-style-type: none"> Index Notation Prime & Composite Numbers Prime Factors and the HCF Prime Factors and the LCM Applying Prime Factors Factor Trees |
| Investigate and use square roots of perfect square numbers | <ul style="list-style-type: none"> Perfect Squares Square Roots Square Roots of Non-Perfect Squares |
| Use index notation with numbers to establish the index laws with positive-integer indices and the zero index | <ul style="list-style-type: none"> Dividing Indices Multiplying Indices Powers of Powers The Power of Zero |

Equations

| Content Descriptor | Lesson Names |
|--|--|
| Solve simple linear equations | <ul style="list-style-type: none"> Arithmetic in Algebra Balancing Equations Concrete Models Flow Charts Visual Methods for Solving Linear Equations Solving One-Step Linear Equations Solving Two-Step Linear Equations Non-Integer Solutions to Linear Equations Order of Operations in Algebra Order of Operations in Algebraic Equations |
| Solve linear equations using algebraic techniques and verify solutions by substitution | <ul style="list-style-type: none"> Solving One-Step Linear Equations Solving Two-Step Linear Equations Non-Integer Solutions to Linear Equations Order of Operations in Algebra Order of Operations in Algebraic Equations Solving Linear Equations with Brackets Checking Solutions |
| Solve simple quadratic equations | <ul style="list-style-type: none"> Solving Quadratic Equations |

Linear Relationships

| Content Descriptor | Lesson Names |
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| Given coordinates, plot points on the Cartesian plane, and find coordinates for a given point | <ul style="list-style-type: none"> Coordinates Introduction to Cartesian Planes Plotting on a Cartesian Plane |
| Describe translations, reflections in an axis, and rotations of multiples of 90° on the Cartesian plane using coordinates | <ul style="list-style-type: none"> Reflection Rotation on Cartesian Planes Translation |
| Plot linear relationships on the Cartesian plane, with and without the use of digital technologies | <ul style="list-style-type: none"> Plotting on a Cartesian Plane Applications of Linear Equations Drawing Graphs Plotting Linear Relationships Reading Graphs Analysing Graphs |
| Solve linear equations using graphical techniques | <ul style="list-style-type: none"> Solving Equations Using Graphical Methods |

Measurement and Geometry

Length

| Content Descriptor | Lesson Names |
|--|---|
| Find perimeters of parallelograms, trapeziums, rhombuses and kites | <ul style="list-style-type: none"> Perimeter Perimeters of Kites, Rhombuses, Trapeziums and Parallelograms Perimeter of Composite Shapes Finding the Perimeter of a Shape with an Unknown Side Perimeter, Composite Shapes and Unknown Sides |
| Investigate the concept of irrational numbers, including π | <ul style="list-style-type: none"> Irrational Numbers Parts of a Circle |
| Investigate the relationship between features of circles, such as the circumference, radius and diameter; use formulas to solve problems involving circumference | <ul style="list-style-type: none"> Parts of a Circle Circumference of Circles Using the Circumference of Circles |

Area

| Content Descriptor | Lesson Names |
|---|--|
| Choose appropriate units of measurement for area and convert from one unit to another | <ul style="list-style-type: none"> Units of Area Converting Between Units of Area Converting Between Units of Area Applications |

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| Establish the formulas for areas of rectangles, triangles and parallelograms and use these in problem solving | <ul style="list-style-type: none"> • Area of Triangles • Area of Rectangles & Squares • Area of Parallelograms |
| Find areas of trapeziums, rhombuses and kites | <ul style="list-style-type: none"> • Area of Trapeziums • Area of Rhombus and Kites • Converting Between Units of Area Applications |
| Investigate the relationship between features of circles, such as the area and the radius; use formulas to solve problems involving area | <ul style="list-style-type: none"> • Parts of a Circle • Calculating the Area of Circles • Using the Area of Circles |

Volume

| Content Descriptor | Lesson Names |
|---|---|
| Draw different views of prisms and solids formed from combinations of prisms | <ul style="list-style-type: none"> • Introduction to Solids • Prisms • Pyramids |
| Choose appropriate units of measurement for volume and convert from one unit to another | <ul style="list-style-type: none"> • Choosing Appropriate Units of Volume • Converting Units of Capacity • Converting Units of Volume • Converting Further Units of Capacity and Applications |
| Develop the formulas for the volumes of rectangular and triangular prisms and of prisms in general; use formulas to solve problems involving volume | <ul style="list-style-type: none"> • Volume of Rectangular Prisms • Calculating Volume of Rectangular Prisms • Calculating Volume of Triangular Prisms • Calculating Volume of Other Regular and Irregular Prisms |
| Calculate the volumes of cylinders and solve related problems | <ul style="list-style-type: none"> • Calculating Volume of Cylinders |

Time

| Content Descriptor | Lesson Names |
|---|--|
| Solve problems involving duration, including using 12-hour and 24-hour time within a single time zone | <ul style="list-style-type: none"> • Duration • Timetables |
| Solve problems involving international time zones | <ul style="list-style-type: none"> • Time Zones |

Right-Angled Triangles

| Content Descriptor | Lesson Names |
|--|---|
| Investigate pythagoras-theorem and its application to solving simple problems involving right-angled triangles | <ul style="list-style-type: none"> • Parts of a Triangle and the Hypotenuse • Pythagoras' Theorem |
| Investigate the concept of irrational numbers | <ul style="list-style-type: none"> • Irrational Numbers |

Properties of Geometrical Figures 1

| Content Descriptor | Lesson Names |
|--|---|
| Classify triangles according to their side and angle properties and describe quadrilaterals | <ul style="list-style-type: none"> Types of Triangles Angles in a Triangle Triangles Classifying Quadrilaterals Angles in Quadrilaterals Applying Rules to Quadrilaterals |
| Identify line and rotational symmetries | <ul style="list-style-type: none"> Line Symmetry Rotational Symmetry |
| Demonstrate that the angle sum of a triangle is 180° and use this to find the angle sum of a quadrilateral | <ul style="list-style-type: none"> Angles in a Triangle Angles in Quadrilaterals |
| Use the properties of special triangles and quadrilaterals to solve simple numerical problems with appropriate reasoning | <ul style="list-style-type: none"> |

Properties of Geometrical Figures 2

| Content Descriptor | Lesson Names |
|---|---|
| Develop the conditions for congruence of triangles | <ul style="list-style-type: none"> Conditions for Congruence: ASA, AAS and HL Conditions for Congruence: SSS and SAS Working with Congruent Triangles |
| Establish properties of quadrilaterals using congruent triangles and angle properties, and solve related numerical problems using reasoning | <ul style="list-style-type: none"> Working with Congruent Triangles Congruence of Rhombuses, Trapeziums and Kites Congruence of Squares, Rectangles and Parallelograms |

Angle Relationships

| Content Descriptor | Lesson Names |
|---|--|
| Use the language, notation and conventions of geometry | <ul style="list-style-type: none"> Introduction to Angles Language, Notation and Conventions of Geometry |
| Recognise the geometrical properties of angles at a point | <ul style="list-style-type: none"> Angles around a Point |
| Identify corresponding, alternate and co-interior angles when two straight lines are crossed by a transversal | <ul style="list-style-type: none"> Angles around Parallel Lines |
| Investigate conditions for two lines to be parallel | <ul style="list-style-type: none"> Parallel Lines |
| Solve simple numerical problems using reasoning | <ul style="list-style-type: none"> Angles around a Point Angles around Parallel Lines |

Statistics and Probability

Data Collection and Representation

| Content Descriptor | Lesson Names |
|---|---|
| Investigate techniques for collecting data, including census, sampling and observation | <ul style="list-style-type: none"> • Introduction to Data • Data Sources & Data Types • Introduction to Data Collection • Data Collection Methods • Experiment and Observation • Surveying • Random Sampling • Survey and Simulation |
| Explore the practicalities and implications of obtaining data through sampling using a variety of investigative processes | <ul style="list-style-type: none"> • Random Sampling • Survey and Simulation • Surveying |
| Identify and investigate issues involving numerical data collected from primary and secondary sources | <ul style="list-style-type: none"> • Collecting Data - Primary & Secondary Sources • Random Sampling • Surveying • Bias in Data |
| Construct and compare a range of data displays, including stem-and-leaf plots and dot plots | <ul style="list-style-type: none"> • Tallies and Tables • Displaying Data • Frequency Polygons • Histograms • Dot Plots and Column (Bar) Graphs • Stem and Leaf Plots • Pie Charts and Divided Bar Graphs • Line Graphs • Pick Your Display Method |

Single Variable Data Analysis

| Content Descriptor | Lesson Names |
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| Calculate mean, median, mode and range for sets of data and interpret these statistics in the context of data | <ul style="list-style-type: none"> • The Mean • The Median • The Mode • The Range |
| Investigate the effect of individual data values, including outliers, on the mean and median | <ul style="list-style-type: none"> • Clusters and Outliers • Outliers • Analysing Numerical Data • Calculating Measures of Centre and Spread • Comparing Measures of Centre |
| Describe and interpret data displays using mean, median and range | <ul style="list-style-type: none"> • Finding Measures of Centre and Spread in Data Displays • Analysing Numerical Data |

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

- Calculating Measures of Centre and Spread
- Comparing Measures of Centre

Probability 1

| Content Descriptor | Lesson Names |
|---|--|
| Construct sample spaces for single-step experiments with equally likely outcomes | <ul style="list-style-type: none"> • Introduction to Likelihood • Introduction to Probability • Probability Terminology • Comparing Probabilities • Experimental Probability |
| Assign probabilities to the outcomes of events and determine probabilities for events | <ul style="list-style-type: none"> • Introduction to Likelihood • Introduction to Probability • Probability Terminology • Comparing Probabilities • Experimental Probability • Probability as a Decimal and a Percentage • Probability as a Fraction • Calculating Probability |
| Identify complementary events and use the sum of probabilities to solve problems | <ul style="list-style-type: none"> • Calculating Complements • Complementary Events |

Probability 2

| Content Descriptor | Lesson Names |
|---|---|
| Describe events using language of 'at least', exclusive 'or' (A or B but not both), inclusive 'or' (A or B or both) and 'and' | <ul style="list-style-type: none"> • Describing Probabilities • Using Descriptions of Probability |
| Represent events in two-way tables and Venn diagrams and solve related problems | <ul style="list-style-type: none"> • Two-Way Tables • Using Two-Way Tables • Making Your Own Two-Way Tables • Venn Diagrams • Using Venn Diagrams • Making Your Own Venn Diagrams |

Stage 5.1

Number and Algebra

Financial Mathematics

| Content Descriptor | Lesson Names |
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