NSW Mathematics

EP Curriculum Map

Stage 3

Number and Algebra

Whole Numbers 1

Content Descriptor	Lesson Names
Recognise, represent and order numbers to at least tens of millions	• Place Values • Number Lines • Expanding Numbers • Introduction to Rounding • Ordering Positive Integers
Identify and describe factors and multiples of whole numbers and use them to solve problems	• Factors • Highest Common Factor • Identifying Factors • Multiples • Applications of Multiples • Lowest Common Multiple

Whole Numbers 2

Content Descriptor	Lesson Names
Investigate everyday situations that use integers; locate and represent these numbers on a number line	• Introduction to Negative Numbers • Negative Integers • Negative Numbers on the Number Line • Ordering Negative Integers
Identify and describe properties of prime, composite, square and triangular numbers	• Square Numbers • Calculating Square Numbers • Triangular Numbers • Prime Numbers • Composite Numbers • Factor Trees

Addition and Subtraction 1

Content Descriptor	Lesson Names
Use efficient mental and written strategies and	• Addition

apply appropriate digital technologies to solve problems	• Subtraction
Use estimation and rounding to check the reasonableness of answers to calculations	• Introduction to Rounding
	• Budgeting • Making a Budget

Addition and Subtraction 2

Content Descriptor	Lesson Names
Select and apply efficient mental and written strategies and appropriate digital technologies to solve problems involving addition and subtraction with whole numbers	• Addition • Applying Addition and Subtraction • Subtraction • The Subtraction Algorithm

Multiplication and Division 1

Content Descriptor	Lesson Names
Solve problems involving multiplication of large numbers by one- or two-digit numbers using efficient mental and written strategies and appropriate digital technologies	• Multiplication Using Place Value • Multiplying Big Numbers • Multiplication Using Rounding and Compensation
Solve problems involving division by a one-digit number, including those that result in a remainder	• Division in Parts • Long Division
Use estimation and rounding to check the reasonableness of answers to calculations	• Introduction to Rounding

Multiplication and Division 2

Content Descriptor	Lesson Names
Select and apply efficient mental and written strategies, and appropriate digital technologies, to solve problems involving multiplication and division with whole numbers	• Column Multiplication • Applying Multiplication and Division
Explore the use of brackets and the order of operations to write number sentences	• Order of Operations • Preserving Order of Operations

Fractions and Decimals 1

Content Descriptor	Lesson Names
Compare and order common unit fractions and locate and represent them on a number line	• Unit Fractions • Fractions on a Number Line
Investigate strategies to solve problems involving	• Proper and Improper Fractions

addition and subtraction of fractions with the same denominator	• Mixed Numbers • Adding Fractions with the Same Denominator • Adding Mixed Numbers with the Same Denominator • Adding Whole Numbers and Fractions • Subtracting Fractions from One Whole • Subtracting Fractions from Whole Numbers • Subtracting Fractions with the Same Denominator
Recognise that the place value system can be extended beyond hundredths	• Introduction to Decimals • Tenths • Hundredths • Thousandths and Beyond
Compare, order and represent decimals	• Comparing Decimals

Fractions and Decimals 2

Content Descriptor	**Lesson Names**
Compare fractions with related denominators and locate and represent them on a number line	• Fractions and Number Lines • Comparing Fractions • Equivalent Fractions • Simplifying Fractions
Solve problems involving addition and subtraction of fractions with the same or related denominators	• Adding Fractions with Related Denominators • Adding Fractions with the Same Denominator • Adding Mixed Numbers with the Same Denominator • Subtracting Fractions with Related Denominators • Subtracting Fractions with the Same Denominator • Subtracting Mixed Numbers with the Same Denominator
Find a simple fraction of a quantity where the result is a whole number, with and without the use of digital technologies	• Fraction of a Quantity
Add and subtract decimals, with and without the use of digital technologies, and use estimation and rounding to check the reasonableness of answers	• Adding Decimals • Applications of Adding Decimals • Subtracting Decimals • Applications of Subtracting Decimals •
Multiply decimals by whole numbers and perform divisions by non-zero whole numbers where the results are terminating decimals, with and without the use of digital technologies	• Dividing Decimals • Multiplying Decimals

Multiply and divide decimals by powers of 10	• Multiplying Decimals
Make connections between equivalent fractions, decimals and percentages	• Introduction to Percentages • Percentages and Decimals • Percentages, Decimals and Fractions • Converting Percentages
Investigate and calculate percentage discounts of 10%, 25% and 50% on sale items, with and without the use of digital technologies	• Discounts • Calculating Discounts • Percentages of a Number • Percentages, Decimals and Fractions

Patterns and Algebra 1

Content Descriptor	Lesson Names
Use equivalent number sentences involving multiplication and division to find unknown quantities	• Equivalent Number Sentences • Gaps in Number Sentences

Patterns and Algebra 2

Content Descriptor	Lesson Names
Continue and create sequences involving whole numbers, fractions and decimals; describe the rule used to create the sequence	• Identifying Relationships • Rules for Patterns • Using Rules to Continue Patterns
Introduce the cartesian-coordinate-system using all four quadrants	• Cartesian Planes • Describing Locations with Cartesian Planes • Describing Locations with Coordinates

Measurement and Geometry

Length 1

Content Descriptor	Lesson Names
Choose appropriate units of measurement for length	• Unit Prefixes • Units of Length • Units of Measurement • Estimating Measurements • Appropriate Units of Length
Calculate the perimeters of rectangles using familiar metric units	• Perimeter • Finding Perimeters

Length 2

Content Descriptor	Lesson Names
Connect decimal representations to the metric system	• Interpreting Units of Length

	• Comparing Units of Length
Convert between common metric units of length	• Converting Units of Length • Method for Converting Units of Length
Solve problems involving the comparison of lengths using appropriate units	• Comparing Units of Length • Perimeter • Finding Perimeters

Area 1

Content Descriptor	Lesson Names
Choose appropriate units of measurement for area	• Area • Units of Measurement • Hectares
Calculate the areas of rectangles using familiar metric units	• Area of Rectangles

Area 2

Content Descriptor	Lesson Names
Solve problems involving the comparison of areas using appropriate units	• Area of Triangles

Volume and Capacity 1

Content Descriptor	Lesson Names
Choose appropriate units of measurement for volume and capacity	• Unit Prefixes • Units of Measurement

Volume and Capacity 2

Content Descriptor	Lesson Names
Connect volume and capacity and their units of measurement	• Volume • Units of Capacity
Connect decimal representations to the metric system	• Interpreting Units of Capacity • Capacity and Volume
Convert between common metric units of capacity	• Converting Units of Capacity • Applications of Converting Units of Capacity
Calculate the volumes of rectangular prisms	• Volume of Rectangular Prisms

Mass 1

Content Descriptor	Lesson Names
Choose appropriate units of measurement for mass	• Unit Prefixes • Units of Measurement • Units of Mass • Net Mass and Gross Mass

Mass 2

Content Descriptor	Lesson Names
Connect decimal representations to the metric system	• Units of Mass • Interpreting Units of Mass
Convert between common metric units of mass	• Converting Units of Mass • Applications of Converting Units of Mass

Time 1

Content Descriptor	Lesson Names
Compare 12- and 24-hour time systems and convert between them	• 24-Hour Time • Converting 12- and 24-Hour Time • Time Zones
Determine and compare the duration of events	• Recording Time • Duration

Time 2

Content Descriptor	Lesson Names
Interpret and use timetables	• Reading Timetables • Timetables and Transport • Using Multiple Timetables • Personal Timetables
Draw and interpret timelines using a given scale	• Timelines

3D Space 1

Content Descriptor	Lesson Names
Compare, describe and name prisms and pyramids	• 3D Solids • Identifying Faces of Prisms and Pyramids • Prisms • Pyramids
Connect three-dimensional objects with their nets and other two-dimensional representations	• Nets of Prisms • Nets of Pyramids

3D Space 2

Content Descriptor	Lesson Names
Construct simple prisms and pyramids	• Drawing Prisms • Drawing Pyramids • Nets of Prisms • Nets of Pyramids • Prisms • Pyramids

2D Space 1

Content Descriptor	Lesson Names
Classify two-dimensional shapes and describe their features	• 2D Shapes • Quadrilaterals • Types of Triangles • Regular Polygons • Irregular Polygons
Describe translations, reflections and rotations of two-dimensional shapes	• Translation on a Grid • Reflection on a Grid • Rotation on a Grid
Identify line and rotational symmetries	• Identifying Rotational Symmetry • Order of Rotational Symmetry • Rotational Symmetry in Life • Line Symmetry • Line Symmetry in Life
Apply the enlargement transformation to familiar two-dimensional shapes and explore the properties of the resulting image compared with the original	• The Enlargement Transformation

2D Space 2

Content Descriptor	Lesson Names
Investigate the diagonals of two-dimensional shapes	•
Identify and name parts of circles	• Parts of a Circle • Circumference of Circles
Investigate combinations of translations, reflections and rotations, with and without the use of digital technologies	• Predicting Patterns • Reflection • Rotation • Translation

Angles 1

Content Descriptor	Lesson Names
Estimate, measure and compare angles using degrees	• Angles • Angles in the Real World • Estimating the Size of Angles • Measuring Acute and Obtuse Angles • Measuring Reflex Angles
Construct angles using a protractor	• Types of Angles • Right Angles • Other Common Angles

Angles 2

Content Descriptor	Lesson Names
Investigate, with and without the use of digital technologies, angles on a straight line, angles at a point, and vertically opposite angles; use the results to find unknown angles	• Angles Around a Point • Angles in Corners • Angles on Straight Lines • Vertically Opposite Angles

Position

Content Descriptor	Lesson Names
Use a grid-reference system to describe locations	• Locations
Describe routes using landmarks and directional language	• Describing Routes • Describing Routes Using Landmarks

Statistics and Probability

Data 1

Content Descriptor	Lesson Names
Pose questions and collect categorical or numerical data by observation or survey	• Collecting Data • Surveys
Construct displays, including column graphs, dot plots and tables, appropriate for data type, with and without the use of digital technologies	• Tally Marks • Data Tables • Column (Bar) Graphs • Dot Plots • Dot Plots and Tables • Picture Graphs • Picture Graphs and Data Tables • Picture Graphs with Keys • Line Graphs

Describe and interpret different data sets in context	• Column (Bar) Graphs • Dot Plots • Dot Plots and Tables • Picture Graphs • Picture Graphs and Data Tables • Picture Graphs with Keys • Line Graphs • Reading Column Graphs

Data 2

Content Descriptor	Lesson Names
Interpret and compare a range of data displays, including side-by-side column graphs for two categorical variables	• Side-by-Side Column Graphs • Two-Way Tables
Interpret secondary data presented in digital media and elsewhere	• Misleading Data and Graphs

Chance 1

Content Descriptor	Lesson Names
List outcomes of chance experiments involving equally likely outcomes and represent probabilities of those outcomes using fractions	• The Probability of Outcomes • Equal and Unequal Outcomes • Probability as a Fraction • Chance Games
Recognise that probabilities range from 0 to 1	• The Likelihood Scale • Likelihood of Events

Chance 2

Content Descriptor	Lesson Names
Compare observed frequencies across experiments with expected frequencies	• Probability Experiments • Observed Outcomes vs. Expected Outcomes
Describe probabilities using fractions, decimals and percentages	• Proportional Reasoning • Writing Probabilities
Conduct chance experiments with both small and large numbers of trials using appropriate digital technologies	• Probability Experiments

Stage 4

Number and Algebra

Computation with Integers

Content Descriptor	Lesson Names
Apply the associative, commutative and distributive laws to aid mental and written computation	• The Associative Law • The Commutative Law • The Distributive Law • Using the Distributive Law
Compare, order, add and subtract integers	• 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	• 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
Compare fractions using equivalence; locate and represent positive and negative fractions and mixed numerals on a number line	• 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	• 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

	• 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	• 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	• Using Fractions - Food • Using Fractions - Money • Using Fractions - Space
Round decimals to a specified number of decimal places	• Rounding to Decimal Places
Investigate terminating and recurring decimals	• Terminating Decimals and Rounding • Recurring Decimals
Connect fractions, decimals and percentages and carry out simple conversions	• Converting Between Fractions and Decimals • Converting Between Percentages and Fractions: Simplifying Fractions
Investigate the concept of irrational numbers, including π	• Irrational Numbers
Find percentages of quantities and express one quantity as a percentage of another, with and without the use of digital technologies	• 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	• Using Percentages • Percentages and Money • Percentages and Populations • Calculating Percentage Discounts • Discounts

Financial Mathematics

Content Descriptor	Lesson Names
Investigate and calculate the Goods and Services Tax (GST), with and without the use of digital technologies	• Goods and Services Tax
Investigate and calculate 'best buys', with and without the use of digital technologies	• 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	• Profit and Loss • Calculating Profit and Loss

Ratios and Rates

Content Descriptor	Lesson Names
Recognise and solve problems involving simple ratios	• Ratios
Solve a range of problems involving ratios and rates, with and without the use of digital technologies	• Applying Ratios and Rate
Investigate, interpret and analyse graphs from authentic data	• 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	• Welcome to Algebra • Arithmetic in Algebra • Substitution
Extend and apply the laws and properties of arithmetic to algebraic terms and expressions	• 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	• 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
Create algebraic expressions and evaluate them by substituting a given value for each variable	• Substitution • Substitution in Algebraic Expressions • Evaluating Algebraic Expressions • Finding Formulas • Using Formulas
Extend and apply the distributive law to the expansion of algebraic expressions	• Expanding I • Expanding II
Factorise algebraic expressions by identifying numerical factors	• Introduction to Factorising • Greatest Common Divisor (Highest Common

	Factor) • Factorising Algebraic Expressions • Factorising Algebraic Expressions with Powers
Factorise algebraic expressions by identifying algebraic factors	• 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	• 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	• 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	• Dividing Indices • Multiplying Indices • Powers of Powers • The Power of Zero

Equations

Content Descriptor	Lesson Names
Solve simple linear equations	• 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	• 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	• Solving Quadratic Equations

Linear Relationships

Content Descriptor	Lesson Names
Given coordinates, plot points on the Cartesian plane, and find coordinates for a given point	• 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	• Reflection • Rotation on Cartesian Planes • Translation
Plot linear relationships on the Cartesian plane, with and without the use of digital technologies	• Plotting on a Cartesian Plane • Applications of Linear Equations • Drawing Graphs • Plotting Linear Relationships • Reading Graphs • Analysing Graphs
Solve linear equations using graphical techniques	• Solving Equations Using Graphical Methods

Measurement and Geometry

Length

Content Descriptor	Lesson Names
Find perimeters of parallelograms, trapeziums, rhombuses and kites	• 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	• 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	• 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	• Units of Area • Converting Between Units of Area • Converting Between Units of Area Applications

Establish the formulas for areas of rectangles, triangles and parallelograms and use these in problem solving	• Area of Triangles • Area of Rectangles & Squares • Area of Parallelograms
Find areas of trapeziums, rhombuses and kites	• 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	• 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	• Introduction to Solids • Prisms • Pyramids
Choose appropriate units of measurement for volume and convert from one unit to another	• 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	• 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	• 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	• Duration • Timetables
Solve problems involving international time zones	• Time Zones

Right-Angled Triangles

Content Descriptor	Lesson Names
Investigate pythagoras-theorem and its application to solving simple problems involving right-angled triangles	• Parts of a Triangle and the Hypotenuse • Pythagoras' Theorem
Investigate the concept of irrational numbers	• Irrational Numbers

Properties of Geometrical Figures 1

Content Descriptor	Lesson Names
Classify triangles according to their side and angle properties and describe quadrilaterals	• Types of Triangles • Angles in a Triangle • Triangles • Classifying Quadrilaterals • Angles in Quadrilaterals • Applying Rules to Quadrilaterals
Identify line and rotational symmetries	• 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	• Angles in a Triangle • Angles in Quadrilaterals
Use the properties of special triangles and quadrilaterals to solve simple numerical problems with appropriate reasoning	•

Properties of Geometrical Figures 2

Content Descriptor	Lesson Names
Develop the conditions for congruence of triangles	• 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	• 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	• Introduction to Angles • Language, Notation and Conventions of Geometry
Recognise the geometrical properties of angles at a point	• Angles around a Point
Identify corresponding, alternate and co-interior angles when two straight lines are crossed by a transversal	• Angles around Parallel Lines
Investigate conditions for two lines to be parallel	• Parallel Lines
Solve simple numerical problems using reasoning	• 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	• 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	• Random Sampling • Survey and Simulation • Surveying
Identify and investigate issues involving numerical data collected from primary and secondary sources	• 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	• 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
Calculate mean, median, mode and range for sets of data and interpret these statistics in the context of data	• The Mean • The Median • The Mode • The Range
Investigate the effect of individual data values, including outliers, on the mean and median	• 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	• 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	• Introduction to Likelihood • Introduction to Probability • Probability Terminology • Comparing Probabilities • Experimental Probability
Assign probabilities to the outcomes of events and determine probabilities for events	• 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	• 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'	• Describing Probabilities • Using Descriptions of Probability
Represent events in two-way tables and Venn diagrams and solve related problems	• 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

Solve problems involving earning money	• Salaries and Wages • Timesheets • Commission • Piecework • Royalties • Overtime, Special rates and Allowances • Alternative Sources of Income • Government Benefits and Allowances • Retirement • Income Tax
Solve problems involving simple interest	• Introduction to Interest • Calculating Simple Interest • Rearranging the Simple Interest Formula
Connect the compound interest formula to repeated applications of simple interest using appropriate digital technologies	• Compound Interest Basic Formula

Indices

Content Descriptor	Lesson Names
Extend and apply the index laws to variables, using positive-integer indices and the zero index	• Dividing Powers • Division as the Base of a Power • Multiplication as the Base of a Power • Multiplying Powers • Powers as the Base of Another Power • The Zero Index
Simplify algebraic products and quotients using index laws	• Simplifying Algebraic Products with Index Laws • Simplifying Algebraic Quotients with Index Laws
Apply index laws to numerical expressions with integer indices	• Positive and Negative Integer Indices • Applying Index Laws

Linear Relationships

Content Descriptor	Lesson Names
Find the midpoint and gradient of a line segment (interval) on the Cartesian plane using a range of strategies, including graphing software	• Line Segments on Cartesian Planes • Midpoint of a Line Segment • Gradient of a Line Segment
Find the distance between two points located on the Cartesian plane using a range of strategies, including graphing software	• Line Segments on Cartesian Planes • Distance and Pythagoras' Theorem
Sketch linear graphs using the coordinates of two points	• Plotting Linear Graphs • Drawing Linear Graphs Using the Gradient • Graphing Using Technology - Casio Calculators
Solve problems involving parallel lines	• Parallel Lines

	• Perpendicular Lines

Non-Linear Relationships

Content Descriptor	Lesson Names
Graph simple non-linear relations, with and without the use of digital technologies	• Linear and Non-Linear Relationships • Parabolas • Exponential Graphs
Explore the connection between algebraic and graphical representations of relations such as simple quadratics, circles and exponentials using digital technologies as appropriate	• Linear and Non-Linear Relationships • Parabolas • Exponential Graphs • Circles • Transforming Parabolas • Transforming Parabolas - Dilation and Reflection • Transforming Parabolas - Translation • Transforming Circles

Measurement and Geometry

Area and Surface Area

Content Descriptor	Lesson Names
Calculate the areas of composite shapes	• Area of Composite Shapes • Area of Parallelograms • Area of Rectangles & Squares • Area of Rhombuses and Kites • Area of Trapeziums • Area of Triangles
Solve problems involving the surface areas of right prisms	• Surface Area of Prisms • Nets of Prisms

Numbers of Any Magnitude

Content Descriptor	Lesson Names
Investigate very small and very large time scales and intervals	• The Metric System • Units of Measurement • Time Scales • Rounding Sensibly • Rounding to Significant Figures • Precision and Accuracy • Precision in Context • Absolute vs. Relative Error • Limits of Accuracy
Express numbers in scientific-notation	• Introduction to Scientific Notation (Standard

	Form) - Large Numbers • Introduction to Scientific Notation (Standard Form) - Small Numbers • Significant Figures and Scientific Notation (Standard Form) • Ordering Numbers and Estimating Calculations in Scientific Notation (Standard Form) • Adding and Subtracting with Scientific Notation (Standard Form) • Multiplying and Dividing in Scientific Notation (Standard Form) • Leading Digit Approximation

Right-Angled Triangles

Content Descriptor	Lesson Names
Use similarity to investigate the constancy of the sine, cosine and tangent ratios for a given angle in right-angled triangles	• Introduction to Trigonometry • Finding Side Lengths Using Trigonometry • Finding Angles Using Trigonometry
Apply trigonometry to solve right-angled triangle problems	• Finding Side Lengths Using Trigonometry • Finding Angles Using Trigonometry
Solve right-angled triangle problems, including those involving angles-of-elevation-and-depression	• Angles of Elevation and Depression

Properties of Geometrical Figures

Content Descriptor	Lesson Names
Use the enlargement transformation to explain similarity	• Introduction to Similarity • The Enlargement Transformation
Solve problems using ratio and scale factors in similar figures	• Introduction to Scaling • Magnitude • Magnitude as a Ratio • Scaling on Cartesian Planes

Statistics and Probability

Single Variable Data Analysis

Content Descriptor	Lesson Names
Identify everyday questions and issues involving at least one numerical and at least one categorical-variable, and collect data directly from secondary sources	• Primary and Secondary Data • Types of Data • Collecting Data • Sampling
Construct back-to-back stem-and-leaf plots and	• Frequency Polygons

histograms and describe data, using terms including 'skewed', 'symmetric' and 'bi-modal'	• Histograms • Back-to-Back Stem and Leaf Plots • Dot Plots • Measures of Centre in Grouped Data • Shape and Mode • Symmetry and Skew in Data • Effect of Shape on Mean and Median
Compare data displays using mean, median and range to describe and interpret numerical data sets in terms of location (centre) and spread	• Back-to-Back Stem and Leaf Plots • Comparing Data Sets • Comparing Dot Plots • Comparing Histograms
Evaluate statistical reports in the media and other places by linking claims to displays, statistics and representative data	• Evaluating Statistical Graphs: Making our Graph • Evaluating Statistical Graphs: the Shape of the Graph • Evaluating Statistical Reports and Claims: Data Collection • Evaluating Statistical Reports and Claims: Data Reporting

Probability

Content Descriptor	Lesson Names
Calculate relative frequencies from given or collected data to estimate probabilities of events involving 'and' or 'or'	• Relative Frequencies • Using Relative Frequencies • Two-Way Tables • Using Two-Way Tables • Venn Diagrams • Using Venn Diagrams • Advanced Venn Diagrams and Two-Way Tables

Stage 5.2

Number and Algebra

Financial Mathematics

Content Descriptor	Lesson Names
Connect the compound-interest formula to repeated applications of simple-interest using appropriate digital technologies	• Compound Interest Basic Formula • Rearranging the Compound Interest Formula • Compound Interest - Months and Weeks • Rearranging Compound Interest - Months and Weeks • Depreciation

Ratios and Rates

Content Descriptor	Lesson Names
Solve problems involving direct proportion; explore the relationship between graphs and equations corresponding to simple rate problems	• Rates • Direct Proportion • Introduction to Inverse Proportion • Analysing Graphs • Introduction to Graphs • Applying Inverse Proportion

Algebraic Techniques

Content Descriptor	Lesson Names
Apply the four operations to simple algebraic fractions with numerical denominators	• Adding Algebraic Fractions • Subtracting Algebraic Fractions • Multiplying Algebraic Fractions • Dividing Algebraic Fractions • Simplifying Multiplication and Division
Apply the four operations to algebraic fractions with pronumerals in the denominator	• Operations Including Binomial Fractions
Apply the distributive law to the expansion of algebraic expressions, including binomials, and collect like terms where appropriate	• Expanding and the Distributive Law • Expanding Binomial Products • Expanding Cubic Expressions • Expanding Differences of Two Squares • Expanding Perfect Squares
Factorise algebraic expressions by taking out a common algebraic factor	• Factorising with Index Laws • Identifying Algebraic Factors • Identifying Complicated Algebraic Factors
Expand binomial products and factorise monic quadratic expressions using a variety of strategies	• Connecting Expanding and Factorising • Factorisation by Grouping • Factorising by Completing the Square • Factorising Differences of Two Squares • Factorising Perfect Squares • Factorising Quadratic Trinomials

Indices

Content Descriptor	Lesson Names
Apply index laws to algebraic expressions involving integer indices	• Positive and Negative Integer Indices • Applying Index Laws • Simplifying Algebraic Products with Index Laws • Simplifying Algebraic Quotients with Index Laws

Equations

Content Descriptor	Lesson Names
Solve linear equations	• Rearranging and Solving Equations • Solving Using Algebraic Methods • Word Problems • Solving Word Problems • Applications of Linear Equations
Solve linear equations involving simple algebraic fractions	• Non-Integer Solutions to Linear Equation
Solve simple quadratic equations using a range of strategies	• Completing the Square: Method 1 - Using Rearrangement • Completing the Square: Method 2 - Using Differences of Two Squares • Factorising Perfect Squares • Factorising Quadratic Expressions • Grouping • Guess and Check • Solving Quadratic Equations Using Technology • The Quadratic Formula
Substitute values into formulas to determine an unknown	• Rearranging and Solving Equations from Formulas • Using Formulas
Solve problems involving linear equations, including those derived from formulas	• Rearranging and Solving Equations from Formulas • Using Formulas • Word Problems • Solving Word Problems • Applications of Linear Equations
Solve linear inequalities and graph their solutions on a number-line	• Introduction to Inequalities • Rearranging Inequalities • Solving Inequalities • Chained Inequalities
Solve linear simultaneous equations, using algebraic and graphical techniques, including with the use of digital technologies	• Using Elimination to Solve Simultaneous Equations • Using Graphs to Solve Simultaneous Equations • Using Substitution to Solve Simultaneous Equations

Linear Relationships

Content Descriptor	Lesson Names
Interpret and graph linear relationships using the gradient-intercept form of the equation of a straight line	• Linear Patterns and Rules • Plotting Linear Graphs

	• Determining Linear Rules • Drawing Linear Graphs Using the Gradient • Graphing Using Technology - Casio Calculators • Horizontal and Vertical Lines
Solve problems involving parallel and perpendicular lines	• Parallel Lines • Perpendicular Lines

Non-Linear Relationships

Content Descriptor	Lesson Names
Graph simple non-linear relationships, with and without the use of digital technologies, and solve simple related equations	• Circles • Exponential Graphs • Parabolas • Transforming Circles • Transforming Parabolas • Transforming Parabolas - Dilation and Reflection • Transforming Parabolas - Translation
Explore the connection between algebraic and graphical representations of relationships such as simple quadratics, circles and exponentials using digital technologies as appropriate	• Circles • Exponential Graphs • Parabolas • Transforming Circles • Transforming Parabolas • Transforming Parabolas - Dilation and Reflection • Transforming Parabolas - Translation

Measurement and Geometry

Area and Surface Area

Content Descriptor	Lesson Names
Calculate the surface areas of cylinders and solve related problems	• Surface Area of Cylinders
Solve problems involving surface area for a range of prisms, cylinders and composite solids	• Surface Area of Prisms • Surface Area of Complex Solids

Volume

Content Descriptor	Lesson Names
Solve problems involving the volumes of right prisms	• Volume of Rectangular Prisms • Calculating Volume of Triangular Prisms • Calculating Volume of Other Regular and Irregular Prisms • Volume of Composite Solids
Solve problems involving volume for a range of prisms,	• Calculating Volume of Cylinders

cylinders and composite solids	• Volume of Composite Solids

Right-Angled Triangles

Content Descriptor	Lesson Names
Apply trigonometry to solve right-angled triangle problems	• Introduction to Trigonometry • Finding Side Lengths Using Trigonometry • Finding Angles Using Trigonometry
Solve right-angled triangle problems, including those involving direction and angles-of-elevation-and-depression	• Angles of Elevation and Depression • Bearings with Right-Angled Triangles

Properties of Geometrical Figures

Content Descriptor	Lesson Names
Formulate proofs involving congruent-triangles and angle properties	• Conditions for Congruence: ASA, AAS and HL • Conditions for Congruence: SSS and SAS • Working with Congruent Triangles • Congruence of Rhombuses, Trapeziums and Kites • Congruence of Squares, Rectangles and Parallelograms • Angle Proofs • Introduction to Proofs and Logic • Parallelogram and Rhombus Proofs • Rectangle and Square Proofs
Use the enlargement transformations to explain similarity and to develop the conditions for triangles to be similar	• Similarity Tests • The Enlargement Transformation
Apply logical reasoning, including the use of congruence and similarity, to proofs and numerical exercises involving plane shapes	• Angle Proofs • Introduction to Proofs and Logic • Parallelogram and Rhombus Proofs • Rectangle and Square Proofs

Statistics and Probability

Single Variable Data Analysis

Content Descriptor	Lesson Names
Determine quartiles and interquartile-range	• Range • Quartiles • Five Point Summary • Interquartile Range
Construct and interpret box plots and use them to	• Box and Whisker Plots

compare data sets	• Plotting Box and Whisker Plots • Comparing Box and Whisker Plots
Compare shapes of box plots to corresponding histograms and dot plots	• Box and Whisker Plots, Histograms and Dot Plot
Investigate reports of surveys in digital media and elsewhere for information on how data was obtained to estimate population means and medians	• Misleading Reports

Bivariate Data Analysis

Content Descriptor	Lesson Names
Investigate and describe bivariate-numerical-data where the independent-variable is time	• Introduction to Bivariate Data • Bivariate Variables • Introduction to Time Series • Analysing Time Series
Use scatter plots to investigate and comment on relationships between two numerical variables	• Introduction to Bivariate Data • Bivariate Variables • Plotting Using a Calculator • Plotting Using a Spreadsheet • Analysing Trend by Eye • Making Predictions by Eye

Probability

Content Descriptor	Lesson Names
List all outcomes for two-step chance experiments, with and without replacement, using tree diagrams or arrays; assign probabilities to outcomes and determine probabilities for events	• Introduction to Two-Step Experiments • Arrays • Using Arrays • Tree Diagrams • Using Tree Diagrams
Describe the results of two- and three-step chance experiments, with and without replacement, assign probabilities to outcomes, and determine probabilities of events; investigate the concept of independence	• Probabilities and Three-Step Experiments • Arrays • Building Three-Step Tree Diagrams • Probabilities of Unequal Outcomes • Three-Step Experiments and Unequal Outcomes • Tree Diagrams with Unequal Outcomes • Introduction to Independence • Investigating Independent Events using Chance Diagrams
Use the language of 'if ... then', 'given', 'of', 'knowing that' to investigate conditional statements and to identify common mistakes in interpreting such language	• Introduction to Conditional Probability • Calculating Conditional Probabilities using Arrays • Calculating Conditional Probability Using Tree Diagrams

	• Investigating Conditional Probability with Two-Way Tables • Investigating Conditional Probability with Venn Diagrams • Word Problems

Stage 5.3

Number and Algebra

Ratios and Rates

Content Descriptor	Lesson Names
Solve problems involving direct proportion; explore the relationship between graphs and equations corresponding to simple rate problems	• Direct Proportion • Introduction to Inverse Proportion • Applying Inverse Proportion • Introduction to Graphs • Analysing Graphs • Constant Rates • Drawing Constant Rates • Reading Constant Rates • Variable Rates • Rates of Change • Analysing Rates of Change

Algebraic Techniques

Content Descriptor	Lesson Names
Add and subtract algebraic fractions with numerical denominators, including those with binomial numerators	• Adding Algebraic Fractions • Subtracting Algebraic Fractions • Multiplying Algebraic Fractions • Dividing Algebraic Fractions • Simplifying Multiplication and Division • Operations Including Binomial Fractions
Expand binomial products using a variety of strategies	• Expanding Binomial Products
Factorise monic and non-monic quadratic expressions	• Connecting Expanding and Factorising • Factorisation by Grouping • Factorising by Completing the Square • Factorising Differences of Two Squares • Factorising Perfect Squares • Factorising Quadratic Trinomials

Surds and Indices

Content Descriptor	Lesson Names
Define rational and irrational numbers and perform operations with surds and fractional indices	• Real Numbers • Introduction to Surds • Multiplying and Dividing Surds • Simplifying Surds • Adding and Subtracting Surds • Index Laws and Fractional Powers • Expanding Surds • Conjugate and Perfect Square Surds • Rationalising Denominators

Equations

Content Descriptor	Lesson Names
Solve complex linear equations involving algebraic fractions	•
Solve a wide range of quadratic equations derived from a variety of contexts	• Monic Factorisation • Solving Monic Quadratic Equations • Non-Monic Factorisation • Solving Non-Monic Quadratic Equations • The Quadratic Formula • Writing Quadratic Equations
Solve simple cubic equations	•
Rearrange literal equations	• Rearranging and Solving Equations from Formulas • Using Formulas
Solve simultaneous equations, where one equation is non-linear, using algebraic and graphical techniques, including the use of digital technologies	• Graphical Non-Linear Simultaneous Equations

Linear Relationships

Content Descriptor	Lesson Names
Find the midpoint and gradient of a line-segment-interval on the Cartesian plane	• Line Segments on Cartesian Planes • Midpoint of a Line Segment • Gradient of a Line Segment
Find the distance between two points located on the Cartesian plane	• Line Segments on Cartesian Planes • Distance and Pythagoras' Theorem
Sketch linear graphs using the coordinates of two points	• Drawing Graphs Using the Equation
Solve problems using various standard forms of the equation of a straight line	• Rearranging and Solving Equations • Rearranging Linear Equations

Solve problems involving parallel and perpendicular lines	• Parallel Lines • Perpendicular Lines

Non-Linear Relationships

Content Descriptor	Lesson Names
Describe, interpret and sketch parabolas, hyperbolas, circles and exponential functions and their transformations	• Features of Polynomial Graphs • Features of Graphs - Roots • Parabolas • Parabola Transformations • Transforming Parabolas - Dilation and Reflection • Transforming Parabolas - Translation • Multiple Transformations of Parabolas • Circle Graphs • Transforming Circles • Exponential Graphs • Hyperbola Graphs • Hyperbola Graph Transformations • Exponential Graphs
Describe, interpret and sketch cubics, other curves and their transformations	• Features of Polynomial Graphs • Features of Graphs - Roots • Cubics • Cubic Transformations • Quartics

Polynomials

Content Descriptor	Lesson Names
Investigate the concept of a polynomial and apply the factor and remainder theorems to solve problems	• Introduction to Polynomials • Evaluating Polynomials • Adding, Subtracting and Multiplying Polynomials • Dividing Polynomials • The Remainder Theorem • The Factor Theorem • Factorising Cubic Polynomials • Factorising Quartic Polynomials • Solving Polynomials
Apply an understanding of polynomials to sketch a range of curves and describe the features of these curves from their equation	• Factorising Cubic Polynomials • Factorising Quartic Polynomials • Solving Polynomials • Features of Polynomial Graphs • Features of Graphs - Roots

Logarithms

Content Descriptor	Lesson Names
Use the definition of a logarithm to establish and apply the laws of logarithms	• Introduction to Logarithms • Deriving the Laws of Logarithms • Using the Laws of Logarithms • Combining Log Laws • Logarithmic Scales
Solve simple exponential equations	• Solving Exponential Equations

Functions and Other Graphs

Content Descriptor	Lesson Names
Describe, interpret and sketch functions	• Introduction to Functions • Function Notation • Inverse Functions and Transformations

Measurement and Geometry

Area and Surface Area

Content Descriptor	Lesson Names
Solve problems involving the surface areas of right pyramids, right cones, spheres and related composite solids	• Finding the Height of Right Pyramids • Surface Area of Cylinders • Surface Area of Prisms • Surface Area of Right Cones • Surface Area of Right Pyramids • Surface Area of Spheres • Surface Area of Complex Solids • Surface Area of Composite Solids

Volume

Content Descriptor	Lesson Names
Solve problems involving the volumes of right pyramids, right cones, spheres and related composite solids	• Volume of Right Cones • Volume of Right Pyramids • Volume of Spheres • Volume of Composite Solids

Trigonometry and Pythagoras' Theorem

Content Descriptor	Lesson Names
Apply pythagoras-theorem and trigonometry to solve three-dimensional problems in right-angled triangles	• Pythagoras' Theorem in 3D • Trigonometry in 3D

	• 3D Problems Using Right-Angled Triangles
Use the unit circle to define trigonometric functions, and graph them, with and without the use of digital technologies	• The Unit Circle and Radians • Understanding and Graphing Cosine • Understanding and Graphing Sine • Understanding and Graphing Tangent • Comparing Trigonometric Functions
Solve simple trigonometric equations	• Special Triangles: 30-60-90 • Special Triangles: 45-45-90 • Trigonometric Ratios and Complementary Angles
Establish the sine, cosine and area rules for any triangle and solve related problems	• The Sine Rule • Finding Angles Using the Sine Rule • The Sine Rule: The Ambiguous Case • The Cosine Rule • Area of a Triangle: ½ ab sin C

Properties of Geometrical Figures

Content Descriptor	Lesson Names
Formulate proofs involving congruent-triangles and angle properties	• Introduction to Proofs and Logic • Showing Congruence • Angle Proofs
Apply logical reasoning, including the use of congruence and similarity, to proofs and numerical exercises involving plane shapes	• Showing Similarity • Showing Congruence • Scaling and Measurement • Parallelogram and Rhombus Proofs • Rectangle and Square Proofs • Angle Proofs

Circle Geometry

Content Descriptor	Lesson Names
Prove and apply tangent and secant properties of circles	• Tangents, Secants and the Alternate Segment Theorem • Intersecting Chords, Secants and Tangents

Statistics and Probability

Single Variable Data Analysis

Content Descriptor	Lesson Names
Calculate and interpret the mean and standard-deviation of data and use these to compare data sets	• Introduction to Standard Deviation • Investigating the Standard Deviation • Calculating Standard Deviation • Calculating Standard Deviation Using

	Technology • Comparing the Measures of Spread • Using the Standard Deviation to Compare Data Sets

Bivariate Data Analysis

Content Descriptor	Lesson Names
Use information technologies to investigate bivariate-numerical-data sets; where appropriate, students use a straight line to describe the relationship, allowing for variation	• Least Squares Fitting using a Calculator • Least Squares Fitting using a Spreadsheet • Lines of Best Fit by Eye • Making Predictions by Eye
Investigate reports of studies in digital media and elsewhere for information on their planning and implementation	• Analysing Sampling in Reports • Misleading Reports • Sampling Errors • Statistics in Organisations • Types of Sampling: Non-Probability Sampling • Types of Sampling: Probability Sampling • What is Sampling?