



# VC Mathematics

EP Curriculum Map

## Level 5

### Number and Algebra

#### Number and place value

Content Descriptor	Lesson Names
Identify and describe factors and multiples of whole numbers and use them to solve problems	<ul style="list-style-type: none"><li>• Factors</li><li>• Identifying Factors</li><li>• Multiples</li></ul>
Use estimation and rounding to check the reasonableness of answers to calculations	<ul style="list-style-type: none"><li>• Estimating Measurements</li><li>• Introduction to Rounding</li><li>• Leading Digit Approximation</li></ul>
Solve problems involving multiplication of large numbers by one- or two-digit numbers using efficient mental, written strategies and appropriate digital technologies	<ul style="list-style-type: none"><li>• Multiplication Using Place Value</li><li>• Multiplying Big Numbers</li><li>• Applications of Multiples</li><li>• Multiplication Using Rounding and Compensation</li></ul>
Solve problems involving division by a one digit number, including those that result in a remainder	<ul style="list-style-type: none"><li>• Division in Parts</li></ul>
Recognise, represent and order numbers to at least hundreds of thousands	<i>Further development planned</i>
Use efficient mental and written strategies and apply appropriate digital technologies to solve problems	<i>Students use a range of strategies throughout all EP lessons. Students have access to digital technology through our EP calculator.</i>

#### Fractions and decimals

Content Descriptor	Lesson Names
Compare and order common unit fractions and locate and represent them on a number line	<ul style="list-style-type: none"><li>• Unit Fractions</li><li>• Fractions on a Number Line</li></ul>
Investigate strategies to solve problems involving addition and subtraction of fractions with the same denominator	<ul style="list-style-type: none"><li>• Adding Fractions with the Same Denominator</li><li>• Subtracting Fractions with the Same Denominator</li></ul>
Recognise that the place value system can be extended beyond hundredths	<ul style="list-style-type: none"><li>• Multiplication Using Place Value</li><li>• Thousandths and Beyond</li></ul>



Compare, order and represent decimals	<ul style="list-style-type: none"><li>• Comparing Decimals</li></ul>
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## Money and financial mathematics

Content Descriptor	Lesson Names
Create simple financial plans	<ul style="list-style-type: none"><li>• Budgeting</li><li>• GST</li><li>• Making a Budget</li></ul>

## Patterns and algebra

Content Descriptor	Lesson Names
Describe, continue and create patterns with fractions, decimals and whole numbers resulting from addition and subtraction	<ul style="list-style-type: none"><li>• Number Patterns</li><li>• Identifying Patterns</li><li>• Missing Pieces of Patterns</li><li>• Continuing Patterns</li><li>• Describing Patterns</li></ul>
Use equivalent number sentences involving multiplication and division to find unknown quantities	<ul style="list-style-type: none"><li>• Equivalent Number Sentences</li><li>• Gaps in Number Sentences</li></ul>
Follow a mathematical algorithm involving branching and repetition (iteration)	<i>Not supported</i>

## Measurement and Geometry

### Using units of measurement

Content Descriptor	Lesson Names
Choose appropriate units of measurement for length, area, volume, capacity and mass	<ul style="list-style-type: none"><li>• Units of Measurement</li><li>• Unit Prefixes</li><li>• Units of Area</li><li>• Units of Length</li><li>• The Metric System</li></ul>
Calculate the perimeter and area of rectangles and the volume and capacity of prisms using familiar metric units	<ul style="list-style-type: none"><li>• Perimeter</li><li>• Finding Perimeters</li><li>• Area of Rectangles</li><li>• Volume of Rectangular Prisms</li></ul>
Compare 12- and 24-hour time systems and convert between them	<ul style="list-style-type: none"><li>• 12-Hour Time</li><li>• 24-Hour Time</li><li>• Converting 12- and 24-Hour Time</li><li>• Duration</li><li>• Recording Time</li></ul>

## Shape

Content Descriptor	Lesson Names
Connect three-dimensional objects with their nets and other two-dimensional representations	<ul style="list-style-type: none"> <li>• 3D Solids</li> <li>• Identifying Faces of Prisms and Pyramids</li> <li>• Irregular Polygons</li> <li>• Nets of Prisms</li> <li>• Nets of Pyramids</li> </ul>

## Location and transformation

Content Descriptor	Lesson Names
Use a grid reference system to describe locations. Describe routes using landmarks and directional language	<ul style="list-style-type: none"> <li>• Describing Routes Using Landmarks</li> <li>• Locations</li> </ul>
Describe translations, reflections and rotations of two-dimensional shapes. Identify line and rotational symmetries	<ul style="list-style-type: none"> <li>• Identifying Rotational Symmetry</li> <li>• Line Symmetry</li> <li>• Line Symmetry in Life</li> <li>• Order of Rotational Symmetry</li> <li>• Translation on a Grid</li> <li>• Reflection on a Grid</li> <li>• Rotation on a Grid</li> <li>• Rotational Symmetry in Life</li> </ul>
Apply the enlargement transformation to familiar two dimensional shapes and explore the properties of the resulting image compared with the original	<ul style="list-style-type: none"> <li>• The Enlargement Transformation</li> </ul>

## Geometric reasoning

Content Descriptor	Lesson Names
Estimate, measure and compare angles using degrees. Construct angles using a protractor	<ul style="list-style-type: none"> <li>• Estimating the Size of Angles</li> <li>• Measuring Acute and Obtuse Angles</li> <li>• Measuring Reflex Angles</li> <li>• Angles</li> </ul>

## Statistics and Probability

### Chance

Content Descriptor	Lesson Names
List outcomes of chance experiments involving equally likely outcomes and represent probabilities of those outcomes using fractions	<ul style="list-style-type: none"> <li>• Chance Games</li> <li>• Likelihood of Events</li> </ul>
Recognise that probabilities range from 0 to 1	<ul style="list-style-type: none"> <li>• The Likelihood Scale</li> </ul>



## Data representation and interpretation

Content Descriptor	Lesson Names
Pose questions and collect categorical or numerical data by observation or survey	<ul style="list-style-type: none"><li>• Questions and Answers</li></ul>
Construct displays, including column graphs, dot plots and tables, appropriate for data type, with and without the use of digital technologies	<ul style="list-style-type: none"><li>• Column (Bar) Graphs</li><li>• Data Tables</li><li>• Dot Plots</li><li>• Dot Plots and Tables</li></ul>
Describe and interpret different data sets in context	<ul style="list-style-type: none"><li>• Reading Column Graphs</li></ul>

## Level 6

### Number and Algebra

#### Number and place value

Content Descriptor	Lesson Names
Identify and describe properties of prime, composite, square and triangular numbers	<ul style="list-style-type: none"> <li>• Calculating Square Numbers</li> <li>• Composite Numbers</li> <li>• Factor Trees</li> <li>• Prime Numbers</li> <li>• Square Numbers</li> <li>• Triangular Numbers</li> </ul>
Select and apply efficient mental and written strategies and appropriate digital technologies to solve problems involving all four operations with whole numbers and make estimates for these computations	<ul style="list-style-type: none"> <li>• Applying Addition and Subtraction</li> <li>• Applying Multiplication and Division</li> <li>• Column Multiplication</li> <li>• Long Division</li> <li>• Multiplication Using Rounding and Compensation</li> </ul>
Investigate everyday situations that use integers. Locate and represent these numbers on a number line	<ul style="list-style-type: none"> <li>• Introduction to Negative Numbers</li> <li>• Negative Integers</li> <li>• Negative Numbers on the Number Line</li> <li>• Ordering Negative Integers</li> <li>• Ordering Positive Integers</li> <li>• Positive Integers</li> </ul>

#### Fractions and decimals

Content Descriptor	Lesson Names
Compare fractions with related denominators and locate and represent them on a number line	<ul style="list-style-type: none"> <li>• Comparing Fractions</li> <li>• Equivalent Fractions</li> <li>• Fractions and Number Lines</li> </ul>
Solve problems involving addition and subtraction of fractions with the same or related denominators	<ul style="list-style-type: none"> <li>• Adding Fractions with Related Denominators</li> <li>• Adding Fractions with the Same Denominator</li> <li>• Subtracting Fractions with Related Denominators</li> <li>• Subtracting Fractions with the Same Denominator</li> </ul>
Find a simple fraction of a quantity where the result is a whole number, with and without digital technologies	<ul style="list-style-type: none"> <li>• Fraction of a Quantity</li> </ul>
Add and subtract decimals, with and without digital technologies, and use estimation and rounding to check the reasonableness of answers	<ul style="list-style-type: none"> <li>• Adding Decimals</li> <li>• Applications of Adding Decimals</li> <li>• Applications of Subtracting Decimals</li> </ul>

	<ul style="list-style-type: none"> <li>Subtracting Decimals</li> </ul>
Multiply decimals by whole numbers and perform divisions by non-zero whole numbers where the results are terminating decimals, with and without digital technologies	<ul style="list-style-type: none"> <li>Dividing Decimals</li> <li>Multiplying Decimals</li> </ul>
Multiply and divide decimals by powers of 10	<ul style="list-style-type: none"> <li>Dividing Decimals</li> <li>Multiplying Decimals</li> </ul>
Make connections between equivalent fractions, decimals and percentages	<ul style="list-style-type: none"> <li>Percentages and Decimals</li> <li>Percentages, Decimals and Fractions</li> </ul>

## Money and financial mathematics

Content Descriptor	Lesson Names
Investigate and calculate percentage discounts of 10%, 25% and 50% on sale items, with and without digital technologies	<ul style="list-style-type: none"> <li>Discounts</li> <li>Calculating Discounts</li> </ul>

## Patterns and algebra

Content Descriptor	Lesson Names
Continue and create sequences involving whole numbers, fractions and decimals. Describe the rule used to create the sequence	<ul style="list-style-type: none"> <li>Continuing Patterns</li> <li>Describing Patterns</li> <li>Identifying Patterns</li> </ul>
Explore the use of brackets and order of operations to write number sentences	<ul style="list-style-type: none"> <li>Order of Operations</li> <li>Preserving Order of Operations</li> </ul>
Design algorithms involving branching and iteration to solve specific classes of mathematical problems	<ul style="list-style-type: none"> <li>Long Division</li> </ul>

## Measurement and Geometry

### Using units of measurement

Content Descriptor	Lesson Names
Connect decimal representations to the metric system	<ul style="list-style-type: none"> <li>Comparing Units of Length</li> <li>Interpreting Units of Capacity</li> <li>Interpreting Units of Length</li> <li>Interpreting Units of Mass</li> </ul>
Convert between common metric units of length, mass and capacity	<ul style="list-style-type: none"> <li>Converting Units of Capacity</li> <li>Converting Units of Length</li> <li>Method for Converting Units of Length</li> <li>Converting Units of Mass</li> <li>Applications of Converting Units of Capacity</li> </ul>

	<ul style="list-style-type: none"> <li>• Applications of Converting Units of Mass</li> </ul>
Solve problems involving the comparison of lengths and areas using appropriate units	<ul style="list-style-type: none"> <li>• Comparing Units of Length</li> <li>• Area</li> <li>• Comparing Lengths and Objects</li> </ul>
Connect volume and capacity and their units of measurement	<ul style="list-style-type: none"> <li>• Capacity and Volume</li> </ul>
Interpret and use timetables	<ul style="list-style-type: none"> <li>• Personal Timetables</li> <li>• Reading Timetables</li> <li>• Timetables and Transport</li> <li>• Using Multiple Timetables</li> </ul>
Measure, calculate and compare elapsed time	<ul style="list-style-type: none"> <li>• Duration</li> </ul>

## Shape

Content Descriptor	Lesson Names
Construct simple prisms and pyramids	<ul style="list-style-type: none"> <li>• Drawing Prisms</li> <li>• Drawing Pyramids</li> <li>• Prisms</li> <li>• Pyramids</li> </ul>

## Location and transformation

Content Descriptor	Lesson Names
Investigate the effect of combinations of transformations on simple and composite shapes, including creating tessellations, with and without the use of digital technologies	<ul style="list-style-type: none"> <li>• Reflection</li> <li>• Rotation</li> <li>• Translation</li> </ul>
Introduce the Cartesian coordinate system using all four quadrants	<ul style="list-style-type: none"> <li>• Cartesian Planes</li> <li>• Describing Locations with Cartesian Planes</li> <li>• Describing Locations with Coordinates</li> </ul>

## Geometric reasoning

Content Descriptor	Lesson Names
Investigate, with and without digital technologies, angles on a straight line, angles at a point and vertically opposite angles. Use results to find unknown angles	<ul style="list-style-type: none"> <li>• Angles Around a Point</li> <li>• Angles in Corners</li> <li>• Angles on Straight Lines</li> <li>• Common Angles</li> <li>• Measuring Angles</li> <li>• Types of Angles</li> <li>• Vertically Opposite Angles</li> </ul>



## Statistics and Probability

### Chance

Content Descriptor	Lesson Names
Describe probabilities using fractions, decimals and percentages	<ul style="list-style-type: none"><li>• Chance Games from Other Cultures</li><li>• Writing Probabilities</li></ul>
Conduct chance experiments with both small and large numbers of trials using appropriate digital technologies	<ul style="list-style-type: none"><li>• Observed Outcomes vs. Expected Outcomes</li><li>• Probability Experiments</li></ul>
Compare observed frequencies across experiments with expected frequencies	<ul style="list-style-type: none"><li>• Observed Outcomes vs. Expected Outcomes</li><li>• Probability Experiments</li></ul>

### Data representation and interpretation

Content Descriptor	Lesson Names
Interpret and compare a range of data displays, including side-by-side column graphs for two categorical variables	<ul style="list-style-type: none"><li>• Column (Bar) Graphs</li><li>• Reading Column (Bar) Graphs</li><li>• Side-by-Side Column Graphs</li><li>• Misleading Data and Graphs</li></ul>
Interpret secondary data presented in digital media and elsewhere	<ul style="list-style-type: none"><li>• Misleading Data and Graphs</li></ul>
Pose and refine questions to collect categorical or numerical data by observation or survey	<ul style="list-style-type: none"><li>• Surveys</li></ul>



# Level 7

## Number and Algebra

### Number and place value

Content Descriptor	Lesson Names
Investigate index notation and represent whole numbers as products of powers of prime numbers	<ul style="list-style-type: none"> <li>• Applying Prime Factors</li> <li>• Factor Trees</li> <li>• Prime &amp; Composite Numbers</li> <li>• Prime Factors and the HCF</li> <li>• Prime Factors and the LCM</li> </ul>
Investigate and use square roots of perfect square numbers	<ul style="list-style-type: none"> <li>• Perfect Squares</li> <li>• Square Roots</li> <li>• Square Roots of Non-Perfect Squares</li> </ul>
Apply the associative, commutative and distributive laws to aid mental and written computation and make estimates for these computations	<ul style="list-style-type: none"> <li>• The Associative Law</li> <li>• The Commutative Law</li> <li>• The Distributive Law</li> <li>• Using the Distributive Law</li> </ul>
Compare, order, add and subtract integers	<ul style="list-style-type: none"> <li>• Adding Negative Numbers</li> <li>• Comparing &amp; Ordering Integers</li> <li>• Negative Integers</li> <li>• Positive Integers</li> <li>• Subtracting Negative Numbers</li> </ul>

### Real numbers

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

	<ul style="list-style-type: none"> <li>Subtracting Mixed Fractions with the Same Denominator</li> </ul>
Multiply and divide fractions and decimals using efficient written strategies and digital technologies	<ul style="list-style-type: none"> <li>Dividing Fractions</li> <li>Dividing Fractions by Simplifying</li> <li>Multiplying Fractions Numerically</li> <li>Multiplying Fractions Using Models</li> </ul>
Express one quantity as a fraction of another, with and without the use of digital technologies	<ul style="list-style-type: none"> <li>Comparing Fractions</li> <li>Comparing Fractions with the Same Denominator</li> <li>Using Fractions - Food</li> <li>Using Fractions - Money</li> <li>Using Fractions - Space</li> </ul>
Round decimals to a specified number of decimal places	<ul style="list-style-type: none"> <li>Rounding Decimals</li> </ul>
Connect fractions, decimals and percentages and carry out simple conversions	<ul style="list-style-type: none"> <li>Application: Town Planning</li> <li>Converting Between Fractions and Decimals</li> <li>Converting Between Percentages and Fractions: Simplifying Fractions</li> </ul>
Find percentages of quantities and express one quantity as a percentage of another, with and without digital technologies.	<ul style="list-style-type: none"> <li>Introduction to Percentages</li> <li>Using Percentages</li> </ul>
Recognise and solve problems involving simple ratios	<ul style="list-style-type: none"> <li>Ratios</li> </ul>

## Money and financial mathematics

Content Descriptor	Lesson Names
Investigate and calculate 'best buys', with and without digital technologies	<ul style="list-style-type: none"> <li>Cost per Item</li> <li>Best Buys</li> <li>Best Buys Using Unit Costs</li> <li>When a Best Buy isn't the Best Option</li> </ul>

## Patterns and algebra

Content Descriptor	Lesson Names
Introduce the concept of variables as a way of representing numbers using letters	<ul style="list-style-type: none"> <li>Welcome to Algebra</li> <li>Arithmetic in Algebra</li> </ul>
Create algebraic expressions and evaluate them by substituting a given value for each variable	<ul style="list-style-type: none"> <li>Simplifying Addition in Algebra</li> <li>Simplifying Division in Algebra</li> <li>Simplifying Multiplication in Algebra</li> <li>Simplifying Subtraction in Algebra</li> <li>Substitution in Algebraic Expressions</li> <li>Evaluating Algebraic Expressions</li> <li>Finding Formulas</li> <li>Using Formulas</li> </ul>

Extend and apply the laws and properties of arithmetic to algebraic terms and expressions	<ul style="list-style-type: none"> <li>• Order of Operations in Algebra</li> <li>• Order of Operations in Algebraic Equations</li> <li>• Translating Between Authentic Situations and Algebraic Expressions</li> <li>• Translating Between Word Descriptions and Algebraic Expressions</li> </ul>
Design and implement mathematical algorithms using a simple general purpose programming language	<i>Not supported</i>

## Linear and non-linear relationships

Content Descriptor	Lesson Names
Given coordinates, plot points on the Cartesian plane, and find coordinates for a given point	<ul style="list-style-type: none"> <li>• Coordinates</li> <li>• Introduction to Cartesian Planes</li> <li>• Plotting on a Cartesian Plane</li> </ul>
Solve simple linear equations	<ul style="list-style-type: none"> <li>• Balancing Equations</li> <li>• Checking Solutions</li> <li>• Concrete Models</li> <li>• Flow Charts</li> <li>• Visual Methods for Solving Linear Equations</li> <li>• Solving Linear Equations with Brackets</li> <li>• Solving One-Step Linear Equations</li> <li>• Solving Two-Step Linear Equations</li> </ul>
Investigate, interpret and analyse graphs from real life data, including consideration of domain and range	<ul style="list-style-type: none"> <li>• Analysing Graphs</li> <li>• Drawing Graphs</li> <li>• Reading Graphs</li> </ul>

## Measurement and Geometry

### Using units of measurement

Content Descriptor	Lesson Names
Establish the formulas for areas of rectangles, triangles and parallelograms, and use these in problem-solving	<ul style="list-style-type: none"> <li>• Area of Composite Shapes</li> <li>• Area of Parallelograms</li> <li>• Area of Rectangles &amp; Squares</li> <li>• Area of Triangles</li> </ul>
Calculate volumes of rectangular prisms	<ul style="list-style-type: none"> <li>• Volume of Rectangular Prisms</li> </ul>

### Shape

Content Descriptor	Lesson Names
Draw different views of prisms and solids formed from	<i>Further development planned</i>

combinations of prisms	
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## Location and transformation

Content Descriptor	Lesson Names
Describe translations, reflections in an axis and rotations of multiples of $90^\circ$ on the Cartesian plane using coordinates. Identify line and rotational symmetries	<ul style="list-style-type: none"> <li>• Reflection</li> <li>• Rotation on Cartesian Planes</li> <li>• Translation</li> </ul>

## Geometric reasoning

Content Descriptor	Lesson Names
Classify triangles according to their side and angle properties and describe quadrilaterals	<ul style="list-style-type: none"> <li>• Angles in a Triangle</li> <li>• Types of Triangles</li> <li>• Angles in Quadrilaterals</li> <li>• Applying Rules to Quadrilaterals</li> <li>• Classifying Quadrilaterals</li> </ul>
Demonstrate that the angle sum of a triangle is $180^\circ$ and use this to find the angle sum of a quadrilateral	<ul style="list-style-type: none"> <li>• Angles in a Triangle</li> <li>• Angles in Quadrilaterals</li> </ul>
Identify corresponding, alternate and co-interior angles when two straight lines are crossed by a transversal	<ul style="list-style-type: none"> <li>• Angles around a Point</li> <li>• Angles around Parallel Lines</li> <li>• Introduction to Angles</li> </ul>
Investigate conditions for two lines to be parallel and solve simple numerical problems using reasoning	<ul style="list-style-type: none"> <li>• Parallel Lines</li> <li>• Angles around Parallel Lines</li> </ul>

## Statistics and Probability

### Chance

Content Descriptor	Lesson Names
Construct sample spaces for single-step experiments with equally likely outcomes	<ul style="list-style-type: none"> <li>• Calculating Probability</li> <li>• Comparing Probabilities</li> <li>• Probability Terminology</li> <li>• Types of Probability</li> </ul>
Assign probabilities to the outcomes of events and determine probabilities for events	<ul style="list-style-type: none"> <li>• Probability as a Decimal and a Percentage</li> <li>• Probability as a Fraction</li> </ul>

### Data representation and interpretation

Content Descriptor	Lesson Names
Identify and investigate issues involving numerical data collected from primary and secondary sources	<ul style="list-style-type: none"> <li>• Misleading Data and Graphs</li> <li>• Relating Graphs and Tables</li> </ul>

	<ul style="list-style-type: none"> <li>● Collecting Data - Primary &amp; Secondary Sources</li> </ul>
Construct and compare a range of data displays including stem-and-leaf plots and dot plots	<ul style="list-style-type: none"> <li>● Stem and Leaf Plots</li> <li>● Dot Plots and Column (Bar) Graphs</li> <li>● Pick Your Display Method</li> </ul>
Calculate mean, median, mode and range for sets of data. Interpret these statistics in the context of data	<ul style="list-style-type: none"> <li>● Calculating Measures of Centre and Spread</li> <li>● Comparing Measures of Centre</li> <li>● The Mean</li> <li>● The Median</li> <li>● The Mode</li> <li>● The Range</li> </ul>
Describe and interpret data displays using median, mean and range	<ul style="list-style-type: none"> <li>● Calculating Measures of Centre and Spread</li> <li>● Comparing Measures of Centre</li> </ul>

# Level 8

## Number and Algebra

### Number and place value

Content Descriptor	Lesson Names
Use index notation with numbers to establish the index laws with positive integral indices and the zero index	<ul style="list-style-type: none"> <li>• Dividing Indices</li> <li>• Multiplying Indices</li> <li>• Perfect Squares</li> <li>• Powers of Multiplied Terms</li> <li>• Powers of Powers</li> <li>• Practising the Index Laws</li> <li>• The Power of Zero</li> </ul>
Carry out the four operations with rational numbers and integers, using efficient mental and written strategies and appropriate digital technologies and make estimates for these computations	<ul style="list-style-type: none"> <li>• Adding and Subtracting Decimals on a Number Line</li> <li>• Addition</li> <li>• Dividing Decimals</li> <li>• Division</li> <li>• Integers</li> <li>• Long Division</li> <li>• Multiplication</li> <li>• Multiplying Decimals</li> <li>• Negative Integer Addition and Subtraction</li> <li>• Negative Integer Multiplication and Division</li> <li>• Order of Operations</li> <li>• Rational Numbers on the Number Line</li> <li>• Subtraction</li> </ul>

### Real numbers

Content Descriptor	Lesson Names
Investigate terminating and recurring decimals	<ul style="list-style-type: none"> <li>• Decimals</li> <li>• Recurring Decimals</li> <li>• Terminating Decimals and Rounding</li> </ul>
Investigate the concept of irrational numbers, including $\pi$	<ul style="list-style-type: none"> <li>• Irrational Numbers</li> </ul>
Solve problems involving the use of percentages, including percentage increases and decreases and percentage error, with and without digital technologies	<ul style="list-style-type: none"> <li>• Calculating Percentage Discounts</li> <li>• Discounts</li> <li>• Percentages and Money</li> <li>• Percentages and Populations</li> <li>• Absolute vs. Relative Error</li> </ul>
Solve a range of problems involving rates and ratios,	<ul style="list-style-type: none"> <li>• Applying Ratios and Rates</li> </ul>

including distance-time problems for travel at a constant speed, with and without digital technologies	<ul style="list-style-type: none"> <li>• Rates</li> <li>• Ratios</li> <li>• Plotting and Reading Travel Graphs</li> <li>• Analysing Travel Graphs</li> </ul>
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## Money and financial mathematics

Content Descriptor	Lesson Names
Solve problems involving profit and loss, with and without digital technologies	<ul style="list-style-type: none"> <li>• Calculating Discounts</li> <li>• Calculating Profit and Loss</li> <li>• Discounts</li> <li>• Profit and Loss</li> </ul>

## Patterns and algebra

Content Descriptor	Lesson Names
Extend and apply the distributive law to the expansion of algebraic expressions	<ul style="list-style-type: none"> <li>• Introduction to Expanding</li> <li>• Expanding I</li> <li>• Expanding II</li> </ul>
Factorise algebraic expressions by identifying numerical factors	<ul style="list-style-type: none"> <li>• Introduction to Factorising</li> <li>• Greatest Common Divisor (Highest Common Factor)</li> <li>• Factorising Algebraic Expressions</li> <li>• Factorising Algebraic Expressions with Powers</li> </ul>
Simplify algebraic expressions involving the four operations	<ul style="list-style-type: none"> <li>• Simplifying Addition and Subtraction</li> <li>• Simplifying Multiplication and Division</li> </ul>
Use algorithms and related testing procedures to identify and correct errors	<i>Not supported</i>

## Linear and non-linear relationships

Content Descriptor	Lesson Names
Plot linear relationships on the Cartesian plane with and without the use of digital technologies	<ul style="list-style-type: none"> <li>• Tables of Values</li> <li>• Equation of a Line</li> <li>• Features of Graphs</li> <li>• Gradient of a Line</li> <li>• Linear Patterns and Rules</li> </ul>
Solve linear equations using algebraic and graphical techniques. Verify solutions by substitution	<ul style="list-style-type: none"> <li>• Solving Using Algebraic Methods</li> <li>• Solving Using Graphical Methods</li> </ul>
Plot graphs of non-linear real life data with and without the use of digital technologies, and interpret and analyse these graphs	<ul style="list-style-type: none"> <li>• Analysing Linear Graphs</li> <li>• Water Evaporation Graphs</li> </ul>

## Measurement and Geometry

### Using units of measurement

Content Descriptor	Lesson Names
Choose appropriate units of measurement for area and volume and convert from one unit to another	<ul style="list-style-type: none"> <li>Choosing Appropriate Units of Volume</li> <li>Converting Between Units of Area</li> <li>Converting Between Units of Area Applications</li> <li>Converting Units of Volume</li> <li>Units of Area</li> </ul>
Find perimeters and areas of parallelograms, trapeziums, rhombuses and kites	<ul style="list-style-type: none"> <li>Perimeter</li> <li>Perimeters of Kites, Rhombuses, Trapeziums and Parallelograms</li> <li>Area of Parallelograms</li> <li>Area of Rhombus and Kites</li> <li>Area of Trapeziums</li> </ul>
Investigate the relationship between features of circles such as circumference, area, radius and diameter. Use formulas to solve problems involving determining radius, diameter, circumference and area from each other	<ul style="list-style-type: none"> <li>Parts of a Circle</li> <li>Circumference of Circles</li> <li>Using the Circumference of Circles</li> <li>Calculating the Area of Circles</li> <li>Using the Area of Circles</li> </ul>
Develop formulas for volumes of rectangular and triangular prisms and prisms in general. Use formulas to solve problems involving volume	<ul style="list-style-type: none"> <li>Calculating Volume of Rectangular Prisms</li> <li>Calculating Volume of Triangular Prisms</li> </ul>
Solve problems involving duration, including using 12- and 24-hour time within a single time zone	<ul style="list-style-type: none"> <li>Duration</li> <li>Time Zones</li> </ul>

### Geometric reasoning

Content Descriptor	Lesson Names
Define congruence of plane shapes using transformations and use transformations of congruent shapes to produce regular patterns in the plane including tessellations with and without the use of digital technology	<ul style="list-style-type: none"> <li>Introduction to Congruence</li> <li>Rotation and Reflection of Plane Shapes</li> <li>Translation and Congruence of Plane Shapes</li> </ul>
Develop the conditions for congruence of triangles	<ul style="list-style-type: none"> <li>Conditions for Congruence: ASA, AAS and HL</li> <li>Conditions for Congruence: SSS and SAS</li> <li>Working with Congruent Triangles</li> </ul>
Establish properties of quadrilaterals using congruent triangles and angle properties, and solve related numerical problems using reasoning	<ul style="list-style-type: none"> <li>Congruence of Rhombuses, Trapeziums and Kites</li> <li>Congruence of Squares, Rectangles and Parallelograms</li> </ul>



## Statistics and Probability

### Chance

Content Descriptor	Lesson Names
Identify complementary events and use the sum of probabilities to solve problems	<ul style="list-style-type: none"> <li>Calculating Complements</li> <li>Complementary Events</li> </ul>
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"> <li>Describing Probabilities</li> <li>Using Descriptions of Probability</li> </ul>
Represent events in two-way tables and Venn diagrams and solve related problems	<ul style="list-style-type: none"> <li>Two-Way Tables</li> <li>Using Two-Way Tables</li> <li>Making Your Own Two-Way Tables</li> <li>Venn Diagrams</li> <li>Using Venn Diagrams</li> <li>Making Your Own Venn Diagrams</li> </ul>

### Data representation and interpretation

Content Descriptor	Lesson Names
Distinguish between a population and a sample and investigate techniques for collecting data, including census, sampling and observation	<ul style="list-style-type: none"> <li>Data Collection Methods</li> <li>Survey and Simulation</li> <li>Experiment and Observation</li> <li>Introduction to Data</li> <li>Introduction to Data Collection</li> <li>Collecting Data - Primary &amp; Secondary Sources</li> <li>Sampling</li> </ul>
Explore the practicalities and implications of obtaining data through sampling using a variety of investigative processes	<ul style="list-style-type: none"> <li>Survey and Simulation</li> <li>Bias in Data</li> <li>Random Sampling</li> <li>Surveying</li> </ul>
Explore the variation of means and proportions of random samples drawn from the same population	<ul style="list-style-type: none"> <li>Bias in Data</li> <li>Random Sampling</li> <li>Surveying</li> <li>Samples and Populations</li> </ul>
Investigate the effect of individual data values including outliers, on the range, mean and median	<ul style="list-style-type: none"> <li>Outliers</li> <li>Clusters and Outliers</li> </ul>

## Level 9

### Number and Algebra

#### Real numbers

Content Descriptor	Lesson Names
Solve problems involving direct proportion. Explore the relationship between graphs and equations corresponding to simple rate problems	<ul style="list-style-type: none"> <li>• Direct Proportion</li> <li>• Introduction to Graphs</li> <li>• Analysing Graphs</li> </ul>
Apply index laws to numerical expressions with integer indices	<ul style="list-style-type: none"> <li>• Applying Index Laws</li> <li>• Dividing Indices</li> <li>• Multiplying Indices</li> <li>• Positive and Negative Integer Indices</li> <li>• Powers of Multiplied Terms</li> <li>• Powers of Powers</li> <li>• The Power of Zero</li> </ul>
Express numbers in scientific notation	<ul style="list-style-type: none"> <li>• Introduction to Scientific Notation (Standard Form) - Small Numbers</li> <li>• Introduction to Scientific Notation (Standard Form) - Large Numbers</li> </ul>

#### Money and financial mathematics

Content Descriptor	Lesson Names
Solve problems involving simple interest	<ul style="list-style-type: none"> <li>• Introduction to Interest</li> <li>• Calculating Simple Interest</li> <li>• Rearranging the Simple Interest Formula</li> </ul>

#### Patterns and algebra

Content Descriptor	Lesson Names
Apply the distributive law to the expansion of algebraic expressions, including binomials, and collect like terms where appropriate	<ul style="list-style-type: none"> <li>• Expanding and the Distributive Law</li> <li>• Expanding Binomial Products</li> <li>• Expanding Differences of Two Squares</li> <li>• Expanding Perfect Squares</li> </ul>
Apply set structures to solve real-world problems	<i>Further development planned</i>

#### Linear and non-linear relationships

Content Descriptor	Lesson Names
Find the distance between two points located on the	<ul style="list-style-type: none"> <li>• Line Segments on Cartesian Planes</li> </ul>

Cartesian plane using a range of strategies, including graphing software	<ul style="list-style-type: none"> <li>Distance and Pythagoras' Theorem</li> </ul>
Find the midpoint and gradient of a line segment (interval) on the Cartesian plane using a range of strategies, including graphing software	<ul style="list-style-type: none"> <li>Midpoint of a Line Segment</li> <li>Gradient of a Line Segment</li> </ul>
Sketch linear graphs using the coordinates of two points and solve linear equations	<ul style="list-style-type: none"> <li>Graphing Using Technology - Casio Calculators</li> <li>Drawing Linear Graphs Using the Gradient</li> <li>Plotting Linear Graphs</li> <li>Determining Linear Rules</li> </ul>
Graph simple non-linear relations with and without the use of digital technologies and solve simple related equations	<ul style="list-style-type: none"> <li>Circles</li> <li>Parabolas</li> <li>Solving Non-Linear Equations</li> <li>Transforming Parabolas</li> </ul>

## Measurement and Geometry

### Using units of measurement

Content Descriptor	Lesson Names
Calculate areas of composite shapes	<ul style="list-style-type: none"> <li>Area of Composite Shapes</li> </ul>
Calculate the surface area and volume of cylinders and solve related problems	<ul style="list-style-type: none"> <li>Surface Area of Cylinders</li> <li>Calculating Volume of Cylinders</li> </ul>
Solve problems involving the surface area and volume of right prisms	<ul style="list-style-type: none"> <li>Surface Area of Prisms</li> <li>Volume of Rectangular Prisms</li> <li>Calculating Volume of Rectangular Prisms</li> <li>Calculating Volume of Triangular Prisms</li> <li>Calculating Volume of Other Regular and Irregular Prisms</li> </ul>
Investigate very small and very large time scales and intervals	<ul style="list-style-type: none"> <li>Scientific Notation</li> <li>Time Scales</li> </ul>

### Geometric reasoning

Content Descriptor	Lesson Names
Use the enlargement transformation to explain similarity and develop the conditions for triangles to be similar	<ul style="list-style-type: none"> <li>Introduction to Similarity</li> <li>Similarity and Angles</li> <li>Similarity and Multiple Triangles</li> <li>Similarity Tests</li> </ul>
Solve problems using ratio and scale factors in similar figures	<ul style="list-style-type: none"> <li>Introduction to Scaling</li> <li>Magnitude</li> <li>Magnitude as a Ratio</li> </ul>

## Pythagoras and trigonometry

Content Descriptor	Lesson Names
Investigate Pythagoras' Theorem and its application to solving simple problems involving right angled triangles	<ul style="list-style-type: none"> <li>Parts of a Triangle and the Hypotenuse</li> <li>Pythagoras' Theorem</li> </ul>
Use similarity to investigate the constancy of the sine, cosine and tangent ratios for a given angle in right-angled triangles	<ul style="list-style-type: none"> <li>Introduction to Trigonometry</li> </ul>
Apply trigonometry to solve right-angled triangle problems	<ul style="list-style-type: none"> <li>Finding Angles Using Trigonometry</li> <li>Finding Side Lengths Using Trigonometry</li> </ul>

## Statistics and Probability

### Chance

Content Descriptor	Lesson Names
List all outcomes for two-step chance experiments, both with and without replacement using tree diagrams or arrays. Assign probabilities to outcomes and determine probabilities for events	<ul style="list-style-type: none"> <li>Introduction to Two-Step Experiments</li> <li>Arrays</li> <li>Using Arrays</li> <li>Tree Diagrams</li> <li>Using Tree Diagrams</li> </ul>
Calculate relative frequencies from given or collected data to estimate probabilities of events involving 'and' or 'or'	<ul style="list-style-type: none"> <li>Two-Way Tables</li> <li>Using Two-Way Tables</li> <li>Venn Diagrams</li> <li>Using Venn Diagrams</li> <li>Advanced Venn Diagrams and Two-Way Tables</li> <li>Relative Frequencies</li> <li>Using Relative Frequencies</li> </ul>
Investigate reports of surveys in digital media and elsewhere for information on how data were obtained to estimate population means and medians	<i>Further development planned</i>

### Data representation and interpretation

Content Descriptor	Lesson Names
Identify everyday questions and issues involving at least one numerical and at least one categorical variable, and collect data directly and from secondary sources	<ul style="list-style-type: none"> <li>Primary and Secondary Data</li> <li>Types of Data</li> </ul>
Construct back-to-back stem-and-leaf plots and histograms and describe data, using terms including 'skewed', 'symmetric' and 'bi modal'	<ul style="list-style-type: none"> <li>Back-to-Back Stem and Leaf Plots</li> <li>Comparing Data Sets</li> <li>Comparing Dot Plots</li> <li>Comparing Histograms</li> <li>Symmetry and Skew in Data</li> </ul>

Compare data displays using mean, median and range to describe and interpret numerical data sets in terms of location (centre) and spread

- Comparing Data Sets
- Effect of Shape on Mean and Median
- Shape and Mode
- Measures of Centre in Grouped Data

# Level 10

## Number and Algebra

### Real numbers

Content Descriptor	Lesson Names
Solve simple problems involving inverse proportion	<ul style="list-style-type: none"> <li>• Introduction to Inverse Proportion</li> <li>• Applying Inverse Proportion</li> </ul>

### Money and financial mathematics

Content Descriptor	Lesson Names
Connect the compound interest formula to repeated applications of simple interest using appropriate digital technologies	<ul style="list-style-type: none"> <li>• Compound Interest - Months and Weeks</li> <li>• Compound Interest Basic Formula</li> <li>• Rearranging Compound Interest - Months and Weeks</li> <li>• Rearranging the Compound Interest Formula</li> </ul>

### Patterns and algebra

Content Descriptor	Lesson Names
Factorise algebraic expressions by taking out a common algebraic factor	<ul style="list-style-type: none"> <li>• Factorisation by Grouping</li> <li>• Factorising</li> <li>• Factorising with Index Laws</li> <li>• Identifying Common Factors</li> <li>• Identifying Common Factors with Indices</li> </ul>
Simplify algebraic products and quotients using index laws	<ul style="list-style-type: none"> <li>• Simplifying Algebraic Products with Index Laws</li> <li>• Simplifying Algebraic Quotients with Index Laws</li> </ul>
Apply the four operations to simple algebraic fractions with numerical denominators	<ul style="list-style-type: none"> <li>• Adding Algebraic Fractions</li> <li>• Subtracting Algebraic Fractions</li> <li>• Multiplying Algebraic Fractions</li> <li>• Dividing Algebraic Fractions</li> </ul>
Expand binomial products and factorise monic quadratic expressions using a variety of strategies	<ul style="list-style-type: none"> <li>• Factorising by Completing the Square</li> <li>• Factorising Differences of Two Squares</li> <li>• Factorising Perfect Squares</li> <li>• Factorising Quadratic Trinomials</li> </ul>
Substitute values into formulas to determine an unknown and re-arrange formulas to solve for a particular term	<ul style="list-style-type: none"> <li>• Rearranging and Solving Equations</li> <li>• Solving Quadratic Equations by Completing the Square</li> <li>• Using Formulas</li> <li>• Rearranging and Solving Equations from</li> </ul>

	Formulas
Implement algorithms using data structures in a general-purpose programming language	<i>Not supported</i>

## Linear and non-linear relationships

Content Descriptor	Lesson Names
Solve problems involving linear equations, including those derived from formulas	<ul style="list-style-type: none"> <li>• Rearranging and Solving Equations</li> <li>• Rearranging and Solving Equations from Formulas</li> <li>• Word Problems</li> <li>• Solving Word Problems</li> <li>• Using Formulas</li> </ul>
Solve linear inequalities and graph their solutions on a number line	<ul style="list-style-type: none"> <li>• Introduction to Inequalities</li> <li>• Rearranging Inequalities</li> <li>• Solving Inequalities</li> <li>• Chained Inequalities</li> <li>• Review Lesson: Inequalities</li> </ul>
Solve linear simultaneous equations, using algebraic and graphical techniques, including using digital technology	<ul style="list-style-type: none"> <li>• Using Elimination to Solve Simultaneous Equations</li> <li>• Using Graphs to Solve Simultaneous Equations</li> <li>• Using Substitution to Solve Simultaneous Equations</li> </ul>
Solve problems involving parallel and perpendicular lines	<ul style="list-style-type: none"> <li>• Parallel Lines</li> <li>• Perpendicular Lines</li> </ul>
Explore the connection between algebraic and graphical representations of relations such as simple quadratic, reciprocal, circle and exponential, using digital technology as appropriate	<ul style="list-style-type: none"> <li>• Circles</li> <li>• Exponential Graphs</li> <li>• Parabolas</li> <li>• Transforming Circles</li> <li>• Transforming Parabolas</li> <li>• Transforming Parabolas - Dilation and Reflection</li> <li>• Transforming Parabolas - Translation</li> <li>• Hyperbola Graphs</li> <li>• Hyperbola Graph Transformations</li> </ul>
Solve linear equations involving simple algebraic fractions	<ul style="list-style-type: none"> <li>• Rearranging and Solving Equations</li> <li>• Rearranging and Solving Equations from Formulas</li> <li>• Word Problems</li> <li>• Solving Word Problems</li> <li>• Using Formulas</li> </ul>
Solve simple quadratic equations using a range of strategies	<ul style="list-style-type: none"> <li>• Factorising Perfect Squares</li> <li>• Factorising Quadratic Expressions</li> <li>• Grouping</li> <li>• Guess and Check</li> </ul>

	<ul style="list-style-type: none"> <li>• Completing the Square: Method 1 - Using Rearrangement</li> <li>• Completing the Square: Method 2 - Using Differences of Two Squares</li> <li>• Solving Quadratic Equations Using Technology</li> <li>• The Quadratic Formula</li> </ul>
Solve equations using systematic guess-check-and-refine with digital technology	<i>Further development planned</i>

## Measurement and Geometry

### Using units of measurement

Content Descriptor	Lesson Names
Solve problems involving surface area and volume for a range of prisms, cylinders and composite solids	<ul style="list-style-type: none"> <li>• Surface Area of Prisms</li> <li>• Surface Area of Cylinders</li> <li>• Surface Area of Complex Solids</li> <li>• Volume of Rectangular Prisms</li> <li>• Calculating Volume of Rectangular Prisms</li> <li>• Calculating Volume of Triangular Prisms</li> <li>• Calculating Volume of Cylinders</li> <li>• Calculating Volume of Other Regular and Irregular Prisms</li> <li>• Types of Prisms</li> <li>• Volume of Composite Solids</li> </ul>

### Geometric reasoning

Content Descriptor	Lesson Names
Formulate proofs involving congruent triangles and angle properties	<ul style="list-style-type: none"> <li>• Using Congruence to Determine Angles in Triangles</li> </ul>
Apply logical reasoning, including the use of congruence and similarity, to proofs and numerical exercises involving plane shapes	<ul style="list-style-type: none"> <li>• Introduction to Proofs and Logic</li> <li>• Angle Proofs</li> <li>• Parallelogram and Rhombus Proofs</li> <li>• Rectangle and Square Proofs</li> </ul>

### Pythagoras and trigonometry

Content Descriptor	Lesson Names
Solve right-angled triangle problems including those involving direction and angles of elevation and depression	<ul style="list-style-type: none"> <li>• Angles of Elevation and Depression</li> <li>• Bearings with Right-Angled Triangles</li> </ul>



## Statistics and Probability

### Chance

Content Descriptor	Lesson Names
Describe the results of two- and three-step chance experiments, both with and without replacements, assign probabilities to outcomes and determine probabilities of events. Investigate the concept of independence	<ul style="list-style-type: none"> <li>● Probabilities and Three-Step Experiments</li> <li>● Probabilities of Unequal Outcomes</li> <li>● Three-Step Experiments and Unequal Outcomes</li> <li>● Building Three-Step Tree Diagrams</li> <li>● Tree Diagrams with Unequal Outcomes</li> <li>● Introduction to Independence</li> <li>● Investigating Independent Events using Chance Diagrams</li> </ul>
Use the language of 'if ....then, 'given', 'of', 'knowing that' to investigate conditional statements and identify common mistakes in interpreting such language	<ul style="list-style-type: none"> <li>● Introduction to Conditional Probability</li> <li>● Investigating Conditional Probability with Two-Way Tables</li> <li>● Investigating Conditional Probability with Venn Diagrams</li> <li>● Calculating Conditional Probabilities using Arrays</li> <li>● Calculating Conditional Probability Using Tree Diagrams</li> <li>● Word Problems</li> </ul>

### Data representation and interpretation

Content Descriptor	Lesson Names
Determine quartiles and interquartile range and investigate the effect of individual data values, including outliers on the interquartile range	<ul style="list-style-type: none"> <li>● Five Point Summary</li> <li>● Quartiles</li> <li>● Range</li> <li>● Interquartile Range</li> <li>● Box and Whisker Plots</li> <li>● Plotting Box and Whisker Plots</li> <li>● Comparing Box and Whisker Plots</li> </ul>
Construct and interpret box plots and use them to compare data sets	<ul style="list-style-type: none"> <li>● Box and Whisker Plots</li> <li>● Plotting Box and Whisker Plots</li> <li>● Comparing Box and Whisker Plots</li> </ul>
Compare shapes of box plots to corresponding histograms and dot plots and discuss the distribution of data	<ul style="list-style-type: none"> <li>● Box and Whisker Plots, Histograms and Dot Plots</li> </ul>
Use scatter plots to investigate and comment on relationships between two numerical variables	<ul style="list-style-type: none"> <li>● Plotting Using a Calculator</li> <li>● Plotting Using a Spreadsheet</li> <li>● Analysing Trend by Eye</li> </ul>

Investigate and describe bivariate numerical data, including where the independent variable is time	<ul style="list-style-type: none"> <li>● Analysing Time Series</li> <li>● Introduction to Time Series</li> </ul>
Evaluate statistical reports in the media and other places by linking claims to displays, statistics and representative data	<ul style="list-style-type: none"> <li>● Evaluating Statistical Graphs: Making our Graph</li> <li>● Evaluating Statistical Graphs: the Shape of the Graph</li> <li>● Evaluating Statistical Reports and Claims: Data Collection</li> <li>● Evaluating Statistical Reports and Claims: Data Reporting</li> </ul>

## Level 10A

### Number and Algebra

#### Real numbers

Content Descriptor	Lesson Names
Define rational and irrational numbers and perform operations with surds and fractional indices	<ul style="list-style-type: none"> <li>● Real Numbers</li> <li>● Introduction to Surds</li> <li>● Multiplying and Dividing Surds</li> <li>● Simplifying Surds</li> <li>● Adding and Subtracting Surds</li> <li>● Index Laws and Fractional Powers</li> <li>● Expanding Surds</li> <li>● Conjugate and Perfect Square Surds</li> <li>● Rationalising Denominators</li> </ul>
Use the definition of a logarithm to establish and apply the laws of logarithms and investigate logarithmic scales in measurement	<ul style="list-style-type: none"> <li>● Introduction to Logarithms</li> <li>● Deriving the Laws of Logarithms</li> <li>● Using the Laws of Logarithms</li> <li>● Combining Log Laws</li> <li>● Logarithmic Scales</li> </ul>

#### Patterns and algebra

Content Descriptor	Lesson Names
Investigate the concept of a polynomial and apply the factor and remainder theorems to solve problems	<ul style="list-style-type: none"> <li>● Introduction to Polynomials</li> <li>● Evaluating Polynomials</li> <li>● Adding, Subtracting and Multiplying Polynomials</li> <li>● Dividing Polynomials</li> <li>● The Remainder Theorem</li> <li>● The Factor Theorem</li> <li>● Factorising Cubic Polynomials</li> <li>● Factorising Quartic Polynomials</li> </ul>

	<ul style="list-style-type: none"> <li>• Solving Polynomials</li> </ul>
Devise and use algorithms and simulations to solve mathematical problems	<ul style="list-style-type: none"> <li>• The Monty Hall Problem</li> </ul>

## Linear and non-linear relationships

Content Descriptor	Lesson Names
Solve simple exponential equations	<ul style="list-style-type: none"> <li>• Applications of Exponential Equations</li> <li>• Solving Exponential Equations</li> </ul>
Describe, interpret and sketch parabolas, hyperbolas, circles and exponential functions and their transformations	<ul style="list-style-type: none"> <li>• Parabolas</li> <li>• Parabola Transformations</li> <li>• Multiple Transformations of Parabolas</li> <li>• Hyperbola Graphs</li> <li>• Hyperbola Graph Transformations</li> <li>• Circle Graphs</li> <li>• Exponential Graphs</li> <li>• Inverse Functions and Transformations</li> </ul>
Apply understanding of polynomials to sketch a range of curves and describe the features of these curves from their equation	<ul style="list-style-type: none"> <li>• Features of Polynomial Graphs</li> <li>• Features of Graphs - Roots</li> <li>• Parabolas</li> <li>• Parabola Transformations</li> <li>• Multiple Transformations of Parabolas</li> <li>• Cubics</li> <li>• Expanding Cubic Expressions</li> <li>• Cubic Transformations</li> <li>• Quartics</li> </ul>
Factorise monic and non-monic quadratic expressions and solve a wide range of quadratic equations derived from a variety of contexts	<ul style="list-style-type: none"> <li>• Monic Factorisation</li> <li>• Non-Monic Factorisation</li> <li>• Solving Monic Quadratic Equations</li> <li>• Solving Non-Monic Quadratic Equations</li> <li>• The Quadratic Formula</li> <li>• Writing Quadratic Equations</li> </ul>
Use function notation to describe the relationship between dependent and independent variables in modelling contexts	<i>Further development planned</i>
Solve simultaneous equations using systematic guess-check-and-refine with digital technology	<i>Further development planned</i>

## Measurement and Geometry

### Using units of measurement

Content Descriptor	Lesson Names
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Solve problems involving surface area and volume of right pyramids, right cones, spheres and related composite solids	<ul style="list-style-type: none"> <li>● Finding the Height of Right Pyramids</li> <li>● Surface Area of Right Pyramids</li> <li>● Surface Area of Right Cones</li> <li>● Surface Area of Spheres</li> <li>● Surface Area of Composite Solids</li> <li>● Volume of Right Pyramids</li> <li>● Volume of Right Cones</li> <li>● Volume of Spheres</li> <li>● Volume of Composite Solids</li> </ul>
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## Geometric reasoning

Content Descriptor	Lesson Names
Prove and apply angle and chord properties of circles	<ul style="list-style-type: none"> <li>● Central Angle Theorem</li> <li>● Proof: Central Angle Theorem</li> <li>● Angles Subtended by the Same Arc</li> <li>● Thales' Theorem: Angles in a Semicircle</li> <li>● Proving Thales' Theorem</li> <li>● Cyclic Quadrilaterals</li> <li>● Equal Length Chord Properties</li> <li>● Perpendicular Bisector to Chords</li> <li>● Tangents, Secants and the Alternate Segment Theorem</li> <li>● Intersecting Chords, Secants and Tangents</li> </ul>

## Pythagoras and trigonometry

Content Descriptor	Lesson Names
Establish the sine, cosine and area rules for any triangle and solve related problems	<ul style="list-style-type: none"> <li>● The Sine Rule</li> <li>● The Sine Rule: The Ambiguous Case</li> <li>● Finding Angles Using the Sine Rule</li> <li>● The Cosine Rule</li> <li>● Finding Angles Using the Cosine Rule</li> <li>● Review Lesson: Trigonometric Rules</li> <li>● Area of a Triangle: <math>\frac{1}{2} ab \sin C</math></li> <li>● Heron's Formula</li> </ul>
Use the unit circle to define trigonometric functions as functions of a real variable, and graph them with and without the use of digital technologies	<ul style="list-style-type: none"> <li>● The Unit Circle and Radians</li> <li>● Understanding and Graphing Cosine</li> <li>● Understanding and Graphing Sine</li> <li>● Understanding and Graphing Tangent</li> <li>● Comparing Trigonometric Functions</li> </ul>
Solve simple trigonometric equations	<ul style="list-style-type: none"> <li>● Special Triangles: 30-60-90</li> <li>● Special Triangles: 45-45-90</li> <li>● Trigonometric Ratios and Complementary Angles</li> </ul>
Apply Pythagoras' Theorem and trigonometry to solving	<ul style="list-style-type: none"> <li>● Pythagoras' Theorem in 3D</li> </ul>

three-dimensional problems in right-angled triangles	<ul style="list-style-type: none"> <li>• Trigonometry in 3D</li> <li>• 3D Problems Using Right-Angled Triangles</li> </ul>
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## Statistics and Probability

### Chance

Content Descriptor	Lesson Names
Investigate reports of studies in digital media and elsewhere for information on their planning and implementation	<ul style="list-style-type: none"> <li>• What is Sampling?</li> <li>• Types of Sampling: Non-Probability Sampling</li> <li>• Types of Sampling: Probability Sampling</li> <li>• Sampling Errors</li> <li>• Analysing Sampling in Reports</li> <li>• Misleading Reports</li> <li>• Statistics in Organisations</li> </ul>

### Data representation and interpretation

Content Descriptor	Lesson Names
Calculate and interpret the mean and standard deviation of data and use these to compare data sets. Investigate the effect of individual data values including outliers, on the standard deviation	<ul style="list-style-type: none"> <li>• Introduction to Standard Deviation</li> <li>• Calculating Standard Deviation</li> <li>• Calculating Standard Deviation Using Technology</li> <li>• Investigating the Standard Deviation</li> <li>• Using the Standard Deviation to Compare Data Sets</li> <li>• Comparing the Measures of Spread</li> </ul>
Use digital technology to investigate bivariate numerical data sets. Where appropriate use a straight line to describe the relationship allowing for variation, make predictions based on this straight line and discuss limitations	<ul style="list-style-type: none"> <li>• Lines of Best Fit by Eye</li> <li>• Least Squares Fitting using a Calculator</li> <li>• Least Squares Fitting using a Spreadsheet</li> <li>• Making Predictions by Eye</li> <li>• Making Predictions Using the Equation</li> </ul>