EP Curriculum Map
NSW (NESA) Mathematics Stage 3 to 5

Stage 3

Representing numbers

Outcomes	A student: • develops understanding and fluency in mathematics through exploring and connecting mathematical concepts, choosing and applying mathematical techniques to solve problems, and communicating their thinking and reasoning coherently and clearly MA0-WM-01 • applies an understanding of place value and the role of zero to represent the properties of numbers MA3-RN-01 • compares and orders decimals up to 3 decimal places MA3-RN-02 • determines percentages of quantities, and finds equivalent fractions and decimals for benchmark percentage values MA3-RN-03	
Content Descriptors	**EP Lessons in *1. Represents numbers A***	
• Whole numbers: Recognise, represent and order numbers in the millions • Whole numbers: Apply place value to partition, regroup and rename numbers to 1 billion • Decimals and percentages: Recognise that the place value system can be extended beyond hundredths • Decimals and percentages: Compare, order and represent decimals	Decimals and percentages • Introduction to Decimals • Tenths • Hundredths • Thousandths and Beyond • Comparing Decimals Practice • Practice: Comparing Decimals • Practice: Decimal Place Values • Practice: Hundredths • Practice: Introduction to Decimals • Practice: Tenths • Practice: Thousandths and Beyond	Hands-on Activity: Place Value Codebreaking • Place Value Codebreaking • Place Value Codebreaking Student Worksheet • Place Value Codebreaking Teacher Guide

Content Descriptors	EP Lessons in *2. Represents numbers B*	
• Whole numbers: Locate and represent integers on a number line • Decimals and percentages: Make connections between benchmark fractions, decimals and percentages • Decimals and percentages: Determine percentage discounts of 10%, 25% and 50%	1. Whole numbers • Number Lines • Positive Integers • Ordering Positive Integers • Introduction to Negative Numbers • Negative Integers • Negative Numbers on the Number Line • Ordering Negative Integers Practice • Practice: Negative Integers • Practice: Ordering Negative Integers • Practice: Ordering Positive Integers • Practice: Positive Integers	2. Decimals and percentages • Introduction to Percentages • Using Percentages • Discounts • Calculating Percentage Discounts • Percentages and Money • Boxing Day Bonanza Practice • Practice: Calculating Percentage Discounts • Practice: Discounts • Practice: Percentages and Money • Practice: Percentages and Populations
Additional resources		
3. Topic Tests • Decimals • Decimals and Percentages • Discounts • Percentages		

Additive relations

<table>
<tr><td>Outcomes</td><td colspan="2">A student:
develops understanding and fluency in mathematics through exploring and connecting mathematical concepts, choosing and applying mathematical techniques to solve problems, and communicating their thinking and reasoning coherently and clearly MA0-WM-01
selects and applies appropriate strategies to solve addition and subtraction problems MA3-AR-01</td></tr>
<tr><td>Content Descriptors</td><td colspan="2">EP Lessons in 1. Additive relations A</td></tr>
<tr><td>Apply efficient mental and written strategies to solve addition and subtraction problems
Use estimation and place value understanding to determine the reasonableness of solutions</td><td>1. Addition and subtraction problems
Addition
Subtraction
The Subtraction Algorithm
Applying Addition and Subtraction
Practice
Practice: Addition
Practice: Applying Addition and Subtraction
Practice: Subtraction</td><td>2. Reasonableness of solutions
Introduction to Rounding
Leading Digit Approximation
Rounding Decimal Numbers</td></tr>
<tr><td>Content Descriptors</td><td colspan="2">EP Lessons in 2. Additive relations B</td></tr>
<tr><td>Choose and use efficient strategies to solve addition and subtraction problems
Applies known strategies to add and subtract decimals</td><td>1. Addition and subtraction problems
Budgeting
Making a Budget
Practice
Practice: Budgeting
Practice: Making a Budget</td><td>2. Add and subtract decimals
Decimal Place Values
Comparing Decimals
Adding Decimals
Applications of Adding Decimals
Subtracting Decimals
Applications of Subtracting Decimals</td></tr>
<tr><td colspan="3">Additional resources</td></tr>
<tr><td>3. Glossary
Definitions List: Addition and Subtraction
Definitions List: Budgeting
Definitions MCQ: Addition and Subtraction
Definitions MCQ: Budgeting
Spelling List: Addition and Subtraction</td><td>4. Topic Test
Budgeting</td><td></td></tr>
</table>

Multiplicative relations

Outcomes	A student: • develops understanding and fluency in mathematics through exploring and connecting mathematical concepts, choosing and applying mathematical techniques to solve problems, and communicating their thinking and reasoning coherently and clearly MA0-WM-01 • selects and applies appropriate strategies to solve multiplication and division problems MA3-MR-01 • constructs and completes number sentences involving multiplicative relations, applying the order of operations to calculations MA3-MR-02	
Content Descriptors	**EP Lessons in *1. Multiplicative relations A***	
• Determine products and factors • Use partitioning and place value to multiply 2-, 3- and 4-digit numbers by one-digit numbers • Select and apply mental and written strategies to multiply 2- and 3-digit numbers by 2-digit numbers • Represent and solve division problems with whole number remainders • Select and apply strategies to divide a number with 3 or more digits by a one-digit divisor • Use estimation and rounding to check the reasonableness of answers to calculations	1. Products and factors • Factors • Identifying Factors • Highest Common Factor • Factor Trees • Prime Numbers • Composite Numbers • Prime & Composite Numbers Practice • Practice: Composite Numbers • Practice: Factor Trees • Practice: Factors • Practice: Prime & Composite Numbers • Practice: Prime Numbers	2. Multiplying 2-, 3- and 4-digit numbers • Multiplication Using Place Value • Multiplying Big Numbers • Column Multiplication • Multiplication Using Rounding and Compensation • Multiplying Big Numbers 3. Division • Division in Parts • Long Division • Short Division - Without Remainders • Short Division - With Whole Number Remainders
Content Descriptors	**EP Lessons in *2. Multiplicative relations B***	
• Select and apply strategies to solve problems involving multiplication and division with whole numbers • Multiply and divide decimals by powers of 10 • Use equivalent number sentences involving multiplication and division to find unknown quantities • Represent and describe number patterns formed by multiples • Explore the use of brackets and the order of operations to write number sentences	1. Solve problems involving multiplication and division • Applying Multiplication and Division 2. Multiply and divide decimals by powers of 10 • Multiplying Decimals • Dividing Decimals by Whole Numbers Practice • Practice: Dividing Decimals • Practice: Multiplying Decimals	3. Number patterns • Multiples • Applications of Multiples • Identifying Patterns • Missing Pieces of Patterns • Continuing Patterns • Equivalent Number Sentences • Describing Patterns • Gaps in Number Sentences • Patterns Found in Nature (Year 5-10)

	Practice • Practice: Continuing Patterns • Practice: Describing Patterns • Practice: Equivalent Number Sentences • Practice: Gaps in Number Sentences • Practice: Identifying Patterns • Practice: Missing Pieces of Patterns	4. Order of operations • Order of Operations • Preserving Order of Operations
Additional resources		
3. Glossary • Definitions List: Multiplication and Division • Definitions MCQ: Multiplication and Division • Spelling List: Multiplication and Division	*4. Topic Test* • Order of Operations	

Fractions

Outcomes	A student: • develops understanding and fluency in mathematics through exploring and connecting mathematical concepts, choosing and applying mathematical techniques to solve problems, and communicating their thinking and reasoning coherently and clearly MA0-WM-01 • compares and orders fractions with denominators of 2, 3, 4, 5, 6, 8 and 10 MA3-RQF-01 • determines 1/2, 1/4, 1/5 and 1/10 of measures and quantities MA3-RQF-02	
Content Descriptors	**EP Lessons in *1. Representing quantity fractions A***	
• Recognise the role of the number 1 as representing the whole • Compare and order common unit fractions • Solve problems involving addition and subtraction of fractions with the same denominator	• Fractions • Using Fractions • Unit Fractions • Fractions on a Number Line • Proper and Improper Fractions • Adding Whole Numbers and Fractions • Adding Fractions with the Same Denominator • Subtracting Fractions from One Whole • Subtracting Fractions with the Same Denominator	Practice • Practice: Adding Fractions with the Same Denominator • Practice: Fractions • Practice: Fractions on a Number Line • Practice: Proper and Improper Fractions • Practice: Subtracting Fractions from One Whole • Practice: Subtracting Fractions from Whole Numbers • Practice: Subtracting Fractions with the Same Denominator • Practice: Unit Fractions

Content Descriptors	**EP Lessons in *2. Representing quantity fractions B***	
• Recognise that a fraction can represent a division • Build up to the whole from a given fractional part • Use equivalence to add and subtract fractional quantities • Find fractional quantities of whole numbers (halves, quarters, fifths and tenths)	• Comparing Fractions • Fraction of a Quantity • Simplifying Fractions • Equivalent Fractions • Equivalent Fractions & Simplifying • Comparing Fractions with the Same Denominator • Subtracting Fractions from Whole Numbers • Adding Fractions with Related Denominators • Subtracting Fractions with Related Denominators • Fraction Word Problems	Practice • Practice: Fraction Word Problems
Additional resources		
3. Glossary • Definitions List: Fractions and Decimals • Definitions MCQ: Fractions and Decimals • Spelling List: Fractions and Decimals	*4. Topic Tests* • Fractions 1 • Fractions 2	

Geometric measure

<table>
<tr><td>Outcomes</td><td colspan="2">A student:
develops understanding and fluency in mathematics through exploring and connecting mathematical concepts, choosing and applying mathematical techniques to solve problems, and communicating their thinking and reasoning coherently and clearly MA0-WM-01
locates and describes points on a coordinate plane MA3-GM-01
selects and uses the appropriate unit and device to measure lengths and distances including perimeters MA3-GM-02
measures and constructs angles, and identifies the relationships between angles on a straight line and angles at a point MA3-GM-03</td></tr>
<tr><td>Content Descriptors</td><td colspan="2">EP Lessons in 1. Geometric measure A</td></tr>
<tr><td>Position: Explore the Cartesian coordinate system
Length: Use metres and kilometres for length and distances
Length: Measure lengths to find perimeters
Angles: Estimate, measure and compare angles using degrees
Angles: Use a protractor to measure and identify types of angles</td><td>1. Position
Locations
Introduction to Cartesian Planes
Map Projections: A Matter of Perspective (Year 5-10)
Practice
Practice: Cartesian Planes
Practice: Locations
2. Length
Units of Measurement
Unit Prefixes
Units of Length
Perimeter
Finding Perimeters
Perimeters of Composite Shapes
Estimating Measurements
Practice
Practice: Finding Perimeter
Practice: Perimeter
Practice: Units of Length</td><td>3. Angles
Angles
Angles in the Real World
Right Angles
Other Common Angles
Types of Angles
Measuring Acute and Obtuse Angles
Measuring Reflex Angles
Estimating the Size of Angles
Practice
Practice: Angles
Practice: Angles in the Real World
Practice: Estimating the Size of Angles
Practice: Measuring Acute and Obtuse Angles
Practice: Measuring Reflex Angles
Practice: Other Common Angles
Practice: Right Angles
Practice: Types of Angles</td></tr>
</table>

Content Descriptors	EP Lessons in *2. Geometric measure B*	
• Position: Use the 4 quadrants of the coordinate plane • Length: Connect decimal representations to the metric system • Length: Convert between common metric units of length • Length: Solve problems involving the comparison of lengths using appropriate units • Angles: Investigate angles on a straight line and angles at a point • Angles: Investigate the relationships formed by the intersection of straight lines	1. Position • Cartesian Planes • Introduction to Cartesian Coordinates • Describing Locations with Coordinates • Describing Locations with Cartesian Planes • Practice • Practice: Cartesian Coordinates • Practice: Describing Locations with Coordinates 2. Length • Appropriate Units of Length • Method for Converting Units of Length • Converting Units of Length • Comparing Units of Length • Interpreting Units of Length Practice • Practice: Comparing Units of Length • Practice: Converting Units of Length • Practice: Interpreting Units of Length • Practice: Method of Converting Units of Length • Practice: Units of Length	3. Angles • Common Angles • Types of Angles • Measuring Angles • Angles in Corners • Angles on Straight Lines • Angles Around a Point • Vertically Opposite Angles Practice • Practice: Angles around a Point • Practice: Angles in Corners • Practice: Angles on Straight Lines • Practice: Common Angles • Practice: Measuring Angles • Practice: Types of Angles • Practice: Vertically Opposite Angles
Additional resources		
3. Glossary • Definitions List: Angles • Definitions List: Length • Definitions MCQ: Angles • Definitions MCQ: Length • Spelling List: Angles • Spelling List: Length	*4. Topic Tests* • Angles 1 • Angles 2 • Position	

Two-dimensional (2D) spatial structure

<table>
<tr><td>Outcomes</td><td colspan="2">A student:
develops understanding and fluency in mathematics through exploring and connecting mathematical concepts, choosing and applying mathematical techniques to solve problems, and communicating their thinking and reasoning coherently and clearly MA0-WM-01
investigates and classifies two-dimensional shapes, including triangles and quadrilaterals based on their properties MA3-2DS-01
selects and uses the appropriate unit to calculate areas, including areas of rectangles MA3-2DS-02
combines, splits and rearranges shapes to determine the area of parallelograms and triangles MA3-2DS-03</td></tr>
<tr><td>Content Descriptors</td><td colspan="2">EP Lessons in 1. Two-dimensional spatial structure A</td></tr>
<tr><td>2D shapes: Classify two-dimensional shapes and describe their properties
Area: Use hectares and square kilometres as units of measurement for area</td><td>1. 2D shapes
2D Shapes
Regular Polygons
Irregular Polygons
Composite Shapes
Types of Triangles
Quadrilaterals
Practice
Practice: 2D Shapes
Practice: Irregular Polygons
Practice: Regular Polygons</td><td>2. Area
Area
Hectares
Area of Rectangles
Area of Rectangles and Squares
Practice
Practice: Area
Practice: Area of Rectangles
Practice: Hectares</td></tr>
<tr><td>Content Descriptors</td><td colspan="2">EP Lessons in 2. Two-dimensional spatial structure B</td></tr>
<tr><td>2D shapes: Dissect two-dimensional shapes and rearrange them using translations, reflections and rotations
Area: Find the area of composite figures
Area: Calculate the area of a parallelogram using subdivision and rearrangement
Area: Determine the area of a triangle</td><td>1. 2D shapes
Translation
Reflection
Rotation
Translation on a Grid
Reflection on a Grid
Rotation on a Grid
The Enlargement Transformation</td><td>Geoboard Tetris
Geoboard Tetris
Geoboard Tetris Student Worksheet
Geoboard Tetris Teacher Guide
Paper Geoboard Tetris Student Worksheet
Printable Geoboard</td></tr>
</table>

	Practice • Practice: Reflection on a Grid • Practice: Rotation on a Grid • Practice: The Enlargement Transformation • Practice: Translation on a Grid 2. Area • Area of Parallelograms • Area of Triangles • Area of Composite Shapes	Practice • Practice: Area of Parallelograms • Practice: Area of Rectangles & Squares • Practice: Area of Triangles
Additional resources		
3. Glossary • Definitions List: Two-Dimensional Space • Definitions MCQ: Two-Dimensional Space • Spelling List: Two-Dimensional Space	*4. Topic Tests* • Transformations 1 • Transformations 2 • Two-Dimensional Shapes	

Three-dimensional (3D) spatial structure

Outcomes	A student: • develops understanding and fluency in mathematics through exploring and connecting mathematical concepts, choosing and applying mathematical techniques to solve problems, and communicating their thinking and reasoning coherently and clearly MA0-WM-01 • visualises, sketches and constructs three-dimensional objects, including prisms and pyramids, making connections to two-dimensional representations MA3-3DS-01 • selects and uses the appropriate unit to estimate, measure and calculate volumes and capacities MA3-3DS-02	
Content Descriptors	**EP Lessons in *1. Three-dimensional spatial structure A***	
• 3D objects: Compare, describe and name prisms and pyramids • 3D objects: Connect three-dimensional objects with two-dimensional representations • Volume: Choose appropriate units of measurement for capacity • Volume: Use displacement to investigate volumes of irregular solids • Volume: Connect decimal representations to the metric system	1. 3D objects • 3D Solids • Prisms • Nets of Prisms • Pyramids • Nets of Pyramids • Identifying Faces of Prisms and Pyramids • Pyramids in the Real World Practice • Practice: 3D Solids • Practice: Identifying Faces of Prisms and Pyramids • Practice: Prisms • Practice: Pyramids • Practice: Pyramids in the Real World 2. Volume • Units of Measurement • Unit Prefixes • Units of Capacity • Interpreting Units of Capacity • Applications of Converting Units of Capacity • Converting Units of Capacity • Capacity and Volume	Practice • Practice: Applications of Converting Units of Capacity • Practice: Capacity and Volume • Practice: Converting Units of Capacity • Practice: Interpreting Units of Capacity • Practice: Units of Capacity • Practice: Units of Volume

Content Descriptors	**EP Lessons in *2. Three-dimensional spatial structure B***	
• 3D objects: Construct prisms and pyramids • Volume: Use cubic metres for measurement of volume • Volume: Recognise the multiplicative structure for finding volume • Volume: Find the volumes of rectangular prisms in cubic centimetres and cubic metres	1. 3D objects Constructing with 3D Objects • Constructing 3D Objects • Making Objects Using Cubes • Making Objects Using Nets Playdough Prisms • Playdough Prisms • Playdough Prisms Student Worksheet • Playdough Prisms Teacher Guide • Playdough Recipe	2. Volume • Types of Prisms • Rectangular Prisms • Volume • Calculating Volume of Rectangular Prisms Practice • Practice: Types of Prisms • Practice: Volume of Rectangular Prisms
Additional resources		
3. Glossary • Definitions List: Volume and Capacity • Definitions MCQ: Volume and Capacity • MCQ: Three-Dimensional Space • Spelling List: Volume and Capacity • Spelling: Three-Dimensional Space • Three-Dimensional Space Spelling	*4. Topic Tests* • Solids 1 • Solids 2	

Non-spatial measure

<table>
<tr><td>Outcomes</td><td colspan="2">A student:
develops understanding and fluency in mathematics through exploring and connecting mathematical concepts, choosing and applying mathematical techniques to solve problems, and communicating their thinking and reasoning coherently and clearly MA0-WM-01
selects and uses the appropriate unit and device to measure the masses of objects MA3-NSM-01
measures and compares duration, using 12- and 24-hour time and am and pm notation MA3-NSM-02</td></tr>
<tr><td>Content Descriptors</td><td colspan="2">EP Lessons in 1. Non-spatial measure A</td></tr>
<tr><td>Mass: Choose appropriate units of measurement for mass
Mass: Connect decimal representations to the metric system
Time: Compare 12- and 24-hour time systems and convert between them</td><td>1. Mass
Units of Measurement
Unit Prefixes
Units of Mass
Practice
Practice: Units of Mass
2. Time
Duration
Recording Time
Digital Clocks
24-Hour Time
Converting 12- and 24-Hour Time
Reading Analog Clocks Basics
Analog Clocks to the Nearest Minute
Timetables
Reading Timetables</td><td>Practice
Practice: 24-Hour Time
Practice: Analog Clocks to the Nearest Minute
Practice: Converting 12- and 24-Hour Time
Practice: Digital Clocks
Practice: Duration
Practice: Reading Analog Clocks Basics
Practice: Reading Timetables
Practice: Recording Time</td></tr>
<tr><td>Content Descriptors</td><td colspan="2">EP Lessons in 2. Non-spatial measure B</td></tr>
<tr><td>Mass: Convert between common metric units of mass
Time: Solve problems involving duration, using 12- and 24-hour time</td><td>1. Mass
Interpreting Units of Mass
Converting Units of Mass
Net Mass and Gross Mass</td><td>Practice
Practice: Applications of Converting Units of Mass
Practice: Converting Units of Mass
Practice: Interpreting Units of Mass
Practice: Net Mass and Gross Mass</td></tr>
</table>

	2. Time • Adding Units of Time • Formatting Time • Personal Timetables • Timetables and Transport	Practice • Practice: Personal Timetables • Practice: Timetables and Transport
Additional resources		
3. Glossary • Definitions List: Mass • Definitions List: Time • Definitions MCQ: Mass	• Definitions MCQ: Time • Spelling List: Mass • Spelling List: Time	*4. Topic Tests* • Clocks • Timetables and Timelines

Data

Outcomes	A student: • develops understanding and fluency in mathematics through exploring and connecting mathematical concepts, choosing and applying mathematical techniques to solve problems, and communicating their thinking and reasoning coherently and clearly MA0-WM-01 • constructs graphs using many-to-one scales MA3-DATA-01 • interprets data displays, including timelines and line graphs MA3-DATA-02	
Content Descriptors	**EP Lessons in *1. Data A***	
• Collect categorical and discrete numerical data by observation or survey • Choose and use appropriate tables and graphs • Describe and interpret different datasets in context	• What is Data? • Collecting Data • Surveys • Data Tables • Tally Marks • Picture Graphs • Picture Graphs with Keys • Picture Graphs and Data Tables	Practice • Practice: Collecting Data • Practice: Data Tables • Practice: Dot Plots • Practice: Dot Plots and Tables • Practice: Picture Graphs • Practice: Picture Graphs and Data Tables • Practice: Picture Graphs with Keys • Practice: Surveys • Practice: Tally Marks • Practice: What is Data

Content Descriptors	**EP Lessons in *2. Data B***	
• Interpret and compare a range of data displays • Interpret data presented in digital media and elsewhere	• Picture Graphs • Picture Graphs with Keys • Dot Plots • Pie Charts • Column (Bar) Graphs • Reading Column (Bar) Graphs • Side-by-Side Column Graphs • Line Graphs • Two-Way Tables • Misleading Data and Graphs	Practice • Practice: Column (Bar) Graphs • Practice: Dot Plots • Practice: Line Graphs • Practice: Misleading Data and Graphs • Practice: Picture Graphs • Practice: Picture Graphs with Keys • Practice: Pie Charts • Practice: Reading Column (Bar) Graphs • Practice: Side-by-Side Column Graphs • Practice: Two-Way Tables
Additional resources		
3. Glossary • Definitions List: Data • Definitions MCQ: Data • Spelling List: Data	*4. Topic Tests* • Data 1 • Data 2	

Chance

Outcomes	A student: • develops understanding and fluency in mathematics through exploring and connecting mathematical concepts, choosing and applying mathematical techniques to solve problems, and communicating their thinking and reasoning coherently and clearly MA0-WM-01 • conducts chance experiments and quantifies the probability MA3-CHAN-01	
Content Descriptors	**EP Lessons in *1. Chance A***	
• List outcomes of chance experiments involving equally likely outcomes and represent probabilities	• The Likelihood Scale • Likelihood of Events • Probability as a Fraction • Equal and Unequal Outcomes • The Probability of Outcomes	Practice • Practice: Chance Games • Practice: Equal and Unequal Outcomes • Practice: Likelihood of Events • Practice: Probability as a Fraction • Practice: The Likelihood Scale • Practice: The Probability of Outcomes
Content Descriptors	**EP Lessons in *2. Chance B***	
• Compare observed frequencies of outcomes with expected results • Create random generators and describe probabilities using fractions • Conduct chance experiments with both small and large numbers of trials	• Writing Probabilities • Proportional Reasoning • Probability Experiments • Observed Outcomes vs. Expected Outcomes • Chance Games • Chance Games from Other Cultures	Practice • Practice: Observed Outcomes vs. Expected Outcomes • Practice: Probability Experiments • Practice: Proportional Reasoning • Practice: Writing Probabilities
Additional resources		
3. Glossary • Definitions List: Chance • Definitions MCQ: Chance • Spelling List: Chance	*4. Topic Tests* • Chance 1 • Chance 2	

Prior Learning

- Addition
- Angles: Amount of Turn
- Area
- Area Models for Multiplication
- Collecting Data
- Comparing Lengths and Objects
- Comparing Shapes
- Counting
- Describing Locations
- Differences in Results
- Directional Language
- Expanding Numbers
- Half
- How Likely?
- Impossible and Certain Events
- Language of Time
- Money
- Multi Digit Odd and Even Numbers
- Multiplication
- Number Lines
- Numbers in Written Form
- Odd and Even Numbers
- Patterns with Objects
- Quarters and Eighths
- Reading from Data Displays
- Rectangles
- Rectangles
- Skip Counting Down
- Skip Counting Up
- Splitting Up Time
- Subtracting with Number Lines
- Subtraction
- Subtraction
- The Metric System
- Transforming Shapes
- Triangles
- Units of Measurement

Stage 4

Computation with integers

<table>
<tr><td>Outcomes</td><td colspan="2">A student:
develops understanding and fluency in mathematics through exploring and connecting mathematical concepts, choosing and applying mathematical techniques to solve problems, and communicating their thinking and reasoning coherently and clearly MA0-WM-01
compares, orders and calculates with integers to solve problems MA4-INT-C-01</td></tr>
<tr><td>Content Descriptors</td><td colspan="2">EP Lessons in 1. Computation with integers</td></tr>
<tr><td>Compare and order integers
Add and subtract positive and negative integers
Multiply and divide positive and negative integers
Apply the 4 operations to integers</td><td>1. Compare and Order Integers
Positive Integers
Negative Integers
Rational Numbers on the Number Line
Comparing & Ordering Integers
Practice
Comparing & Ordering Integers Practice
Integers Practice
2. Add and subtract positive and negative integers
Addition
Subtraction
Adding Negative Numbers
Negative Integer Addition and Subtraction
Subtracting Negative Numbers
Adding and Subtracting Decimals on a Number Line
Practice
Adding & Subtracting Integers Practice</td><td>3. Multiply and divide positive and negative integers
Multiplication
Division
Long Division
Negative Integer Multiplication and Division
Multiplying Decimals
Dividing Decimals
4. Apply the 4 operations to integers
Order of Operations
Practice
Order of Operations 1
Order of Operations 2
Order of Operations 3
5. Glossary
Definitions List: Computation with Integers
Definitions MCQ: Computation with Integers</td></tr>
</table>

Fractions, decimals and percentages

Outcomes	A student: • develops understanding and fluency in mathematics through exploring and connecting mathematical concepts, choosing and applying mathematical techniques to solve problems, and communicating their thinking and reasoning coherently and clearly MA0-WM-01 • represents and operates with fractions, decimals and percentages to solve problems MA4-FRC-C-01	
Content Descriptors	**EP Lessons in *2. Fractions, decimals and percentages***	
• Compare fractions using equivalence • Round decimals to a specified degree of accuracy using approximations • Identify terminating and recurring decimals • Identify and make use of the relationship between fractions, decimals and percentages to carry out simple conversions • Examine the concept of irrational numbers • Order and compare the value of fractions, decimals and percentages • Solve problems that involve the addition and subtraction of fractions • Solve problems that involve the multiplication and division of fractions and decimals • Represent one quantity as a fraction, decimal or percentage of another, with and without the use of digital tools • Solve problems that involve the use of percentages	*1. Fractions* 1. Comparing Fractions • Equivalent Fractions • Mixed Numbers • Fraction Walls • Improper Fractions • Fractions and Number Lines • Comparing Fractions • Comparing Fractions with the Same Denominator • Simplifying Fractions Practice • Practice: Comparing Fractions as Decimals • Practice: Comparing Fractions with the Same Denominator 2. Adding and Subtracting Fractions • Adding Fractions with the Same Denominator • Subtracting Fractions with the Same Denominator • Adding Fractions with a Different Denominator • Subtracting Fractions with a Different Denominator • Adding Mixed Fractions with the Same Denominator • Subtracting Mixed Fractions with the Same Denominator • Subtracting Mixed Fractions with a Different Denominator	Practice • Practice: Adding Fractions with a Different Denominator • Practice: Adding Fractions with the Same Denominator • Practice: Subtracting Fractions with a Different Denominator • Practice: Subtracting Fractions with the Same Denominator • Practice: Subtracting Mixed Numbers with a Different Denominator 3. Multiplying and Dividing Fractions • Multiplying Fractions Numerically • Multiplying Fractions Using Models • Dividing Fractions • Dividing Fractions by Simplifying Practice • Practice: Dividing Fractions • Practice: Multiplying Fractions 4. Using Fractions • Using Fractions in Context • Using Fractions - Food • Using Fractions - Space • Using Fractions - Money Practice • Practice: Fractions and Food • Practice: Fractions and Shopping • Practice: Fractions and the Cosmos

	2. Decimals • How Decimals Work • Recurring Decimals • Rounding to Decimal Places • Terminating Decimals and Rounding • Multiplying Decimals • Dividing Decimals *3. Percentages* • Introduction to Percentages • Using Percentages • Discounts • Calculating Discounts • Calculating Percentage Discounts • Percentages and Money • Percentages and Populations • Profit and Loss • Calculating Profit and Loss • Supply Chains • Goods and Services Tax • Income Tax • Maths in Context: Boxing Day Bonanza Practice • Practice: Calculating Discounts • Practice: Calculating Percentage Discounts • Practice: Calculating Profit and Loss • Practice: Discounts • Practice: Percentages and Money • Practice: Profit and Loss • Practice: Supply Chains • Uses of Financial Mathematics Practice *4. Converting Between Real Numbers* • Converting Between Fractions and Decimals • Converting Between Percentages and Fractions: Simplifying Fractions • Application: Town Planning	Hands-On Activity: Real Number Dominoes • Real Number Dominoes • Real Number Dominoes Student Worksheet • Real Number Dominoes Teacher Guide Practice • Practice: Converting Between Decimals and Percentages • Practice: Converting Between Fractions and Decimals • Practice: Converting Between Percentages and Fractions *5. Irrational Numbers* • Irrational Numbers • Happy Pi Day! Practice • Practice: Irrational Numbers *6. Glossary* • Definitions List: Decimals • Definitions List: Finance • Definitions List: Fractions • Definitions List: Irrational Numbers • Definitions List: Money and Financial Mathematics • Definitions List: Percentages • Definitions List: Percentages • Definitions List: Real Numbers • Definitions MCQ: Decimals • Definitions MCQ: Finance • Definitions MCQ: Fractions • Definitions MCQ: Irrational Numbers • Definitions MCQ: Money and Financial Mathematics • Definitions MCQ: Percentages • Definitions MCQ: Percentages • Definitions MCQ: Real Numbers • Spelling List: Money and Financial Mathematics *7. Topic Tests*

		• Discounts and GST • Fractions, Decimals and Percentages

Ratios and rates

Outcomes	A student: • develops understanding and fluency in mathematics through exploring and connecting mathematical concepts, choosing and applying mathematical techniques to solve problems, and communicating their thinking and reasoning coherently and clearly MA0-WM-01 • solves problems involving ratios and rates, and analyses distance–time graphs MA4-RAT-C-01	
Content Descriptors	**EP Lessons in *3. Ratios and rates***	
• Recognise and simplify ratios • Solve problems involving ratios • Recognise and simplify rates • Solve problems involving rates • Interpret and construct distance–time graphs from authentic data	*1. Ratios* • Ratios Introduction • Ratios • Maps and Scales Hands-On Activity: Planning a Party • Planning a Party • Planning a Party Student Worksheet • Planning a Party Teacher Guide Practice • Practice: Ratios • Practice: Ratios II *2. Rates* • Rates • Applying Ratios and Rates • Cost per Item • Best Buys Using Unit Costs • When a Best Buy isn't the Best Option • Budgeting: Preparing a Personal Budget • Water Evaporation Graphs • Extension: Solving Practical Measurement Problems	Practice • Calculating a Best Buy Practice • Cost per Item Practice • Mixed Practice: Ratios and Rates • Practice: Applying Rates and Ratios • Practice: Rates • Unit Pricing Practice *3. Distance-time graphs* • Plotting and Reading Travel Graphs • Analysing Travel Graphs *4. Glossary* • Definitions List: Ratios and Rates • Definitions MCQ: Ratios and Rates *5. Topic Test* • Rates and Ratios

Algebraic techniques

<table>
<tr><td>Outcomes</td><td colspan="2">A student:
develops understanding and fluency in mathematics through exploring and connecting mathematical concepts, choosing and applying mathematical techniques to solve problems, and communicating their thinking and reasoning coherently and clearly MA0-WM-01
generalises number properties to operate with algebraic expressions including expansion and factorisation MA4-ALG-C-01</td></tr>
<tr><td>Content Descriptors</td><td colspan="2">EP Lessons in 4. Algebraic techniques</td></tr>
<tr><td>Examine the concept of pronumerals as a way of representing numbers
Create algebraic expressions and evaluate them by substitution
Extend and apply the laws and properties of arithmetic to algebraic terms and expressions
Extend and apply the distributive law to the expansion of algebraic expressions
Factorise algebraic expressions by identifying numerical and algebraic factors</td><td>1. Introduction to Algebra
Welcome to Algebra
Order of Operations in Algebra
Order of Operations in Algebraic Equations
Translating Between Word Descriptions and Algebraic Expressions
Translating Between Authentic Situations and Algebraic Expressions
Practice
Practice: Introduction to Algebra
Practice: Relating Words to Algebra
2. Algebraic Expressions
Substitution
Arithmetic in Algebra
Substitution in Algebraic Expressions
Using Formulas
Finding Formulas
Writing and Evaluating Algebraic Expressions
Translating Between Situations and Algebraic Expressions
Practice
Practice: Arithmetic Laws and Algebra
Practice: Formulas
Practice: Translating Between Situations and Algebraic Expressions
Practice: Writing and Evaluating Algebraic Expressions</td><td>3. Simplifying and Evaluating Algebra
Simplifying Addition in Algebra
Simplifying Subtraction in Algebra
Simplifying Multiplication in Algebra
Simplifying Division in Algebra
Evaluating Algebraic Expressions
Simplifying Addition and Subtraction
Simplifying Multiplication and Division
The Commutative Law
The Associative Law
Practice
Mixed Practice: Patterns and Algebra
Practice: Associative Law
Practice: Commutative Law
Practice: Evaluating Algebraic Expressions
Practice: Simplifying Addition and Subtraction
Practice: Simplifying Algebraic Expressions
Practice: Simplifying Multiplication and Division
4. Distributive Law
The Distributive Law
Using the Distributive Law
Expanding I
Expanding II</td></tr>
</table>

	Practice • Practice: Distributive Law • Practice: Expanding I • Practice: Expanding with Binomial Brackets • Practice: Expanding with Powers • Practice: Expanding with the Distributive Law *5. Factorising Algebraic Expressions* • Greatest Common Divisor (Highest Common Factor) • Introduction to Factorising • Factorising Algebraic Expressions • Factorising Algebraic Expressions with Powers Practice • Practice: Factorising Algebraic Expressions • Practice: Factorising Algebraic Expressions with Powers • Practice: Greatest Common Divisor (Highest Common Factor) • Practice: Introduction to Factorising *6. Glossary* • Definitions List: Algebraic techniques • Definitions MCQ: Algebraic techniques *7. Topic Tests* • Algebraic Techniques • Arithmetic Laws	

Indices

Outcomes	A student: • develops understanding and fluency in mathematics through exploring and connecting mathematical concepts, choosing and applying mathematical techniques to solve problems, and communicating their thinking and reasoning coherently and clearly MA0-WM-01 • operates with primes and roots, positive-integer and zero indices involving numerical bases and establishes the relevant index laws MA4-IND-C-01	
Content Descriptors	**EP Lessons in *5. Indices***	
• Apply index notation to represent whole numbers as products of powers of prime numbers • Examine cube roots and square roots • Use index notation to establish the index laws with positive-integer indices and the zero index	*1. Index Notation* • Index Notation • Prime Factors and the HCF • Prime Factors and the LCM • Applying Prime Factors Practice • Mixed Practice: Prime Numbers and Prime Factors • Practice: Index Notation • Practice: Prime Factors *2. Cube Roots and Square Roots* • Perfect Squares • Square Roots • Square Roots of Non-Perfect Squares • Fractional Indices Practice • Mixed Practice: Squares and Square Roots • Practice: Fractional Indices • Practice: Perfect Squares • Practice: Square Roots • Practice: Square Roots of Non-Perfect Squares	*3. The Index Laws and Zero Index* • Multiplying Indices • Dividing Indices • The Power of Zero • Powers of Powers Practice • Mixed Practice: Indices • Practice: Dividing Indices • Practice: Multiplying Indices • Practice: Power of Powers • Practice: The Power of Zero *4. Glossary* • Definitions List: Indices • Definitions MCQ: Indices *5. Topic Test* • Multiplying and Dividing Indices

Equations

Outcomes	A student: • develops understanding and fluency in mathematics through exploring and connecting mathematical concepts, choosing and applying mathematical techniques to solve problems, and communicating their thinking and reasoning coherently and clearly MA0-WM-01 • solves linear equations of up to 2 steps and quadratic equations of the form 〖ax〗^2=c MA4-EQU-C-01	
Content Descriptors	**EP Lessons in *6. Equations***	
• Solve linear equations up to 2 steps • Solve and verify linear equations by substitution • Solve quadratic equations	*1. Introduction to Equations* • Using Formulas • Rearranging and Solving Equations from Formulas Hands- On Activity: Physically Balancing Equations • Physically Balancing Equations • Physically Balancing Equations Student Worksheet • Physically Balancing Equations Teacher Guide Practice • Practice: Solving Equations • Practice: Using Formulas *2. Solving Linear Equations* • Linear Equations • Rearranging Linear Equations • Balancing Equations • Concrete Models • Flow Charts • Visual Methods for Solving Linear Equations • Solving One-Step Linear Equations • Solving Two-Step Linear Equations • Solving Linear Equations with Brackets • Applications of Linear Equations • Non-Integer Solutions to Linear Equations • Checking Solutions • Problem-Solving: Opening a New Aquarium	Practice • Mixed Practice: Methods for Solving Equations • Practice: Solving Linear Equations with Algebraic Methods • Practice: Solving Linear Equations with Visual Methods *3. Solving Quadratic Equations* • Solving Simple Quadratic Equations *4. Glossary* • Definitions List: Equations • Definitions MCQ: Equations • Spelling List: Equations *5. Topic Test* • Solving Linear Equations

Length

Outcomes	A student: • develops understanding and fluency in mathematics through exploring and connecting mathematical concepts, choosing and applying mathematical techniques to solve problems, and communicating their thinking and reasoning coherently and clearly MA0-WM-01 • applies knowledge of the perimeter of plane shapes and the circumference of circles to solve problems MA4-LEN-C-01	
Content Descriptors	**EP Lessons in *8. Length***	
• Solve problems involving the perimeter of various quadrilaterals and simple composite figures • Describe the relationships between the features of circles	*1. Perimeter* • Perimeter • Perimeter of Composite Shapes • Finding the Unknown Side of a Composite Shape • Calculating the Perimeter of a Shape with an Unknown Side • Perimeters of Kites, Rhombuses, Trapeziums and Parallelograms • Perimeter and Circumference of Composite Shapes Practice • Practice: Perimeter • Practice: Perimeter of Composite Shapes *2. Circles* • Parts of a Circle • Circumference of Circles • Using the Circumference of Circles • Constructing Circles *3. Glossary* • Definitions List: Length • Definitions MCQ: Length • Spelling List: Length *4. Topic Test* • Perimeter	

Pythagoras and trigonometry

<table>
<tr><td>Outcomes</td><td colspan="2">A student:
develops understanding and fluency in mathematics through exploring and connecting mathematical concepts, choosing and applying mathematical techniques to solve problems, and communicating their thinking and reasoning coherently and clearly MAO-WM-01
applies Pythagoras’ theorem to solve problems in various contexts MA4-PYT-C-01</td></tr>
<tr><td>Content Descriptors</td><td colspan="2">EP Lessons in 9. Pythagoras and trigonometry</td></tr>
<tr><td>Identify and define Pythagoras’ theorem
Examine problems involving Pythagoras’ theorem</td><td>1. Right-angled triangles (Pythagoras’ theorem)
Parts of a Triangle and the Hypotenuse
Pythagoras' Theorem
2. Glossary
Definitions List: Pythagoras and Trigonometry
Definitions MCQ: Pythagoras and Irrational Numbers
3. Topic Test
Pythagoras' Theorem</td><td></td></tr>
</table>

Area and surface area

<table>
<tr><td>Outcomes</td><td colspan="2">A student:
develops understanding and fluency in mathematics through exploring and connecting mathematical concepts, choosing and applying mathematical techniques to solve problems, and communicating their thinking and reasoning coherently and clearly MAO-WM-01
applies knowledge of area and composite area involving triangles, quadrilaterals and circles to solve problems MA4-ARE-C-01</td></tr>
<tr><td>Content Descriptors</td><td colspan="2">EP Lessons in 10. Area and surface area</td></tr>
<tr><td>Develop and use formulas to find the area of rectangles, triangles and parallelograms to solve problems
Develop and use the formula to find the area of circles and sectors to solve problems
Develop and use the formulas to find the area of trapeziums, rhombuses and kites to solve problems
Choose appropriate units of measurement for area and convert between units</td><td>1. Units of Area
Units of Area
Converting Between Units of Area
Converting Between Units of Area Applications
Practice
Practice: Converting between Units of Area
Practice: Converting between Units of Area Applications
Practice: Units of Area
2. Calculating Area
Area of Rectangles and Squares
Area of Triangles
Area of Parallelograms
Area of Circles
Using the Area of Circles
Area of Trapeziums
Area of Rhombus and Kites
Area of Composite Shapes
Practice
Mixed Practice: Area
Practice: Area of Composite Shapes
Practice: Area of Parallelograms
Practice: Area of Parallelograms
Practice: Area of Rectangles & Squares
Practice: Area of Rhombus and Kites
Practice: Area of Trapeziums
Practice: Area of Triangles</td><td>3. Glossary
Definitions List: Area
Definitions MCQ: Area
Spelling List: Area
4. Topic Tests
Units of Area</td></tr>
</table>

Volume

Outcomes	A student: • develops understanding and fluency in mathematics through exploring and connecting mathematical concepts, choosing and applying mathematical techniques to solve problems, and communicating their thinking and reasoning coherently and clearly MAO-WM-01 • applies knowledge of volume and capacity to solve problems involving right prisms and cylinders MA4-VOL-C-01	
Content Descriptors	**EP Lessons in *11. Volume***	
• Describe the different views of prisms and solids that have been formed from prism combinations • Develop and apply the formula to find the volume of a prism to solve problems • Develop the formula for finding the volume of a cylinder and apply the formula to solve problems • Choose appropriate units of measurement for volume and capacity and convert between units	*1. Prisms and Solids* • Introduction to Solids • Types of Prisms • Rectangular Prisms • Curved Solids Practice • Practice: 3D Solids • Practice: Curved Solids • Practice: Triangular Prisms • Practice: Types of Prisms *2. Units of Volume* • Units of Volume • Converting Units of Volume • Converting Units of Capacity • Converting Further Units of Capacity and Applications Practice • Practice: Units of Capacity *3. Calculating Volume* • Calculating Volume of Rectangular Prisms • Calculating Volume of Triangular Prisms • Calculating Volume of Cylinders • Calculating Volume of Other Regular and Irregular Prisms • Volume of Composite Shapes	Practice • Practice: Cylinder Exercises • Practice: Volume of Composite Shapes • Practice: Volume of Composite Shapes with Unknown Lengths • Practice: Volume of Cylinders • Practice: Volume of Other Regular and Irregular Prisms • Practice: Volume of Rectangular Prisms • Practice: Volume of Regular Triangular Prisms Practice • Practice: Volume of Right Angled Triangular Prisms *4. Topic Test* • Calculating Volume

Angle relationships

Outcomes	A student: • develops understanding and fluency in mathematics through exploring and connecting mathematical concepts, choosing and applying mathematical techniques to solve problems, and communicating their thinking and reasoning coherently and clearly MAO-WM-01 • applies angle relationships to solve problems, including those related to transversals on sets of parallel lines MA4-ANG-C-01	
Content Descriptors	**EP Lessons in *12. Angle relationships***	
• Apply the language, notation and conventions of geometry • Identify geometrical properties of angles at a point • Identify and describe corresponding, alternate and co-interior angles when 2 straight lines are crossed by a transversal, including parallel lines • Solve numerical problems involving angles using reasoning	*1. Angles* • Language, Notation and Conventions of Geometry • Parallel Lines • Angles around Parallel Lines • Angles in Corners • Angles around a Point • Angles on Straight Lines • Angles Around a Point • Vertically Opposite Angles • Geometric Reasoning Practice • Angles around a Point Practice • Angles in Corners Practice • Angles on Straight Lines Practice • Mixed Practice: Angle Relationships • Practice: Angles Around Parallel Lines • Practice: Angles Around a Point • Vertically Opposite Angles Practice *2. Glossary* • Definitions List: Angle Relationships • Definitions MCQ: Angle Relationships • Spelling List: Angle Relationships *3. Topic Tests* • Angle Relationships • Angle Relationships	

Properties of geometrical figures

<table>
<tr><td>Outcomes</td><td colspan="2">A student:
develops understanding and fluency in mathematics through exploring and connecting mathematical concepts, choosing and applying mathematical techniques to solve problems, and communicating their thinking and reasoning coherently and clearly MAO-WM-01
identifies and applies the properties of triangles and quadrilaterals to solve problems MA4-GEO-C-01</td></tr>
<tr><td>Content Descriptors</td><td colspan="2">EP Lessons in 13. Properties of geometrical figures</td></tr>
<tr><td>Classify triangles according to their side and angle properties
Classify quadrilaterals and describe their properties
Apply the properties of triangles and quadrilaterals</td><td>1. Triangles
Types of Triangles
Angles in a Triangle
Angles and Triangles
Interior and Exterior Angles of Triangles
Practice
Mixed Practice: Triangles
Practice: Angles in a Triangle
Practice: Types of Triangles
Triangles in the Real World
Triangles in the Real World
Triangles in the Real World Student Worksheet
Triangles in the Real World Teacher Guide
2. Quadrilaterals
Classifying Quadrilaterals
Angles in Quadrilaterals
Applying Rules to Quadrilaterals
Classification of Triangles and Quadrilaterals
Exterior Angles in Triangles and Quadrilaterals
Practice
Mixed Practice: Quadrilaterals
Practice: Angles in a Quadrilateral
Practice: Types of Quadrilaterals</td><td>3. Glossary
Definitions List: Geometric Reasoning
Definitions List: Properties of Geometric Figures
Definitions MCQ: Geometric Reasoning
Definitions MCQ: Properties of Geometric Figures
Spelling List: Properties of Geometrical Figures</td></tr>
</table>

Data classification and visualisation

<table>
<tr><td>Outcomes</td><td colspan="2">A student:
develops understanding and fluency in mathematics through exploring and connecting mathematical concepts, choosing and applying mathematical techniques to solve problems, and communicating their thinking and reasoning coherently and clearly MAO-WM-01
classifies and displays data using a variety of graphical representations MA4-DAT-C-01</td></tr>
<tr><td>Content Descriptors</td><td colspan="2">EP Lessons in 14. Data classification and visualisation</td></tr>
<tr><td>Classify data as either numerical (discrete or continuous) or categorical (nominal or ordinal) variables
Display data using graphical representations relevant to the purpose of the data
Interpret data in graphical representations</td><td>1. Displaying Data
Displaying Data
Dot Plots and Column (Bar) Graphs
Line Graphs
Introduction to Stem and Leaf Plots
Pie Charts and Divided Bar Graphs
Histograms
Frequency Polygons
Dot Plots
Stem and Leaf Plots
Back-to-Back Stem and Leaf Plots
Selecting Appropriate Graphs
Creating an Infographic
Lolly Graphs
Lolly Graphs
Lolly Graphs Student Worksheet
Lolly Graphs Teacher Guide
Practice
Mixed Practice: Displaying Data
Practice: Back-to-Back Stem and Leaf Plots
Practice: Displaying Data
Practice: Dot Plots and Column Graphs
Practice: Finding Measures of Centre and Spread in Data Displays</td><td>Practice: Histograms
Practice: Line Graphs
Practice: Pick Your Display Method
Practice: Pie Charts and Divided Bar Graphs
Practice: Stem and Leaf Plots
2. Glossary
Definitions List: Data classification and visualisation
Definitions MCQ: Data classification and visualisation
Spelling List: Data classification and visualisation
3. Topic Test
Data Displays
Data Sources and Statistical Reports</td></tr>
</table>

Data analysis

<table>
<tr><td>Outcomes</td><td colspan="2">A student:
develops understanding and fluency in mathematics through exploring and connecting mathematical concepts, choosing and applying mathematical techniques to solve problems, and communicating their thinking and reasoning coherently and clearly MAO-WM-01
analyses simple datasets using measures of centre, range and shape of the data MA4-DAT-C-02</td></tr>
<tr><td>Content Descriptors</td><td colspan="2">EP Lessons in 15. Data analysis</td></tr>
<tr><td>Calculate and compare the mean, median, mode and range for simple datasets
Interpret the effect individual data points have on measures of centre and range
Analyse datasets presented in various ways and draw conclusions</td><td>1. Mean, Median, Mode and Range
Analysing Numerical Data
Mean
Median
Mode
Comparing Measures of Centre
The Range
Calculating Measures of Centre and Spread
Practice
Mixed Practice: Introduction to Data
Mixed Practice: Mean, Median and Mode
Mixed Practice: Shape and Spread in Data
Practice: Calculating Measures of Centre and Spread
Practice: Comparing Measures of Centre
Practice: Introduction to Data
Practice: Measures of Centre in Grouped Data
Practice: The Median
Practice: The Mean
Practice: The Mode
Practice: The Range
Practice: Shape and Mode
2. The Effect of Individual Data Points
Outliers
Clusters and Outliers
Effect of Shape on Mean and Median
Scrambled Statistics</td><td>Adding and Removing Data
Samples and Populations
Implications and Consequences of Big Data
Practice
Practice: Clusters and Outliers
Practice: Effect of Shape on Mean and Median
Practice: Outliers
Practice: Samples and Populations
Practice: Symmetry and Skew in Data
3. Analyse Datasets and Draw Conclusions
Reporting on Statistical Investigations
Evaluating Statistical Reports and Claims: Data Collection
Evaluating Statistical Reports and Claims: Data Reporting
Evaluating Statistical Graphs: Making our Graph
Evaluating Statistical Graphs: the Shape of the Graph
Random Sampling</td></tr>
</table>

	Practice • Mixed Practice: Introduction to Data Methods • Practice: Evaluating Statistical Graphs: Making our Graph • Practice: Evaluating Statistical Reports and Claims: Data Collection • Practice: Evaluating Statistical Reports and Claims: Data Reporting • Practice: Introduction to Data Collection • Practice: Shape of the Graph *3. Glossary* • Definitions List: Single Variable Data Analysis • Definitions List: Single Variable Data Analysis • Definitions MCQ: Single Variable Data Analysis • Definitions MCQ: Single Variable Data Analysis • Spelling List: Single Variable Data Analysis *4. Topic Test* • Analysing and Comparing Data • Investigating and Analysing Data • Mean, Median, Mode and Range	

Probability

Outcomes	A student: • develops understanding and fluency in mathematics through exploring and connecting mathematical concepts, choosing and applying mathematical techniques to solve problems, and communicating their thinking and reasoning coherently and clearly MAO-WM-01 • solves problems involving the probabilities of simple chance experiments MA4-PRO-C-01	
Content Descriptors	**EP Lessons in *16. Probability***	
• Determine probabilities for chance experiments • Determine probabilities for complementary events	*1. Introduction to Probability* • Probability Terminology • Introduction to Likelihood • Probability • What are Events? • Experimental Probability • Impossible and Certain Events Practice • Mixed Practice: Introduction to Probability • Practice: Introduction to Probability *2. Exploring Probabilities* • Comparing Probabilities • Probability as a Fraction • Probability as a Decimal and a Percentage • Probability Summary *3. Determining Probabilities* • Types of Probability • Calculating Probability • Experimental Probability • Using Simulations to Determine Probabilities • Exploring Outcomes • The Probability of Observations Further Resources • Unfortunate Events A Chance of Rain • A Chance of Rain • A Chance of Rain Student Worksheet • A Chance of Rain Teacher Guide	A Tree Snake Chance Game • A Tree Snake Chance Game • A Tree Snake Chance Game Student Worksheet • A Tree Snake Chance Game Teacher Guide Practice • Mixed Practice: Finding Probability • Practice: Experimental Probability • Practice: Finding Probabilities *4. Complementary Events* • Complementary Events • Calculating Complements Practice • Mixed Practice: Complementary Events • Practice: Calculating Complements • Practice: Complementary Events *5. Glossary* • Definitions List: Probability • Definitions MCQ: Probability *6. Topic Tests* • Descriptions of Probability and Complementary Events • Finding Probability • Introduction to Probability

Stage 5

Financial mathematics

A student: • develops understanding and fluency in mathematics through exploring and connecting mathematical concepts, choosing and applying mathematical techniques to solve problems, and communicating their thinking and reasoning coherently and clearly MAO-WM-01		
EP Lessons in *1. Financial mathematics A*		
Outcome: • solves financial problems involving simple interest, earning money and spending money MA5-FIN-C-01 **Content:** • Solve problems involving earning money • Solve problems involving simple interest • Solve problems involving spending money	1. Earning and Spending Money • Salaries and Wages • Commission • Income Tax • Piecework • Royalties • Timesheets • Overtime, Special Rates and Allowances • Goods and Sevices Tax	2. Simple Interest • Introduction to Interest • Calculating Simple Interest • Rearranging the Simple Interest Formula
EP Lessons in *2. Financial mathematics B*		
Outcome: • solves financial problems involving compound interest and depreciation MA5-FIN-C-02 **Content:** • Solve problems involving compound interest and depreciation	• Compound Interest Basic Formula • Rearranging the Compound Interest Formula • Compound Interest - Months and Weeks • Rearranging Compound Interest - Months and Weeks • Mortgages • Retirement • Depreciation	
Additional resources		
3. Glossary • Definitions List: Compound Interest • Definitions List: Financial Mathematics • Definitions List: Income, Tax and Simple Interest	• Definitions MCQ: Compound Interest • Definitions MCQ: Financial Mathematics • Definitions MCQ: Income, Tax and Simple Interest • Spelling List: Financial Mathematics	*3. Topic Test* • Compound Interest

Algebraic techniques

A student:

- develops understanding and fluency in mathematics through exploring and connecting mathematical concepts, choosing and applying mathematical techniques to solve problems, and communicating their thinking and reasoning coherently and clearly MA0-WM-01

EP Lessons in *1. Algebraic techniques A*

Outcome: • simplifies algebraic fractions with numerical denominators and expands algebraic expressions MA5-ALG-C-01 **Content:** • Apply the 4 operations to simplify algebraic fractions with numerical denominators • Apply the distributive law to the expansion of algebraic expressions, and collect like terms where appropriate	• Variables, Conventions and Arithmetic • Expanding Binomial Products • Expanding and the Distributive Law • Expanding Binomial Products II Practice • Practice: Expanding Binomial Products • Practice: Expanding Binomial Products	

EP Lessons in *2. Algebraic techniques B (Path)*

Outcome: • simplifies algebraic fractions involving indices, and expands and factorises algebraic expressions (Path: Adv) MA5-ALG-P-01 **Content:** • Apply the 4 operations involving algebraic fractions with pronumerals in the denominator • Factorise algebraic expressions by taking out a common algebraic factor • Expand binomial products and factorise monic quadratic expressions	• Identifying Algebraic Factors • Identifying Complicated Algebraic Factors • Simplifying Algebraic Fractions • Adding Algebraic Fractions • Subtracting Algebraic Fractions • Multiplying Algebraic Fractions • Dividing Algebraic Fractions • Operations Including Binomial Fractions • Factorising with Index Laws • Factorisation by Grouping	Practice • Practice: Adding Algebraic Fractions • Practice: Algebraic Fractions Extended • Practice: Cancelling Common Factors • Practice: Dividing Algebraic Fractions • Practice: Factorisation by Grouping • Practice: Factorising with Index Laws • Practice: Multiplying Algebraic Fractions • Practice: Subtracting Algebraic Fractions

EP Lessons in *3. Algebraic techniques C (Path)*		
Outcome: • selects and applies appropriate algebraic techniques to operate with algebraic fractions, and expands, factorises and simplifies algebraic expressions (Path: Adv) MA5-ALG-P-02 **Content:** • Operate with algebraic fractions involving binomial numerators and numerical denominators • Expand, factorise and simplify algebraic expressions including special products	• Connecting Expanding and Factorising • Expanding Cubic Expressions • Expanding Perfect Squares • Expanding Differences of Two Squares • Factorising Quadratic Trinomials • Factorising Perfect Squares • Factorising Differences of Two Squares	Practice • Practice: Expanding to Trinomials • Practice: Factorising Differences of Two Squares • Practice: Factorising Perfect Squares • Practice: Factorising Quadratic Trinomials • Practice: Identifying Common Factors
Additional resources		
4. Glossary • Definitions List: Algebraic Techniques • Definitions MCQ: Algebraic Techniques	*5. Topic Test* • Algebraic Fractions	

Indices

A student:

- develops understanding and fluency in mathematics through exploring and connecting mathematical concepts, choosing and applying mathematical techniques to solve problems, and communicating their thinking and reasoning coherently and clearly MAO-WM-01

EP Lessons in *1. Indices A*

Outcome: • simplifies algebraic expressions involving positive-integer and zero indices, and establishes the meaning of negative indices for numerical bases MA5-IND-C-01 **Content:** • Extend and apply the index laws to variables, using positive-integer indices and the zero index • Simplify algebraic products and quotients using index laws • Apply index laws to numerical expressions with negative-integer indices	• Multiplying Powers • Dividing Powers • The Zero Index • Powers as the Base of Another Power • Multiplication as the Base of a Power • Division as the Base of a Power • Simplifying Algebraic Products with Index Laws • Simplifying Algebraic Quotients with Index Laws Practice • Practice: Dividing Powers • Practice: Division as the Base of a Power • Practice: Integers • Practice: Multiplication as the Base of a Power • Practice: Multiplying Powers • Practice: Positive Integer Indices • Practice: Powers as the Base of Another Power • Practice: The Zero Index	

EP Lessons in *2. Indices B (Path)*

Outcome: • applies the index laws to operate with algebraic expressions involving negative-integer indices (Path: Adv) MA5-IND-P-01 **Content:** • Apply index laws to algebraic expressions involving negative-integer indices	• Applying Index Laws • Positive and Negative Integer Indices Practice • Practice: Applying Index Laws • Practice: Negative Integer Indices	

EP Lessons in *3. Indices C (Path)*		
Outcome: • describes and performs operations with surds and fractional indices (Path: Adv) MA5-IND-P-02 **Content:** • Describe surds • Apply knowledge of surds to solve problems • Describe and use fractional indices	• The Real Number System • Exact Values and Approximate Values • Fractional Indices • Introduction to Surds • Index Laws and Fractional Powers • Simplifying Surds • Adding and Subtracting Surds • Multiplying and Dividing Surds • Expanding Surds • Rationalising Denominators • Applications of Surds • Conjugate and Perfect Square Surds Pracitce • Practice: Fractional Indices	
Additional resources		
4. Glossary • Definitions List: Indices • Definitions MCQ: Indices • Spelling List: Indices	*5. Topic Test* • Simplifying Algebraic Products and Integer Indices	

Equations

A student:

- develops understanding and fluency in mathematics through exploring and connecting mathematical concepts, choosing and applying mathematical techniques to solve problems, and communicating their thinking and reasoning coherently and clearly MA0-WM-01

EP Lessons in *1. Equations A*

Outcome:

- solves monic quadratic equations, linear inequalities and cubic equations of the form 〖ax〗^3=k (Path: Adv) MA5-EQU-P-01

Content:

- Solve linear equations involving up to 3 steps
- Solve linear equations involving one algebraic fraction
- Solve linear equations arising from word problems and substitution into formulas

- Word Problems
- Rearranging and Solving Equations
- Solving Word Problems
- Solving Using Algebraic Methods
- Non-Integer Solutions to Linear Equations
- Applications of Linear Equations

Practice

- Practice: Rearranging and Solving Equations
- Practice: Solving Word Problems
- Practice: Word Problems

EP Lessons in *2. Equations B (Path)*

Outcome:

- solves linear equations of up to 3 steps, limited to one algebraic fraction MA5-EQU-C-01

Content:

- Solve monic quadratic equations
- Solve cubic equations
- Solve linear inequalities and graph their solutions on a number line

- Introduction to Inequalities
- Investigating Linear Inequalities with Technology
- Solving Inequalities
- Rearranging Inequalities
- Chained Inequalities
- Review Lesson: Inequalities
- Monic Factorisation
- Solving Monic Quadratic Equations

Practice

- Practice: Chained Inequalities

EP Lessons in *3. Equations C (Path)*		
Outcome: • solves linear equations of more than 3 steps, monic and non-monic quadratic equations, and linear simultaneous equations (Path: Adv) MA5-EQU-P-02 **Content:** • Solve linear equations involving algebraic fractions and equations of more than 3 steps • Rearrange literal equations • Solve quadratic equations using a variety of methods • Solve linear simultaneous equations, both algebraically and graphically	1. Solve Quadratic Equations • Factorising Quadratic Expressions • Solving Quadratic Equations Using Technology • Guess and Check • The Quadratic Formula • Using the Quadratic Formula • Completing the Square: Method 1 - Using Rearrangement • Completing the Square: Method 2 - Using Differences of Two Squares • Grouping • Factorising by Completing the Square • Non-Monic Factorisation • Solving Non-Monic Quadratic Equations Practice • Practice: Completing the Square • Practice: Completing the Square Using Differences of Two Squares • Practice: Factorising Quadratic Expressions • Practice: Factorising by Completing the Square • Practice: Grouping • Practice: Guess and Check • Practice: Solving Quadratic Equations Using Technology • Practice: The Quadratic Formula	2. Solve Linear Simultaneous Equations • Using Graphs to Solve Simultaneous Equations • Using Elimination to Solve Simultaneous Equations • Using Substitution to Solve Simultaneous Equations Practice • Practice: Using Elimination to Solve Simultaneous Equations • Practice: Using Graphs to Solve Simultaneous Equations • Practice: Using Substituation to Solve Simultaneous Equations
Additional resources		
4. Glossary • Definitions List: Equations • Definitions MCQ: Equations	*5. Topic Test* • Solving Quadratic Equations	

Linear relationships

A student:

- develops understanding and fluency in mathematics through exploring and connecting mathematical concepts, choosing and applying mathematical techniques to solve problems, and communicating their thinking and reasoning coherently and clearly MA0-WM-01

EP Lessons in *1. Linear relationships A*

Outcome:

- determines the midpoint, gradient and length of an interval, and graphs linear relationships, with and without digital tools MA5-LIN-C-01

Content:

- Find the midpoint and gradient of a line segment (interval) on the Cartesian plane
- Find the distance between 2 points located on the Cartesian plane
- Recognise and graph equations
- Examine parallel, horizontal and vertical lines

1. Find the Midpoint and Gradient
   - Line Segments on Cartesian Planes
   - Distance and Pythagoras' Theorem
   - Gradient of a Line Segment
   - Midpoint of a Line Segment
   - Applications of Coordinate Geometry: Distance
   - Applications of Coordinate Geometry: Midpoint

Practice

- Practice: Calculating the Gradient
- Practice: Distance and Pythagoras' Theorem
- Practice: Identifying Coordinates
- Practice: Line Segments on Cartesian Planes
- Practice: Midpoint of a Line Segment

2. Recognise and Graph Equations
   - Plotting Linear Graphs
   - Graphing Using Technology - Casio Calculators
   - Practice
   - Practice: Plotting Linear Graphs

3. Horizontal, Parallel and Perpendicular Lines
   - Horizontal and Vertical Lines
   - Parallel Lines
   - Perpendicular Lines

Practice

- Practice: Horizontal and Vertical Lines
- Practice: Parallel Lines
- Practice: Perpendicular Lines

EP Lessons in *2. Linear Relationships B*

Outcome:

- graphs and interprets linear relationships using the gradient/slope-intercept form MA5-LIN-C-02

Content:

- Examine the gradient/slope-intercept form
- Find the equations of parallel and perpendicular lines

- Drawing Linear Graphs Using the Gradient
- Applications of Coordinate Geometry: Gradient
- Parallel Lines
- Perpendicular Lines

Practice

- Practice: Drawing Linear Graphs Using the Gradient
- Practice: Parallel Lines
- Practice: Perpendicular Lines

EP Lessons in *3. Linear Relationships C (Path)*		
Outcome: • describes and applies transformations, the midpoint, gradient/slope and distance formulas, and equations of lines to solve problems (Path: Adv) MA5-LIN-P-01 **Content:** • Apply formulas to find the midpoint and gradient/slope of an interval on the Cartesian plane • Apply the distance formula to find the distance between 2 points located on the Cartesian plane • Use various forms of the equation of a straight line • Solve problems by applying coordinate geometry formulas • Identify line and rotational symmetries • Describe translations, reflections in an axis, and rotations through multiples of 90 degrees on the Cartesian plane, using coordinates	• Line Segments on Cartesian Planes • Distance and Pythagoras' Theorem • Gradient of a Line Segment • Midpoint of a Line Segment • Applications of Coordinate Geometry: Distance • Applications of Coordinate Geometry: Gradient • Applications of Coordinate Geometry: Midpoint • Translation • Reflection • Rotation Practice • Mixed Practice: Transformations • Practice: Distance and Pythagoras' Theorem • Practice: Gradient of a Line Segment • Practice: Line Segments on Cartesian Planes • Practice: Midpoint of a Line Segment • Practice: Reflection • Practice: Rotation • Practice: Translation	
Additional resources		
4. Glossary • Definitions List: Linear Relationships • Definitions MCQ: Linear Relationships	*5. Topic Test* • Linear Relationships	

Non-linear relationships

A student: • develops understanding and fluency in mathematics through exploring and connecting mathematical concepts, choosing and applying mathematical techniques to solve problems, and communicating their thinking and reasoning coherently and clearly MA0-WM-01		
EP Lessons in *1. Non-linear relationships A*		
Outcome: • identifies connections between algebraic and graphical representations of quadratic and exponential relationships in various contexts MA5-NLI-C-01 **Content:** • Examine the connection between algebraic and graphical representations of quadratics and exponentials	• Linear and Non-Linear Relationships • Parabolas • Exponential Graphs	
EP Lessons in *2. Non-linear relationships B*		
Outcome: • identifies and compares features of parabolas and exponential curves in various contexts MA5-NLI-C-02 **Content:** • Graph and examine quadratic relationships • Graph and examine exponential relationships • Distinguish between linear, quadratic and exponential relationships by examining their graphical representations	• Features of Polynomial Graphs • Features of Graphs - Roots	

EP Lessons in *3. Non-linear relationships C (Path)*		
Outcome: • interprets and compares non-linear relationships and their transformations, both algebraically and graphically (Path: Adv) MA5-NLI-P-01 **Content:** • Graph parabolas and describe their features and transformations • Graph exponentials and describe their features and transformations • Graph hyperbolas and describe their features and transformations • Graph circles and describe their features and transformations • Distinguish between different types of graphs by examining their algebraic and graphical representations and solve problems • Graph and compare polynomial curves and describe their features and transformations	1. Non-Linear Graphs • Transforming Parabolas - Translation • Transforming Parabolas - Dilation and Reflection • Circle Graphs • Transforming Circles • Exponential Graphs I • Exponential Graphs II • Hyperbola Graphs • Hyperbola Graph Transformations Practice • Practice: Exponential Graphs • Practice: Transforming Circles • Practice: Transforming Parabolas - Dilation and Reflection • Practice: Transforming Parabolas - Translation	2. Polynomial Graphs • Parabolas • Parabola Transformations • Multiple Transformations of Parabolas • Cubics • Cubic Transformations • Quartics
Additional resources		
4. Spelling and Definitions • Definitions List: Non-Linear Relationships • Definitions MCQ: Non-Linear Relationships	*5. Topic Test* • Non-Linear Relationships	

Numbers of any magnitude

A student:

- develops understanding and fluency in mathematics through exploring and connecting mathematical concepts, choosing and applying mathematical techniques to solve problems, and communicating their thinking and reasoning coherently and clearly MA0-WM-01

EP Lessons in *7. Numbers of any magnitude*

Outcome:

- solves measurement problems by using scientific notation to represent numbers and rounding to a given number of significant figures MA5-MAG-C-01

Content:

- Identify and describe very small and very large measurements
- Find absolute and percentage error
- Estimate and round numbers to a specified degree of accuracy
- Express numbers in scientific notation

- Rounding to Significant Figures
- Rounding Sensibly
- Leading Digit Approximation
- Precision and Accuracy
- Precision in Context
- Absolute vs. Relative Error
- Limits of Accuracy
- Introduction to Scientific Notation (Standard Form) - Large Numbers
- Introduction to Scientific Notation (Standard Form) - Small Numbers
- 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)
- Significant Figures and Scientific Notation (Standard Form)
- Time Scales
- Representing Very Large and Very Small Units

Glossary

- Definitions List: Numbers of Any Magnitude
- Definitions MC0: Numbers of Any Magnitude

Topic Test

- Numbers of Any Magnitude

Pythagoras and trigonometry

A student:

- develops understanding and fluency in mathematics through exploring and connecting mathematical concepts, choosing and applying mathematical techniques to solve problems, and communicating their thinking and reasoning coherently and clearly MAO-WM-01

EP Lessons in *1. Trigonometry A*

Outcome: • applies trigonometric ratios to solve right-angled triangle problems MA5-TRG-C-01 **Content:** • Demonstrate and explain the constancy of trigonometric ratios for a given angle in right-angled triangles • Apply trigonometry to solve right-angled triangle problems	• Introduction to Trigonometry • Finding Side Lengths Using Trigonometry • Finding Angles Using Trigonometry • Review Lesson: Trigonometric Ratios	

EP Lessons in *2. Trigonometry B*

Outcome: • applies trigonometry to solve problems, including bearings and angles of elevation and depression MA5-TRG-C-02 **Content:** • Solve right-angled triangle problems involving angles of elevation and depression • Solve right-angled triangle problems involving bearings	• Angles of Elevation and Depression • Bearings with Right-Angled Triangles • Using Trigonometric Functions in Real World Applications • Using Inverse Trigonometric Functions in Real World Applications • Applications of Trigonometry in Coding	

EP Lessons in *3. Trigonometry C (Path)*		
Outcome: • uses function notation to describe and graph functions of one variable and graphs inequalities in one and 2 variables (Path: Adv) MA5-FNC-P-01 **Content:** • Solve 3-dimensional problems involving right-angled triangles • Apply the sine, cosine and area rules to any triangle and solve related problems	1. Trigonometric Rules • The Sine Rule • Finding Angles Using the Sine Rule • The Sine Rule: The Ambiguous Case • The Cosine Rule • Finding Angles Using the Cosine Rule • Pythagorean Triples • Review Lesson: Trigonometric Rules 2. Area of a Triangle • Area of a Triangle: ½ ab sin C • Heron's Formula	3. Pythagoras' Theorem and Trigonometry in 3D • Pythagoras' Theorem in 3D • Trigonometry in 3D • 3D Problems Using Right-Angled Triangles Extended Investigations • Building with Pythagoras • Pirates' Treasure • Airplane Flight Paths • Bearings with Right-Angled Triangles
EP Lessons in *4. Trigonometry D (Path)*		
Outcome: • establishes and applies the properties of trigonometric functions and finds solutions to trigonometric equations (Path: Adv) MA5-TRG-P-02 **Content:** • Use the unit circle to define trigonometric functions and represent them graphically • Solve trigonometric equations using exact values and the relationships between supplementary and complementary angles	1. Defining and Graphing Trigonometric Functions • The Unit Circle and Radians • Understanding and Graphing Sine • Understanding and Graphing Cosine • Understanding and Graphing Tangent • Comparing Trigonometric Functions 2. Solving Simple Trigonometric Equations • Special Triangles: 30-60-90 • Special Triangles: 45-45-90 • Trigonometric Ratios and Complementary Angles • Balloons Over Waikato • Forestry Subdivision	
Additional resources		
5. Glossary • Definitions List: Right-Angled Triangles (Trigonometry) • Definitions MCQ: Right-Angled Triangles (Trigonometry) • Spelling List: Pythagoras and Trigonometry	*6. Topic Tests* • Inverse Trig, Bearings and Elevation • Right-Angle Triangles	

Area and surface area

A student:

- develops understanding and fluency in mathematics through exploring and connecting mathematical concepts, choosing and applying mathematical techniques to solve problems, and communicating their thinking and reasoning coherently and clearly MA0-WM-01

EP Lessons in *1. Area and surface area A*

Outcome:

- solves problems involving the surface area of right prisms and practical problems involving the area of composite shapes and solids MA5-ARE-C-01

Content:

- Solve problems involving areas and surface areas
- Develop and apply the formula for surface areas of cylinders
- Solve problems involving surface areas of cylinders and related composite solids

1. Area

- Area of Composite Shapes I
- Area of Composite Shapes II
- Area of Rectangles & Squares
- Area of Triangles
- Area of Parallelograms
- Area of Rhombuses and Kites
- Area of Trapeziums

Practice

- Practice: Area of Composite Shapes

2. Surface Area

- Surface Area of Prisms
- Surface Area of Cylinders
- Surface Area of Complex Solids
- Composite Shapes and Solids
- Surface Area of Composite Solids

Practice

- Mixed Practice: Surface Area
- Practice: Surface Area
- Practice: Surface Area of Complex Solids
- Practice: Surface Area of Cylinders
- Practice: Surface Area of Prisms

EP Lessons in *2. Area and surface area B*

Outcome:

- applies knowledge of the surface area of right pyramids and cones, spheres and composite solids to solve problems (Path: Stn, Adv) MA5-ARE-P-01

Content:

- Solve problems involving surface areas

- Finding the Height of Right Pyramids
- Surface Area of Right Pyramids
- Surface Area of Right Cones
- Surface Area and Right Pyramids
- Surface Area of Spheres
- Surface Area of Composite Solids

Additional resources

3. Glossary

- Definitions List: Area and Surface Area
- Definitions MCQ: Area and Surface Area

4. Topic Tests

- Area and Surface Area
- Surface Area

Volume

A student: • develops understanding and fluency in mathematics through exploring and connecting mathematical concepts, choosing and applying mathematical techniques to solve problems, and communicating their thinking and reasoning coherently and clearly MA0-WM-01		
EP Lessons in *1. Volume A*		
Outcome: • solves problems involving the volume of composite solids consisting of right prisms and cylinders MA5-VOL-C-01 **Content:** • Solve problems involving composite solids consisting of right prisms and cylinders	• Volume of Rectangular Prisms • Calculating Volume of Triangular Prisms • Calculating Volume of Cylinders • Calculating Volume of Other Regular and Irregular Prisms • Volume of Composite Solids	Practice • Mixed Practice: Volume • Practice: Volume • Practice: Volume of Composite Solids
EP Lessons in *2. Volume B*		
Outcome: • applies knowledge of the volume of right pyramids, cones and spheres to solve problems involving related composite solids (Path: Stn, Adv) MA5-VOL-P-01 **Content:** • Solve problems involving volumes	• Volume of Right Pyramids • Volume of Right Cones • Volume of Spheres • Volume of Composite Solids	
Additional resources		
3. Glossary • Definitions List: Volume • Definitions MCQ: Volume	*4. Topic Test* • Calculating Volume	

Properties of geometrical figures

A student:

- develops understanding and fluency in mathematics through exploring and connecting mathematical concepts, choosing and applying mathematical techniques to solve problems, and communicating their thinking and reasoning coherently and clearly MAO-WM-01

EP Lessons in *1. Properties of geometrical figures A*

Outcome:

- identifies and applies the properties of similar figures and scale drawings to solve problems MA5-GEO-C-01

Content:

- Identify and describe the properties of similar figures
- Solve problems using ratio and scale factors in similar figures

- The Enlargement Transformation
- Introduction to Scaling
- Magnitude
- Magnitude as a Ratio
- Scaling on Cartesian Planes

Practice

- Practice: Introduction to Scaling
- Practice: Introduction to Similarity
- Practice: Magnitude
- Practice: Magnitude as a Ratio
- Practice: Scaling on Cartesian Planes

EP Lessons in *2. Properties of geometrical figures B (Path)*

Outcome:

- establishes conditions for congruent triangles and similar triangles and solves problems relating to properties of similar figures and plane shapes (Path: Ext) MA5-GEO-P-01

Content:

- Identify and explain congruence
- Develop and use the conditions for congruent triangles
- Develop and apply the minimum conditions for triangles to be similar
- Establish and apply properties of similar shapes and solids
- Apply logical reasoning to numerical problems involving plane shapes

1. Congruence

- Introduction to Congruence
- Conditions for Congruence: SSS and SAS
- Conditions for Congruence: ASA, AAS and HL
- Working with Congruent Triangles
- Congruence of Squares, Rectangles and Parallelograms
- Congruence of Rhombuses, Trapeziums and Kites

Practice

- Practice: ASA, AAS and HL Congruence Tests
- Practice: Congruence of Rhombuses, Trapeziums and Kites
- Practice: Congruence of Squares, Rectangles and Parallelograms
- Practice: SSS and SAS Congruence Tests
- Practice: Triangles
- Practice: Working with Congruent Triangles

2. Similarity

- Introduction to Similarity
- Similarity Tests
- Similarity and Angles
- Creating Algorithms and Flowcharts

3. Plane shapes

- Rotation and Reflection of Plane Shapes
- Translation and Congruence of Plane Shapes
- Polygons and Interior Angles
- Polygons and Exterior Angles

Practice

- Practice: Reflection
- Practice: Rotation
- Practice: Rotation and Reflection of Plane Shapes
- Practice: Symmetry
- Practice: Translation
- Practice: Translation and Congruence of Plane Shapes

EP Lessons in *3. Properties of geometrical figures C (Path)*		
Outcome: • constructs proofs involving congruent triangles and similar triangles and proves properties of plane shapes (Path: Ext) MA5-GEO-P-02 **Content:** • Construct formal proofs involving congruent and similar triangles • Apply logical reasoning to proofs involving plane shapes	• Introduction to Proofs and Logic • Angle Proofs • Parallelogram and Rhombus Proofs • Rectangle and Square Proofs • Applications of Geometric Reasoning Practice • Practice: Angle Proofs • Practice: Applications of Geometric Reasoning • Practice: Introduction to Proofs and Logic • Practice: Parallelogram and Rhombus Proofs • Practice: Rectangle and Square Proofs	
Additional resources		
4. Glossary • Definitions List: Geometric Reasoning • Definitions List: Geometry • Definitions MCQ: Geometric Reasoning • Definitions MCQ: Geometry	*5. Topic Tests* • Angles • Proofs	

Data analysis

A student:

- develops understanding and fluency in mathematics through exploring and connecting mathematical concepts, choosing and applying mathematical techniques to solve problems, and communicating their thinking and reasoning coherently and clearly MA0-WM-01

EP Lessons in *1. Data analysis A*

Outcome:

- compares and analyses datasets using summary statistics and graphical representations MA5-DAT-C-01

Content:

- Examine standard deviation as a measure of spread
- Determine quartiles and interquartile range
- Represent datasets using box plots and use them to compare datasets

1. Standard deviation as a measure of spread
   - Mean and Standard Deviation
   - Calculating Standard Deviation
   - Calculating Standard Deviation Using Technology
   - Investigating the Standard Deviation
   - Measures of Centre in Grouped Data
   - Comparing the Measures of Spread
   - Finding Measures of Centre and Spread

Practice

- Practice: Measures of Centre in Grouped Data

2. Determine quartiles and interquartile range
   - Introduction to Box and Whisker Plots
   - Range
   - Quartiles and Interquartile Range
   - Five Point Summary

Practice

- Practice: Five Point Summary
- Practice: Interquartile Range
- Practice: Quartiles
- Practice: Range

3. Representing and comparing data
   - Comparing Data Sets
   - Back-to-Back Stem and Leaf Plots
   - Comparing Dot Plots
   - Comparing Histograms
   - Using the Standard Deviation to Compare Data Sets
   - Building Box and Whisker Plots
   - Comparing Box and Whisker Plots
   - Box and Whisker Plots, Histograms and Dot Plots

Practice

- Mixed Practice: Comparing Data
- Practice: Back-to-Back Stem and Leaf Plots
- Practice: Comparing Data Sets
- Practice: Comparing Dot Plots
- Practice: Comparing Histograms

EP Lessons in *2. Data analysis B*		
Outcome: • displays and interprets datasets involving bivariate data MA5-DAT-C-02 **Content:** • Identify and describe numerical datasets involving 2 variables • Represent datasets involving 2 numerical variables, using a scatter plot and a line of best fit, by eye • Interpret data involving 2 numerical variables, using graphical representations	1. Bivariate data • Introduction to Bivariate Data • Bivariate Variables • Plotting Using a Calculator • Plotting Using a Spreadsheet • Analysing Trend by Eye • Cleaning Bivariate Data • Introduction to Time Series • Analysing Time Series	2. Lines of best fit • Lines of Best Fit by Eye • Least Squares Fitting using a Calculator • Least Squares Fitting using a Spreadsheet • Making Predictions by Eye • Making Predictions Using the Equation • Testing Regression Models Using A Calculator • Testing Regression Models Using A Spreadsheet
EP Lessons in *3. Data analysis C*		
Outcome: • plans, conducts and reviews a statistical inquiry into a question of interest (Path: Stn, Adv) MA5-DAT-P-01 **Content:** • Plan and conduct a statistical inquiry into a question of interest • Examine reports of studies in digital media and elsewhere for information on their planning and implementation	1. Plan and conduct a statistical inquiry • What is Sampling? • Types of Sampling: Probability Sampling • Types of Sampling: Non-Probability Sampling • Sampling Errors 2. Examine reports • Statistical Reports In The Media • Public Opinion Surveys • Cultural Bias • Analysing Sampling in Reports • Misleading Reports • Statistics in Organisations	
Additional resources		
4. Glossary • Definitions List: Bivariate Data Analysis • Definitions List: Data Representation and Interpretation • Definitions List: Single Variable Data Analysis • Definitions MCQ: Bivariate Data Analysis	• Definitions MCQ: Single Variable Data Analysis • Spelling List: Data Representation and Interpretation • Spelling List: Data Representation and Interpretation	*5. Topic Tests* • Analysing and Comparing Data • Bivariate Data Analysis • Data Sources and Statistical Reports • Lines of Best Fit

Probability

A student:

- develops understanding and fluency in mathematics through exploring and connecting mathematical concepts, choosing and applying mathematical techniques to solve problems, and communicating their thinking and reasoning coherently and clearly MA0-WM-01

EP Lessons in *1. Probability A*

Outcome:

- solves problems involving probabilities in multistage chance experiments and simulations MA5-PRO-C-01

Content:

- Describe multistage chance experiments involving independent and dependent events
- Solve problems for multistage chance experiments
- Design and use simulations to model and examine situations involving probability

1. Independence
   - Introduction to Independence
   - Investigating Independent Events using Chance Diagrams
   - Independent and Dependent Events

Practice
   - Practice: Introduction to Independence
   - Practice: Investigating Independent Events using Chance Diagrams

2. Two-step experiments
   - Introduction to Two-Step Experiments
   - Tree Diagrams
   - Using Tree Diagrams
   - Arrays
   - Using Arrays
   - Unfortunate Events

Practice
   - Practice: Arrays
   - Practice: Introduction to Two-Step Chance
   - Practice: The Probability Adventure
   - Practice: Tree Diagrams
   - Practice: Using Arrays
   - Practice: Using Tree Diagrams

3. Multi-step events
   - Arrays
   - Probabilities and Three-Step Experiments
   - Building Three-Step Tree Diagrams
   - Tree Diagrams with Unequal Outcomes
   - Probabilities of Unequal Outcomes
   - Three-Step Experiments and Unequal Outcomes

Practice
   - Practice: Arrays
   - Practice: Building Three-Step Tree Diagrams
   - Practice: Probabilities and Three-Step Experiments
   - Practice: Probabilities of Unequal Outcomes
   - Practice: Three-Step Experiments and Unequal Outcomes
   - Practice: Tree Diagrams with Unequal Outcomes

4. Using simulations to model probability
   - Using Simulations to Compare Probabilities
   - Simulating Traditional Indigenous Games

EP Lessons in *2. Probability B (Path)*		
Outcome: • solves problems involving Venn diagrams, 2-way tables and conditional probability (Path: Adv) MA5-PRO-P-01 **Content:** • Solve problems involving Venn diagrams and 2-way tables • Use the language, 'if … then', 'given', 'of' and 'knowing that', to examine conditional statements and identify common mistakes in interpreting the language • Describe mutually and non-mutually exclusive events using specific language and calculate related probabilities	• Introduction to Conditional Probability • Investigating Conditional Probability with Venn Diagrams • Investigating Conditional Probability with Two-Way Tables • Calculating Conditional Probability Using Tree Diagrams • Calculating Conditional Probabilities using Arrays • Word Problems Practice • Practice: Calculating Conditional Probabilities Using Arrays • Practice: Calculating Conditional Probability Using Tree Diagrams • Practice: Introduction to Conditional Probability • Practice: Investigating Conditional Probability with Two-Way Tables • Practice: Investigating Conditional Probability with Venn Diagrams • Practice: Word Problems	
Additional resources		
3. Glossary • Definitions List: Probability • Definitions MCQ: Probability	*4. Topic Tests* • Conditional Probability • Venn Diagrams and Two-Way Tables	

Ratios and rates

A student: • develops understanding and fluency in mathematics through exploring and connecting mathematical concepts, choosing and applying mathematical techniques to solve problems, and communicating their thinking and reasoning coherently and clearly MA0-WM-01		
EP Lessons in *1. Variation and rates of change A (Path)*		
Outcome: • identifies and solves problems involving direct and inverse variation and their graphical representations (Path: Stn, Adv) MA5-RAT-P-01 **Content:** • Identify and describe problems involving direct and inverse variation • Identify and describe graphs involving direct and inverse variation • Solve problems involving direct and inverse variation and examine the relationship between graphs and equations corresponding to proportionality	• Rates • Direct Proportion • Introduction to Inverse Proportion • Applying Inverse Proportion • Introduction to Graphs Practice • Practice: Applying Inverse Proportion • Practice: Direct Proportion • Practice: Introduction to Graphs • Practice: Introduction to Inverse Proportion	
EP Lessons in *2. Variation and rates of change B (Path)*		
Outcome: • analyses and constructs graphs relating to rates of change (Path: Adv) MA5-RAT-P-02 **Content:** • Analyse graphs that are decreasing or increasing at a constant rate • Analyse the relationship between graphs and variable rates of change • Construct graphical representations of rates of change	• Constant Rates • Reading Constant Rates • Drawing Constant Rates • Variable Rates • Rates of Change • Analysing Rates of Change • Analysing Graphs	Practice • Practice: Analysing Graphs • Practice: Constant Rates • Practice: Rates of Change • Practice: Variable Rates
Additional resources		
3. Glossary	• Definitions List: Ratios and Rates	• Definitions MCQ: Ratios and Rates

Polynomials (Path)

A student:

- develops understanding and fluency in mathematics through exploring and connecting mathematical concepts, choosing and applying mathematical techniques to solve problems, and communicating their thinking and reasoning coherently and clearly MA0-WM-01

EP Lessons in *15. Polynomials (Path)*

Outcome:

- defines, operates with and graphs polynomials and applies the factor and remainder theorems to solve problems (Path: Adv, Ext) MA5-POL-P-01

Content:

- Define and operate with polynomials
- Divide polynomials
- Apply the factor and remainder theorems to solve problems
- Graph polynomials

- Introduction to Polynomials
- Evaluating Polynomials
- Adding, Subtracting and Multiplying Polynomials
- Dividing Polynomials
- The Remainder Theorem
- The Factor Theorem
- Factorising Quartic Polynomials
- Solving Polynomials
- Fractal Trees and Recursion (Year 7-10)
- Patterns Found in Nature (Year 5-10)

Practice

- Practice: Adding, Subtracting and Multiplying Polynomials
- Practice: Dividing Polynomials
- Practice: Evaluating Polynomials
- Practice: Factorising Cubic Polynomials
- Practice: Factorising Quartic Polynomials
- Practice: Introduction to Polynomials
- Practice: Solving Polynomials
- Practice: The Factor Theorem
- Practice: The Remainder Theorem

Glossary

- Definitions List: Polynomials
- Definitions MCQ: Polynomials
- Spelling List: Polynomials

Topic Test

- Topic Test: Polynomials

Logarithms (Path)

A student:

- develops understanding and fluency in mathematics through exploring and connecting mathematical concepts, choosing and applying mathematical techniques to solve problems, and communicating their thinking and reasoning coherently and clearly MA0-WM-01

EP Lessons in *16. Logarithms (Path)*

Outcome: • establishes and applies the laws of logarithms to solve problems (Path: Adv) MA5-LOG-P-01 **Content:** • Examine logarithms both numerically and graphically • Establish and apply the laws of logarithms to solve problems	• Introduction to Logarithms • Deriving the Laws of Logarithms • Using the Laws of Logarithms • Combining Log Laws • Logarithmic Scales • Solving Exponential Equations	

Functions and other graphs (Path)

A student:

- develops understanding and fluency in mathematics through exploring and connecting mathematical concepts, choosing and applying mathematical techniques to solve problems, and communicating their thinking and reasoning coherently and clearly MA0-WM-01

EP Lessons in *17. Functions and other graphs (Path)*

Outcome: • uses function notation to describe and graph functions of one variable and graphs inequalities in one and 2 variables (Path: Adv) MA5-FNC-P-01 **Content:** • Define relations and functions, and use function notation • Find the domain and range of a function and graph functions • Graph regions corresponding to linear inequalities in one and 2 variables	• Introduction to Functions • Function Notation • Inverse Functions and Transformations	

Circle geometry (Path)

A student:

- develops understanding and fluency in mathematics through exploring and connecting mathematical concepts, choosing and applying mathematical techniques to solve problems, and communicating their thinking and reasoning coherently and clearly MA0-WM-01

EP Lessons in *18. Circle geometry (Path)*

Outcome:

- applies deductive reasoning to prove circle theorems and solve related problems (Path: Ext) MA5-CIR-P-01

Content:

- Prove and apply angle and chord properties of circles
- Prove and apply tangent and secant properties of circles

1. Angle theorems for circles

- Central Angle Theorem
- Proof: Central Angle Theorem
- Angles Subtended by the Same Arc
- Thales' Theorem: Angles in a Semicircle
- Proving Thales' Theorem
- Cyclic Quadrilaterals

2. Chord properties

- Equal Length Chord Properties
- Perpendicular Bisector to Chords
- Tangents, Secants and the Alternate Segment Theorem
- Intersecting Chords, Secants and Tangents

3. Glossary

- Definitions List: Circle Geometry
- Definitions MCQ: Circle Geometry
- Spelling List: Circle Geometry

Introduction to networks (Path)

A student:

- develops understanding and fluency in mathematics through exploring and connecting mathematical concepts, choosing and applying mathematical techniques to solve problems, and communicating their thinking and reasoning coherently and clearly MA0-WM-01

EP Lessons in *19. Introduction to networks (Path)*

Outcome: • solves problems involving the characteristics of graphs/networks, planar graphs and Eulerian trails and circuits (Path: Stn) MA5-NET-P-01 **Content:** • Examine and describe a graph/network • Define a planar graph and apply Euler's formula for planar graphs • Explain the concept of Eulerian trails and circuits in the context of the Königsberg bridges problem	• Understanding Graph Terminology and Representing Practical Situations Using Networks • Equivalent Networks • Euler's Formula and Polyhedra • The Seven Bridges of Königsberg • Network Diagrams	