



Mathematics ~ Stage 4 Course Outline

INTRODUCTION TO THE STAGE 4 MATHEMATICS COURSE

Mathematics provides students with knowledge, skills and understanding in Number and Algebra, Measurement and Geometry, and Statistics and Probability. It focuses on developing increasingly sophisticated and refined mathematical understanding, fluency, communication, logical reasoning, analytical thought and problem-solving skills. These capabilities enable students to respond to familiar and unfamiliar situations by employing strategies to make informed decisions and solve problems relevant to their further education and everyday lives.

COURSE OBJECTIVES AND OUTCOMES

Working Mathematically

Students develop understanding and fluency in mathematics through inquiry, exploring and connecting mathematical concepts, choosing and applying problem-solving skills and mathematical techniques, communication and reasoning;

- MA4-1WM communicates and connects mathematical ideas using appropriate terminology, diagrams and symbols;
- MA4-2WM applies appropriate mathematical techniques to solve problems;
- MA4-3WM recognises and explains mathematical relationships using reasoning.

Number and Algebra

Students develop efficient strategies for numerical calculation, recognise patterns, describe relationships and apply algebraic techniques and generalisation;

- MA4-4NA compares, orders and calculates with integers, applying a range of strategies to aid computation;
- MA4-5NA operates with fractions, decimals and percentages;
- MA4-6NA solves financial problems involving purchasing goods;
- MA4-7NA operates with ratios and rates, and explores their graphical representation;
- MA4-8NA generalises number properties to operate with algebraic expressions;
- MA4-9NA operates with positive-integer and zero indices of numerical bases;
- MA4-10NA uses algebraic techniques to solve simple linear and quadratic equations;
- MA4-11NA creates and displays number patterns; graphs and analyses linear relationships; and performs transformations on the Cartesian plane.

Measurement and Geometry

Students identify, visualise and quantify measures and the attributes of shapes and objects, and explore measurement concepts and geometric relationships, applying formulas, strategies and geometric reasoning in the solution of problems

- MA4-12MG calculates the perimeters of plane shapes and the circumferences of circles;
- MA4-13MG uses formulas to calculate the areas of quadrilaterals and circles, and converts between units of area;
- MA4-14MG uses formulas to calculate the volumes of prisms and cylinders, and converts between units of volume;
- MA4-15MG performs calculations of time that involve mixed units, and interprets time zones;

- MA4-16MG applies Pythagoras' theorem to calculate side lengths in right-angled triangles, and solves related problems;
- MA4-17MG classifies, describes and uses the properties of triangles and quadrilaterals, and determines congruent triangles to find unknown side lengths and angles;
- MA4-18MG identifies and uses angle relationships, including those related to transversals on sets of parallel lines.

Statistics and Probability

Students collect, represent, analyse, interpret and evaluate data, assign and use probabilities, and make sound judgements;

- MA4-19SP collects, represents and interprets single sets of data, using appropriate statistical displays;
- MA4-20SP analyses single sets of data using measures of location, and range;
- MA4-21SP represents probabilities of simple and compound events.

Stage 4 Mathematics - Year 7

Term 1 - 10 weeks

Week1	Week2	Week3	Week4	Week5	Week6	Week7	Week8	Week9	Week10
1. Integers			2. Angles			3. Whole Numbers			
MA4-1WM, MA4-2WM, MA4-3WM			MA4-1WM, MA4-2WM, MA4-3WM			MA4-1WM, MA4-2WM, MA4-3WM, MA4-4NA			
MA4-4NA compares, orders and calculates with integers, applying a range of strategies to aid computation			MA4-18MG identifies and uses angle relationships, including those related to transversals on sets of parallel lines			MA4-9NA operates with positive-integer and zero indices of numerical bases			
Open ended questions involving integers			Assignment: Angles			Quiz on operating with indices			

Term 2 - 10 weeks

Week1	Week2	Week3	Week4	Week5	Week6	Week7	Week8	Week9	Week10
4. Fractions and percentages			5. Algebra & equations			6. Geometry			
MA4-1WM, MA4-2WM, MA4-3WM			MA4-1WM, MA4-2WM, MA4-3WM			MA4-1WM, MA4-2WM, MA4-3WM			
MA4-4NA compares, orders, converts and calculates with fractions, decimals, percentages; find simple fractions and percentages of a quantity.			MA4-8NA generalises number properties to operate with algebraic expressions, substitution and solving simple equations			MA4-17MG revise transformation and symmetry concepts, classifies, describes and uses the properties of triangles and quadrilaterals, and determines congruent triangles to find unknown side lengths and angles			
Formal Assessment Task			Problem solving, words to algebraic expressions then solve.			Card matching activity on properties of triangles and quadrilaterals			

Term 3 - 10 weeks

Week1	Week2	Week3	Week4	Week5	Week6	Week7	Week8	Week9	Week10
7. Decimals			8. Area and volume			9. The number plane			
MA4-1WM, MA4-2WM, MA4-3WM			MA4-1WM, MA4-2WM			MA4-1WM, MA4-2WM, MA4-3WM, MA4-11NA			
MA4-5NA operates with fractions, decimals and percentages			MA4-12MG,13MG,14MG perimeter and area of plane shapes and volume of prisms and converts between units			MA4-11NA creates and displays number patterns; graphs and analyses linear relationships; and performs transformations on the Cartesian plane			
Working with decimals research activity			Group work, constructing a metre cube			Number plane picture puzzle			

Term 4 - 10 weeks

Week1	Week2	Week3	Week4	Week5	Week6	Week7	Week8	Week9	Week10
10. Analysing data			11. Probability		12. Ratios, rates and time				
MA4-1WM, MA4-2WM, MA4-3WM			MA4-1WM, MA4-2WM		MA4-1WM, MA4-2WM, MA4-3WM, MA4-4NA				
MA4-19SP,20SP collects, represents and interprets single sets of data, using appropriate statistical displays, analyses using measures of location, and range			MA4-21SP represents probabilities of simple and compound events		MA4-7NA,15MG operates with ratios and rates, and explores their graphical representation, performs calculations of time that involve mixed units, and interprets time zones				
Formal Assessment Task			Design a game or spinner that satisfies some probability specifications		Investigation activity on population density, population growth, birth rate, death rate, speed, and fuel consumption.				

Stage 4 Mathematics - Year 8

Term 1 - 10 weeks

Week1	Week2	Week3	Week4	Week5	Week6	Week7	Week8	Week9	Week10
1. Pythagoras' theorem			2. Working with numbers			3. Algebra			
MA4-1WM, MA4-2WM			MA4-1WM, MA4-2WM, MA4-3WM			MA4-1WM, MA4-2WM, MA4-3WM			
MA4-16MG applies Pythagoras' theorem to calculate side lengths in right-angled triangles, and solves related problems			MA4-4NA,5NA,9NA operates with integers, fractions, decimals, percentages and indices			MA4-8NA operate with algebraic expressions, including the processes of expanding and factorising			
Using excel spreadsheets to find unknown sides and generate triads			Non-calculator task involving fractions, percentages and indices			Problem solving activities, Task Centres			

Term 2 - 10 weeks

Week1	Week2	Week3	Week4	Week5	Week6	Week7	Week8	Week9	Week10
4. Geometry			5. Area and volume			6. Fractions and percentages			
MA4-1WM, MA4-2WM, MA4-3WM			MA4-1WM, MA4-2WM			MA4-1WM, MA4-2WM, MA4-3WM			
MA4-17MG,18MG applying properties of triangles and quadrilaterals, determines congruent triangles to find unknown side lengths and angle, uses angle relationships, including those related to transversals on sets of parallel lines			MA4-12MG,13MG,14MG calculates the perimeters of plane shapes and uses formulas to calculate the areas of quadrilaterals, circumferences and areas of circles, volume of prisms and converts between units of area and volume			MA4-5NA, 6NA operates with fractions, decimals and percentages, solves financial problems involving purchasing goods			
Formal Assessment Task			Open-ended and back-to-front questions			Collage/poster on the applications of percentages			

Term 3 - 10 weeks

Week1	Week2	Week3	Week4	Week5	Week6	Week7	Week8	Week9	Week10
7. Investigating data			8. Congruent figures			9. Probability			
MA4-1WM, MA4-2WM, MA4-3WM			MA4-1WM, MA4-2WM, MA4-3WM			MA4-1WM, MA4-2WM, MA4-3WM			
MA4-19SP, 20SP collects, represents and interprets single sets of data, using appropriate statistical displays, analyses using measures of location, and range			MA4-18MG use the congruency tests to identify a pair of congruent triangles and solve related numerical problems using reasoning			MA4-21SP represents probabilities of simple and compound events, introducing Venn diagrams and two-way tables			
Practical Class activity; collect class data which can then be used for calculation and analysis			Assignment: Formal setting-out of geometry proof			Writing activities involving probability			

Term 4 - 10 weeks

Week1	Week2	Week3	Week4	Week5	Week6	Week7	Week8	Week9	Week10
10. Equations			11. Ratios, rates and time			12. Graphing linear equations			
MA4-1WM, MA4-2WM, MA4-3WM			MA4-1WM, MA4-2WM, MA4-3WM			MA4-1WM, MA4-3WM			
MA4-10NA uses algebraic techniques to solve simple linear and quadratic equations			MA4-7NA, 15MG operates with ratios and rates, and explores their graphical representation, calculate time that involve mixed units, and interprets time zones			MA4-11NA creates and displays number patterns; graphs and analyses linear relationships; and performs transformations on the Cartesian plane			
Formal Assessment Task			Assignment: Scale drawing			Practical activity: Using computer to graph equations			