# Mathematics Stage 5: Sample scope and sequence (Core and selected Paths)

The Core–Paths structure is designed to encourage aspiration in students and provide the flexibility needed to enable teachers to create pathways for students working towards Stage 6. The structure is intended to extend students as far along the continuum of learning as possible and provide solid foundations for the highest levels of student achievement. The structure allows for a diverse range of endpoints up to the end of Stage 5.

This scope and sequence is one example of a pathway towards Stage 6 Mathematics Advanced and Extension.

Students should not be locked into a definitive pathway in Stage 4. Teachers are best placed to make programming decisions about pathways towards Stage 6 courses in the middle of students’ Stage 5 learning.

In Mathematics 7–10 there is one overarching **Working mathematically outcome.**

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.

Stn (Standard), Adv (Advanced) and Ext (Extension) have been used to suggest Paths for related Stage 6 courses.

## Year 9 – Term 1

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| Weeks 1–4 | Weeks 5–6 | Weeks 7–9 | Week 10 |
| **Unit:** Algebraic techniques**Focus area(s):** Algebraic techniques Asimplifies algebraic fractions with numerical denominators and expands algebraic expressions | **Unit:** Indices**Focus area(s):** Indices A andIndices Bsimplifies algebraic expressions involving positive-integer and zero indices, and establishes the meaning of negative indices for numerical bases applies the index laws to operate with algebraic expressions involving negative-integer indices | **Unit:** Equations**Focus area(s):** Equations A and Equations Bsolves linear equations of up to 3 steps, limited to one algebraic fraction solves monic quadratic equations, linear inequalities and cubic equations of the form $ax^{3}=k$ | **Unit:** Numbers of any magnitude**Focus area(s):** Numbers of any magnitudesolves measurement problems by using standard form to represent numbers and rounding to a given number of significant figures |
| Outcomes: MA5-ALG-C-01Life Skills outcomes: MALS-PAT-01 | Outcomes: MA5-IND-C-01,MA5-IND-P-01Life Skills outcomes: Review and consolidate prior Life Skills outcomes | Outcomes: MA5-EQU-C-01,MA5-EQU-P-01Life Skills outcomes: MALS-ADS-01, MALS-MDI-01 | Outcomes: MA5-MAG-C-01Life Skills outcomes: Review and consolidate prior Life Skills outcomes |

## Year 9 – Term 2

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| Weeks 1–4 | Weeks 5–7 | Weeks 8–10 |
| **Unit:** Financial mathematics**Focus area(s):** Financial mathematics A and Financial mathematics Bapplies algebraic and numerical techniques to solve financial problems involving simple interest, earning money and spending money **solves financial problems involving compound interest and depreciation** | **Unit:** Properties of geometrical figures**Focus area(s):** Properties of geometrical figures A, and Properties of geometrical figures B (Ext)identifies and applies the properties of similar figures and scale drawings to solve problemsestablishes conditions for congruent triangles and similar triangles and solves problems relating to properties of similar figures and plane shapes  | **Unit:** Data analysis**Focus area(s):** Data analysis Acompares and analyses datasets using summary statistics and graphical representations |
| Outcomes: MA5-FIN-C-01, MA5-FIN-C-02Life Skills outcomes: MALS-FIN-01, MALS-FIN-02 | Outcomes: MA5-GEO-C-01, MA5-GEO-P-01Life Skills outcomes: MALS-GEO-01 | Outcomes: MA5-DAT-C-01Life Skills outcomes: MALS-DAT-02 |

## Year 9 – Term 3

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| Weeks 1–3 | Weeks 4–7 | Weeks 8–9 | Week 10 |
| **Unit:** Probability **Focus area(s):** Probability A and Probability B (Adv)solves problems involving probabilities in multistage chance experiments solves problems involving Venn diagrams, 2-way tables and conditional probability | **Unit:** Right-angled trigonometry**Focus area(s):** Trigonometry A and Trigonometry Bapplies trigonometric ratios to solve right-angled triangle problems applies trigonometry to solve problems, including bearings and angles of elevation and depression | **Unit:** Area and surface area**Focus area(s):** Area and surface area Asolves problems involving the surface area of right prisms and practical problems involving the area of composite shapes and solids | **Unit:** Volume**Focus area(s):** Volume Asolves problems involving the volume of composite solids consisting of right prisms and cylinders |
| Outcomes: MA5-PRO-C-01, MA5-PRO-P-01Life Skills outcomes: MALS-PRO-01 | Outcomes: MA5-TRG-C-01, MA5-TRG-C-02Life Skills outcomes: Review and consolidate prior Life Skills outcomes | Outcomes: MA5-ARE-C-01Life Skills outcomes: MALS-ARE-01 | Outcomes: MA5-VOL-C-01Life Skills outcomes: MALS-VOL-01 |

## Year 9 – Term 4

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| Weeks 1–3 | Weeks 4–5 | Weeks 6–8 | Weeks 9–10 |
| **Unit:** Linear relationships**Focus area(s):** Linear relationships A, Linear relationships B, and Linear relationships C (Adv)determines the midpoint, gradient and length of an interval, and graphs linear relationships with and without digital tools graphs and interprets linear relationships using the gradient/slope-intercept form applies the midpoint, gradient/slope and distance formulassolves further linear equation problemdescribes symmetry, translations, reflections and rotations on the Cartesian plane | **Unit:** Variation and rates of change**Focus area(s):** Variation and rates of change A (Stn, Adv)identifies and solves problems involving direct and inverse variation and their graphical representations | **Unit:** Introduction to networks**Focus area(s):** Introduction to networks (Stn)solves problems involving the characteristics of graphs/networks, planar graphs and Eulerian trails and circuits | **Revision** |
| Outcomes: MA5-LIN-C-01, MA5-LIN-C-02, MA5-LIN-P-01 (Adv)Life Skills outcomes: MALS-POS-01 | Outcomes: MA5-RAT-P-01Life Skills outcomes: Review and consolidate prior Life Skills outcomes | Outcomes: MA5-NET-P-01Life Skills outcomes: Review and consolidate prior Life Skills outcomes | **Revision** |

## Year 10 – Term 1

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| Weeks 1–2 | Weeks 3–4 | Weeks 5–7 | Weeks 8–10 |
| **Unit:** Algebraic techniques**Focus area(s):** Algebraic techniques B (Adv)simplifies algebraic fractions involving indices, and expands and factorises algebraic expressions | **Unit:** Algebraic techniques (continued)**Focus area(s):** Algebraic techniques C (Adv)selects and applies appropriate algebraic techniques to operate with algebraic fractions, and expands, factorises and simplifies algebraic expressions | **Unit:** Indices and surds**Focus area(s):** Indices Cdescribes rational and irrational numbers and performs operations with surds and fractional indices | **Unit:** Bivariate data analysis**Focus area(s):** Data analysis Bdisplays and interprets datasets involving 2-variable data |
| Outcomes: MA5-ALG-P-01Life Skills outcomes: Review and consolidate prior Life Skills outcomes | Outcomes: MA5-ALG-P-02Life Skills outcomes: Review and consolidate prior Life Skills outcomes | Outcomes: MA5-IND-P-02Life Skills outcomes: Review and consolidate prior Life Skills outcomes | Outcomes: MA5-DAT-C-02Life Skills outcomes: MALS-DAT-02 |

## Year 10 – Term 2

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| Weeks 1–3 | Weeks 4–7 | Weeks 8–9 | Week 10 |
| **Unit:** Equations**Focus area(s):** Equations C (Adv)solves linear equations of more than 3 steps, monic and non-monic quadratic equations, and linear simultaneous equations | **Unit:** Non-right-angled trigonometry**Focus area(s):** Trigonometry C (Stn, Adv)applies Pythagoras’ theorem and trigonometry to solve 3-dimensional problems, and applies the sine, cosine and area rules to solve 2-dimensional problems, including bearings | **Unit:** Area and surface area**Focus area(s):** Area and surface area B (Stn, Adv)applies knowledge of the surface area of right pyramids and cones, spheres and composite solids to solve problems | **Unit:** Volume**Focus area(s):** Volume B (Stn, Adv)applies knowledge of the volume of right pyramids, cones and spheres to solve problems involving related composite solids |
| Outcomes: MA5-EQU-P-02Life Skills outcomes: MALS-ADS-01, MALS-MDI-01 | Outcomes: MA5-TRG-P-01Life Skills outcomes: Review and consolidate prior Life Skills outcomes | Outcomes: MA5-ARE-P-01Life Skills outcomes: MALS-ARE-01 | Outcomes: MA5-VOL-P-01Life Skills outcomes: Review and consolidate prior Life Skills outcomes |

## Year 10 – Term 3

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| Weeks 1–4 | Weeks 5–7 | Weeks 8–10 |
| **Unit:** Non-linear relationships**Focus area(s):** Non-linear relationships A, Non-linear relationships B, and Non-linear relationships C (Adv)identifies connections between algebraic and graphical representations of quadratic and exponential relationships in various contexts identifies and compares features of parabolas and exponential curves in various contextsinterprets and compares non-linear relationships and their transformations, both algebraically and graphically | **Unit:** Functions**Focus area(s):** Functions and other graphs (Adv)uses function notation to describe and graph functions of one variable and graph inequalities in one and 2 variables | **Unit:** Trigonometric functions and equations**Focus area(s):** Trigonometry D (Adv)establishes and applies the properties of trigonometric functions and finds solutions to trigonometric equations |
| Outcomes: MA5-NLI-C-01, MA5-NLI-C-02, MA5-NLI-P-01Life Skills outcomes: Review and consolidate prior Life Skills outcomes | Outcomes: MA5-FNC-P-01Life Skills outcomes: Review and consolidate prior Life Skills outcomes | Outcomes: MA5-TRG-P-02Life Skills outcomes: Review and consolidate prior Life Skills outcomes |

## Year 10 – Term 4

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| Weeks 1–2 | Weeks 3–5 | Weeks 6–7 | Weeks 8–10 |
| **Unit:** Variation and rates of change**Focus area(s):** Variation and rates of change B (Adv)analyses and constructs graphs relating to rates of change | **Unit:** Polynomials **Focus area(s):** Polynomials (Adv, Ext)defines, operates with, and graphs polynomials and applies the factor and remainder theorems to solve problems  | **Unit:** Logarithms**Focus area(s):** Logarithms (Adv)establishes and applies the laws of logarithms to solve problems | **Revision and preparation for Year 11** |
| Outcomes: MA5-RAT-P-02Life Skills outcomes: Review and consolidate prior Life Skills outcomes  | Outcomes: MA5-POL-P-01Life Skills outcomes: Review and consolidate prior Life Skills outcomes | Outcomes: MA5-LOG-P-01Life Skills outcomes: Review and consolidate prior Life Skills outcomes | **Revision and preparation for Year 11** |