# Mathematics Stage 4: Sample scope and sequence (Stage based)

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 an example of a pathway towards Stage 6 Mathematics Standard or Advanced through stage-based classes.

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.

## Term 1A

|  |  |  |
| --- | --- | --- |
| Weeks 1–4 | Weeks 5–8 | Weeks 9–10 |
| **Unit:** Computation with integers**Focus area(s):** Computation with integerscompares, orders and calculates with integers to solve problems | **Unit:** Understandingfractions, decimals and percentages**Focus area(s):** Fractions, decimals and percentagesrepresents and operates with fractions, decimals and percentages to solve problems | **Unit:** Perimeter of plane shapes**Focus area(s):** Lengthapplies knowledge of the perimeter of plane shapes and the circumference of circles to solve problems **Note:** exclude study of circles at this point of learning. |
| Outcomes: MA4-INT-C-01Life Skills outcomes: MALS-LAN-01, MALS-COM-01, MALS-REP-01, MALS-COM-01, MALS-ADS-01, MALS-MDI-01 | Outcomes: MA4-FRC-C-01Life Skills outcomes: MALS-FRC-01, MALS-DEP-01 | Outcomes: MA4-LEN-C-01Life Skills outcomes: MALS-LEN-01 |

## Term 2A

|  |  |  |
| --- | --- | --- |
| Weeks 1–5 | Weeks 6–7 | Weeks 8–10 |
| **Unit:** Algebraic techniques**Focus area(s):** Algebraic techniquessimplifies algebraic fractions with numerical denominators and expands algebraic expressions  | **Unit:** Data classification and visualisation**Focus area(s):** Data classification and visualisationclassifies and displays data using a variety of graphical representations  | **Unit:** Areas of triangles and quadrilaterals**Focus area(s):** Areaapplies knowledge of area and composite area involving triangles, quadrilaterals and circles to solve problems**Note:** exclude study of circles at this point of learning. |
| Outcomes: MA4-ALG-C-01Life Skills outcomes: MALS-PAT-01 | Outcomes: MA4-DAT-C-01Life Skills outcomes: MALS-DAT-01 | Outcomes: MA4-ARE-C-01Life Skills outcomes: MALS-ARE-01 |

## Term 3A

|  |  |  |  |
| --- | --- | --- | --- |
| Weeks 1–3 | Weeks 4–5 | Weeks 6–8 | Weeks 9–10 |
| **Unit:** Equations**Focus area(s):** Equationssolves linear equations of up to 2 steps and quadratic equations of the form  | **Unit:** Indices**Focus area(s):** Indicesoperates with primes and roots, positive-integer and zero indices involving numerical bases and establishes the relevant index laws | **Unit:** Angle relationships**Focus area(s):** Angle relationshipsapplies angle relationships to solve problems, including those related to transversals on sets of parallel lines | **Unit:** Volume of prisms**Focus area(s):** Volumeapplies knowledge of volume and capacity to solve problems involving right prisms and cylinders **Note:** exclude study of cylinders at this point of learning. |
| Outcomes: MA4-EQU-C-01Life Skills outcomes: MALS-ADS-01,MALS-MDI-01 | Outcomes: MA4-IND-C-01Life Skills outcomes: Review and consolidate prior Life Skills outcomes | Outcomes: MA4-ANG-C-01Life Skills outcomes: Review and consolidate prior Life Skills outcomes | Outcomes: MA4-VOL-C-01Life Skills outcomes: MALS-VOL-01 |

## Term 4A

|  |  |  |
| --- | --- | --- |
| Weeks 1–4 | Weeks 5–7 | Weeks 8–10 |
| **Unit:** Data analysis**Focus area(s):** Data analysisanalyses simple datasets using measures of centre, range and shape of the data  | **Unit:** Ratios and rates**Focus area(s):** Ratios and ratessolves problems involving ratios and rates, and analyses distance–time graphs  | **Unit:** Circles – measurement**Focus area(s):** Length, Area, Volumeapplies knowledge of the perimeter of plane shapes and the circumference of circles to solve problemsapplies knowledge of area and composite area involving triangles, quadrilaterals and circles to solve problemsapplies knowledge of volume and capacity to solve problems involving right prisms and cylinders |
| Outcomes: MA4-DAT-C-02Life Skills outcomes: MALS-DAT-02 | Outcomes: MA4-RAT-C-01Life Skills outcomes: MALS-ADS-01, MALS-MDI-01 | Outcomes:MA4-LEN-C-01, MA4-ARE-C-01, MA4-VOL-C-01Life Skills outcomes: MALS-LEN-01, MALS-ARE-01, **MALS-VOL-01** |

## Term 1B

|  |  |  |
| --- | --- | --- |
| Weeks 1–4 | Weeks 5–8 | Weeks 9–10 |
| **Unit:** Computation with integers**Focus area(s):** Computation with integerscompares, orders and calculates with integers to solve problems | **Unit:** Fractions, decimals and percentages**Focus area(s):** Fractions, decimals and percentagesrepresents and operates with fractions, decimals and percentages to solve problems | **Unit:** Perimeter of plane shapes**Focus area(s):** Lengthapplies knowledge of the perimeter of plane shapes and the circumference of circles to solve problems**Note:** exclude study of circles at this point of learning |
| Outcomes: MA4-INT-C-01Life Skills outcomes: MALS-LAN-01, MALS-COM-01, MALS-REP-01, MALS-ADS-01, MALS-MDI-01 | Outcomes: MA4-FRC-C-01Life Skills outcomes: MALS-FRC-01, MALS-DEP-01 | Outcomes: MA4-LEN-C-01Life Skills outcomes:MALS-LEN-01 |

## Term 2B

|  |  |  |
| --- | --- | --- |
| Weeks 1–5 | Weeks 6–7 | Weeks 8–10 |
| **Unit:** Algebraic techniques**Focus area(s):** Algebraic techniquesgeneralises number properties to operate with algebraic expressions including expansion and factorisation | **Unit:** Probability**Focus area(s):** Probabilitysolves problems involving the probabilities of simple chance experiments | **Unit:** Areas of triangles and quadrilaterals**Focus area(s):** Areaapplies knowledge of area and composite area involving triangles, quadrilaterals and circles to solve problems **Note:** exclude study of circles at this point of learning. |
| Outcomes: MA4-ALG-C-01Life Skills outcomes: MALS-PAT-01 | Outcomes: MA4-PRO-C-01Life Skills outcomes: MALS-PRO-01 | Outcomes: MA4-ARE-C-01Life Skills outcomes: MALS-ARE-01 |

## Term 3B

|  |  |  |
| --- | --- | --- |
| Weeks 1–4 | Weeks 5–8 | Weeks 9–10 |
| **Unit:** Equations**Focus area(s):** Equationssolves linear equations of up to 2 steps and quadratic equations of the form  | **Unit:** Pythagoras’ theorem**Focus area(s):** Right-angled triangles (Pythagoras’ theorem)applies Pythagoras’ theorem to solve problems in various contexts  | **Unit:** Volume ofprisms**Focus area(s):** Volumeapplies knowledge of volume and capacity to solve problems involving right prisms and cylinders **Note:** exclude study of cylinders at this point of learning. |
| Outcomes: MA4-EQU-C-01Life Skills outcomes: MALS-ADS-01, MALS-MDI-01 | Outcomes: MA4-PYT-C-01Life Skills outcomes: Review and consolidate prior Life Skills outcomes | Outcomes: MA4-VOL-C-01Life Skills outcomes:MALS-VOL-01 |

## Term 4B

|  |  |  |
| --- | --- | --- |
| Weeks 1–4 | Weeks 5–7 | Weeks 8–10 |
| **Unit:** Linear relationships**Focus area(s):** Linear relationshipscreates and displays number patterns and finds graphical solutions to problems involving linear relationships | **Unit:** Properties of geometrical figures**Focus area(s):** Properties of geometrical figuresidentifies and applies the properties of triangles and quadrilaterals to solve problems  | **Unit:** Circles – measurement**Focus area(s):** Length, Area, Volumeapplies knowledge of the perimeter of plane shapes and the circumference of circles to solve problemsapplies knowledge of area and composite area involving triangles, quadrilaterals and circles to solve problemsapplies knowledge of volume and capacity to solve problems involving right prisms and cylinders |
| Outcomes: MA4-LIN-C-01Life Skills outcomes: MALS-POS-01 | Outcomes: MA4-GEO-C-01Life Skills outcomes: MALS-GEO-01 | Outcomes:MA4-LEN-C-01, MA4-ARE-C-01, MA4-VOL-C-01Life Skills outcomes: MALS-LEN-01,MALS-ARE-01, **MALS-VOL-01** |

# Mathematics Stage 5: Sample scope and sequence (Stage based)

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 an example of a pathway towards Stage 6 Mathematics Standard or Advanced through stage-based classes.

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.

## Term 1A

|  |  |  |
| --- | --- | --- |
| Weeks 1–3 | Weeks 4–7 | Weeks 8–10 |
| **Unit:** Indices**Focus area(s):** Indices A, Indices B (Adv)simplifies 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:** Algebraic techniques**Focus area(s):** Algebraic techniques A, Algebraic techniques B (Adv)simplifies algebraic fractions with numerical denominators and expands algebraic expressions simplifies algebraic fractions involving indices, and expands and factorises algebraic expressions | **Unit:** Linear relationships**Focus area(s):** Linear relationships Adetermines the midpoint, gradient and length of an interval, and graphs linear relationships, with and without digital tools |
| Outcomes: MA5-IND-C-01, MA5-IND-P-01Life Skills outcomes: Review and consolidate prior Life Skills outcomes | Outcomes: MA5-ALG-C-01, MA5-ALG-P-01Life Skills outcomes: MALS-PAT-01 | Outcomes: MA5-LIN-C-01Life Skills outcomes: MALS-POS-01 |

## Term 2A

|  |  |  |
| --- | --- | --- |
| Weeks 1–2 | Weeks 3–6 | Weeks 7–10 |
| **Unit:** Linear relationships**Focus area(s):** Linear relationships Bgraphs and interprets linear relationships using the gradient/slope-intercept form | **Unit:** Non-linear relationships**Focus area(s):** Non-linear relationships A, Non-linear relationships Bidentifies connections between algebraic and graphical representations of quadratic and exponential relationships in various contextsidentifies and compares features of parabolas and exponential curves in various contexts  | **Unit:** Surface area of solids**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  |
| Outcomes:MA5-LIN-C-02Life Skills outcomes: MALS-POS-01 | Outcomes: MA5-NLI-C-01, MA5-NLI-C-02Life Skills outcomes: Review and consolidate prior Life Skills outcomes | Outcomes: MA5-ARE-C-01Life Skills outcomes: MALS-ARE-01 |

## Term 3A

|  |  |  |
| --- | --- | --- |
| Weeks 1–5 | Weeks 6–7 | Weeks 8–10 |
| **Unit:** Equations**Focus area(s):** Equations A, Equations B (Adv)solves linear equations of up to 3 steps, limited to one algebraic fraction solves monic quadratic equations, linear inequalities and cubic equations of the form  | **Unit:** Volume**Focus area(s):** Volume A, Volume B (Stn, Adv)solves problems involving the volume of composite solids consisting of right prisms and cylindersapplies knowledge of the volume of right pyramids, cones and spheres to solve problems involving related composite solids | **Unit:** Probability**Focus area(s):** Probability Asolves problems involving probabilities in multistage chance experiments and simulations |
| Outcomes: MA5-EQU-C-01, MA5-EQU-P-01Life Skills outcomes: MALS-ADS-01, MALS-MDI-01 | Outcomes: MA5-VOL-C-01, MA5-VOL-P-01Life Skills outcomes: MALS-VOL-01 | Outcomes: MA5-PRO-C-01Life Skills outcomes: MALS-PRO-01 |

## Term 4A

|  |  |  |
| --- | --- | --- |
| Weeks 1–3 | Weeks 4–6 | Weeks 7–10 |
| **Unit:** Linear relationships**Focus area(s):** Linear relationships C (Adv)describes and applies transformations, the midpoint, gradient/slope and distance formulas, and equations of lines to solve problems | **Unit:** Surface area of curved solids**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 | **Revision and preparation for Year 11** |
| Outcomes: MA5-LIN-P-01Life Skills outcomes: Review and consolidate prior Life Skills outcomes | Outcomes: MA5-ARE-P-01Life Skills outcomes: MALS-ARE-01 | **Revision and preparation for Year 11** |

## Term 1B

|  |  |  |  |
| --- | --- | --- | --- |
| Weeks 1–3 | Weeks 4–5 | Weeks 6–7 | Weeks 8–10 |
| **Unit:** Earning and managing money**Focus area(s):** Financial mathematics Asolves financial problems involving simple interest, earning money and spending money  | **Unit:** Numbers of any magnitude**Focus area(s):** Numbers of any magnitudesolves measurement problems by using scientific notation to represent numbers and rounding to a given number of significant figures | **Unit:** Variation and rates of change**Focus area(s):** Variation and rates of change A (Stn, Adv), Variation and rates of change B (Adv)identifies and solves problems involving direct and inverse variation and their graphical representations | **Unit:** Properties of geometrical figures**Focus area(s):** Properties of geometrical figures Aidentifies and applies the properties of similar figures and scale drawings to solve problems |
| Outcomes: MA5-FIN-C-01Life Skills outcomes: MALS-FIN-01MALS-FIN-02 | Outcomes: MA5-MAG-C-01Life Skills outcomes: Review and consolidate prior Life Skills outcomes | Outcomes: MA5-RAT-P-01, MA5-RAT-P-02Life Skills outcomes: Review and consolidate prior Life Skills outcomes | Outcomes: MA5-GEO-C-01Life Skills outcomes: MALS-GEO-01 |

## Term 2B

|  |  |  |
| --- | --- | --- |
| Weeks 1–2 | Weeks 3–6 | Weeks 7–10 |
| **Unit:** Compound interest and depreciation**Focus area(s):** Financial mathematics Bsolves financial problems involving compound interest and depreciation | **Unit:** Data analysis**Focus area(s):** Data analysis Acompares and analyses datasets using summary statistics and graphical representations | **Unit:** Trigonometric ratios**Focus area(s):** Trigonometry A, Trigonometry Bapplies trigonometric ratios to solve right-angled triangle problemsapplies trigonometry to solve problems, including bearings and angles of elevation and depression |
| Outcomes: MA5-FIN-C-02Life Skills outcomes: MALS-FIN-01, MALS-FIN-02 | Outcomes: MA5-DAT-C-01Life Skills outcomes: MALS-DAT-02 | Outcomes: MA5-TRG-C-01, MA5-TRG-C-02Life Skills outcomes: Review and consolidate prior Life Skills outcomes |

## Term 3B

|  |  |
| --- | --- |
| Weeks 1–5 | Weeks 6–10 |
| **Unit:** Bivariate data analysis**Focus area(s):** Data analysis Bdisplays and interprets datasets involving bivariate data | **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 |
| Outcomes: MA5-DAT-C-02Life Skills outcomes: MALS-DAT-02 | Outcomes: MA5-NET-P-01Life Skills outcomes: Review and consolidate prior Life Skills outcomes |

## Term 4B

|  |  |  |
| --- | --- | --- |
| Weeks 1–3 | Weeks 4–6 | Weeks 7–10 |
| **Unit:** Non-right-angled trigonometry**Focus area(s):** Trigonometry C (Stn, Adv)applies Pythagoras’ theorem and trigonometry to solve three-dimensional problems and applies the sine, cosine and area rules to solve two-dimensional problems, including bearings | **Unit:** Data analysis**Focus area(s):** Data analysis C (Stn, Adv)plans, conducts and reviews a statistical inquiry into a question of interest | **Revision and preparation for Year 11** |
| Outcomes: MA5-TRG-P-01Life Skills outcomes: Review and consolidate prior Life Skills outcomes | Outcomes: MA5-DAT-P-01Life Skills outcomes: Review and consolidate prior Life Skills outcomes | **Revision and preparation for Year 11** |