# 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 integers  compares, orders and calculates with integers to solve problems | **Unit:** Understandingfractions, decimals and percentages  **Focus area(s):** Fractions, decimals and percentages  represents and operates with fractions, decimals and percentages to solve problems | **Unit:** Perimeter of plane shapes  **Focus area(s):** Length  applies 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-01  Life Skills outcomes: MALS-LAN-01, MALS-COM-01, MALS-REP-01, MALS-COM-01, MALS-ADS-01,  MALS-MDI-01 | Outcomes: MA4-FRC-C-01  Life Skills outcomes: MALS-FRC-01, MALS-DEP-01 | Outcomes: MA4-LEN-C-01  Life Skills outcomes:  MALS-LEN-01 |

## Term 2A

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| --- | --- | --- |
| Weeks 1–5 | Weeks 6–7 | Weeks 8–10 |
| **Unit:** Algebraic techniques  **Focus area(s):** Algebraic techniques  simplifies algebraic fractions with numerical denominators and expands algebraic expressions | **Unit:** Data classification and visualisation  **Focus area(s):** Data classification and visualisation  classifies and displays data using a variety of graphical representations | **Unit:** Areas of triangles and quadrilaterals  **Focus area(s):** Area  applies 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-01  Life Skills outcomes: MALS-PAT-01 | Outcomes: MA4-DAT-C-01  Life Skills outcomes:  MALS-DAT-01 | Outcomes: MA4-ARE-C-01  Life Skills outcomes: MALS-ARE-01 |

## Term 3A

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| --- | --- | --- | --- |
| Weeks 1–3 | Weeks 4–5 | Weeks 6–8 | Weeks 9–10 |
| **Unit:** Equations  **Focus area(s):** Equations  solves linear equations of up to 2 steps and quadratic equations of the form | **Unit:** Indices  **Focus area(s):** Indices  operates 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 relationships  applies angle relationships to solve problems, including those related to transversals on sets of parallel lines | **Unit:** Volume of prisms  **Focus area(s):** Volume  applies 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-01  Life Skills outcomes: MALS-ADS-01,  MALS-MDI-01 | Outcomes: MA4-IND-C-01  Life Skills outcomes: Review and consolidate prior Life Skills outcomes | Outcomes: MA4-ANG-C-01  Life Skills outcomes: Review and consolidate prior Life Skills outcomes | Outcomes: MA4-VOL-C-01  Life Skills outcomes:  MALS-VOL-01 |

## Term 4A

|  |  |  |
| --- | --- | --- |
| Weeks 1–4 | Weeks 5–7 | Weeks 8–10 |
| **Unit:** Data analysis  **Focus area(s):** Data analysis  analyses simple datasets using measures of centre, range and shape of the data | **Unit:** Ratios and rates  **Focus area(s):** Ratios and rates  solves problems involving ratios and rates, and analyses distance–time graphs | **Unit:** Circles – measurement  **Focus area(s):** Length, Area, Volume  applies knowledge of the perimeter of plane shapes and the circumference of circles to solve problems  applies knowledge of area and composite area involving triangles, quadrilaterals and circles to solve problems  applies knowledge of volume and capacity to solve problems involving right prisms and cylinders |
| Outcomes: MA4-DAT-C-02  Life Skills outcomes: MALS-DAT-02 | Outcomes: MA4-RAT-C-01  Life Skills outcomes: MALS-ADS-01, MALS-MDI-01 | Outcomes:  MA4-LEN-C-01, MA4-ARE-C-01, MA4-VOL-C-01  Life 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 integers  compares, orders and calculates with integers to solve problems | **Unit:** Fractions, decimals and percentages  **Focus area(s):** Fractions, decimals and percentages  represents and operates with fractions, decimals and percentages to solve problems | **Unit:** Perimeter of plane shapes  **Focus area(s):** Length  applies 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-01  Life Skills outcomes: MALS-LAN-01, MALS-COM-01, MALS-REP-01, MALS-ADS-01, MALS-MDI-01 | Outcomes: MA4-FRC-C-01  Life Skills outcomes: MALS-FRC-01, MALS-DEP-01 | Outcomes: MA4-LEN-C-01  Life Skills outcomes:  MALS-LEN-01 |

## Term 2B

|  |  |  |
| --- | --- | --- |
| Weeks 1–5 | Weeks 6–7 | Weeks 8–10 |
| **Unit:** Algebraic techniques  **Focus area(s):** Algebraic techniques  generalises number properties to operate with algebraic expressions including expansion and factorisation | **Unit:** Probability  **Focus area(s):** Probability  solves problems involving the probabilities of simple chance experiments | **Unit:** Areas of triangles and quadrilaterals  **Focus area(s):** Area  applies 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-01  Life Skills outcomes: MALS-PAT-01 | Outcomes: MA4-PRO-C-01  Life Skills outcomes: MALS-PRO-01 | Outcomes: MA4-ARE-C-01  Life Skills outcomes: MALS-ARE-01 |

## Term 3B

|  |  |  |
| --- | --- | --- |
| Weeks 1–4 | Weeks 5–8 | Weeks 9–10 |
| **Unit:** Equations  **Focus area(s):** Equations  solves 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):** Volume  applies 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-01  Life Skills outcomes: MALS-ADS-01, MALS-MDI-01 | Outcomes: MA4-PYT-C-01  Life Skills outcomes: Review and consolidate prior Life Skills outcomes | Outcomes: MA4-VOL-C-01  Life Skills outcomes:  MALS-VOL-01 |

## Term 4B

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| --- | --- | --- |
| Weeks 1–4 | Weeks 5–7 | Weeks 8–10 |
| **Unit:** Linear relationships  **Focus area(s):** Linear relationships  creates and displays number patterns and finds graphical solutions to problems involving linear relationships | **Unit:** Properties of geometrical figures  **Focus area(s):** Properties of geometrical figures  identifies and applies the properties of triangles and quadrilaterals to solve problems | **Unit:** Circles – measurement  **Focus area(s):** Length, Area, Volume  applies knowledge of the perimeter of plane shapes and the circumference of circles to solve problems  applies knowledge of area and composite area involving triangles, quadrilaterals and circles to solve problems  applies knowledge of volume and capacity to solve problems involving right prisms and cylinders |
| Outcomes: MA4-LIN-C-01  Life Skills outcomes: MALS-POS-01 | Outcomes: MA4-GEO-C-01  Life Skills outcomes: MALS-GEO-01 | Outcomes:  MA4-LEN-C-01, MA4-ARE-C-01, MA4-VOL-C-01  Life 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 A  determines 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-01  Life Skills outcomes: Review and consolidate prior Life Skills outcomes | Outcomes: MA5-ALG-C-01, MA5-ALG-P-01  Life Skills outcomes: MALS-PAT-01 | Outcomes: MA5-LIN-C-01  Life Skills outcomes: MALS-POS-01 |

## Term 2A

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| --- | --- | --- |
| Weeks 1–2 | Weeks 3–6 | Weeks 7–10 |
| **Unit:** Linear relationships  **Focus area(s):** Linear relationships B  graphs and interprets linear relationships using the gradient/slope-intercept form | **Unit:** Non-linear relationships  **Focus area(s):** Non-linear relationships A,  Non-linear relationships B  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 contexts | **Unit:** Surface area of solids  **Focus area(s):** Area and surface area A  solves problems involving the surface area of right prisms and practical problems involving the area of composite shapes and solids |
| Outcomes:  MA5-LIN-C-02  Life Skills outcomes: MALS-POS-01 | Outcomes: MA5-NLI-C-01, MA5-NLI-C-02  Life Skills outcomes: Review and consolidate prior Life Skills outcomes | Outcomes: MA5-ARE-C-01  Life 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 cylinders  applies knowledge of the volume of right pyramids, cones and spheres to solve problems involving related composite solids | **Unit:** Probability  **Focus area(s):** Probability A  solves problems involving probabilities in multistage chance experiments and simulations |
| Outcomes: MA5-EQU-C-01, MA5-EQU-P-01  Life Skills outcomes: MALS-ADS-01, MALS-MDI-01 | Outcomes:  MA5-VOL-C-01,  MA5-VOL-P-01  Life Skills outcomes: MALS-VOL-01 | Outcomes: MA5-PRO-C-01  Life 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-01  Life Skills outcomes: Review and consolidate prior Life Skills outcomes | Outcomes: MA5-ARE-P-01  Life Skills outcomes: MALS-ARE-01 | **Revision and preparation for Year 11** |

## Term 1B

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| --- | --- | --- | --- |
| Weeks 1–3 | Weeks 4–5 | Weeks 6–7 | Weeks 8–10 |
| **Unit:** Earning and managing money  **Focus area(s):** Financial mathematics A  solves financial problems involving simple interest, earning money and spending money | **Unit:** Numbers of any magnitude  **Focus area(s):** Numbers of any magnitude  solves 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 A  identifies and applies the properties of similar figures and scale drawings to solve problems |
| Outcomes: MA5-FIN-C-01  Life Skills outcomes: MALS-FIN-01  MALS-FIN-02 | Outcomes: MA5-MAG-C-01  Life Skills outcomes: Review and consolidate prior Life Skills outcomes | Outcomes: MA5-RAT-P-01, MA5-RAT-P-02  Life Skills outcomes: Review and consolidate prior Life Skills outcomes | Outcomes: MA5-GEO-C-01  Life Skills outcomes: MALS-GEO-01 |

## Term 2B

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| --- | --- | --- |
| Weeks 1–2 | Weeks 3–6 | Weeks 7–10 |
| **Unit:** Compound interest and depreciation  **Focus area(s):** Financial mathematics B  solves financial problems involving compound interest and depreciation | **Unit:** Data analysis  **Focus area(s):** Data analysis A  compares and analyses datasets using summary statistics and graphical representations | **Unit:** Trigonometric ratios  **Focus area(s):** Trigonometry A, Trigonometry B  applies trigonometric ratios to solve right-angled triangle problems  applies trigonometry to solve problems, including bearings and angles of elevation and depression |
| Outcomes: MA5-FIN-C-02  Life Skills outcomes: MALS-FIN-01, MALS-FIN-02 | Outcomes: MA5-DAT-C-01  Life Skills outcomes: MALS-DAT-02 | Outcomes: MA5-TRG-C-01, MA5-TRG-C-02  Life 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 B  displays 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-02  Life Skills outcomes: MALS-DAT-02 | Outcomes: MA5-NET-P-01  Life 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-01  Life Skills outcomes: Review and consolidate prior Life Skills outcomes | Outcomes: MA5-DAT-P-01  Life Skills outcomes: Review and consolidate prior Life Skills outcomes | **Revision and preparation for Year 11** |