|  |
| --- |
| Mathematics course of study mapped to *Essential Learnings* — Ways of working |
|  |

|  |  |  |
| --- | --- | --- |
|  | Units of work | |
|  | Year 1 Cycle (2009-2010) | Year 2 Cycle (2010-2011) |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | **Semester 1** | | | **Semester 2** | | | | | | **Semester 1** | | | **Semester 2** | | | | | |
| **Ways of work**ing | ***Unit title*** | Space: Location & Movement | Number: Numbers & Indices (I) | Algebra: Equations | Measurement: Units, Formulae, Rate & Time | C&D: Data Collection & Analysis | Number: Financial Knowledge | Algebra: Linear Relationships | Space: Geometry (2D & 3D shapes) | Measurement: Trigonometry | Number: Numbers & Indices (I) | Algebra: Equations | C&D: Probability | Number: Numbers & Indices (II) | Space: Geometry(Proofs, Angles, Congruence & Similarity) | Measurement: Units, Formulae & Rate | Number: Financial Knowledge | Algebra: Linear Relationships | C&D: Data Collection & Analysis | |
| **Students are able to:** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| analyse situations to identify the key mathematical features and conditions, strategies and procedures that may be relevant in the generation of a solution | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| pose and refine questions to confirm or alter thinking and develop hypotheses and predictions |  |  |  | • |  |  |  |  |  |  |  | • |  |  |  | • |  |  |
| plan and conduct activities and investigations, using valid strategies and procedures to solve problems |  |  |  |  | • |  | • |  |  |  |  | • |  |  |  | • |  | • |
| select and use mental and written computations, estimations, representations and technologies to generate solutions and to check for reasonableness of the solution | • | • |  | • | • | • | • | • | • |  |  |  |  | • |  |  | • | • |
| use mathematical interpretations and conclusions to generalise reasoning and make inferences |  |  |  |  |  | • | • | • |  |  |  | • |  | • |  |  |  |  |
| evaluate their own thinking and reasoning, considering their application of mathematical ideas, the efficiency of their procedures and opportunities to transfer results into new learning |  |  | • |  |  |  |  | • |  |  | • |  |  | • |  |  |  |  |
| communicate thinking, and justify and evaluate reasoning and generalisations, using mathematical language, representations and technologies | • | • |  |  | • |  |  | • | • | • |  | • | • | • |  |  |  |  |
| reflect and identify the contribution of mathematics to their own and other people’s lives |  |  | • |  |  | • |  |  | • |  | • |  |  |  |  |  |  |  |
| reflect on learning, apply new understandings and justify future applications. |  |  |  |  | • |  |  |  |  |  |  |  |  |  |  | • |  |  |

|  |
| --- |
| Mathematics course of study mapped to *Essential Learnings* — Knowledge and understanding |
|  |

|  |  |  |
| --- | --- | --- |
|  | Units of work | |
|  | Year 1 Cycle (2009-2010) | Year 2 Cycle (2010-2011) |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | **Semester 1** | | | | **Semester 2** | | | | | | **Semester 1** | | | **Semester 2** | | | | | | |
| **Knowledge and understanding** | ***Unit title*** | Space: Location & Movement | Number: Numbers & Indices (I) | Algebra: Equations | Measurement: Units, Formulae, Rate & Time | | C&D: Data Collection & Analysis | Number: Financial Knowledge | Algebra: Linear Relationships | Space: Geometry (2D & 3D shapes) | Measurement: Trigonometry | Number: Numbers & Indices (I) | Algebra: Equations | C&D: Probability | | Number: Numbers & Indices (II) | Space: Geometry(Proofs, Angles, Congruence & Similarity) | Measurement: Units, Formulae & Rate | Number: Financial Knowledge | Algebra: Linear Relationships | C&D: Data Collection & Analysis |
| Number  Number properties and operations and a range of strategies can be applied when working with integers and rational numbers. | | | | | | | | | | | | | | | | | | | | | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Rational numbers (integers, fractions and decimals) can be represented and described in different ways, including using scientific notation and index notation, for a variety of purposes. |  | • |  |  |  |  |  |  |  | • |  |  | • |  |  |  |  |  |
| Rational numbers (integers, fractions and decimals) can be used to describe and solve problems involving rate, ratio, proportion and percentage. |  | • |  |  |  |  |  |  |  | • |  |  | • |  |  |  |  |  |
| Rational numbers, and decimal approximations of irrational numbers including π, can be represented on the real number line. |  | • |  |  |  |  |  |  |  | • |  |  | • |  |  |  |  |  |
| Decimal approximations of irrational numbers can be used in geometric contexts. |  | • |  |  |  |  |  |  |  | • |  |  | • |  |  |  |  |  |
| Estimates with upper and lower boundaries can be formed. |  | • |  |  |  |  |  |  |  | • |  |  | • |  |  |  |  |  |
| Problems can be interpreted and solved using rational and irrational numbers, including integers, simple powers and square roots, and conventions of the four operations to generate solutions using mental, written and technology-assisted strategies. |  | • |  |  |  |  |  |  |  | • |  |  | • |  |  |  |  |  |
| Financial decisions can be made based on the analysis of short- and long-term benefits and consequences of cash, credit and debit transactions. |  |  |  |  |  | • |  |  |  |  |  |  |  |  |  | • |  |  |
| Financial transactions for the provision of goods and services may incur additional costs determined by government and organisations. |  |  |  |  |  | • |  |  |  |  |  |  |  |  |  | • |  |  |
| Algebra  Variables, algebraic expressions and equations, relationships and functions can be described, represented and interpreted. | | | | | | | | | | | | | | | | | | |
| Variables and constants are represented using words and symbols when writing expressions and equations. |  |  | • |  |  |  |  |  |  |  | • |  |  |  |  |  |  |  |
| Algebraic relationships can be modelled, interpreted and evaluated using integer, decimal and fraction values of variables. |  |  | • |  |  |  |  |  |  |  | • |  |  |  |  |  |  |  |
| Inverse, associative, commutative and distributive properties can be used to manipulate and rearrange algebraic expressions that involve the four operations, reciprocals, whole-number powers and square roots. |  |  | • |  |  |  |  |  |  |  | • |  |  |  |  |  |  |  |
| Linear and some non-linear equations related to real-life problems can be represented and solved using a variety of methods. |  |  |  |  |  |  | • |  |  |  |  |  |  |  |  |  | • |  |
| Tables of values constructed for linear and simple non-linear functions can be graphed. |  |  |  |  |  |  | • |  |  |  |  |  |  |  |  |  | • |  |
| Measurement  Units of measure, instruments, formulas and strategies can be used to estimate and calculate measurement and consider reasonable error. | | | | | | | | | | | | | | | | | | |
| Instruments, technologies, strategies and formulas are used to estimate, compare and calculate measures and derived measures, including rate, area, duration and Australian time zone differences. |  |  |  | • |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Relationships exist between units of equivalent measure and are used to make conversions of units. |  |  |  | • |  |  |  |  |  |  |  |  |  |  | • |  |  |  |
| Lengths and angles that cannot be measured directly can be investigated using scale, similarity or trigonometry. |  |  |  |  |  |  |  |  | • |  |  |  |  |  | • |  |  |  |
| Judgments can be made about acceptable error of measurement and error can be compounded by repetition and calculation. |  |  |  | • |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

(Continued on next page)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Chance and data  Judgments can be based on theoretical or experimental probability. Data can be displayed in various ways and analysed to make inferences and generalisations. | | | | | | | | | | | | | | | | | | |
| Data can be gathered from samples and surveys, experiments and simulations, published data and databases, and used to estimate probabilities of events and to respond to claims and questions. |  |  |  |  |  |  |  |  |  |  |  | • |  |  |  |  |  |  |
| Sample spaces can be specified for single events and straightforward compound events using tables and tree diagrams, and probabilities can be determined using different methods, including counting, measuring and symmetry. |  |  |  |  |  |  |  |  |  |  |  | • |  |  |  |  |  |  |
| Data interpretation is simplified through the use of suitable representations and descriptive statistics. |  |  |  |  | • |  |  |  |  |  |  |  |  |  |  |  |  | • |
| Simple measures of spread and centre, distribution of responses, and the effect of bias and outliers on the measures of location are used to make inferences. |  |  |  |  | • |  |  |  |  |  |  |  |  |  |  |  |  | • |
| Space  Geometric conventions can be used to describe, represent, construct and manipulate a range of complex geometric shapes. Mapping conventions can be used to represent location, distance and orientation in maps and plans. | | | | | | | | | | | | | | | | | | |
| Geometric conventions are used to describe a variety of 2D shapes and 3D objects, including curved surfaces, and compound and embedded shapes. |  |  |  |  |  |  |  | • |  |  |  |  |  |  |  |  |  |  |
| 2D shapes and 3D objects and their cross-sections can be represented as sketches, drawings or electronic images, using specifications and conventions to identify and show geometric properties. |  |  |  |  |  |  |  | • |  |  |  |  |  |  |  |  |  |  |
| 3D objects can be constructed from plans, cross-sections, nets, and isometric and perspective diagrams. |  |  |  |  |  |  |  | • |  |  |  |  |  |  |  |  |  |  |
| Congruence, similarity, sequences of transformations, and symmetry are used to analyse geometric properties. |  |  |  |  |  |  |  |  |  |  |  |  |  | • |  |  |  |  |
| Deductions about geometric properties can be supported by proofs related to angle properties associated with parallel, perpendicular and transverse lines and polygons. |  |  |  |  |  |  |  |  |  |  |  |  |  | • |  |  |  |  |
| Maps and plans using scale, coordinates, distance, bearing, angles, keys and annotations can be constructed and used to specify location and represent spatial relationships, as well as distance and orientation between locations. | • |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

|  |
| --- |
| Mathematics course of study mapped to *Essential Learnings* — Assessable elements |
|  |

|  |  |  |
| --- | --- | --- |
|  | Units of work | |
|  | Year 1 Cycle (2009-2010) | Year 2 Cycle (2010-2011) |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | **Semester 1** | | | | **Semester 2** | | | | | | **Semester 1** | | | | **Semester 2** | | | | | |
| **Assessable elements** | ***Unit title*** | Space: Location & Movement | Number: Numbers & Indices (I) | Algebra: Equations | Measurement: Units, Formulae, Rate & Time | | C&D: Data Collection & Analysis | Number: Financial Knowledge | Algebra: Linear Relationships | Space: Geometry (2D & 3D shapes) | Measurement: Trigonometry | Number: Numbers & Indices (I) | Algebra: Equations | C&D: Probability | Number: Numbers & Indices (II) | | Space: Geometry(Proofs, Angles, Congruence & Similarity) | Measurement: Units, Formulae & Rate | Number: Financial Knowledge | Algebra: Linear Relationships | C&D: Data Collection & Analysis |
| Knowledge and understanding | | • | • | • | • | | • | • | • | • | • | • | • | • | • | | • | • | • | • | • |
| Thinking and reasoning | | • | • | • | • | | • | • | • | • | • |  | • | • |  | | • |  | • | • | • |
| Communicating | | • | • | • |  | | • | • | • | • | • | • |  | • | • | | • |  |  |  |  |
| Reflecting | |  |  | • |  | | • | • |  |  | • |  | • |  |  | |  |  | • |  |  |