Mathematics

LEVEL 1	15 TCE CREDIT POINTS
COURSE CODE	MAT115123
COURSE SPAN	2023 — 2027
READING AND WRITING STANDARD	NO
MATHEMATICS STANDARD	NO
COMPUTERS AND INTERNET STANDARD	NO

This course is current for 2024.

Mathematics Level 1 is designed to build on foundational knowledge of mathematics that enables learners to select and apply problem-solving strategies and mathematical techniques to engage in situations involving numbers, proportional reasoning, financial mathematics and pattern; using units of measurement, shape, maps and plans; and everyday chance events, data collection and representation

Learners will develop their multiplicative thinking and mathematical reasoning by, engaging in mathematical discussions, working on collaborative problem-solving tasks, sharing strategies and solutions and providing explanations for their answers. They will reflect on everyday scenarios involving mathematics and will integrate their prior knowledge, skills, attitudes and values in mathematics to refine and improve their understanding and personal decisions.

Focus Area

Personal futures

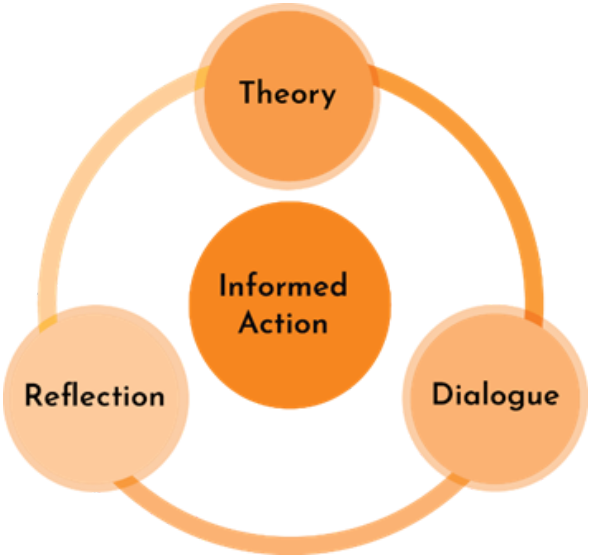
Courses aligned to the Years 9 to 12 Curriculum Framework belong to one of the five focus areas of Discipline-based study, Transdisciplinary projects, Professional studies, Work-based learning and Personal futures.

Mathematics Level 1 is a Personal futures course.

Personal futures courses prepare learners to be independent young adults, able to lead healthy, fulfilled and balanced lives. Learning is highly personalised. Learners develop strategies to optimise learning, make decisions, solve problems, set career and life goals and pursue areas of strong personal interest. Personal futures supports learners to develop the required knowledge, skills and understandings to make informed choices that enhance their own and others' health and wellbeing. The inclusion of Personal futures as a focus area responds to a range of contemporary research findings highlighting the importance of learners having broad educational goals that include individual and collective wellbeing and opportunities for learner agency as they navigate a complex and uncertain world.

Personal futures courses have three key features that guide teaching and learning

- theory and dialogue
- informed action
- reflection and dialogue.



In this course learners will do this by:

- building foundational understanding, background knowledge, rules and conventions of mathematics
- interacting and working with other people, engaging in mathematical discourse to explore ideas, reasoning and approaches
- identifying challenges and problems, using problem-solving and mathematical reasoning to trial strategies, compare solutions, generate knowledge and take informed action
- reflecting on their own understanding, integrating prior knowledge and sharing solutions with others.

Rationale

The *Mathematics* Level 1 course is designed to develop adolescent learners' confidence and self-esteem to engage with mathematics and develop their ability to apply mathematical thinking and reasoning in real-world contexts. In doing so, the course enables learners to build the requisite knowledge and skills and the capacity, confidence and disposition to use mathematics to take informed action in varied personal contexts.

This course will promote mathematics and numeracy learning opportunities that aim to:

- build the foundational knowledge to enable learners to engage with content in the *Essential Mathematics - Personal* Level 2 and *Essential Mathematics - Workplace* Level 2 courses
- enable learners to interpret everyday practical situations
- provide the basis for many informed personal decisions.

These aims will be met by developing learners' ability to formulate situations mathematically and to employ mathematical concepts, facts, procedures and reasoning to interpret these situations. This is more pertinent than ever before as 75% of the fastest growing occupations require competence in STEM with an estimated 44% or 5.1 million jobs in Australia at risk of digital disruption1. Successful completion of the course will provide learners with a level of mathematical competence that will enable them to contribute productively in the rapidly changing workforce.

The purpose of Years 9 to 12 Education is to enable all learners to achieve their potential through Years 9 to 12 and beyond in further study, training or employment.

Years 9 to 12 Education enables personal empowerment, cultural transmission, preparation for citizenship and preparation for work.

This course is built on the principles of access, agency, excellence, balance, support and achievement as part of a range of programs that enables learners to access a diverse and flexible range of learning opportunities suited to their level of readiness, interests and aspirations.

Reference: 1Price-Waterhouse Report (April, 2015). A Smart Move: Future proofing Australia's workforce by growing skills in science, technology, engineering and maths (STEM)

Learning Outcomes

On successful completion of this course, learners will be able to:

1. communicate thinking, strategies and solutions using appropriate mathematical or statistical language
2. plan, organise and manage learning to complete tasks and assess progress
3. understand concepts and apply numeric techniques and multiplicative thinking to represent situations and solve problems
4. apply mathematical reasoning to make inferences, generalise and represent relationships and explain thinking in a range of contexts
5. act as creative, critical and reflective thinkers to assess ideas and take informed action
6. understand concepts and apply techniques to solve problems and make informed choices in situations involving pattern and algebra
7. understand concepts and apply techniques to solve problems and make informed choices in situations involving statistics and probability
8. understand concepts and apply techniques to solve problems and make informed choices in situations involving measurement and geometry.

Pathways

The *Mathematics* Level 1 course enables learning continuity from Year 10 Australian Curriculum Mathematics for learners whose reports indicated they performed below the standard or were approaching the standard for year level in earlier years. The course is also suitable for learners where an agreed Learning Plan was in place.

Mathematics Level 1 will provide the fundamental knowledge for learners pursuing further mathematics study in *Essential Mathematics – Personal* Level 2 and *Essential Mathematics - Workplace* Level 2.

Integration of General Capabilities and Cross-curriculum Priorities

The general capabilities addressed specifically in this course are:

- Critical and creative thinking
- Literacy
- Numeracy
- Personal and social capability

The cross-curriculum priorities enabled through this course are:

- Aboriginal and Torres Strait Islander histories and cultures
- Sustainability

Course Size And Complexity

This course has a complexity level of 1.

For a full description of courses at a complexity level of 1, please refer to the Levels of Complexity - Tasmanian Senior Secondary Education document.

This course has a size value of 15. Upon successful completion of this course (i.e., a Preliminary Achievement (PA) award or higher), a learner will gain 15 credit points at Level 1 towards the Participation Standard of the Tasmanian Certificate of Education (TCE).

Course Structure

This course consists of three 50-hour modules.

Module 1: Pattern and algebraic reasoning

Module 2: Probability and statistical reasoning

Module 3: Measurement and geometric reasoning

Course Delivery

Module 1 may be delivered concurrently with either module 2 or module 3. Modules 2 and 3 can be delivered in any order.

Course Requirements

Access

This course requires learners to collaborate with others.

Resource requirements

The learning outcomes in this course require learners to have access to specific mathematics manipulatives and concrete materials including counters, dice, spinners, blocks and three-dimensional models.

Learners will require access to general calculators in this course. On occasions, computers and the internet will be required to enable learners' access to information and data sources.

Course Content: Module 1

Module 1: Pattern and algebraic reasoning

This module contains three topics:

- number and place value
- fractions, decimals and percentages
- algebraic reasoning.

'Number and place value' and 'Fractions, decimals and percentages' will enable learners to develop a capacity to work flexibly and efficiently with whole numbers, decimals, common fractions, rates and percentages. In turn this will improve learners' ability to recognise and solve problems involving multiplication and division, including direct and indirect proportion. These skills will provide the foundation that learners will apply to the remaining course content.

'Algebraic reasoning' will enable learners to develop the capacity to communicate mathematical situations effectively through words, symbolic expressions, written algorithms and other representations. They will explore, describe and extend number patterns, find generalisations in situations involving two variables, identify equivalent expressions and explore equivalence, factors and properties of numbers.

Module 1 learning outcomes

The following learning outcomes are a focus of this module:

1. communicate thinking, strategies and solutions using appropriate mathematical or statistical language
2. plan, organise and manage learning to complete tasks and assess progress
3. understand concepts and apply numeric techniques and multiplicative thinking to represent situations and solve problems
4. apply mathematical reasoning to make inferences, generalise and represent relationships and explain thinking in a range of contexts
5. act as creative, critical and reflective thinkers to assess ideas and take informed action
6. understand concepts and apply techniques to solve problems and make informed choices in situations involving pattern and algebra.

Module 1 content

Key knowledge and skills

Topic 1 - number and place value

- investigate and use the properties of odd and even numbers
- identify and describe factors and multiples of whole numbers and use them to solve problems
- solve problems involving multiplication of large numbers by one- or two-digit numbers using efficient mental, written strategies and appropriate digital technologies
- investigate everyday situations that use integers. Locate and represent these numbers on a number line
- compare, order, add and subtract integers
- carry out the four operations with integers, using efficient mental and written strategies and appropriate digital technologies
- apply place value to partition, rearrange and regroup numbers to at least ten thousand to assist calculations and solve problems
- make connections between fractions and decimal notation
- recognise that the place value system can be extended beyond hundredths
- solve problems involving division by a one-digit number, including those that result in a remainder
- use estimation and rounding to check the reasonableness of answers to calculations
- select and apply efficient mental and written strategies and appropriate digital technologies to solve problems involving all four operations with whole numbers; for example:
    - choose to calculate 5 x 12 rather than 12 + 12 + 12 + 12 + 12 to answer the question: If I buy 5 cartons of 12 eggs how many eggs do I have?
- recognise and use the correct order of operations for a multi-step equation; for example:
    - complete the division first in the equation 18 ÷ 6 – 2.
- apply the associative, commutative and distributive laws to aid mental and written computation
- calculate to make comparisons between items; for example:
    - multiply the cost of a 500-gram bag of flour x 4 to compare it to the price of a 2 kg bag of flour
- use a calculator to assist in solving multi-step number problems involving large numbers; for example:
    - a stall at the athletics carnival is selling sausages for $1.50. If the stall buys six x 20 packs of sausages for $12 each and 4 loaves of bread, containing 30 slices, for $4.50 each, how many sausages would the stall need to sell to start making a profit?

Topic 2 - fractions, decimals and percentages

- count by quarters, halves and thirds, including with mixed numerals. Locate and represent these fractions on a number line
- compare fractions with related denominators and locate and represent them on a number line
- investigate strategies to solve problems involving addition and subtraction of fractions with the same denominator
- compare fractions using equivalence. Locate and represent positive and negative fractions and mixed numbers on a number line
- solve problems involving addition and subtraction of fractions, including those with unrelated denominators
- find a simple fraction of a quantity where the result is a whole number, with and without the use of digital technologies
- express one quantity as a fraction of another, with and without the use of digital technologies
- compare, order and represent decimals
- investigate terminating and recurring decimals
- round decimals to a specified number of decimal places
- multiply and divide decimals by powers of 10
- connect fractions, decimals and percentages and carry out simple conversions
- find percentages of quantities and express one quantity as a percentage of another, with and without the use of digital technologies
- solve problems involving the use of percentages, including percentage increases and decreases, with and without the use of digital technologies
- estimate costs and change on purchases; for example:
    - select appropriate coins and notes to cover the cost of purchases
    - use rounding to an appropriate nomination to estimate the amount of change due on purchases. Examples would include large appliances to the nearest $100, groceries to the nearest dollar or nearest $10 for bulk items etc.

- solve problems involving purchases and the calculation of change due using a range of strategies, including concrete materials, mental, written and calculator techniques as appropriate
- interpret the use of percentages in everyday life; for example:
    - investigate and calculate percentage discounts of 10%, 25% and 50% on sale items, with and without the use of digital technologies.

Topic 3 - algebraic reasoning

This topic has two subtopics:

- rates, ratio and proportion
- pattern, modelling and equivalence

Rates, ratio and proportion

- use and apply rates and ratios and their units in familiar situations; for example:
    - speed, km per hr, ingredient costs, $ per kg, mixing quantities, 1 part: 5 parts
- compare familiar rates and ratios and describe difference using simple language; for example:
    - which is faster?
    - which is a stronger mix of cordial?
- recognise and describe proportional growth in real terms in familiar situations; for example:
    - a puppy weighed 2 kg when it was born. At six months its weight has tripled. How much does the puppy weigh?

Pattern, modelling and equivalence

- explore and describe number patterns resulting from performing multiplication
- describe, continue and create patterns with familiar fractions, decimals and whole numbers resulting from addition and subtraction
- solve word problems by using number sentences involving multiplication or division where there is no remainder
- find unknown quantities in number sentences involving multiplication and division and identify equivalent number sentences involving multiplication and division
- introduce the concept of symbols as a way of representing numbers using letters
- investigate and use square roots of perfect square numbers
- model real-life problems using concrete materials or diagrams or both; for example:
    - find the number of people that can be seated in a classroom by setting up different configurations of tables and chairs, or by drawing a diagram
- complete a table of values to describe modelled situations
- generalise a rule based on modelled real-life problems and use it to create solutions; for example:
    - when configuring the classroom with rectangular tables individually, it can seat 2 people on each long end and 1 person on each short end. In this configuration, the number of chairs needed for any number of tables is: number of chairs = number of tables x 6
    - when two or more of these tables are joined together at the long end the number of chairs needed = (number of tables x 2) + 4.

Module 1 work requirements

This module includes the following work requirement:

- 6-10 short responses within a project, applying pattern and algebraic reasoning.

See Appendix 3 for summary of work requirement specifications for this course.

Course Content: Module 2

Module 2: Probability and statistical reasoning

This module contains two topics:

- chance
- data

'Chance' provides an opportunity for learners to describe the probability of everyday events occurring, to construct and carry out single-step experiments for equiprobable outcomes. Learners will use mathematical reasoning to compare the frequency of outcomes with theoretical probability equating differences to concepts including randomness, variation and distribution.

'Data' enables learners to select and trial simple data collection processes and to represent, read and interpret information in routine tables, graphs and charts, including column graphs, picture graphs, dot plots and stem-and-leaf plots. They will explore the variation between different samples taken from the same population and investigate the effect of individual data values on the mean and median.

Module 2 learning outcomes

The following learning outcomes are a focus of this module:

1. communicate thinking, strategies and solutions using appropriate mathematical or statistical language
2. plan, organise and manage learning to complete tasks and assess progress
3. understand concepts and apply numeric techniques and multiplicative thinking to represent situations and solve problems
4. apply mathematical reasoning to make inferences, generalise and represent relationships and explain thinking in a range of contexts
5. act as creative, critical and reflective thinkers to assess ideas and take informed action
7. understand concepts and apply techniques to solve problems and make informed choices in situations involving statistics and probability

Module 2 content

Key knowledge and skills

Topic 1 - chance

- describe possible everyday events and order their chances of occurring
- identify everyday events where one cannot happen if the other happens
- identify events where the chance of one will not be affected by the occurrence of the other
- recognise that probabilities range from 0, impossible, to 1, certain
- represent probabilities using a range of notations; for example:
    - words
    - fractions
    - ratios
    - percentages
- list outcomes of chance experiments involving equally likely outcomes and represent probabilities of those outcomes using fractions
- construct sample spaces for single-step experiments with equally likely outcomes
- describe probabilities using fractions, decimals and percentages
- assign probabilities to the outcomes of events and determine probabilities for events
- conduct chance experiments with both small and large numbers of trials using appropriate digital technologies
- identify possible reasons for variations and distribution of outcomes in trials
- compare the likelihood of events based on their numerical probability
- compare observed frequencies across experiments with expected frequencies
- draw conclusions or make predictions from the results of probability experiments.

Topic 2 - data collection, representation and interpretation

- select and trial methods for data collection, including survey questions and recording sheets
- pose questions and collect categorical or numerical data by observation or survey
- identify the key features of graphs and data displays, including heading, scale, key, axes and labels
- construct simple graphs, from given or collected data, using provided scales and axes with gradations of 1s, 5s, 10s or 100s, including column graphs and dot plots
- construct tables and picture graphs where one picture can represent many data values.
- construct frequency tables and make calculations related to these; for example:
    - calculate the total for each column.
- construct and compare a range of data displays, including stem-and-leaf plots and dot plots
- interpret and compare a range of data displays, including side-by-side column graphs for two categorical variables
- assess the accuracy and fairness of a graph; for example:
    - check it has all the necessary key features
    - check if it has any misleading information.
- recognise that the terms 'mean' and 'average' describe the same concept in everyday use; for example:
    - cricket batting or bowling averages.
- calculate mean, median, mode and range for sets of simple data. Interpret these statistics in the context of data
- describe and interpret data displays using median, mean and range
- identify variability and randomness in experimental data; for example:
    - a 6-sided die is rolled 30 times: What are the expected results for each number versus actual results?
- identify and describe variability or randomness in data displays.

Module 2 work requirements

This module includes the following work requirement:

- 6-10 short responses within a project, applying data collection and analysis.

See Appendix 3 for a summary of work requirement specifications for this course.

Module 2 assessment

This module has a focus on criteria 1, 2, 3, 4, 5 and 7.

Course Content: Module 3

Module 3: Measurement and geometric reasoning

This module contains three topics:

- using units of measurement
- shapes, maps and plans
- geometric reasoning.

'Using units of measurement' enables learners to perform measurements using scaled instruments, connect decimal representations to the metric system and name, convert and use appropriate units of measure. They will estimate, calculate and solve problems involving length, area, volume and capacity, temperature and time.

'Shapes, maps and plans' will enable learners to develop their knowledge of 2-Dimensional shapes and 3-Dimensional objects. They will utilise this knowledge of the attributes and properties of shapes to construct, compare, draw and describe objects. Learners will use the features of routine maps, plans and timetables to read and interpret information, describe locations and routes and calculate distances or travel times.

'Geometric reasoning' will enable learners to describe translations, reflections and rotations of shapes, identify line and rotational symmetry and create symmetrical patterns and pictures. Learners will measure, construct and classify angles and use their properties to classify triangles, describe quadrilaterals and investigate relationships between angles.

Module 3 learning outcomes

The following learning outcomes are a focus of this module:

1. communicate thinking, strategies and solutions using appropriate mathematical or statistical language
2. plan, organise and manage learning to complete tasks and assess progress
3. understand concepts and apply numeric techniques and multiplicative thinking to represent situations and solve problems
4. apply mathematical reasoning to make inferences, generalise and represent relationships and explain thinking in a range of contexts
5. act as creative, critical and reflective thinkers to assess ideas and take informed action
8. understand concepts and apply techniques to solve problems and make informed choices in situations involving measurement and geometry.

Module 3 content

Key knowledge and skills

Topic 1 - using units of measurement

- estimate and compare lengths, masses and capacities; for example:
    - decide if the food in one container will fit into another container of a different shape
    - the different masses of items to be packed into hand luggage and suitcases so that maximum limits are not exceeded.
- use scaled instruments to measure and compare lengths, masses, capacities, time and temperatures
- use comparative language that relates to length, time, temperature, mass, capacity and volume
- calculate perimeters by adding given side lengths from diagrammatic representations of shapes
- solve problems involving perimeter; for example:
    - calculate how much barricade tape is required to cordon off the cricket pitch area of the school oval.
- calculate the perimeter and area of rectangles and triangles using familiar metric units
- connect decimal representations to the metric system
- recognise and use metric units of length, area, volume, capacity and mass and their abbreviations
- convert between common metric units of length, mass and capacity
- recognise the unit □Celsius and its abbreviation □C
- solve problems involving the comparison of lengths and areas using appropriate units
- investigate the relationship between mass, volume and capacity and their units of measurement:
    - discover and apply the fact that 1 L of water weighs 1 kg
    - discover and use the fact that 1 mL of water is equivalent to 1 cm3
    - recognise that large objects can be very light, while smaller objects can be very heavy
- tells time using analogue and digital clocks using a 12-hour time system
- interpret calendars and calculate days between dates
- use 'am' and 'pm' notation and solve simple time problems
- convert between units of time
- compare 12- and 24-hour time systems and convert between them.

Topic 2 - shapes, maps and plans

- compare the areas of regular and irregular shapes by informal means
- compare and describe two-dimensional shapes that result from combining and splitting common shapes, with and without the use of digital technologies
- connect three-dimensional objects with their nets and other two-dimensional representations
- construct simple prisms and pyramids
- draw different views of prisms and solids formed from combinations of prisms
- solve problems involving two-dimensional shapes and three-dimensional objects; for example:
    - construct a two-dimensional net that will produce a three-dimensional package of 6 golf balls
    - position net templates on an A3 card to use the card as sustainably as possible
- use simple scales, legends and directions to locate positions or gather information contained in basic maps
- use a simple grid reference system to describe locations. Describe routes using landmarks and directional language
- use the Cartesian coordinate system:
    - initially using the top right quadrant
    - introducing the bottom right quadrant in situations such as above and below sea level
    - introducing the top left quadrant in situations involving movement either side of a fixed origin.
- create simple maps; for example:
    - sketch a map to show how to get from one location to another.

- solve problems involving maps; for example:
    - identify or calculate travel time and distance between two places using given information
    - determine estimated time of arrival based on given distance and other parameters based on experience, such as traffic at time of travel, reliability of public transport etc.
- use plans to locate positions or gather information; for example:
    - interpret a site plan of a local market
    - use a plan of a stadium to find their allocated seat.
- construct simple plans; for example:
    - complete a floor plan of their home or a shopping centre.
- investigate travel times using digital technology; for example:
    - public transport planning websites or apps.
- use and interpret time to plan travel; for example:
    - use calendars to consider travel dates
    - identify the typical features of each season and use this to make decisions about recreation activities and clothing required.
- read and interpret timetables in a range of formats and contexts; for example:
    - everyday timetables, such as school, cinema, local fitness centre, TV guide
    - travel timetables, such as bus, ferry, flight
    - event timetables, such as a sporting competition or a festival program.
- solve everyday problems involving time; for example:
    - is there enough time to walk to the cinema before the movie starts?
    - identify what time to leave home to arrive somewhere by a given time if getting a lift or travelling on public transport.

Topic 3 - geometric reasoning

- estimate, measure and compare angles using degrees
- construct angles using a protractor
- compare angles and classify them by name according to angle size, acute, obtuse, right, straight, reflex and rotation
- classify triangles according to their side and angle properties
- investigate angles on a straight line, angles at a point and vertically opposite angles. Use results to find unknown angles
- demonstrate that the angle sum of a triangle is 180° and use this to find the angle sum of a quadrilateral
- describe translations, reflections and rotations of two-dimensional shapes. Identify line and rotational symmetries
- create symmetrical patterns, pictures and shapes.

Module 3 work requirements

This module includes the following work requirements:

- a project, applying measurement and geometric reasoning.

See Appendix 3 for a summary of work requirement specifications for this course.

Module 3 assessment

This module has a focus on criteria 1, 2, 3, 4, 5 and 8.

Assessment

Criterion-based assessment is a form of outcomes assessment that identifies the extent of learner achievement at an appropriate endpoint of study. Although assessment as part of the learning program is continuous, much of it is formative and is done to help learners identify what they need to do to attain the maximum benefit from their study of the course. Therefore, assessment for summative reporting to TASC will focus on what both teacher and learner understand to reflect endpoint achievement.

The standard of achievement each learner attains on each criterion is recorded as a rating 'A', 'B', or 'C', according to the outcomes specified in the standards section of the course.

A 't' notation must be used where a learner demonstrates any achievement against a criterion less than the standard specified for the 'C' rating.

A 'z' notation is to be used where a learner provides no evidence of achievement at all.

Internal assessment of all criteria will be made by the provider. Providers will report the learner's rating for each criterion to TASC.

Quality Assurance Process

The following processes will be facilitated by TASC to ensure there is:

- a match between the standards of achievement specified in the course and the skills and knowledge demonstrated by individual learners
- community confidence in the integrity and meaning of the qualification.

Process

TASC will verify that the provider's course delivery and assessment meet the course requirements and community expectations for fairness, integrity and validity of qualifications TASC issues. This will involve checking:

- Provider standard 1: scope and sequence documentation:
  - course delivery plan
  - course assessment plan, assessment matrix
- Provider standard 2: student attendance records
- Provider standard 3: examples of assessments tools and instruments and associated rubrics and marking guides
- Provider standard 1 and 3: examples of student work including that related to any work requirements articulated in the course document
- Provider standard 4: class records of assessment.

This process will be scheduled by TASC using a risk-based approach.

Criteria

The assessment for *Mathematics* Level 1 will be based on the degree to which the learner can:

1. identify and use mathematical conventions, information and ideas
2. manages own time to complete tasks
3. identify mathematical techniques used to solve problems
4. use mathematical reasoning to make observations
5. use mathematical strategies to solve problems
6. use mathematical techniques to solve pattern and ratio problems
7. use mathematical techniques to solve data and chance problems
8. use mathematical techniques to solve measurement and geometry problems

	Module 1	Module 2	Module 3
Criteria focus	1,2,3,4,5,6	1,2,3,4,5,7	1,2,3,4,5,8

Standards

Criterion 1: identify and use mathematical conventions, information and ideas

Standard Element	Rating A	Rating B	Rating C
E01 - Mathematical information	identify a range of mathematical information and ideas in a range of given contexts	identify mathematical information and ideas in given contexts	identify mathematical information and ideas in given contexts as directed
E02 - Mathematical conventions	uses appropriate mathematical conventions, symbols and rules from a given range	uses mathematical conventions, symbols and rules from a given range	uses limited mathematical conventions and symbols from a given range
E03 - Mathematical ideas	uses appropriate language from a given range to express mathematical ideas	uses language from a given range to express mathematical ideas	uses language from a given range to express limited mathematical ideas

Criterion 2: manages own time to complete tasks

Standard Element	Rating A	Rating B	Rating C
E01 - Plans and organises	uses a range of given planning strategies to complete tasks	uses given planning strategies to complete tasks as directed	uses given planning strategies to complete aspects of tasks as directed
E02 - Works individually and collaboratively	describes tasks to be completed in individual or collaborative activities	identifies tasks to be completed in individual or collaborative activities	identifies tasks from a given set to be completed in individual or collaborative activities as directed

Criterion 3: identify mathematical techniques used to solve problems

Standard Element	Rating A	Rating B	Rating C
E01 - Properties of numbers	identifies factors of whole numbers and solves basic problems involving multiples	identifies factors of whole numbers and solves a limited range of basic problems involving multiples	identifies factors of whole numbers
E02 - Order of operations	uses order of operations to solve calculations	uses order of operations to solve basic calculations	uses order of operations to solve basic calculations as directed
E03 - Place value	uses place value to solve mathematical problems	uses place value to solve basic mathematical problems	identifies place value from a given range

Criterion 4: use mathematical reasoning to make observations

Standard Element	Rating A	Rating B	Rating C
E01 - Observations	makes plausible observations to solve mathematical problems	makes observations to solve basic mathematical problems	makes observations about basic mathematical problems: there may be some errors
E02 - Mathematical processes	describes why mathematical processes are used to solve a problem.	identifies why mathematical processes are used to solve a problem	identifies why given mathematical processes are used to solve a problem.

Criterion 5: use mathematical strategies to solve problems

Standard Element	Rating A	Rating B	Rating C
E01 - Mathematical strategies	uses a range of given ideas and approaches appropriately to solve a range of problems	uses a range of given ideas and approaches to solve problems	uses limited approaches to solve given problems as directed
E02 - Checks solutions	uses an appropriate method from a given range to check and correct own solutions against given answers	uses an appropriate method from a given range to check own solutions against given answers	uses given methods to check own solutions against given answers

Criterion 6: use mathematical techniques to solve pattern and ratio problems

Standard Element	Rating A	Rating B	Rating C
E01 - Patterns	identifies patterns that follow a rule and use this to predict sequences	identifies patterns that follow a rule and use this to predict sequences as directed	identifies patterns from a given range, that follow a rule

E02 - Rates and ratios	uses rates and ratios in given situations and appropriately compares differences	uses rates and ratios in given situations and compares differences	uses rates and ratios in given situations as directed

Criterion 7: use mathematical techniques to solve data and chance problems

Standard Element	Rating A	Rating B	Rating C
E01 - Display data	uses processes to collect and display a range of data	uses a given process to collect and display data	uses a given process to sort and display given data
E02 - Use data	selects and uses appropriate data to solve basic problems	uses data to solve basic problems	uses given data to solve basic problems as directed
E03 - Chance	describes the likelihood of everyday chance events	identifies the likelihood of everyday chance events	identifies the likelihood of given chance events

Criterion 8: use mathematical techniques to solve measurement and geometry problems

Standard Element	Rating A	Rating B	Rating C
E01 - Units of measurement	selects, uses and converts between range of units of measurement	uses and converts between given range of units of measurement	uses and converts between given units of measurement as directed
E02 - Shapes, maps and plans	selects and uses shapes, maps or plans to solve a range of basic problems	uses given shapes, maps or plans to solve basic problems	uses given shapes, maps or plans as directed
E03 - Geometric reasoning	selects and uses geometric reasoning to solve a range of basic problems	uses geometric reasoning to solve basic problems	uses geometric reasoning as directed

Qualifications Available

Mathematics Level 1 (with the award of):

EXCEPTIONAL ACHIEVEMENT

HIGH ACHIEVEMENT

COMMENDABLE ACHIEVEMENT

SATISFACTORY ACHIEVEMENT

PRELIMINARY ACHIEVEMENT

Award Requirements

The final award will be determined by the Office of Tasmanian Assessment, Standards and Certification from 8 ratings.

The minimum requirements for an award are as follows:

EXCEPTIONAL ACHIEVEMENT (EA)
6 'A' ratings, 2 'B' ratings

HIGH ACHIEVEMENT (HA)
3 'A' ratings, 4 'B' ratings, 1 'C' rating

COMMENDABLE ACHIEVEMENT (CA)
4 'B' ratings, 3 'C' ratings

SATISFACTORY ACHIEVEMENT (SA)
6 'C' ratings

PRELIMINARY ACHIEVEMENT (PA)
4 'C' ratings

A learner who otherwise achieves the rating for a CA (Commendable Achievement) or SA (Satisfactory Achievement) award but who fails to show any evidence of achievement in one or more criteria ('z' notation) will be issued with a PA (Preliminary Achievement) award.

Course Evaluation

Years 9-12 Learning will develop and regularly review and revise the curriculum. Course evaluation is informed by the experience of the course's implementation, delivery and assessment. More information about course evaluation can be found on the Years 11 and 12 website.

Course Developer

This course has been developed by the Department of Education's Years 9-12 Learning Unit in collaboration with Catholic Education Tasmania and Independent Schools Tasmania.

Accreditation

Accredited on 7 December 2022 for use from 1 January 2023 to 31 December 2027.

Version History

Version 1

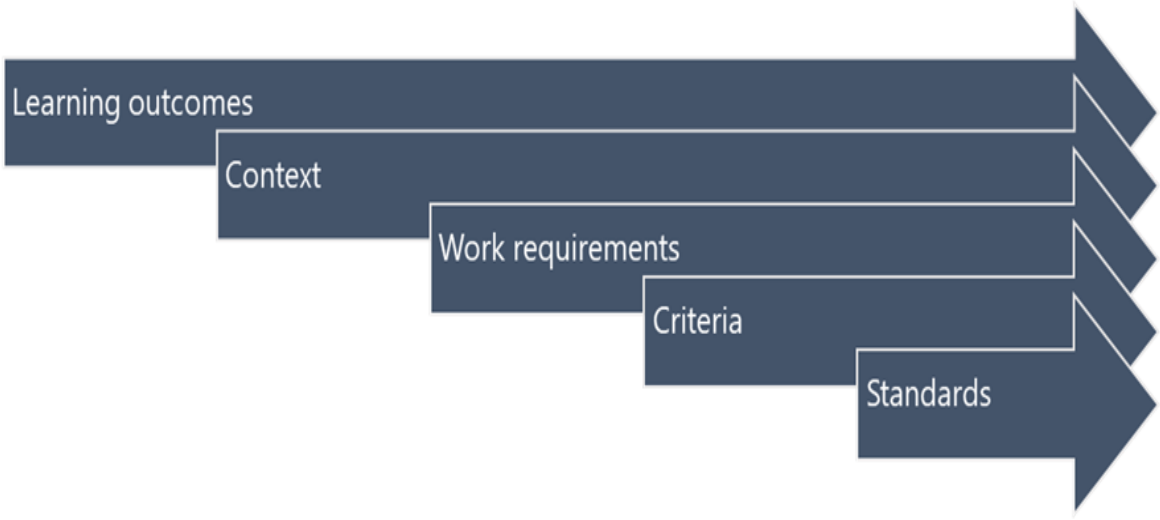
Accredited on 7 December 2022 for use from 1 January 2023 to 31 December 2027. This course replaced *Everyday Maths* Level 1 (MTE110114) which expired on 31 December 2022.

Version 1a

Amendment approved on 26 May 2022. The title of work requirement, mode or format and description sections in Appendix 3 for modules 2 and 3 were swapped to maintain consistency throughout the course document.

Appendix 1 – Line of sight

Line of sight



Learning outcomes	Course content: module	Work requirements: module	Criterion	General capabilities
1. communicate thinking, strategies and solutions using appropriate mathematical or statistical language	1, 2, 3	1, 2, 3	1	Literacy; Numeracy; Critical and creative thinking
2. plan, organise and manage learning to complete tasks and assess progress	1, 2, 3	1, 2, 3	2	Critical and creative thinking; Personal and social capability
3. understand concepts and apply numeric techniques and multiplicative thinking to represent situations and solve problems	1, 2, 3	1, 2, 3	3	Numeracy; Critical and creative thinking
4. apply mathematical reasoning to make inferences, generalise and represent relationships and explain thinking in a range of contexts	1, 2, 3	1, 2, 3	4	Numeracy; Critical and creative thinking
5. act as creative, critical and reflective thinkers to assess ideas and take informed action	1, 2, 3	1, 2, 3	5	Numeracy; Critical and creative thinking; Personal and social capability
6. understand concepts and apply techniques to solve problems and make informed choices in situations involving pattern and algebra	1	1	6	Numeracy; Critical and creative thinking
7. understand concepts and apply techniques to solve problems and make informed choices in situations involving statistics and probability	2	2	7	Numeracy; Critical and creative thinking
8. understand concepts and apply techniques to solve problems and make informed choices in situations involving measurement and geometry	3	3	8	Numeracy; Critical and creative thinking

Appendix 2 – Alignment to curriculum frameworks

Alignment to curriculum framework

Mathematics Level 1aligns with course content contained in:

- Predominantly Level 2, and where deemed necessary to enable access, Level 1 of the Australian Core Skills Framework (ACSF).
- AC: Mathematics Year 3-8.

Appendix 3 – Work requirements

Work requirements

The work requirements of a course are processes, products or performances that provide a significant demonstration of achievement that is measurable against the course's standards. Work requirements need not be the sole form of assessment for a module.

Module 1 work requirements specifications

Work requirement 1 of 1

Title of work requirement: Pattern and algebraic reasoning project

Mode or format: folio of short responses, written question and answer or an oral interview or both, and mathematical calculations or manipulation of materials.

Description: Learners will complete a series of short responses within a project. They will employ a range of mathematical techniques and procedures, problem solving strategies and mathematical reasoning to make informed choices relating to personal situations involving pattern and algebra.

Evidence of mathematical thinking and calculations can be captured through observation or recording of use of manipulatives and learner responses, and discussion can be captured through written, oral or AAC methods as appropriate for the learner. Additionally, where possible, learners should be provided with opportunities to collaborate in pairs or small groups, and should be enabled to engage in mathematical discussion to share ideas, solutions and thinking.

Size: between 6 and 10 responses

Timing: ongoing throughout module.

External agencies: at teacher discretion.

Focus criteria: 1, 2, 3, 4, 5 and 6

Module 2 work requirements specifications

Work requirement 1 of 1

Title of work requirement: Data collection and analysis project

Mode or format: project

Description: Learners will complete a data collection and analysis project where they will employ a range of mathematical techniques and procedures, problem solving strategies and mathematical reasoning, to make informed choices relating to personal situations involving probability and statistics.

Evidence of data collection, organisation and representation can be captured through observation or recording of use of manipulatives, and learner responses and discussion can be captured through written, oral or AAC methods as appropriate for the learner. Additionally, where possible, learners should be provided with opportunities to collaborate in pairs or small groups and should be enabled to engage in mathematical discussion to discuss their data collection process and results.

Size: between 6 and 10 responses

Timing: ongoing throughout module.

External agencies: at teacher discretion.

Focus criteria: 1, 2, 3, 4, 5 and 7

Module 3 work requirements specifications

Work requirement 1 of 1

Title of work requirement: Measurement and geometric reasoning project

Mode or format: folio of short responses, written question and answer or oral interview or both, and mathematical calculations or manipulation of materials.

Description: Learners will complete a series of short responses within a project. They will employ a range of mathematical techniques and procedures, problem solving strategies and mathematical reasoning to make informed choices relating to personal situations involving measurement and geometry.

Evidence of mathematical thinking and calculations can be captured through observation or recording of use of manipulatives and learner responses and discussion can be captured through written, oral or AAC methods as appropriate for the learner. Additionally, where possible, learners should be provided with opportunities to collaborate in pairs, or small groups and enabled to engage in mathematical discussion to share ideas, solutions and thinking.

Size: 10 responses equivalent to 2-3 written sentences each and associated mathematical calculations.

Timing: ongoing throughout module.

External agencies: at teacher discretion.

Focus criteria: 1, 2, 3, 4, 5 and 8

Appendix 4 – General capabilities and cross-curriculum priorities

General capabilities and cross-curriculum priorities

Learning across the curriculum content, including the cross-curriculum priorities and general capabilities, assists students to achieve the broad learning outcomes defined in the *Alice Springs (Mparntwe) Education Declaration* (December 2019).

General capabilities:

The general capabilities play a significant role in the Australian Curriculum in equipping young Australians to live and work successfully in the twenty-first century.

In the Australian Curriculum, capability encompasses knowledge, skills, behaviours and dispositions. Students develop capability when they apply knowledge and skills confidently, effectively and appropriately in complex and changing circumstances, in their learning at school and in their lives outside school.

The general capabilities include:

- Critical and creative thinking
- Ethical understanding
- Information and communication technology capability
- Intercultural understanding
- Literacy
- Numeracy
- Personal and social capability

Cross-curriculum priorities:

Cross-curriculum priorities enable students to develop understanding about and address the contemporary issues they face, for their own benefit and for the benefit of Australia as a whole. The priorities provide national, regional and global dimensions which will enrich the curriculum through development of considered and focused content that fits naturally within learning areas. Incorporation of the priorities will encourage conversations between students, teachers and the wider community.

The cross-curriculum priorities include:

- Aboriginal and Torres Strait Islander histories and cultures
- Asia and Australia's engagement with Asia
- Sustainability

Appendix 5 – Glossary

Glossary

algorithm

An algorithm is a precisely defined routine procedure that can be applied and systematically followed through to a conclusion.

associative operations

Operations are associative if the order in which operations take place does not affect the result.

For example, addition of numbers is associative, since the order in which they are added does not change their sum. The corresponding associative law is: $(a + b) + c = a + (b + c)$ for all numbers a, b and c.

Multiplication is also associative, as the product of the numbers does not vary with the order of their multiplication. The corresponding associative law is: $(ab)c = a(bc)$ for all numbers a, b and c.

Subtraction and division are not associative, as the order of operations changes the value of the expression.

calculate

Determine or find; for example, a number, answer, by using mathematical processes; obtain a numerical answer showing the relevant stages in the working; ascertain or determine from given facts, figures or information.

Cartesian plane

Two intersecting number lines are taken intersecting at right angles at their origins to form the axes of the coordinate system; the plane is divided into four quadrants by these perpendicular axes, called the x-axis, horizontal line and the y-axis (vertical line); the position of any point in the plane can be represented by an ordered pair of numbers, x, y. These ordered pairs are called the coordinates of the point. This is called the Cartesian coordinate system; the plane is called the Cartesian plane.

commutative operations

Operations are commutative if the order in which terms are given does not affect the result.

The commutative law for addition is:

$a + b = b + a$, for all numbers a and b.

For example, 3+5=5+3.

The commutative law for multiplication is: $ab = ba$, for all numbers a and b.

For example, 4×7=7×4.

Subtraction and division are not commutative; for example, 5-3≠3-5 and 12÷4≠4÷12.

distributive law

Multiplication of numbers is said to be 'distributive over addition', because the product of one number with the sum of two others equals the sum of the products of the first number with each of the others.

For example, the product of 3 with (4+5) gives the same result as the sum of 3×4 and 3×5:

3×(4+5)=3×9=27 and 3×4+3×5=12+15=27

This distributive law is expressed algebraically as follows:

$a(b + c) = ab + ac$, for all numbers a, b and c.

equivalence

Two expressions are said to be equivalent if they are equal in value.

Face, shape

Any of the individual flat surfaces of a solid object.

integer

The integers are the "whole numbers" including those with a negative sign ⋯-3, -2, -1, 0, 1, 2, 3⋯. In Latin, the word integer means "whole." The set of integers is usually denoted by Z. Integers are basic building blocks in mathematics.

mean

The arithmetic mean, $\bar{x}$, of a list of numbers is the sum of the data values divided by the number of values in the list.

In everyday language, the arithmetic mean is commonly called the average.

median

The median is the value in a set of ordered set of data values that divides the data into two parts of equal size. When there is an odd number of data values, the median is the middle value. When there is an even number of data values, the median is the arithmetic mean of the two central values.

mode

The mode is the most frequently occurring value in a data set.

order of operations

The order of performing mathematical operations:

1. evaluate brackets or grouping symbols first
2. evaluate any powers and roots
3. working left to right, evaluate any multiplication and division
4. working left to right, evaluate any addition or subtraction, may also be known as BODMAS, BIDMAS, BEDMAS, etc.'

partitioning

Partitioning means dividing a quantity into parts. In early years curriculum, it commonly refers to the ability to think about numbers as made up of two parts, such as, 10 is 8 and 2. In later years it refers to dividing both continuous and discrete quantities into equal parts.

picture graph

A picture graph is a statistical graph for organising and displaying categorical data.

place value

Place value refers to the value of a digit as determined by its position in a number, relative to the ones, or units, place. For integers, the ones place is occupied by the rightmost digit in the number. The value of the next column, the first after the decimal point, represents tenths of ones and this continues with the value of each corresponding digit being representative of a value 10 times smaller than the previous.

For example, in the number 2 594.6 the 4 denotes 4 ones, the 9 denotes 90 ones or 9 tens, the 5 denotes 500 ones or 5 hundreds, the 2 denotes 2000 ones or 2 thousands and the 6 denotes $\frac{6}{10}$ of a one or 6 tenths.

probability

The likelihood or chance of something; the relative frequency of the occurrence of an event as measured by the ratio of the number of cases or alternatives favourable to the event to the total number of cases or alternatives.

range

The range is the difference between the largest and smallest observations in a data set.

rate

A particular kind of ratio in which the two quantities are measured in different units; for example, the ratio of distance to time, known as speed, is a rate because distance and time are measured in different units, such as kilometres and hours; the value of the rate depends on the units in which the quantities are expressed.

ratio

A comparison of two quantities of the same kind; for example, if a recipe uses 2 cups of milk and 3 cups of flour, the ratio of milk to flour is 2 is to 3. This can also be written with a colon, 2:3, or as a fraction, $\frac{2}{3}$.

recurring decimal

Non-terminating decimals may be recurring: that is, contain a pattern of digits that repeats indefinitely after a certain number of places.

reflection

To reflect the point A in an axis of reflection, a line is drawn at right angles to the axis of reflection and the point A is marked at the same distance from the axis of reflection as A, but on the other side.

The point A' is called the reflection image of A.

A reflection is a transformation that moves each point to its reflection image.

sample

Part of a population; a subset of the population, often randomly selected for the purpose of estimating the value of a characteristic of the population as a whole.

sample space

The sample space of a chance experiment is the set of all possible outcomes for that experiment.

sampling

Sampling is the selection of a subset of data from a statistical population. Methods of sampling include:

1. systematic sampling - sample data is selected from a random starting point and using a fixed periodic interval
2. self-selecting sampling - non-probability sampling where individuals volunteer themselves to be part of a sample
3. simple random sampling - sample data is chosen at random where each member has an equal probability of being chosen
4. stratified sampling - after dividing the population into separate groups or strata, a random sample is then taken from each group or strata in an equivalent proportion to the size of that group or strata in the population.

A sample can be used to estimate the characteristics of the statistical population.

scale

A graduated line, as on a map, representing proportionate size.

sketch

Execute a drawing or painting in simple form, giving essential features but not necessarily with detail or accuracy. In mathematics, it means to represent by means of a diagram or graph; the sketch should give a general idea of the required shape or relationship and should include features.

symmetry

A plane figure f has line symmetry in a line m, if the image of f under the reflection in $m$is f itself. The line $m$is called the axis of symmetry.

A plane figure f has rotational symmetry about a point O, if there is a rotation such that the image of f under the rotation is f itself.

terminating decimal

A terminating decimal is a decimal that contains a finite number of digits.

translation

Shifting a figure in the plane without turning it is called translation. To describe a translation in the plane, it is enough to say how far left or right and how far up or down the figure is moved.

A translation is a transformation that moves each point to its translation image.

Appendix 6 - Degree of difficulty of problems

Degree of difficulty of problems

Acknowledgement: The following material has been sourced with approval from the Queensland Curriculum and Assessment Authority curriculum.

Within this course, the degree of difficulty of problems a learner can answer correctly is a defining feature of their understanding. Within the criteria and standards, the expected depth of knowledge is described using the following terms.

Simple familiar

Problems of this degree of difficulty require learners to demonstrate knowledge and understanding of the subject matter and application of skills in a situation where:

- relationships and interactions are obvious and have few elements; and
- all of the information to solve the problem is identifiable; that is
    - the required procedure is clear from the way the problem is posed, or
    - in a context that has been a focus of prior learning.

Complex familiar

Problems of this degree of difficulty require learners to demonstrate knowledge and understanding of the subject matter and application of skills in a situation where:

- relationships and interactions have a number of elements, such that connections are made with subject matter within and/or across the domains of mathematics; and
- all of the information to solve the problem is identifiable; that is
    - the required procedure is clear from the way the problem is posed, or
    - in a context that has been a focus of prior learning.

Some interpretation, clarification and analysis will be required to develop responses.

Complex unfamiliar

Problems of this degree of difficulty require learners to demonstrate knowledge and understanding of the subject matter and application of skills in a situation where:

- relationships and interactions have a number of elements, such that connections are made with subject matter within and/or across the domains of mathematics; and
- all the information to solve the problem is not immediately identifiable; that is
    - the required procedure is not clear from the way the problem is posed, and
    - in a context in which learners have had limited prior experience.

Learners interpret, clarify and analyse problems to develop responses.