

Tables showing which M1 Maths modules relate to each Queensland Years 11-12 Essential Mathematics topic

Unit 1	Topic 1	Topic 2	Topic 3	
Unit 2	Topic 1	Topic 2	Topic 3	
Unit 3	Topic 1	Topic 2	Topic 3	Topic 4
Unit 4	Topic 1	Topic 2	Topic 3	

The syllabus element is in the left column and the relevant module is in the right column.

Fundamental Topic – Calculations	
Calculations	
solve practical problems requiring basic number operations	N1-9 Decimal Operations 1 N2-5 Decimal Operations 2
apply arithmetic operations according to their correct order	N1-7 Order of Operations
ascertain the reasonableness of answers to arithmetic calculations	N1-10 Rounding and Approximation
use leading-digit approximation to obtain estimates of calculations	
use a calculator for multi-step calculations	N1-5 Calculators
check results of calculations for accuracy	N1-10 Rounding and Approximation
recognise the significance of place value after the decimal point	N1-2 Fraction Meaning
evaluate decimal fractions to the required number of decimal places	N1-10 Rounding and Approximation
round up or round down numbers to the required number of decimal places	
apply approximation strategies for calculations	

Unit 1 Topic 1 – Number	
Ratios	
demonstrate an understanding of the fundamental ideas and notation of ratio	N2-4 Ratios
understand the relationship between fractions and ratio	
express a ratio in simplest form using whole numbers	
find the ratio of two quantities in its simplest form	
divide a quantity in a given ratio [complex]	

use ratio to describe simple scales [complex]	G2-1 Maps and Scales
Rates	
review identifying common usage of rates, including km/h	N2-3 Rates
convert between units for rates	
complete calculations with rates, including solving problems involving direct proportion in terms of rate [complex]	
use rates to make comparisons	
use rates to determine costs	
Percentages	
calculate a percentage of a given amount	N2-2 Fractions of Numbers
determine one amount expressed as a percentage of another for same units	
determine one amount expressed as a percentage of another for different units [complex]	
apply percentage increases and decreases in situations, including mark-ups, discounts and GST [complex]	
determine the overall change in a quantity following repeated percentage changes [complex]	
calculate simple interest for different rates and time periods [complex]	N3-2 Simple Interest

Unit 1 Topic 2 – Representing Data

Classifying data	
identify examples of categorical data	S3-4 Data Types
identify examples of numerical data	
Data presentation and interpretation	
display categorical data in tables and column graphs	S1-1 Data Displays 1 S3-2 Data Displays 2
display numerical data as frequency distribution tables, dot plots, stem-and-leaf plots and histograms	
recognise and identify outliers from a dataset	S4-2 Quantiles and Spread
compare the suitability of different methods of data presentation in real-world contexts [complex]	

Unit 1 Topic 3 – Graphs

Reading and interpreting graphs

interpret information presented in graphs, such as step graphs, column graphs, pie graphs, picture graphs, conversion graphs of calories \leftrightarrow kilojoules, line graphs using units of energy to describe consumption of electricity, including kilowatt hours	S1-1 Data Displays 1 S3-2 Data Displays 2
interpret information presented in two-way tables	
discuss and interpret tables and graphs, including misleading graphs found in the media and in factual texts [complex]	S3-3 Critiquing

Drawing graphs

determine which type of graph is best used to display a dataset	
use spreadsheets to tabulate and graph data [complex]	S3-1 Spreadsheets
draw a line graph to represent any data that demonstrates a continuous change, such as hourly temperature [complex]	S1-1 Data Displays 1 S3-2 Data Displays 2

Using graphs

use graphs in practical situations	
interpret graphs in practical situations [complex]	S1-1 Data Displays 1 S3-2 Data Displays 2
draw graphs from given data to represent practical situations [complex]	
interpret the point of intersection and other important features (x - and y -intercepts) of given graphs of two linear functions drawn from practical contexts [complex]	A3-8 Linear Functions A4-3 Simultaneous Equations - Linear

Unit 2 Topic 1 – Managing Money

Earning money

find earnings, including salary, wages, overtime, piece-work and commission	
convert between annual, monthly, fortnightly, weekly and hourly rates of earning [complex]	
understand the purpose of superannuation	
interpret entries on a selection of wage or salary pay slips and timesheets	
understand the purpose of taxation and the use of tax file numbers	
use tax tables to determine PAYG tax for periodic (weekly/fortnightly/monthly) earnings [complex]	
interpret entries on a simple PAYG summary	
apply the concepts of taxable income, gross income, allowable deductions and levies in simple contexts [complex]	

calculate a simple income tax return and net income using current income tax rates [complex]	
Budgeting	
investigate the costs involved in independent living [complex]	
prepare a personal budget plan [complex]	

Unit 2 Topic 2 – Time and Motion	
Time	
use units of time and convert between fractional, decimal and digital representations	
represent time using 12-hour and 24-hour clocks	
calculate time intervals, including time between, time ahead, time behind	M2-2 Time 2
interpret timetables for buses, trains and/or ferries	M1-2 Time 1
use several timetables and/or electronic technologies to plan the most time-efficient routes	
interpret complex timetables, such as tide charts, sunrise charts and moon phases [complex]	
compare the time taken to travel a specific distance with various modes of transport	
Distance	
use scales to find distances, e.g. on maps	G2-1 Maps and Scales
investigate distances through trial and error or systematic methods [complex]	
apply directions to distances calculated on maps including the eight compass points in relation to the rising and setting of the sun: N, NE, E, SE, S, SW, W, NW [complex]	G1-3 Position
Speed	
identify the appropriate units for different activities, e.g. walking, running, swimming, driving and flying	N2-3 Rates
use units of energy used for foods, including calories	
use units of energy to describe the amount of energy in activity, including kilojoules	
calculate speed, distance or time using the formula $\text{speed} = \text{distance} / \text{time}$	N2-3 Rates
calculate the time and costs for a journey from distances estimated from maps, given a travelling speed [complex]	
calculate average speed	C6-2 Velocity Numerically

interpret distance-versus-time graphs, including reference to the steepness of the slope (or average speed) [complex].	C1-1 Velocity Graphically
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Unit 2 Topic 3 – Data Collection

Census	
investigate the procedure for conducting a census	S2-1 Data Collection
investigate the advantages and disadvantages of conducting a census [complex]	
Surveys	
understand the purpose of sampling to provide an estimate of population values when a census is not used	S2-1 Data Collection
investigate the different kinds of samples [complex]	
investigate the advantages and disadvantages of these kinds of samples [complex]	
Simple survey procedure	
identify the target population to be surveyed	S2-1 Data Collection
investigate questionnaire design principles, including simple language, unambiguous questions, consideration of number of choices, issues of privacy and ethics, and freedom from bias [complex]	S2-1 Data Collection S3-3 Critiquing
Sources of bias	
describe the faults in the process of collecting data	S2-1 Data Collection S3-3 Critiquing
describe sources of error in surveys, including sampling error and measurement error	
investigate the possible misrepresentation of the results of a survey due to misunderstanding the procedure or the reliability of generalising the survey findings to the entire population [complex]	S3-3 Critiquing
investigate errors and misrepresentation in surveys, including examples of media misrepresentations of surveys [complex]	

Unit 3 Topic 1 – Measurement

Geometry	
recognise the properties of common two-dimensional geometric shapes, including squares, rectangles and triangles, and three-dimensional solids, including cubes, rectangular-based prisms and triangular-based prisms	G2-3 Properties of Polygons
interpret different forms of two-dimensional representations of three-dimensional objects, including nets of cubes, rectangular-based prisms and triangular-based prisms [complex]	G1-1 Drawings

Linear measure	
use metric units of length (millimetres, centimetres, metres, kilometres), their abbreviations (mm, cm, m, km), conversions between them, and appropriate levels of accuracy and choice of units	M1-1 Dimensions, Size and Mass M1-3 Unit Conversion
estimate lengths	M1-1 Dimensions, Size and Mass
calculate perimeters of familiar shapes, including triangles, squares, rectangles, polygons, circles and arc lengths	M1-4 Length, Area and Volume 1
calculate perimeters of familiar composite shapes [complex]	
Area measure	
use metric units of area (square millimetres, square centimetres, square metres, square kilometres, hectares), their abbreviations (mm^2 , cm^2 , m^2 , km^2 , ha), conversions between them and appropriate choices of units	M1-1 Dimensions, Size and Mass M4-1 Length, Area and Volume 4
estimate the areas of different shapes	M2-3 Length, Area and Volume 2
calculate areas of regular shapes, including triangles, squares, rectangles, parallelograms and circles	
calculate areas of regular shapes, including trapeziums and sectors [complex]	
calculate areas of composite figures by decomposing them into regular shapes [complex]	M3-4 Length, Area and Volume 3
calculate surface areas of familiar prisms, including cubes, rectangular and triangular prisms, spheres and cylinders [complex]	M2-3 Length, Area and Volume 2 M4-1 Length, Area and Volume 4
calculate surface areas of familiar pyramids, including rectangular-based and triangular-based pyramids [complex]	M2-3 Length, Area and Volume 2
calculate surface areas of irregular solids [complex]	M4-1 Length, Area and Volume 4
Volume and capacity	
use metric units of volume (cubic millimetres, cubic centimetres, cubic metres), their abbreviations (mm^3 , cm^3 , m^3), conversions between them and appropriate choices of units	M1-1 Dimensions, Size and Mass M4-1 Length, Area and Volume 4
understand and use the relationship between volume and capacity, recognising that $1 \text{ cm}^3 = 1 \text{ mL}$ (millilitre), $1000 \text{ cm}^3 = 1 \text{ L}$ (litre), $1 \text{ m}^3 = 1 \text{ kL}$ (kilolitre), $1000 \text{ kL} = 1 \text{ ML}$ (megalitre)	
estimate volume and capacity of various objects	M1-1 Dimensions, Size and Mass
calculate the volume and capacity of regular objects, including cubes, rectangular and triangular prisms, and cylinders	M1-4 Length, Area and Volume 1 M2-3 Length, Area and Volume 2
calculate the volume and capacity of right pyramids, including square-based and rectangular-based pyramids, and spheres	M4-1 Length, Area and Volume 4

Mass	
use metric units of mass (milligrams, grams, kilograms, metric tonnes), their abbreviations (mg, g, kg, t), conversions between them and appropriate choices of units	M1-1 Dimensions, Size and Mass M1-3 Unit Conversions
estimate the mass of different objects	M1-1 Dimensions, Size and Mass
recognise the need for milligrams	

Unit 3 Topic 2 – Scales, Plans and Models

Interpret scale drawings	
interpret commonly used symbols and abbreviations in scale drawings	G2-1 Maps and Scales
find actual measurements from scale drawings, including lengths, perimeters and areas	G2-1 Maps and Scales M1-4 Length, Area and Volume 1
estimate and compare quantities, materials and costs using actual measurements from scale drawings [complex]	
Creating scale drawings	
understand and apply drawing conventions of scale drawings, including scales in ratio, clear indications of dimensions and clear labelling [complex]	G2-1 Maps and Scales
construct scale drawings by hand and by using software packages [complex]	
Right-angled triangles	
apply Pythagoras' theorem to solve problems for all side lengths using $a^2+b^2=c^2$	M3-1 Pythagoras
apply the tangent, sine and cosine ratios to find unknown angles and sides [complex]	M3-2 Trigonometry
use the concepts of angle of elevation and angle of depression to solve practical problems [complex]	

Unit 3 Topic 3 – Summarising and Comparing Data

Summarising and interpreting data	
identify the mode from a dataset	S1-2 Data Summary
calculate measures of central tendency, the mean and the median from a dataset	
investigate the suitability of measures of central tendency in various real-world contexts [complex]	
investigate the effect of outliers on the mean and the median [complex]	

calculate quartiles from a dataset [complex]	S4-1 Quantiles and Spread
interpret quartiles, deciles and percentiles from a graph [complex]	
use everyday language to describe spread, including spread out, dispersed, tightly packed, clusters, gaps, more/less dense regions, outliers	
calculate and interpret statistical measures of spread, such as the range, interquartile range and standard deviation [complex]	
investigate real-world examples from the media illustrating inappropriate uses of measures of central tendency and spread [complex]	
Comparing datasets	
complete a five-number summary for different datasets	S4-1 Quantiles and Spread
construct box plots using a five-number summary	
compare parallel box plots and back-to-back stem plots for different datasets [complex]	
compare the characteristics of the shape of histograms using symmetry, skewness and bimodality, where applicable [complex]	S6-1 Data Distributions

Unit 4 Topic 1 – Bivariate Graphs

Cartesian plane

demonstrate familiarity with Cartesian coordinates in two dimensions by plotting points on the Cartesian plane	G1-3 Position
generate tables of values for linear functions, including for negative values of x	A1-2 Relations 2 A3-8 Linear Functions
graph linear functions for all values of x with pencil and paper and with graphing software	A3-8 Linear Functions

Bivariate scatter plots

describe the patterns and features of bivariate data	S4-2 Linear Regression
describe the association between two numerical variables in terms of direction (positive/negative), form (linear/non-linear) and strength (strong/moderate/weak)	

Line of best fit

identify the dependent and independent variable	A1-2 Relations 2
find the line of best fit by eye	S4-2 Linear Regression
use technology to find the line of best fit [complex]	
interpret relationships in terms of the variables [complex]	A1-1 Relation 1 S4-2 Linear Regression

use technology to find the correlation coefficient (an indicator of the strength of linear association) [complex]	S4-2 Linear Regression
use the line of best fit to make predictions, both by interpolation and extrapolation [complex]	
recognise the dangers of extrapolation [complex]	
distinguish between causality and correlation through examples [complex]	

Unit 4 Topic 2 – Probability and Relative Frequency

Simulations	
perform simulations of probability experiments using technology	
recognise that the repetition of chance events is likely to produce different results	P1-1 Probability
identify relative frequency as probability	
identify factors that could complicate the simulation of real-world events [complex]	
Simple probabilities	
construct a sample space for an experiment	P2-1 Compound Events
use a sample space to determine the probability of outcomes for an experiment	P1-1 Probability
use arrays or tree diagrams to determine the outcomes and the probabilities for experiments	P2-1 Compound Events P4-1 Complex Probabilities

Unit 4 Topic 3 – Loans and Compound Interest

Compound interest	
review the principles of simple interest through substitution of given values for other pronumerals into a mathematical formula to find the value of the subject of the formula	N3-2 Simple Interest
understand the concept of compound interest as a recurrence relation	N4-1 Compound Interest
consider similar problems involving compounding [complex]	
use technology (online calculator) to calculate the future value of a compound interest loan or investment and the total interest paid or earned	
use technology (spreadsheet) to calculate the future value of a compound interest loan or investment and the total interest paid or earned [complex]	S3-1 Spreadsheets

use technology (online calculator) to compare, numerically and graphically, the growth of simple interest and compound interest loans and investments	N3-2 Simple Interest N4-1 Compound Interest
use technology (spreadsheet) to compare, numerically and graphically, the growth of simple interest and compound interest loans and investments [complex]	S3-1 Spreadsheets
use technology (online calculator) to investigate the effect of the interest rate and the number of compounding periods on the future value of a loan or investment	
use technology (spreadsheet) to investigate the effect of the interest rate and the number of compounding periods on the future value of a loan or investment [complex]	S3-1 Spreadsheets
Reducing balance loans	
understand that reducing balance loans are compound interest loans with periodic repayments	S3-1 Spreadsheets
use technology (online calculator) to model a reducing balance loan	
use technology (spreadsheet) to model a reducing balance loan [complex]	S3-1 Spreadsheets
use technology (online calculator) to investigate the effect of the interest rate and repayment amount on the time taken to repay a loan	
use technology (spreadsheet) to investigate the effect of the interest rate and repayment amount on the time taken to repay a loan [complex]	S3-1 Spreadsheets