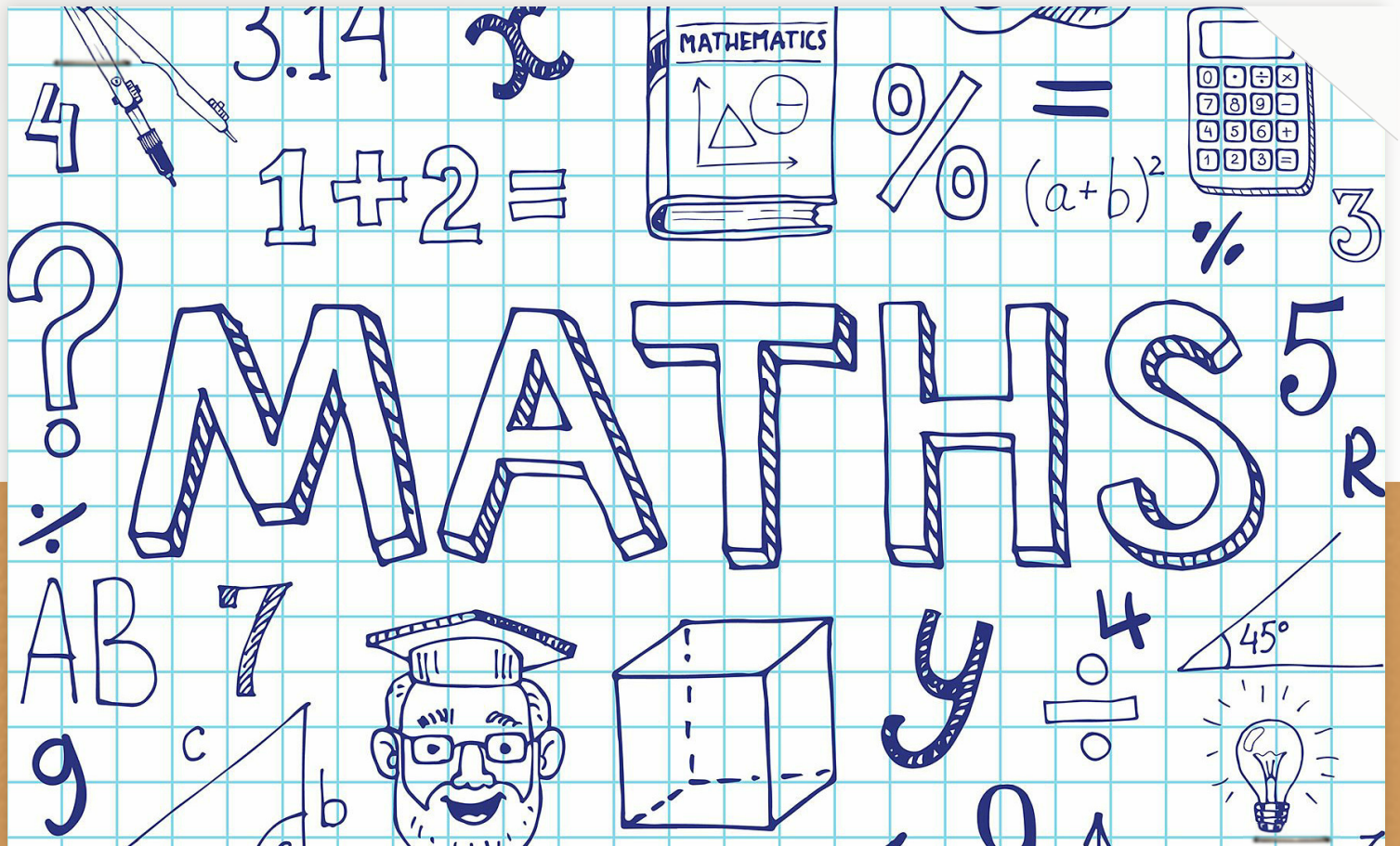


Standard Mathematics

"Not everything that counts can be counted. Not everything that can be counted counts." Albert Einstein



Year 12 Standard 2 Dot Point Booklet

"Arithmetic is being able to count up to twenty without taking off your shoes." Mickey Mouse

"No employment can be managed without arithmetic, no mechanical invention without geometry." Benjamin Franklin

3.14159265358979323846...

Topic: Algebra

Outcomes

A student:

- › uses detailed algebraic and graphical techniques to critically evaluate and construct arguments in a range of familiar and unfamiliar contexts MS2-12-1
- › solves problems by representing the relationships between changing quantities in algebraic and graphical forms MS2-12-6
- › chooses and uses appropriate technology effectively in a range of contexts, and applies critical thinking to recognise appropriate times and methods for such use MS2-12-9
- › uses mathematical argument and reasoning to evaluate conclusions, communicating a position clearly to others and justifying a response MS2-12-10

Related Life Skills outcomes: MALS6-1, MALS6-7, MALS6-8, MALS6-13, MALS6-14


Topic Focus

Algebra involves the use of symbols to represent numbers or quantities and to express relationships. It is an essential tool in problem solving through the solution of equations, graphing of relationships and modelling with functions.

Knowledge of algebra enables the modelling of a problem conceptually so that it is simpler to solve, before returning the solution to its more complex practical form.

Study of algebra is important in developing students' reasoning skills and logical thought processes, as well as their ability to represent and solve problems.

Subtopics

MS-A4: Types of Relationships 

Algebra

MS-A4 Types of Relationships

Outcomes

A student:

- › uses detailed algebraic and graphical techniques to critically evaluate and construct arguments in a range of familiar and unfamiliar contexts MS2-12-1
- › solves problems by representing the relationships between changing quantities in algebraic and graphical forms MS2-12-6
- › chooses and uses appropriate technology effectively in a range of contexts, and applies critical thinking to recognise appropriate times and methods for such use MS2-12-9
- › uses mathematical argument and reasoning to evaluate conclusions, communicating a position clearly to others and justifying a response MS2-12-10

Related Life Skills outcomes: MALS6-1, MALS6-7, MALS6-8, MALS6-13, MALS6-14

Subtopic Focus

The principal focus of this subtopic is the graphing and interpretation of relationships, and the use of simultaneous linear equations in solving practical problems.

Students develop their ability to communicate concisely, use equations to describe and solve practical problems, and use algebraic or graphical representations of relationships to predict future outcomes.

Within this subtopic, schools have the opportunity to identify areas of Stage 5 content which may need to be reviewed to meet the needs of students.

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Content

A4.1: Simultaneous linear equations

Students:

- solve a pair of simultaneous linear equations graphically, by finding the point of intersection between two straight-line graphs, using technology 

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Students:

- develop a pair of simultaneous linear equations to model a practical situation **AAM**   

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Students:

- solve practical problems that involve finding the point of intersection of two straight-line graphs, for example determine and interpret the break-even point of a simple business problem where cost and revenue are represented by linear equations **AAM**  

[illegible]





A4.2: Non-linear relationships

Students:

- use an exponential model to solve problems **AAM**
 - graph and recognise an exponential function in the form $y = a^x$ and $y = a^{-x}$ ($a > 0$) using technology
 - interpret the meaning of the intercepts of an exponential graph in a variety of contexts
 - construct and analyse an exponential model to solve a practical growth or decay problem

[illegible]

Students:

- construct and analyse a quadratic model to solve practical problems involving quadratic functions or expressions of the form $y = ax^2 + bx + c$, for example braking distance against speed **AAM** 
 
 - recognise the shape of a parabola and that it always has a turning point and an axis of symmetry
 - graph a quadratic function using technology 
 - interpret the turning point and intercepts of a parabola in a practical context
 - consider the range of values for x and y for which the quadratic model makes sense in a practical context

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Students:

- recognise that reciprocal functions of the form $y = \frac{k}{x}$, where k is a constant, represent inverse variation, identify the rectangular hyperbolic shape of these graphs and their important features **AAM** 
 - use a reciprocal model to solve practical inverse variation problems algebraically and graphically, eg the amount of pizza received when sharing a pizza between increasing numbers of people

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Topic: Measurement

Outcomes

A student:

- › interprets the results of measurements and calculations and makes judgements about their reasonableness, including the degree of accuracy and the conversion of units where appropriate MS2-12-3
- › analyses two-dimensional and three-dimensional models to solve practical problems MS2-12-4
- › chooses and uses appropriate technology effectively in a range of contexts, and applies critical thinking to recognise appropriate times and methods for such use MS2-12-9
- › uses mathematical argument and reasoning to evaluate conclusions, communicating a position clearly to others and justifying a response MS2-12-10

Related Life Skills outcomes: MALS6-3, MALS6-4, MALS6-13, MALS6-14


Topic Focus

Measurement involves the application of knowledge, skills and understanding of numbers and geometry to quantify and solve problems in practical situations.

Knowledge of measurement enables an understanding of basic daily situations involving rates and ratios, such as speed and the interpretation of maps and plans, effectively in a variety of situations.

Study of measurement is important in developing students' ability to solve problems related to two-dimensional and three-dimensional models and representations and to work effectively with a variety of rates and ratios.

Subtopics

MS-M6: Non-right-angled Trigonometry 

MS-M7: Rates and Ratios

Measurement

MS-M6 Non-right-angled Trigonometry

Outcomes

A student:

- › interprets the results of measurements and calculations and makes judgements about their reasonableness, including the degree of accuracy and the conversion of units where appropriate MS2-12-3
- › analyses two-dimensional and three-dimensional models to solve practical problems MS2-12-4
- › chooses and uses appropriate technology effectively in a range of contexts, and applies critical thinking to recognise appropriate times and methods for such use MS2-12-9
- › uses mathematical argument and reasoning to evaluate conclusions, communicating a position clearly to others and justifying a response MS2-12-10

Related Life Skills outcomes: MALS6-3, MALS6-4, MALS6-13, MALS6-14

Subtopic Focus

The principal focus of this subtopic is to solve problems involving right-angled and non-right-angled triangles in a variety of contexts.

Students develop their ability to justify mathematical thinking and communicate solutions in an ordered and concise fashion.

Within this subtopic, schools have the opportunity to identify areas of Stage 5 content which may need to be reviewed to meet the needs of students.

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Content

Students:

- review and use the trigonometric ratios to find the length of an unknown side or the size of an unknown angle in a right-angled triangle **AAM**

[illegible]

Students:

- determine the area of any triangle, given two sides and an included angle, by using the rule $A = \frac{1}{2}ab\sin C$, and solve related practical problems **AAM** 

[illegible]



Students:

- solve problems involving non-right-angled triangles using the sine rule, $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$ (ambiguous case excluded) and the cosine rule, $c^2 = a^2 + b^2 - 2ab \cos C$ **AAM** 🗑️
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Students:

- understand various navigational methods
 - understand the difference between compass and true bearings
 - investigate navigational methods used by different cultures, including but not limited to those of Aboriginal and Torres Strait Islander Peoples 🗑️ ⚙️
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Students:

- solve practical problems involving Pythagoras’ theorem, the trigonometry of right-angled and non-right-angled triangles, angles of elevation and depression and the use of true bearings and compass bearings **AAM**  
 - work with angles correct to the nearest degree and/or minute

Students:

- construct and interpret compass radial surveys and solve related problems   

Measurement

MS-M7 Rates and Ratios

Outcomes

A student:

- › interprets the results of measurements and calculations and makes judgements about their reasonableness, including the degree of accuracy and the conversion of units where appropriate MS2-12-3
- › analyses two-dimensional and three-dimensional models to solve practical problems MS2-12-4
- › chooses and uses appropriate technology effectively in a range of contexts, and applies critical thinking to recognise appropriate times and methods for such use MS2-12-9
- › uses mathematical argument and reasoning to evaluate conclusions, communicating a position clearly to others and justifying a response MS2-12-10

Related Life Skills outcomes: MALS6-3, MALS6-4, MALS6-13, MALS6-14

Subtopic Focus

The principal focus of this subtopic is the use of rates and ratios to solve problems in practical contexts, including the interpretation of scale drawings.

Students develop awareness of the use of rates and ratios and solve problems in everyday situations, such as health sciences, energy and finance.

Within this subtopic, schools have the opportunity to identify areas of Stage 5 content which may need to be reviewed to meet the needs of students.

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Content

Students:

- use rates to solve and describe practical problems **AAM**
 - use rates to make comparisons, eg using unit prices to compare best buys, working with speed, comparing heart rates after exercise and considering target heart rate ranges during training ⚙️💻🏃
 - know that a watt (W) is the International System of Units (SI) derived unit of power and is equal to one joule per second
 - interpret the energy rating of household appliances and compare running costs of different models of the same type of appliance, considering costs of domestic electricity, eg calculate the cost of running a 200-watt television for six hours if the average peak rate for domestic electricity is \$0.15/kWh ⚡
 - investigate local council requirements for energy-efficient housing ⚡
 - calculate the amount of fuel used on a trip, given the fuel consumption rate, and compare fuel consumption statistics for various vehicles

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Students:

- solve practical problems involving ratio, for example map scales, mixtures for building materials or cost per item **AAM** ⚙️💻
 - work with ratio to express a ratio in simplest form, to find the ratio of two quantities and to divide a quantity in a given ratio
 - use ratio to describe map scales

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Students:

- obtain measurements from scale drawings, including but not limited to maps (including cultural mappings or models) or building plans, to solve problems **AAM** 🖐️⚙️
 - interpret commonly used symbols and abbreviations on building plans and elevation views 🏠
 - calculate the perimeter or area of a section of land, using the Trapezoidal rule where appropriate, from a variety of sources, including but not limited to a site plan, an aerial photograph, radial surveys or maps that include a scale 📐
 - calculate the volume of rainfall over an area, using $V = Ah$, from a variety of sources, including but not limited to a site plan, an aerial photograph, radial surveys or maps that include a scale 📐

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Topic: Financial Mathematics

Outcomes

A student:

- › makes informed decisions about financial situations, including annuities and loan repayments MS2-12-5
- › chooses and uses appropriate technology effectively in a range of contexts, and applies critical thinking to recognise appropriate times and methods for such use MS2-12-9
- › uses mathematical argument and reasoning to evaluate conclusions, communicating a position clearly to others and justifying a response MS2-12-10

Related Life Skills outcomes: MALS6-5, MALS6-6, MALS6-13, MALS6-14

Topic Focus


Financial Mathematics involves the application of knowledge, skills and understanding of numbers to earning, spending, investing, saving and borrowing money.

Knowledge of financial mathematics enables students to analyse different financial situations, to calculate the best options for given circumstances, and to solve financial problems.

Study of financial mathematics is important in developing students' ability to make informed financial decisions, to be aware of the consequences of such decisions, and to manage personal financial resources effectively.

Subtopics

MS-F4: Investments and Loans 

MS-F5: Annuities 

Financial Mathematics

MS-F4 Investments and Loans

Outcomes

A student:

- › makes informed decisions about financial situations, including annuities and loan repayments MS2-12-5
- › chooses and uses appropriate technology effectively in a range of contexts, and applies critical thinking to recognise appropriate times and methods for such use MS2-12-9
- › uses mathematical argument and reasoning to evaluate conclusions, communicating a position clearly to others and justifying a response MS2-12-10

Related Life Skills outcomes: MALS6-5, MALS6-6, MALS6-13, MALS6-14

Subtopic Focus

The principal focus of this subtopic is to calculate and compare the value of different types of investments, including shares, over a period of time and to gain an understanding of reducing balance loans and that an asset may depreciate in value over time rather than appreciate.

Students develop awareness of mechanisms to optimise their financial position, both now and into the future, justifying their thinking and reasoning mathematically.

Within this subtopic, schools have the opportunity to identify areas of Stage 5 content which may need to be reviewed to meet the needs of students.

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Content

F4.1: Investments

Students:

- calculate the future value (FV) or present value (PV) and the interest rate (r) of a compound interest investment using the formula $FV = PV(1 + r)^n$ 
- compare the growth of simple interest and compound interest investments numerically and graphically, linking graphs to linear and exponential modelling using technology 
- investigate the effect of varying the interest rate, the term or the compounding period on the future value of an investment, using technology 
- compare and contrast different investment strategies, performing appropriate calculations when needed 

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Students:

- solve practical problems involving compounding, for example determine the impact of inflation on prices and wages **AAM** 

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Students:

- work with shares and calculate the appreciated value of items, for example antiques **AAM**  
 - record and graph the price of a share over time
 - calculate the dividend paid on a portfolio of shares, and the dividend yield (excluding franked dividends)

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F4.2: Depreciation and loans

Students:

- calculate the depreciation of an asset using the declining-balance method using the formula $S = V_0(1 - r)^n$, where S is the salvage value of the asset after n periods, V_0 is the initial value of the asset, r is the depreciation rate per period, expressed as a decimal, and n is the number of periods, as an application of the compound interest formula **AAM** 

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Students:

- solve practical problems involving reducing balance loans, for example determining the total loan amount and monthly repayments **AAM**   

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Students:

- recognise credit cards as an example of a reducing balance loan and solve practical problems relating to credit cards **AAM**
 - identify the various fees and charges associated with credit card usage  
 - compare credit card interest rates with interest rates for other loan types 
 - interpret credit card statements, recognising the implications of only making the minimum payment  
 - understand what is meant by an interest-free period
 - calculate the compounding interest charged on a retail purchase, transaction or the outstanding balance for a given number of days, using technology or otherwise 

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Financial Mathematics

MS-F5 Annuities

Outcomes

A student:

- › makes informed decisions about financial situations, including annuities and loan repayments MS2-12-5
- › chooses and uses appropriate technology effectively in a range of contexts, and applies critical thinking to recognise appropriate times and methods for such use MS2-12-9
- › uses mathematical argument and reasoning to evaluate conclusions, communicating a position clearly to others and justifying a response MS2-12-10

Related Life Skills outcomes: MALS6-5, MALS6-6, MALS6-13, MALS6-14

Subtopic Focus

The principal focus of this subtopic is the nature and mathematics of annuities, the processes by which they accrue, and ways of optimising their value as an investment.

Students develop awareness of the use of annuities in their lives, for example superannuation and home loans.

Within this subtopic, schools have the opportunity to identify areas of Stage 5 content which may need to be reviewed to meet the needs of students.

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Content

Students:

- solve compound interest related problems involving financial decisions, for example a home loan, a savings account, a car loan or an annuity **AAM**     
- identify an annuity as an investment account with regular, equal contributions and interest compounding at the end of each period, or as a single sum investment from which regular, equal withdrawals are made 
- using technology, model an annuity as a recurrence relation, and investigate (numerically or graphically) the effect of varying the amount and frequency of each contribution, the interest rate or the payment amount on the duration and/or future value of the annuity 
- use a table of future value interest factors to perform annuity calculations, eg calculating the future value of an annuity, the contribution amount required to achieve a given future value or the single sum that would produce the same future value as a given annuity   

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Topic: Statistical Analysis

Outcomes

A student:

- › analyses representations of data in order to make inferences, predictions and draw conclusions MS2-12-2
- › solves problems requiring statistical processes, including the use of the normal the correlation of bivariate data MS2-12-7
- › chooses and uses appropriate technology effectively in a range of contexts, and applies critical thinking to recognise appropriate times and methods for such use MS2-12-9
- › uses mathematical argument and reasoning to evaluate conclusions, communicating a position clearly to others and justifying a response MS2-12-10

Related Life Skills outcomes: MALS6-2, MALS6-9, MALS6-13, MALS6-14

Topic Focus


Statistical Analysis involves the collection, display, analysis and interpretation of data to identify and communicate key information.

Knowledge of statistical analysis enables the careful interpretation of situations and raises awareness of contributing factors when presented with information by third parties, including the possible misrepresentation of information.

Study of statistical analysis is important in developing students' understanding of how conclusions drawn from data can be used to inform decisions made by groups, such as scientific investigators, business people and policy-makers.

Subtopics

MS-S4: Bivariate Data Analysis 

MS-S5: The Normal Distribution 

Statistical Analysis

MS-S4 Bivariate Data Analysis

Outcomes

A student:

- › analyses representations of data in order to make inferences, predictions and draw conclusions MS2-12-2
- › solves problems requiring statistical processes, including the use of the normal distribution, and the correlation of bivariate data MS2-12-7
- › chooses and uses appropriate technology effectively in a range of contexts, and applies critical thinking to recognise appropriate times and methods for such use MS2-12-9
- › uses mathematical argument and reasoning to evaluate conclusions, communicating a position clearly to others and justifying a response MS2-12-10

Related Life Skills outcomes: MALS6-2, MALS6-9, MALS6-13, MALS6-14

Subtopic Focus

The principal focus of this subtopic is to introduce students to a variety of methods for identifying, analysing and describing associations between pairs of numerical variables.

Students develop the ability to display, interpret and analyse statistical relationships related to bivariate numerical data analysis and use this ability to make informed decisions.

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Content

Students:

- construct a bivariate scatterplot to identify patterns in the data that suggest the presence of an association (ACMGM052) **AAM** 

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Students:

- use bivariate scatterplots (constructing them when needed) to describe the patterns, features and associations of bivariate datasets, justifying any conclusions **AAM** 
 - describe bivariate datasets in terms of form (linear/non-linear) and, in the case of linear, the direction (positive/negative) and strength of any association (strong/moderate/weak)
 - identify the dependent and independent variables within bivariate datasets where appropriate
 - describe and interpret a variety of bivariate datasets involving two numerical variables using real-world examples from the media or freely available from government or business datasets 
 - calculate and interpret Pearson’s correlation coefficient (r) using technology to quantify the strength of a linear association of a sample (ACMGM054) 

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Students:

- model a linear relationship by fitting an appropriate line of best fit to a scatterplot and using it to describe and quantify associations **AAM** 
 - fit a line of best fit both by eye and by using technology to the data (ACMEM141, ACMEM142) 
 - fit a least-squares regression line to the data using technology 
 - interpret the intercept and gradient of the fitted line (ACMGM059)

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Students:

- use the appropriate line of best fit, both found by eye and by applying the equation, to make predictions by either interpolation or extrapolation 
 - recognise the limitations of interpolation and extrapolation, and interpolate from plotted data to make predictions where appropriate (ACMGM062) 

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Students:

- implement the statistical investigation process to answer questions that involve identifying, analysing and describing associations between two numerical variables **AAM**

[illegible]

Students:

- construct, interpret and analyse scatterplots for bivariate numerical data in practical contexts **AAM**

- demonstrate an awareness of issues of privacy and bias, ethics, and responsiveness to diverse groups and cultures when collecting and using data
- investigate using biometric data obtained by measuring the body or by accessing published data from sources including government organisations, and determine if any associations exist between identified variables 

[illegible]

Statistical Analysis

MS-S5 The Normal Distribution

Outcomes

A student:

- › analyses representations of data in order to make inferences, predictions and draw conclusions MS2-12-2
- › solves problems requiring statistical processes, including the use of the normal distribution, and the correlation of bivariate data MS2-12-7
- › chooses and uses appropriate technology effectively in a range of contexts, and applies critical thinking to recognise appropriate times and methods for such use MS2-12-9
- › uses mathematical argument and reasoning to evaluate conclusions, communicating a position clearly to others and justifying a response MS2-12-10

Related Life Skills outcomes: MALS6-2, MALS6-9, MALS6-13, MALS6-14

Subtopic Focus

The principal focus of this subtopic is to develop an understanding of the properties of the normal distribution and the value of relative measure in the analysis and comparison of datasets arising from random variables that are normally distributed.

Students develop techniques to analyse normally distributed data and make judgements in individual cases justifying the reasonableness of their solutions.

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Content

Students:

- recognise a random variable that is normally distributed, justifying their reasoning, and draw an appropriate 'bell-shaped' frequency distribution curve to represent it 
 - identify that the mean and median are approximately equal for data arising from a random variable that is normally distributed

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Students:

- calculate the z -score (standardised score) corresponding to a particular value in a dataset **AAM** 
 - use the formula $z = \frac{x - \bar{x}}{s}$, where \bar{x} is the mean and s is the standard deviation 
 - describe the z -score as the number of standard deviations a value lies above or below the mean
 - recognise that the set of z -scores for data arising from a random variable that is normally distributed has a mean of 0 and standard deviation of 1

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Students:

- use calculated z -scores to compare scores from different datasets, for example comparing students' subject examination scores **AAM** 0

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Students:

- use collected data to illustrate that, for normally distributed random variables, approximately 68% of data will have z -scores between -1 and 1, approximately 95% of data will have z -scores between -2 and 2 and approximately 99.7% of data will have z -scores between -3 and 3 (known as the empirical rule) 0
 - apply the empirical rule to a variety of problems
 - indicate by shading where results sit within the normal distribution, eg where the top 10% of data lies

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Students:

- use z-scores to identify probabilities of events less or more extreme than a given event **AAM**

Students:

- use z-scores to make judgements related to outcomes of a given event or sets of data **AAM**

Topic: Networks

Outcomes

A student:

- › solves problems using networks to model decision-making in practical problems MS2-12-8
- › chooses and uses appropriate technology effectively in a range of contexts, and applies critical thinking to recognise appropriate times and methods for such use MS2-12-9
- › uses mathematical argument and reasoning to evaluate conclusions, communicating a position clearly to others and justifying a response MS2-12-10

Related Life Skills outcomes: MALS6-11, MALS6-12, MALS6-13, MALS6-14

Topic Focus

Networks involve the graphical representation and modelling of situations as an approach to decision-making processes.

Knowledge of networks enables development of a logical sequence of tasks or a clear understanding of connections between people or items.

Study of networks is important in developing students' ability to interpret a set of connections or sequence of tasks as a concise diagram in order to solve related problems.

Subtopics

MS-N2: Network Concepts

MS-N3: Critical Path Analysis

Networks

MS-N2 Network Concepts

Outcomes

A student:

- › solves problems using networks to model decision-making in practical problems MS2-12-8
- › chooses and uses appropriate technology effectively in a range of contexts, and applies critical thinking to recognise appropriate times and methods for such use MS2-12-9
- › uses mathematical argument and reasoning to evaluate conclusions, communicating a position clearly to others and justifying a response MS2-12-10

Related Life Skills outcomes: MALS6-11, MALS6-12, MALS6-13, MALS6-14

Subtopic Focus

The principal focus of this subtopic is to identify and use network terminology and to solve problems involving networks.



Students develop their awareness of the applicability of networks throughout their lives, for example social media networks, and their ability to use associated techniques to optimise practical problems.

This image shows a full page of white paper with horizontal dotted lines, typical of primary school writing paper. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Content

N2.1: Networks

Students:

- identify and use network terminology, including vertices, edges, paths, the degree of a vertex, directed networks and weighted edges  

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Students:

- solve problems involving network diagrams **AAM**
 - recognise circumstances in which networks could be used, eg the cost of connecting various locations on a university campus with computer cables   
 - given a map, draw a network to represent the map, eg travel times for the stages of a planned journey 
 - draw a network diagram to represent information given in a table
 - investigate and solve practical problems, eg the Königsberg Bridge problem or planning a garbage bin collection route

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N2.2: Shortest paths

Students:

- determine the minimum spanning tree of a given network with weighted edges **AAM**
 - determine the minimum spanning tree by using Kruskal's or Prim's algorithms or by inspection
 - determine the definition of a tree and a minimum spanning tree for a given network
 - use minimum spanning trees to solve minimal connector problems, eg minimising the length of cable needed to provide power from a single power station to substations in several towns (ACMGM103) 

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Students:

- find a shortest path from one place to another in a network with no more than 10 vertices **AAM** 
 - identify a shortest path on a network diagram
 - recognise a circumstance in which a shortest path is not necessarily the best path or contained in any minimum spanning tree 

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Networks

MS-N3 Critical Path Analysis

Outcomes

A student:

- › solves problems using networks to model decision-making in practical problems MS2-12-8
- › chooses and uses appropriate technology effectively in a range of contexts, and applies critical thinking to recognise appropriate times and methods for such use MS2-12-9
- › uses mathematical argument and reasoning to evaluate conclusions, communicating a position clearly to others and justifying a response MS2-12-10

Related Life Skills outcomes: MALS6-11, MALS6-12, MALS6-13, MALS6-14

Subtopic Focus

The principal focus of this subtopic is to use critical path analysis in the optimisation of real-life problems.

Students develop awareness that critical path analysis is a useful tool in project planning, management and logistics.

[illegible]

Content

Students:

- construct a network to represent the duration and interdependencies of activities that must be completed during a particular project, for example a student schedule, or preparing a meal **AAM**



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Students:

- given activity charts, prepare network diagrams and use critical path analysis to determine the minimum time for a project to be completed **AAM**
 - use forward and backward scanning to determine the earliest starting time (EST) and latest starting time (LST) for each activity in the project (ACMGM105)
 - understand why the EST for an activity could be zero, and in what circumstances it would be greater than zero 
 - calculate float times of non-critical activities (ACMGM108) 
 - understand what is meant by critical path
 - use ESTs and LSTs to locate the critical path(s) for the project (ACMGM106)

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Students:

- solve small-scale network flow problems, including the use of the ‘maximum-flow minimum-cut’ theorem, for example determining the maximum volume of oil that can flow through a network of pipes from an oil storage tank (the source) to a terminal (the sink) (ACMGM109) **AAM**
 - convert information presented in a table into a network diagram
 - determine the flow capacity of a network and whether the flow is sufficient to meet the demand in various contexts

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