



COURSE OUTLINE
MATHEMATICS ESSENTIALS – GENERAL YEAR 11: 2021
UNIT 1 & UNIT 2



Term	Week	Topic and key teaching points	Syllabus content	Assessment
<p>Throughout the unit, students apply the mathematical thinking process to real-world problems</p> <ul style="list-style-type: none"> • interpret the task and gather the key information • identify the mathematics which could help to complete the task • analyse information and data from a variety of sources • apply existing mathematical knowledge and strategies to obtain a solution • verify the reasonableness of the solution • communicate findings in a systematic and concise manner. 				
1	1-3	Basic calculations, percentages and rates	1.1.1 use leading digit approximation to obtain estimates of calculations 1.1.2 check results of calculations for accuracy 1.1.3 understand the meaning and magnitude of numbers involved, including fractions, percentages and the significance of place value after the decimal point 1.1.4 ascertain the reasonableness of answers, in terms of context, to arithmetic calculations 1.1.5 round up or round down answers to the accuracy required, including to the required number of decimal places 1.1.6 choose and use addition, subtraction, multiplication and division, or combinations of these operations, to solve practical problems 1.1.7 apply arithmetic operations according to their correct order 1.1.8 convert between fractions, decimals and percentages, using a calculator when appropriate 1.1.9 evaluate fractions and decimals of quantities to the required number of decimal places; for example, $\frac{3}{4}$ of 250 ml, 0.4 of 3kg 1.1.10 apply approximation strategies for calculations if appropriate 1.1.11 use mental and/or flexible written strategies when appropriate	



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			<p>1.1.12 use a calculator appropriately and efficiently for multi-step calculations.</p> <p>1.1.13 calculate a percentage of a given amount, using mental/written strategies or technology when appropriate</p> <p>1.1.14 determine one amount expressed as a percentage of another</p> <p>1.1.15 apply percentage increases and decreases in situations, for example, mark-ups and discounts and GST.</p>	
1	3	Revision & Test	Basic Calculations, percentages, rates	Test 1 Term1 Week 3
1	4-5	Rates (no inverse proportion).	<p>1.1.16 identify common usage of rates, such as: km/h as a rate to describe speed or beats/minute as a rate describing pulse rate</p> <p>1.1.17 convert units of rates occurring in practical situations to solve problems. For example, 1 tablespoon (bsp.) = 4 teaspoons (tsp) or 1 tbsp = 20 ml (Australia) or 15 ml (US and UK)</p> <p>1.1.18 use rates to make comparisons.</p>	
1	5-6	Using formulas for practical purposes	<p>1.2.1 identify common use of formulas to describe practical relationships between quantities</p> <p>1.2.2 substitute values for the variables in a mathematical formula in given form to calculate the value of the subject of the formula</p>	
1	6	Revision & Test	Rates (no inverse proportion) Using formulas for practical purposes	Test 2 Term1 Week 6
1	7-8	Measurement Linear	<p>1.3.1 choose and use appropriate metric units of length, their abbreviations and conversions between them and appropriate level of accuracy, such as mm for building and other trade contexts, cm for textiles</p> <p>1.3.2 estimate lengths</p> <p>1.3.3 convert between metric units of length and other length units for simple practical purposes, for example, 1 inch = 2.54cm</p>	



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			1.3.4 calculate perimeters of familiar shapes, including: triangles, squares, rectangles and composites of these shapes.	
1	8-9	Area and Mass	1.3.5 choose and use appropriate metric units of area, their abbreviations and conversions between them 1.3.6 estimate the area of different shapes 1.3.7 converts between metric units of area and other area units. 1.3.8 calculate areas of rectangles and triangles, and composites of these shapes. 1.3.9 choose and use appropriate metric units of mass, their abbreviations and conversions between them. 1.3.10 estimate the mass of different objects	
2	1-3	Volume and Capacity	1.3.11 choose and use appropriate metric units of volume, their abbreviations, and conversions between them. 1.3.12 understand the relationship between volume and capacity, recognising that $1 \text{ cm}^3 = 1 \text{ mL}$ and $1 \text{ m}^3 = 1 \text{ kL}$ 1.3.13 estimate volume and capacity of various objects 1.3.14 calculate the volume and capacity of cubes and rectangular and triangular prisms	Practical Application 1 Term2 Week 3 Area, Volume, Capacity
2	4-5	Units of energy	1.3.15 use units of energy to describe consumption of electricity, such as kilowatt hours 1.3.16 use units of energy used for foods, including kilojoules and calories 1.3.17 use units of energy to describe the amount of energy expended during activity 1.3.18 convert from one unit of energy to another, such as calories/kilojoules	



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2	5	Revision & Test	Linear/Area measurement Mass, volume, capacity Units of energy	Test 3 Term 2 Week 5
2	6-7	Graphs: Reading and interpreting graphs	1.4.1 interpret information presented in graphs, such as: conversion graphs, line graphs, step graphs, column graphs and picture graphs 1.4.2 interpret information presented in two-way tables 1.4.3 discuss and interpret graphs found in the media and in factual texts	
2	7-8	Drawing graphs	1.4.4 determine which type of graph is the best one to display a dataset 1.4.5 use spreadsheets to tabulate and graph data 1.4.5 draw a line graph to represent any data that demonstrates a continuous change, such as hourly temperature.	Practical Application 2 Term 2 Week 8 Reading & interpreting graphs



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		<p>Throughout the unit, students apply the mathematical thinking process to real-world problems</p> <ul style="list-style-type: none"> interpret the task and gather the key information identify the mathematics which could help to complete the task analyse information and data from a variety of sources apply existing mathematical knowledge and strategies to obtain a solution verify the reasonableness of the solution communicate findings in a systematic and concise manner. <p>Students apply the statistical investigation process to real-world tasks</p> <ul style="list-style-type: none"> clarify the problem and pose one or more questions that can be answered with data design and implement a plan to collect or obtain appropriate data select and apply appropriate graphical or numerical techniques to analyse the data interpret the results of this analysis and relate the interpretation to the original question communicate findings in a systematic and concise manner. 		
2	9-10	<p>Statistical Investigation Process Part 1: Questions that. Can be answered with secondary data, selecting and applying appropriate graphical techniques to analyse the data, interpret the results of this analysis and relate the interpretation to the original question</p>	<p>Classifying data 2.1.1 identify examples of categorical data 2.1.2 identify examples of numerical data</p> <p>Data presentation and interpretation 2.1.3 display categorical data in tables and column graphs 2.1.4 display numerical data as frequency distributions, dot plots, stem and leaf plots and histograms 2.1.5 recognise and identify outliers compare the suitability of different methods of data presentation in real-world contexts 2.1.6 compare the suitability of different methods of data presentation in real-world contexts.</p>	
2 3	11 1	<p>Statistical Investigation Process Part 2:</p>	<p>Summarising and Interpreting Data</p>	



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			<p>2.1.7 identify the mode and calculate other measures of central tendency, the arithmetic mean and the median, using technology when appropriate</p> <p>2.1.8 investigate the suitability of measures of central tendency in various real-world contexts</p> <p>2.1.9 investigate the effect of outliers on the mean and the median</p> <p>2.1.10 calculate and interpret quartiles</p> <p>2.1.11 use informal ways of describing spread, such as: spread out/dispersed, tightly packed, clusters, gaps, more/less dense regions, outliers</p> <p>2.1.12 interpret statistical measures of spread, such as: the range, interquartile range and standard deviation</p> <p>2.1.13 investigate real-world examples from the media illustrating inappropriate uses, of measures of central tendency and spread.</p>	
3	2	Revision + Test	<p>Classifying data</p> <p>Summarising & interpreting data</p>	<p>Test 4</p> <p>Term 3 Week 2</p>
3	2-3	Comparing data sets	<p>2.1.14 compare back - to - back stem plots for different data sets</p> <p>2.1.15 complete a five-number summary for different data sets</p> <p>2.1.16 construct and interpret box plots using a five- number summary</p> <p>2.1.17 compare the characteristics of the shape of histograms using symmetry, skewness and bimodality.</p>	
3	3-4	Modelling Statistical Process to real world situations which involve secondary data.	<p>Gather & represent data and analyse data, Comparing Data Sets</p> <p>Communicate findings in a systematic and concise manner</p>	<p>Statistical Investigation</p> <p>Term 3 Week 4</p>
3	5-6	Percentages Applications of percentages	<p>2.2.1 review calculating a percentage of a given amount</p> <p>2.2.2 review one amount expressed as a percentage of another</p>	



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			<p>2.2.3 determine the overall change in a quantity following repeated percentage changes; for example, an increase of 10% followed by a decrease of 10%</p> <p>2.2.4 calculate simple interest</p>	
3	6-9	Rates and ratios	<p>2.3.1 identify common use of ratios to express comparisons of quantities in practical situations</p> <p>2.3.2 use diagrams or concrete materials to show simple ratios, such as 1 to 4, 1:1:2</p> <p>2.3.3 understand the relationship between simple fractions, percentages and ratio, for example, a ratio of 1:4 is the same as 20% to 80% or $\frac{1}{5}$ to $\frac{4}{5}$.</p> <p>2.3.4 express a ratio in simplest form</p> <p>2.3.5 determine the ratio of two quantities in context</p> <p>2.3.6 divide a quantity in a given ratio, for example, share \$12 in the ratio 1 to 2</p> <p>2.3.7 use ratio to describe simple scales</p> <p>2.3.8 review identifying common usage of rates, such as km/h</p> <p>2.3.9 convert units for rate; for example, km/h to m/s, mL/min to L/h</p> <p>2.3.10 complete calculations with rates, including solving problems involving direct proportion in terms of rate</p> <p>2.3.11 use rates to make comparisons</p> <p>2.3.12 use rates to determine costs</p>	
3	10	Revision & Test	Percentages, rates and ratios	Test 5 Term 3 Week 10
3 4	10 1	Time and Motion	2.4.1 use of units of time, conversions between units, fractional, digital and decimal representations	



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			<p>2.4.2 represent time using 12 hour and 24 hour clocks</p> <p>2.4.3 calculate time intervals, for example, time between, time ahead, time behind</p> <p>2.4.4 interpret timetables, such as bus, train and ferry timetables</p> <p>2.4.5 use several timetables and electronic technologies to plan the most time-efficient routes</p> <p>2.4.6 interpret complex timetables, such as tide charts, sunrise charts and moon phases</p> <p>2.4.7 compare the time taken to travel a specific distance with various modes of transport.</p>	
4	1-2	Distance and length	<p>2.4.8 use scales to calculate distances and lengths on plans, maps and charts</p> <p>2.4.9 plan routes for practical purposes, accounting for local conditions.</p>	
4	3-5	Speed	<p>2.4.10 identify the appropriate units for different activities, such as walking, running, swimming and flying</p> <p>2.4.11 calculate speed, distance or time using the formula $\text{speed} = \frac{\text{distance}}{\text{time}}$</p> <p>2.4.12 calculate the time or costs for a journey from distances estimated from maps</p> <p>2.4.13 interpret distance versus time graphs</p> <p>2.4.14 calculate and interpret the average speed</p>	Practical Application 2 Time and Motion Term 4 Week 3
4	5	Revision & Test	Time, Distance & Speed	Test 5 Term 4 Week 5

Grade descriptions Year 11 Essential
A grade



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- Interpret the task and choose the maths Identifies information that is concentrated or from multiple sources. Chooses the appropriate mathematics to solve a range of problems in unstructured but familiar situations.
- Apply mathematical knowledge to obtain a solution Applies information and calculates accurate solutions for multi-step problems. Modifies calculated results or conclusions when conditions are changed.
- Interpret and communicate Compares situations and explains or justifies solutions and conclusions to multi-step problems. Uses comprehensive mathematical language and ideas. Links responses to the original question or context.

B grade

- Interpret the task and choose the maths Identifies and links more than one piece of information. Chooses the appropriate mathematics to solve problems in mostly familiar and sometimes unstructured but familiar situations.
- Apply mathematical knowledge to obtain a solution Applies information and calculates mostly accurate solutions for problems with limited steps. Checks calculated results and makes adjustments where necessary.
- Interpret and communicate Expresses or justifies solutions to limited step problems using a range of mathematical language with some link to the original question or context. Mostly includes correct units.

C grade

- Interpret the task and choose the maths Identifies relevant information and chooses the appropriate mathematics to solve a problem in straightforward or familiar situations.
- Apply mathematical knowledge to obtain a solution Applies information and calculates mostly accurate solutions for single step problems. Rounds to specified level or appropriate to familiar, everyday contexts.
- Interpret and communicate Expresses solutions or conclusions to single-step problems using simple mathematical language or a routine statement. Mostly includes correct units in short responses.

D grade

- Interpret the task and choose the maths Identifies relevant information that is narrow in scope or when supported by scaffolding or prompts.
- Apply mathematical knowledge to obtain a solution Applies information from simple tables, graphs and text to answer structured questions that require short calculations or where an example is supplied.
- Interpret and communicate Provides limited evidence of methods or calculations used to answer a familiar problem. Provides some detail with limited use of mathematical language, in interpretation or presenting a conclusion when prompted.

E grade

- Does not meet the requirements of a D grade and/or has completed insufficient assessment tasks to be assigned a higher grade.



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