



Victorian Lesson Plans: Mathematics

Curriculum coverage and suggested level teaching and learning programs for 7-10A

Version 1

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General guidance

Victorian Lesson Plans (VLP) in Mathematics are classroom ready curriculum resources arranged into sequences which can form the core of your teaching and learning program. Sequences align to the Victorian Curriculum 2.0 and illustrate Victorian Teaching and Learning Model 2.0 (VTLM 2.0) practices.

In this guide

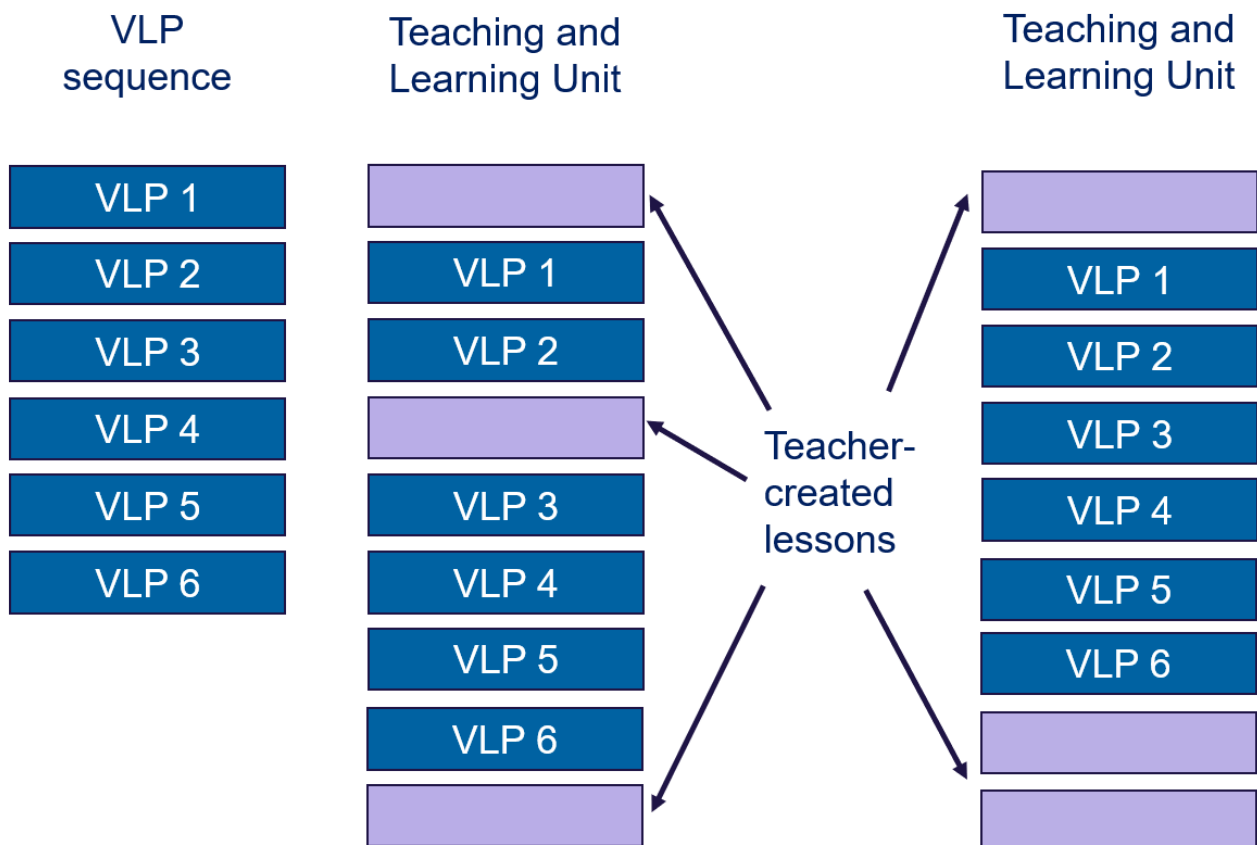
In this document you will find:

- 7-10A curriculum code coverage
- level overviews with curriculum codes
- teaching and learning programs with suggested sequence and retrieval order.

Using Mathematics VLPs including Retrieval Resources

Mathematics VLP sequences are designed to be taught in the specific order presented in the learning programs in this document

Teaching teams are encouraged to add to sequences in a way that suits the needs and context of the school and students. The diagram below illustrates how VLP sequences can be flexibly adapted to form Teaching and Learning Units.

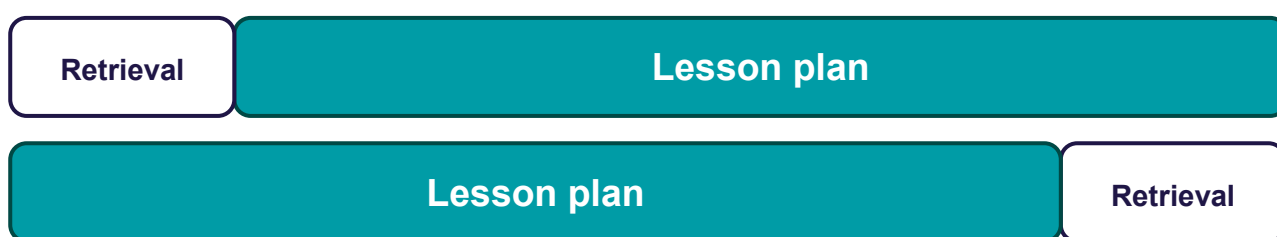


VLP sequences should be complemented by the Retrieval Resources. These support regular review of mathematical concepts and to transfer learning to long-term memory. Each Mathematics Victorian Lesson Plans sequence includes a set of Retrieval Resources.

There are two kinds of Retrieval Resources in the level 7-10A Mathematics VLPs.

- *Lesson Loop* resources provide review of skills and knowledge learned in individual lessons.
- *Mastery Mix* resources are problem-solving activities that draw on a mixture of topics from different sequences.

Mathematics lessons should consist of a short opportunity for retrieval alongside a main lesson or VLP. Retrieval sessions will typically revision knowledge, concepts or skills taught in the prior month, term or year. The sequencing of retrieval in the suggested learning programs illustrates how Retrieval Resources might be organised; however, schools will be best placed to make decisions about the timing and content of retrieval through their collaborative planning processes.



For more information about retrieval practice see:

[VTLM 2.0 - Develop and deliver quality curriculum materials](https://go.vic.gov.au/4iVAKs1) [https://go.vic.gov.au/4iVAKs1]

[VTLM 2.0 - Revisit and review](https://go.vic.gov.au/4pRITB2) [https://go.vic.gov.au/4pRITB2]

7 – 10A curriculum coverage

Level	Number	Algebra	Measurement	Space	Statistics	Probability
7	VC2M7N01 VC2M7N06 VC2M7N02 VC2M7N07 VC2M7N03 VC2M7N08 VC2M7N04 VC2M7N09 VC2M7N05 VC2M7N10	VC2M7A01 VC2M7A02 VC2M7A03 VC2M7A04 VC2M7A05 VC2M7A06	VC2M7M01 VC2M7M02 VC2M7M03 VC2M7M04 VC2M7M05 VC2M7M06	VC2M7SP01 VC2M7SP02 VC2M7SP03 VC2M7SP04	VC2M7ST01 VC2M7ST02 VC2M7ST03	VC2M7P01 VC2M7P02
8	VC2M8N01 VC2M8N02 VC2M8N03 VC2M8N04 VC2M8N05 VC2M8N06	VC2M8A01 VC2M8A02 VC2M8A03 VC2M8A04 VC2M8A05	VC2M8M01 VC2M8M02 VC2M8M03 VC2M8M04 VC2M8M05 VC2M8M06 VC2M8M07	VC2M8SP01 VC2M8SP02 VC2M8SP03 VC2M8SP04	VC2M8ST01 VC2M8ST02 VC2M8ST03 VC2M8ST04	VC2M8P01 VC2M8P02 VC2M8P03
9	VC2M9N01	VC2M9A01 VC2M9A05 VC2M9A02 VC2M9A06 VC2M9A03 VC2M9A07 VC2M9A04	VC2M9M01 VC2M9M02 VC2M9M03 VC2M9M04 VC2M9M05	VC2M9SP01 VC2M9SP02 VC2M9SP03	VC2M9ST01 VC2M9ST02 VC2M9ST03 VC2M9ST04 VC2M9ST05	VC2M9P01 VC2M9P02 VC2M9P03
10	VC2M10N01	VC2M10A01 VC2M10A09 VC2M10A02 VC2M10A10 VC2M10A03 VC2M10A11 VC2M10A04 VC2M10A12 VC2M10A05 VC2M10A13 VC2M10A06 VC2M10A14 VC2M10A07 VC2M10A15 VC2M10A08 VC2M10A16	VC2M10M01 VC2M10M02 VC2M10M03 VC2M10M04	VC2M10SP01 VC2M10SP02	VC2M10ST01 VC2M10ST02 VC2M10ST03 VC2M10ST04 VC2M10ST05	VC2M10P01 VC2M10P02
10A	VC2M10AN01 VC2M10AN02 VC2M10AN03	VC2M10AA01 VC2M10AA06 VC2M10AA02 VC2M10AA07 VC2M10AA03 VC2M10AA08 VC2M10AA04 VC2M10AA09 VC2M10AA05 VC2M10AA10	VC2M10AM01 VC2M10AM02	VC2M10ASP01 VC2M10ASP02 VC2M10ASP03 VC2M10ASP04 VC2M10ASP05 VC2M10ASP06	VC2M10AST01 VC2M10AST02 VC2M10AST03	VC2M10AP01 VC2M10AP02

*Minimal content in VLPs. Schools may choose to expand the coverage of these content descriptions.

Level 7 – Overview

Name	Sequence learning goals	Content descriptions
<u>Integers</u> (Whole numbers)	- Grasping the concept of perfect square numbers, discerning their properties and proficiently identifying them - Comprehending square roots and establishing their definition - Investigating the connection between square roots and perfect square numbers - Grasping prime numbers, exponent notation and methods for determining products of powers of prime numbers	Number VC2M7N01 VC2M7N02
<u>Directed number</u>	- Comparing and ordering integers - Adding and subtracting integers - Estimating and rounding integers to solve problems	Number VC2M7N03 VC2M7N04 VC2M7N08
<u>Rational numbers</u>	- Developing a conceptual understanding of the five constructs of fractions - Converting between representations of fractions, decimal fractions and percentages accurately - Building proficiency in using proportional reasoning to compare and analyse relationships between different quantities - Applying knowledge of fractions, decimals, percentages and ratios to solve real-world problems	Number VC2M7N03 VC2M7N05 VC2M7N06 VC2M7N07 VC2M7N09
<u>Cartesian plane</u>	- Reading, writing and plotting points on Cartesian planes - Plotting polygons on a Cartesian plane - Rotating and translating polygons on a Cartesian plane - Reflecting polygons on a Cartesian plane	Algebra VC2M7A05 Space VC2M7SP03
<u>Variables and rules</u>	- Understanding algebraic vocabulary and conventional algebraic notation - Adding and subtracting linear like terms - Substituting numerical values into algebraic expressions - Solving linear equations using algebraic methods and verifying solutions through substitution - Creating tables of values relating to patterns and algebraic expressions, deriving algebraic formulas to represent patterns and using the formulas to make predictions about the patterns - Formulating algebraic expressions from real-world problems involving linear relations	Algebra VC2M7A01 VC2M7A02 VC2M7A03 VC2M7A05

Name	Sequence learning goals	Content descriptions
<u>Multiplicative thinking</u>	- Exploring multiplication with fraction measures, focusing on visual representations and understanding the concept of multipliers with integers - Developing efficient mental and written strategies for multiplying and dividing fractions, emphasising the importance of understanding fraction relationships - Exploring multiplication with decimal fractions, using visual models and strategies for efficient computation - Devising strategies for dividing decimal fractions, including understanding place value and using the conceptual relationship of multiplicative thinking (times as many) - Exploring multiplicative thinking with Cartesian products, focusing on understanding how combinations are formed and visualising and representing outcomes using tables, tree diagrams and Venn diagrams - Utilising mathematical modelling to solve problems in multiplicative situations	Number VC2M7N05 VC2M7N09 VC2M7N010 Algebra VC2M7A02
<u>Operating with numbers</u>	- Introducing the concept of proportional reasoning and its importance in solving mathematical problems using real-world examples - Exploring addition, subtraction, multiplication and division with integers, focusing on developing efficient strategies and understanding the properties of operations - Utilising the four operations with positive fractions and decimals, emphasising number sense calculation strategies and real-world problem-solving contexts - Exploring proportion using percentage fractions to express one quantity as a percentage of another and applying percentages of quantities to various contexts - Solving problems involving addition and subtraction of integers in everyday contexts such as temperature changes, financial transactions and elevation changes	Number VC2M7N05 VC2M7N07 VC2M7N08 VC2M7N010
<u>Proportional reasoning</u>	- Understanding the concept of proportional reasoning and its significance in solving mathematical problems using real-world examples - Exploring ratios and rates across various contexts, emphasising their connection to proportional reasoning and practical relevance in everyday scenarios - Applying proportional reasoning in solving practical problems related to circle calculations, such as determining circumference based on given diameter or radius ratios - Using mathematical modelling techniques to address real-world problems involving ratios, focusing on developing efficient strategies and grasping the underlying concepts - Utilising rounding and estimation techniques in context-based problems to ensure the reasonableness of solutions, promoting accuracy and practicality in mathematical problem-solving	Number VC2M7N04 VC2M7N09 Measurement VC2M7M03 VC2M7M06

Name	Sequence learning goals	Content descriptions
<u>Variables in context</u>	- Introducing variables and their role in representing unknown quantities, focusing on using substitution in visual and story scenarios - Understanding and describing relationships between variables represented in graphs of functions, identifying and communicating patterns and trends - Exploring how mathematical problems can generate tables of values, establish rules and generate graphs of functions, deepening understanding of algebraic relationships - Using mathematical modelling to explore problems related to approximations of figures and objects, applying algebraic concepts to real-world scenarios	Measurement VC2M7M01 VC2M7M02 VC2M7M04 VC2M7M05 VC2M7M06 Space VC2M7SP01 VC2M7SP02
<u>Polygons and objects</u>	- Extending understanding of the interior angle sum of triangles to other polygons and utilising this knowledge to classify shapes based on their properties - Drawing three-dimensional objects in two dimensions and justifying alternative visual representations to enhance spatial reasoning skills - Identifying and utilising properties of right prisms, establishing the conceptual formula for volume and applying geometric reasoning to solve problems involving rectangular and triangular prisms - Utilising shape and object properties for classification and discussion and applying geometric reasoning to analyse their characteristics and relationships	Algebra VC2M7A01 VC2M7A02 Space VC2M7SP04
<u>Exploring and investigating data</u>	- Exploring data sets and basic statistical terms, focusing on understanding how data is organised and represented - Investigating the nature of the distribution of data sets, including measures of central tendency and dispersion, to make informed decisions - Planning and conducting statistical investigations for issues involving discrete and continuous numerical data, including analysis and interpretation of data - Designing sample spaces for single-stage experiments and assigning probabilities to the possible outcomes, exploring the concept of probability - Explaining the connection between prediction and experiment, understanding how statistical investigations can inform predictions and vice versa	Statistics VC2M7ST01 VC2M7ST02 VC2M7ST03 Probability VC2M7P01

Name	Sequence learning goals	Content descriptions
<u>Probability and simulations</u>	• Exploring statistical literacy and basic concepts, focusing on understanding the importance of data interpretation and analysis • Designing and conducting repeated chance experiments and running simulations with a large number of trials using digital tools, exploring the effect of ratios on the prediction of outcomes • Exploring the concept that tools used for chance have no memory, understanding how past outcomes do not influence future outcomes in random experiments • Connecting probability with statistical interpretation, explaining the differences and the effect of sample size on the outcomes • Using mathematical modelling to design and test simulations, justifying choices and understanding the role of simulations in predicting outcomes	Probability VC2M7P01 VC2M7P02
Minimal content in VLPs. Schools may choose to expand the coverage of these content descriptions:		Algebra VC2M7A04 VC2M7A06

Level 7 - Learning and retrieval program

		Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10
Term 1	Lesson sequence		<u>Integers (Whole numbers)</u>		<u>Directed number</u>		<u>Rational numbers</u>				Consolidation
	Retrieval	<u>Level 6 Multiplicative thinking</u>	<u>Level 6 Multiplicative thinking</u>	<u>Level 6 Integers</u>	<u>Level 6 Cartesian plane</u>	<u>Level 6 Conceptualising fractions</u>	<u>Level 6 Algebraic thinking</u>	<u>Integers (whole numbers)</u>	<u>Rational numbers</u>	<u>Directed number</u>	
Term 2	Lesson sequence	<u>Cartesian plane</u>		<u>Variables and rules</u>				<u>Multiplicative thinking</u>			
	Retrieval	<u>Level 6 Angle properties</u>	<u>Integers (whole numbers)</u>	<u>Rational numbers</u>	<u>Cartesian plane</u>	<u>Directed number</u>	<u>Level 6 Properties of rectangles</u>	<u>Cartesian plane</u>	<u>Rational numbers</u>	<u>Variables and rules</u>	
Term 3	Lesson sequence	<u>Operating with numbers</u>			<u>Proportional reasoning</u>			<u>Variables in context</u>			
	Retrieval	<u>Directed number</u>	<u>Multiplicative thinking</u>	<u>Cartesian plane</u>	<u>Operating with numbers</u>	<u>Multiplicative thinking</u>	<u>Rational numbers</u>	<u>Variables and rules</u>	<u>Proportional reasoning</u>	<u>Level 6 Statistics and probability</u>	
Term 4	Lesson sequence	<u>Polygons and objects</u>			<u>Exploring and investigating data</u>			<u>Probability and simulations</u>			
	Retrieval	<u>Operating with numbers</u>	<u>Variables in context</u>	<u>Directed number</u>	<u>Polygons and objects</u>	<u>Proportional reasoning</u>	<u>Rational numbers</u>	<u>Exploring and investigating data</u>	<u>Variables in context</u>	<u>Cartesian plane</u>	

Minimal content in VLPs. Schools may choose to expand the coverage of these content descriptions.

VC2M7A04 *investigate, interpret and describe relationships between variables represented in graphs of functions developed from authentic data*

VC2M7A06 *manipulate formulas involving several variables using digital tools, and describe the effect of systematic variation in the values of the variables*

Level 8 – Overview

Name	Sequence learning goals	Content descriptions
<u>Operating with rational numbers</u>	- Performing operations with numbers, including positive and negative integers - Developing mental and written strategies for accurate addition and subtraction with positive and negative fractions and decimals, exploring efficient strategies, representations and digital tools where appropriate - Investigating the relationship between fractions and terminating decimals, exploring patterns and recurring decimals - Examining non-terminating decimals and analysing their fractional equivalents or approximations, including repeating and non-repeating patterns - Exploring multiplication and division with rational numbers, employing both mental and written strategies and making estimates to check the reasonableness of computations - Formulating problems based on real-world contexts involving rational numbers and interpreting and communicating solutions in terms of the provided context	Number VC2M8N03 VC2M8N04 VC2M8N06
<u>Comparing proportional quantities</u>	- Solving complex percentage problems involving compound interest, compound growth and percentage error using sophisticated problem-solving strategies - Utilising mathematical modelling to analyse financial scenarios, including profit margins, discounts and revenue optimisation strategies - Investigating rates in multivariate contexts - Comparing and analysing proportional relationships between multiple variables	Number VC2M8N05 VC2M8N06 Measurement VC2M8M05 VC2M8M07
<u>Exponentials and irrational numbers</u>	- Identifying irrational numbers and investigating their properties, including π and the square roots of non-perfect squares - Exploring the basics of exponential functions and index laws and understanding their fundamental properties and relationships - Establishing and applying exponent laws with positive integer exponents, developing skills in simplifying expressions and solving problems - Applying exponent laws with zero exponent to solve problems and understanding the significance of zero in exponential expressions - Solving problems involving irrational numbers and exponent laws such as determining the circumference of a circle, the diagonal of a square and finding the enlargement factor of squares	Number VC2M8N01 VC2M8N02 Measurement VC2M8M03

Name	Sequence learning goals	Content descriptions
<u>Linear functions</u>	- Creating and expanding linear expressions, exploring various techniques to manipulate and simplify them - Exploring methods for factorising and rearranging linear expressions to reveal patterns and relationships - Using the Cartesian plane to graph linear relations and understanding how variables interact and influence the shape of the graph - Developing skills in solving linear equations using both algebraic methods and graphical representations and verifying solutions through substitution - Exploring strategies for solving one-variable inequalities, applying algebraic techniques and verifying solutions to ensure accuracy - Applying mathematical modelling to solve real-world problems involving linear relations, analysing data and making predictions	Algebra VC2M8A01 VC2M8A02 VC2M8A03 VC2M8A05
<u>Pythagoras' theorem</u>	- Introducing Pythagoras' theorem and its significance in finding the missing length in a right-angled triangle - Practising using Pythagoras' theorem to solve problems involving the side lengths of right-angled triangles in simple scenarios - Exploring Pythagorean triples and special right-angled triangles, understanding their properties and applications in problem-solving - Applying Pythagoras' theorem to solve problems involving the perimeter of right-angled triangles and composite shapes - Using Pythagoras' theorem to find the area of right-angled triangles and irregular shapes, applying concepts of length, width and height	Number VC2M8N01 VC2M8N04 Measurement VC2M8M06
<u>Geometric reasoning</u>	- Exploring the conditions for similarity of shapes, including angle–angle (AA) and side–side–side (SSS), and understanding their application in solving similarity problems - Identifying similar shapes based on the angle–angle (AA) condition and the side–side–side (SSS) condition - Applying the conditions of similarity to solve problems involving the identification and comparison of similar shapes - Understanding the concept of scale factor and its relationship to similarity of shapes - Solving real-world problems involving similarity of shapes, applying the concepts of angle–angle (AA) and side–side–side (SSS) similarity conditions	Measurement VC2M8M03 Space VC2M8SP01 VC2M8SP02 VC2M8SP03 VC2M8SP04
<u>Measurement using polygons and circles</u>	- Calculating the perimeter of polygons and composite shapes and occasionally using Pythagoras' theorem while employing both numerical and algebraic solutions - Calculating the area of polygons and composite shapes and occasionally using Pythagoras' theorem while employing both numerical and algebraic solutions - Calculating the perimeter of circles and composite shapes including semicircles and occasionally using Pythagoras' theorem while employing both numerical and algebraic solutions - Calculating the area of circles and composite shapes including semicircles employing both numerical and algebraic solutions - Calculating the perimeter and area of sectors of circles and composite shapes that contain sectors	Measurement VC2M8M01 VC2M8M02 VC2M8M03

Name	Sequence learning goals	Content descriptions
<u>Conducting statistical investigations</u>	- Differentiating between populations and samples and exploring various techniques for collecting data from both primary and secondary sources - Analysing and reporting on the distribution of data obtained from primary and secondary sources using random and non-random sampling techniques and focusing on understanding the characteristics of the data - Comparing variations in distributions and proportions obtained from random samples of the same size drawn from a population and emphasising the effect of sample size on the variability of the data - Investigating sources of error in statistical investigations, examining the concept of bias and analysing the implications of uncertainty in data collection and analysis to foster critical thinking about the reliability of results	Statistics VC2M8ST01 VC2M8ST02 VC2M8ST03 VC2M8ST04
<u>Analysing statistics and probability in context</u>	- Recognising that complementary events have a combined probability of one and utilising this relationship to calculate probabilities in various applied contexts - Determining all possible outcome combinations for two events using two-way tables, tree diagrams and Venn diagrams and applying these to calculate probabilities of specific events in practical situations - Conducting repeated chance experiments and simulations using digital tools to determine probabilities for compound events and describing the results in terms of probability outcomes - Extending understanding of probability modelling by exploring more complex scenarios involving compound events and conditional probabilities and employing covered techniques to solve problems	Probability VC2M8P01 VC2M8P02 VC2M8P03
<u>Financial mathematics</u>	- Analysing real-world financial scenarios, formulating linear equations to represent them and solving them using algebraic techniques - Collecting and reviewing data from different financial contexts, analysing trends and identifying linear relationships using graphical and numerical methods - Using mathematical modelling to predict and analyse profit and loss scenarios in various business contexts and applying linear functions to represent these relationships, including informal notions of simultaneous equations	Algebra VC2M8A02 VC2M8A03 VC2M8A05

Name	Sequence learning goals	Content descriptions
<u>Modelling – proportion and rates</u>	- Introducing the project theme of modelling proportion and rates, allowing students to explore various scenarios involving proportionality in everyday life such as time-distance relationships - Analysing real-world scenarios involving proportionality, formulating linear equations to represent them and solving them using algebraic techniques - Collecting data from different contexts involving proportion and rates, analysing trends and identifying proportional relationships using graphical and numerical methods - Using mathematical modelling to predict and analyse distance and time scenarios such as travel at constant speeds and applying proportional reasoning to represent these relationships	Measurement VC2M8M05 VC2M8M07
	Minimal content in VLPs. Schools may choose to expand the coverage of these content descriptions:	Algebra VC2M8A04 Measurement VC2M8M04

Level 8 – Learning and retrieval program

		Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10
Term 1	Lesson sequence	<u>Operating with rational numbers</u>				<u>Comparing proportional quantities</u>			<u>Exponentials and irrational numbers</u>		
	Retrieval	<u>Level 7 Directed number</u>	<u>Level 7 Rational numbers</u>	<u>Level 7 Multiplicative thinking</u>	<u>Level 7 Proportional reasoning</u>	<u>Level 7 Exploring and investigating data</u>	<u>Level 7 Variables and rules</u>	<u>Level 7 Integers (whole numbers)</u>	<u>Operating with rational numbers</u>	<u>Comparing proportional quantities</u>	
Term 2	Lesson sequence	<u>Linear functions</u>						<u>Pythagoras' theorem</u>			
	Retrieval	<u>Exponentials and irrational numbers</u>	<u>Operating with rational numbers</u>	<u>Level 7 Probability and simulations</u>	<u>Exponentials and irrational numbers</u>	<u>Comparing proportional quantities</u>	<u>Level 7 Polygons and objects</u>	<u>Linear functions</u>	<u>Exponentials and irrational numbers</u>	<u>Linear functions</u>	
Term 3	Lesson sequence	<u>Geometric reasoning</u>			<u>Measurement using polygons and circles</u>			<u>Conducting statistical investigations</u>			
	Retrieval	<u>Pythagoras theorem</u>	<u>Operating with rational numbers</u>	<u>Comparing proportional quantities</u>	<u>Geometric reasoning</u>	<u>Linear functions</u>	<u>Pythagoras theorem</u>	<u>Geometric reasoning</u>	<u>Exponentials and irrational numbers</u>	<u>Measurement using polygons and circles</u>	
Term 4	Lesson sequence	<u>Analysing statistics and probability in context</u>			<u>Financial mathematics</u>			<u>Modelling – proportion and rates</u>			
	Retrieval	<u>Conducting statistical investigations</u>	<u>Measurement using polygons and circles</u>	<u>Geometric reasoning</u>	<u>Linear functions</u>	<u>Analysing statistics and probability in context</u>	<u>Comparing proportional quantities</u>	<u>Financial mathematics</u>	<u>Analysing statistics and probability in context</u>	<u>Financial mathematics</u>	

Consolidation

Minimal content in VLPs. Schools may choose to expand the coverage of these content descriptions.

VC2M8A04 use algorithms and related testing procedures to identify and correct errors

VC2M8M04 solve problems involving time and duration, including using 12- and 24-hour time across multiple time zones

Level 9 – Overview

Name	Sequence learning goals	Content descriptions
<u>Data and statistics</u>	- Representing the distribution of multiple data sets for numerical variables using comparative representations such as back-to-back stem-and-leaf plots and histograms - Comparing data distributions using mean, median and range to describe and interpret numerical data sets with consideration of centre, spread and shape and the effect of outliers on these measures - Analysing survey reports across digital and traditional media, discerning data collection methods for both numerical and categorical variables to estimate population means and medians - Analysing the impact of various sampling methods on survey results and the influence of representation choices on perspectives, supporting different viewpoints - Selecting appropriate forms of data display or visualisation, justifying choices and interpreting displays within specific contexts	Statistics VC2M9ST01 VC2M9ST02 VC2M9ST03 VC2M9ST04 VC2M9ST05
<u>Probability</u>	- Determining all outcomes for two-step chance experiments both with and without replacement using lists, tree diagrams, tables or arrays - Assigning probabilities to outcomes and events - Calculating relative frequencies from given or collected data to estimate probabilities of events involving and, inclusive or and exclusive or - Designing and conducting repeated chance experiments and simulations using digital tools to estimate probabilities that cannot be determined exactly	Probability VC2M9P01 VC2M9P02 VC2M9P03
<u>Probability and statistics in game design</u>	- Using stem-and-leaf plots to analyse data from a decision-making game - Using different sampling methods to identify bias in game design - Analysing and comparing experimental and theoretical probabilities to evaluate fairness and make predictions in games and real-world scenarios - Using tree diagrams and the theory of independent events to solve problems relating to dice outcomes	Statistics VC2M9ST03 Probability VC2M9P02

Name	Sequence learning goals	Content descriptions
<u>Number and exponents</u>	- Solving problems involving real numbers with and without using digital tools - Revising notions of operating with number, including fractions, decimals and percentages - Revising notions of operating with number, including order of operations - Applying the exponent laws to numerical expressions with positive integer exponents and the zero exponent and extending to variables - Solving problems involving very small and very large measurements, timescales and intervals expressed in scientific notation - Calculating and interpreting absolute, relative and percentage errors in measurements	Number VC2M9N01 Algebra VC2M9A01 Measurement VC2M9M02 VC2M9M04
<u>Geometric reasoning</u>	- Applying similarity properties to estimate distance and solve problems involving similar triangles - Proving Pythagoras' theorem using similar triangles - Showing how Thales' theorem can be used to find the centre of a circle - Finding the distance between two distinct points on the Cartesian plane - Explaining the relationship between changes in length, area and volume and determining the length scale factor of similar objects using their area or volume - Determining an unknown length using information about the volume or area of similar objects	Algebra VC2M9A04 VC2M9A05 Measurement VC2M9M01 VC2M9M03 Space VC2M9SP02
<u>Trigonometry</u>	- Modelling $\sin$, $\cos$, $\tan$, $\sin^{-1}$, $\cos^{-1}$ and $\tan^{-1}$ measurement problems using right-angled triangles - Applying the trigonometric ratios and their inverse functions to solve practical problems involving lengths and angles - Identifying combinations of information about angles and side lengths in right-angled triangles - Applying relevant methods involving trigonometry to solve problems modelled by right-angled triangles	Measurement VC2M9M03 Space VC2M9SP01
<u>Linear equations</u>	- Sketching linear graphs of equations in various algebraic forms - Solving linear equations - Finding the gradient of a line segment, the midpoint of the line interval and the distance between two distinct points on the Cartesian plane - Experimenting with the effects of the variation of parameters on graphs of related functions using digital tools, making connections between graphical and algebraic representations and generalising emerging patterns - Calculating the distance and midpoint of a line segment	Algebra VC2M9A03 VC2M9A04 VC2M9A07

Name	Sequence learning goals	Content descriptions
<u>Quadratic functions</u>	- Simplifying algebraic expressions - Applying the distributive law to expand algebraic expressions including binomial products - Factorising monic quadratic expressions - Identifying and graphing quadratic functions - Solving quadratic equations graphically and numerically - Using the null factor law to solve monic quadratic equations with integer roots algebraically using graphing software and digital tools as appropriate	Algebra VC2M9A02 VC2M9A05 VC2M9A07
Minimal content in VLPs. Schools may choose to expand the coverage of these content descriptions:		Algebra VC2M9A06 Measurement VC2M9M05 Space VC2M9SP03

Level 9 – Learning and retrieval program

		Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10
Term 1	Lesson sequence		<u>Data and statistics</u>			<u>Probability</u>			<u>Probability and statistics in game design</u>		Consolidation
	Retrieval	<u>Level 8 Conducting statistical investigations</u>	<u>Level 8 Analysing statistics and probability in context</u>	<u>Level 8 Modelling – Proportion and rates</u>	<u>Level 8 Financial mathematics</u>	<u>Level 8 Analysing statistics and probability in context</u>	<u>Data and statistics</u>	<u>Level 8 Geometric reasoning</u>	<u>Data and statistics</u>	<u>Probability</u>	
Term 2	Lesson sequence		<u>Number and exponents</u>				<u>Linear equations</u>				
	Retrieval	<u>Probability and statistics in game design</u>	<u>Level 8 Exponentials and irrational numbers</u>	<u>Data and statistics</u>	<u>Probability</u>	<u>Level 8 Linear functions</u>	<u>Probability and statistics in game design</u>	<u>Number and exponents</u>	<u>Level 8 Measurement using polygons and circles</u>	<u>Linear equations</u>	
Term 3	Lesson sequence		<u>Quadratic functions</u>								
	Retrieval	<u>Number and exponents</u>	<u>Linear equations</u>	<u>Quadratic functions</u>	<u>Number and exponents</u>	<u>Level 8 Modelling – proportion and rates</u>	<u>Quadratic functions</u>	<u>Level 8 Geometric reasoning</u>	<u>Linear equations</u>	<u>Quadratic functions</u>	
Term 4	Lesson sequence		<u>Geometric reasoning</u>				<u>Trigonometry</u>				
	Retrieval	<u>Level 8 Geometric reasoning</u>	<u>Quadratic functions</u>	<u>Number and exponents</u>	<u>Geometric reasoning</u>	<u>Data and statistics</u>	<u>Geometric reasoning</u>	<u>Probability</u>	<u>Trigonometry</u>	<u>Geometric reasoning</u>	

Minimal content in VLPs. Schools may choose to expand the coverage of these content descriptions.

VC2M9A06 use mathematical modelling to solve applied problems involving change, including financial contexts involving simple interest; formulate problems, choosing to use either linear or quadratic functions or other simple variations; interpret solutions in terms of the context; evaluate the model and report methods and findings

VC2M9M05 use mathematical modelling to solve practical problems involving direct proportion, rates, ratio and scale, including financial contexts; formulate the problems and interpret solutions in terms of the situation; evaluate the model and report methods and findings

VC2M9SP03 design, test and refine algorithms involving a sequence of steps and decisions based on geometric constructions and theorems; discuss and evaluate refinements

Level 10/10A – Overview

Name	Sequence learning goals	Content descriptions
<u>Linear functions – Part A</u>	- Understanding the basic concepts of linear functions, including slope and y-intercept, graphing exercises and applying real-world scenarios - Recognising patterns and establishing connections between variables, constants and linear algebraic rules by examining growing patterns and translating them into linear equations - Demonstrating proficiency in rearranging linear formulas to isolate specific terms and substituting values into equations to solve for unknown quantities - Applying advanced reasoning skills to solve linear equations, including those derived from formulas, through guided practice and challenging problem-solving tasks that deepen comprehension and problem-solving abilities	Algebra VC2M10A05 VC2M10A07 VC2M10A10 VC2M10A12 VC2M10AA03
<u>Linear functions – Part B</u>	- Understanding the concepts of substituting values into formulas and rearranging equations to isolate specific terms to enable effective problem-solving in mathematical contexts - Developing proficiency in sketching linear functions by identifying and interpreting key features such as gradient and y-intercept - Enhancing understanding of sketching linear functions through advanced exploration, including different forms (gradient-intercept form and general form) and incorporating transformations such as translations and reflections - Utilising graphical and algebraic methods to solve linear equations systematically, ensuring comprehensive exploration of all possible solutions and strengthening problem-solving skills - Solving linear inequalities and graphing their solutions	Algebra VC2M10A05 VC2M10A07 VC2M10A08 VC2M10A09 VC2M10AA08 VC2M10AA09
<u>Quadratic fundamentals</u>	- Representing quadratic trinomials in factorised and completed square form - Learning the identities for perfect squares and the difference of squares - Solving quadratic equations using factorisation - Solving quadratic equations by completing the square and using the quadratic formula	Algebra VC2M10A01 VC2M10A04 VC2M10A11 VC2M10A13 VC2M10AA07
<u>Quadratic rules and graphs</u>	- Sketching graphs of quadratic functions from rules in completed square form - Sketching graphs of quadratic functions from rules in factorised and trinomial forms - Determining the key features (orientation, axes intercepts and vertex) of a graph of a quadratic function from its rule - Solving equations related to practical problems involving quadratic functions and their graphs	Algebra VC2M10A05 VC2M10A11 VC2M10A13 VC2M10AA09 Measurement VC2M10AM02

Name	Sequence learning goals	Content descriptions
<u>Functions and relations</u>	- Simplifying and evaluating expressions involving surds and exponents, using exponent laws and solving simple exponential equations - Applying logarithmic scales - Identifying functions and using function notation - Finding the domain and range of functions and relations - Operating on polynomials, including using the remainder and factor theorems to divide and factorise polynomials - Sketching cubic, reciprocal, exponential and circular functions and examining the effect of transformations on these graphs	Algebra VC2M10A02 Number VC2M10A11 VC2M10AN01 VC2M10A14 VC2M10AN02 VC2M10AA01 VC2M10AN03 VC2M10AA05 Measurement VC2M10AA06 VC2M10M02 VC2M10AA10
<u>Building with geometry</u>	- Solving problems involving the surface area and volume of composite objects and applying appropriate units to calculations to reinforce understanding of surface area and volume concepts in geometric contexts - Solving practical problems using Pythagoras' theorem, including scenarios involving direction, angles of elevation and depression, and enhancing proficiency in applying geometric principles to real-world situations - Applying Pythagoras' theorem in three dimensions to solve problems involving surface area and volume, thus extending comprehension of geometric principles into spatial contexts and reinforcing problem-solving skills in three-dimensional geometry - Solving practical problems using Pythagoras' theorem, including problems involving direction, angles of elevation and depression - Applying Pythagoras' theorem in three dimensions to solve problems involving surface area and volume	Measurement VC2M10M01 VC2M10M03 VC2M10AM01 Space VC2M10SP01 VC2M10ASP05
<u>Discoverable networks</u>	- Identifying features of a connected network - Determining equivalence in networks - Modelling networks from given information - Interpreting networks to deduce information - Applying networks to practical problems - Representing connectedness and relationships	Space VC2M10SP02
<u>Probability and decision making</u>	- Exploring the foundational principles of probability through simple one-step probability experiments to establish a solid understanding of probability concepts - Using the technical language of conditional statements, including if then, given, of and knowing that, to analyse common mistakes in interpretation and strengthen comprehension of conditional probability - Describing and analysing the outcomes of more complex two- and three-step chance experiments, considering replacements and independence to deepen understanding of probability and its applications - Exploring the concept of independence in probability, investigating how events may or may not affect each other and how this impacts the calculation of probabilities and enhancing proficiency in probability analysis	Probability VC2M10AP01 VC2M10P01 VC2M10P02

Name	Sequence learning goals	Content descriptions
<u>Investigating statistics</u>	- Analysing data distributions using quartiles, interquartile range and various graphical representations such as boxplots, histograms and dot plots and interpreting the significance of centre, spread, shape and outliers - Constructing, interpreting and drawing conclusions from two-way tables, exploring relationships between categorical variables and enhancing skills in analysing categorical data - Planning and executing statistical investigations involving bivariate data, evaluating findings while considering the limitations of inferences drawn and fostering critical thinking and problem-solving abilities in statistical analysis - Utilising parallel boxplots to compare data distributions across different categories, evaluating centre, spread and outliers to make informed comparisons and draw meaningful conclusions from the data - Exploring different data sets and determining which measure of central tendency, mean or median, is most appropriate for describing the data	Statistics VC2M10ST01 VC2M10ST02 VC2M10ST03 VC2M10ST05 VC2M10AST01 VC2M10AST03
<u>Applying algorithms</u>	- Interpreting and modelling a mathematical problem - Designing and implementing simple algorithms using pseudocode or other general-purpose programming languages - Making and testing simulations using digital tools - Clearly communicating ideas and strategies to others	Algebra VC2M10A06 VC210AA02 Space VC2M10ASP06
<u>Working with exponentials and logarithms</u>	- Evaluating numbers and converting between exponent notation and surd form - Solving logarithmic equations and checking if the solutions are valid - Solving exponential equations - Using logarithm laws - Sketching the graphs of exponential and logarithmic functions - Finding the rule of the inverse graph of a function	Algebra VC2M10A02 VC2M10A11 VC2M10AN01 VC2M10A14 VC2M10AN02 VC2M10AA01 VC2M10AN03 VC2M10AA05 Measurement VC2M10AA06 VC2M10M02 VC2M10AA10
Minimal content in VLPs. Schools may choose to expand the coverage of these content descriptions:		Number VC2M10N01 Algebra VC2M10A03 VC2M10A15 VC2M10A16 Measurement VC2M10M04 Space VC2M10ASP01 VC2M10ASP02 VC2M10ASP03 VC2M10ASP0 Statistics VC2M10ST04 VC2M10AST02 Probability VC2M10AP02

Level 10/10A – Learning and retrieval program

		Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10
Term 1	Lesson sequence	<u>Linear functions – Part A</u>			<u>Linear functions – Part B</u>				<u>Quadratic fundamentals</u>		
	Retrieval	<u>Level 9 Linear equations</u>	<u>Level 9 Number and exponents</u>	<u>Level 9 Quadratic functions</u>	<u>Level 9 Trigonometry</u>	<u>Level 9 Quadratic functions</u>	<u>Linear functions – Part A</u>	<u>Level 9 Geometric reasoning</u>	<u>Level 9 Quadratic functions</u>	<u>Linear functions – Part B</u>	<u>Level 9 Data and statistics</u>
Term 2	Lesson sequence		<u>Quadratic rules and graphs</u>				<u>Functions and relations</u>				
	Retrieval	<u>Quadratic fundamentals</u>	<u>Level 9 Probability</u>	<u>Linear functions – Part A</u>	<u>Level 9 Probability and statistics in game design</u>	<u>Linear functions – Part B</u>	<u>Quadratic rules and graphs</u>	<u>Level 9 Trigonometry</u>	<u>Functions and relations</u>	<u>Quadratic rules and graphs</u>	<u>Functions and relations</u>
Term 3	Lesson sequence	<u>Building with geometry</u>				<u>Applying algorithms</u>			<u>Working with exponentials and logarithms</u>		
	Retrieval	<u>Linear functions – Part A</u>	<u>Functions and relations</u>	<u>Linear functions – Part B</u>	<u>Level 9 Data and statistics</u>	<u>Quadratic fundamentals</u>	<u>Quadratic rules and graphs</u>	<u>Building with geometry</u>	<u>Applying algorithms</u>	<u>Working with exponentials and logarithms</u>	<u>Applying algorithms</u>
Term 4	Lesson sequence	<u>Discoverable networks</u>			<u>Probability and decision making</u>				<u>Investigating statistics</u>		
	Retrieval	<u>Working with exponentials and logarithms</u>	<u>Building with geometry</u>	<u>Level 9 Probability</u>	<u>Discoverable networks</u>	<u>Functions and relations</u>	<u>Quadratic rules and graphs</u>	<u>Probability and decision making</u>	<u>Discoverable networks</u>	<u>Investigating statistics</u>	<u>Probability and decision making</u>

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VC2M10A15 use mathematical modelling to solve applied problems involving inverse proportion, growth and decay, including in financial contexts to establish the compound interest formula as repeated applications of simple interest; formulate problems, choosing to apply linear, quadratic or exponential models; interpret solutions in terms of the situation; evaluate and modify models as necessary and report assumptions, methods and findings

VC2M10A16 solve equations graphically or using systematic numerical guess-check-and-refine with digital tools, with consideration of whether all solutions have been found

VC2M10ASP01 prove and apply relationships between angles and various lines associated with circles (radii, diameters, chords, tangents)

VC2M10ASP02 establish the sine, cosine and area rules for any triangle and solve related problems

VC2M10ASP03 use the unit circle to define the simple trigonometric functions of $y = \sin(x)$, $y = \cos(x)$ and $y = \tan(x)$ as functions of a real variable, and graph them with and without the use of digital tools

VC2M10ASP04 solve simple trigonometric equations

VC2M10N01 recognise the effect of using approximations of real numbers in repeated calculations and compare the results when using exact representations

VC2M10AST02 identify measures of spread, and understand their interpretation and usefulness with respect to different data distributions

VC2M10ST04 analyse claims, inferences and conclusions of statistical reports in the media and other places, by linking claims to displays, statistics and representative data, including ethical considerations and identification of potential sources of bias

VC2M10AP02 investigate reports of studies in digital media and elsewhere for information on their planning and implementation