MINISTRY OF EDUCATION
TE TĀHUHU O TE MĀTAURANGA

Learning Area Whakataukī:

Kei hopu tōu ringa ki te aka tāepa, *engari kia mau ki te aka matua*	*Cling to the main vine, not the loose one*

Big Idea [Process]…	Big Idea [Process]…	Big Idea [Process]…
Critical thinking, and mathematical and statistical generalisations, emerge from te hononga of different observations, knowledges, and processes	Tāiringa kōrero allows for creativity and exploration, and the discovery of mathematical and statistical concepts, theories, and models	In Mathematics and Statistics, wānanga stimulates logical argument, investigation, analysis, and justification, supporting critical evaluation and reasoned conclusions

Big Idea [Knowledge]…	At Curriculum Level 6, students will…				

Numbers, measures, geometric representations, numerical or algebraic expressions, and equations can be represented in multiple ways
 	
 Big Idea [Knowledge]…
 	
 Patterns and relationships can be represented numerically, algebraically, graphically, and geometrically
 	
 Big Idea [Knowledge]…
 	
 Mathematical and statistical methods can be used to explore, solve, or model problems while recognising variation, certainty, and uncertainty
	Number
	
	 • use rates, ratios, and percentages in both directions, including finding an original value
	 • use number knowledge and technology when solving problems
	
	 With algebra
	
	 • use a variety of methods in solving percentage problems, rates, and ratios, such as number strategies, equations, tables, and graphs
	 • use algebra to describe the properties of operations as they apply to rational numbers and exponents, including expanding, factorising, and simplifying
	 • make connections between representations, such as number patterns, spatial patterns, tables, equations, and graphs
	
	 With measurement
	
	 • work with numbers in standard form, and move flexibly between standard form and ordinary form
	 • understand the effect of the accuracy of measurement on subsequent calculations.
		Algebra
		
		 • use algebra and graphing for solving linear equations and inequations
		 • use factorising, graphical relationships, and knowledge of parabolas to solve quadratic equations and inequations
		 • use graphing and algebra for solving simultaneous equations
		 • demonstrate understanding of linear, quadratic, and simple exponential relationships
		 • relate rates of change to the gradient of a graph
		
		 With number
		
		 • use number knowledge, rather than logarithms, for solving exponential equations
		 • identify and use key features of graphs
		
		 With measurement
		
		 • find optimal solutions, which are solutions that maximise or minimise a quantity while meeting the constraints of the situation.
			Geometry
			
			 • identify, describe, or use key features of transformations, including centres and angles of rotation, centres of enlargement, scale factors, lines of symmetry, and vectors
			
			 With number
			
			 • use angle properties to find unknown angles in circles, building on knowledge of both the angle properties of polygons, and intersecting and parallel lines
			 • use properties of similar shapes in solving problems
			
			 With algebra
			
			 • use knowledge of linear expressions to find unknown properties of shapes
			
			 With measurement
			
			 • model objects using 3D shapes.
				Measurement
				
				 With number
				
				 • convert between metric units
				 • find volume(s) of compound prisms, pyramids, cones, and spheres
				 • find the surface area of prisms, pyramids, cones, and spheres
				
				 With geometry
				
				 • use trigonometric ratios and Pythagoras' Theorem to find lengths and angles in 2- and 3- dimensions.
					Statistics & Probability
					
					 With number
					
					 • calculate probabilities in discrete situations, using systematic lists, 2-way tables, and tree diagrams with counts
					 • calculations can include: conditional probability and expected values
					
					 With measurement
					
					 • plan the collection of data. This includes identifying variables, identifying and managing sources of variation
					
					 Statistics and Probability
					
					 • collect and explore data (including summary investigations), selecting appropriate graphs, displays, and summary statistics
					 • analyse features in context for the following investigation types:
					   o comparison: shape, centre, spread.
					   o relationship: trend, direction, strength.
					   o time series: trend, seasonality, variation.
					   o experimental probability: frequencies.
					 • form a conclusion, including telling a story about the wider situation for the following investigation styles:
					   o comparison: inferences about the population from random samples.
					   o relationship: predictions.
					   o time series: predictions.
					   o experimental probability: long-run relative frequency.
					 • evaluate statistical reports in the media by relating the displays, statistics, processes, and probabilities used to the claims made.

Footnote:

- '*Process*' Big Ideas are the epistemic processes relating to how Mathematics and Statistics functions as a discipline.
- '*Knowledge*' Big Ideas includes the knowledge and concepts of Mathematics and Statistics.