

# Years 1 to 10 Mathematics: Beyond Level 6 — Discretionary Learning Outcomes

Number	Patterns and Algebra	Measurement	Chance and Data	Space
<b>Level statements</b>				
<p><i>Students compare, order and classify real numbers, integers and unit fractional powers. They consider the costs associated with saving and spending by referring to schedules of business and government charges and their available income.</i></p> <p><i>Students solve problems that involve calculations with real numbers by selecting from a range of methods and determine rates of change using their own or others' graphs.</i></p>	<p><i>Students use the properties of functions to identify the form and shape of particular families of functions such as linear, quadratic, reciprocal, and exponential. They explain the effects of changing the parameters in these families of functions. They interpret or use the set of possible values of the independent variable to identify the domain of a function and represent that using inequality symbols.</i></p> <p><i>Students solve simultaneous equations and quadratic equations and manipulate expressions involving rational powers.</i></p>	<p><i>Students identify and apply known formulae to assist in solving multistep problems. They apply trigonometric ratios to determine the side lengths and angles of triangles.</i></p>	<p><i>Students design simulations to determine probabilities of situations where direct experimentation is not practical and use addition and multiplication properties.</i></p> <p><i>Students analyse data displayed in graphs and plots and assess any unusual observations in terms of the particular circumstances under which the data was collected. They interpret and convert time and date scales and use this knowledge to experiment with different plots over different timeframes. They identify and interpret variation using histograms and stem and leaf plots.</i></p>	<p><i>Students solve problems related to shapes, lines and angles by referring to known properties. They deduce geometric properties using chains of reasoning and can follow and appreciate the validity and elegance of others' reasoning of similar problems.</i></p> <p><i>Students interpret, draw and analyse simple network diagrams and determine the number of routes, the shortest route and critical paths.</i></p>
<b>Discretionary learning outcomes</b>				
<p><b>Number concepts</b></p> <p><b>N DB6.1a</b> Students interpret and use the various sets of real numbers and integer and unit fractional powers.</p> <p><b>N DB6.1b</b> Students make informed decisions regarding earning, spending and saving money, with reference to schedules of government and business charges.</p>	<p><b>Patterns and functions</b></p> <p><b>PA DB6.1a</b> Students interpret and model trends in data and solve problems by using graphs, formulae and equations.</p> <p><b>PA DB6.1b</b> Students identify and interpret the properties of various families of functions.</p> <p><b>PA DB6.1c</b> Students specify the domain of a function using inequality symbols.</p>	<p><b>Length, mass, area and volume</b></p> <p><b>M DB 6.1a</b> Students use combinations of procedures and formulae to solve multistep problems.</p> <p><b>M DB 6.1b</b> Students apply trigonometric ratios to particular situations involving triangles.</p>	<p><b>Chance</b></p> <p><b>CD DB6.1</b> Students design simulations and use addition and multiplication properties to assist in finding probabilities.</p>	<p><b>Shape and line</b></p> <p><b>S DB6.1</b> Students use deductive reasoning to establish theorems associated with circles and quadrilaterals.</p>
<p><b>Addition and subtraction</b></p> <p><b>N DB6.2</b> Students identify and solve addition and subtraction problems involving real numbers using a range of computation methods and strategies.</p>	<p><b>Equivalence and equations</b></p> <p><b>PA DB6.2</b> Students manipulate expressions and solve equations including simultaneous equations and quadratic equations.</p>	<p><b>Time</b></p> <p>No outcome at this level.</p>	<p><b>Data</b></p> <p><b>CD DB6.2</b> Students interpret box and whisker plots and use them to compare sets of data.</p>	<p><b>Location, direction and movement</b></p> <p><b>S DB6.2</b> Students analyse simple network diagrams to determine optimal pathways in a system.</p>
<p><b>Multiplication and division</b></p> <p><b>N DB6.3a</b> Students multiply and divide rational numbers and calculate rates of change from graphs.</p> <p><b>N DB6.3b</b> Students identify and solve multiplication problems involving real numbers using a range of computation methods and strategies.</p>				