Level description: Year 7

In Year 7, learning in Mathematics builds on each student's prior learning and experiences. Students engage in a range of approaches to learning and doing mathematics that develop their understanding of and fluency with concepts, procedures and processes by making connections, reasoning, problem-solving and practice. Proficiency in mathematics enables students to respond to familiar and unfamiliar situations by employing mathematical strategies to make informed decisions and solve problems efficiently. Students further develop proficiency and positive dispositions towards mathematics and its use as they:

• **extend their understanding of the integer and rational number systems, strengthen their fluency with mental calculation, written algorithms and digital tools ; and routinely consider the reasonableness of results in context**
• **use exponents and exponent notation to consolidate and formalise their understanding of representations of natural numbers , and use these to make conjectures involving natural numbers by experiment with the assistance of digital tools**
• **recognise the use of algebraic expressions and formulas using conventions, notations, symbols and pronumerals. They interpret algebraic expressions and formulas, use substitution to evaluate and determine unknown terms where other values are given, and solve simple equations using a variety of methods**
• **use mathematical modelling to solve practical problems involving rational numbers , ratios and percentages , formulating and making choices about representations, calculation strategies and communicating solutions within the context**
• **use variables , constants, relations and functions to express relationships in real life data and interpret key features of their representation in rules, tables and graphs**
• **extend their knowledge of angles to establish further relationships and apply these when solving measurement and spatial problems**
• **create and use algorithms to classify shapes in the plane and use tools to construct shapes , including two-dimensional representations of prisms and other objects**
• **use coordinates in the Cartesian plane to describe transformations**
• **apply the statistical investigation process to obtain numerical data related to questions of interest, choose displays for the distributions of data and interpret summary statistics for determining the centre and spread of the data in context**
• **conduct probability simulations and experiments involving chance events , construct corresponding sample spaces and observe related frequencies, comparing expected, simulated and experimental results.**

Achievement standard: Year 7

By the end of Year 7, students represent natural numbers in expanded form and as products of prime factors, using exponent notation. They solve problems involving squares of numbers and square roots of perfect square numbers. Students solve problems involving addition and subtraction of integers. They use all 4 operations in calculations involving positive fractions and decimals, choosing efficient calculation strategies. Students choose between equivalent representations of rational numbers and percentages to assist in calculations. They use mathematical modelling to solve practical problems involving rational numbers, percentages and ratios, in financial and other applied contexts, justifying choices of representation. Students use algebraic expressions to represent situations, describe the relationships between variables from authentic data and substitute values into formulas to determine unknown values. They solve linear equations with natural number solutions. Students create tables of values related to algebraic expressions and formulas, and describe the effect of variation.

They apply knowledge of angle relationships and the sum of angles in a triangle to solve problems, giving reasons. Students use formulas for the areas of triangles and parallelograms and the volumes of rectangular and triangular prisms to solve problems. They describe the relationships between the radius, diameter and circumference of a circle. Students classify polygons according to their features and create an algorithm

designed to sort and classify shapes. They represent objects two-dimensionally in different ways, describing the usefulness of these representations. Students use coordinates to describe transformations of points in the plane.

They plan and conduct statistical investigations involving discrete and continuous numerical data, using appropriate displays. Students interpret data in terms of the shape of distribution and summary statistics, identifying possible outliers. They decide which measure of central tendency is most suitable and explain their reasoning. Students list sample spaces for single step experiments, assign probabilities to outcomes and predict relative frequencies for related events. They conduct repeated single-step chance experiments and run simulations using digital tools, giving reasons for differences between predicted and observed results.