	OBJECTIVE	LIFE SKILL	STAGE 4 – YEARS 7 & 8	STAGE 5 – YEARS 9 & 10		
				5.1	5.2	5.3
WORKING MATHEMATICALLY	Students develop understanding and fluency in mathematics through inquiry, exploring and connecting mathematical concepts, choosing and applying problem-solving skills and mathematical techniques, communication and reasoning	**COMMUNICATING** • MALS-1WM responds to and uses mathematical language to demonstrate understanding	MA4-1WM communicates and connects mathematical ideas using appropriate terminology, diagrams and symbols	MA5.1-1WM uses appropriate terminology, diagrams and symbols in mathematical contexts	MA5.2-1WM selects appropriate notations and conventions to communicate mathematical ideas and solutions	MA5.3-1WM uses and interprets formal definitions and generalisations when explaining solutions and/or conjectures
		PROBLEM SOLVING • MALS-2WM applies mathematical strategies to solve problems	MA4-2WM applies appropriate mathematical techniques to solve problems	MA5.1-2WM selects and uses appropriate strategies to solve problems	MA5.2-2WM interprets mathematical or real-life situations, systematically applying appropriate strategies to solve problems	MA5.3-2WM generalises mathematical ideas and techniques to analyse and solve problems efficiently
		REASONING • MALS-3WM uses reasoning to recognise mathematical relationships	MA4-3WM recognises and explains mathematical relationships using reasoning	MA5.1-3WM provides reasoning to support conclusions that are appropriate to the context	MA5.2-3WM constructs arguments to prove and justify results	MA5.3-3WM uses deductive reasoning in presenting arguments and formal proofs
NUMBER & ALGEBRA	Students develop efficient strategies for numerical calculation, recognise patterns, describe relationships and apply algebraic techniques and generalisation	**COMPUTATION WITH INTEGERS** • MALS-4NA recognises language used to represent number • MALS-5NA counts in familiar contexts • MALS-6NA reads and represents numbers • MALS-7NA compares and orders numbers • MALS-10NA selects and uses strategies for addition and subtraction • MALS-11NA selects and uses strategies for multiplication and division	MA4-4NA compares, orders and calculates with integers, applying a range of strategies to aid computation			
		FRACTIONS, DECIMALS AND PERCENTAGES • MALS-8NA recognises and compares fractions in everyday contexts • MALS-9NA represents and operates with fractions, decimals or percentages in everyday contexts	MA4-5NA operates with fractions, decimals and percentages			
		FINANCIAL MATHEMATICS • MALS-12NA recognises and matches coins and notes • MALS-13NA compares and orders coins and notes • MALS-14NA reads and writes amounts of money • MALS-15NA calculates with money • MALS-16NA makes informed decisions about purchasing goods and services • MALS-17NA plans and manages personal finances	MA4-6NA solves financial problems involving purchasing goods	MA5.1-4NA solves financial problems involving earning, spending and investing money	MA5.2-4NA solves financial problems involving compound interest	
		RATIOS AND RATES • MALS-19NA calculates missing values by completing simple number sentences	MA4-7NA operates with ratios and rates, and explores their graphical representation		MA5.2-5NA recognises direct and indirect proportion, and solves problems involving direct proportion	MA5.3-4NA draws, interprets and analyses graphs of physical phenomena
		ALGEBRAIC TECHNIQUES • MALS-18NA recognises and continues repeating patterns	MA4-8NA generalises number properties to operate with algebraic expressions		MA5.2-6NA simplifies algebraic fractions, and expands and factorises quadratic expressions	MA5.3-5NA selects and applies appropriate algebraic techniques to operate with algebraic expressions
		INDICES	MA4-9NA operates with positive-integer and zero indices of numerical bases	MA5.1-5NA operates with algebraic expressions involving positive-integer and zero indices, and establishes the meaning of negative indices for numerical bases	MA5.2-7NA applies index laws to operate with algebraic expressions involving integer indices	MA5.3-6NA performs operations with surds and indices
		EQUATIONS • MALS-19NA calculates missing values by completing simple number sentences	MA4-10NA uses algebraic techniques to solve simple linear and quadratic equations		MA5.2-8NA solves linear and simple quadratic equations, linear inequalities and linear simultaneous equations, using analytical and graphical techniques	MA5.3-7NA solves complex linear, quadratic, simple cubic and simultaneous equations, and rearranges literal equations
		LINEAR RELATIONSHIPS • MALS-32MG responds to and uses the language of position in everyday contexts • MALS-33MG recognises that maps and plans are a representation of positions in space • MALS-34MG uses maps and plans in a range of contexts	MA4-11NA creates and displays number patterns; graphs and analyses linear relationships; and performs transformations on the Cartesian plane	MA5.1-6NA determines the midpoint, gradient and length of an interval, and graphs linear relationships	MA5.2-9NA uses the gradient-intercept form to interpret and graph linear relationships	MA5.3-8NA uses formulas to find midpoint, gradient and distance on the Cartesian plane, and applies standard forms of the equation of a straight line
		NON-LINEAR RELATIONSHIPS		MA5.1-7NA graphs simple non-linear relationships	MA5.2-10NA connects algebraic and graphical representations of simple non-linear relationships	MA5.3-9NA sketches and interprets a variety of non- linear relationships
		POLYNOMIALS				MA5.3-10NA recognises, describes and sketches polynomials, and applies the factor and remainder theorems to solve problems
		LOGARITHMS				MA5.3-11NA uses the definition of a logarithm to establish and apply the laws of logarithms
		FUNCTIONS AND OTHER GRAPHS				MA5.3-12NA uses function notation to describe and sketch functions
MEASUREMENT & GEOMETRY	Students identify, visualise and quantify measures and the attributes of shapes and objects, and explore measurement concepts and geometric relationships, applying formulas, strategies and geometric reasoning in the solution of problems	**LENGTH** • MALS-25MG estimates and measures in everyday contexts • MALS-26MG recognises and uses units to estimate and measure length	MA4-12MG calculates the perimeters of plane shapes and the circumferences of circles			
		AREA • MALS-29MG applies formal units to estimate and calculate area	MA4-13MG uses formulas to calculate the areas of quadrilaterals and circles, and converts between units of area	MA5.1-8MG calculates the areas of composite shapes, and the surface areas of rectangular and triangular prisms	MA5.2-11MG calculates the surface areas of right prisms, cylinders and related composite solids	MA5.3-13MG applies formulas to find the surface areas of right pyramids, right cones, spheres and related composite solids
		VOLUME • MALS-28MG selects and uses units to estimate and measure volume and capacity • MALS-30MG recognises, matches and sorts three-dimensional objects and/or two-dimensional shapes • MALS-31MG identifies the features of three-dimensional objects and/or two-dimensional shapes and applies these in a range of contexts	MA4-14MG uses formulas to calculate the volumes of prisms and cylinders, and converts between units of volume		MA5.2-12MG applies formulas to calculate the volumes of composite solids composed of right prisms and cylinders	MA5.3-14MG applies formulas to find the volumes of right pyramids, right cones, spheres and related composite solids
		TIME • MALS-20MG recognises time in familiar contexts • MALS-21MG recognises and relates time in a range of contexts • MALS-22MG reads and interprets time in a variety of situations • MALS-23MG calculates and measures time and duration in everyday contexts • MALS-24MG organises personal time and manages scheduled activities	MA4-15MG performs calculations of time that involve mixed units, and interprets time zones	MA5.1-9MG interprets very small and very large units of measurement, uses scientific notation, and rounds to significant figures		
		RIGHT-ANGLED TRIANGLES AND TRIGONOMETRY	MA4-16MG applies Pythagoras' theorem to calculate side lengths in right-angled triangles, and solves related problems	MA5.1-10MG applies trigonometry, given diagrams, to solve problems, including problems involving angles of elevation and depression	MA5.2-13MG applies trigonometry to solve problems, including problems involving bearings	MA5.3-15MG applies Pythagoras' theorem, trigonometric relationships, the sine rule, the cosine rule and the area rule to solve problems, including problems involving three dimensions
		PROPERTIES OF GEOMETRICAL FIGURES • MALS-30MG recognises, matches and sorts three-dimensional objects and/or two-dimensional shapes • MALS-31MG identifies the features of three- dimensional objects and/or two-dimensional shapes and applies these in a range of contexts	MA4-17MG classifies, describes and uses the properties of triangles and quadrilaterals, and determines congruent triangles to find unknown side lengths and angles	MA5.1-11MG describes and applies the properties of similar figures and scale drawings	MA5.2-14MG calculates the angle sum of any polygon and uses minimum conditions to prove triangles are congruent or similar	MA5.3-16MG proves triangles are similar, and uses formal geometric reasoning to establish properties of triangles and quadrilaterals
		ANGLE RELATIONSHIPS	MA4-18MG identifies and uses angle relationships, including those related to transversals on sets of parallel lines			
		CIRCLE GEOMETRY				MA5.3-17MG applies deductive reasoning to prove circle theorems and to solve related problems
STATISTICS & PROBABILITY	Students collect, represent, analyse, interpret and evaluate data, assign and use probabilities, and make sound judgements	**DATA COLLECTION AND REPRESENTATION** • MALS-35SP recognises data displayed in a variety of formats • MALS-36SP gathers, organises and displays data • MALS-37SP interprets information and draws conclusions from data displays	MA4-19SP collects, represents and interprets single sets of data, using appropriate statistical displays			
		SINGLE VARIABLE DATA ANALYSIS	MA4-20SP analyses single sets of data using measures of location, and range	MA5.1-12SP uses statistical displays to compare sets of data, and evaluates statistical claims made in the media	MA5.2-15SP uses quartiles and box plots to compare sets of data, and evaluates sources of data	MA5.3-18SP uses standard deviation to analyse data
		BIVARIATE DATA ANALYSIS			MA5.2-16SP investigates relationships between two statistical variables, including their relationship over time	MA5.3-19SP investigates the relationship between numerical variables using lines of best fit, and explores how data is used to inform decision-making processes
		PROBABILITY • MALS-38SP recognises and uses the language of chance in a range of contexts • MALS-39SP recognises the elements of chance and probability in everyday events	MA4-21SP represents probabilities of simple and compound events	MA5.1-13SP calculates relative frequencies to estimate probabilities of simple and compound events	MA5.2-17SP describes and calculates probabilities in multi-step chance experiments	

ASSESSMENT

STANDARDS:

The Board of Studies *K–10 Curriculum Framework* is a standards-referenced framework that describes, through syllabuses and other documents, the expected learning outcomes for students.

Standards in the framework consist of three interrelated elements:

- outcomes and content in syllabuses showing what is to be learned
- stage statements that summarise student achievement
- samples of work on the Board's Assessment Resource Centre (ARC) website which provide examples of levels of achievement within a stage.

Syllabus outcomes in Mathematics contribute to a developmental sequence in which students are challenged to acquire new knowledge, understanding and skills.

ASSESSMENT:

Assessment is an integral part of teaching and learning. Well-designed assessment is central to engaging students and should be closely aligned to the outcomes within a stage. Effective assessment increases student engagement in their learning and leads to enhanced student outcomes.

Assessment for Learning, Assessment as Learning and *Assessment of Learning* are three approaches to assessment that play an important role in teaching and learning. The Board of Studies Years K–10 syllabuses particularly promote Assessment for Learning as an essential component of good teaching.

Assessment for learning:

- enables teachers to use information about students' knowledge, understanding and skills to inform their teaching
- teachers provide feedback to students about their learning and how to improve.

Assessment as learning:

- involves students in the learning process where they monitor their own progress. ask questions and practise skills
- students use self-assessment and teacher feedback to reflect on their learning, consolidate their understanding and work towards learning goals.

Assessment of learning:

- assists teachers to use evidence of student learning to assess student achievement against learning goals and standards.

Further advice on programming and appropriate assessment practice in relation to the Mathematics syllabus is contained in Mathematics Years K–10: Advice on Programming and Assessment. This support document provides general advice on assessment as well as strategies to assist teachers in planning education programs.